PPT 4300 Series

Product Reference Guide

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Symbol Technologies, Inc. One Symbol Plaza, Holtsville N.Y. 11742

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70-31471-03
Revision A
May 1999

symbol®

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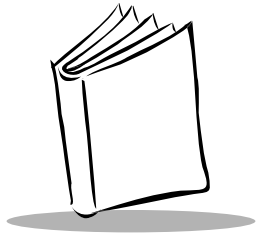
Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
http://www.symbol.com



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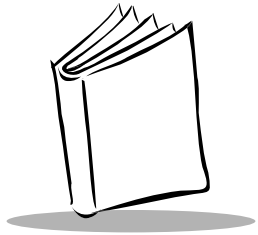


About This Manual

Overview

This Product Reference Guide provides information about the PPT 4300 Series terminal and its accessories, including:

- installation procedures
- configuration
- operation and maintenance
- troubleshooting
- utilities

The instructions and examples in this manual apply to terminals running the following versions of the system software:

- EM Digitizer Driver V0.29 or Touch Panel Driver V0.59
- System Function Driver V0.55
- PPT 4300 BIOS V2.43
- Keyboard Controller mic51sl V1.40
- Control Panel V1.92
- Terminal Emulators V2.01
- Citrix ICA Client for DOS V4.00.606

Notational Conventions

This document uses these conventions:

- "Terminal" refers to a PPT 4300 series terminal.
- "User" refers to anyone using an application on a PPT 4300 series terminal.
- "You" refers to the System Administrator or Technical Support person using this manual as a reference to install, configure, operate, maintain and troubleshoot a PPT 4300 series terminal.
- Non-alphanumeric keys on the terminal's keypad are shown in bold type and angle brackets. For example: Press **<Del>**.
- Menu items and fields on a terminal screen appear in **Bold** type.
- DOS command line text and file names appear in `Courier` type.
- *Italics* are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents.
- Bullets (♦) indicate:
  - lists of alternatives or action items
  - lists of required steps that are not necessarily sequential
- Numbered lists indicate a set of instructions that describe step-by-step procedures.

Related Publications

The following list of documents and publications also provide useful information about PPT 4300 terminals or about the tools and utilities that are available for the terminal.

Documents Available from Symbol Technologies

- *PPT 4300 Series Quick Reference Guide*
  p/n 70-35832-xx
- *PPT 4300 Series with Integrated Scanner Quick Reference Guide*
  p/n 70-36495-xx
- *Spectrum24 Wireless LAN PC Card User Guide*
  p/n 70-12058-xx
- *Spectrum24 Ethernet Access Point User's Guide*
  p/n 70-12057-xx

- *Spectrum24 Access Point AP-3020 Product Reference Guide*
  p/n 70-20504-xx
- *CardSoft 3.1 User's Guide*
  p/n 70-17013-xx

External Documents and Publications

- *Citrix*® MetaFrame *Citrix ICA Client User's Guide* V4.0, Citrix Systems Inc.
- *Citrix*® MetaFrame *Administrator's Guide* V1.0, Citrix Systems Inc.
- *Datalight*® *ROM-DOS 6.22 User's Guide*, Datalight, Inc.
- *Internetworking with TCP/IP, Vol. I*, Douglas E. Comer, Prentice Hall, 1991

Service Information

If you have a problem with the PPT 4300 equipment, contact the Symbol Support Center. Before calling, have the terminal near at hand. Call from a phone in an area near the server and an Access Point, so that the technical support person can try to talk you through your problem.

If your problem cannot be resolved by telephone, you may need to return the equipment for servicing. If that is necessary, you will be given special directions.

Note: *Symbol Technologies is not responsible for any damage incurred during shipment if the approved shipping container is not used. Shipping the units improperly may void the warranty. If the original shipping container has not been kept, contact Symbol to have another sent to you.*

Symbol Support Center

If you purchased your Symbol Product from a Symbol Business Partner, contact that Business partner for service.Otherwise, contact the Symbol Support Center for service information, warranty information or technical assistance.

USA

1-800-653-5350

Canada

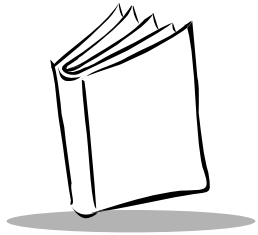
Mississauga, Ontario
Canadian Headquarters
(905) 629-7226

Europe

Wokingham, England
European Headquarters
0734-771-222 (Inside UK)
+441-734-771222 (Outside UK)

Asia

Singapore
Symbol Technologies Asia, Inc.
337-6588 (Inside Singapore)
+65-337-6588 (Outside Singapore)



Chapter 1 Getting Started

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Overview

The PPT 4300 series of portable terminals allow users to run stand-alone or network applications. Radio-equipped terminals can provide access to your facility's existing network applications. They run Terminal Emulators, and offer Windows™ functionality through the Citrix® ICA™ Client for DOS. Integrated Scanning terminals provide 1-D standard scanning capability.

PPT 4300 standard features include:

- 7.2 inch color VGA screen with backlight (640 x 480 resolution)
- 78 key keypad, with 12 function keys
- pen touch and select
- mouse functions with pen in Citrix mouse-aware applications: left and right click, double click, drag and drop
- keypad backlight
- user-accessible expansion slot (PCMCIA) for running specialized applications and utilities and customizing the terminal.
- serial and IrDA (infrared) ports
- external keyboard port
- terminal emulators: TN3270, TN5250 and VT220, over TCP/IP
- support for a radio card using the Spring or 802.11 protocols
- support for Windows applications, via the Citrix ICA DOS Client
- support for DOS applications

PPT 4340 versions include a Symbol Spectrum24 wireless LAN card in an internal PCMCIA slot. Integrated Scanner versions include an integrated bar code scanning module.

Purpose of This Manual

This manual is for Information Systems or Technical Support personnel responsible for installing and supporting PPT 4300 series terminals. It describes how to install, configure, operate and maintain a PPT 4300 series terminal.

For information on day-to-day functions for end-users, see the *PPT 4300 Series Quick Reference Guide*, p/n 70-35832-xx, or the *PPT 4300 Series with Integrated Scanner Quick Reference Guide,* p/n 70-36495-xx.

Information in this manual is valid for terminals running the following versions of the system software:

- EM Digitizer Driver V0.29 or Touch Panel Driver V0.59
- System Function Driver V0.55
- PPT 4300 BIOS V2.43
- Keyboard Controller mic51sl V1.40
- Control Panel V1.87
- Terminal Emulators V2.01
- Citrix ICA Client for DOS V4.00.606

Unpacking the Terminal

When you unpack the terminal, carefully remove all protective material from around the device. Save the shipping container and materials for later storage and shipping.

Verify that you have received all equipment listed on the packing slip and inspect the equipment for damage. If you find any damage, or are missing items, contact the Symbol Support Center at **(800) 653-5350** immediately.

Standard accessories include:

- one Electromagnetic or Resistive pen
- one battery
- a Quick Reference Guide

Optional accessories may include:

- extra Electromagnetic pens
- extra batteries
- 18V DC wall adapter (for use in North America only)
- PPT 4300 Utilities PC card
- a 12 inch (30.5 cm) or 60 inch (1.52 m) strap
- external keyboard
- serial to RS232 adapter cable
- serial adapter cable for attaching a bar code scanner
- four-slot battery charger with adapter

- single-slot battery charger with adapter
- plastic stand

Wireless Communication Overview

When you switch on a terminal that has been configured for wireless communication, it transmits a radio signal to a Spectrum24 Access Point, requesting connection. The request includes information that uniquely identifies the terminal that sent the transmission. The Access Point receives the radio signal and forwards it over the wired network to the host computer (see Figure 1-1).

Assuming that the host computer recognizes the terminal that sent the signal, the host sends information back over the network to the Access Point. The Access Point then forwards the information to the terminal that originally sent the request.

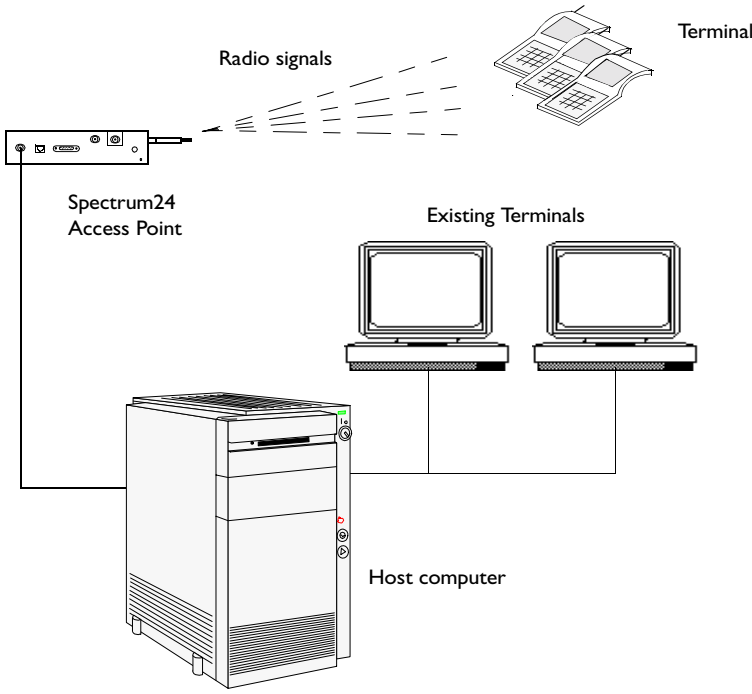


Figure 1-1. Wireless Communication Overview

Parts of the Terminal

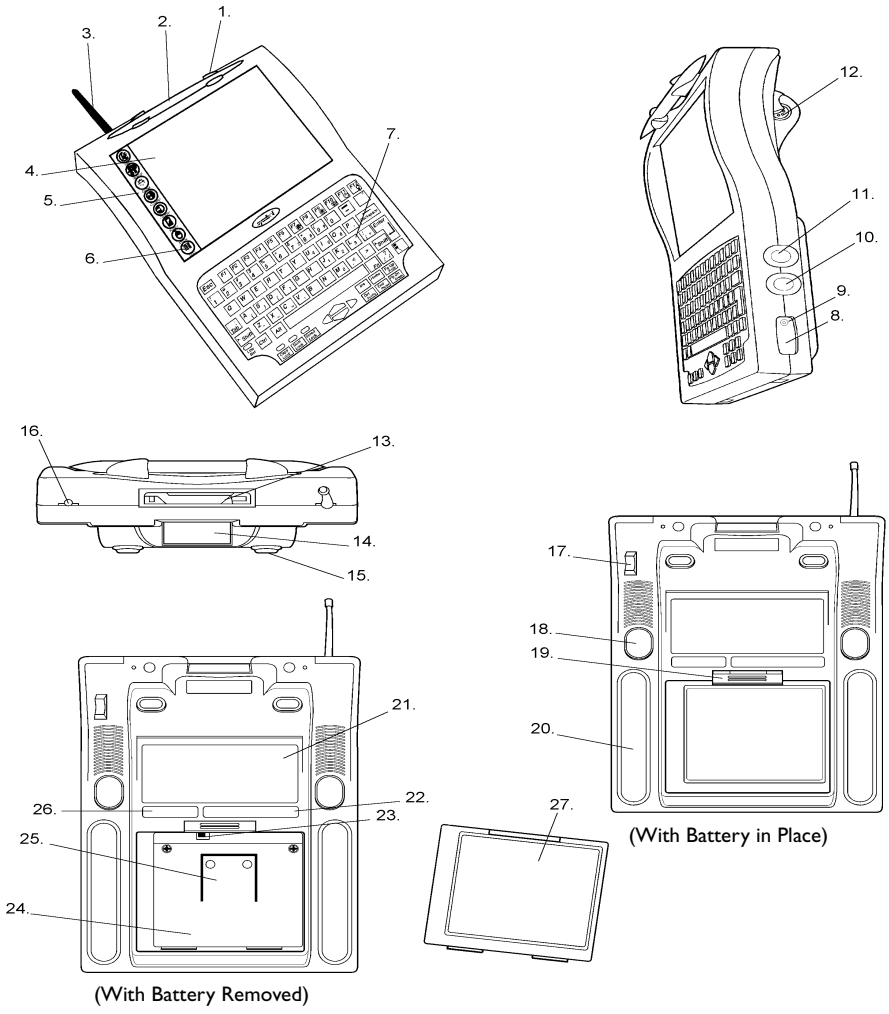


Figure 1-2. Parts of a PPT 4300 Series Terminal

Parts of the Terminal

A PPT 4300 series terminal has the parts listed here. Refer to Figure 1-2 for location of these parts.

1. Pen Snap Holder
2. Pen
3. Antenna (*on radio-equipped terminals only)*
4. Display Screen
5. Direct Access Panel
6. Scanning Icon (*functions only on PPT 4300-S0E models*)
7. Keypad
8. IrDA Port
9. Force-On Switch
10. DC Power Input Connector
11. External Keyboard Connector
12. RS232 Serial Connector
13. PCMCIA Slot
14. Scanner Lens (*functions only on PPT 4300-S0E models*)
15. Scanner Foot (*functions only on PPT 4300-S0E model.*)
16. Strap Mounting Screw-hole
17. Support for RS232 Interface Plug
18. Scanner Switch (*functions only on PPT 4300-S0E models*)
19. Battery Latch
20. Rubber Foot
21. Regulatory Label
22. Serial Number Label
23. Run/Ship Switch
24. Battery Well
25. Battery Ejector Spring
26. Model Number Label
27. NiMH Battery Pack

Parts of the Terminal

Direct Access Panel. A vertical strip of icons located on the left side of the Display Screen. Direct Access Panel icons allow you to control or view settings and features, including: Power, Settings, Brightness, Contrast, Battery Level and Scanning. To select an icon from the Direct Access Panel, press it with the pen.

Display Screen. A color 7.2 inch VGA screen. PPT 4300-00E and PPT 4300-S0E models use an electromagnetic digitizer with an active pen.PPT 4300-00R series models use a pressure-sensitive resistive digitizer with a plastic-tipped, passive pen. Only use the correct Symbol-approved pen on the Display screen.

Keypad. An integral 78-key keypad with 12 function keys and embedded numeric keypad.

Antenna. Used in wireless radio frequency communication. To comply with FCC regulations, DO NOT attempt to remove, repair or modify the antenna in any way.

Ports. Includes Infrared (IrDA) port, external DC port, external keyboard port, and a nine-pin serial port. The Infrared port also incorporates a Force On switch.

Scanner Lens. May be installed on the terminal, but only functions on PPT 4300-S0E models. Located at the top of the terminal. The scanner laser beam is transmitted through the red lens. *Do not look into the lens while using the scanner.* To activate the Scanner, press either the switches on the back of the terminal, or press the Scan icon on the Direct Access panel.

Scanner Switches. May be installed on the terminal, but only functions on PPT 4300-S0E models. Located on the back of the terminal. The left switch and the right switch both activate the integrated scanner.

Expansion Slot. A user-accessible Expansion Slot that holds a Type I or Type II PCMCIA Card. Facilities may use the Expansion Slot to customize the terminal or run applications. See PC Card Slots on page 1-9.

Run/Ship Switch. Located inside the battery well. When terminals are shipped, this switch is set to Ship to conserve CMOS battery power. When you first configure the terminal, set the switch to Run, insert a charged battery, and then boot the terminal by pressing the Power icon on the Direct Access Panel. Do not set the switch to Ship unless the terminal is being shipped, or will be stored without a battery for longer than a week.

Serial Number Label and Sticker. The label and underlying sticker show the terminal's serial number. You need this serial number if you call Symbol Customer Support about the terminal.

Processing Capability. Includes an AMD SC310 processor with 33 MHz clock rate, 256 or 512 KB of BIOS flash storage, 4 or 16 MB on-board RAM, and 2 or 16 MB flash storage space.

PC Card Slots. Provides two Type II PC Card slots that accept a Type I or Type II PC Card, including SRAM, DRAM or Flash cards to provide additional storage space, as well as radio, modem and LAN cards. Standard configuration includes a Symbol Spectrum24 wireless LAN radio (requires one PC Card slot), using TCP/IP protocols.

Operating System. Datalight™ ROM-DOS version 6.22.

Accessories/Peripherals

PPT 4300 series terminals also use the accessories and peripheral equipment listed here. To prevent voiding regulatory approvals, always use accessories supplied by Symbol.

Pen

Citrix sessions use the pen as a mouse for left and right click, double click, and drag-and-drop operations. In TN3270 or TN 5250 sessions, you can use the pen to select items. PPT 4300-00E and PPT 4300-S0E series models use an electromagnetic pen. PPT 4300-00R series models use a plastic-tipped pen. Only use the correct, Symbol-approved pen for your model of PPT 4300. *Do not* use anything that will scratch or mark the screen.

Battery Pack and Swap Battery

For primary power, the terminal uses a removable, rechargeable NiMH battery pack. A new battery pack has an active life of 4 - 5 hours of continuous use. Active battery life increases if Power Management is used. An internal rechargeable swap battery provides backup power so that users can change the battery pack without powering the terminal off or losing connection with the host. For more information on batteries and power, see Chapter 5, *Operation*.

Battery Chargers

Two types of battery chargers are available. The single-slot charger recharges a single battery For more information, refer to the documentation that came with the battery charger.

18V DC Wall Adapter

An 18V DC wall adapter allows you to power the terminal from a standard North American electrical outlet. DC wall adapters are available for 120V and 220V systems. When using an adapter with a terminal, make sure to use the correct DC adapter; using other adapters may damage the terminal's circuitry.

External Keyboard

Symbol can provide a low power PS/2-AT keyboard, suitable for battery operation. It connects to the external keyboard port and has a small footprint. See *Using an External Keyboard* on page 5-9 for more information.

RS232 Adapter Cable

A cable with a 9-pin RS232 D-connector that is available to connect with some serial devices. It connects to the terminal's custom 9-pin serial port.

Serial Port Scanner Adapter Cable

A cable with a 9-pin connector that is available to connect to some Symbol scanners (*e.g.*, the LS1820 scanner). It connects to the terminal's custom 9-pin serial port.

Straps

For easier carrying, Symbol can provide a 12 inch non-adjustable or a 60 inch adjustable shoulder strap for the terminal. See Appendix C, *Hardware Components*.

PPT 4300 Utilities PC Card

This PCMCIA card allows you to re-install any of the software that was provided with the PPT 4300 series terminal. It also includes a number of supplementary drivers and utilities. See Chapter 3, *Software Installation*.

Before You Use the Terminal

This section outlines what must be done before anyone attempts to use the terminal.

1. Set up Network and Access Point Prerequisites

If you intend to configure or use a PPT 4340 terminal for wireless communication, one or more compatible Spectrum24 Access Points must be set up and configured for your network. If you run Windows applications, you must set up a server to run the Citrix ICA software. See Spectrum24 and Citrix ICA documentation for details.

2. Provide a Power Source

Before using a PPT 4300 terminal for the first time, either plug it into an external power source, or make sure you have several fully-charged NiMH batteries available. See Chapter 5, *Operation*, and Chapter 9, *Maintenance*, for instructions on changing and charging batteries.

Note: *You can power the terminal from an external DC adapter plugged into an electrical outlet, while waiting for batteries to charge. Only use the wall adapter available from Symbol.*

---

3. Set the Run/Ship Switch

Terminals are shipped with the battery Run/Ship switch set to **Ship**. This setting conserves CMOS battery power while the terminal is being shipped. See Figure 1-2 for location of this switch. Move the switch to the **Run** position before using the terminal.

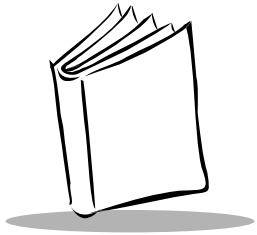
4. Start the Terminal

To start the terminal, press the Power icon on the Direct Access Panel with the pen. If the terminal does not start, see Chapter 10, *Troubleshooting*.

5. Configure the Terminal

Each terminal includes the ROM-DOS® operating system, and a suite of other software, loaded at time of manufacture. For information on the software environment, see Chapter 2, *Software Environment*. For information on loading or modifying the software see Chapter 3, *Software Installation*.

Basic terminal configuration consists of starting the terminal and setting the terminal's operating parameters. For information on configuration procedures and options, see Chapter 4, *Standard Terminal Configuration*.



Chapter 2 Software Environment

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Overview

PPT 4300 terminals come with software pre-installed in an on-board flash file system. Software installed into flash includes the Datalight ROM-DOS Operating System, the Terminal Emulation software, the Citrix ICA Client for DOS application, and all of the utilities and drivers necessary for running these applications. The operating system loads into on-board RAM when the terminal boots.

The terminal also has two PC card slots. One is internal and *not* accessible from the outside of the terminal. For standard terminals set up for wireless communication with a network, the internal slot has a factory-installed Spectrum24 radio card. The other slot is a user-accessible external Expansion Slot that can be used to load and run applications or other functions from a PCMCIA card. The Expansion Slot is also used to upgrade the BIOS and other software from a PPT 4300 Utilities PC card.

This chapter describes the operating system and supported software, protocols and drivers. For installation procedures, see Chapter 3, *Software Installation*.

Memory and File Storage Space

A standard PPT 4300 terminal has 4 MB of internal RAM, 2 MB of file storage space in an on-board flash file system, and 256 KB of BIOS flash storage. Terminals are available with up to 16 MB of internal RAM and 16 MB of flash storage space. The amounts of RAM and internal flash determine what software can be loaded and configured on the terminal.

Internal RAM

A standard terminal has 4 MB of RAM for running applications, but terminals with up to 16 MB of RAM are also available. The internal RAM is loaded with the BIOS, BIOS extensions, VGA BIOS and other features shown in the Memory Layout diagram below. BIOS extensions include the CardTrick and CardBoot utilities. CardTrick allows the BIOS to read, write to, or boot from internal flash. CardBoot allows the BIOS to read, write or boot from a PC card in the Expansion Slot. See *Expansion Slot Options* on page 2-18 for more information.

The BIOS includes a System Configuration Utility that allows you to change or edit BIOS settings. See *System Configuration Utility (SCU)* on page 10-5 for more information on using the SCU. For more Memory Map information, see Appendix C, *Hardware Components*.

Memory Layout

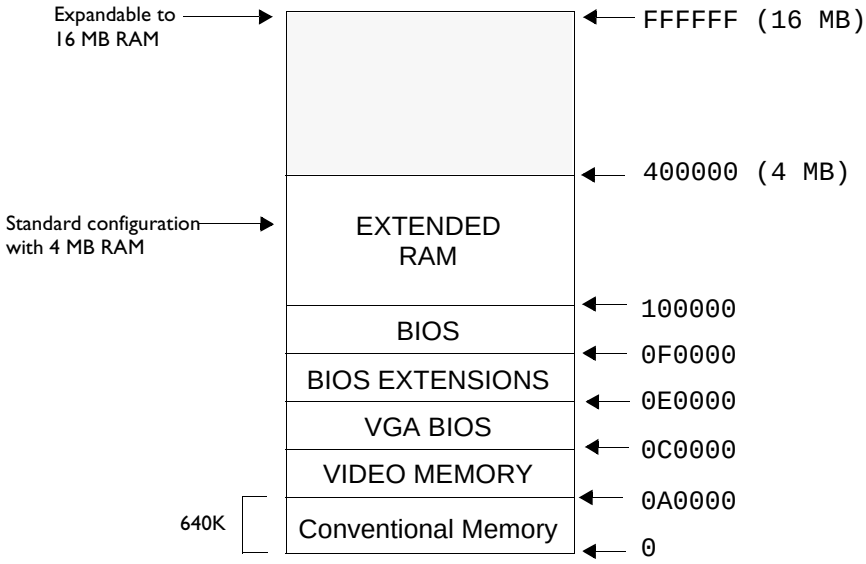


Figure 2-1. Memory Layout Diagram

Internal Flash Memory

A standard terminal has an internal flash file system with 2 MB of data storage formatted as one drive, but terminals are available with up to 16 MB of flash storage space in a Flash Expansion Module. This internal file system is fully readable and writable: you can create, edit and remove files from the flash file system.

The flash file system stores the ROM-DOS operating system, and the other software supplied with the terminal or loaded by your facility. For information on the software provided with the terminal, see *Operating System and Software* on page 2-6.

Adding File Storage Space

To increase the file storage space on the terminal you may:

- use an internal, factory-installed Flash Expansion Module
- insert a PCMCIA (PC) storage card in the external PC Card Slot
- use a combination of a Flash Expansion Module and a PC card in the Expansion Slot

A Flash Expansion Module expands the size of the existing on-board flash file system from 2 MB to 4, 8, or 16 MB. It must be factory-installed, but it leaves the Expansion Slot open. See Chapter 3, *Software Installation* for information on partitioning Flash Expansion Modules. A PC storage card, mounted as a separate drive, can be used in the PC Expansion Slot to add 80 MB or more to the total system, depending on the size of the PC card. PPT 4300 terminals support PC cards in ATA (recommended), SRAM and linear FTL formats.

CMOS Memory

The terminal has 128 bytes of non-volatile CMOS memory that stores BIOS settings and the date and time registers (real-time clock).

Operating System and Software

Software Installed on a PPT 4300

A standard PPT 4300 terminal comes with this software installed:

- **ROM-DOS**. A DOS 6.22 compatible operating system. A subset of ROM-DOS files is pre-installed on the terminal. The PPT 4300 Utilities PC card includes additional DOS files.
- **CardSoft**. CardSoft allows the terminal to use a wider variety of PC cards (*e.g.*, FTL-formatted, SRAM). See page 2-12 for more information on CardSoft. By default, this software is *not* installed on the terminal, but it has been included on the PPT 4300 Utilities PC Card. You can install CardSoft files using the installation utility on the PPT 4300 Utilities PC card (described on page 3-8).
- **Networking.** Software that allows the terminal to communicate with the network. A subset of this software is pre-installed on the terminal.
- **Citrix** ICA Client for DOS. Software that allows you to run Windows applications remotely. A subset of this software is pre-installed on the terminal.
- **Terminal Emulators**. Software that makes a PPT 4340 emulate a standard character-based terminal. The PPT 4340 supports emulations in TN3270, TN5250, or VT220.
- **Utility package**. The terminal also comes equipped with a number of utilities. This software includes `mutohpen.com`, `touch.com`, `off.com` and some configuration files.

For release notes, see `\release.txt` in the root directory on the terminal. For a complete list of files included on the terminal, see Appendix D, *Software Files*. Symbol has a PPT 4300 Utilities PC card available that can be used to re-install any of this software, should the need arise. See *PPT 4300 Utilities PC Card* on page 2-15.

PPT 4300 Directory Structure

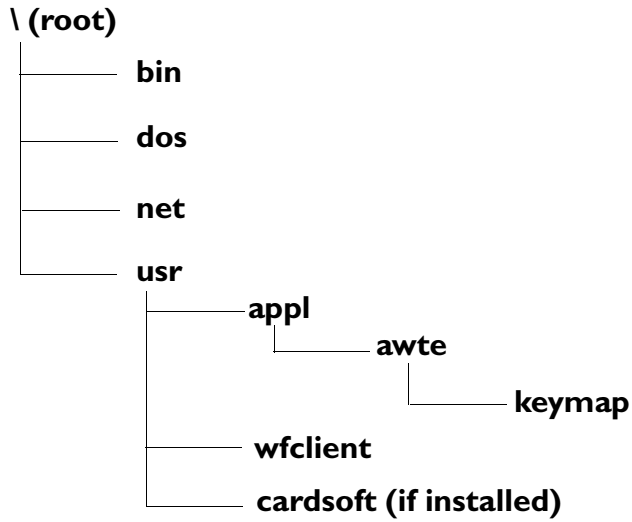


Figure 2-2. PPT 4300 Directory Structure

root: Includes `autoexec.bat`, `config.sys` and other important system and configuration files, including `ppt4300.ini`. See page 7-4 for detailed information on `ppt4300.ini`.

bin: Includes some important system utilities and drivers, including `ctrlpnl.exe`, `mutohpen.com`, `touch.com`, `sfinit.com`, `sftsr.com`, `kbwedge.com` and `off.com`. PPT 4300-00E and PPT 4300-S0E units only use the `mutohpen.com` driver.

dos: ROM-DOS files. These include `emm386.exe`, the NED text editor, `ata.sys` and `himem.sys`.

net: Contains the software files and drivers necessary for communication with a network.

usr: Includes two subdirectories: `awte` and `wfclient`. If you install CardSoft, the installation utility places the `cardsoft` directory as a subdirectory of `usr`.

- The `awte` subdirectory includes the software necessary for running the PPT 4300 Terminal Emulators. The `keymap` subdirectory contains the `keymap.cfg` file required for defining the Host Choice List and custom keymaps. See Chapter 7, *Using the Terminal Emulators* for more information.
- The `wfclient` subdirectory includes the software necessary for running the Citrix ICA Client for DOS application.

Using the NED Editor

The terminal comes with a copy of the NED full screen editor. You can use it to create or edit files in the on-board flash system. To use this editor:

1. Boot the terminal to a command line prompt. To do this, look for the ROM-DOS Start-up Menu that appears as the terminal is booting. When it appears, press **<Esc>**, then select option **3**.
2. At the DOS prompt, type `ned` and press **<Enter>** to start the editor. To open the editor for a particular file, you can type in the name of the file at the same time that you open the editor (*e.g.*, `ned autoexec.bat`). Other commands:
   a. To open a menu, press the **<Alt>** key plus the first letter of the menu heading. For example, press **<Alt-F>** to see the **File** menu.
   b. To select an item from a menu, open the menu, press the up or down arrow keys to move the highlight to the choice you want, and then press **<Enter>**. As an alternative, each menu item has a highlighted letter. When a menu is open, press the highlighted letter of the choice you want. For example, press 'x' to select **Exit** from the **File** menu.
   c. Press **<Esc>** to close a menu without making a choice.
   d. Select **Open** from the **File** menu to open a file for editing.
   e. Select **Save** from the **File** menu to save changes to a file.
   f. Select **Exit** from the **File** menu to exit the NED editor. To cancel changes to a file, exit the editor without saving.

Editing autoexec.bat and config.sys

To edit `autoexec.bat`, `config.sys` or other files in the flash file system:

1. Boot the terminal to a DOS prompt (option **3** on the ROM-DOS Start-up Menu).
2. Open the file in the NED editor application. (*e.g.*, `ned autoxec.bat`).

   If an error in `autoexec.bat` or `config.sys` prevents booting to a DOS prompt, you may force them to be skipped by pressing **<F5>** while the terminal is powering up. Since the PATH will not be initialized you will need to type `\dos\ned autoexec.bat` to start the editor.
3. Edit and save the file. Then exit the NED editor and press **<Ctrl-Alt-Del>** to reboot the terminal and activate the changes.

Tables 2-1 and 2-2 summarize the commands available for `autoexec.bat` and `config.sys`. For more specific information, refer to the Datalight ROM-DOS documentation.

Table 2-1. Commands for `autoexec.bat`

Command	Purpose
prompt	Sets the appearance of the command prompt.
mode[a]	Sets the characteristics of the keypad, display, and communications ports.
path	Specifies which directories ROM-DOS will search for executable files (files with `.com`, `.bat` or `.exe` extensions) and the order in which they will be searched.
pause	Causes execution to halt until a key is pressed.
echo	Tells ROM-DOS to display `autoexec.bat` file commands as they run.
rem	Remark. Place this command at the start of any line to prevent it from executing.
set	Creates an environment variable that programs can use.
for	Performs one DOS command on a set of files.
goto	Moves control to a specified line in the batch file.
if	Performs a command based on a specified condition.
loadhigh	Loads a program into the upper memory area.
shift	Shifts replaceable parameters one position to the left.

a. This command is not available on the terminal itself, but the PPT 4300 Utilities PC card has a \dos directory that includes a full installation of all ROM-DOS features and commands.

Table 2-2. Commands for `config.sys`

Command	Purpose
;	Remark. Place this command at the start of any non-executing line.
BREAK	Turns on or off the ability to stop program execution at a non-I/O point.
BUFFERS	Sets the number of internal data buffers.
DEVICE	Installs a device driver into ROM-DOS.
DEVICEHIGH	Loads a device into the upper memory area.
DOS	Installs ROM-DOS into High Memory Area (HMA).
FCBS	Specifies the number of File Control Blocks (FCBS) open at the same time.
FILES	Sets the maximum number of files that can be open at once on the system.
INCLUDE	`config.sys` menu configuration command. Allows instructions in one configuration block to be included in another configuration block.

Table 2-2. Commands for `config.sys`

Command	Purpose
INSTALL	Loads Terminate and Stay Resident (TSR) programs during `config.sys` processing.
LASTDRIVE	Sets the maximum number of drives.
MENUCOLOR	`config.sys` menu configuration command. Allows setting of text and background colors for start-up menu.
MENUDEFAULT	`config.sys` menu configuration command. Sets the default menu item choice and time-out value for making a selection.
MENUITEM	`config.sys` menu configuration command. Specifies an item to be placed on the start-up menu displayed during system boot.
NEWFILE	Allows continuation of `config.sys` processing from a new file.
NUMLOCK	Sets the NUMLOCK keyboard key to on or off when the terminal starts.
SET	Sets environment variables and command processor strings.
SHELL	Allows selection of an alternate shell program from the default `command.com` command processor.
STACKS	Allows for the use of dynamic data stacks to handle interrupts.
SUBMENU	`config.sys` menu configuration command. Defines a menu item that represents a secondary menu.
SWITCHES	Allows special `config.sys` file options.
COUNTRY[a]	Sets local date, time and currency conventions for a different country.

a. The PPT 4300 terminal provides a subset of ROM-DOS features and commands. This command is not available on the terminal itself, but the PPT 4300 Utilities PC card has a \dos directory that includes a full installation of all ROM-DOS features and commands.

PPT 4300 Utilities PC Card

The PPT 4300 Utilities PC card allows you to re-install any of the software that was provided with a PPT 4300 series terminal. This includes: the BIOS, System files, Terminal Emulators, Citrix ICA Client for DOS and communications software. It also includes a number of supplementary drivers, utilities and diagnostic tests. See Appendix D, *PPT 4300 Software Files* for a complete list of files included on the PPT 4300 Utilities PC card.

Utilities PC Card Directory Structure

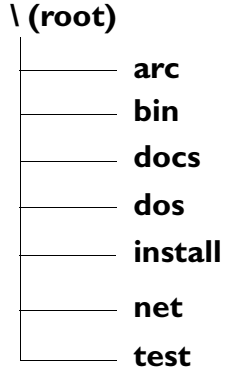


Figure 2-3. PPT 4300 Utilities PC Card Directory Structure

`root`: Includes copies of `autoexec.bat`, `config.sys`, `menu.bat` and `ppt4300.ini`. The `menu.bat` file displays menus when you boot from the PPT 4300 Utilities PC card.

`arc`: Contains a zipped file that contains the BIOS image for a PPT 4300 series terminal. The install utility extracts the BIOS image from this file.

`bin`: Includes the same system utilities and drivers found in the `bin` directory on the terminal. It also includes some supplementary files that may be necessary (*e.g.*, `dlfmt.exe`, `fload.exe`, `scanner.com`, `awsys.exe`).

`docs`: Release note files.

`dos`: A complete set of ROM-DOS files and utilities.

`install`: An installation utility and a compressed archive of PPT 4300 series software.

`net`: A complete set of the files and drivers necessary for communication with a network.

`test`: Contains all of the diagnostic tests and utilities. See Chapter 11, *PPT 4300 Utilities PC Card*, for information on performing diagnostic tests.

Powering the Terminal On

CardBoot and CardTrick

When you power on the terminal, it boots from its own internal flash drive, or from a PC Card in the Expansion Slot. When the terminal boots, the CardBoot BIOS extension checks to see if the Expansion Slot has a bootable PC card. If it finds one, it designates the PC card as the C: drive. Then CardTrick (another BIOS extension) checks the internal flash file system for a valid file system. If C: has already been assigned, the internal flash will become the D: drive, otherwise it will be C: drive. See *Drive Letter Designations*, below, for more information. The System tab of the Control Panel determines whether or not the terminal will try to boot from the Expansion Slot. By default, the **Enable PC Card Boot** option is enabled (box contains an "x"). If you disable the PC Card Boot option, the terminal will not boot from a PC Card.

CardSoft

The CardSoft files include software drivers that allow the terminal to use various types of PC cards, and to read and write to SRAM and FTL-formatted PC storage cards. They are provided on the PPT 4300 Utilities PC card and can be installed as a configuration option.

To install CardSoft software, follow the instructions for installing software from the PPT 4300 Utilities PC card (page 3-8). Select one of the installation options that includes CardSoft (*e.g.*, `Install Only CardSoft`).

Note: *If you use CardSoft, disable the* `ata.sys` *line in the* `config.sys` *file because both utilities will attempt to control the same card slots.*

Drive Letter Designations

If the terminal boots from the internal flash system, ROM-DOS assigns the C: drive letter to the first partition of the internal flash drive, if it contains a bootable image. Other drive letters are assigned sequentially as determined by file system drivers (*e.g.*, `ata.sys`, `ctrfa.sys`) loaded in `config.sys` or `autoexec.bat`. Usually the next internal partition becomes the D: drive. A subsequent partition would become the E: drive, and so on. See Table 2-3 for a summary.

The PPT 4300 Utilities PC card uses an unusual system for drive mapping. If you boot from a PC card, the CardBoot BIOS extension mounts the card as the C: drive. Then the CardTrick BIOS extension mounts the first partition of the internal flash as the D: drive. However if this

internal partition is corrupt or not formatted, CardTrick will not load and the D: letter will not be assigned at this point. To cover this situation and allow the partition to be accessed, a second file system driver (`ctrfa.sys`) is loaded for the first partition. The `ctrfa.sys` driver loads even if the partition is corrupt, and allows a re-format to be done.

If you boot from the PPT 4300 Utilities PC card, and the first internal partition is intact, it will have two drivers attached to it: CardTrick (D:) and `ctrfa.sys` (E:). If the first internal partition is corrupt, CardTrick does not load, and `ctrfa.sys` loads as the D: drive.

Table 2-3 summarizes drive letter assignments for a terminal using a standard configuration with a single or multi-partitioned internal flash drive. Terminals with custom configurations (*e.g.*, changes to `autoexec.bat` or `config.sys`) may use different drive letter assignments.

Table 2-3. Drive Letter Assignments

Drive Letters: / Booting From:	Ext. PC Card Slot	Int. PC Card Slot	First Int. Flash Drive (via CardTrick)	First Int. Flash Drive (via ctrfa.sys)[a]	Other Int. Flash Drives (via ctrfa.sys)
First Internal Flash Drive	D:[b] (via ata.sys)	E: (via ata.sys)	C:	Not used	F:, G:, etc.
PPT 4300 Utilities PC Card (first internal flash drive intact)	C: (via CardBoot)	No drive letter.	D:	E:[c]	F:, G:, etc.
PPT 4300 Utilities PC Card (first internal flash drive corrupt or unformatted)	C: (via CardBoot)	No drive letter.	Will not load.	D:	E:, F:, etc.

a. When specifying drive partitions for formatting or installing, use the ctrfa.sys drive (usually E:).
b. PC card is inserted after the terminal boots.
c. Where D: and E: both point to the first internal flash drive, use the E: drive letter. Do not switch from E: to D: or vice versa.

Expansion Slot Options

Other software can be installed onto the terminal's internal flash file system, as described in *Copying Other Software onto a Terminal* on page 3-23, however you may also use a PCMCIA (PC) card in the Expansion Slot for additional storage. This allows you to use:

- applications that do not fit into the terminal's on-board flash
- applications that are only required occasionally
- alternate configurations, without reconfiguring the internal flash

The Expansion Slot holds a Type I or Type II PC card. It can be used to run applications and files loaded onto an ATA card (recommended), or FTL-formatted or SRAM cards. Note that a PPT 4300 series terminal also has an internal PC card slot that is *not* user-accessible. On PPT 4340 terminals this slot holds a factory-installed Spectrum24 radio card.

PCMCIA (PC) Cards

A PCMCIA (PC) Card is a plug-in component commonly used on laptop computers. PC cards are 85.6mm long x 54 mm wide, and have a 68 pin connector. There are several different types, as shown in Table 2-4.

Table 2-4. PC Card Types

Type	Height	Common Use	Supported?
Type I	3.3 mm	SRAM, DRAM or Flash cards. These can add up to 80 MB of additional file storage space	Yes
Type II	5 mm	Modems, Radio Cards, LAN adaptors	Yes
Type III	10.5 mm	Hard Disks	No

PPT 4300 series terminals support Type I and Type II PC cards. ATA PC cards:

- allow read-write access,
- can be formatted on a PPT 4300
- recommended for file storage.

For more information, see *Creating a Bootable PC Card for the PPT 4300* on page 3-25. SRAM and Linear FTL-formatted cards can also be used (see *FTL-Formatted Cards and SRAM Cards* on page 2-15).

Powering On From a PC Card

If you power on (boot) from a PC card, the terminal loads ROM-DOS and start-up files from the PC card, not from the internal flash. A bootable PC card has its own `autoexec.bat` and `config.sys` files, menus and applications that may be completely different from the on-board flash file system. You can use the Control Panel to enable or disable the PC card boot process. See *System Options* on page 6-17.

ATA Cards

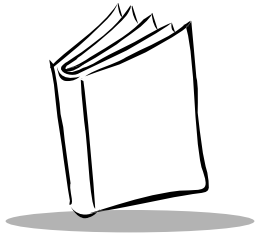
PPT 4300 terminals have full read/write access to ATA cards.

- If you boot from the internal flash drive, and then insert an ATA card, CardTrick mounts the internal flash as the C: drive, and `ata.sys`, if present, mounts the ATA card as the D: drive.
- If you boot from the ATA card, CardBoot mounts the ATA card as the C: drive, and CardTrick mounts the internal flash as the D: drive.

Custom installations may result in other drive letter assignments (see page 2-12). For example, different drive letters will be assigned if the internal flash has been partitioned into multiple drives. See *Partitioning a Flash Expansion Module* on page 3-27 for instructions on partitioning.

FTL-Formatted Cards and SRAM Cards

FTL-formatted PC cards and SRAM cards can also be used with the PPT 4300. Some modifications may need to be made to the configuration (*e.g.*, loading CardSoft drivers, editing `autoexec.bat`). Contact Symbol Technical Support for more information.



Chapter 3 Software Installation

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Overview

You may need to install or upgrade PPT 4300 software if:

- pre-installed software has been removed and you wish to replace it
- upgrades to the installed software become available

This chapter describes how to:

- format the internal flash file system
- install or upgrade software
- upgrade the BIOS
- partition a Flash Expansion module

Note: *To use PPT 4300 Utilities PC card to install software, you must enable the* ***PC Card Boot*** *option on the System tab on the Control Panel. If necessary you can also enable this option by restoring factory default settings at the System Configuration Utility (SCU).*

Formatting the Internal Flash File System

Formatting completely erases the contents of the internal flash file system, including boot files. You must format the internal flash file system (the integrated flash array) if the file system is corrupt. You may also need to reformat the first partition if you boot the terminal, and see a "`System Not Found`" message (see Chapter 10, *Troubleshooting*).

If you are formatting a terminal that has more than one internal partition, use these instructions to format and install system files ('sys') to the first internal partition only (C:, when you boot from the terminal). To format subsequent internal flash partitions, use the `dlfmt` command, as described in Step 3 on page 3-31. After formatting the internal flash file system, you must re-install and re-configure the terminal's software.

To format the internal flash file system on a PPT 4300 series terminal:

1. Plug the terminal into an electrical outlet using a DC wall adapter to disable power management and prevent low battery interruptions during the process.
2. Remove the rubber plug from the Expansion Slot at the top of the terminal.
3. Insert the PPT 4300 Utilities PC card into the user-accessible Expansion Slot, connector edge first. Press gently until the card is fully seated.
4. Boot the terminal from the PC card.
5. When you first boot from the Utilities card, you will be prompted to select a keyboard type, as shown in Figure 3-1. If you select 2, the software allows you to select from a list of international keyboards. After five seconds, the default choice is activated (Standard US Keyboard), and the Utility Card Main Menu appears.

```
ROM_DOS Startup Menu                                Time Remaining: 5


1. Standard US Keyboard
2. International Keyboard

Enter Choice: 1




F5=Bypass Startup Files F6=Confirm each CONFIG line [N]
```

Figure 3-1. Utilities Card Keyboard Selection

6. At the Utility Card Main Menu, press **1** to select **Software Installation Menu**.

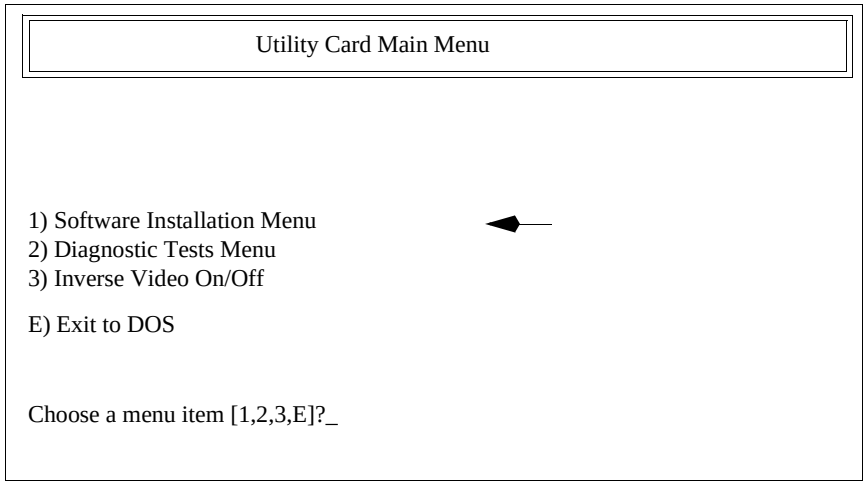


Figure 3-2. Utilities Card Main Menu

7. At the Software Installation Menu, press **1** to select **Run the PPT4300 Software Install Utility.** This loads the install program.

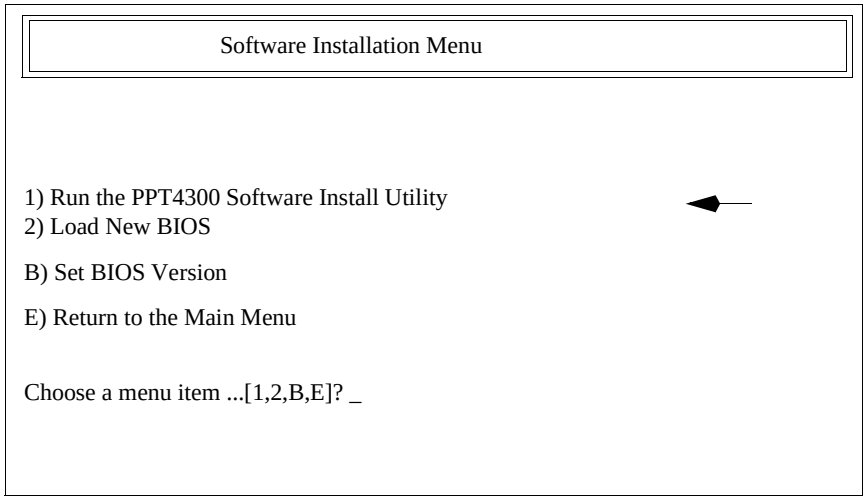


Figure 3-3. Software Installation Menu

8. At the Software Install Utility screen, select **Format & SYS Flash File System.**

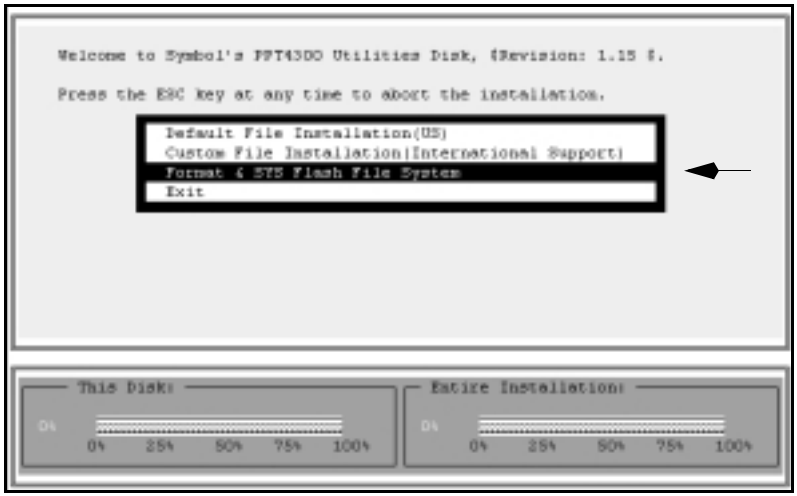


Figure 3-4. Software Install Utility

9. This warning screen appears:

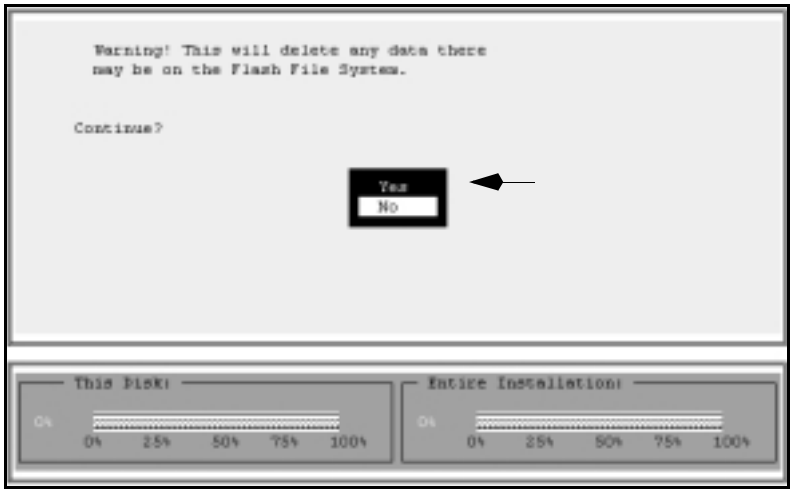


Figure 3-5. Warning Screen

10. Select **Yes** to continue.
11. When prompted for a destination drive, select **E:** to format the first partition of the internal flash drive.

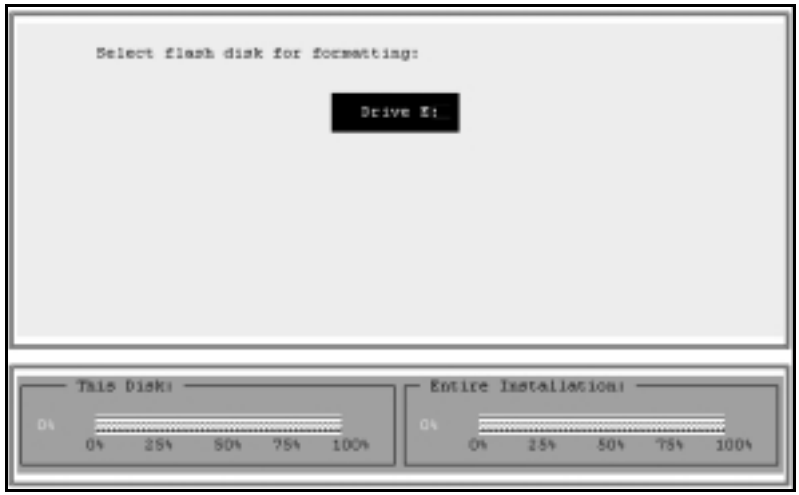


Figure 3-6. Selecting a Destination Drive

The PPT 4300 Utilities PC card uses the C: drive letter and the CardBoot BIOS Extension uses the D: drive letter. However if the internal flash file system is corrupt, use D: as the destination drive. See *Drive Letter Designations* on page 2-12 for a more complete explanation.

12. The Software Install Utility formats the internal file system with the `dflfmt` command and makes it bootable with `sys.com`. These files are copied to the file system: `ibmbio.com`, `ibmdos.com` and `command.com`. The first two of these files are hidden.
13. Enter the Volume Label when prompted.
14. Press the spacebar to return to the Software Install Utility screen.
15. The terminal's internal flash file system has now been formatted and made bootable. You can load software onto it.
    - To install software from the PPT 4300 Utilities PC card see *Default File Installation* on page 3-8 or *Custom File Installation* on page 3-12.
    - Also see *Copying Other Software onto a Terminal* on page 3-22.

Installing Software from the PPT 4300 Utilities Card

This section describes how to install software from a PPT 4300 Utilities PC card onto a PPT 4300 series terminal. Two installation types are available: default and custom.

The default installation uses an auto-detect feature to detect the type of digitizer and Spectrum 24 radio in your terminal and install the correct drivers. The default option installs integrated scanner drivers and the Core/Citrix/AWTE combination of software.

The custom installation allows you to select specified different software combinations, change the digitizer type, install integrated scanner utilities, and configure the keyboard for a country other than the default (United States).

Default File Installation

To perform a default installation of the software from the PPT 4300 Utilities PC card:

1. Plug the terminal into an electrical outlet using a DC wall adapter to disable power management and prevent low battery interruptions during the process.
2. Remove the rubber plug from the Expansion Slot at the top of the terminal and insert the PPT 4300 Utilities PC card, connector edge first. Press gently until the card is fully seated.
3. Boot the terminal from the PPT 4300 Utilities PC card. When you first boot from the PC card, you will be prompted to select a keyboard type, as shown in Figure 3-7. If you select 2, the software allows you to select from a list of international keyboards. After five seconds, the default choice is activated (Standard US Keyboard), and the Utility Card Main menu appears, as shown in Figure 3-8.

```
ROM_DOS Startup Menu                          Time Remaining: 5


1. Standard US Keyboard
2. International Keyboard

Enter Choice: 1




F5=Bypass Startup Files F6=Confirm each CONFIG line [N]
```

Figure 3-7. Utilities Card Keyboard Selection

4. At the Utility Card Main Menu, press **1** to select **Software Installation Menu**.

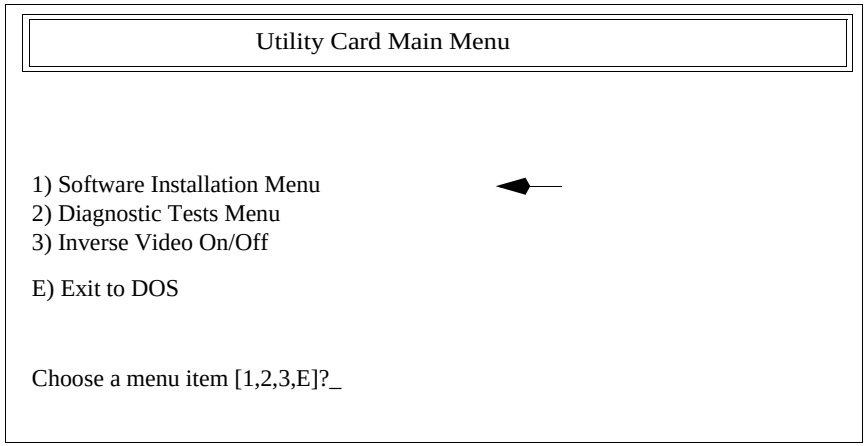


Figure 3-8. Utilities Card Main Menu

5. At the Software Installation Menu, press **1** to select **Run the PPT4300 Software Install Utility.** This loads the install program (shown in Figure 3-10).

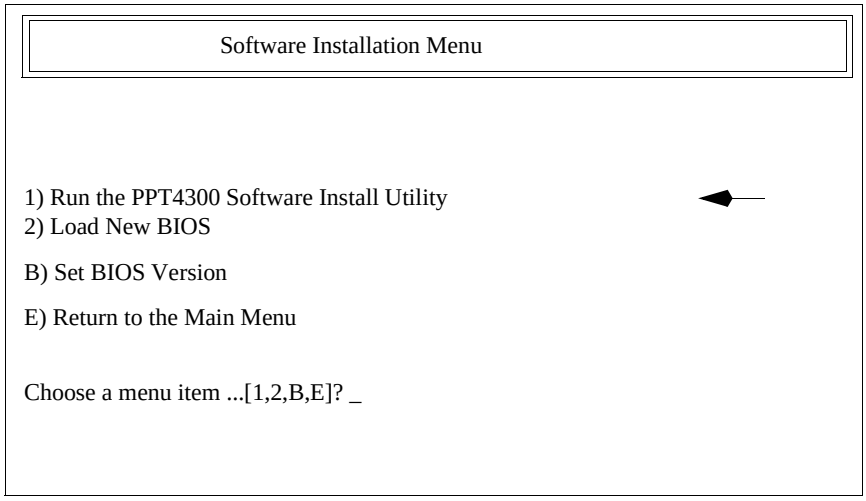


Figure 3-9. Software Installation Menu

6. If you wish to format the flash file system, do so now. This will erase the contents of a specified partition and install system files on it. To format the flash file system:
   a. At the Software Install Utility screen, select **Format & SYS Flash File System**
   b. Destination Drive: Select **E:** to format the main on-board drive.

      The PPT 4300 Utilities PC card uses the C: drive letter and the CardBoot BIOS Extension uses the D: drive letter. However if the internal flash file system is corrupt, CardTrick will not load, and you should use D: as the destination drive. See *Drive Letter Designations* on page 2-12 for a more complete explanation.
   c. The utility formats the specified partition with the `dflfmt` command, makes it bootable with `sys.com`, and returns you to the Software Install Utility.
7. At the Software Install Utility screen, select **Default File Installation (US)**.

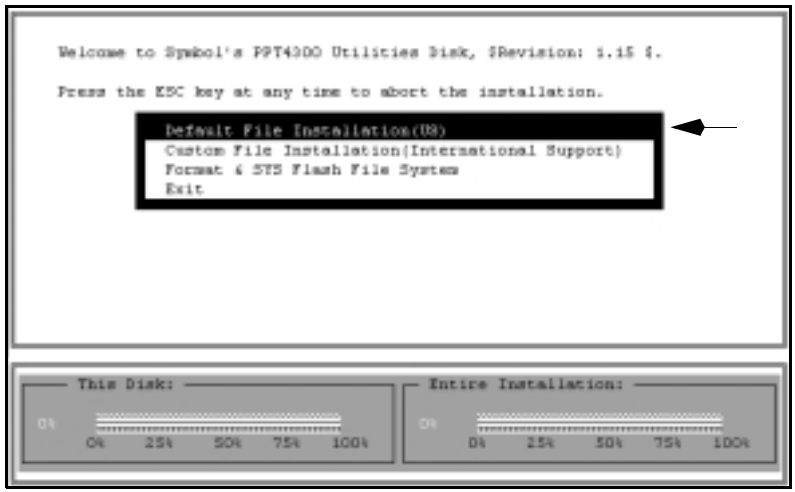


Figure 3-10. Default File Installation

8. When the installation screen displays the confirmation message shown in Figure 3-11, select **Yes** to begin the installation. Note that Figure 3-11 is illustrating an installation for a terminal with an electromagnetic digitizer.
9. When the installation is complete, this message appears:

   ```
   Default (E) installation (Citrix/AWTE/Utilities) to E:\ is complete.
   Do you want to return to Installation Menu?
   ```

10. Select **No** and then press **<Enter>**. The Software Install Utility reappears.

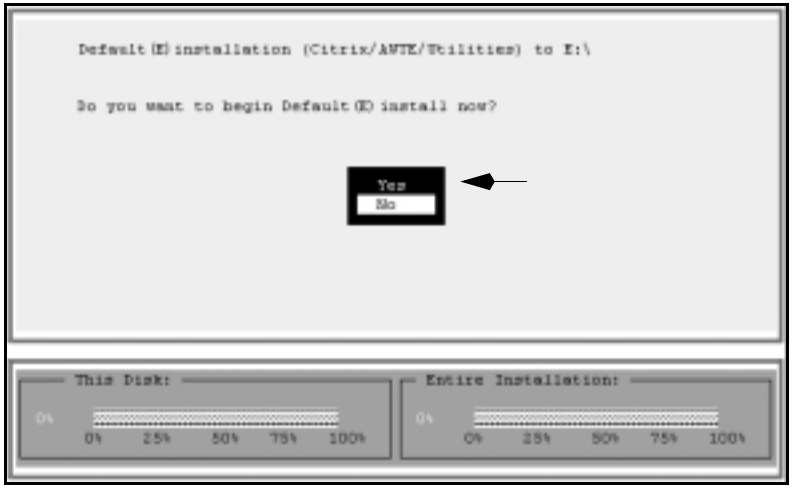


Figure 3-11. Default File Installation Confirmation Message

11. Do not attempt to view or use the installed files until you have rebooted the terminal. Press **E** to return to the Main Menu, and then press **E** to exit to DOS.
12. At the DOS prompt, type `off` then press **<Enter>** to power the terminal off. Remove the Utilities card, replace the rubber plug in the Expansion Slot, and power the terminal on.
13. Configure the terminal with correct IP addresses and other configuration settings following the procedures described in Chapter 4, *Standard Terminal Configuration*.

Custom File Installation

If you customize a terminal's installation or configuration, we strongly suggest that you make backup copies of these files so that you don't have to recreate your customizations if you ever need to re-install the system. To begin custom file installation:

1. Plug the terminal into an electrical outlet using a DC wall adapter to disable power management and prevent low battery interruptions during the process.
2. Remove the rubber plug from the Expansion Slot at the top of the terminal and insert the PPT 4300 Utilities PC card into the Expansion Slot, connector edge first. Press gently until the card is fully seated.
3. Boot the terminal from the PPT 4300 Utilities PC card. When you first boot from the PC card, you will be prompted to select a keyboard type, as shown in Figure 3-12. If you select 2, the software allows you to select from a list of international keyboards. After five seconds, the default choice is activated (Standard US Keyboard), and the Utility Card Main menu appears, as shown in Figure 3-13.

```
ROM_DOS Startup Menu                          Time Remaining: 5


1. Standard US Keyboard
2. International Keyboard

Enter Choice: 1




F5=Bypass Startup Files F6=Confirm each CONFIG line [N]
```

Figure 3-12. Utilities Card Keyboard Selection

4. At the Utility Card Main Menu, press **1** to display the **Software Installation Menu**.

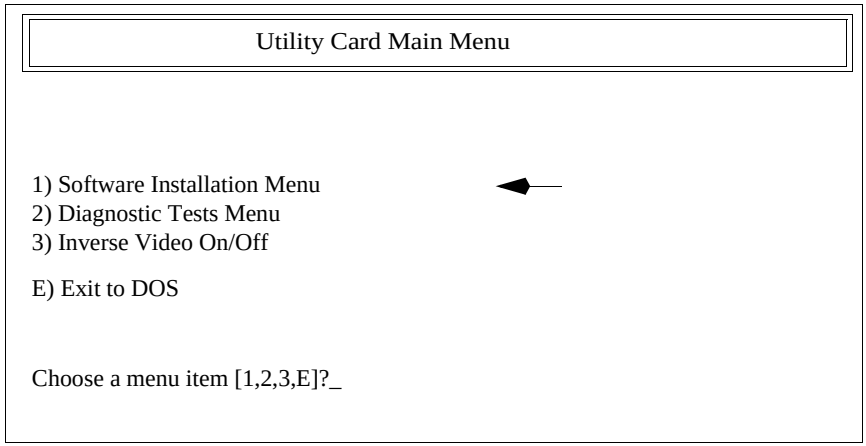


Figure 3-13. Utilities Card Main Menu

5. At the Software Installation Menu, press **1** to select **Run the PPT4300 Software Install Utility.** This loads the install program (shown in Figure 3-15).

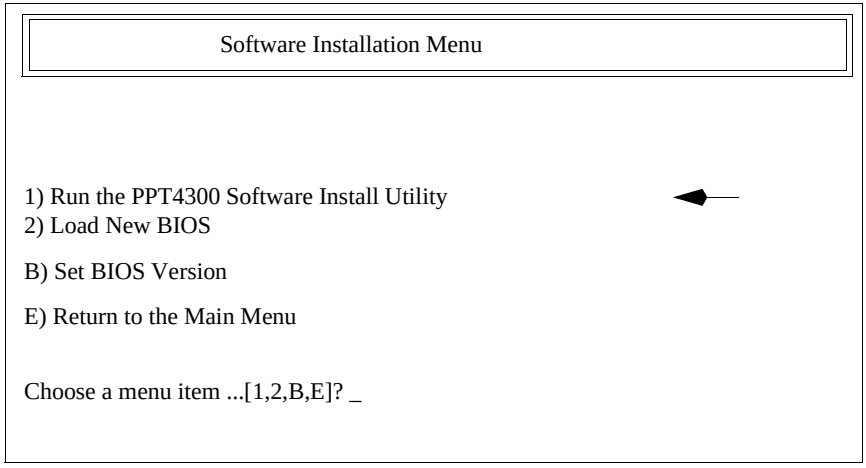


Figure 3-14. Software Installation Menu

6. At the Software Installation Utility, select **Custom File (International Support)** as shown in Figure 3-15.

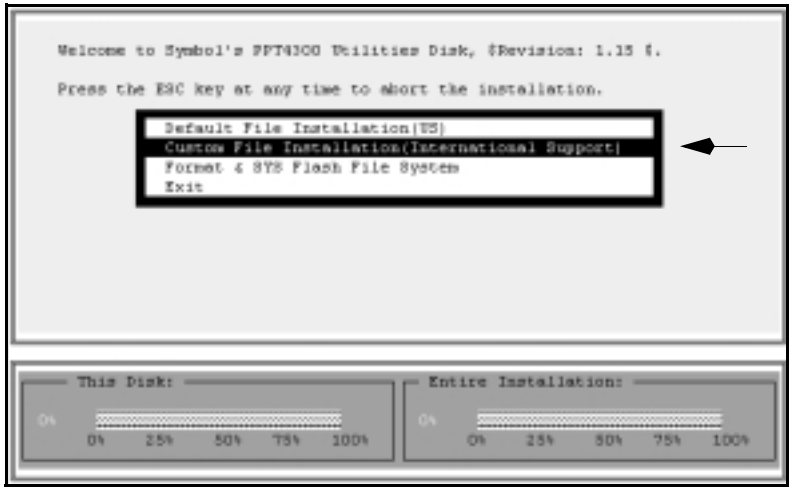


Figure 3-15. Software Installation Utility

7. Select a software combination to install:

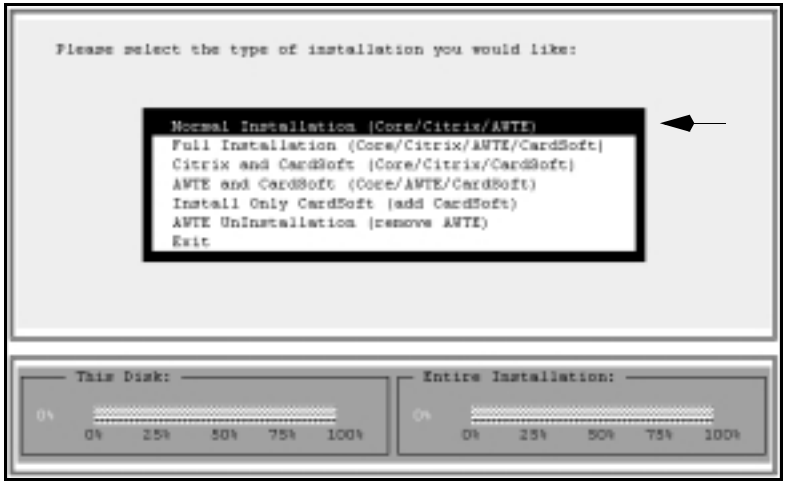


Figure 3-16. Custom Software Installation

Normal Installation (**Core/Citrix/AWTE**) is intended for all terminals.

Citrix refers to the Citrix ICA Client software. **AWTE** refers to the terminal emulation software. **CardSoft** refers to the CardSoft drivers that provide PC card support for SRAM, FTL-formatted and other cards. If you install CardSoft, you must edit `autoexec.bat` to have the terminal load the specific CardSoft drivers you need.

Full Installation requires more than 2 MB of file system space; this option is for terminals manufactured with flash expansion modules. Check for available space before you try to install anything. The **AWTE UnInstallation** option allows you to remove the terminal emulators if you don't need them.

The **Normal Installation** and **Full Installation** options both include system files necessary for operating the terminal (`autoexec.bat` and `config.sys` files, `\dos`, `\bin` and `\net` directories).

Select an option that provides the software combination that you want. The files are copied into the installation subdirectory. If the files of the same name already exist in this directory, they are overwritten.

8. Keep the default digitizer detected by the software, or change the digitizer type as shown in Figure 3-17.

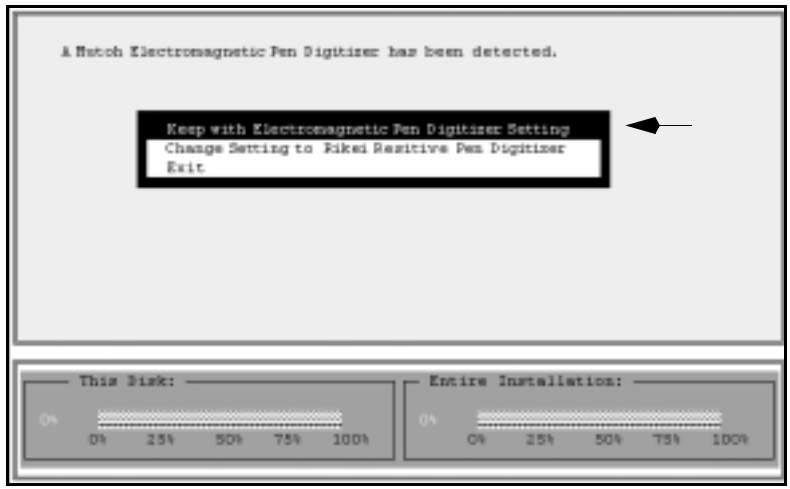


Figure 3-17. Selecting the Digitizer Type

9. Next you will be prompted to install scanner support files. If you wish to install them, select **Yes**. Note that the **No** option is selected in Figure 3-18.

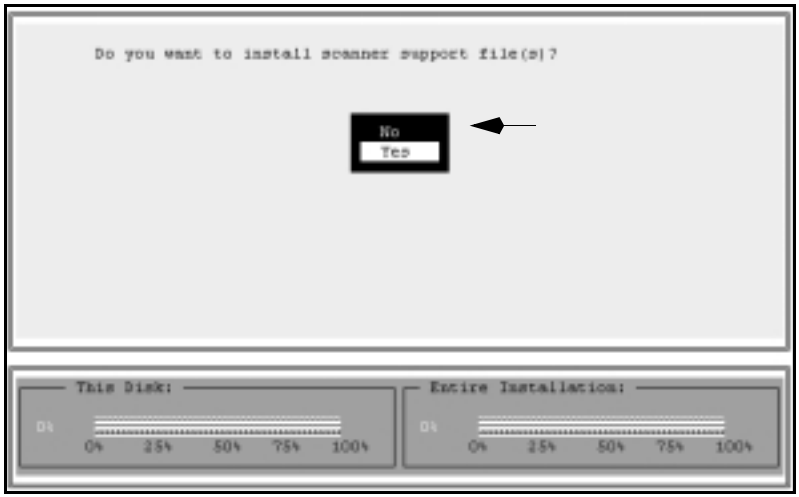


Figure 3-18. Installing Scanner Support Files

10. To accept the default drive, select **No**. To select a different drive, select **Yes**.

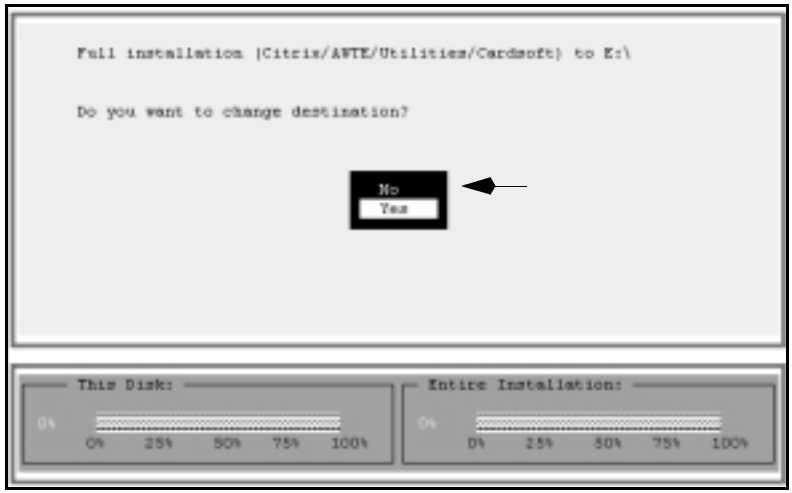


Figure 3-19. Selecting a Destination Drive

Usually, if you are installing the software on the first partition of the internal flash drive, the default destination is the E: drive. However if the internal flash file system is corrupt, the destination for the installation becomes the D: drive. See *Drive Letter Designations* on page 2-12 for more complete information.

11. You will be prompted to select the Country for the keyboard type, as shown in Figure 3-20. Select the correct country or accept the default selection (United States).

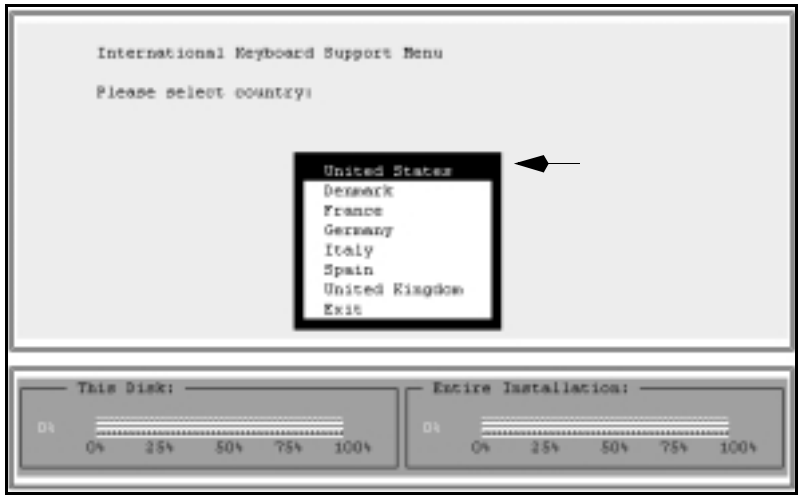


Figure 3-20. Selecting a Keyboard Type

Note: *If the File System runs out of space before it finishes the installation (e.g., if you select* ***Full Installation*** *for a terminal with only 2 MB of Flash File System space), you will see a message indicating "No more files". If this happens, press* ***<Esc>*** *to return to the Utilities Card Main Menu. Begin the installation process again at Formatting the Internal Flash File System on page 3-4, then begin the installation again.*

---

12. Select **Yes** at the prompt to begin the installation process. The progress shows in bar graphs at the bottom of the screen, and takes a few minutes.

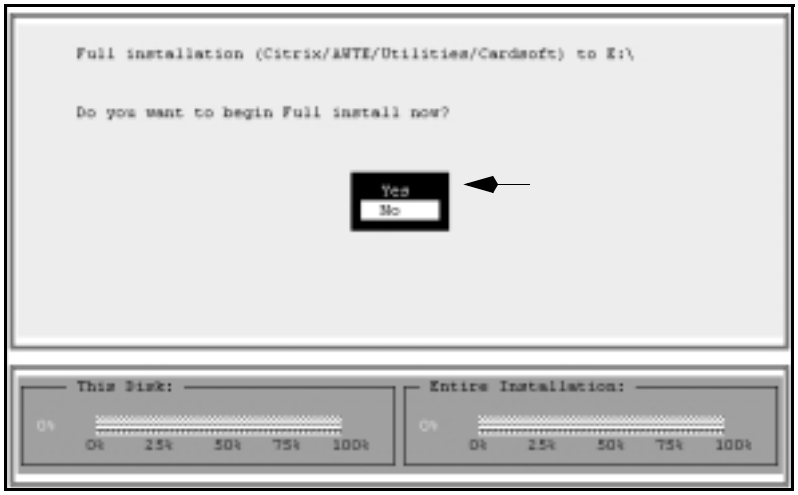


Figure 3-21. Beginning the Installation

13. When the installation is complete, you will be asked if you want to return to the Installation Utility. Select **No** to return to the Software Installation menu.

    Do not attempt to view or use the installed files until you have rebooted the terminal.

15. Press **E** to return to the Utility Card Main menu, and then press **E** again to exit to the DOS prompt.
16. At the DOS prompt, type `off` and press **<Enter>** to power the terminal off. Remove the Utilities card, replace the rubber plug in the Expansion Slot, and power the terminal on normally.
17. Configure the terminal with correct IP addresses and other configuration settings following the procedures described in Chapter 4, *Standard Terminal Configuration*.

Upgrading the BIOS

To load a new BIOS from a PPT 4300 Utilities PC card to the BIOS flash on a PPT 4300 series terminal:

1. Plug the terminal into an electrical outlet using a DC wall adapter to disable power management and prevent low battery interruptions during the process.
2. Remove the rubber plug from the Expansion Slot at the top of the terminal. Insert the PPT 4300 Utilities PC card into the Expansion Slot, connector edge first. Press gently until the card is firmly seated.
3. Boot the terminal from the PPT 4300 Utilities PC card. When you first boot from the PC card, you will be prompted to select a keyboard type, as shown in Figure 3-22. If you select 2, the software allows you to select from a list of international keyboards. After five seconds, the default choice is activated (Standard US Keyboard), and the Utility Card Main menu appears, as shown in Figure 3-23.

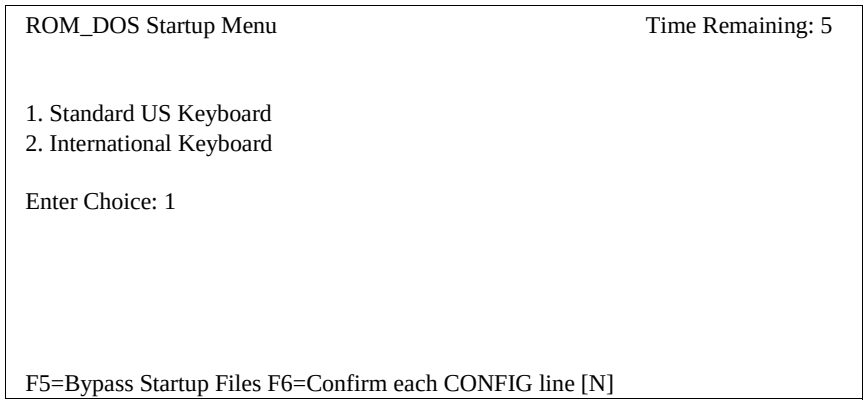


Figure 3-22. Utilities Card Keyboard Selection

4. At the Utility Card Main menu, press 1 to display the Software Installation Menu.

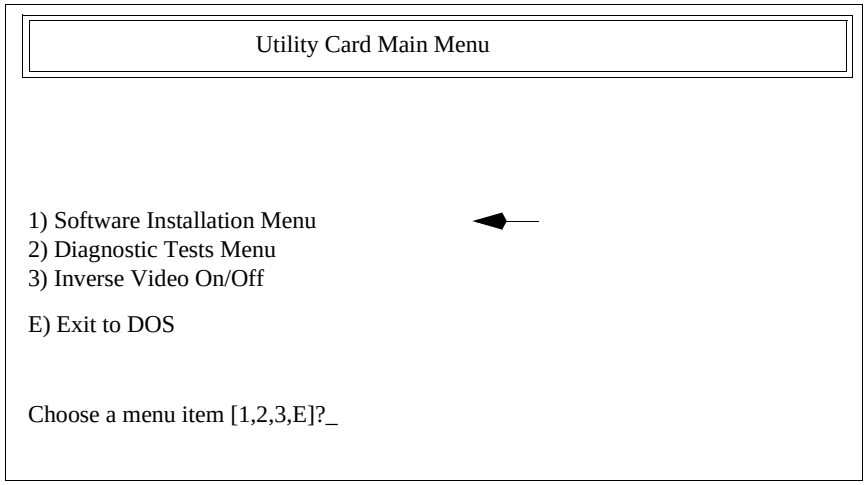


Figure 3-23. Utilities Card Main Menu

5. At the Software Installation menu, press **2** to select **Load New BIOS**.

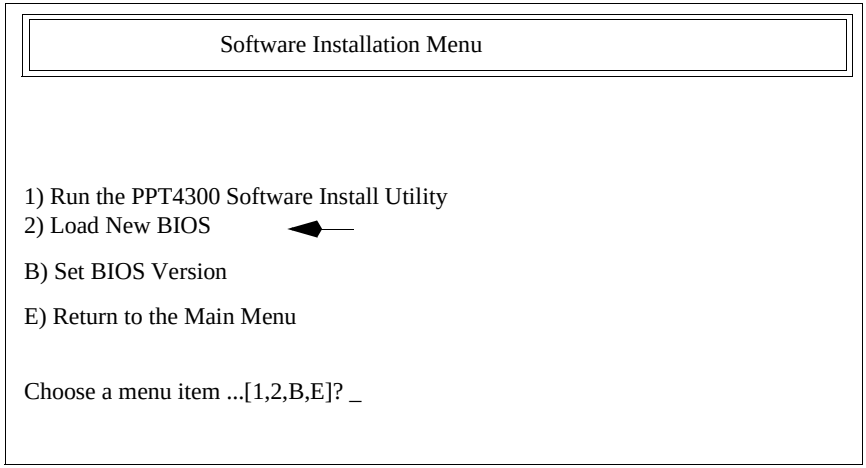


Figure 3-24. Software Installation Menu

6. You will be prompted to confirm that you want to load a new BIOS, as shown in Figure 3-25. Press **N** to cancel the procedure, or press **Y** to load the new BIOS.

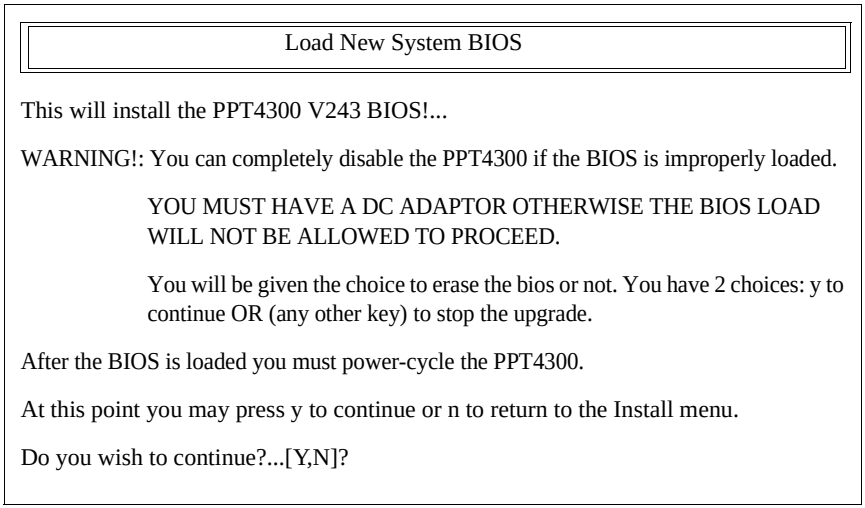


Figure 3-25. Loading a New BIOS

Caution

After you answer **Y** to the confirmation prompt, the utility erases the BIOS flash on the PPT 4300 terminal. There is no way to halt the process. If the process is interrupted after you have pressed **Y**, you will not be able to use the terminal, or load the new BIOS; the terminal must be returned for repair.

7. After the program erases the old BIOS flash, it replaces it with the new BIOS. This process runs the `fload` command (*e.g.*, `fload winm243.bin`). You should see messages as the programming progresses through pages 0 to 16.
8. When the programming is done, this prompt appears:
   `Do you wish to turn the PPT4300 off? ... [Y,N]?`
   Press **Y** to turn off the terminal.
9. Remove the Utilities card and power the terminal on normally.

Note: *You must turn the terminal off by typing "Y" at the prompt; do not use* ***<Ctrl-Alt-Del>*** *or the Power icon, since this would use the old, shadowed BIOS.*

Other Software Applications

This section describes two methods for running other software applications on a PPT 4300 terminal:

1. Copy a software application from a PC card onto the terminal's flash file system and then run the application.
2. Load and run a software application from a PC card, without copying anything onto the internal flash file system.

If you have not prepared a PC card for loading applications onto the terminal, see *Creating a Bootable PC Card for the PPT 4300* on page 3-24.

Storage and RAM Requirements

Before starting, determine how much file storage space and RAM your application needs, and decide how to make it available. Depending on the application involved, this may mean removing unused existing software. A standard PPT 4300 series terminal comes with 2MB of applications and data in its internal flash file system, and 4 MB of RAM. However terminals may be ordered with internal flash modules that provide up to 16 MB of internal storage space, and up to 16 MB of RAM. You can also add 80 MB or more of storage space to any terminal by using a PC storage card in the Expansion Slot.

Copying Other Software onto a Terminal

This section describes how to install other software onto a PPT 4300 series terminal. The first four steps format the terminal's flash file system and perform a normal installation, so that all files necessary for running the terminal are present. This provides you with a known base from which to start. The remaining steps allow you to remove any unnecessary directories and files, and load the other software. To install other software:

1. Determine how much space the application requires.
2. Format the terminal's internal flash file system using the PPT 4300 Utilities PC card (described on page 3-4).
3. When the formatting process finishes, press the spacebar to display the Software Installation Utility screen, as shown in Figure 3-26. To install the terminal's base files (`config.sys`, `autoexec.bat`, `\dos`, `\bin`), select **Default File Installation (US)** from the list.
4. When the Default Installation is complete, return to the Software Installation Menu. Then press **E** to go to the Utility Card Main Menu. Press **E** again to exit to a DOS prompt. Type `off` and press **<Enter>** to turn the terminal off.

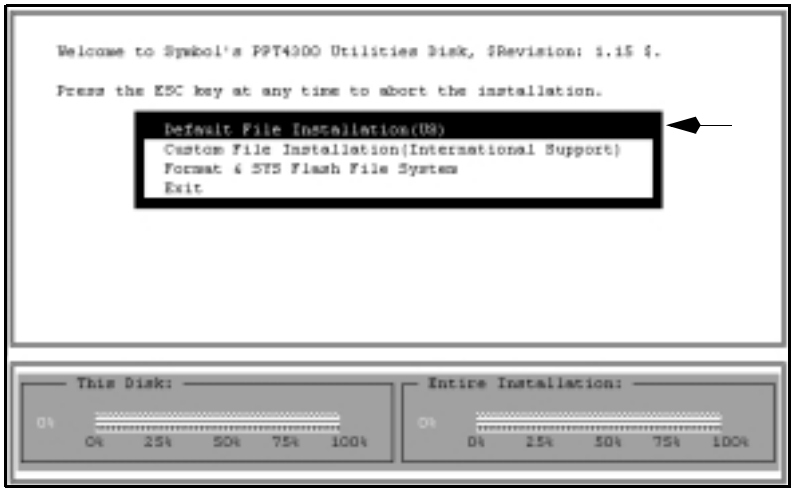


Figure 3-26. Default File Installation

5. Remove the PPT 4300 Utilities PC card.
6. Boot the terminal to a DOS prompt and delete any directories you don't want. We suggest you keep the `autoexec.bat`, `config.sys` and `ppt4300.ini` files, and the `\dos`, `\bin`, and `\net` directories. Make sure the terminal's internal flash file system will have enough space to hold the application files.
7. Insert an ATA Card loaded with the other software into the Expansion Slot.
8. Copy the software from the card to the terminal. At this point, the internal flash file system is drive C:\ and the PC card is drive D:\.
9. Edit `config.sys`, `autoexec.bat` and any other system files as required, to support the software.
10. Remove the PC card, replace the Expansion Slot plug, and reboot the terminal.
11. If you keep the Control Panel application, configure and customize other terminal settings (*e.g.,* Power Management options). See Chapter 4, *Standard Terminal Configuration*, for configuration information.

Running Applications from a PC Card

This section describes how to run applications from a PC card. You need a bootable ATA PC card for a PPT 4300 series terminal, and a laptop with a PC card drive.

1. Boot the terminal from the internal flash file system. Then insert the bootable ATA card into a PPT 4300 series terminal and copy all the necessary system files to the card (`autoexec.bat`, `config.sys`, `\bin`, `\net`, `\dos`, and so on).
2. Remove the ATA card from the terminal, and insert it into the laptop computer. Copy the files for your application from the laptop onto the ATA card.
3. On the ATA card, edit `config.sys`, `autoexec.bat` and any other system files as required, to support your application software.
4. Insert the ATA card into the terminal, and boot the terminal from the card. You should now be able to run your application from the ATA card.
5. See Chapter 4 *Standard Terminal Configuration*, for configuration information.

Creating a Bootable PC Card for the PPT 4300

To create a bootable, ATA PC card for use with a PPT 4300 series terminal:

1. Use a laptop with an ATA drive, and a copy of `awsys.exe` (available from Symbol Technical Support).
2. Insert a blank ATA card into the laptop.
3. At a DOS prompt on the laptop, type `format g: /v` and press **<Enter>** (where `g:` is the drive letter of the blank ATA card). This card can now be used to transfer files between your laptop and a PPT 4300 series terminal.
4. If you also wish to boot from this card, then type `awsys g:` and press **<Enter>**. This creates a bootable card for the PPT 4300.

Note: *Do not use the Windows '95 GUI format utility. You must use the* `format` *command from a DOS prompt.*

Removing Software

You can remove some of the terminal's standard software to make room for other software. For example, if your facility does not use Terminal Emulators, you may remove them. You can remove directories and files from the terminal's DOS prompt, or you can reformat the internal flash file system (as described on page 3-4). Table 3-1 describes some files that should not be removed if the terminal is to maintain basic functionality.

Table 3-1. Software That Should Not Be Removed

Software Component	Function
dos*.*	The directory that holds files necessary for running ROM-DOS.
command.com[a]	The ROM-DOS operating system.
ibmbio.com[a]	A hidden file required by the system.
ibmdos.com[a]	A hidden file required by the system.
autoexec.bat	A batch file that ROM-DOS runs immediately after carrying out the commands in config.sys. It loads the drivers necessary for running applications and communication.
config.sys	The boot configuration file. It loads required device drivers when the terminal boots up.
bin\kbwedge.com	Controls the integrated scanner on PPT 4300-S0E (integrated scanner) terminals. If removed, the scanner will not work.
bin\off.com	Allows you to power off the terminal at the DOS prompt. You may also use this command in batch files (*e.g.*, in `autoexec.bat`).
bin\touch.com	Controls the digitizer on PPT 4300-00R series terminals. If removed, the pen will not work.
bin\mutohpen.com	Controls the digitizer on PPT 4300-00E series terminals. If removed, the electromagnetic pen will not work.
bin\sftsr.com	The system function driver. It controls the Direct Access Panel icons. If removed, you cannot use the Direct Access Panel icons, and the calibration and Battery Monitoring features will not work.
bin\sfinit.com	Configures `sftsr.com`. If removed, you cannot use the Direct Access Panel icons.
bin\ctrlpnl.exe	The Control Panel. If removed, you cannot configure some terminal features.
bin\ppt4300.ini	A file that controls a number of settings for the terminal. If removed, the values controlled by this file revert to their defaults and cannot be changed unless you re-install `ppt4300.ini`. See *Settings in ppt4300.ini* on page 7-4.

a. command.com, ibmbio.com and ibmdos.com must be installed using the ROM-DOS 'sys' command or with the FORMAT and SYS options in the PPT 4300 Software Install Utility.

Flash Expansion Modules

Some PPT 4300 series terminals are manufactured with Flash Expansion modules that increase the size of the available internal flash file system. If your terminal has a Flash Expansion module, you can use it to create a single large internal flash drive, or partition the internal flash into separate drives. Examples:

- Allocate the entire Flash Expansion module to the first partition of the internal flash (*e.g.*, add a 14 MB flash expansion module to make a single, 16 MB internal drive).
- Leave the first internal flash drive with 2 MB and partition the Flash Expansion module into one or more separate internal drives.
- Use part of the Flash Expansion Module to increase the size of the first partition of the internal flash drive, and define the rest of it as separate drives (*e.g.*, a 4 MB C: drive and a 12 MB D: drive).

Partitioning a Flash Expansion Module

This section describes how to partition a Flash Expansion module for use on a PPT 4300 series terminal. There are two sets of instructions.

- The first describes how to allocate the internal flash plus Flash Expansion module as one complete partition.
- The second describes how to allocate the internal flash plus Flash Expansion module as multiple partitions.

A standard PPT 4300 Utilities PC card is configured to mount a 2 MB internal flash disk. If you resize or repartition a PPT 4300 with flash expansion module, you will need to modify the PPT 4300 Utilities PC card to match the size and number of internal flash disk partition. You can do this by adding `ctrfa.sys` lines, as described in these instructions.

In these procedures, boot the terminal from the PPT 4300 Utilities PC card. It is assumed that the first internal flash drive is intact. If the first internal flash drive is corrupt or unformatted, then the drive letters will be different from those shown here (refer to *Drive Letter Designations* on page 2-12).

Note: *All partitions must be sized in 2 MB increments.*

Creating a Single Large Internal Flash Drive

To allocate the internal flash plus Flash Expansion module as one complete partition:

1. Set the **Flash Size** on the Control Panel. This field sets the size of the first partition of the internal flash. To do this:
   a. Boot the terminal from the PPT 4300 Utilities PC Card and exit to a DOS prompt. Type `ctrlpnl` and press **<Enter>** to start the Control Panel application.

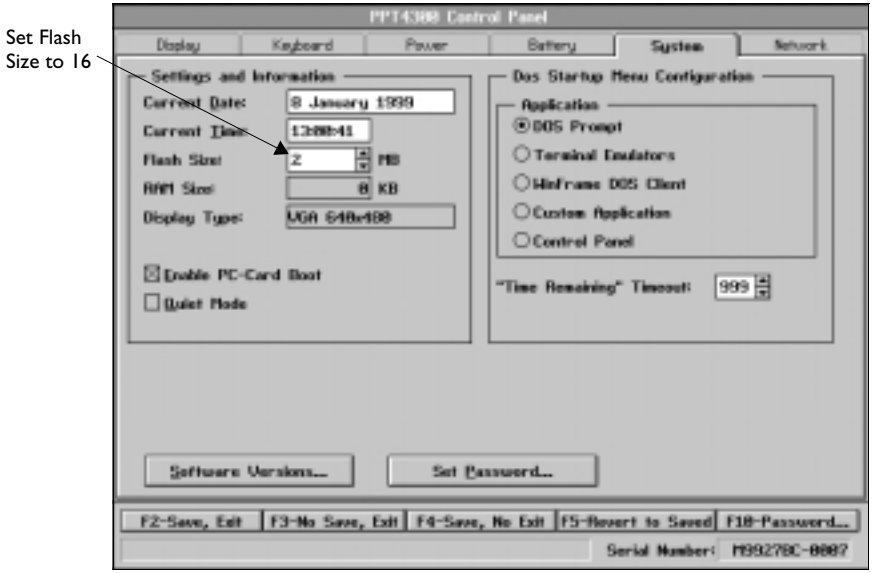


Figure 3-27. Control Panel System Tab

   b. On the System tab (shown in Figure 3-27), set the **Flash Size** to **16**, the maximum setting available. This changes the terminal's CMOS settings for the first partition of the internal flash drive. If you ever reset the CMOS, or the CMOS loses its settings, you will need to reset this field with a PPT 4300 Utilities PC card, or from the System Configuration Utility (SCU). The default is 2 MB. Setting the Flash size to 0 disables the internal flash drive.
   c. Save the settings and exit the Control Panel.
2. Reboot the terminal from the PPT 4300 Utilities PC Card and exit to a DOS prompt.

3. Edit `config.sys` on the PPT 4300 Utilities PC card. This step adds a driver on the Utilities PC card for the internal flash file system.
   a. First, save a copy of `config.sys`. Type `copy c:\config.sys c:\config.bak` and press **<Enter>**.
   b. From the command line, type `ned config.sys` to edit `config.sys`.
   c. Look for this line:

      ```
      DeviceHigh=C:\bin\ctrfa.sys
      ```

      - `ctrfa.sys` is a driver that allows the internal flash file system to be used and partitioned. It has two command line parameters:
        `/s=0`("0" can be any number from 0 - 15. The default is "0")
        `/n=1` ("1" can be any number from 1 - 15. The default is "1")
      - The `/s` parameter sets the start bank number for the flash file system.
      - The `/n` parameter sets the number of banks. Each bank is 2 MB.

   d. Edit the DeviceHigh line to define the size of the internal flash file system. It must match the Flash Size you set in Step 1b. For example, for a 16 MB internal flash file system eight 2 MB banks would define a 16 MB internal flash file system:

      ```
      DeviceHigh=c:\bin\ctrfa.sys /s=0 /n=8
      ```

   e. Save `config.sys` on the Utility Card and exit to the command line.
4. Format the Internal Flash Partition:
   a. Reboot from the PPT 4300 Utilities PC card and exit to a DOS prompt. The current drive designations work like this:
      - C: is the PPT 4300 Utilities PC card, because you booted from it.
      - D: and E: both refer to the first partition of the internal flash. However, after you remove the Utilities card and boot from the terminal, this partition will be the C: drive. See *Drive Letter Designations* on page 2-12.

   b. To format the first partition of the internal flash, type:

      ```
      dlfmt E: /v
      ```

      and press **<Enter>**. This erases anything that was stored on the drive. Use `/v` if you want to give it an 11-character volume name. You will be asked to confirm the format command.

   c. From the root directory (C:), type:

      ```
      sys E:
      ```

      and press **<Enter>**. This installs boot files on the first partition of the internal flash drive.

5. At the DOS prompt, type:
   `install\install.exe`
   and press **<Enter>** to run the Software Installation Utility.

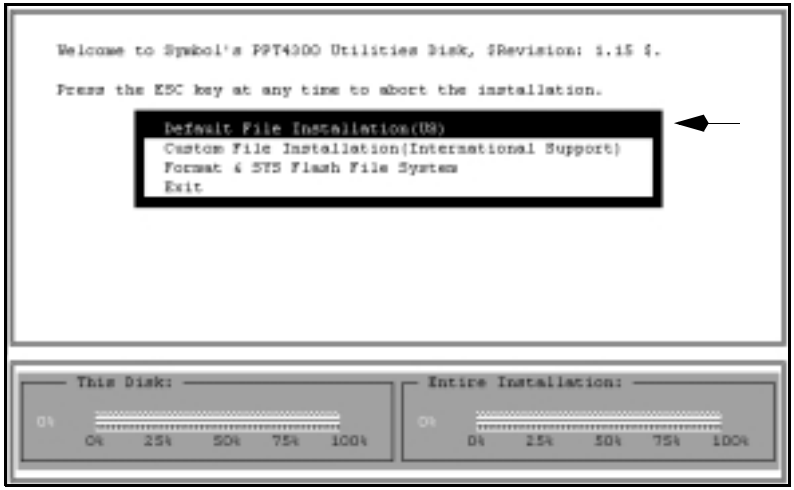


Figure 3-28. Default File Installation

6. At the Software Install Utility screen (shown in Figure 3-28), select **Default File Installation** (US).
   This installs the Basic System Files, the Citrix DOS Client and the Terminal Emulators. You can delete some of these later, if you don't need them. See *Default File Installation* on page 3-8 for more information on installing software.
7. When the installation screen displays a confirmation message, select **Yes** to begin the installation.
8. Exit the Software Installation Utility and reboot from the PPT 4300 Utilities PC card. Do not make any more file system changes until you have rebooted.
9. Restore the original config.sys file to the PPT 4300 Utilities PC card. Type `copy c:\config.bak c:\config.sys` and press **<Enter>**.
10. Type `off` and press **<Enter>**.
11. Remove the Utilities Card and reboot the terminal. It should mount the entire flash file system as a single drive.

Creating an Internal Flash Drive with Multiple Partitions

1. Set the **Flash Size** on the Control Panel. This field sets the size of the first partition of the internal flash. To do this:
   a. Boot the terminal from the PPT 4300 Utilities PC card and exit to a DOS prompt. Type `ctrlpnl` and press **<Enter>** to start the Control Panel application.

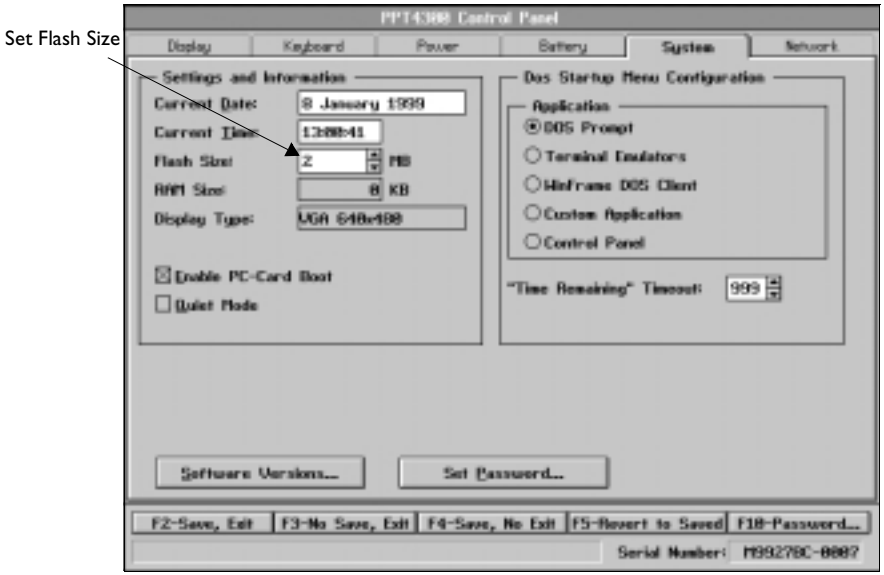


Figure 3-29. Control Panel System Tab

   b. On the System Tab, (shown in Figure 3-29), set the **Flash Size** to the size you need for the first partition. This changes the terminal's CMOS settings for the first partition of the internal flash drive. Minimum size for the first internal partition is 2 MB. Setting the Flash size to "0" disables the internal flash drive. If you reset the CMOS, or the CMOS loses its settings, you will need to reset this field with a PPT 4300 Utilities PC card, or from the System Configuration Utility (SCU).
   c. Save the settings and exit the Control Panel.
2. Reboot the terminal from the PPT 4300 Utilities PC Card and exit to a DOS prompt.
3. Edit `config.sys` on the PPT 4300 Utilities PC card. This step adds a driver for each file system partition you wish to create.
   a. First, save a copy of `config.sys`. Type `copy c:\config.sys c:\config.bak` and press **<Enter>**.

b. From the command line, type `ned config.sys` to edit `config.sys`.

c. Look for this line:

```
DeviceHigh=C:\bin\ctrfa.sys
```

- `ctrfa.sys` is a driver that allows the flash file system to be partitioned and used. After partitioning, ctrfa.sys is required for accessing the partitions. It has two command line parameters:
  `/s=0`("0" can be any number from 0 - 15. The default is "0")
  `/n=1` ("1" can be any number from 1 - 15. The default is "1")
- The `/s` parameter sets the start bank number for the flash file system.
- The `/n` parameter sets the number of banks. Each bank is 2 MB.
- Partitions cannot overlap.

d. Add one line for each flash partition you want to define. The first partition of the internal flash drive always starts at bank 0 (`s=0`). The number of banks in the first partition must match the **Flash Size** you set at the Control Panel.

Example 1: For a 2 MB first partition and 14 MB second partition:

```
DeviceHigh=c:\bin\ctrfa.sys /s=0 /n=1
DeviceHigh=c:\bin\ctrfa.sys /s=1 /n=7
```

Example 2: For a 4 MB first partition and 12 MB second partition:

```
DeviceHigh=c:\bin\ctrfa.sys /s=0 /n=2
DeviceHigh=c:\bin\ctrfa.sys /s=2 /n=6
```

Example 3: For an 8 MB first partition, a 4 MB second partition, and a 4 MB third partition:

```
DeviceHigh=c:\bin\ctrfa.sys /s=0 /n=4
DeviceHigh=c:\bin\ctrfa.sys /s=4 /n=2
DeviceHigh=c:\bin\ctrfa.sys /s=6 /n=2
```

e. Save `config.sys` on the Utility Card and exit to the DOS prompt.

4. Format the Internal Flash Drive(s):

a. Reboot from the PPT 4300 Utilities PC card and exit to a DOS prompt. The current drive designations work like this:

- C: is the PPT 4300 Utilities PC card, because you booted from it.
- D: refers to the first partition of the internal flash. When you boot from the terminal, this will be the C: drive.
- The first `ctrfa.sys` entry uses the E:\ drive letter and points to the first partition of the internal flash. Subsequent `ctrfa.sys` entries will allocate other drive letters, starting with F:\.

b. To format the first partition of the internal flash, type:

```
dlfmt E: /v
```

and press **<Enter>**. Use /v if you want to give it an 11-character volume name. This erases anything that was stored on the drive. You will be asked to confirm the format command.

c. To format a second drive partition, type:

```
dlfmt F: /v
```

and press **<Enter>**. Use `/v` if you want to give it a volume name. You will be asked to confirm the format command.

d. Continue with the `dlfmt` command until you've formatted all of the drives.

e. From the root directory (C:\), type:

```
sys E:
```

and press **<Enter>**. This installs boot files on the first partition of the internal flash drive.

f. At the command line, type

```
install\install.exe
```

to run the Software Installation Utility (shown in Figure 3-30).

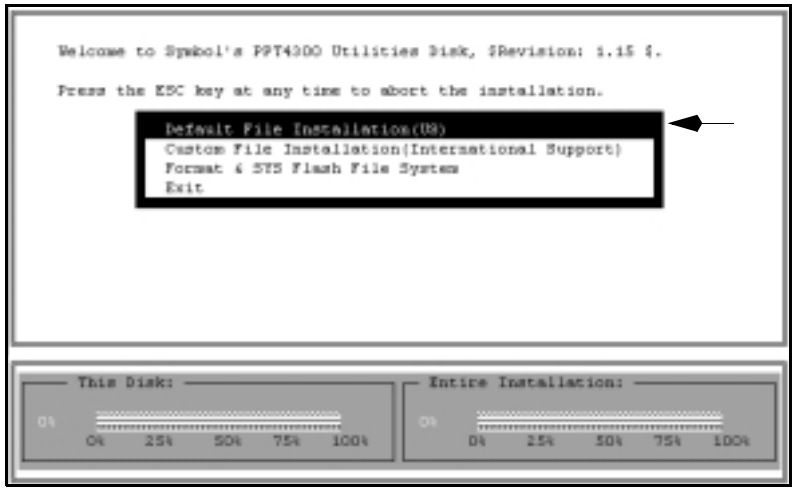


Figure 3-30. Default File Installation

5. At the Software Install Utility screen, select **Default File Installation (US)**.

   This installs the Basic System Files, the Citrix DOS Client and the Terminal Emulators onto the first partition of the internal flash drive. You can delete some of these later, if you don't need them. See *Default File Installation* on page 3-8 for more information on installing software.
6. When the installation screen displays a confirmation message, select **Yes** to begin the installation.
7. When installation is complete, exit to a DOS prompt.
8. Copy `ctrfa.sys` from the Utilities PC card to the terminal:
   a. Copy the `ctrfa.sys` driver from the Utilities PC card to the first internal flash drive on the terminal (E:\, at this point): `copy c:\bin\ctrfa.sys e:\bin\`
   b. Edit `config.sys` on the terminal's main drive: `ned e:\config.sys`

      Add the `ctrfa.sys` information for any partitions you have defined after the first internal drive. Add the same `ctrfa.sys` information that you added in Step 2, *except* for the line that refers to the first partition of the internal flash. The terminal takes the size information for the first partition of the internal flash from the CMOS and mounts it using CardTrick. The examples from Step 3 (d) would look like this:

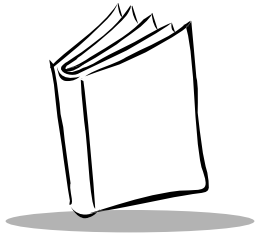
      Example 1: For a 2 MB first partition and 14 MB second partition:
      ```
      DeviceHigh=c:\bin\ctrfa.sys /s=1 /n=7
      ```

      Example 2: For a 4 MB first partition and 12 MB second partition:
      ```
      DeviceHigh=c:\bin\ctrfa.sys /s=2 /n=6
      ```

      Example 3: For a 8 MB first partition, a 4 MB second partition, and a 4 MB third partition:
      ```
      DeviceHigh=c:\bin\ctrfa.sys /s=4 /n=2
      DeviceHigh=c:\bin\ctrfa.sys /s=6 /n=2
      ```
   c. Save `e:\config.sys` and exit to a DOS prompt.
9. Restore the original config.sys file to the PPT 4300 Utilities PC card. Type

   `copy c:\config.bak c:\config.sys`

   and press **<Enter>**.
10. Type `off` and press **<Enter>**.
11. Remove the PPT 4300 Utilities PC card and power up the terminal. It should mount the file system partitions you have set up.



Chapter 4 Standard Terminal Configuration

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Overview

This chapter describes configuration for a PPT 4300 series terminal. Standard PPT 4300 terminals have no radios, and can be configured to run in stand-alone (batch) mode. PPT 4340 terminals have wireless radios that can communicate with a host computer network. They can be configured to run Terminal Emulators, or the Citrix ICA Client for DOS.

This chapter describes how to:

- start a new terminal and adjust the initial settings
- set the application that will appear when a user powers the terminal on
- configure a radio terminal to communicate with a network
- configure a stand-alone terminal

Powering a Terminal On

Before a terminal is powered on, make sure it has a fully charged battery pack.

1. The battery well at the back of the terminal has a Run/Ship switch. Before you insert a battery, move the switch from the Ship position (on the right) to the Run position (on the left).
2. Insert a fully-charged Symbol smart battery pack, so that the contacts on the battery align with the contacts in the battery well.
3. Press the Power icon with the pen. Hold the pen down until the terminal beeps and begins to boot (about one second). If the terminal does not boot, press the Force On switch in the IrDA window port (see Figure 1-2 on page 1-6). If pressing the Force On switch fails to start the terminal, see Chapter 10, *Troubleshooting*.
4. If the terminal has come directly from the factory, it loads the Control Panel when it starts. If the Control Panel does *not* appear, press **<Ctrl-Alt-Del>** to reboot the terminal. Watch the messages that appear as it boots. After about 20 seconds, the ROM-DOS Startup Menu should appear. When this menu appears, you have one second to make a selection. Press **5** to display the Control Panel.
5. Set contrast and brightness to comfortable levels by tapping **<Fn-F9>**, **<Fn-F10>**, and **<Fn-F11>**. If the Control Panel has loaded, you may also adjust contrast on the Display tab of the Control Panel. Contrast and Display icons on the Direct Access Panel are active after the boot process passes the Startup Menu.
6. Modify Control Panel settings as described in *Configuring for Network Communication* on page 4-9 or in *Configuring for Stand-Alone Operation* on page 4-16.

Calibrating the Pen

When a new terminal is first powered on, you may need to calibrate the pen:

1. Run an application in which the pen driver is active: the Control Panel, a Citrix ICA session or a Terminal Emulator.
2. Check the pen calibration by pressing the screen with the tip of the pen.
3. Note the alignment between the pen tip and the "arrow" image. They should be aligned to within about 1/8 inch. If they are not aligned, calibrate the pen.
4. To calibrate the pen, press **<Fn-F8>**, and follow the on-screen instructions. You may also calibrate the pen from the Display tab on the Control Panel.

The Control Panel

The Control Panel application allows a system administrator to view or change all available options related to the Display, Keyboard, Power, Battery, System, and Network. To start the Control Panel, use any of these methods:

- look for the ROM-DOS Startup Menu that appears as the terminal is booting, and select option **5**
- press **<Fn-F7>** while the terminal is booting
- tap the Settings icon, when prompted, while the terminal is booting
- type `ctrlpnl` at the ROM-DOS prompt and press **<Enter>**

The Control Panel may also appear automatically, if it has been selected as the startup application on the System tab of the Control Panel. For more information, see Chapter 6, *The Control Panel*.

Note: `autoexec.bat` *must load the appropriate pen driver before you can use the pen on the Control Panel. The PPT 4300-00E and PPT 4300-S0E models use the* `mutohpen.com` *driver. The PPT 4300-00R model uses the* `touch.com` *driver.*

CMOS Settings

Some terminal parameters are stored in CMOS memory and can be changed at the Control Panel. Use the Control Panel to set or change:

- the time and date (System tab)
- the CMOS set-up password (System tab)
- key click (System tab)
- Power Management options (Power tab)
- character repeat options (Keyboard tab)

If you wish to modify other CMOS settings, contact Symbol Technical Support.

Note: *The CMOS settings can be lost when these conditions occur:*

- *If you store a terminal with no battery for longer than 30 days the internal swap battery may run down and the terminal may revert to original factory default CMOS settings. Any changes you made during configuration will be lost.*
- *If you force the power off to the terminal you may also clear some CMOS settings.*

For these reasons, if you change the CMOS or any other settings, we recommend you record the settings and store them in a safe location.

Starting and Ending a ROM-DOS Session

Starting a session:

To start a ROM-DOS session (boot to a DOS prompt), look for the ROM-DOS Startup Menu that appears as the terminal is booting and select option **3** from the Startup Menu.

To bypass `config.sys` and `autoexec.bat`, press **<F5>** while the terminal is booting. In this situation, no drivers will be loaded, and the path will not be set. If you want to run the Control Panel, type `\bin\ctrlpnl` and press **<Enter>**. The pen will not work at the Control Panel, as the pen driver has not been loaded. Press **<Alt-Tab>** and **<Shift-Alt-Tab>** to move from tab to tab. Press the **<Tab>** key to move the focus from field to field on the screen.

Ending a session:

When you are finished, type `off` at the DOS prompt and press **<Enter>** to end the session and power off the terminal.

ROM-DOS Startup Menu

The ROM-DOS Startup Menu appears during the boot process so that a system administrator can bypass the terminal's defaults when necessary. For example, the terminal may be set to start the Citrix CIA DOS Client by default, but a system administrator may wish to boot to a DOS prompt.

The menu appears as shown in Figure 4-1 during the boot process that occurs when you first power on the terminal. If you make no other selection, the menu defaults to one of the selections after 1 second (a time configurable at the Control Panel). When a terminal ships from the factory, the menu default is the Control Panel. You can set the menu default (*e.g.*, the Citrix CIA DOS Client) at the Control Panel's System tab.

```
ROM-DOS Startup Menu

1. Citrix CIA DOS Client
2. AirWire Mobile Terminal Emulators
3. Dos Prompt
4. Custom
5. Control Panel

Enter Choice:_
```

Figure 4-1. ROM DOS Startup Menu

This menu is not intended for end-users; it is for administrative use only. To set the length of time for which this menu appears, edit the **"Time Remaining" Timeout** field on the System tab of the Control Panel. The timeout length can be set from 1 to 60 seconds. For example,

- if you set the timer to 10, the menu appears for 10 seconds, and then goes to the default application if no other selection is made.
- If you set the time to 0, the menu stays on the screen until the user selects an option.
- If you prefer not to use this menu at your installation, set the time to 1 : the menu still appears briefly, but does not allow users enough time to select an option. In this case, you can still boot to a DOS prompt by pressing **<F5>** as the terminal is booting, and bypass `autoexec.bat` and `config.sys`.

Editing the ROM-DOS Startup Menu

To edit the ROM-DOS Startup Menu manually:

1. Power the terminal on and boot to a DOS prompt by selecting option **3** from the ROM-DOS Startup Menu.
2. Type `ned config.sys` to open the NED full screen editor.
3. Look for this section:

   ```
   [MENU]
   MenuItem=wfclient,Citrix ICA DOS Client
   MenuItem=awte,AirWire Mobile Terminal Emulators
   MenuItem=dos,DOS Prompt
   MenuItem=custom,Custom
   MenuItem=ctrlpnl, Control Panel
   MenuDefault=dos,1
   ```

   `MenuItem` entries include the section name of the commands, as they appear in `config.sys` and `autoexec.bat`, followed by the text that appears on the menu. For example, for the first menu item, `wfclient` is the command section name in `config.sys`, and `Citrix ICA DOS Client` is the text that appears on the menu. The `MenuDefault` entry defines the default menu choice (`dos` in the example), and the number of seconds to wait before activating the default.

4. You can edit a number of menu features:
   a. To change the text that appears on the menu, change the `MenuItem` menu text.
   b. To change the default choice, edit the `MenuDefault` entry. Do not delete this line.
   c. To change the number of seconds the menu waits before selecting the default, change the `MenuDefault` number. If you set this number to **1**, the menu appears briefly, but does not allow a user to make a selection.
5. Select **Save** from the **File** menu to save changes (press **<Alt-F>**, and then **S**).
6. Select **Exit** from the **File** menu to exit the NED editor (press **<Alt-F>**, and then **X**).
7. Reboot the terminal to activate the changes.

Adding a Custom Entry to the ROM-DOS Startup Menu

If you have loaded a custom application onto the terminal, you can add an option for it on the ROM-DOS Startup Menu. To do this:

1. Power the terminal on and boot to a DOS prompt by selecting option **3** from the ROM-DOS Startup Menu.
2. Open `config.sys` for editing in the NED editor (`ned config.sys`). In the [CUSTOM] section, add any device driver information that your application requires.
3. In the [MENU] section of `config.sys`, edit: `MenuItem=custom,Custom`

   Replace the menu text "`Custom`" with the menu text that you want to appear on the ROM-DOS Startup menu. Do not change the section name "`custom`". If you want the application to start by default when the terminal boots, also edit the MenuDefault line to read: `MenuDefault=custom,1`
4. Save and close `config.sys`.
5. Open `autoexec.bat` for editing.
6. In the `:custom` section of `autoexec.bat`, place information necessary for running the application (commands, path, etc.). Note that if you include the `off` command at the end of the section, the terminal will power itself off as soon as someone exits the application.
7. Save and close `autoexec.bat`. Exit the NED editor.
8. Reboot the terminal to activate the changes.
9. Make a record of your changes, for backup purposes.

Other Configuration Options

Because it is possible to add Flash Expansion modules to increase file space, or replace default PPT 4300 software with other applications, the terminal allows a wide variety of other configurations. For more information, see:

- *Expansion Slot Options* on page 2-14
- *Powering the Terminal On* on page 2-12
- *Other Software Applications* on page 3-22

Configuring for Network Communication

A PPT 434X series terminal communicates with a network using a Spectrum24 radio card and TCP/IP communications protocols. Before you can configure the terminal, your facility must have a network set up with one or more compatible Spectrum24 Access Points and a network host (*e.g.*, Citrix ICA). Then you can configure a terminal to communicate with the network, and select an application to run when the terminal powers on.

TCP/IP

TCP/IP is a set of networking protocols that control how data is passed between computers on a network. The Terminal Emulators and the Citrix ICA DOS client use the Novell TCP/IP transport software configured by `net.cfg` in the `\net` directory. The Control Panel edits the `ip_address`, `ip_network` and `ip_router` parameters in the `Protocol TCPIP` section of `net.cfg`.

There are two versions of the TCP/IP communications protocol — Spring (1 Mbps) and 802.11 (2 Mbps). The Spring protocol is a proprietary communications protocol used by the Spectrum24 radio card. Spectrum24 cards can also be configured to use the 802.11 protocol, an IEEE standard protocol. A terminal using a Spring radio card can only communicate with Access Points that also use the Spring protocol. A terminal using an 802.11 radio card can only communicate with Access Points that also use the 802.11 protocol. You must use the correct Symbol radio driver for the protocol being used.

RF Options

For a terminal using a Spectrum24 radio card with the Spring protocol, the NetID determines which Spectrum24 Access Points a terminal can communicate with. The NetID is set on the Network tab of the Control Panel and is shown in Figure 4-2 on page 4-11. It must be set correctly for the RF card to communicate with a Spectrum24 Access Point. The terminal can communicate with Access Points that have a matching NetID.

For a terminal using a Spectrum24 radio card with the 802.11 protocol, the ESS ID, set on the Network tab of the Control Panel, determines which Spectrum24 Access Points a terminal can communicate with. If the ESS ID is blank, the terminal defaults to the three-digit hex value of the NetID.

If you reconfigure the Spectrum24 I/O Port Address, Interrupt or Memory Address in `protocol.ini` or `net.cfg`, you may render the Spectrum24 device inoperable. For more information on hardware setting, see Appendix C. For information on other Spectrum24 options, consult the documentation for the Spectrum24 radio card and Access Point.

These instructions describe how to configure a terminal with a Spectrum24 radio card using the Spring protocol:

1. Power the terminal on and go to the Control Panel (see page 4-4). If necessary, press **<Fn-F9>**, **<Fn-F10>**, and **<Fn-F11>** to adjust contrast and brightness.
2. If a password has been defined, you must press **<F10>** and enter a password before you can make or save most changes on the Control Panel. If there is no password defined, then no password is required anywhere in the Control Panel. To set or change the password, select the F10-Passwords... button on the System tab.
3. Select the Network tab and configure PPT 4340 network communications by filling in the following fields:
   - **Terminal Name**: The Citrix ICA Client name for the terminal (up to 15 alphanumeric characters). This name appears on Citrix ICA administration screens. We recommend naming the terminal according to serial number or unique terminal ID. This parameter is saved in `\wfcname.ini`.
   - **Terminal IP Address**: The terminal's network address. Networks use IP addresses to determine where to send data that is being transmitted over the network. An IP address is a 32-bit number commonly specified as four 8-bit numbers in decimal dot notation (e.g., 199.96.16.22). The highest 8-bit number you can use is 254. This field is required. This parameter is saved in `\net\net.cfg` and `\lanman.dos\protocol.ini`, if they exist.
   - **Gateway Address**: The IP address for a network gateway or router. A terminal is part of a subnet as specified by its IP Address and Netmask. It can send packets directly to any node that is on the same subnet. If the destination node is on a different subnet, then the terminal sends the packet to the gateway first. The gateway then determines how to route the packet to the destination subnet. This field is only required if a gateway is needed to reach the host. This parameter is saved in `\lanman.dos\protocol.ini` and `\net\net.cfg`, if they exist.
   - **Subnet Mask**: A number that the network uses to determine whether or not one device can communicate directly with another (*e.g.*, a terminal attempting to communicate with a host computer). In some cases, devices must communicate indirectly through a gateway. The network system uses the subnet mask to compare the IP addresses of the two devices involved and determine whether they will communicate directly or indirectly. The subnet mask depends on your facility's IP address allocations. If the special subnet mask of "255.255.255.255" is specified, then the TCP driver (`tn_tcpip.exe`) used by the Terminal Emulators is specified, then the TCP driver (`tn_tcpip.exe`) used by the Terminal Emulators will calculate a subnet mask derived from the first 2 bits of the Terminal IP Address. However if your facility uses site-specific subnets, you may need to set a different subnet mask.

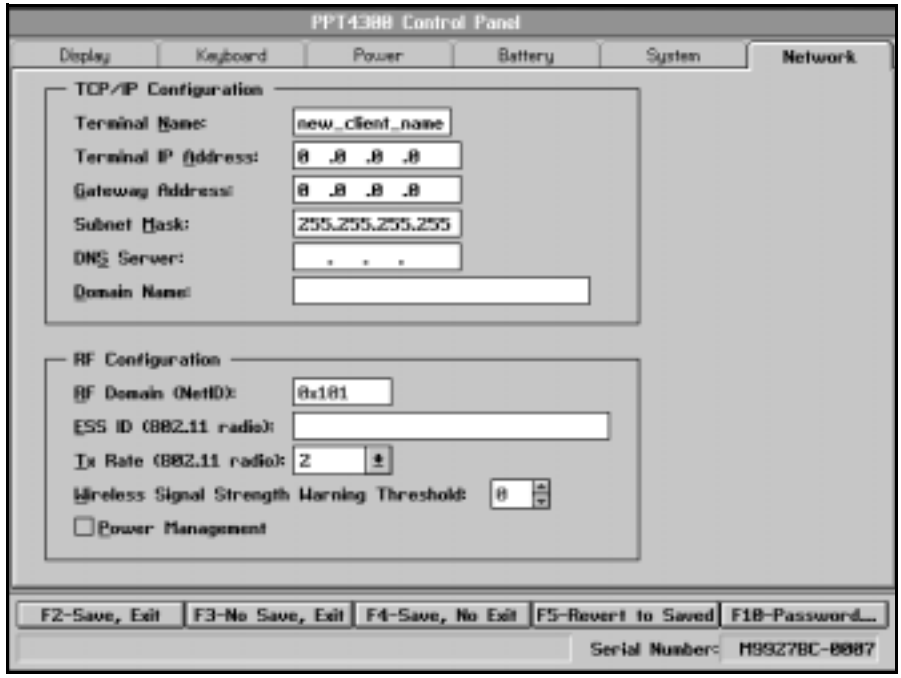


Figure 4-2. Network Tab

- **DNS Server:** If you are using the Microsoft TCP stack, use this field to specify the IP address for a Domain Name Server (DNS). It allows users to use server names, rather than IP addresses. To use this feature with the Microsoft TCP stack, you must load DNS software (`dnr.exe`). If you are using a Novell TCP stack, you must specify a DNS by editing the *`c:\net\resolv.cfg`* file. Contact Symbol Technical Support for more information.
- **Domain Name:** If you are using the Microsoft TCP stack, use this field to specify the Domain Name for a DNS server (*e.g.*, `symbol.com`). To use this feature with the Microsoft TCP stack, you must load DNS software. If you are using a Novell TCP stack, you must specify a Domain Name by editing the *`c:\net\resolv.cfg`* file. Contact Symbol Technical Support for more information.

Note: *Select tabs on the Control Panel by tapping the tab name with the pen, or by pressing* ***<Alt-Tab>*** *and* ***<Shift-Alt-Tab>****.*

- **RF Domain (NetID)**: Use this option for terminals with Spectrum24 cards using the Spring communications protocol (and for cards using the 802.11 protocol, if no **ESS ID** has been defined). A NetID allows facilities to restrict which Access Points a PPT 4340 terminal can communicate with. This field is required. Use a hexadecimal number, *e.g.*, '0x101' or its decimal equivalent, *e.g.*, '255'. A terminal can only communicate with Access Points that have matching NetIDs. See the Spectrum24 documentation for more information. This parameter is saved in `\lanman.dos\protocol.ini` and `\net\net.cfg`, if they exist.
- **ESS ID**: Use this option for terminals with Spectrum24 cards using the 802.11 communications protocol. An ESS ID allows facilities to restrict which Access Points a PPT 4340 terminal can communicate with. A terminal can only communicate with Access Points that have matching ESS IDs. The ESS ID is an alphanumeric, case-sensitive network identifier. It is 1 to 32 (ASCII) bytes in length. If the ESS ID contains spaces, enclose it within single quotation marks. If the ESS_ID contains numbers, enclose it within double quotation marks. See the Spectrum24 documentation for more information. This parameter is saved in `\lanman.dos\protocol.ini` and `\net\net.cfg`, if they exist. If the ESS ID is blank, the terminal defaults to the three-digit hex value of the NetID.
- **Tx Rate**: Use this option for terminals with Spectrum24 cards using the 802.11 communications protocol. This field controls the rate at which a terminal communicates with a Spectrum24 Access Point. If the terminal has a 2 Mbps radio, you can set this field to **1** or **2**. When the field is set to **1**, the terminal communicates at the rate of 1 Mbps and can only communicate with 1 Mbps Access Points. When set to **2**, it communicates at 2 Mbps and can only communicate with 2 Mbps Access Points. On terminals with 2 Mbps radios, **2** is the default value for this field. If the terminal has a 1 Mbps radio, then the only option available is **1**.
- **Wireless Signal Strength Warning Threshold**: This field lets you set the RF Received Strength Signal Indicator (RSSI) value that will cause a warning message to appear. The RSSI has a range of 0 to 99. Normal operating range is 25 to 65. Below 25, the terminal is likely to roam for a better connection. Below 20, you may lose your connection with the host computer. You can disable the message by setting this field to "0". The pop-up message appears when the signal drops to the level set in this field, or when the terminal is roaming. This message can also be set or disabled in `ppt4300.ini` (see *Settings in ppt4300.ini* on page 7-4). This parameter is saved in `\lanman.dos\protocol.ini` if it exists.
- **Power Management:** This option controls a hardware-based power management setting on the Spectrum24 radio card. It is not related to the software-based PPT 4300 Power Management scheme, which is configured in the Power tab. This Power Management setting controls the `PowerMgmt=x` in either `net.cfg` (Novell

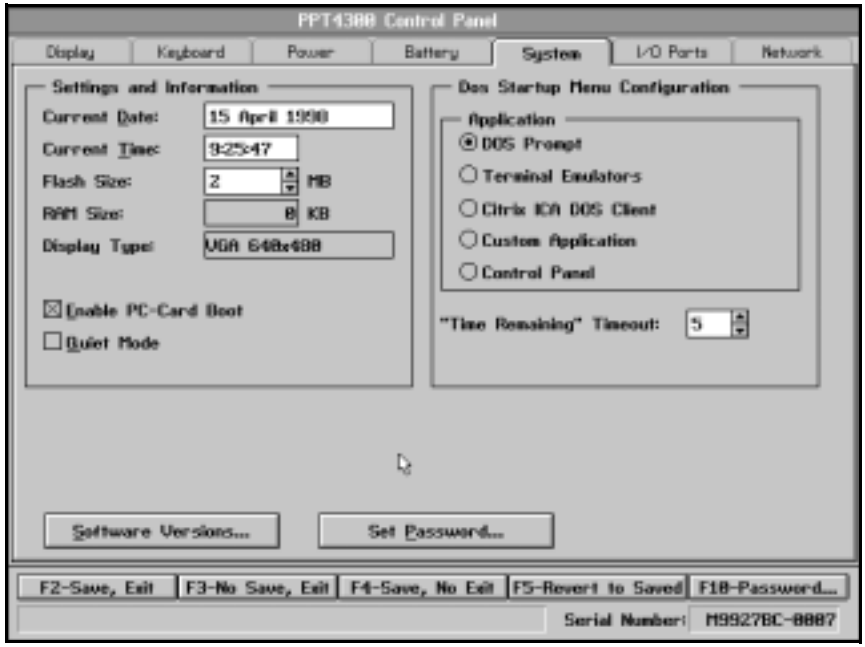


Figure 4-3. System Tab

TCP/IP stack) or `protocol.ini` (Microsoft TCP/IP stack). In `net.cfg` the value is either "`Y`" or "`N`". In `protocol.ini` the value is either "`1`" (active) or "`0`"(inactive). Use of this Power Management scheme is not recommended with the Microsoft TCP/IP stack. *If you are using Citrix Client for DOS with the Microsoft TCP/IP stack, leave the Spectrum24 Power Management off (*`powermgmt=0`*).*

When Power Management is inactive, the radio card draws normal power and actively maintains its radio connection.

When Power Management is active, the radio card only communicates with the Access Point when it has something to send. This reduces the drain on the battery and saves power. However there can be a small but noticeable delay when the terminal needs to communicate over the network with the Access Point and host.

4. Select the System tab and set the **"Time Remaining" Timeout** field. This sets the length of time for which the ROM-DOS Startup Menu appears when the terminal boots. The timeout length can be set from 0 to 60 seconds. For example, if the timeout length is "10", the menu appears for 10 seconds, and then goes to the default application if no other selection is made. If you set the time to "0" or "1", the menu appears briefly, but does not allow the user to make a selection. If you set the time to "999", the menu stays on the screen until the user selects an option.
5. Next, select a default application. This is the application that will run if no selection is made on the ROM-DOS Startup Menu. The DOS Startup Menu Configuration section of the System tab lists the options. Tap a radio button to select an option:
   - **DOS Prompt**: ROM-DOS command line prompt.
   - **Terminal Emulators**: VT220, TN3270 or TN5250 terminal emulators. These are designed for use when communicating with a character-based host.
   - Citrix ICA **DOS Client**: Citrix ICA login window. This is designed for use when communicating with a Citrix server on a network.
   - **Custom Application**: Select this to specify a user-specific menu application. See *Adding a Custom Entry to the ROM-DOS Startup Menu* on page 4-8.
   - **Control Panel**: This option causes the terminal to boot to the Control Panel.
6. Select the Power tab and set Power Management options.

   For the Terminal Emulators, leave the "Stop CPU Clocks during Power Management" box selected (marked with an 'x'). This allows the Spectrum24 card to stay active if the terminal enters Sleep mode. If you deselect the option, you will be delayed in reconnecting to the host computer session.

   To run Citrix ICA, or systems where the host needs to send unsolicited data to a terminal, deselect the "Stop CPU Clocks during Power Management" box. This ensures continual CPU availability to Citrix while still providing some Power Management. Also, leave the **Maintain power to PC Card sockets during sleep mode** option selected.

7. Select F2-Save, Exit, or press **<F2>** to save your changes and reboot the terminal.

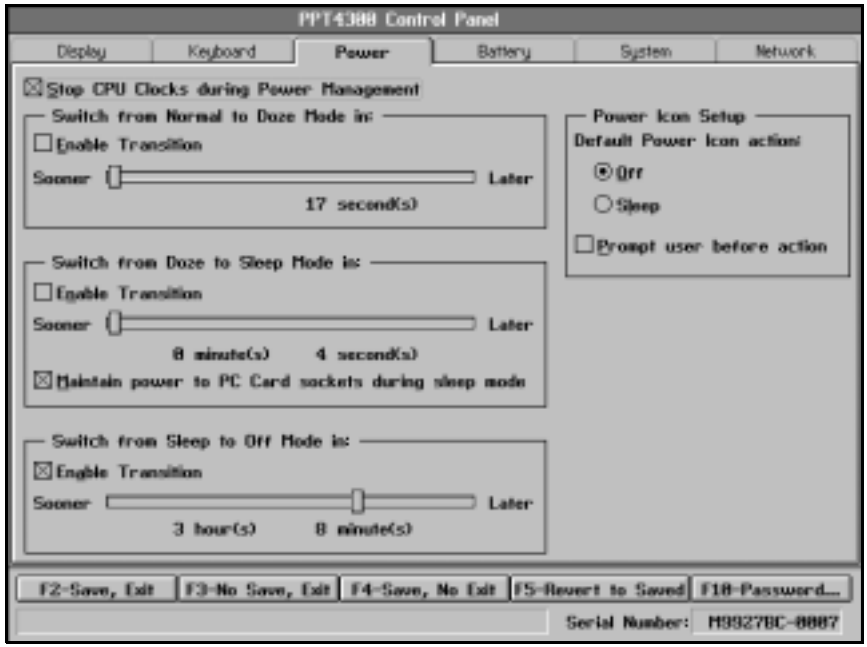


Figure 4-4. Power Tab

If you have set the terminal to run the Citrix ICA DOS Client, the next time you power the terminal on the Citrix ICA Client for DOS screen appears and you will be prompted to add a Citrix WinFrame or MetaFrame server (see *First Time Set-up* on page 8-5). Then you can connect and log in. For information on Citrix ICA options, see Chapter 8, *Citrix ICA DOS Client*.

If you have set the terminal to run Terminal Emulators, you must provide host information in the `\usr\appl\awte\keymap\keymap.cfg` file on the terminal. See *Host Choice List* on page 7-14 for complete instructions on editing this file.

Note: *The Control Panel does not save changes automatically. If you make changes, select* F4-Save, No Exit *or press* **<F4>** *to save without exiting.*

Configuring for Stand-Alone Operation

A standard PPT 4300 terminal comes with some software pre-installed (described in *Software Installed on a PPT 4300* on page 2-6). However you may install custom software and configure the terminal for stand-alone or batch operation. To configure a PPT 4300 for stand-alone operation:

1. Power the terminal on and boot to the Control Panel (see *The Control Panel* on page 4-4). If necessary, tap **<Fn-F9>**, **<Fn-F10>**, and **<Fn-F11> to** adjust contrast and brightness.
2. If a password has been defined, you must press **<F10>** and enter a password before you can make or save most changes on the Control Panel. If there is no password defined, then no password is required anywhere in the Control Panel. To set or change the password, select the F10-Password... button on the System tab (shown in Figure 4-5).
3. Select the System tab and set the **"Time Remaining" Timeout** field. This sets the length of time for which the ROM-DOS Startup Menu appears when the terminal boots. The timeout length can be set from 1 to 60 seconds. For example, if the timeout length is **10**, the menu appears for 10 seconds, and then goes to the default customer application if no other selection is made. If you set the time to **1**, the menu appears briefly, but does not allow the user to make a selection. If you set the time to **0**, the menu stays on the screen until the user selects an option.
4. Next, select a default application from the DOS Startup Menu Configuration box on the System tab. This is the application that opens if no selection is made at the ROM-DOS Startup Menu. Tap a radio button to select one of the following:
   - **DOS Prompt**: ROM-DOS command line prompt.
   - **Terminal Emulators**: VT220, TN3270 or TN5250 terminal emulators. These are designed for use when communicating with a character-based host.
   - Citrix ICA **DOS Client**: Citrix ICA login window. This is designed for use when communicating with a Citrix server on a network.
   - **Custom Application**: Select this to specify a user-specific application. See *Adding a Custom Entry to the ROM-DOS Startup Menu* on page 4-8 for information on how to add a custom menu item.
   - **Control Panel**: Select this to cause the terminal to boot to the Control Panel.

Note: *Select tabs on the Control Panel by tapping the tab name with the pen, or by pressing* ***<Alt-Tab>*** *and* ***<Shift-Alt-Tab>****.*

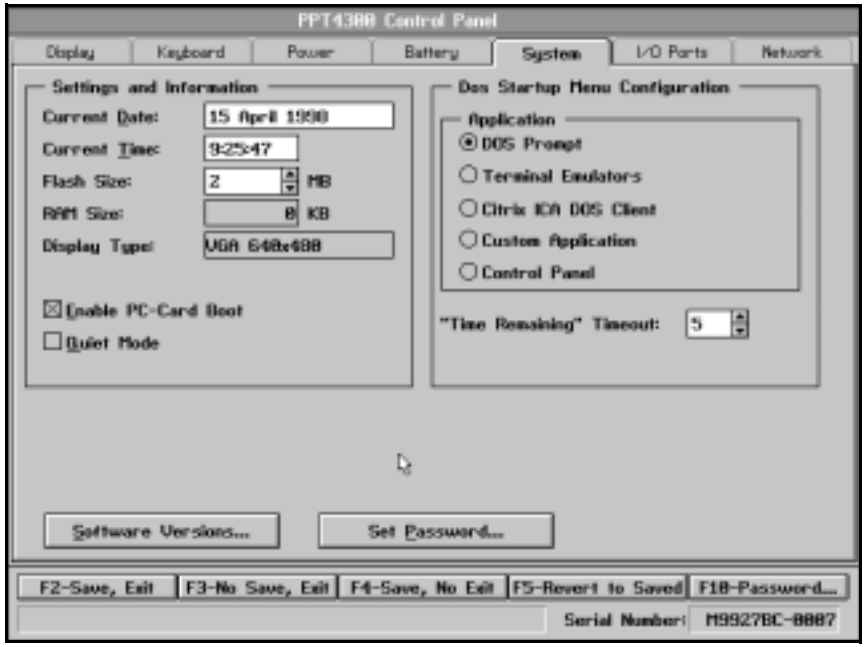
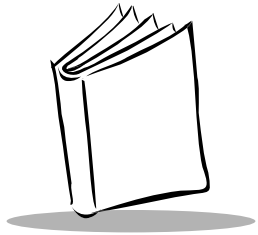


Figure 4-5. System Tab

5. Go to the Power tab and set Power Management options. See *Power Options* on page 6-12 for more information on these options.
6. Select F2-Save, Exit, or press **<F2>** to reboot the terminal.

Note: *The Control Panel does not save changes automatically. To save changes without exiting, select* F4-Save, No Exit *or press* **<F4>.**



Chapter 5 Operation

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Overview

Once a PPT 4300 series terminal has been configured for your facility, it can be released for use. This chapter describes how to use the terminal, including:

- powering a terminal on ("booting")
- navigating using the pen and keyboard
- calibrating the pen
- controlling brightness, contrast and backlight with Direct Access Panel icons
- reading Smart Battery information
- setting Power Management options
- changing a battery
- using an external power supply
- using an external keyboard
- using bar code scanners

The instructions in this chapter assume that the terminal has been configured to run Terminal Emulators or a Citrix ICA DOS Client. For information on configuring a terminal, see Chapter 4, *Standard Terminal Configuration*.

Basic Operation

Powering the Terminal On

To power the terminal on, press the Power icon with the pen. Hold the pen down until the terminal emits a three-tone musical beep and begins to boot (about one second). If battery power is low, the terminal emits a two-tone non-musical beep, and remains off. After a configured terminal powers on, one of the following appears:

- a Citrix ICA Client for DOS screen (described in Chapter 8, *Using the Citrix ICA DOS Client*)
- a Terminal Emulation Host Choice List (described in Chapter 7, *Using Terminal Emulators*, and shown below. Also see *Note*.),
- a custom application, specific to your facility

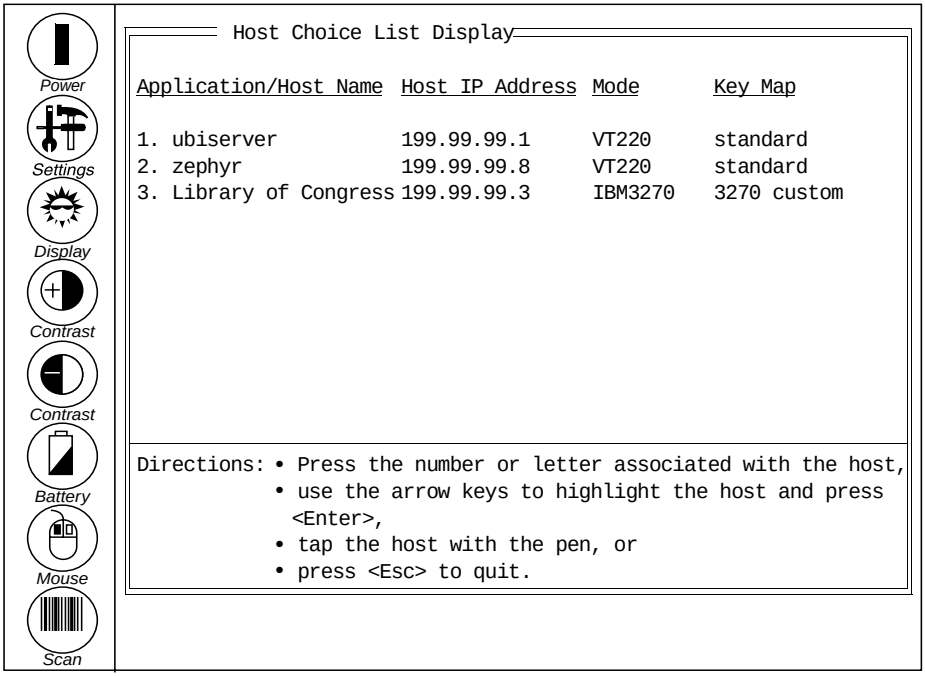


Figure 5-1. Host Choice List Display

Note: *The terminal may be configured to skip these screens and open directly into an application. See Bypassing the Host Choice List on page 7-15, or Auto-connecting to a Citrix Server or Published Application on page 8-7.*

Follow your facility's procedures for logging in. If the terminal does not power on, make sure you are using a charged battery, inserted correctly, and that the Run/Ship switch in the battery well is set to Run. To force a terminal to re-boot, press **<Ctrl-Alt-Del>**, or if the terminal won't power on, press the Force On switch in the Infrared Port (see page 1-6). See Chapter 10 for other troubleshooting information.

Powering the Terminal Off

Usually, a terminal powers off when a user ends a session and logs out. For details, see Table 5-1, below. You may use the Power icon to power the terminal off, but it may not close your session — see page 5-11 for more information.

Table 5-1. Turning the Terminal Off

Session Type	How to Exit
Terminal Emulation	Follow your facility's procedures to close a session. When all sessions are closed, press **<Esc>** to exit the Host Choice List and power the terminal off.
Citrix ICA	To close your session, click on the Citrix ICA Program Manager **File** menu and select **Logoff**. When the Citrix ICA DOS window appears, select the **Exit** button.
DOS	Type `off` at the C:\ prompt, and press **<Enter>**.

Note: *For Terminal Emulations, the* **<Shift-Alt-X>** *key combination closes the session. You can create a custom "Close" button by mapping a key or key combination to the CLOSE_SESSION function. See Appendix B for information on custom key mapping.*

Power On Beeps

When you power on a PPT 4300, you should hear a three-note melodic beep, followed by one long beep. This indicates that the terminal is beginning to boot normally.

If the melodic beep is followed by a harsher two-note signal, it means the battery is depleted, or there is no battery or power supply. The two-note signal repeats several times. This "depleted battery" sound also occurs if a user ignores low battery warnings and runs the battery down to under 1% power (sound occurs as the terminal powers off). If there is no battery or power supply, the terminal will not make any sounds, and will not power up.

On Resistive Digitizer terminals only: If the terminal is powered off, and something is touching the display screen at a location other than the Power icon, you will hear a repeating beep. After 10 beeps, the digitizer turns itself off to prevent draining the battery and you must use the Force On button to power on the terminal.

Navigation

This section describes how to interact with a PPT 4300 series terminal using the keypad, the pen or an external keyboard.

Using the Pen

PPT 4300 series terminals are designed to be used with a pen. PPT 4300-00R models use a plastic-tipped stylus on a resistive digitizer. PPT 4300-00E and PPT 4300-S0E models use an active, battery-powered pen on an electromagnetic (EM) digitizer. In all models, the pen acts as a mouse. Table 5-2 describes how the pen works in a Windows session run on a Citrix ICA DOS client. If you are running a Terminal Emulator or DOS application, the pen may not function, or may behave differently, depending on the application and the host configuration.

Table 5-2. Using the Pen in Citrix ICA

Action	How to Do It
Move the pointer	Place the end of the pen onto the surface of the display. The arrow goes to where the pointer is.
Left click	Press once with the pen. Do not tap too hard on the display.
Double click	Press twice, quickly, with the pen.
Right click	PPT 4300 x0E: Press and hold the button on the side of the EM pen while you press the display with the pen. The Mouse icon has been disabled on the PPT 4300 x0E models. PPT 4300 00R: Select the Mouse icon to turn a pen press into a right click. After a single or double right click, the pen press automatically switches back to acting as a left mouse click. Note: The default click (left or right) can be configured at the Control Panel.
Drag objects (Drag & Drop)	Place the pointer on the object that you wish to move (*e.g.*, on the Title Bar of a window). Without lifting the pen from the display, drag the tip of the pen to the new location for the object. Lift the pen to drop the object.

Note: *If you lose your pen, DO NOT use anything that will scratch or mark the screen. Symbol can supply extra pens for the terminal. Contact your Symbol Representative.*

Using the Keypad

The PPT 4300 has an integral 78-key keypad. The keypad also includes a special function key, the *Fn* key. It allows access to the set of functions listed here:

Fn-F2 Display the Battery Status window
Fn-F3 Set the next pen tap to be read as a right click (PPT 4300-00R terminals only)
Fn-F4 Put the terminal into Sleep Mode
Fn-F7 Display the Settings window
Fn-F8 Activate the Pen Calibration utility
Fn-F9 Increase (darken) contrast
Fn-F10 Decrease (lighten) contrast
Fn-F11 Cycle the LCD backlight through three levels of brightness
Fn-F12 Turn the keyboard backlight on or off

The **<Fn-F2>**, **<Fn-F4>**, **<Fn-F7>** and **<Fn-F8>** keys require the `sftsr` driver to be loaded. The **<Fn-F8>** key also requires the pen driver to be loaded. Other characters and functions that are available by Fn key are indicated in blue text on the keypad. For example, to trigger the Break function, press **<Fn-PgDn>**.

Figure 5-2. PPT 4300 Keypad (North American Version)

Note: *International versions of the PPT 4300 use slightly different keypad layouts. Some functions change; for French and German layouts, the Caps Lock function can be deactivated by pressing the Shift key.*

Numeric Keypad

The keypad incorporates a numeric keypad, using the symbols marked in small, colored symbols on the right side of the keypad. On North American keypads, the numeric keypad symbols appear on the 7, 8, 9, 0, U, I, O, P, J, K, L, ;, M, > and ? keys. To use the numeric keypad:

1. Press the **<NumLock>** key. When the **<Numlock>** key is on, the LED above it lights up.
2. To enter numbers, press and hold the **<Fn>** key, and then press keypad keys (*e.g.*, **<Fn-J>** = 1).
3. You can also set the terminal into Quick Numeric Keypad Overlay mode, so that when **<Numlock>** is on, the numeric keypad works as a numeric keypad without the **<Fn>** key (*e.g.*, J=1).

Using an External Keyboard

The PPT 4300 has a port for connecting a Symbol-approved, low power PS/2-AT type keyboard. See *Parts of the Terminal* on page 1-6 for the location of this port. Do not use a keyboard that has not been approved for use by Symbol. Using unapproved keyboards may cause excessive power consumption and reduce battery life.

Make sure you are using the correct keyboard for the type of terminal you have. PPT 4300-00R terminals provide 3.3V to the keyboard port. PPT 4300-00E and PPT 4300-S0E terminals provide 5V to the keyboard port.

Direct Access Panel Icons

The Direct Access Panel is a vertical row of icons located on the left side of the display window. It allows users to select from pre-defined options such as adjusting brightness and contrast, or displaying battery information. To select an item from the Direct Access Panel, press a Direct Access Panel icon firmly with the pen. Some of the Direct Access Panel icons have keyboard shortcuts—see *Using the Keypad* on page 5-8.

Direct Access Panel options are available to all users. System Administrators can also adjust display and contrast settings at the Control Panel. For more information, see Chapter 6, *The Control Panel*.

Note: *Direct Access Panel icons only work if the* `sftsr.com`, `sfinit.com`, *and pen drivers (*`mutohpen.com` *or* `touch.com`*) have been loaded.*

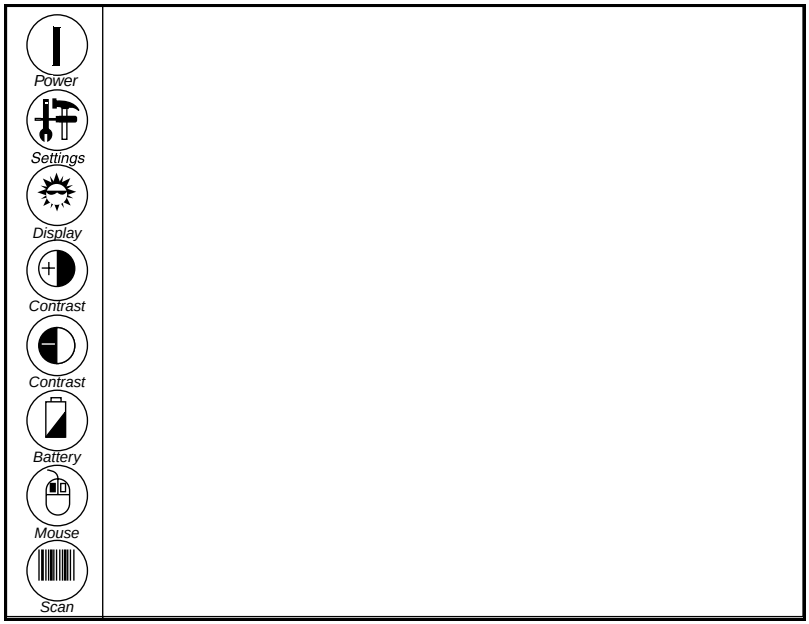


Figure 5-3. Direct Access Panel Icons

The Power Icon

The Power icon is the top icon on the Direct Access Panel, on the left side of the display.

If the terminal is off:

The Power icon powers the terminal on. Press and hold the pen to the Power icon until you hear a three-note melodic beep. This indicates that the terminal is beginning to boot normally. You must wait for the terminal to finish booting before you can log in and use applications. If the melodic beep is followed by a harsher two-note sound, it means the battery is depleted. This "depleted battery" sound also occurs if a user ignores low battery warnings and the battery drops to less than 1% capacity (sound occurs as the terminal powers off). If there is no battery or power supply, there are no sounds when you press the Power icon. If the terminal does not power on, check the Run/Ship switch in the battery well. Also see Chapter 10, *Troubleshooting*.

On PPT-4300-00R (Resistive Digitizer) terminals only: If the terminal is powered off, and something touches the display screen at a location other than the Power icon, the terminal emits a single repeating beep. If the screen continues to be pressed while in this mode, the terminal beeps 10 times and then disables the touch screen, including the Power icon. The terminal must then be powered on using the Force On switch.

If the terminal is on:

By default, pressing the Power icon powers the terminal off. If you have been running a Terminal Emulation session, the status line prompts you to close your session before the terminal powers off. If you have been running a Citrix ICA client session, the terminal powers off. If you have not logged off, the host disconnects the terminal but leaves your session running for a period of time (time depends on host configuration). If you reconnect to the host during this time period, you can reconnect to the same session.

You can change the default action of the Power icon so that it puts the terminal into Sleep mode instead of powering it off. To reactivate a sleeping terminal, press the pen on the screen or press a keypad key (*e.g.*, Shift key). A pen or keystroke activates the terminal but does not affect any application that may be running on the terminal. System Administrators can use the Control Panel to set the length of time the terminal spends in Sleep mode before powering off, or to disable powering off from Sleep. For more information, see *Power Management Modes* on page 5-19 and *Power Options* on page 6-12.

To change the default action of the Power icon, edit the Power tab settings in the Control Panel application. As an alternative, you can also edit the `PowerIconOff` and `PowerIconPrompt` values in the `[PowerMgmt]` section of the `ppt4300.ini`. See *Settings in ppt4300.ini* on page 7-4 for details.

Settings

To display a Settings window, press the Settings icon or press **<Fn-F7>**. The Settings window displays the terminal's current settings, including: IP Address, Terminal Name, radio MAC address (if a radio driver is loaded), Date, Time and serial number. If the RF/AP Diagnostic tool has been enabled, a checkbox appears on the settings pop-up. To run this tool, select the checkbox. See page 10-17 for more information on the RF/AP Diagnostic tool.

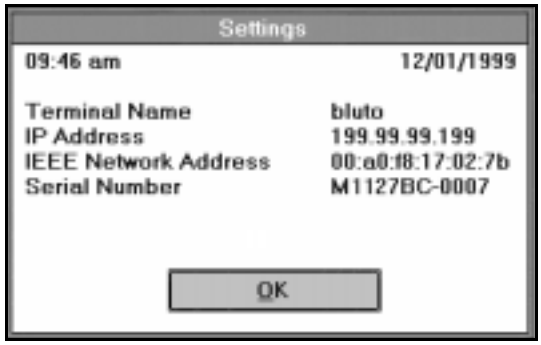


Figure 5-4. The Settings Pop-up Window

You can also use the Settings icon to run the Control Panel. To run the Control Panel, press the Settings icon when prompted, while the terminal is booting. For more information on the Control Panel application, see Chapter 6, *The Control Panel*.

Brightness

The terminal has three brightness levels, set at the Display tab of the Control Panel. To cycle through the available brightness levels, press the Display icon or press **<Fn-F11>**. See *Display Options* on page 6-6 for information on using the Control Panel to set intensities for the brightness levels.

Contrast

To increase (darken) screen contrast, press the Contrast (+) icon or press **<Fn-F9>**. To decrease (lighten) screen contrast, press the Contrast (-) icon or press **<Fn-F10>**. The terminal retains its contrast settings when you shut it off. See *Display Options* on page 6-6 for information on using the Control Panel to set the contrast level.

Battery Level

To display the Battery Status window, press the Battery icon or press **<Fn-F2>**. It shows the current battery capacity and the Warning and Critical limits. The Control Panel provides more detailed battery information. See *Battery Options* on page 6-15 for more information.

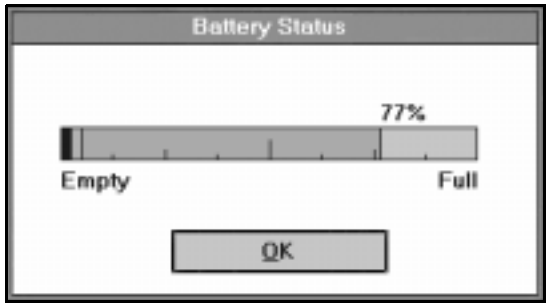


Figure 5-5. Battery Status Pop-up Window

Mouse Setting (PPT 4300-00R only)

By default, pressing the display with the pen acts as a left mouse click. On PPT 4300-00E and PPT 4300-S0E models, users can right click by pressing and holding the button on the side of the Electromagnetic pen as they press the screen. On these models, the Mouse icon is disabled. You can use the Control Panel to set a right click to be the default pen action. See *Default Mouse Click* on page 6-8 for details. For Terminal Emulator applications, if you do not wish to use the right-click action, you can alter it by setting the `RightEqualsLeft` parameter in `ppt4300.ini` (see *Settings in ppt4300.ini* on page 7-4).

The Mouse icon allows you to perform a right click or right double click on a PPT 4300-00R. To perform a right click on this model, select the Mouse icon; the next pen action acts as a right mouse click. After one right click or double click, the pen action reverts back to a left click.

Scan (PPT 4300-S0E only)

This icon is only active on PPT 4300-S0E terminals. To perform a scan, press the icon with the pen while you are using an application that accepts scanned data. You may also trigger a scan by pressing one of the Scan buttons located on the back of the terminal. See *Scanning* on page 5-20 for more information on scanning from a PPT 4300-S0E terminal.

Batteries and Power

A PPT 4300 series terminal runs on a rechargeable NiMH (Nickel Metal Hydride) battery pack using Smart Battery technology. A fully charged battery pack lasts for four to five hours of active use, with Power Management disabled. The terminal's Power Management features can extend this time significantly. To run a terminal for extended periods without a battery, use a Symbol-supplied 18V DC Adapter plugged into a standard North American electrical outlet.

PPT 4300 series terminals also have an internal battery known as a Swap battery. It provides limited power to essential circuits while the main battery pack is being replaced (or "swapped"). It also maintains power to the CMOS memory. It is not user-accessible.

This section describes:

- Smart Battery features
- the internal swap battery
- the battery warning messages
- how to check the battery level
- how to change and recharge batteries
- Power Management features

Note: *To prevent damage to the battery well, always leave a battery pack in the terminal, except when shipping or storing the terminal for more than a week. If you are shipping or storing the terminal, remove the battery and set the Run/Ship switch to* ***Ship*** *to maximize CMOS memory retention time. See Figure 1-2 in Chapter 1.*

Smart Battery Information

The terminal uses NiMH batteries containing a "smart" battery chip. This chip monitors the information listed below, and sends the information to the terminal. To view battery information, display the Battery tab of the Control Panel (described in *Battery Options* on page 6-15).

The Smart Battery monitors this information:

- Battery Serial Number
- Date of manufacture (Last Service Date)
- Original (nominal) maximum battery capacity
- Current capacity

Swap Battery

The swap battery is a small internal NiCd battery that maintains CMOS settings when there is no main battery. It also allows you to change a battery pack without switching the terminal off. When you remove the main battery, the swap battery maintains your session for up to 30 seconds while you change the battery pack. The terminal automatically powers off if it is left running on the swap battery for more than 30 seconds, with no attempt to close user applications or sessions in progress.

Charging the Swap Battery

The swap battery recharges itself from either the main battery or from AC power, regardless of whether the terminal is on or off.

- After a single, 30-second swap, the swap battery needs about 1 hour to recharge. The main battery fast charges the swap battery.
- A swap battery that has been completely depleted (*e.g.*, if the terminal has been sitting unused for a number of weeks) may take up to 10–16 hours to fully recharge.

If the swap battery has not had enough time to recharge, the terminal may turn off when you try to perform a battery swap.

Note: *The swap battery in a new PPT 4300 series terminal requires a break-in period of two to three days. If you attempt to use the swap batteries during the break-in period, the terminal may turn off abruptly and you may lose your session. Before you change battery packs during the break-in period, either:*
- *log out of your session and power the terminal off, or*
- *connect the terminal to AC power.*

Battery Warning Messages

When battery capacity drops to low levels, the terminal provides pop-up warning messages and the low battery light flashes. There are a number of Control Panel options that control when and how the warning messages appear. See *Battery Options* on page 6-15 for details. Note that `sftsr.com` and `sfinit.com` must be loaded for the Battery Warnings to operate. The pop-up battery warnings can be disabled in `ppt4300.ini` (see *Settings in ppt4300.ini* on page 7-4), but the low battery light still flashes. When a battery warning message appears, either change the battery, or end your session and power the terminal off.

You can change the timing of the battery warning messages at the Battery tab of the Control Panel (at what percentage of battery capacity they appear, and how long they appear and disappear).

By default, the Low warning window appears when battery capacity falls to 8%. At 8% of battery capacity, you have about 19 minutes of active battery life left. The Low warning pop-up window is framed in yellow. It appears for 8 seconds, disappears, and then reappears 15 seconds later. This continues until you press **<Enter>** or the **OK** button to acknowledge it.

By default, the Critical warning window appears when battery capacity falls to 4%. At 4% of battery capacity, you have less than 10 minutes of active battery life left. The Critical warning pop-up window is framed in red. It appears for 8 seconds, disappears, and then reappears 15 seconds later. This continues until you press **<Enter>** or the **OK** button to acknowledge it.

If battery capacity falls below 1%, the terminal may power itself off abruptly at any time. If you had an active session with the host and the terminal turns off, your session will be abruptly disconnected and you may lose unsaved work. The session on the host may or may not be closed (depending on the host and application).

Checking the Current Battery Level

To check the current battery level:

1. Display a Battery Status window by pressing the Battery icon on the Direct Access Panel, or by pressing **<Fn-F2>**.
2. The status window has yellow and red regions that correspond to the Low and the Critical warning levels. If the current battery level is in the yellow or red regions, complete your current task and then change the battery.
3. To close the Battery Status window, press the **OK** button with the pen, or press **<Enter>**, or wait for the window to disappear by itself.

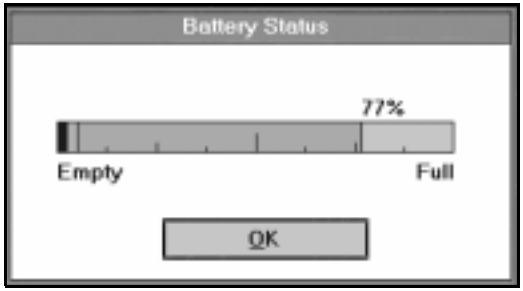


Figure 5-6. Checking the Battery Level

Changing the Main Battery

The terminal includes a small swap battery that maintains power to the terminal while you change the battery pack. To change the battery pack on a PPT 4300 series terminal without logging out or losing your session:

1. Make sure you have a fully charged battery pack available and close at hand.
2. Hold the terminal so that the back of it is facing you, but do not rest it on a table. The table may cause keys to be pressed, causing input to an application.
3. Firmly push up on the Battery Latch. The Ejector Spring pushes the battery up.
4. Slide the discharged battery pack out of the compartment. The terminal enters a Swap mode as soon as you remove the battery. Swap mode is similar to Sleep mode, but the CPU stays active. The swap battery maintains power to the terminal for up to 30 seconds, while you insert a fully charged battery. If you fail to insert a new battery within 30 seconds, the terminal powers off.
5. Place the bottom of the fully charged battery pack into the battery well. The tabs at the bottom of the battery fit into two slots at the bottom of the battery well.
6. Push the top into place until the battery latch clicks into place. Make sure the latch spring is all the way down, or the terminal will not be able to use the battery.

Note: *These instructions assume that the terminal's swap battery has enough capacity to sustain a 30-second swap operation. For the first two to three days with a new terminal, end your session and power the terminal off before you change the battery. This break-in period allows the swap battery to acquire a full charge.*

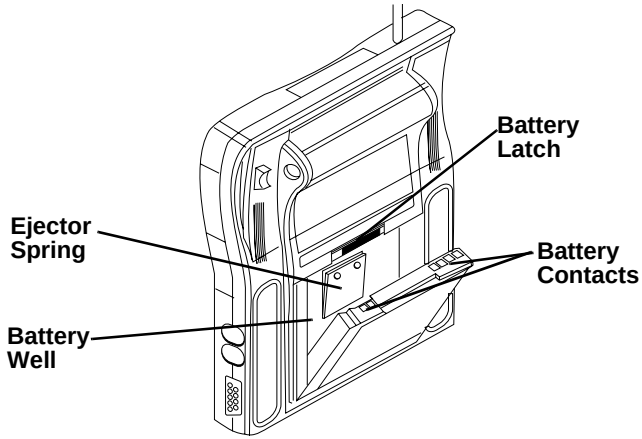


Figure 5-7. Parts of the Battery

Using an External Power Supply

As an alternative to using battery power, you can connect a PPT 4300 series terminal to an 18V DC adapter and plug it into a standard North American electrical outlet. Power Management features are disabled while the DC adapter is supplying power. To connect power to the terminal through a DC adapter:

1. Plug the DC adapter into the DC Port on the right side of the terminal.
2. Plug the other end of the adapter into an electrical outlet.
   - The Run/Ship switch must be set to **Run**.
   - The DC adapter will trickle charge a battery pack at about 1% an hour if the terminal is on, or 2% an hour if the terminal is off.

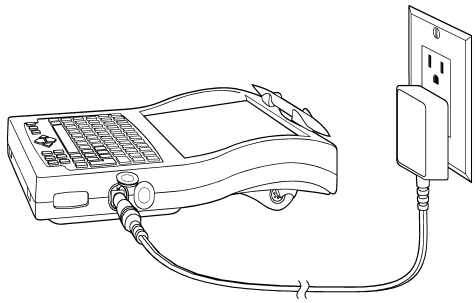


Figure 5-8. Connecting External Power to the Terminal

Note: *Use only a Symbol-approved adapter, and leave a battery pack in place while you are using the terminal with external power. Make sure to use the correct adapter for the terminal. Using a different adapter (*e.g.*, The 24V DC Adapter for the Battery Charger) will damage the terminal's circuitry. Contact your Symbol Representative for information on adapters for use outside of North America.*

Power Management Modes

PPT 4300 series terminals support Power Management modes that extend the period of time the terminal can run on a single battery. When the terminal is on, but is not in active use (this means no input from keypad or pen), it uses these modes to decrease the drain on the battery. Table 5-3 defines the Power Management modes. You can enable or disable Power Management modes at the Control Panel. For more information, see *Power Options* on page 6-12.

Table 5-3. Power Management Modes

Power Management Mode	Description
Run	The terminal is in full active use, with all components working at full power. After 17–76 seconds of inactivity (no input from keyboard or pen), the terminal enters Doze mode. Use the Control Panel to configure the amount of time before the terminal enters Doze mode.
Doze	In Doze mode, the CPU slows or stops, depending on the **Stop CPU Clocks during Power Management** setting at the Control Panel. The screen backlight dims and, if the CPU is stopped, the screen freezes. The session resumes as soon as you use the keyboard or pen. The terminal stays in Doze mode from 4 seconds up to 17 minutes, depending on the Control Panel setting. Then it enters Sleep mode. The terminal can maintain power to the radio during Doze and Sleep modes, but if the CPU is stopped, it suspends communication with the host. As a result the host may disconnect your session. If this occurs, you must log in again. To avoid such disconnects, deselect the **Stop CPU Clocks during Power Management** option, or consider disabling the Run–Doze transition. Note: if you disable the Run–Doze transition, the lower transitions are also disabled (Doze–Sleep).
Sleep	In Sleep mode, the CPU slows or stops, depending on the **Stop CPU Clocks during Power Management** setting. The screen backlight turns off and, if the CPU is stopped, the screen freezes. When you use the keyboard or pen the session resumes. The terminal stays in Sleep mode for 1 to 272 minutes and then powers off, depending on the Control Panel setting. To force the terminal into Sleep mode, if the Power icon has been configured for this, press the Power icon or press **<Fn-F4>**. See *Settings in ppt4300.ini* on page 7-4.
Off	After 1 to 272 minutes in Sleep mode, the terminal powers off, and must be re-booted. While the terminal is off, only the CMOS memory and digitizer panel controller maintain power.

Scanning

Operating a Scanning Terminal

The PPT 4300-S0E provides an integrated SE 1223 scanning module, with 1-D standard capability. The scanner is configured for level (triggered) mode. You can configure other modes by using configuration bar codes. For the configuration bar codes and further information about configuring the scanner, contact your Symbol support representative.

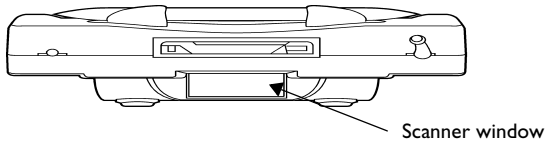


Figure 5-9. The Integrated Scanner on a PPT 4300-S0E

Caution

The SE 1223 scanner engine is a Class 2 laser scanner. It uses a low power, visible light diode. As with any very bright light source, the user should *avoid staring directly into the laser beam*. Momentary exposure to a Class 2 laser is not known to be harmful.

Note: *The scanner should decode properly printed bar codes quickly and effortlessly. Contact the Symbol Support Center if you have difficulty scanning.*

Using the Scanner

The terminal must be running a scanning application and scanner driver before anyone can use the scanner. To use the integrated scanner in level (triggered) mode:

1. Make sure that the terminal is on and the screen display is active.
2. An application must be running, and in a state that allows scanning.
3. Hold the scanner approximately 6–18 inches (15–45 cm) from the bar code. Aim the scanner window at the bar code.
4. Press a Scan button on the back of the terminal, or press the Scan icon with the pen. See Figure 1-2 on page 1-6 for location of the buttons and icons.
5. Adjust the aim of the thin, red laser beam to cover the entire length of the bar code:

Wrong **Right**

   The red laser beam stays lit while the bar code is being decoded. If decoding is not successful, the scanner turns off after approximately 3 seconds.
6. If the decode is successful, data appears on the screen.

Note: *On terminals with radios, the scanner locks out radio transmission for up to three seconds during the scan. This should not affect your session with a host computer; most communications systems will tolerate occasional brief interruptions like this.*

Scanning Tips

Scanning is usually a matter of aiming, scanning, and decoding. It is generally mastered simply and intuitively after a few quick test scans. Two important considerations can optimize any scanning technique — range and angle.

Range

The best scanning range depends on a bar code's size and density, but most combinations work at a distance of about 12 inches (31 cm). In general:

- Hold the scanner farther away for larger symbols.
- Move the scanner closer for symbols with bars that are close together.

- Start scanning at a distance from the bar code — not from direct contact. If the bar code does not readily decode, move the scanner closer.

The best way to specify an appropriate working range is through a chart called a Decode Zone (see Appendix E, *PPT 4300 With Integrated Scanner (PPT 4300-S0E)*). A decode zone plots working range as a function of minimum element widths of bar code symbols.

Angle

The scanning angle is important for quick bar code decoding. If you scan at the wrong angle, or place the scan window directly over the bar code, the laser light will reflect directly back into the scan window from the bar code. This is known as specular reflection. Specular reflection can "blind" the scanner and make decoding difficult.

For the scanner to successfully decode:

- Hold the unit directly in front of the bar code at a slight angle (no more than 30°).
- Do not scan at a sharp angle or the decode will not be successful.
- Practice several test scans to find the best angle.

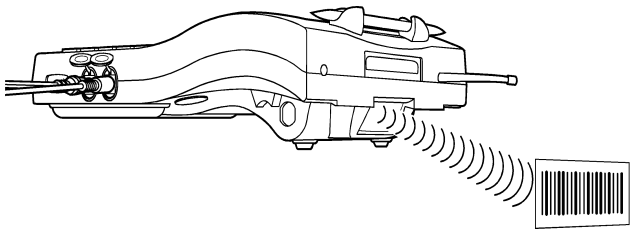


Figure 5-10. Scanning a Bar Code

Scanning and Power Management Modes

If the terminal is in Doze or Sleep mode, pressing a Scanner button will not return the terminal to Normal mode. To return to Normal mode:

- Press a key on the keyboard.
- Press the pen anywhere on the display.

Note: *If the terminal is in Doze or Sleep mode, pressing the Scan icon on the Direct Access panel returns the terminal to Normal mode but does not activate the scanner. You must press the icon a second time to scan.*

Using an External Bar Code Scanner

PPT 4300 series terminals support external bar code scanners for use with applications in Citrix ICA and Metaframe, DOS and the Terminal Emulators. The two options described here apply to external, tethered scanners only and not to integrated scanners.

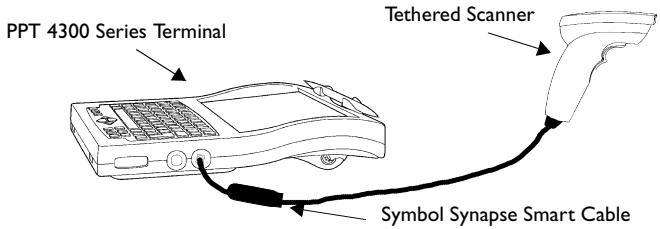


Figure 5-11. Using a Tethered Scanner from the External Keyboard Port

Scanning from the External Keyboard Port

This solution for bar code scanning works from Citrix ICA, DOS and Terminal Emulator applications. The scanner plugs into the external keyboard port and functions similarly to an integrated scanner. You need:

- a Symbol Synapse Smart Cable
- any PPT 4300-00E series terminal with a serial number starting with M02 or a PPT 4300-S0E terminal.
- a tethered, compatible scanner (*e.g.*, the LS4004 scanner)

The Smart Cable plugs into the keyboard port, and the scanner plugs into the Smart Cable. You do not need `kbwedge.com` or other special software. The scanner, also known as a "wedging" scanner, functions with any application that accepts input from the keyboard data stream. Contact Symbol Technical Support for information on compatible scanners.

Note that the PPT 4300-00R and earlier versions of the PPT 4300-00E are not voltage-compatible with the Symbol Synapse Smart Cable.

Scanning from the Serial Port

This solution works with DOS, Terminal Emulator and Citrix applications. The scanner plugs into the RS232 serial port. The serial port is activated by the `scanner.com` program, which causes the terminal to supply power to the scanner. You need:

- a tethered, decoded scanner (*e.g.*, the LT1820 scanner)
- a PPT 4300 serial adapter cable

- the `scanner.com` utility for configuring the serial port for use with a scanner
- keyboard wedge software (`kbwedge.com`) for inserting scanner data into the keyboard data stream

The `scanner.com` and `kbwedge.com` software are available from Symbol. To use the serial port (COM1) for scanning, you must activate COM1 for RS232 mode, and load the keyboard wedge.

To activate COM1 in scanner mode (RS232 mode with +5V power on the RI pin):

1. Install the `scanner.com` file onto the terminal in `C:\bin`.
2. Type `scanner` at the DOS prompt and press **<Enter>**.

To load the keyboard wedge:

1. Install the `kbwedge.com` file onto the terminal in `C:\bin`.
2. To redirect the data to the keyboard buffer (as is done when using the internal scanner, or a wedging tethered scanner), you must run `kbwedge` as follows:

   ```
   C:\>kbwedge /COM=1
   ```

   The "`/COM=1`" argument tells it to get the data from the serial port.

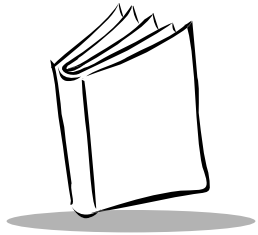
3. Plug the scanner into the RS232 Port.

If you have any questions about tethered bar code scanning, or for information on compatible scanners, please contact Symbol Technical Support.

Note: *If you use a tethered scanner with a PPT 4300-S0E integrated scanner terminal, the* `kbwedge.com` *program will load on start up. The program cannot be loaded twice. Therefore, if you are using an external scanner, unload (*`kbwedge /unload`*) and then reload the program using the "*`/COM=1`*" argument.*

The `scanner.com` Utility

The `scanner.com` utility configures the serial port on a PPT 4300 series terminal to allow use with an external scanner. It enables the serial port (if it was disabled). It also provides +5V supply to the RI pin. You can run it more than once without causing problems. There are no command line parameters. If you don't want +5V on the RI pin, use the `rs232.com` utility.



Chapter 6 The Control Panel

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Overview

The Control Panel application allows a System Administrator to view and modify terminal configuration. This chapter describes how to use the Control Panel, including:

- calibrating the pen
- controlling brightness, contrast and backlight
- setting battery warning message options
- setting Power Management options
- other Control Panel features

The instructions in this chapter assume that the terminal has been configured to run Terminal Emulators or a Citrix ICA DOS Client. For information on configuring a terminal, see:

- Chapters 4, *Standard Terminal Configuration*
- Chapter 7, *The Terminal Emulators*
- Chapter 8, *The Citrix ICA DOS Client*

Note: *If you run the Control Panel from the PPT 4300 Utilities PC card or other PC card, and you make changes, the Control Panel saves some parameters to files on the current drive (the drive corresponding to the letter shown in the DOS prompt).*

Navigating the Control Panel

These instructions describe how to make changes at the Control Panel. The sections that follow afterward describe the specifics of each tab in the Control Panel.

If a password has been defined, you must press **<F10>**, type the password and press **<Enter>** before you can make or save changes to many of the options on the Control Panel. If no password has been defined, all options can be changed freely.

To display the Control Panel and make changes:

1. Use one of these methods to display the Control Panel:
   a. As the terminal boots, select option **5** at the ROM-DOS Start-up menu.
   b. As the terminal boots, press the Settings icon or press **<Fn-F7>** when prompted. The prompt appears after the ROM-DOS Start-up menu disappears.
   c. Boot to a DOS prompt, type `bin\ctrlpnl` and press **<Enter>**.
2. If a password has been defined, select F10-Password..., or press **<F10>** to display the Control Panel password screen. Type the password and select **OK**.
3. The Control Panel has six screens ("tabs") of information and configurable options. Select a tab by pressing the pen on one of the tab labels at the top of the window. You can also navigate by pressing **<Alt-Tab>** and **<Shift-Alt-Tab>**.

   To select a field or a button, press it with the pen. You can also use the **<Tab>** key to move the focus through the updateable fields and buttons. Press **<Enter>** to activate a button that has focus. Use arrow keys to move sliders on the slide bars.
4. If you make changes, select one of these buttons by pressing it with the pen, or by pressing the associated Function Key:

F2-Save, Exit	Save changes and exit the Control Panel.
F3-No Save, Exit	Exit without saving changes.
F4-Save, No Exit	Save changes without exiting the Control Panel.
F5-Revert to Saved	Revert to the last saved version of the Control Panel options.

Most Control Panel changes take effect as soon as they have been saved, and the terminal powers off when you exit the Control Panel. However if you change the start-up application on the System tab, or any of the fields on the Network tab, the terminal reboots when you exit the Control Panel, to activate the changes.

Setting the Control Panel Password

If a password has been defined for your terminal, users must enter it before they can make or save changes to many Control Panel settings. If no password has been defined, anyone can make and save changes at the Control Panel. If you have set a password and forgotten it, contact Symbol Technical Support for assistance. To set or change the password from the Control Panel:

1. Display the Control Panel and select the System tab.
2. At the System tab, select the F10-Password... button.
3. At the Set New Password dialogue, type the new password into the **New Password** field.
4. Type the new password again into the **Confirm New Password** field.
5. Type the old password into the **Old Password** field.
6. Select the **Set** button to set the password, or select **Cancel** to cancel

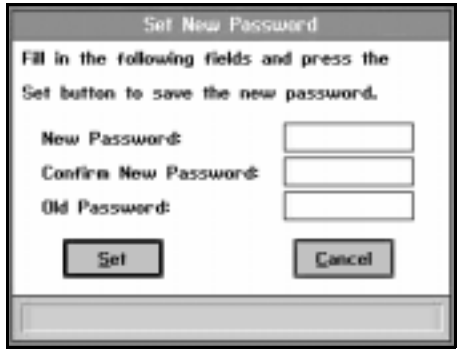


Figure 6-1. Changing the Password

Note: *You may also set this password in the System Configuration Utility (SCU). To run the SCU, press* ***<Ctrl-Alt-S>*** *as the terminal is booting.*

Display Options

The Display tab allows you to set contrast and brightness levels, configure the pen, and set video mode options. To make changes, follow the instructions in *Navigating the Control Panel* on page 6-4. No password is required to make changes on this page.

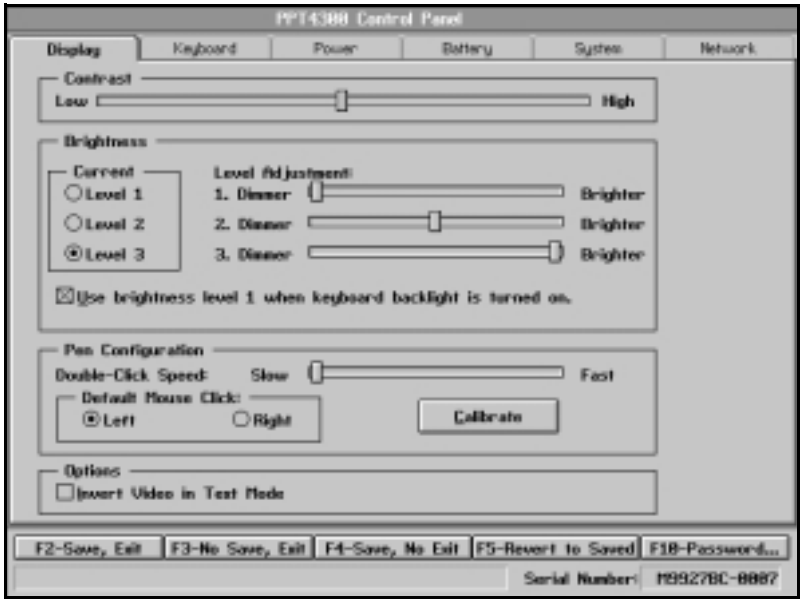


Figure 6-2. Control Panel Display Tab

Contrast

Adjust the position of the slider on the slider bar to set contrast for the terminal. “Low” and “High” represent the lowest and highest contrasts possible on the terminal. After the terminal finishes booting, users can adjust contrast using the Contrast icons on the Direct Access Panel, or by repeatedly pressing **<Fn-F9>** and **<Fn-F10>**. The terminal maintains its contrast settings from one session to the next.

Brightness

The terminal has settings for three levels of brightness. The Level Adjustment option allows you to set a specific brightness intensity for each level. The "Dimmer" and "Brighter" settings represent the lowest and highest possible brightness intensities.

The **Current** section shows what brightness level is currently in effect (Level 1, 2 or 3). To change the level, select one of the buttons, press the Display icon on the Direct Access Panel, or press **<Fn-F11>**. Note that users cannot change the relative brightness for any particular level; they must use one of the three levels defined on this tab.

Changing brightness for display Levels 1, 2 and 3: The **Level Adjustment** section has a slider bar for each brightness level. To set display brightness for a particular level:

1. Select a level from the **Current** box (*e.g.*, Level 1).
2. Click and drag the slider on the slider bar to adjust brightness for the chosen level.
3. Repeat these for the other levels. For example, you might set the slider toward "Dimmer" for Level 1, in the middle for Level 2, and toward "Brighter" for Level 3.

Note: *Keeping screen brightness levels fairly low can increase active battery life by up to 20%.*

Keyboard Backlight

When the checkbox is marked for **Use brightness level 1 when keyboard backlight is turned on** checkbox, the terminal automatically lowers the brightness level to Level 1 when the keypad backlight is turned on. This helps balance the brightness between the screen and keyboard areas. When this feature is enabled, users can still change to a different brightness level manually.

Pen Configuration

Double Click Speed

Drag the slider bar to adjust the double-click speed for the pen. The "Slow" setting allows a longer interval between double-click pen presses than the "Fast" setting. For terminals that will be used for Terminal Emulation, set this option to maximum "Fast". This disables the double click option, and improves Terminal Emulation pen press reliability.

Default Mouse Click

The **Left** option is the default. It causes a single pen press on the display to act as a left mouse click. Pressing twice acts as a left double-click. For a right click:

- PPT 4300-00E and PPT 4300-S0E: Push and hold the button on the side of the pen as you press the screen.
- PPT 4300-00R: Select the Mouse icon. The next pen action acts as a right mouse click, or right double click, and then reverts back to a left click.

The **Right** option causes a single pen press to act as a right mouse click. Pressing twice acts as a right double-click.

Pen Calibration

To check pen calibration:

1. Touch the screen with the pen and note the alignment between the pen tip and the arrow image. They should be aligned to within 1/8 inch. If they are not aligned closely, calibrate the pen.

To calibrate the pen:

1. Press the Calibrate button and follow the on-screen instructions.
2. You may also start the Calibration utility by pressing **<Fn-F8>** at any time after the terminal has finished booting.
3. Once you start calibration, you have 15 seconds to complete the process. If you do not complete the calibration within 15 seconds, the calibration utility shuts off, cancels a partial calibration and returns you to the originating session. If this happens, simply start the calibration process again.

Options

Invert Video in Text Mode: You can switch this option on or off to ensure that DOS character-based applications appear with the correct colors or to improve visibility. When this option is selected, the color palette is inverted. This means that when the video is in a text mode, specified colors are reverse polarity. For example, with the standard color map, this means that:

- black becomes white
- white becomes black
- dark blue becomes yellow
- yellow becomes dark blue
- dark green becomes pink
- pink becomes dark green
- dark cyan becomes light red
- light red becomes dark cyan
- light gray becomes dark gray
- dark gray becomes light gray

Note that if the color palette is manipulated (which happens rarely in text video mode) the colors could be different.

Keyboard Options

The Keyboard tab allows you to set defaults for the behavior of keys on the keyboard. To make changes, follow the instructions in *Navigating the Control Panel* on page 6-4. No password is required to make changes on this page.

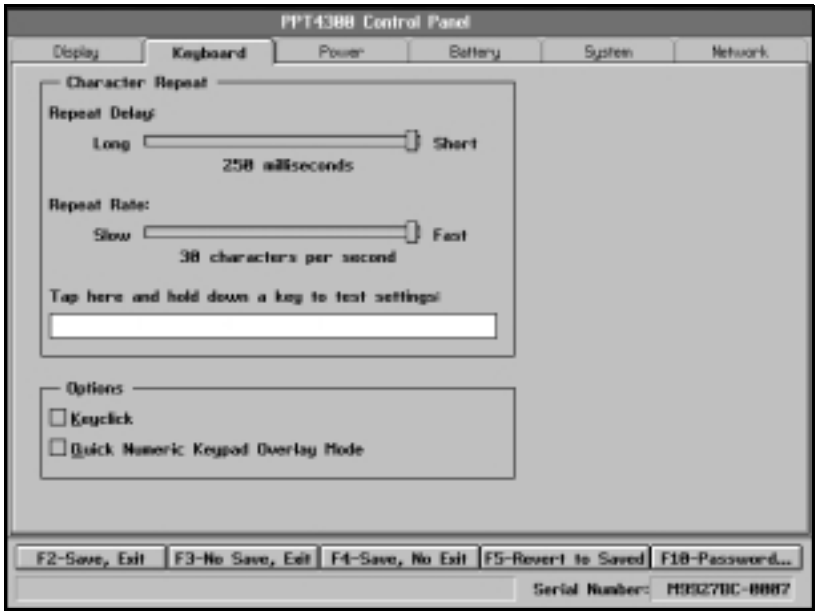


Figure 6-3. Control Panel Keyboard Tab

Character Repeat

Repeat Delay

To set the length of time that a key must be held down before it starts to repeat, adjust the position of the slider bar for **Repeat Delay**. The label below the slider bar changes to reflect the current time delay. The length of delay ranges from 1000 milliseconds to 250 milliseconds (adjusted in 250 millisecond increments).

Repeat Rate:

To set how many characters repeat per second, adjust the position of the slider bar for **Repeat Rate**. The label below the slider bar changes to show the current setting. The number of characters that repeat range from 2 characters per second, to 30 characters per second.

Test Field

To test any changes before you implement them, select the test field and hold down a key on the keypad.

Key Click

Select this checkbox to turn the audible **Key Click** feature on and off. When the box is marked, the keys on the keypad click when users press them. When the box is unmarked, the keys on the keypad do not click when pressed. This is different from suppressing beeps from the host (see *Quiet Mode* on page 6-18).

Quick Numeric Keypad Overlay Mode

The terminal's keypad incorporates a numeric keypad, using the blue symbols marked in small letters on the 7, 8, 9, 0, U, I, O, P, J, K, L, M, > and ? keys (on the North American keypad). International keypads may vary slightly. By default, Quick Numeric Keypad Overlay Mode is **off**, and the numeric keypad works like this:

1. Turn NumLock on by pressing the **<NumLock>** key (the LED above it lights up).
2. Enter numbers by pressing the **<Fn>** key plus a numeric keypad key (*e.g.*, **<Fn-J>** = 1).

If you turn Quick Numeric Keypad Overlay Mode **on** (checkbox is marked on the Keyboard tab), the numeric keypad automatically works as a numeric keypad when the **<NumLock>** key is active (*e.g.*, **J** = 1).

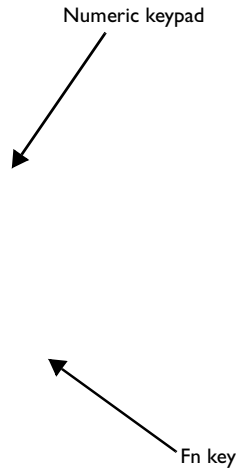


Figure 6-4. Numeric Keypad (North American version)

Power Options

The Power tab allows you to set Power Management defaults that will extend the usage time of a battery pack. The settings determine how much time an inactive terminal spends in a particular mode before switching to the next Power Management mode. You may also use this tab to turn the Power Management features off. For a complete description of the Power Management modes, see page 5-19.

To make changes to the Power options, follow the instructions in *Navigating the Control Panel* on page 6-4. The options on this page require a password, if one exists.

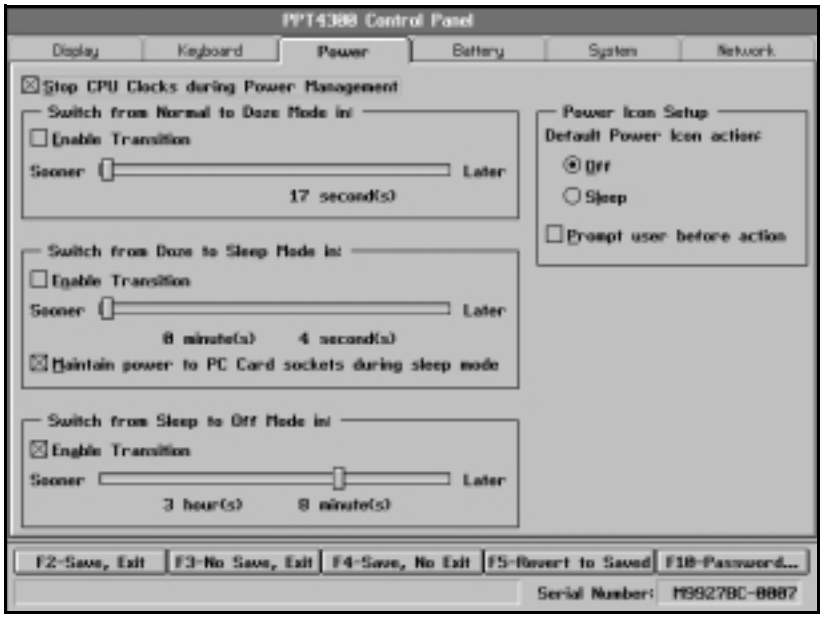


Figure 6-5. Control Panel Power Tab

Stop CPU Clocks During Power Management

This option controls the activity of the CPU when the terminal is in Doze or Sleep mode. If this option is selected, the CPU halts during Doze and Sleep modes and provides the most efficient Power Management.

If you deselect this option, the CPU slows down when the terminal is in Doze or Sleep mode, to minimize power usage, but it still processes all system functions including radio traffic and

screen updates. This ensures continual CPU availability to Citrix and other applications that need it, while still providing some Power Management.

Normal to Doze Mode

If the **Enable Transition** checkbox is marked, the terminal enters Doze mode after it has been inactive for a certain period of time. To set the amount of time that must pass for the terminal to enter Doze mode from Normal, adjust the position of the slider on the slider bar. The range is from 17 seconds to 76 seconds. The current setting appears just below the slider bar. If the **Enable Transition** checkbox is not marked, the terminal will not enter Doze mode. You can enable the Normal–Doze transition without enabling transitions to Sleep or Off modes.

Doze to Sleep Mode

If the **Enable Transition** checkbox is marked, the terminal goes into Sleep mode after it has been inactive for a certain period of time in Doze mode. To set how much time must pass in Doze mode before the terminal enters Sleep mode, re-position the slider on the slider bar. The range is 4 to 1020 seconds (17 minutes). The current setting appears just below the slider bar. If the **Enable Transition** checkbox is not marked, Power Management will not cause the terminal to enter Sleep mode, but you can still force the terminal into Sleep mode by pressing **<Fn-F4>**. The Normal–Doze transition must be enabled for the Doze–Sleep transition to be possible.

If the **Maintain power to PC Card sockets during sleep Mode** checkbox is marked (in some versions **5V on During Sleep mode**), the terminal maintains power to the PC Card slots while it is in Sleep mode. If there is no power to the PC Card slots, then the radio card will temporarily not function, and, depending on how your network is set up, the host may disconnect your session when the terminal is in Sleep mode.

Sleep to Off

If the **Enable Transition** checkbox is marked, the terminal powers itself off after it has been inactive for a certain period of time in Sleep mode. To set the amount of time that must pass in Sleep mode for the terminal to power itself off, adjust the position of the slider on the slider bar. The range is from 1 minute to 272 minutes (4 hours, 32 minutes). The current setting appears just below the slider bar. If the **Enable Transition** checkbox is not marked, the terminal will not turn off until the battery runs down. The Normal–Doze and Doze–Sleep transitions must be enabled for the Sleep–Off transition to be possible.

Note: *A terminal is inactive when there is no keyboard or pen activity. Network activity is not considered "activity" by Power Management.*

Power Icon Setup (Control Panel Versions 1.77 or later)

This section allows you to set the action of the Power icon during an active session. If the **Sleep** option is selected, the terminal enters Sleep mode when a user presses the Power icon. If the **Off** option is selected, the terminal powers off when a user presses the Power icon. If the **Prompt user before action** checkbox is selected, when the user presses the Power icon a pop-up window appears and prompts the user to confirm the Sleep or Off action. If the user presses **<Enter>,** the default action is selected.

By default, the Power icon powers the terminal off, with a confirmation prompt. However there are also some options that can be set in the `ppt4300.ini` file (see *Settings in ppt4300.ini* on page 7-4).

During a Terminal Emulation session, if you press the Power icon, the emulators ask "`Close the Session (y/n)`". If you answer yes, the telnet connection will be closed. Then if FastExit is on *and* this was the last active session, the Terminal Emulators exit. If the "`off.com`" command is in the `autoexec.bat` the terminal powers off. In this case, you cannot use the Power icon to put the terminal into Sleep mode. Instead you can use **<Fn-F4>** to put the terminal into Sleep mode. See the [Emulators] section of the table on page 7-5 for more information on the FastExit option. See *The Power Icon* on page 5-11 for more information on the Power icon.

Battery Options

The Battery tab displays current battery information and allows you to set defaults for warning messages. For a complete description of batteries and how to change a battery, see *Batteries and Power* on page 5-14. To make changes on this tab, follow the instructions in *Navigating the Control Panel* on page 6-4. The options on this page require a password, if one exists.

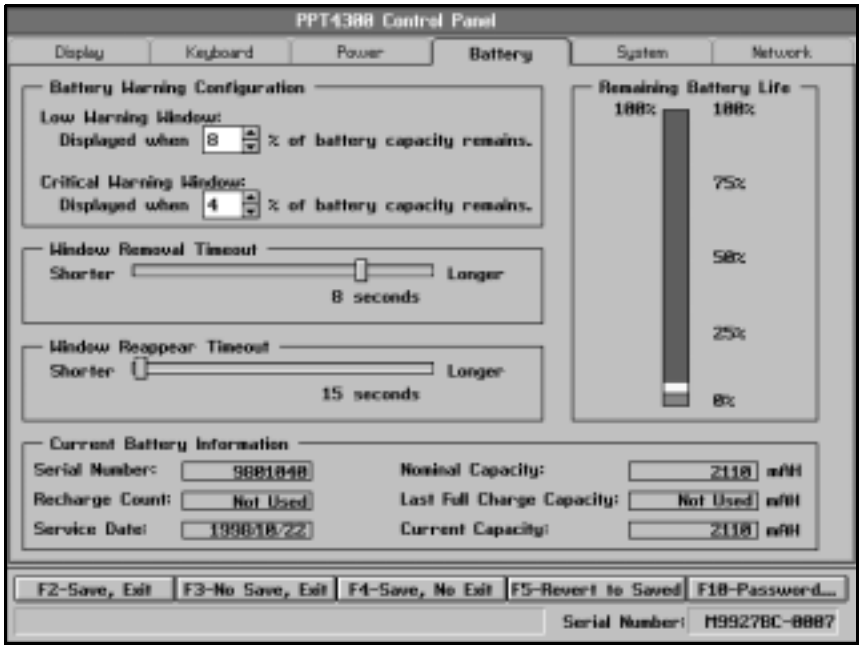


Figure 6-6. Control Panel Battery Tab

Battery Warning Configuration

The Low Warning Window appears when battery capacity has dropped to a level where the battery pack should be changed. The Critical Warning Window appears if battery capacity drops to a level where the battery pack must be changed. Both warning windows can be disabled in `ppt4300.ini`. See *Settings in ppt4300.ini* on page 7-4 for more information.

In Figure 6-6, the Low warning window is set to appear when battery capacity drops to 8%. The Critical warning window is set to appear when battery capacity drops to 4%. At 8% of battery capacity, you have about 19 minutes of normal, active use left. At 4%, you have less

than 10 minutes of normal use left before the terminal shuts off. To change the timing of the Battery warning messages, edit the battery capacity fields in the **Battery Warning Configuration** box.

Window Removal Time-out/Window Reappear Timeout

A Low or Critical warning window appears on the terminal's screen for a set period of time (*e.g.*, 8 seconds). If you do not acknowledge the window while it is on the screen, it disappears, and then reappears a number of seconds later.

The **Window Removal Timeout** field sets the length of time that the message window stays on the screen. The default time is 8 seconds. To change this time, adjust the position of the slider on the slider bar.

The **Window Reappear Timeout** field sets the length of time that passes before the message window reappears, if you have not acknowledged it. The default time is 15 seconds. To change this time, adjust the position of the slider on the slider bar. To acknowledge a message, press the **Close** button with the pen, or press **<Enter>** while the message is displayed.

Remaining Battery Life

This bar graph shows how much capacity the battery has left. Current battery level is marked by a line and is updated every 10 seconds. The bottom two segments of the bar appear in yellow and red. The yellow area corresponds to a battery level that will cause a Low warning window to appear. The red area corresponds to a battery level that will cause a Critical warning window to appear. If you are using an external power source (DC Adapter), the **Remaining Battery Life** bar freezes at the last known battery level.

Current Battery Information

When the terminal is powered from a battery, the Current Battery Information area at the bottom of the screen shows battery information.

- **Serial Number:** The battery's serial number.
- **Recharge Count**: This feature is reserved for future use.
- **Service Date:** The date the battery was initialized during manufacture.
- **Nominal Capacity**: The capacity of the battery when it was first manufactured, in milliamp-hours (mAH) .
- **Last Full Charge Capacity**: This option is reserved for future use.
- **Current Capacity**: Shows how much capacity is left in the battery — this is the number illustrated on the Remaining Battery Life graph.

System Options

The System tab displays system information for the terminal. To make changes, follow the instructions in *Navigating the Control Panel* on page 6-4. The options on this page require a password, if one exists. This tab also allows you to:

- select a start-up application
- view software versions
- set or change the Control Panel password
- enable or disable booting from the PC Expansion Slot
- set Quiet Mode on or off

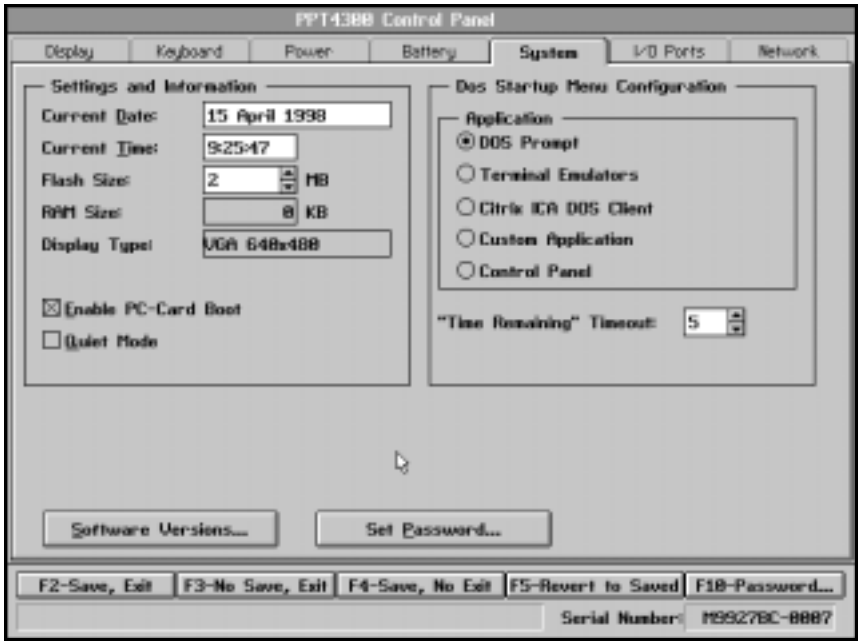


Figure 6-7. Control Panel System Tab

Note: *If you change the* ***Current Time****, immediately select* F4-Save, No Exit *so that the time is saved promptly.*

Settings and Information

Current Date: Shows the current date. You can edit this field.

Current Time: Shows the current time. You can edit this field.

Flash Size: The default setting for this field is 2MB. *Do not change this setting unless you are adding or partitioning an internal flash expansion module.*

To change the setting, click the arrows at the end of the field. On standard terminals, the options are 0 and 2, but setting this field to 0 disables the on-board Flash memory. On terminals with Flash Expansion modules, you can set a higher flash size — available options depend on the size of the Flash Expansion module. For more information, see *Partitioning a Flash Expansion Module* on page 3-26.

RAM Size: Shows the size of the on-board RAM. This field is for display only.

Display Type: Shows the screen display type and resolution. This field is for display only.

Enable PC-Card Boot: If this option is selected, when the PPT 4300 powers on, it -will attempt to boot first from a PC card in the Expansion Slot. If there is no card in the Expansion Slot, it attempts to boot from the internal flash. To prevent the terminal from booting from a PC card, make sure this option is not selected.

Quiet Mode: Some host applications may cause the terminal to beep when some actions occur (Note: this is different from the **Key Click** option described on page 6-11). To prevent this, select **Quiet Mode**. To enable the beeps from the host, make sure **Quiet Mode** is not selected.

DOS Start-up Menu Configuration

This box allows you to select which application will run once a terminal powers up and finishes booting. Select the radio button for the application that you wish to start. See *ROM-DOS Start-up Menu* on page 4-6 for more information.

Software Versions

Press to see a list of the software currently loaded and running on the terminal's flash file system. If you have booted from the PPT 4300 Utilities PC card and the loaded software comes from the PC Card, then you will get the versions of the software on the PC Card. If you boot from the internal flash and the loaded software comes from the internal flash, you will see the versions of the software on the internal flash. To dismiss this list, select the **Close** button.

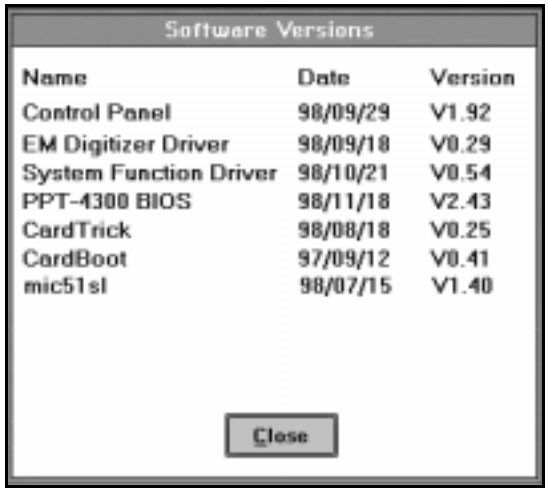


Figure 6-8. Software Versions Pop-up Window

Setting a Password

Press the Set Password... button to add or change a password for the Control Panel. See *Setting or Changing the Control Panel Password* on page 6-5 for more information.

Network Options

For terminals that communicate with a network, the Network tab displays information about the terminal's current communications configuration. *If you change the settings on this page, you change the terminal's ability to communicate with the network.* Also, if you make changes that directly affect communications, the terminal will reboot when you exit the Control Panel, to activate the changes.

To make changes, follow the instructions in *Navigating the Control Panel* on page 6-4. The options on this page require a password, if one exists.

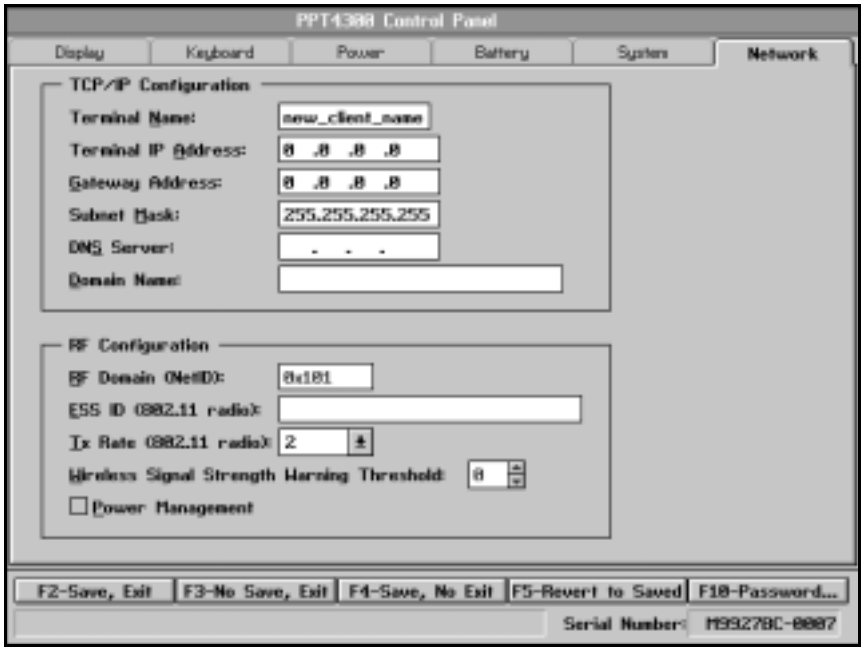


Figure 6-9. Control Panel Network Page

TCP/IP Configuration

This section of the screen allows you to set information in the fields listed below:

Terminal Name

This field holds the Citrix ICA Client name for the terminal (up to 15 alphanumeric characters). This name appears on Citrix server administration screens. We recommend naming the terminal according to serial number or a unique terminal ID.

Terminal IP Address

This field holds the terminal's network address. Networks use IP addresses to determine where to send data that is being transmitted over a network. An IP address is a 32-bit number commonly specified as a series of 8-bit numbers in decimal dot notation (*e.g.*, 199.99.99.5). The highest 8-bit number you can use is 254. This field is required.

Gateway Address

This field holds the IP address for a network gateway or router. A terminal is part of a subnet as specified by its IP Address and Netmask. It can send packets directly to any node that is on the same subnet. If the destination node is on a different subnet, then the terminal sends the packet to the gateway first. The gateway then determines how to route the packet to the destination subnet. This field is only required if a gateway is needed to reach the host.

Subnet Mask

This is a number that the network uses to determine whether or not one device can communicate directly with another (*e.g.*, a terminal attempting to communicate with a host computer). In some cases, devices must communicate indirectly through a gateway. The network system uses the subnet mask to compare the IP addresses of the two devices involved and determine whether they will communicate directly or indirectly. The subnet mask depends on your facility's IP address allocations. If the special subnet mask of "255.255.255.255" is specified, then the TCP driver (`tn_tcpip.exe`) used by the Terminal Emulators will calculate a subnet mask derived from the first 2 bits of the Terminal IP Address. However if your facility uses site-specific subnets, you may need to set a different subnet mask.

DNS Server

If you are using the Microsoft TCP stack, use this field to specify the IP address for a Domain Name Server (DNS). It allows users to use server names, rather than IP addresses. To use this feature with the Microsoft TCP stack, you must load DNS software (`dnr.exe`). If you are using a Novell TCP stack, you must specify a DNS by editing the *`c:\net\resolv.cfg`* file. Contact Symbol Technical Support for more information.

Domain Name

If you are using the Microsoft TCP stack, use this field to specify the Domain Name for a DNS server (*e.g.*, `symbol.com`). To use this feature with the Microsoft TCP stack, you must load DNS software. If you are using a Novell TCP stack, you must specify a Domain Name by editing the *`c:\net\resolv.cfg`* file. Contact Symbol Technical Support for more information.

RF Configuration

This box allows you to set the **RF Domain (NetID)**, **ESS ID (802.11 radio)** and the **Wireless Signal Strength Threshold (RSSI)**.

RF Domain (NetID)

Use this option for terminals with Spectrum24 cards using the Spring communications protocol (and for cards using the 802.11 protocol, if no **ESS ID** has been defined). A NetID allows facilities to restrict which Access Points a PPT 4340 terminal can communicate with. This field is required. Use a hexadecimal number, *e.g.*, '0x101' or its decimal equivalent, *e.g.*, '255'. A terminal can only communicate with Access Points that have matching NetIDs. See the Spectrum24 documentation for more information. This parameter is saved in `\lanman.dos\protocol.ini` and `\net\net.cfg`, if they exist.

ESS ID (802.11 radio)

This field only appears in Control Panel versions 1.87 and later. Use this option for terminals with Spectrum24 cards using the 802.11 communications protocol. An ESS ID allows facilities to restrict which Access Points a PPT 4340 terminal can communicate with. A terminal can only communicate with Access Points that have matching ESS IDs. The ESS ID is an alphanumeric, case-sensitive network identifier. It is 1 to 32 (ASCII) bytes in length. If the ESS ID contains spaces, enclose it within single quotation marks. If the ESS ID contains numbers, enclose it within double quotation marks. See the Spectrum24 documentation for more information. This parameter is saved in `\lanman.dos\protocol.ini` and `\net\net.cfg`, if they exist. If the ESS ID is not present, the terminal uses the NetID.

Tx Rate

Use this option for terminals with Spectrum24 cards using the 802.11 communications protocol. This field controls the rate at which a terminal communicates with a Spectrum24 Access Point. If the terminal has a 2 Mbps radio, you can set this field to **1** or **2**. When the field is set to **1**, the terminal communicates at the rate of 1 Mbps and can only communicate with 1 Mbps Access Points. When set to **2**, it communicates at 2 Mbps and can only communicate with 2 Mbps Access Points. On terminals with 2 Mbps radios, **2** is the default value for this field. If the terminal has a 1 Mbps radio, then the only option available is **1**.

Wireless Signal Strength Warning Threshold

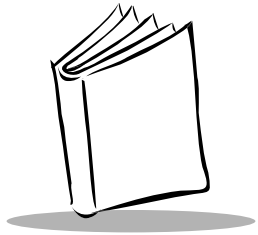
This field lets you set the Received Signal Strength Indicator (RSSI) value that will cause a pop-up warning message to appear. The message immediately alerts users that they have entered an area of poor radio coverage, so they can get back in range. The RSSI has a range of 0 to 99. Normal operating range is 25 to 65. Below 25, the terminal is likely to roam for a better connection. Below 20, you may lose your connection with the host computer. To disable the message, set this field to 0. The pop-up message appears when the signal drops below the level set in this field, or when the terminal is roaming. This message can also be set or disabled in `ppt4300.ini` (see *Settings in ppt4300.ini* on page 7-4).

Power Management

This option controls a hardware-based power management setting on the Spectrum24 radio card. It is not related to the software-based PPT 4300 Power Management scheme, which is configured in the Power tab. This Power Management setting controls the `PowerMgmt=x` in either `net.cfg` (Novell TCP/IP stack) or `protocol.ini` (Microsoft TCP/IP stack). In `net.cfg` the value is either "`Y`" or "`N`". In `protocol.ini` the value is either "`1`" (on) or "`0`" (off). Use of this Power Management scheme is not recommended with the Microsoft TCP/IP stack.

When Power Management is off, the radio card draws normal power and actively maintains its radio connection.

When Power Management is on, the radio card only communicates with the Access Point when it has something to send. This reduces the drain on the battery and saves power. However there can be a small but noticeable delay when the terminal needs to communicate over the network with an Access Point and host.



Chapter 7 The Terminal Emulators

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Overview

The standard configuration for terminal emulation allows a terminal to communicate with one or more hosts. A PPT 4300 series terminal includes software for running three different terminal emulations through Telnet: 3270, 5250 and VT220. If the terminal will be used for terminal emulation, it must also have a radio card installed (*e.g.*, the PPT 4340 model) and must be configured for network communication as described in Chapter 4, *Standard Terminal Configuration*.

This chapter describes some terminal emulation features, including the Terminal Emulation Options screen, the Host Choice List, and Multiple Sessions. You may also define a custom key map (see Appendix B, *Key Mapping for Terminal Emulators*). These features are specific to terminal emulation; they do not apply to Citrix ICA Client for DOS applications, or to any DOS applications.

Note: *Terminal Emulation set-up and configuration is unique to the PPT 4340 and may be different from Terminal Emulation set-up and configuration for other Symbol terminals.*

Starting and Ending a Terminal Emulation Session

If the terminal has been set to run terminal emulations, and a Host Choice List has been set up, you can start and end sessions as described here:

Starting a session

When you power up the terminal a Host Choice List appears after the terminal finishes booting. Use the pen, arrow keys, or keyboard to select a host. Then use site-specific procedures to log in (*e.g.*, User ID and password). You may also configure the terminal to skip the Host Choice List and connect automatically to the first host on the list. See *Bypassing the Host Choice List* on page 7-15.

Ending a session

To end a session you can:

- use site-specific procedures to end your session (*e.g.*, type `logout` or press **<Ctrl-D>**). You can also press **<Shift-Alt-X>** to force the telnet session to close. When the Host Choice List reappears, select another host, or press **<Esc>** to power the terminal off.
- configure the terminal to power off when you exit your last session. See *Bypassing the Host Choice List* on page 7-15.
- define a custom key to close a telnet session. See Appendix B, *Key Mapping for Terminal Emulators*.

Programming for the Power icon

If your facility is developing Terminal Emulator applications for use with a PPT 4340, the Power icon can be configured to perform a function defined by the application. If a callback function is registered by an application, then the application determines what the Power icon does. For example, the PPT 4340 Terminal Emulators configure the Power icon to perform a 'close current session' function and then power off, when pressed. For more information, contact Symbol Technical Support.

Terminal Emulation Options

Settings in ppt4300.ini

The `ppt4300.ini` file determines some important settings for the terminal emulators and system utilities. Many of these settings can be changed from the Control Panel, or overridden at the Terminal Emulation Options screen described on page 7-9. However this file may also be edited manually.

Table 7-1. Settings in ppt4300.ini

Section	Default Setting	Description

[VT220]	`Newline=1`
	`AutoWrap=0`
	`BackSpaceKey=1`
		These are VT220 defaults. You can override these in `keymap.cfg`, or at the Terminal Emulation Options screen (press **<Shift-Alt-O>** during a Terminal Emulation session).

[3270]	`HostCursorHome=1`	The `HostCursorHome` setting is a 3270 default. It controls the cursor location when you move to a new screen. When the feature is active (a value of **1**), the cursor moves to any position the host requests, including the home position in the top left corner. If you deactivate this feature (a value of **0**), the cursor stays in the same relative position on the new screen or moves to a field defined by the host application. However, it will *not* return to the home position.
	`Extended=1`	The `Extended` setting controls extended 3270 commands, with host-defined colors and highlighting. A value of **1** means that support for the extended 3270 commands are on. A value of **0** means that the extended commands are off.

Table 7-1. Settings in ppt4300.ini

Section	Default Setting	Description
[3270] (cont'd)	`UseUserClr=0`	Set UseUserClr to **1** if you want to override host defined colors with the colors defined above.

	`InputNormalClr=`
	`InputIntenseClr=`
	`ProtNormalClr=`
	`ProtIntenseClr=`
		These settings define field colors based on field attribute characteristics: Input/Protected, Normal/Intense (or Non-Selectable/Selectable). If you list two colors for a setting, the first defines the field color for that field type when it is unmodified, and the second defines the field color when the field has been modified. If the color is to remain the same regardless of the Unmodified/Modified state, then list one color. Color commands from the host are ignored if `UseUserClr` is set to **1**.
		The defaults (when no color is specified) are:
		`InputNormalClr=Green,Green`
		`InputIntenseClr=Red,Red`
		`ProtNormalClr=Turquoise,Turquoise`
		`ProtIntenseClr=White,White`
		The colors to choose from are:
		• Black • Blue • Green
		• Turquoise • Red • Pink
		• DarkGray • LightBlue • LightGreen
		• LightTurquoise • LightRed • LightPink
		• Yellow (brownish) • LightYellow • White
		• Neutral (dull white)

[5250]	`Terminal Type=1`	Use this option to set the type of 5250 terminal reported to the host by the PPT 4300. The default value is **1**. Possible values include: 0 - for IBM 5251-11 (24x80 monochrome) 1 - for IBM 3179-2 (24x80 color)
[Emulators]	`FastStart=0`	`FastStart`, when set to **1**, causes the terminal to skip the Host Choice List and connect to the first host on the list. The default, **0**, makes the terminal boot to the Host Choice List.

Table 7-1. Settings in ppt4300.ini

Section	Default Setting	Description
[Emulators] (cont'd)	`FastExit=0`	`FastExit`, when set to **1**, makes the terminal automatically exit the emulators when the last active session closes. The default, **0**, makes the terminal return to the Host Choice List when the last active session closes.
	`DiamondsActive=1`	`DiamondsActive` controls the session-switching diamonds on a Terminal Emulator's status line . The diamonds can be used to switch sessions with the pen. The default is **1**. To prevent the diamonds from appearing, set `DiamondsActive` to **0**.
	`DrawPointerArrow=0`	`DrawPointerArrow` controls the presence of a visible arrow pointer for the pen on the screen when the emulators are running. A value of **0** (the default) means the arrow pointer is not visible. A value of **1** means the arrow is visible.
	`RightEqualsLeft=0`	`RightEqualsLeft` controls the action of a right pen tap in a terminal emulation session. When set to **0** (the default), a left pen tap moves the cursor and performs the Pen Select action, and a right pen tap simply moves the cursor. When set to **1**, then a right pen tap performs the same function as the left pen tap.
[Pen]	`DoubleClick=0`	`DoubleClick` defines the double click speed for the double click heuristic in the digitizer driver and can have a value from **0** (slowest) to **9** (fastest). You can also set this at the Control Panel. For the Terminal Emulators (which do not use the double-click), set this value to **9** to improve pen tap response.
	`LeftClick=1`	Set `LeftClick` to **1** (the default) to have the default pen tap act as a left mouse button click. When set to **0**, the default pen tap becomes a right mouse button click. You can also set this at the Control Panel.

Table 7-1. Settings in ppt4300.ini

Section	Default Setting	Description
[Battery]	`RemoveTimer=8`	`RemoveTimer` determines how long a battery warning message appears before being removed (must be <10 seconds). You can also set this at the Control Panel.
	`WarningAlert=8`	`WarningAlert` determines the battery percentage at which the Battery Low Warning appears. You can also set this at the Control Panel.
	`CriticalAlert=4`	`CriticalAlert` determines the battery percentage at which the Battery Critical Warning appears. You can also set this at the Control Panel.
	`ReappearTimer=15`	`ReappearTimer` determines how many seconds will pass before a battery message reappears, if not acknowledged (15 - 60 seconds). You can also set this at the Control Panel.
	`WantAlerts=1`	`WantAlerts` controls whether the low battery alert windows will pop up when the battery runs low. It defaults to **1** (on). If set to **0**, the battery alerts will not display when the battery runs low. However the Low Battery LED still functions. This feature can only be set in `ppt4300.ini`.
[Power Management]	`PowerIconOff=1`	This setting controls the Power icon. A **1** means the terminal will turn off when the Power icon is pressed (default). A **0** means the terminal will enter Sleep mode.
	`PowerIconPrompt=0`	This setting controls a user confirmation prompt for the Power icon. A **1** means that a confirmation prompt appears when a user presses the Power icon, and the user must select "Sleep" or "Off". A **0** means the terminal powers off or goes into Sleep mode with *no* confirmation prompt when the user presses the Power icon. You can change these settings at the Power tab of the Control Panel. See *Power Options* on page 6-12.

Table 7-1. Settings in ppt4300.ini

Section	Default Setting	Description
[System]	`SerialNumber=`	This contains the terminal's serial number (it may be blank). *Do not change the serial number.*
	`WantPopups=1`	`WantPopups` controls whether the Battery Status, Settings and Low RSSI windows will pop up when the appropriate Direct Access icons or Fn-keys are pressed. The default is **1**. If set to **0**, then the Battery Status and Settings pop-up windows will not appear. It does not control the user confirmation window that may appear when a user presses the Power Icon. Use `PowerIconPrompt` for this.
	`PermitS24Info=0`	If the terminal uses a Spectrum24 card, `PermitS24Info` determines whether on-screen Spectrum24 information will be available to the user when using the RF/AP utility to test RF signal strength. If set to **1**, the on-screen Spectrum24 information is allowed. The default is **0** (disabled).
	`S24InfoWantAP=0`	`S24InfoWantAP` controls whether the on-screen S24 information will include the Access Point ID of the associated Access Point. The default is **0** (disabled).
	`S24LowRSSILevel=0`	This sets the threshold for the Poor Reception/Low RSSI warning. This pop-up window provides an immediate warning if a user enters an area with poor radio reception. The RSSI range is 0 to 99. Default value for this setting is **0** (disabled). It can be set at the Control Panel.

Double-Click Setting for Terminal Emulators

Since Terminal Emulators do not use double-clicking, you can disable the **Double-Click** by setting the **Double-Click Speed** to **Fast** on the Display tab of the Control Panel. This improves Terminal Emulation pen reliability. It is a recommended Control Panel setting for use with Terminal Emulators.

Terminal Emulation Options Screen

The Terminal Emulation Options screen displays information and allows you to set some emulator-specific options. All changes made at this screen affect the *current session only*. When you close the session, the options revert to default values. To change the default values, edit `keymap.cfg` (described on page 7-15). To use the Terminal Emulation Options screen:

1. With a charged battery pack in place, power up the terminal and log in to a host. Note that the Terminal Emulation Options screen is not available from the Host Choice List. You must log in to a host.
2. To display the Terminal Emulation Options screen:
   a. Press **<Shift-Alt-O>**.
   b. Type `amtrtu` as the password and press **<Enter>**. The password cannot be changed.
3. Make any necessary changes to the settings.

   A check appears in front of any activated option, and a dot appears in front of the selected item in a radio button group. If no check appears, the option is not activated. Use the pen to activate and deactivate options. You may also use the keyboard: each option name has a highlighted character (*e.g.*, **A** in **A**utowrap). Press this character to toggle the option on or off. Some hosts may automatically change some options.
4. To save and exit, press **<Enter>**. To exit without saving, press **<Esc>**.

```
                    User Configuration Options

3270 options                          VT220 options
[ ] Host Cursor Home Command      [√] New-line mode
                                  [ ] Auto-wrap
                                  <-- ( )is Delete
Supported Emulators                   (•)is Backspace
[ ] IBM 3270
   (•)Default 3270                    MT Defaults

[ ] IBM 5250                      [√] Key Click
   (•)Default 5250

[√] VT220
   (•)1. VT220 custom
   ( )CHS (Pharmakon)
   ( )STandard

Press a highlighted letter to access an option.
Press <ENTER> to save and exit or <ESC> to exit without saving.
```

Figure 7-1. VT220 Terminal Emulator with Custom Key Map

Terminal Emulators and Key Maps

The **Supported Emulators** section of the Terminal Emulation Options screen displays information about the emulation being used in the current session. For example, if the **VT220** emulation is checked, then the current session is using a VT220 Terminal Emulator to connect to a VT220 host, and the screen shows the current options, as configured in `keymap.cfg`.

The Supported Emulator checkboxes are for information only. Selecting a checkbox does not change which emulator is currently active. To enable a specific Terminal Emulation, add a host entry for it on the Host Choice list (see *Creating the Host Choice List* on page 7-15). To change to an alternate key map see Defining the Host Choice List on page

Each Terminal Emulation has a default key map, listed beneath the Terminal Emulation name on the Terminal Emulation Options screen. If more than one key map is available for an emulator, the other key maps are also listed below the Terminal Emulator name. The currently selected key map is marked with a dot. To use an alternate key map, press the highlighted letter in the key map name. For example, the VT220 Terminal Emulator in Figure 7-1 has a custom key map selected. To select the standard key map for VT220, press **T**. The keymap becomes active immediately, and but only stays active for the current session. To change the default keymap for a type of Terminal Emulation, you must edit `keymap.cfg`. Also see Appendix B, *Key Mapping for Terminal Emulators*.

3270 Options

The 3270 emulation provides the **Host Cursor Home Command** option. Press **C** to turn this feature on or off. It controls where the cursor appears when you move to a new screen. When the feature is on, the cursor moves to any position the host requests, including the home position in the top left corner. If the feature is turned off, the cursor stays in the same relative position on the new screen or moves to a field defined by the host application. However, it will *not* return to the home position.

VT220 Options

The VT220 emulation also includes these options:

New-line Mode: Press **N** to toggle New-line mode on or off.

Auto-wrap: Press **A** to toggle Auto-wrap on or off.

← is ( ) Backspace *or* **( ) Delete**: Press **B** to select the Backspace function for the '←' key, or **D** to select the Delete function for the '←' key.

Key Click

The key click option allows you to turn key clicks on or off. On the Terminal Emulation options screen, press **K** to toggle the option on or off (checked = on). This setting temporarily overrides the global Key Click setting in the Keyboard tab of the Control Panel.

Host Beeps (Quiet Mode)

Some host applications may cause the terminal to beep when certain actions occur (Note: this is different from the Key Click option). To control this, you can set the Quiet Mode option at the System tab on the Control Panel:

1. Power the terminal on and boot to the Control Panel. To do this, look for the ROM-DOS Startup Menu that appears as the terminal is booting, and select option **5**.
2. Select the System tab.
3. On the System tab, select the **Quiet Mode** option. When Quiet Mode is selected, the terminal will not beep. If Quiet Mode is not selected, then the terminal will beep if the host application requests it.
4. Select F2-Save, Exit, or press <F2> to save your changes and reboot the terminal.

VT220 Features

The VT220 Terminal Emulation supports a number of other features, as described here.

VT220 Scrolling

The VT220 emulation supports 132 columns, with scrolling from side to side. The screen displays 80 columns at a time. In applications that use 132 columns, press **<Ctrl>** plus a left or right arrow key to scroll 10 columns to the left or right. For example, press **<Ctrl→>** to shift the view 10 columns to the right. Press **<Shift-Ctrl→>** to shift all the way to the right.

The status line shows how many columns are to the Left or Right of the current view. For example, if the status line shows:

```
<<10←                              42>>
```

- `<<10` indicates 10 columns exist to the left.
- `42>>` indicates 42 columns exist to the right.
- ← indicates the direction that you must scroll in order to find the cursor. The display *will not* automatically shift to the cursor location when you start to type.

Compucare™

The PPT 4340 VT220 emulation works with character-based Compucare applications, and with WordPerfect™. For a seamless integration, you will need the latest set of support tools from Compucare. Contact Compucare for specific details.

VT220 Answerback

Some hosts verify a terminal's identity by using an 'answerback' query mechanism. The host uses the enquiry command to prompt the terminal for a unique terminal identifier. The terminal sends an answerback message in response. To set the answerback message:

1. Boot the terminal to a ROM-DOS prompt.
2. Open the `autoexec.bat` file in the NED editor (`ned autoexec.bat`).
3. Set a 5-digit numeric environment variable (`AMTNUM0`) in the Emulators section of the file, before the line that reads `awte.exe`. For example, `set AMTNUM0=12345`, where "`12345`" is a unique identifier for the terminal. You may also set this variable from the command line.
4. Save the file and exit the editor.
5. Reboot the terminal.

After this variable is set, if the VT220 host prompts the terminal with the enquiry command, the terminal will respond with the answerback message: `KB12345<CR>`.

ASCII Control Functions

These combinations retain standard ASCII Control Functions in the VT220 emulation, even in WordPerfect:

Table 7-2. ASCII Control Functions in VT220

Key Combination	Function
<Ctrl-I>	Tab Right
<Ctrl-H>	Destructive Backspace
<Ctrl-J >	Force Page (**<Ctrl-Enter>**)
<Ctrl-K>	Delete to end of Page
<Ctrl-M>	Line Feed
<Ctrl-Q>	Resume
<Ctrl-S>	Suspend

Table 7-2. ASCII Control Functions in VT220

Key Combination	Function
<Ctrl-U>	Non destructive backspace
<Ctrl-V>	Key= function
<Ctrl-W>	Cursor up one line
<Ctrl-Z>	Same as **<Enter>**

Exiting WordPerfect: Exit WordPerfect correctly, when possible. If you end a session while WordPerfect is running, the old session is likely to remain running on the host until it is manually terminated. This may cause problems with performance or running out of licences.

Host Choice List

If a terminal is configured to run Terminal Emulators, a Host Choice List appears after the terminal boots. It presents a list of available hosts. To select a host:

- tap a host name with the pen, or
- press the letter or number associated with the host, or
- use arrow keys to highlight the host, and press **<Enter>**.

When you exit your last active session, the Host Choice List reappears, and you may:

- select a different host, or
- power the terminal off by pressing <Esc> or the Power icon.

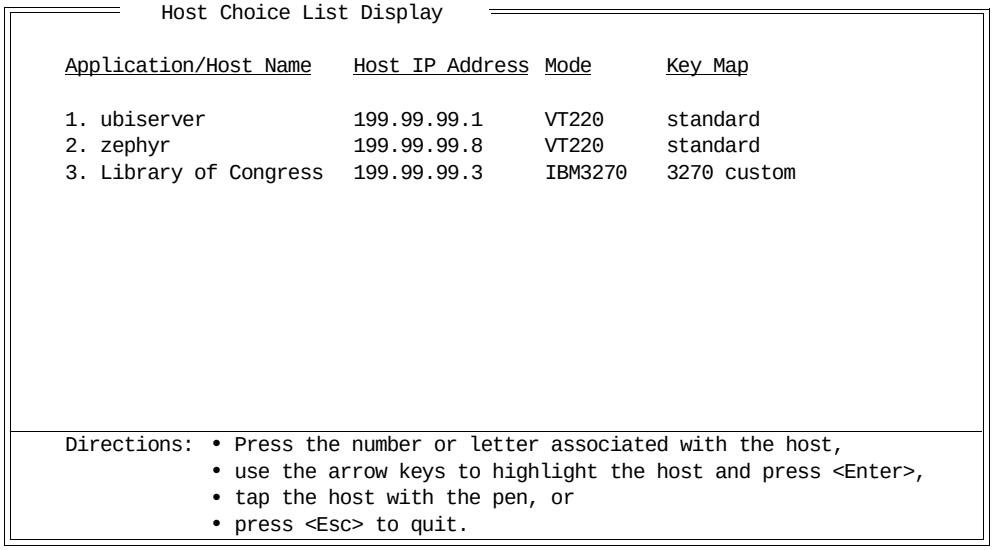


Figure 7-2. Host Choice List Screen

Note: *VT220 sessions do not allow use of a pen.*

Bypassing the Host Choice List

If the **Fast Start** option is activated, the terminal skips the Host Choice List screen. When you power the terminal on it connects automatically to the first host on the list. The **Fast Exit** option causes the terminal to automatically exit the emulators and power the terminal off when the last active session is closed. To set these options in `ppt4300.ini`:

1. Boot the terminal to a DOS prompt and open the `ppt4300.ini` file in the NED editor: `ned \bin\ppt4300.ini`
2. In the `[Emulators]` section, look for the `FastStart` and `FastExit` options:
   `FastStart=1` activates the Fast Start option
   `FastExit=1` activates the Fast Exit option
3. Save the changes and reboot the terminal.

See the [Emulators] section on page 7-4 for more information.

Creating the Host Choice List

The PPT 4340 terminal includes a configuration file, `keymap.cfg`, that allows you to create a list of hosts or to re-map keys (see Appendix B, *Key Mapping for Terminal Emulators*). The hosts on this list will appear on the Host Choice List when a terminal is powered up at your facility. For each host on the list, you can configure the telnet port, emulation type, key mapping, gateway, IP address, and Terminal Emulator options.

Editing the Host Choice List (keymap.cfg)

To edit the Host Choice List:

1. Boot the terminal to a DOS prompt. To do this, select option **3** from the ROM-DOS start-up menu when it appears during the boot process.
2. Open the `keymap.cfg` file: type `ned \usr\appl\awte\keymap\keymap.cfg` and press **<Enter>**.
3. Look for a section with an entry that begins with `newHostEntry`. For example:

   ```
   newHostEntry("Calvin", 199.99.99.18, default, VT220, "CW's CKT
   vt220", default, 0x70);
   ```

   Each host entry begins with a `newHostEntry` call. You can set seven parameters for the newHostEntry call. In the example above:

- the Host Choice List name is `"Calvin"`
- the host IP address is `199.99.99.18`

- telnet port is set to `default` (port value of 23)
- emulation mode is `VT220`.
- it uses a custom key map named "`CW's CKT vt220`" defined earlier in the `keymap.cfg` file.
- the gateway IP address uses the `default` taken from the gateway value entered on the Network tab of the Control Panel. If necessary, you can set a different gateway value in the `newHostEntry`, and it will override the default Control Panel value.
- The Options settings field has been set to `0x70`. "`0x`" is the prefix for a hexadecimal constant. The `7` means:
  - the Host Cursor Home Command is disabled.
  - NewLine mode is enabled.
  - Autowrap mode is enabled.
  - Delete-Backspace is set to Backspace.

  The `0` means
  - Key click is disabled.

  Table 7-3 describes the parameters in more detail. Also, see Table 7-4 for Hexadecimal values for the Option settings field. Note that you can set the Port, Gateway, and Option settings to "default" if you want this information to be retrieved from the Control Panel settings.

4. Add Host Choice List items by creating `newHostEntry` entries to the `[Host Choices]` section of the `keymap.cfg` file (after definitions for custom key maps). You can have up to 16 entries. They will appear on the Host Choice List screen when a user boots the terminal.

Table 7-3. Creating Host Choice List Items

Parameter	Purpose
User-given Application/Host Name	The name of the host choice entry as it will appear on the Host Choice List screen. Limit is 29 characters.
Host IP address	The host IP address.
Port	The telnet port to connect to on the host. The `default` is 23.
Emulation Mode	Emulation mode must be one of VT220, 5250, or 3270.

Table 7-3. Creating Host Choice List Items (Continued)

Parameter	Purpose	
Key Map name	The name of the key map to use. You may • specify a custom key map name (as named in a `newKeyMap` entry), if one exists, • use `default` for default 3270 or 5250 key maps, • use `standard` for standard VT220, or `chs` for the non-standard VT220 key map.	
Gateway	The IP address of the gateway to use to access hosts not on the local network. You may specify an IP address or `default`, to use the gateway specified in the Control Panel.	
Option settings	Option settings are controlled by a one-byte Options field. The setting starts with the hex prefix "0x" and must be followed by two hexadecimal digits that indicate the bit settings for the options field. To use the settings in `ppt4300.ini`, you may use `default`. See page 7-4 for information on `ppt4300.ini`. See Table 7-4 for possible hex values. The bits represent:	
	bit 7: Host Cursor Home Command (3270)	0: disabled 1: enabled
	bit 6: NewLine Mode (vt220)	0: disabled 1: enabled
	bit 5: Auto Wrap Mode (vt220)	0: disabled 1: enabled
	bit 4: Delete-Backspace Key (vt220)	0: delete 1: backspace
	bit 3: Key click	0: disabled 1: enabled
	bit 2-0	unused

Table 7-4. Hexadecimal Values for Option Settings

Hexa-decimal	Binary Value	First Digit (Bits 7-4)	Second Digit (Bits 3 - 0)
0	0000	• Host Cursor Home Command disabled • NewLine mode disabled • Autowrap mode disabled • Delete-Backspace set to Delete	• Key click disabled
1	0001	• Host Cursor Home Command disabled • NewLine mode disabled • Autowrap mode disabled • Delete-Backspace set to Backspace	• Key click disabled
2	0010	• Host Cursor Home Command disabled • NewLine mode disabled • Autowrap mode enabled • Delete-Backspace set to Delete	• Key click disabled
3	0011	• Host Cursor Home Command disabled • NewLine mode disabled • Autowrap mode enabled • Delete-Backspace set to Backspace	• Key click disabled
4	0100	• Host Cursor Home Command disabled • NewLine mode enabled • Autowrap mode disabled • Delete-Backspace set to Delete	• Key click disabled
5	0101	• Host Cursor Home Command disabled • NewLine mode enabled • Autowrap mode disabled • Delete-Backspace set to Backspace	• Key click disabled
6	0110	• Host Cursor Home Command disabled • NewLine mode enabled • Autowrap mode enabled • Delete-Backspace set to Delete	• Key click disabled
7	0111	• Host Cursor Home Command disabled • NewLine mode enabled • Autowrap mode enabled • Delete-Backspace set to Backspace	• Key click disabled

Table 7-4. Hexadecimal Values for Option Settings (Continued)

Hexa-decimal	Binary Value	First Digit (Bits 7-4)	Second Digit (Bits 3 - 0)
8	1000	• Host Cursor Home Command enabled • NewLine mode disabled • Autowrap mode disabled • Delete-Backspace set to Delete	• Key click enabled
9	1001	• Host Cursor Home Command enabled • NewLine mode disabled • Autowrap mode disabled • Delete-Backspace set to Backspace	• Key click enabled
a	1010	• Host Cursor Home Command enabled • NewLine mode disabled • Autowrap mode enabled • Delete-Backspace set to Delete	• Key click enabled
b	1011	• Host Cursor Home Command enabled • NewLine mode disabled • Autowrap mode enabled • Delete-Backspace set to Backspace	• Key click enabled
c	1100	• Host Cursor Home Command enabled • NewLine mode enabled • Autowrap mode disabled • Delete-Backspace set to Delete	• Key click enabled
d	1101	• Host Cursor Home Command enabled • NewLine mode enabled • Autowrap mode disabled • Delete-Backspace set to Backspace	• Key click enabled
e	1110	• Host Cursor Home Command enabled • NewLine mode enabled • Autowrap mode enabled • Delete-Backspace set to Delete	• Key click enabled
f	1111	• Host Cursor Home Command enabled • NewLine mode enabled • Autowrap mode enabled • Delete-Backspace set to Backspace	• Key click enabled

Multiple Sessions

A PPT 4340 can maintain as many as five different Terminal Emulation sessions at the same time. The Status Line at the bottom of the screen displays a number of diamonds, as shown in Figure 7-3.

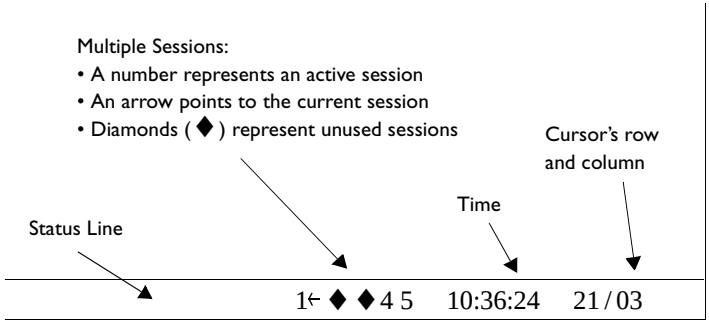


Figure 7-3. Terminal Emulator Status Line

- You may log in to the same host more than once, as long as the host allows it.
- You must successfully establish the current session before starting a new session.

Activating Multiple Sessions with the Pen

To activate and use multiple sessions using the pen:

1. Power the terminal on and log in to a session, using the Host Choice List.
2. For this first session, you will see a "1" on the Status Line, followed by 4 diamonds. Each diamond represents an unused session. An arrow points to the "1", indicating that it is the active session.
3. To start another session, press any one of the diamonds with the pen and select another host from the Host Choice List.

   When you press a diamond, the Host Choice List appears for 30 seconds. After 30 seconds, it disappears and returns to your previous session if you don't select anything. You may also press **<Esc>** to return to the previous session.
4. When you start another session, it will have a session number on the Status Line ("2", "3", "4" or "5", depending on which diamond you pressed).
5. You may repeat these steps to run as many as five different sessions at the same time. The arrow in the Status Line always points to the current session.

6. To switch to a different active session, press its session number in the Status Line with the pen. For example, to switch from session #1 to session #4, press the **4** in the Status Line.
7. You can log out of any session at any time. When you exit the last session, the Host Choice List reappears, and you can either select a different session, or press **<Esc>** to power the terminal off.

Disabling the Status Line Diamonds

Some facilities prefer not to use the status line diamonds, as users may press a diamond or a session number accidentally and be presented with an unfamiliar screen. To disable the diamonds on the Status Line as a means of switching sessions:

1. Boot the terminal to a DOS prompt and open the `ppt4300.ini` file in the NED editor: `ned \bin\ppt4300.ini`
2. In the `[Emulators]` section, set DiamondsActive to "0": `DiamondsActive=0`
3. Save the changes and reboot the terminal.

If you disable the Status Line diamonds, you can still activate and use multiple sessions using the keyboard method, described below.

Activating Multiple Sessions Using the Keyboard

To activate and use multiple sessions using the keyboard:

1. Power on the terminal and log in to a session, using the Host Choice List.
2. Display the Session Manager. To do this, press and hold the **<Alt>** key. Then press and release the **<Tab>** key, while still holding the **<Alt>** key. The Session Manager (shown in Figure 7-4) stays on the screen as long as you hold the **<Alt>** key.

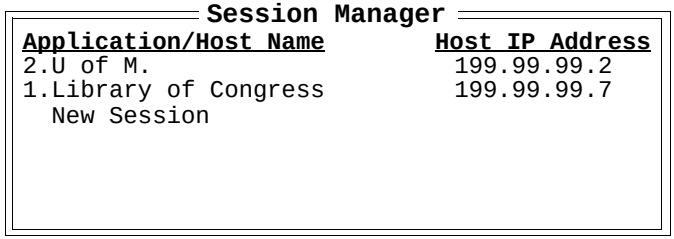


Figure 7-4. Session Manager

3. While continuing to hold the **<Alt>** key, press the **<Tab>** key to move the highlight to the New Session option. Then release both keys. The Host Choice List appears for 30 seconds. After 30 seconds, it disappears and returns you to your previous session, if you don't select anything from the list. You may also press **<Esc>** to return to the previous session.
   - You may also display the Session Manager by pressing and releasing **<Ctrl-Esc>**. The Session Manager stays up until you select a session or press **<Esc>** to make it disappear. Press the **<Tab>** or arrow keys to highlight the selection you want, and then press **<Enter>**
4. When you start another session, it will have a session number on the Status Line, unless you've disabled this feature.
5. You may repeat these steps to run as many as five different sessions at the same time. The arrow in the Status Line always points to the current session, unless you've disabled this feature.
6. To switch to a different active session, display the Session Manager and **<Tab>** to highlight the session you want. Then release both keys. Note:
   - The order of the Session Manager list changes dynamically. The current session appears at the bottom of the Session Manager list, regardless of its session number. The top of the list displays the session you were in, previous to the current session.
   - If you try to switch to a session where the host has closed the connection, the session closes at the terminal when you try to switch to it.
7. You can log out of any session at any time. When you exit the last session, the Host Choice List reappears, and you can either select a different session, or press **<Esc>** to shut the terminal off.

Keyboard Shortcuts

Some keyboard shortcuts for dealing with multiple sessions:

- Press **<Shift-Alt-N>** to start a new session. The maximum is still five active sessions at a time. If you try to start a sixth session, a message appears on the status line (`No free sessions available`) and you remain in the current session.
- To move quickly to a previous session, press and quickly release the **<Alt-Tab>** keys. This allows you to switch back and forth between two sessions (the current one, and the previous one).
- Press **<Shift-Alt-S>** to switch to the next active session. This key combination cycles through all active sessions in order.

Mainframe Session Management

The mobile computing environment presents several unique technical issues for mainframe session management. This section describes the issues and some solutions.

Mobility

A PPT 4340 terminal allows a user to walk freely about while communicating with a host computer. If, however, a user moves to a region of diminished radio reception, there is a point at which the system cannot maintain communication. The terminal tries to re-establish the connection for about 100 seconds, to allow for temporary disruptions in communication. However after a time the terminal closes the connection.

Systems react in various ways when this occurs. In some cases the user's mainframe sessions are flushed. In other cases the sessions remain running on the mainframe but the user cannot log in again (because sessions are still active). In the latter case a user's sessions may need to be terminated by IS personnel. In both cases, the user may lose any unsaved work.

Session Manager

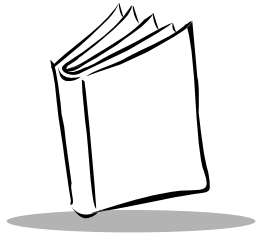
A solution to the Mobility issue is to use a Session Manager on the mainframe to manage user sessions. The Session Manager tracks Terminal ID against sessions started by a user. Thus, users who lose their connections can log in again and re-acquire sessions through the Session Manager. The user returns to the screen that was active at the time the connection was lost.

Census

In traditional environments the system knows (typically through the LU assignment) where the fixed terminals are physically located, so that applications can provide the correct census, inventory, etc. However, if the system uses pooled LUs for terminal connections there is no link between physical location of the terminal and LU number because the LU changes from session to session. Non-pooled LU assignment is the preferred approach in this situation.

Printing

The system needs to know which printer to send output to. For systems in which printer location is derived from a terminal's LU number, a fixed terminal-LU assignment is again the preferred approach.



Chapter 8 Citrix ICA Client for DOS

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Overview

Users can gain mobile access to Windows applications by using a PPT 4340 running the Citrix ICA Client for DOS and supporting software. This chapter describes how to run the Citrix ICA Client for DOS on a PPT 4340 terminal after it has been configured to communicate with a Citrix server through TCP/IP. For basic configuration instructions, see Chapter 4, *Standard Terminal Configuration*. For detailed information on the Citrix software, see the *Citrix ICA Client User's Guide*, and the *Citrix MetaFrame Administrator's Guide*.

Running Applications Under Citrix ICA

A Citrix WinFrame Server runs a modified version of Windows NT Server (v3.51) software. A Citrix MetaFrame Server runs Windows NT Terminal Server Edition, with MetaFrame installed. Most applications that run on a Windows NT server will also run under WinFrame or MetaFrame and can be accessed from a PPT 4340 using the Citrix ICA Client for DOS. This includes Win16, Win32, DOS, OS/2 (v1.1, non-PM), and some POSIX applications. There are some exceptions:

- Applications that will not run on Windows NT v3.5.1/NT 4.0 cannot be accessed and run through the Citrix ICA client on the PPT 4340 terminal.
- Applications that perform keyboard polling may use excessive amounts of CPU resources. These applications tend to be older DOS applications. In some cases, the application can be adjusted to run successfully through Citrix.
- Applications that rely on MAC hardware addressing of the Ethernet or other network adaptor only allow one user at a time. You may be able to add a gateway or router and use a connectionless-based protocol (*e.g.*, NetBEUI) between the application and the file server, to provide multi-user access to these applications.

Starting and Ending a Session in Citrix ICA Client for DOS

If the terminal has been configured to run a Citrix ICA Client for DOS on a Citrix host, you can start and end sessions as described here:

Starting a session

Power the terminal on and select a Citrix host when the Citrix ICA Client for DOS screen appears. To connect to a host, select it with the pen and press the

button, or use arrow keys to highlight the host name and press **<Enter>**.

Ending a session

When you have saved your work, exit your Windows applications. Then:

1. **WinFrame Series**: In the Program Manager window, open the **File** menu and select **Logoff** to return to the Citrix ICA Client for DOS screen.

   MetaFrame Series: Select **Logoff** from the **Start** menu and then click **OK** to end the Windows NT session and return to the Citrix ICA Client for DOS screen.

2. At the Citrix ICA Client for DOS screen, select **Exit** to exit the client and power the terminal off.

Making Double-Clicks Easier in Citrix ICA Client for DOS

Citrix reads a double-click as two consecutive pen strokes, detected close together within a specified time. If the pen strokes are not physically close enough together on the screen, or if too much time elapses between strokes, the two pen strokes are detected as two separate single clicks. Some users have reported having difficulty performing a double-click on the digitizer. You can increase the "Sweet Spot" area where a double-click is detected; this allows users to be less exact about getting the second pen stroke right on top of the spot where the first pen stroke was detected.

The default Sweet Spot size is 4x4 (pixels). On the PPT 4340 display this is about 1x1 mm. Increasing the area to 20x20 pixels provides more reliable operation. To change the Sweet Spot size:

1. Run `regedt32` on the Citrix host and open the `HKEY_USERS` window. You will see `.DEFAULT` plus additional entries for each user presently logged in.
2. Double click on `.DEFAULT`, then `Control Panel`, then `Mouse`. You will see:
   `DoubleClickHeight :REG_SZ:4`
   `DoubleClickWidth :REG_SZ:4`
3. Edit these values to be 20 each.

This procedure changes the Sweet Spot size for new user accounts. It does not change existing user accounts. You can create a registration edit script that sets these values with less effort:

```
REGEDIT32
[HKEY_CURRENT_USER\Control Panel\Mouse]
"DoubleClickHeight"="20"
"DoubleClickWidth"="20"
```

Put this script into a file with a `.reg` suffix, *e.g.*, `setmouse.reg`. Existing users can double click on it from the File Manager to change the Sweet Spot size.

First Time Set-up

If you configure the terminal to run the Citrix ICA Client for DOS, the Citrix ICA Client for DOS screen appears when you boot the terminal. This window allows you to:

- add or remove servers and published applications from the list
- view or edit existing server information
- set preferences

To add entries to the Citrix ICA Client's Server list:

1. Configure the terminal to run the Citrix ICA Client for DOS, as described in Chapter 4, *Standard Terminal Configuration*.
2. Power up the terminal. After it boots, a Citrix ICA Client for DOS dialogue box appears, asking you to enter server information. Press the **Yes** button to display the Entry Properties screen (shown in Figure 8-1).
3. On the "Entry Properties" screen fill in these fields by selecting the field and typing into it, or by pressing the drop-down list symbol and selecting an item:
   a. **Description**: Enter a description (*e.g.*, the server name).
   b. **Transport**: Click the drop-down list symbol and select **TCP/IP - Novell Lan WorkPlace**. When you select this option, a list of servers may become available in the Server field.

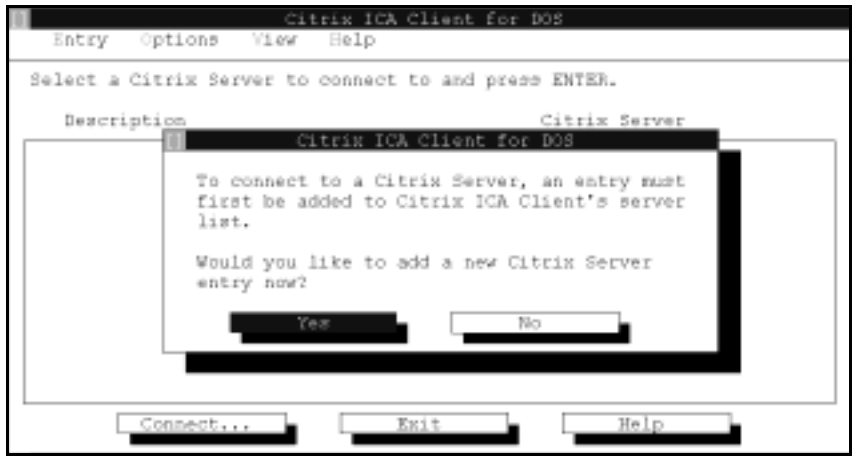


Figure 8-1. Citrix ICA Client for DOS dialogue box

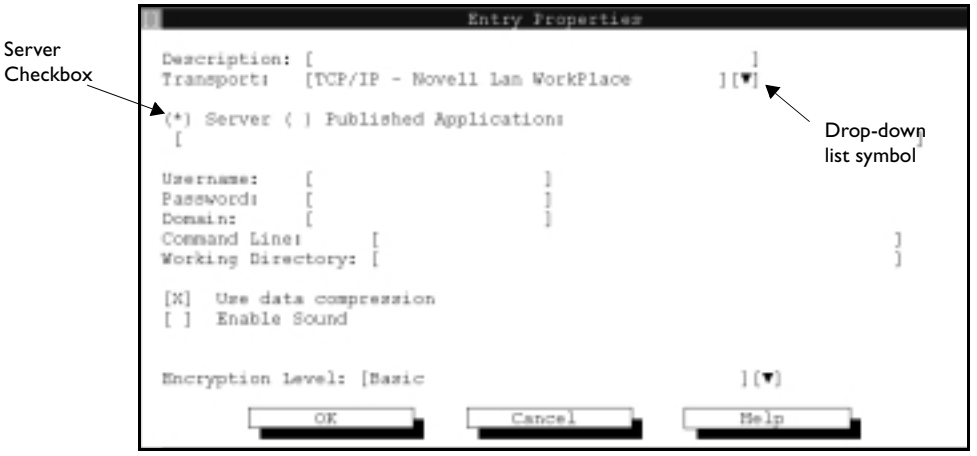


Figure 8-2. Entry Properties screen

c. **Server**: Make sure the Server checkbox is selected, unless your facility is set up to use Published Applications. Then select a server from the list. If you wish, you may type an IP Address for a Citrix Server into this field.

d. **Username** and **Password**: These fields are optional. Fill them in if you want the terminal to skip the login prompt when someone starts a Citrix session.

e. **Command Line** and **Working Directory**: These fields are optional. Fill them in to invoke a specific application to run when someone starts a session.

f. **Encryption Level**: Set an Encryption Level, if appropriate for your facility.

g. Press the **OK** button to display the Citrix ICA Client for DOS screen.

4. To add more servers to the list, select **New** from the **Entry** menu at the Citrix ICA Client for DOS screen.

5. To start a Citrix ICA session, select a Server name from the list at the Citrix ICA Client for DOS screen and press the Connect... button. Then log in to the session.

Auto-connecting to a Citrix Server or Published Application

When you use the auto-connect method to open a session the client will automatically connect to a Citrix server, bypassing the Citrix ICA Client for DOS screen. When you close the session, the Citrix ICA client for DOS exits and powers the terminal off.

Make the following changes or additions:

1. On the Citrix ICA Client for DOS screen, add an entry for the server. Include the user name and password if you want to automatically log in to the server.
2. Edit the `autoexec.bat` file by adding the **Description** name (*e.g.*, Citrixserver) from the Entry Properties screen to the end of the line that begins `wfclient`.

```
cd \net
LoadHigh lsl
LoadHigh slaodi [or sl8odipc]
sfinit
Rem if exist \bin\kbwedge.com loadhigh kbwedge
LoadHigh tcpip
cd \usr\wfclient
wfclient Citrixserver
off
```

3. Save the `autoexec.bat` file and reboot the terminal.

Multiple Sessions

If your facility uses more than one Citrix server, a PPT 4340 running the Citrix ICA Client for DOS can maintain several different sessions simultaneously.

Activating Multiple Sessions

To activate multiple sessions:

1. Power up the terminal and log in to a Citrix server, using the Citrix ICA Client for DOS screen.
2. At the Windows Program Manager or NT Desktop window, press **<Shift-F1>** to return to the Citrix ICA Client for DOS screen. Your active sessions appear with an asterisk beside the Server Name.
3. Select another server from the Citrix ICA Client for DOS screen, just as you did when establishing the first session.
4. You will be asked to verify that the client should disconnect its current session. It will then connect to a new server.
5. Repeat steps 2 - 3 to establish other new, simultaneous, sessions. Note:
   - You cannot log in to the same server more than once with the same logon ID.
   - An asterisk appears beside any host name where you already have an active session.
   - You must successfully establish the current session before you start a new session.
6. You may disconnect from active sessions from the Citrix ICA Client for DOS screen by pressing **<Alt-Del>**, or by selecting **Disconnect...** from the *Entry* menu. This leaves the session running on the Citrix server.
7. You may log off from any active session in the usual way. You must close each session separately.

Switching Between Sessions

To select an active session from the Citrix ICA Client for DOS screen:

1. Display the "Citrix ICA Client for DOS" screen by pressing **<Shift-F1>** while you are in an active session.
2. To return to any active session, double click on it on the list, or highlight the server entry and press **<Enter>**.

Disconnected Sessions

Citrix ICA sessions can become unexpectedly disconnected if the server sends data to a terminal, but gets no response. This section describes some situations where this can happen and how to avoid it.

Disconnection During Sleep and Doze Modes

If a terminal Dozes or Sleeps during a Citrix session, and hardware power management is active (the **Stop CPU Clocks during Power Management** option is enabled), it stops processing radio traffic when the CPU is halted. If the server sends data to the terminal while it is in this mode, the PPT 4340 will not acknowledge the data and after about 10 seconds, the server disconnects the session. The session stays running on the server, and in most cases, users can reconnect to the server and resume their sessions.

Impact

- If the terminal dozes or sleeps, and hardware power management is on, the host disconnects the session after 10 seconds.
- The same situation can occur when the battery pack is swapped. You must complete battery swaps within 10 seconds or your session may disconnect.

Workaround

- Disable the **Stop CPU Clocks during Power Management** option in the Control Panel (located on the Power tab). This allows the CPU to slow down during Doze and Sleep, but it will not halt.
- Train users to swap battery packs within 10 seconds.

Disconnection Due to Timeout

Citrix has an "Idle Timeout" setting that disconnects a session after it has been inactive for a certain period of time. Sometimes the Citrix session disconnects unexpectedly after a period of inactivity that is different from the Idle Timeout setting. If you are watching the terminal, you will see a warning message just before the session disconnects and the TCP connection shuts down normally (*i.e.*, both ends transmit a FIN packet).

Possible Reason

If an Administrator sets the Idle Timeout period while logged on from a WinStation terminal, the Citrix server displays a message stating that all connections will be reset and updated. It then proceeds to change the Idle Timeout and reset each Winstation starting at #001.

However this process *stops* when the Administrator's WinStation connection is reset. The Administrator's WinStation ID and all WinStation IDs above it retain their previous Idle Timeout values.

Because of this, the Timeout value can vary from terminal to terminal based on the Administrator's WinStation ID when the timeout was set. This can make it look like the terminals are disconnecting after random idle times.

To Avoid this Problem

Only run WinFrame or MetaFrame Administration from the Server console.

Power Management for the Spectrum24 Radio Card

Spectrum24 radio Power Management operates independently of the hardware Power Management, and allows for additional power savings. When radio power management is not enabled, the card operates in "Continuously Aware" mode (CAM). Radio power management puts the card into Power Save Polling mode (PSP). This mode causes the terminal to periodically wake and check for messages from an access point.

To put the Spectrum24 card into a low power consumption mode, set `powermgmt` to **y** in `net.cfg`. If you are using the Microsoft TCP/IP stack, do not set `powermgmt` to **1** in `protocol.ini` (leave it at **0**). You can also set this parameter in the Control Panel by selecting the Power Management checkbox on the Network tab. See *Network Options* on page 6-20.

Server Keepalive Settings

By default, a Citrix server takes two hours to recognize that a PPT 4340 terminal TCP connection has closed abnormally (*e.g.*, due to loss of battery power). If you try to log in within the two hour time period, you cannot reconnect to your previous session because the server has not disconnected it; you will receive a new session. However you can make some changes to a Registry key to improve the Citrix Server's ability to manage sessions left running by a PPT 4340 that has closed abnormally. To make the changes:

1. **WinFrame Series:** Select **Run** from the **File** menu.
   MetaFrame Series: Select **Run** from the Start Menu.

   Note: Only make these changes from a WinFrame or MetaFrame Server console. See page 8-9.

2. In the Run dialogue box, type `REGEDT32` and press **<Enter>**.
3. In the HKEY_LOCAL_MACHINE window locate the following folder:
   `SYSTEM\CurrentControlSet\Services\Tcpip\Parameters`
4. Add the following values to the `Parameters` folder:

Table 8-1. Server Keepalive Parameters

KeepAliveTime	REG_DWORD	60000
KeepAliveInterval	REG_DWORD	1000
TcpMaxDataRetransmissions	REG_DWORD	*5*

5. Close and Exit `REGEDT32`.

6. In the Administrative Tools Group, select WinStation Configuration (WinFrame) or Terminal Server Connection Configuration (MetaFrame) and modify the properties of the TCP connections as follows:
   a. Under ADVANCED, change the value of "On Broken or timed out connections" located near the bottom of the screen to DISCONNECT.
   b. You must de-select **Inherit user configuration** located to the right of this field before you will be able to make this change.
   c. Save these changes and exit the Configuration tool.
7. SHUTDOWN and RESTART the server to apply these changes.

Parameter Definitions

KeepAliveTime

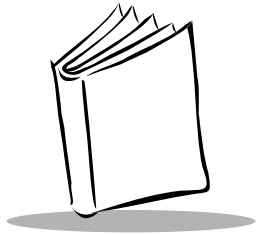
This parameter controls how often TCP tries to send a `keepalive` packet to verify that an idle connection is still intact. If the remote system (the PPT 4340) is reachable and functioning, it acknowledges the `keepalive` transmission. The default is 7,200,000 milliseconds (two hours). By changing the `KeepAliveTime` to 60,000 milliseconds, you change how often the server checks for an idle connection to one minute.

TcpMaxDataRetransmissions

If a `keepalive` packet is sent but not acknowledged, the `TcpMaxDataRetransmissions` sets the number of `keepalive` packets that will be sent before the connection is determined to be disconnected. This means that this parameter controls the number of times TCP will retransmit an individual packet before ending the connection. The default value for `TcpMaxDataRetranmission` is 5. The retransmission timeout is doubled with each successive retransmission on a connection. It is reset when responses resume. The base timeout value is dynamically determined by the measured round-trip time on the connection.

KeepAliveInterval

If the `keepalive` check fails, `KeepAliveInterval` sets the interval between `TcpMaxDataRetranmission` packets. It determines the interval separating `keepalive` retransmissions until a response is received. Once a response is received, the delay until the next `keepalive` transmission is again controlled by the value of `KeepAliveTime`. The connection is ended after the number of retransmissions specified by `TcpMaxDataRetransmissions` have gone unanswered. The default is 1000 (1 second).



Chapter 9 Maintenance

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Overview

This chapter describes how to care for and maintain a PPT 4300 series terminal, and how to condition and re-charge batteries.

Care and Cleaning

Cleaning

Unit Case and Keyboard

Clean the terminal case and keyboard regularly with warm water and a mild cleaner (*e.g.*, a highly stabilized Hydrogen Peroxide-based disinfectant cleaner). If you are not sure whether or not to use a particular cleanser, contact Symbol for advice.

Do not gas or steam autoclave a terminal.

Do not use acetone to clean the terminal.

Terminal Display

Clean the terminal display regularly using an ammonia-based glass cleaner. Spray the cleaner on a soft cloth and then wipe the area. Do not spray the cleaner directly onto the display screen.

Scanning Lens (PPT 4300-S0E models only)

Use an ammonia-based glass cleaner and a soft cloth to clean the scanning lens. Do not spray the cleaner directly on the scanner lens. Spray the cleaner on the cloth then wipe the lens.

Spills

A PPT 4300 series terminal is resistant to most liquids. Simply wipe the terminal with an absorbent cloth, clean it, and return it to regular use. Keep the plugs in place to help keep liquids outside the case.

If you spill dangerous or potentially contagious materials on the terminal, you may clean it with warm water and any common hospital disinfectant (*e.g.*, Hydrogen Peroxide). If spills are excessive, or the terminal fails to function properly after a spill, contact Symbol for service.

Operating Temperature

The terminal has an operating temperature range of 32°F to 104°F (0°C to 40°C), and a storage temperature range of -4°F to 140°F (-20°C to 60°C).

Dropping

The terminal is resistant to damage from minor drops or other accidental bumps and abrasions. If a PPT 4300 series terminal malfunctions or breaks after being dropped, please contact Symbol for service.

Cleaning a Battery Charger

Make sure the battery charger contacts (located at the bottom of each slot) are clean before you place a battery into the charger. The device may malfunction if you use it when the contacts are dirty. You may clean the contacts with an alcohol swab.

Storage

Store PPT 4300 series terminals in a clean, dry place. If the terminals will be stored for longer than a week, remove the battery packs, and set the Run/Ship switch to **Ship**. A fully charged swap battery can maintain CMOS settings for up to 30 days. If settings are lost, the terminal will boot using default settings. In this case, you can reconfigure the terminal using the instructions from Chapter 4, *Standard Terminal Configuration*.

Caution

DO NOT stack terminals on top of one another, as the stand on a terminal may *scratch* the screen of the terminal beneath it. Symbol is not responsible for damage caused by stacking terminals.

Batteries

Re-charging a Battery Pack

Before you use a PPT 4300 series terminal, make sure the NiMH battery pack has been completely charged. Symbol has single slot and four slot battery Chargers available. For complete information on using a Battery Charger, see the documentation that accompanies the charger you are using.

To re-charge a battery using the Symbol UBC 2000 Battery Charger:

1. Make sure the charger is attached to a power supply with the correct DC Adapter. The POWER LED should be a solid green.
2. Insert a battery into the battery charger as shown in Figure 9-1. Each slot has two pins on one side, and one pin on the other. Place the side of the battery with two contacts into the 2-pin side of the slot. Never force a battery into the charger; batteries should slide in easily.
3. If you have inserted the battery correctly, the CHARGE LED beneath the battery slot should be solid yellow to indicate that a battery is charging.
4. If the LED does not come on, take the battery out and then re-insert it, making sure that you are inserting it correctly.
5. The READY LED appears in solid green when the battery is charged. Batteries recharge to full capacity within 2 - 3 hours.

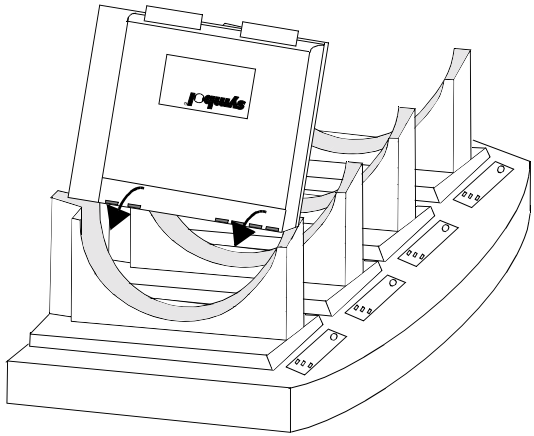


Figure 9-1. Inserting a Battery Into the Charger

Checking Battery Levels

To check current battery levels, press the Battery icon. Battery Low and Critical warning windows appear as battery power drops. See *Batteries and Power* on page 5-14, and *Battery Options* on page 6-15.

Faulty Batteries

If you insert a battery into the charger, and the CHARGE or FAULT/CONDITION LED is flashing yellow, then the battery charger is rejecting the battery. The battery may be faulty or damaged. Remove the battery from the charger and see the *UBC 2000 Product Guide* for more troubleshooting information. If the battery is still within its warranty period, contact your local Symbol Representative or Symbol Support Center for replacement information.

Battery Life Span

PPT 4300 series terminals use a NiMH battery with a "smart" battery chip. This chip provides information that facilities can use for battery management. The smart battery chip tracks:

- the capacity of the battery when it was manufactured (nominally)
- how much capacity is currently left in the battery (shown as a percentage of the battery's original full capacity)

New NiMH batteries can be charged to a nominal 2150 mAH. However as the battery ages, the maximum capacity it can achieve will slowly diminish so that the full charge won't reach 2150 mAH. After 500-600 charge/discharge cycles, the battery will have a noticeably shorter active run-time. When this happens, consider replacing the battery.

Conditioning Batteries

The conditioning process completely discharges a battery and then recharges it. This process ensures that a new battery can achieve a maximum charge. To condition a new battery in a Symbol UBC 2000 Battery Charger:

1. Make sure the charger is attached to a power supply with the correct DC Adapter. The POWER LED should be a solid green.
2. Insert a battery into the battery charger as shown in Figure 9-1. Each slot has two pins on one side, and one pin on the other. Place the side of the battery with two contacts into the 2-pin side of the slot. Never force a battery into the charger; batteries should slide in easily.
3. On the panel beneath the battery slot, press and hold the PRESS TO CONDITION symbol for two seconds.

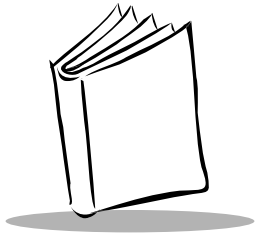
- The READY or CONDITION LED turns solid orange.
- The CHARGE or FAULT/CONDITION LED is solid orange.

4. The READY LED appears in solid green when the battery is charged.

The conditioning cycle can take up to 12 hours, if the battery has a full charge at the beginning of the Conditioning Cycle. You may repeat the conditioning cycle once every two months, to extend battery life. You may also try conditioning a battery if it doesn't seem to be holding a full charge (provides limited run time after a charge cycle). Do not condition the battery on a daily or weekly basis, as it shortens the usable life of the battery.

Storing Batteries

Store batteries in a dry, clean area. Unused, fully charged NiMH batteries slowly discharge, even when they are not in a terminal, at a rate of 1 or 2% per day. If you store fully-charged batteries for longer than a few weeks, you may need to re-charge or condition them before using them.



Chapter 10 Troubleshooting

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Overview

This chapter describes solutions to problems that may occur when users are working with a PPT 4300 series terminal. It includes information on network troubleshooting, radio interference, effective range and the warning messages that appear if you lose connection with the network. It also describes the diagnostic utilities and the error messages for the Terminal Emulators and Citrix ICA.

Power a Terminal On

If you have trouble starting a PPT 4300 series terminal, follow these instructions. Begin with step one. If the terminal does not start after step one, continue to step two, and so on. Stop following the instructions once the terminal starts.

If the terminal starts but does not seem to be functioning properly, see *Troubleshooting a PPT 4300 Series Terminal* on page 10-7. Also see *Switches on the Terminal* on page 10-6.

1. Power the terminal on by using the Power icon on the Direct Access panel:
   a. Set the Run/Ship switch to **Run** (see Figure 10-2).
   b. Insert a fully charged battery pack or connect a DC adapter.
   c. Press the pen against the Power icon for one full second (see Figure 10-1). Listen for start-up beeps and watch for text to appear on the screen.

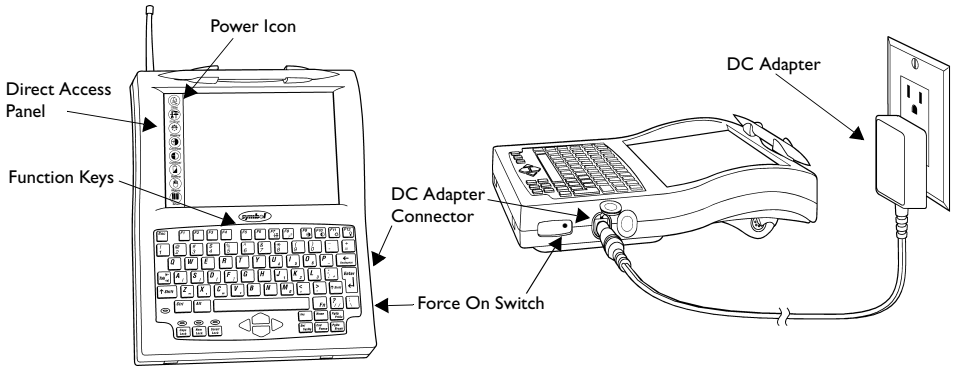


Figure 10-1. Starting a PPT 4300 terminal

2. If the terminal does not power up after step one, press the Force On switch for one full second (see Figure 10-1). Listen for start-up beeps and watch for text to appear on the screen.

3. If the terminal does not power up after step two, try the Master Reset switch:
   a. Place the terminal face down and gently pry off the left rubber foot.
   b. Press the Master Reset switch for one full second (see Figure 10-2). Listen for start-up beeps and watch for text to appear on the screen.
4. If the terminal does not power up after step three, try pressing the Force On and Master Reset switches in this combination:
   a. Press and hold the Force On switch.
   b. While still holding the Force On switch, press and hold the Master Reset switch for one full second and then release it.
   c. Release the Force On switch. Listen for start-up beeps and watch for text to appear on the screen
5. If the terminal still does not power up after step four, you must remove all power to the circuits by sliding the CMOS battery switch to the off position before starting.
   a. Remove the battery pack and external DC adapter.
   b. Slide the CMOS battery switch to the OFF position (see Figure 10-2).
   c. Wait 30 seconds.
   d. Insert a fully charged battery pack or external DC adapter.
   e. Press the Master Reset switch for one full second. Listen for start-up beeps and watch for text to appear on the screen. You will need to run the System Configuration Utility. See *System Configuration Utility* on page 10-5.
   f. When the terminal boots normally, slide the CMOS Battery switch to the ON position.

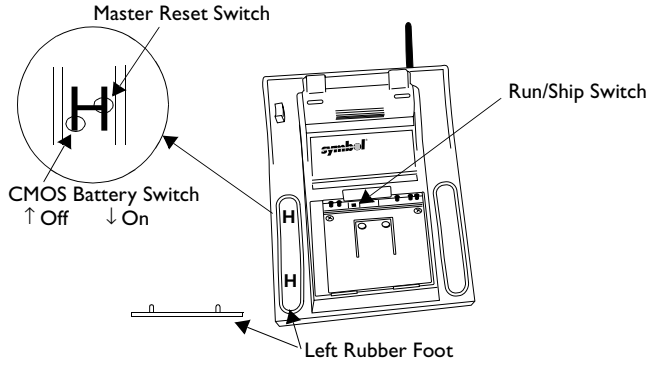


Figure 10-2. Switch Locations

Note: *If you think the terminal is running but the screen is completely black or white, with no text visible, try changing the contrast. Hold down the* ***<Fn>*** *key and press* ***<F9>*** *to darken or* ***<F10>*** *to lighten the screen until the text appears. You may have to press the <Fn> key combination 50 times or more to make the display visible.*

System Configuration Utility (SCU)

When the terminal starts, it may halt at the first screen with this message:

```
WARNING - CMOS FAILURE - RUN SCU
CTRL-ALT-S to enter System Configuration Utility.
Press F1 to Continue
```

This means the CMOS is either corrupt or uninitialized. To reset the CMOS:

1. Press **<Ctrl-Alt-S>** to open the System Configuration Utility (SCU).
2. Do not change anything.
3. Press **<Esc>** and then press **<Enter>**. The terminal should reboot normally. You will need to configure it at the Control Panel (see Chapter 4, *Standard Terminal Configuration*).
4. If you have a terminal with a flash expansion module (model PPT 43xx-xxxWxx), you must go back into the SCU and set the Flash size:
   a. Watch the text on the display screen as the terminal boots.
   b. When prompted, press **<Ctrl-Alt-S>** to open the SCU.
   c. Open the **Flash File** menu and select **Set Flash File System Size**.
   d. Set the flash to the size of the first internal partition of the terminal's internal flash file system (*e.g.*, 2 MB).
   e. Press **<Esc>** and then press **<Enter>** to reboot the terminal.
   f. Configure the terminal at the Control Panel (see Chapter 4, *Standard Terminal Configuration*). Edit any settings that may have been reset. If you change Control Panel settings during configuration, copy and store the settings in a safe location.

Note: *A fully charged swap battery will maintain the CMOS parameters for at least 30 days in* ***Ship*** *mode. If the swap battery was not fully charged when the terminal was shelved, or if it was in* ***Run*** *mode, then the CMOS parameters can be lost in* less *than 30 days.*

Switches on the Terminal

<Ctrl-Alt-Del>

Press **<Ctrl-Alt-Del>** to perform a soft boot of ROM-DOS.

Force On

Use the Force On switch if the terminal has had a crash or abnormal shutdown, and then fails to turn on when the Power icon is pressed. You can reach it through a hole in the IRDA window on the right side of the terminal. *Use a non-metallic item to gently press it and hold for one second*.

Normally, when a PPT 4300 series terminal powers off, it configures the Digitizer Panel to allow the terminal to power up when the Power icon area is pressed. If the terminal does not power off normally, this configuration may not occur (*e.g.*, if ROM-DOS crashes abruptly). The Force On switch provides a direct turn-on signal to the circuitry, and starts the terminal. Note that the Force On switch does not turn the terminal off.

Run/Ship Switch

This switch is normally used when storing or shipping a PPT 4300 series terminal. When set to Ship, the two swap batteries are changed from series to parallel connection, to increase the effective CMOS retention time.

On PPT 4300-00R models only: You cannot start the terminal with the Power icon while the Run/Ship switch is set to Ship. In Ship mode, the digitizer is disabled to prevent the terminal from being turned on accidentally.

Note: *Do not use a metallic object to activate the Force On or Master Reset switches.The EM Pen tip does not fit into the opening for the Force On switch*.

Master Reset Switch

Use the Master Reset switch if the terminal refuses to power on or off. It is a last resort method. This push-button switch is located at the back of the terminal, under the left rubber "foot". To use it, place the terminal screen side down, with the two long rubber feet in front of you. Gently pry off the left foot. To press the Master Reset switch, gently press a non-metallic stick down into the upper 'H' cutout (closest to the Run/Ship switch) and hold for one second. See Figure 10-2 on page 10-4.

Troubleshooting a PPT 4300 Series Terminal

Table 10-1 describes some common terminal problems and what actions to take.

Table 10-1. PPT 4300 Troubleshooting

Symptom	Possible Cause	Action
Terminal does not power up: • no display • no keyboard backlight	Terminal not powered on.	Press the Power icon to start the terminal. If it does not start, see *Terminal does not power up:* on page 10-7.
	Battery is not installed.	Make sure the battery is correctly placed in the terminal and the latch is fully extended.
	Battery is not charged.	Make sure to use a charged battery.
	Power supply is not plugged in.	If you are using a DC Adapter, make sure it is connected properly to the terminal and plugged into a live power outlet.
	The digitizer is not initialized.	Press the Force On switch inside the IrDA port window.
	Previous application crash or other abnormal shut-down.	Toggle the Run/Ship switch in the battery well. If this doesn't work, use the Master Reset switch (described on page 10-6).
	Bad CMOS values due to dead batteries.	1. Press and hold the Force On switch (see Figure 10-1). 2. While still holding the Force On switch, press the Master Reset switch for one full second and then release it (see Figure 10-2). 3. Release the Force On switch. Listen for start-up beeps and watch for text to appear on the screen. You may have to reset the CMOS using the SCU. See *System Configuration Utility (SCU)* on page 10-5.
	Battery Latch is stuck in the "up" position. The start-up beeps happen, but no lights come on.	Move the battery latch back and forth and then repeat the battery swap, making sure the Battery Latch moves down into place. Then use the Master Reset switch to restart the terminal (see Figure 10-2).

Table 10-1. PPT 4300 Troubleshooting

Symptom	Possible Cause	Action
Terminal does not power up (continued from page 10-7).	PPT 4300-00R models only: the Run/Ship switch is set to **Ship** in the battery well.	Set the Run/Ship switch to **Run**.
Cannot see screen. • LEDs light up • keyboard backlight works	Contrast or brightness not adjusted properly.	Press the brightness and contrast control icons on the Direct Access Panel or press **<Fn-F9>** and **<Fn-F10>** to adjust the contrast and press **<Fn-F11>** to adjust the brightness. If the brightness or contrast are set at an extreme, you may need to press these keys several dozen times.
	Terminal is in Doze or Sleep mode.	Press the screen with the pen or press a key to reactivate the terminal.
Terminal does not turn off.	Application crash or program failure.	Reset the terminal. Press **<Ctrl-Alt-Del>** to reboot, or you can press **<Ctrl-Fn-F12>** to power off immediately. You can also toggle the Run/Ship switch in the battery well. If these don't work, use the Master Reset switch, as described on page 10-6.
Terminal does not boot properly.	The internal flash file system and/or the BIOS may be corrupt.	Attempt to boot from the PPT 4300 Utilities PC card. If the terminal boots from the card, then the BIOS is likely to be OK but the Flash File System is corrupt. Reformat and `sys` the internal flash file system and then reload the software. See *Formatting the Internal Flash File System* on page 3-4. If the terminal will NOT boot from the Utilities card, then the BIOS is corrupt or Cardboot is not enabled. Return the terminal to Symbol Technologies for repair.
Message: `Floppy disk fault -- insert valid boot disk and press any key.`	The CMOS is either corrupt or uninitialized.	Reset the CMOS following the instructions in *System Configuration Utility (SCU)* on page 10-5.

Table 10-1. PPT 4300 Troubleshooting

Symptom	Possible Cause	Action
`System Not Found` appears when the terminal boots.	Boot files are either corrupt or missing. The internal flash file system may need to be rebuilt.	Boot from the PPT 4300 Utilities PC Card and inspect the internal flash file system. Depending on which files may have been damaged, you may need to reinstall boot files using `sys.com`, or reformat the internal flash file system, as described on page 3-4.

Message:
`WARNING - CMOS FAILURE - RUN SCU`
`CTRL-ALT-S to enter System Configuration Utility.`
`Press F1 to Continue`
	This message may appear after a reset or a crash. It means that the `checksum` is incorrect and you may have lost the CMOS settings
	You may also lose CMOS settings if you store a terminal with no battery for longer than 30 days.
		Reset the CMOS following the instructions in *System Configuration Utility (SCU)* on page 10-5.

After Card Trick and Cardboot load, screen goes blank, with blinking cursor in upper left corner.	`\ibmbio.com` and `\ibmdos` are missing or damaged.	Boot from the PPT 4300 Utilities PC Card. Exit to a DOS prompt, and run `sys d:` to install boot files. If this fails, the internal flash file system may need to be reformatted, as described on page 3-3.
Battery warnings and low battery light not working.	Terminal is "dozing" due to Power Management.	"Wake" the terminal by pressing the screen with the pen.
	Battery Warnings are disabled in `ppt4300.ini` or in the Control Panel.	Check the settings in `ppt4300.ini` or the Control Panel (see *Settings in ppt4300.ini* on page 7-4 or *Battery Options* on page 6-15 for details).

	System function driver not loaded.	Boot to a DOS prompt and verify that the sftsr driver (`sftsr.com`) is loaded when the terminal starts. Make sure that `autoexec.bat` includes these lines in the `:driver` area:
		`sftsr`
		`sfinit`

Table 10-1. PPT 4300 Troubleshooting

Symptom	Possible Cause	Action
Terminal powers off when you try to do a Battery Swap.	Swap battery doesn't have enough charge to maintain the session during a Battery Swap.	Recharge the swap batteries (see *Batteries and Power* on page 5-14). Note: The host may disconnect the session after 10 seconds. The terminal automatically powers off if it is left running on the swap battery for more than 45 seconds.
	Run/Ship switch is set to **Ship**.	Set the Run/Ship switch to **Run** so that the swap batteries will charge during normal use, and allow you to do a battery swap (see Batteries and Power on page 5-13).
Battery charger not re-charging batteries.	Battery packs inserted incorrectly into the Battery Charger.	Make sure each battery pack is being inserted correctly. See the documentation for your Battery Charger for more information.
	Charger is not working.	Try a number of different batteries in the same battery charger slot. If none of the battery packs will charge, and you are inserting the packs correctly, then the charger slot may not be working properly. Also try inserting the battery pack into different chargers. If the pack charges when placed in a different charger, then the battery charger slot may be faulty. If a battery does not charge in any battery charger, then the battery pack is faulty.
	Battery pack is faulty.	
	Battery voltage is so low that the charger assumes the battery is defective.	Place the battery in a terminal powered by a DC adapter to trickle charge for a few hours. Then retry in the Battery Charger.
Battery life too short (less than 4 hours of active use).	Battery not fully charged.	Replace the battery with a fully charged battery. Run the faulty battery through a conditioning cycle in the Battery Charger.
	Battery is old.	After a battery has been recharged 500- 600 times, it may be past its useful life. Run the battery through a conditioning cycle in the Battery Charger, or replace the old battery with a new battery. See *Conditioning Batteries* on page 9-6.

Table 10-1. PPT 4300 Troubleshooting

Symptom	Possible Cause	Action
Battery life too short (continued from page 10-10).	Battery Smart chip out of synchronization.	Run the battery through a conditioning cycle to resynchronize the capacity value.
	Power Management warning limits have been set at too high a level.	Check the Power Management settings on the Power tab of the Control Panel. By default, the Low warning is set at 8%, and the Critical warning is set at 4%.
	Power Management has been turned off.	Check Power Management settings on the Power tab on the Control Panel. Some transitions may have been turned off, or set very long, resulting in lower power savings than expected.
Pen and Direct Access Panel icons not working.	Digitizer driver is not loaded.	Boot to a command line prompt and verify that the driver (`mutohpen.com` or `touch.com`) is being loaded when the terminal starts. The `autoexec.bat` file must include one of these lines: For a PPT 4300-00E: `loadhigh c:\bin\mutohpen.com /int=5 /io_base=220 /load_init` /rate_div=3 For a PPT 4300-00R: `loadhigh c:\bin\touch.com /int=e /io_base=220 /load_init`
	Digitizer is not initialized.	Run `c:\bin\sfinit.exe`.
	Pen battery is dead.	Change pen battery.
Cursor not aligned with pen tip.	Pen Digitizer not properly calibrated.	Re-calibrate the Pen, by pressing **<Fn-F8>** or by using the Calibration utility on the Control Panel (Display tab). For this utility to work, `sftsr` and the pen driver must be loaded.
Pen Calibration screen doesn't appear.	Driver not loaded.	Boot to a DOS prompt and verify that the sftsr and pen drivers (`sftsr.com` and `mutohpen.com` or `touch.com`) are loaded when the terminal starts. Make sure `autoexec.bat` includes lines that load the drivers.

Table 10-1. PPT 4300 Troubleshooting

Symptom	Possible Cause	Action
Control Panel doesn't load.	Not enough low memory or the Control Panel .exe executable file is missing.	Limit the number of drivers loaded. You may run the Control Panel during the boot sequence by pressing the Settings icon or **<Fn-F7>** before the drivers load. You may also reboot and choose option `5` from the ROM-DOS Start-up Menu. In either case, the Control Panel should start because there are fewer drivers loaded.
	File `ctrlpnl.exe` not loaded.	Check that file is present in `c:\bin\ctrlpnl.exe`.
Keyboard is locked.	Application crash or program failure.	Reset the terminal. Press **<Ctrl-Alt-Del>** to reboot, or you can press **<Ctrl-Fn-F12>** to power off immediately. You can also toggle the Run/Ship switch in the battery well. If these don't work, use the Master Reset switch, as described on page 10-6.
	In the VT220 terminal emulator environment, if a user presses **<Ctrl-S>** in an application, it will appear as if the terminal's keyboard has locked up.	Press **<Ctrl-Q>** to resume operation.
External Keyboard doesn't work.	The keyboard you are using is incompatible with the terminal.	You must use a Symbol-approved low power/low voltage keyboard: ♦ 5V for PPT 43xx-xxE ♦ 3.3V for PPT 43xx-xxR

Beep Codes

Some problems with the terminal will cause a series of audible beeps, in a sequence. Table 10-2 describes these beep codes.

Table 10-2. Beep Codes

Beep Code	Beep Sequence[a]	Meaning
0	S-S-S-P-S-S-L-P	The DMA page registers are faulty.
1	S-S-S-P-S-L-S-P	The refresh circuitry is faulty.
2	S-S-S-P-S-L-L-P	The ROM checksum is incorrect.
3	S-S-S-P-L-S-S-P	The CMOS RAM test failed.
4	S-S-S-P-L-S-L-P	The DMA controller is faulty
5	S-S-S-P-L-L-S-P	The interrupt controller failed.
6	S-S-S-P-L-L-L-P	The 8042 keyboard controller failed.
7	S-S-L-P-S-S-S-P	No video adapter was found.
8	S-S-L-P-S-S-L-P	No RAM is installed. No message is displayed.

a. S= Short, L=Long, P=Pause

Diagnostic Utilities

The PPT 4300 Utilities PC Card includes a number of diagnostic utilities. If a terminal is not functioning properly, these utilities can help identify the problem. The Utilities PC Card is available from Symbol. Call your Symbol representative at 1-800-653-5350. The utilities include diagnostics for:

- System Board
- Memory
- Serial/COM Port
- IrDA Port
- Video Controller
- Keyboard
- Battery
- Radio

For information on using the diagnostic utilities, see *Diagnostic Test Utilities* on page 11-6.

Bypassing and Debugging config.sys and autoexec.bat

To bypass `config.sys` and `autoexec.bat`, press **<F5>** when you see `Starting ROM-DOS` as the terminal is booting. For information on editing these files, see *Editing autoexec.bat and config.sys* on page 2-8. Note that if you bypass these files, no drivers will load (*e.g.*, the digitizer driver), and your path will not be set.

You can step through the files selectively by pressing **<F8>** at the `"Starting ROM-DOS"` message shown as the terminal is booting. The process gives you the option of executing or skipping each line in `config.sys` and `autoexec.bat`.

Network Troubleshooting

Table 10-3 describes some of the most likely reasons that a terminal might stop communicating. For information on troubleshooting the Access Point, see the Spectrum24 documentation. For information on troubleshooting the Network or Host computer, see the documentation specific to the equipment you are using.

Table 10-3. Network Troubleshooting

Problem Source	Possible Cause	Action
PPT 4340 terminal	Incorrect terminal configuration.	Check the terminal configuration on the Network tab of the Control Panel and inspect `\net\net.cfg` or `\lanman.dos\protocol.ini`.
	Drivers not loaded.	The drivers normally load when the terminal boots. As the terminal powers up, check the boot messages for errors as the drivers load.
	Interference source between terminal and AP that prevents communication.	Identify and remove the source of the interference. See *Interference* on page 10-19, for more details.
	Faulty radio card.	For Spectrum24 cards: • Use the Diagnostics Utilities described on page 11-6. • Use the Spectrum24 Access Point to ping your radio and test the MAC layer. See the Spectrum24 documentation. For other card types, see the documentation that accompanies the card.
	Out of range of any Access Point.	You must be within Effective Range of a Spectrum24 Access Point with a NetID or ESS ID that matches the NetID or ESS ID of the terminal. See *Effective Range* on page 10-19. You can use the built-in RF/AP Diagnostic Utility to check the RF link (described on page 10-17).
	Radio drivers not compatible with radio.	Use `s_ver` to determine the radio protocol type your terminal is using. The 1 Mbps Spring radios (`s_ver`=3.x) use the `slaodi.exe` driver. The 2 Mbps 802.11 radios (`s_ver`=4.x) use the `sl8odipc.com` driver.

Table 10-3. Network Troubleshooting

Problem Source	Possible Cause	Action
Access Point	Incorrect Access Point configuration.	• Check Access Point status lights and configuration. Ensure that the NetId or ESS ID matches between all Access Points and terminals. • Ping or telnet to an Access Point that has been configured with an IP address. It can be accessed from the wired network, or on the RF side using a PPT 4300 VT220 telnet emulator or the Utility card radio ping diagnostic (see page 11-10). See the Spectrum24 User Manuals for more information. • Use the built-in RF/AP Diagnostic Utility to check the RF link (described on page 10-17).
Network	Incorrect network/LAN configuration.	The network may have problems that prevent communication between Access Points and the host computer. Check the network equipment and their logging mechanisms; actions to be taken depend on the network at your facility. • The host can ping the Access Point if the Access Point has been configured with a valid IP address. • The host can ping a terminal if the terminal has loaded the appropriate radio and stack drivers.
Host Computer	Incorrect host computer configuration, or other host computer malfunction.	• Verify that a wired terminal connects to the host successfully. • If the host is configured incorrectly or is malfunctioning, it cannot communicate with the network. Check the host; actions to be taken depend on the host computer you are using at your facility.

RF/AP Diagnostic Utility

This diagnostic utility provides wireless network information from the Spectrum24 radio driver in the upper left corner of the screen. It is designed to be a diagnostic or troubleshooting tool, and is not meant to be used on an everyday basis. It can temporarily affect colors during screen updates.

To use this tool, you must first enable it in `ppt4300.ini`:

1. Boot the terminal to a DOS prompt and open the `ppt4300.ini` file in the NED editor:
   `ned ppt4300.ini`
2. In the `[System]` section set the following parameters as shown here:

   ```
   PermitS24Info=1
   S24InfoWantAP=1
   ```

   `PermitS24Info` determines whether the on-screen RF/AP Diagnostic Tool is available to the user. If set to "1", the on-screen information is allowed. If set to "0", the feature is disabled. The default is "0".

   `S24InfoWantAP` controls whether the S24 information will be extended to contain Access Point identification. The default is "0" (disabled).
3. Save the changes and reboot the terminal.
4. After the terminal boots, press the Settings icon to display a pop-up window. A checkbox appears in the Settings pop-up. When the checkbox is selected, a status line appears in the upper left corner of the window, as illustrated in Figure 10-3.
5. To turn the RF/AP Diagnostic Tool off, de-select the checkbox in the Settings pop-up window. You may also disable the settings by directly editing `ppt4300.ini` with the NED editor and running `sfinit` from a DOS prompt.

The RF/AP utility requires the Spectrum24 drivers. On a standard terminal, Spectrum24 drivers are only loaded under Citrix ICA and Terminal Emulators. To run this utility from DOS:

1. Boot to DOS.
2. Load the Link Support Layer: `\net\lsl.com`
3. Load the Spectrum24 driver manually: `\net\slaodi.exe` (Spring protocol) or `\net\sl8odipc.exe` (802.11 protocol).
4. Run `sftsr` and then `sfinit`.
5. Turn the RF/AP utility on from the Settings pop-up window.

Using the RF/AP Diagnostic Utility

The Transmit and Receive lights appear in the top left corner of the display window.

- Both lights are red when no data is being transmitted or received.
- The Transmit light flashes green when data is being transmitted by the terminal.
- The Receive light flashes green when the terminal is receiving data.
- RSSI value shows the strength of the RF signal. Normal operating range is 25 - 65. Below 25, the terminal is likely to roam for a better connection. “RR” displays while the terminal is roaming.
- AP ID shows the ID of the Access Point with which the terminal is currently communicating. This corresponds to the AP_ID setting on the Access Point. If you are using an 802.11 radio, the AP_ID will be the last two bytes of the Access Point’s MAC address in hexadecimal (*e.g.*, 044E).

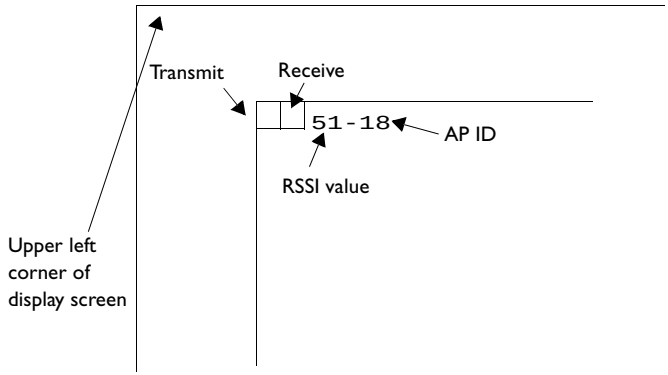


Figure 10-3. The RF/AP Diagnostic Tool

Troubleshooting RF Interference

If there is a problem with the wireless network connection:

- you may have encountered an area of interference
- you may be standing in a null spot
- you may be too far from the Access Point (out of range)
- the Access Point may have stopped working

Move to a location where you know the terminal works. If the problem is range, a null spot or interference, you may solve the problem simply by moving. If moving does not solve the problem, then check the Access Point.

Interference

Certain structures, objects, machines or transmissions may interfere with radio signals passing between PPT 4340 terminals and Spectrum24 Access Points. Once a network in a facility has been installed with Access Points and PPT 4340 terminals, radio interference usually becomes the most common problem experienced. Symptoms of interference include:

- slow response time
- no response
- sudden loss of connection with the host computer

Problem areas and objects differ from place to place. Symbol can perform a site survey to pinpoint problem areas before any Access Points or terminals are installed. This allows your facility to arrange its equipment so that interference can be minimized. You can also use the RF/AP Diagnostic Utility, as described on page 10-17.

Null spots

A Null spot is an area in which a terminal behaves as though it has lost connection with the host computer. It is caused by reflection and cancellation of radio waves. Null spots tend to be small; usually if you move 2 - 3 feet in any direction you will move out of the null area.

Effective Range

For a terminal to work reliably, it must be within radio range of an Access Point. Maximum effective range indoors is about 300 feet, but doors, walls, corners and construction materials may combine to decrease this range. Outdoor effective range increases to about 800 feet. Response time may deteriorate as you reach the end of your range. You can greatly extend a terminal's functional range by setting up a network of Spectrum24 Access Points.

Terminal Emulators

Keyboard Lock

In the VT220 terminal emulator, if a user presses **<Ctrl-S>** in an application, it will appear as if the terminal's keyboard has locked up. Press **<Ctrl-Q>** to resume operation. Other standard ASCII Control Functions remain active. See *ASCII Control Function*s on page 7-12 for a list.

If the terminal stops responding, check the status line. If `XTWAIT` (in 3270) or `X` (in 5250) appears on the status line, then the terminal is waiting for data or acknowledgment from the Host. To see if the pen is responding, tap the Battery icon on the Direct Access Panel. If the Battery window pops up, the pen is still working. To see if the keyboard has stop responding, press the Caps Lock key. If the Caps Locks light responds, the keyboard is still working. If both pen and keyboard are still working, then the Host has started to ignore the client, or some part of the network connection between the two has problems. You can try probing the host by pressing the Attention key (**<Esc>** in 5250, **<Alt-A>** in 3270).

If the keyboard and pen stop responding, press **<Ctrl-Alt-Del>** to attempt to reboot the terminal. Also see *Switches on the Terminal* on page 10-6.

Status Line Warning Messages

Table 10-4. Status Line Warning Messages

Message	Cause	Action
Session may be lost in 90 seconds. Network or Host problems exist:	Terminal is having communication problems. Stop entering data immediately, to avoid over-filling keyboard buffers.	Wait to see if the connection with the host can be re-established. When the time count reaches zero, a pop-up error message appears on the screen in an enclosed box, indicating the nature of the problem. Note the error message and the action it suggests.
Re-establishing network link	The terminal is re-establishing a connection (may take 10-15 seconds).	Continue your session when you see: `Wireless link re-established`.

Table 10-4. Status Line Warning Messages

Message	Cause	Action
Warning: Open Connection may fail in xx secs	If this appears when you attempt to connect to a host, then the connection is proceeding to the gateway, but the gateway or other network device along the path cannot route communication to the host.	Reboot the terminal to the Control Panel application (as described on page 6-4). Go to the Network tab on the Control Panel and check IP addresses for the host and gateway. The "xx" represents a number of seconds; the message counts down to zero and then ends the connection.

Error Messages

These error and comment messages may appear in a pop-up message box on the terminal when you are using a Terminal Emulator. For more information on any error message, note the error number and contact Symbol Technical Support.

Table 10-5. Terminal Emulator Error Messages

Error	Problem or Comment	Action
001.User Stack Size Error	User stack size for the emulator is too small.	The problem may be transient. Reboot the terminal and try to log in again. If the problem persists, re-install the Terminal Emulators, using the PPT 4300 Utilities PC Card.
002.Connecting to Self Not Allowed	The terminal has attempted to connect to itself.	Check the host IP address (in `keymap.cfg`) and the terminal IP address at the Control Panel to make sure they are correct.
003.No Gateway Defined	The defined host is not on the local network. A gateway to other networks is needed but none is defined in the configuration.	Check the host IP address and gateway in `keymap.cfg`, or add a default gateway IP address to the configuration at the Control Panel.
004.Gateway Not Responding	The defined host is not on the local network. A gateway to other networks is needed but is not responding to ARP requests.	Ensure that the gateway IP address is correct and the gateway and Access Point are running and properly connected to the local network.

Table 10-5. Terminal Emulator Error Messages

Error	Problem or Comment	Action
005.Host Not Responding	The host is on the local network but is not responding to ARP requests.	Ensure that the host IP address is correct in `keymap.cfg`, and the host and Access Point are functioning and properly connected to the network.
006.No Response from Any Network Device	The terminal is unable to find the host. ARP requests have been ignored by all machines on the network.	Make sure the gateway and host are properly defined and connected to the network.
007.User Datagram Protocol (UDP) Close Requested	User Datagram Protocol is an unused feature. If this message appears, there may be corruptions in the application software.	Re-install the Terminal Emulators, using the PPT 4300 Utilities PC Card.
008.Connection Closed Normally	The terminal has closed the connection successfully.	None. The terminal session will close in less than 5 seconds.
009.Connection Closed Abnormally	The terminal was unable to fully negotiate the close of the session.	Check the network path to the host.
010.Connection Timed Out - No Activity	The inactivity time-out feature is not used by the terminal.	Re-install the Terminal Emulators, using the PPT 4300 Utilities PC Card.
011.Timeout; Closing Connection Abnormally	The connection has abnormally closed because communication problems exist.	Check the network path to the host.
012.Connection Closed by Network Control	Network Control (ICMP) has closed the connection to the host because it found problems with the connection.	Check the network path to the host.
013.Host has Reset the Connection	The host has reset the connection.	The terminal session has been abruptly disconnected by the host and will close.
014.Connection Closed by Host	The connection between the terminal and the host has been successfully closed by the host.	None. The terminal session will close in less than 5 seconds.

Table 10-5. Terminal Emulator Error Messages

Error	Problem or Comment	Action
015.Host Refused Connection	The terminal's connection request has been rejected by the host.	Check the host to find out why the host refused to accept a connection request from the terminal.
016.Open Connection Timed Out	The terminal's attempt to open a connection with the host has been unsuccessful because the host is not responding to the terminal.	Make sure the host IP address is correct in `keymap.cfg`, and that the host is running and connected to the network.
017.Connection Timed Out	The terminal has been waiting for input from the host but the host has not sent anything for a period of time.	Check the host.
018.Connection Closed	The terminal's connection with the host has successfully closed.	None. The terminal session will close in less than 5 seconds.
019.Close Connection Timed Out	The terminal's attempt to close the connection with the host has been unsuccessful because network or host problems exist.	Check network and host connections.
020.Network Unreachable	This is a Network Control (ICMP) message. The terminal's attempt to connect to the host has failed because the host's network is unreachable.	Check configuration for the terminal, network and host.
021.Host Unreachable	This is a Network Control (ICMP) message.The terminal's attempt to connect to the host has failed because the host is unreachable.	Check configuration for the terminal, network and host.
022.Protocol Unreachable	This is a Network Control (ICMP) message.The terminal's attempt to connect to the host has failed because the host's protocol is unreachable.	This is likely an installation network problem; check the host IP address in `keymap.cfg`

Table 10-5. Terminal Emulator Error Messages

Error	Problem or Comment	Action
023.Port Unreachable	This is a Network Control (ICMP) message.The terminal's attempt to connect to the host has failed because the specified port on the host is unreachable.	Check the host IP address port in `keymap.cfg`.
024.Fragmentation needed and DF set	This is a Network Control (ICMP) message.The terminal cannot connect to the host because IP fragment re-assembly is required but not supported by an intermediate network device.	Check network devices to make sure that they support IP fragment re-assembly.
025.Source Route Failed	This is a Network Control (ICMP) message.The requested source route has failed.	Check the pathway to the host to make sure that source routing is valid.
026.Packet Driver Initialization Failed	The process of initializing the packet driver failed.	Reboot the terminal. If the problem persists, use the Utilities PC Card to re-install Terminal Emulators
027.Automatic terminal Configuration Failed	BOOTP was required to configure the terminal but the BOOTP process failed.	Check the setup parameters for BOOTP and verify that a BOOTP server is attached to the local network.
028: Link Configuration Failure	The terminal emulator could not properly configure the session.	Check the configuration parameters of the specific host in the `keymap.cfg` file.
029.Telnet Interface Error	The terminal emulator cannot interface with the telnet portion of the emulation program.	There is an incompatibility between the emulator and the TCP/IP stack. Re-install the Terminal Emulators, using the PPT 4300 Utilities PC Card.
030.Connection Closed by Host	The host has closed the connection.	None. The terminal session will close in less than 5 seconds.
031.No Telnet Stack Present	The telnet stack isn't loaded.	Load `tn_tcpip.exe` before starting emulators in `autoexec.bat`.

Table 10-5. Terminal Emulator Error Messages

Error	Problem or Comment	Action
032.No Packet Driver	The terminal emulator cannot find the packet driver.	Make sure there's a packet driver loaded. For NDIS stacks, load `Dis_pkt.dos` as a device in `config.sys`. For ODI stacks, load `odipkt.com` in the autoexec.bat. In both cases, the RF card driver must already be loaded (`slandis.exe` for NDIS, `slaodi.exe` or `sl8odipc.exe` for ODI).
033.Closing Connection...	The terminal user has requested that the connection to the host be closed.	None. The terminal session will close in less than 5 seconds.
034.Trying to Close the Connection...	The terminal has tried to send data to the host but has received no response to its send attempts. The terminal is trying to close the connection.	None. The terminal session will close in less than 5 seconds.
035.Open Connection Request Terminated	The process of opening a connection from the terminal to the host has been prematurely terminated by the user.	None. The terminal session will close in less than 5 seconds.
036.No Hosts Defined in keymap.cfg	No hosts have been defined in the key map and host choice list configuration file.	Add at least one 'newHostEntry' line to the `keymap.cfg` file.
037.Out of Memory for Host Choice List	The terminal has run out of memory while trying to create the host choice list.	Make sure enough conventional memory is available for the Terminal Emulators to use.
038.File keymap.cfg Not Found	The key map and host choice list configuration file was not found.	Create the `keymap.cfg` file and add at least one host entry.

Citrix ICA Client for DOS

Frozen Sessions and Disconnections

If a WinFrame or MetaFrame server sends data to a PPT 4340 terminal, and receives no response, it may disconnect the terminal from the session. The session stays active on the server, and a user can reconnect to the same session. The server may terminate the disconnected session after a site-specific time-out period.

A PPT 4340 terminal will stop responding to the server if:

- the user walks out of Access Point range, or somehow loses radio contact (by walking into a null spot, for example).
- the battery is removed. When a battery is removed, the terminal goes directly into Sleep mode. A user must complete a battery swap within 10 seconds, or the session may be disconnected by the host. The terminal turns itself off, if swap time exceeds 45 seconds.
- the terminal Dozes or Sleeps due to power management. In this case, the host disconnects the session after 10 seconds of Sleep. To avoid this problem, make sure the **Stop CPU Clocks during Power Management** option is de-selected on the Power tab of the Control Panel. This ensures that the CPU will run continuously and maintain communications with the Citrix server.

See *Disconnected Sessions* on page 8-9 for more information on Citrix ICA session disconnections.

TCP Error Messages Under Citrix ICA

Tables 10-5, 10-6 and 10-7 show the TCP error messages that may appear in a message window on the terminal when you are using the Citrix ICA Client for DOS. For more information about these or other system messages that may appear during a Citrix ICA session, contact Symbol Technical Support.

Table 10-6. Citrix ICA Error Messages

Transport Driver Error	Explanation
Browser 26	A DOS client has tried to connect to a published application and there are no more licenses available.
Browser 27	All WinStations for the transport type are in use.

Novell LAN Workplace for DOS TCP Stack

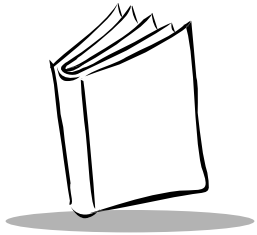
Table 10-7. Novell LAN Workplace for DOS TCP Stack

Transport Driver Error	Explanation
TCP/IP 60	This error can occur after an 80 second time-out if the PPT 4340 is booting and cannot communicate with the Citrix Server. For example, this may happen due to incorrect configuration of the PPT 4340 or a fault in LAN communications.
TCP/IP 54	This error occurs if the PPT 4340 loses its ability to communicate with the Citrix Server during a session. For example this may happen if the user walks out of range, or if there is a fault in LAN communications.
LSL-214-14: The NET.CFG file was not found. The LSL will use system defaults. Max Boards 4, Max Stacks 4	This error message appears when LSL tries to load and the `\net\net.cfg` file is missing. To solve this problem: 1. Replace `\net\net.cfg` with the same file from a working terminal or from a PPT 4300 Utilities PC card. 2. Run the Control Panel application and reset the Network information.

Microsoft TCP Stack

Table 10-8. Microsoft TCP Stack

Transport Driver Error	Explanation
TCP/IP 116	This error occurs if user is out of range for more than 30 seconds and the server has disconnected the session.
TCP/IP 117	This error occurs after a network interruption and may appear repeatedly. Requires a PPT 4340 reboot.
TCP/IP 119	This error occurs if during a session the host loses its network connection or the Access Point is turned off. It appears after a 5 minute time-out.
TCP/IP 121	This error occurs if the Access Point or host are not on the network while the PPT 4340 is trying to connect.
TCP/IP 122	This error occurs if the host loses its network connection during a session.



Chapter 11 Diagnostic Tests

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Overview

The PPT 4300 Utilities PC card is a bootable PC card that contains

- copies of all of the terminal's factory-installed software and configuration files
- batch files for formatting PC cards and rebuilding the internal flash file system
- CardSoft software
- diagnostic utilities
- a complete distribution of ROM-DOS

This chapter describes how to use the card and the diagnostic utilities. For a complete list of files and ROM-DOS commands, see Appendix D, *PPT 4300 Software Files*.

You can use the PPT 4300 Utilities PC Card to:

- replace or add software, upgrade the BIOS or rebuild the internal flash file system. You can also use it to format PC cards. See Chapter 3, *Software Installation* for instructions.
- access ROM-DOS commands and utilities that may not be available on the terminal.
- diagnose and solve problems on the terminal.

For information on the software loaded onto the terminal, see *Operating System and Software* on page 2-6. For information on the RF/AP diagnostic utility, see page 10-19.

Note: *If you make changes at the Control Panel, be aware of what drive you are currently on. The Control Panel saves some parameters to files on the current drive. The current drive is identified in the DOS prompt. The C: drive may be the internal flash drive or the PPT 4300 Utilities PC card, depending on how you booted the terminal.*

Using the PPT 4300 Utilities PC Card

To use the PPT 4300 Utilities PC card:

1. Remove the rubber plug from the Expansion Slot at the top of the terminal and insert the PPT 4300 Utilities PC card, connector edge first.
2. Boot the terminal from the PC card.
3. The terminal boots to the Utilities Card Main Menu on the PC card. If it does not:
   a. The card may not be fully seated in the slot or it may be in backwards, or
   b. The **PC Card Boot** option may be disabled. See *System Options* on page 6-17.
4. Use the options or utilities that you need and take any action necessary. When you finish using the PC card, exit to a DOS prompt, type `off` and press **<Enter>**.
5. Look into the Expansion Slot at the top of the terminal and press the square black button to partially eject the card. Then pull out the card and replace the rubber plug.

Utilities Card Menus and Files

When you first boot from the Utilities card, you will be prompted to select a keyboard type, as shown in Figure 11-1. If you select **2**, the software allows you to select from a list of international keyboards. After five seconds, the default choice is activated (Standard US Keyboard), and the next menu appears, as shown in Figure 11-2.

```
ROM_DOS Startup Menu                          Time Remaining: 5


1. Standard US Keyboard
2. International Keyboard

Enter Choice: 1




F5=Bypass Startup Files F6=Confirm each CONFIG line [N]
```

Figure 11-1. Utilities Card Keyboard Selection

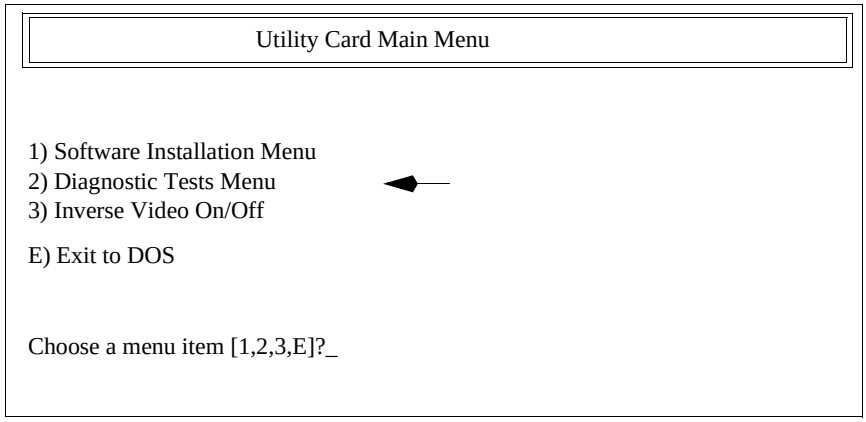


Figure 11-2. Utility Card Main Menu

Software Installation Menu: Use this option for rebuilding the flash file system, installing or removing software, or loading a new BIOS. Aso see Chapter 3, *Software Installation*.

Diagnostic Tests Menu: Use this option for running the diagnostic test utilities.

Inverse Video On/Off: This option allows you to invert the colors shown on the display screen. Under some lighting conditions, this may make the screen easier to read.

Diagnostic Test Utilities

The PPT 4300 Utilities PC card has a number of diagnostic utilities available to help you troubleshoot and solve problems on the terminal. There are diagnostic tests for:

- System Board
- Memory
- Com Port
- IrDA Port
- Video Controller
- Keyboard
- Battery
- Radio

To carry out the diagnostic tests, you need a terminal and a DC adapter. If you intend to test the Com Port, you will also need a PPT 4300 Loopback Plug. The IrDA Port tests require a JetEYE serial-to-IrDA adapter. To use the Diagnostic Test Utilities:

1. Remove the plug from the PCMCIA Slot and insert the PPT 4300 Utilities PC card. Insert the Loopback Plug and JetEYE serial-to-IrDA adapter. Plug in an external keyboard, if one is available.
2. Power the terminal from a DC Adapter to avoid interruptions that could be caused by a low battery or by having the terminal enter Doze or Sleep mode.
3. Boot the terminal from the card. When the Utilities Card Main appears, press **2** to display the AirWire Systems Test/Burn-in Menu (shown in Figure 11-3).
4. Select a number to run a particular test (described below), or press **A** to select `All of the above`. This option causes all of the tests to run in sequence except for the Battery Tests option. The Battery Tests must be performed separately. If the terminal fails a test, the diagnostics provide error and warning messages. Start the tests and follow the prompts, noting any errors. Some tests require input from you.

   If you find an error, re-run the test to generate an error log and report of the test results. Then press a **V** from the AirWire Systems Test/Burn-in menu to view the error log files. When you exit the Test/Burn-in menu, the system checks for the existence of the log files and prompts you to delete them or not.

   To end a test at any time, press **<Esc>.**

5. Take action according to the results of the diagnostics tests. Then remove the PPT 4300 Utilities PC card and reboot normally.

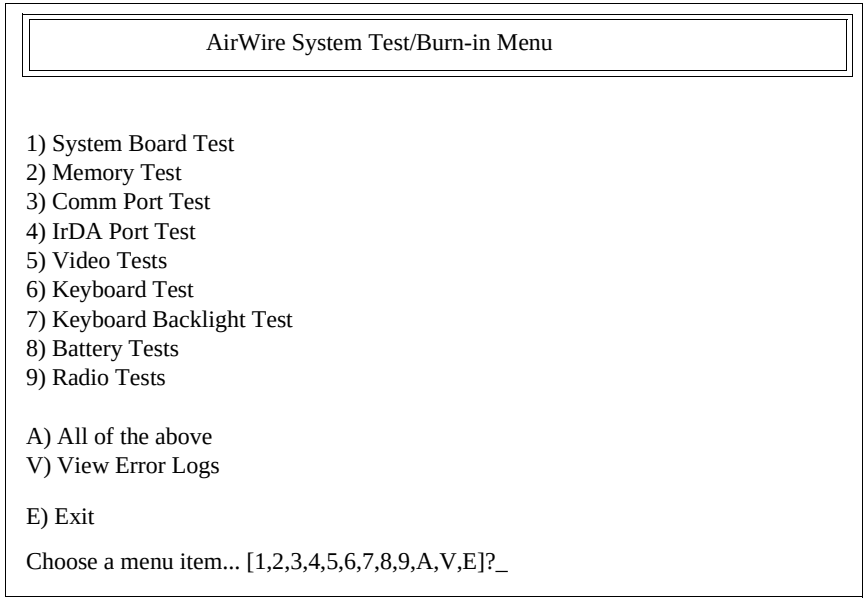


Figure 11-3. Diagnostic Tests Menu

Summary of Diagnostic Utilities

This section summarizes the options on the Diagnostic Tests Menu on the PPT 4300 Utilities PC card. See Appendix D, *Software Files*, for detailed information on the diagnostic files and their parameters.

System Board Test

This test uses `cksys.exe` to test the terminal's main board. If the terminal fails the System Board Test, make sure that the date and time have been set correctly on the System tab of the Control Panel. Then try the test again. For any other problem, note the error message, and contact Symbol Technical Support.

Memory Test

This test uses `ckmem.exe` to check the on-board RAM. If it fails the test, note the error message, and contact Symbol Technical Support.

COM Port Test

Before you perform this test, make sure the Loopback Plug has been securely placed into the Serial Port; the test will fail if a Loopback Plug has not been placed. Watch the test as it steps through each baud rate. Make sure characters are being sent and received. If there are problems with any baud rates, or characters are not being sent and received, note error messages and contact Symbol Technical Support. The COM Port Test uses `ckcom.exe`.

IrDA Port Test

This tests the IrDA port using the `ckirda.com` utility. It requires a serial port adapter and a JetEYE serial-to-IrDA adapter, and it assumes the serial port is working. Plug the serial port adapter into the serial port. Attach the JetEYE adapter to the serial adapter (the test will fail if this adapter has not been attached). Aim the JetEYE at the PPT 4300's IrDA port, at a distance of about 12 inches. Then press **Y** to start the test.

When the test begins, make sure that characters are being transmitted and received. There should be 0 bytes in error and 0 bytes lost. See page D-18 for test parameters.

Video Controller Tests

If you select **All of the above** from the AirWire System Test/Burn-in Menu, all of the AirWire System Video Tests run except for the **Comprehensive Video Test** (described on page 11-8). However if you select **5** from the AirWire System Test/Burn-in Menu, a sub-menu appears, as shown in Figure 11-4. You can select individual video tests from the Video Tests menu. If there are particular problems, document them, and contact Symbol Technical Support.

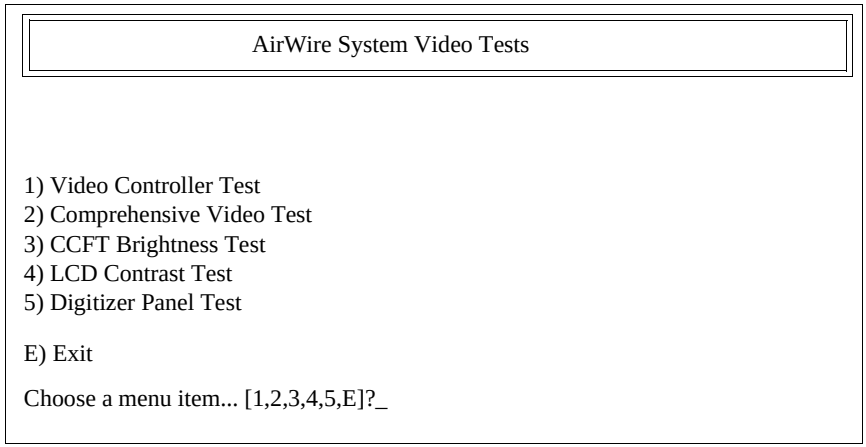


Figure 11-4. Video Tests Menu

Video Controller Test: This option tests for display functionality and quality. Watch the tests as they progress and note any display problems or idiosyncrasies (pixel dropout, odd screen artifacts).

Comprehensive Video Test: This option performs a more comprehensive set of Video tests than option 1, including a test of video and text modes, and a display quality test.

CCFT Brightness Test: This option tests the screen brightness. There should be three clearly distinguishable Brightness levels. You can adjust the Brightness level at the Display tab of the Control Panel.

LCD Contrast Test: This option tests screen contrast. Contrast should go from very bright to very dark. The **Digitizer Panel Test** option tests the digitizer. Draw a large 'X' when asked to draw on the screen.

Exit: Returns to the Diagnostic Tests Menu.

Keyboard Tests

This option tests the keypad and external keyboard (if you have attached one). The tests run one after another, in sequence. Contact Symbol Technical Support if the terminal fails any of these tests:

Key Press Test: Press all of the keys. Make sure all of the keys register when they are pressed. Also press a few external keyboard keys. To exit the test, press any key three times in succession.

Auto-Repeat Test: On the auto-repeat test screen, press and hold a key until the matching key on the screen turns from yellow to blue.

Lock Lights Test: After the auto-repeat test, the Lock Lights should be flashing for the Caps Lock, Num Lock and Scroll Lock keys.

End of Keyboard Tests: At the end of keyboard testing, the terminal beeps twice (because you exited the key-pressing test before it finished).

Keyboard Backlight Test

This test causes the Low Battery Light and the terminal's keyboard backlight to flash on and off at one-second intervals. Press any key to end the test. The Display tab on the Control Panel has an option called **Use brightness level 1 when keyboard backlight is turned on**. If this option is selected, the screen will dim and brighten as the keyboard backlight goes on and off. If the Key Click option is enabled, you will hear the key click sound during this test.

Note: *The terminal must run on battery power to perform the following battery tests. If you have been powering the terminal from a DC Adapter, the diagnostics will pause. To continue, insert a Smart Battery into the terminal. Then unplug the DC Adapter from the DC Power port on the terminal. The display should continue to show clearly.*

Smart Battery Test

This option displays the Battery Pack Diagnostic Utility. You must run the terminal from a battery in order to perform this test. This screen displays a list of values related to the Battery Pack. Instructions:

1. The status of each value should be "`Ok`". Older Utility Cards may show a value of "`Error`" for the Battery Capacity test. You can safely disregard this. Reasonable battery ranges with DC adapter removed:

   Main battery: 12v - 14v. Swap batteries: 3.0v - 4.5v.

2. Press the Battery icon. The pop-up Battery window should appear, showing current battery capacity.
3. Test the Low Battery Light and Swap feature. First, remove the battery and wait 5 seconds. The screen should go dark and the Low Battery light should flash. Then snap the battery back into place. The terminal should resume operation without turning itself off or rebooting. The Low Battery light should stop flashing.

Radio Tests

This option displays a sub-menu as shown in Figure 11-5 on page 11-11.

Signal Strength Test: This test provides detailed radio status and Spectrum24 version information. If the radio is operating correctly, and you are within about 20 feet of an Access Point in direct line of sight, this test should result in an RSSI reading of more than 40. The RSSI parameter provides a relative indication of signal strength. If no value appears, the radio is not communicating with the Access Point. Press **<Esc>** to return to the Radio Tests menu. Refer to Spectrum24 documentation for more information about `s_info.exe`.

Ping Test: The Ping Test should run 50 times with no errors. Press **<Esc>** to exit to the Radio Tests menu.

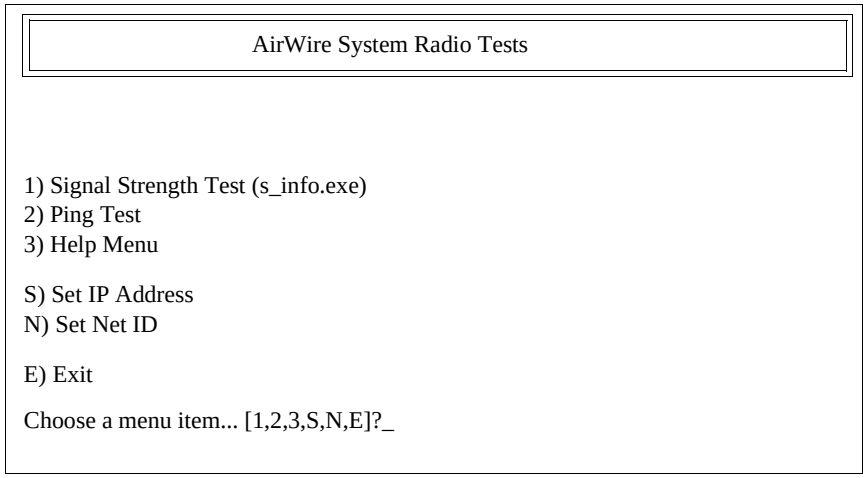


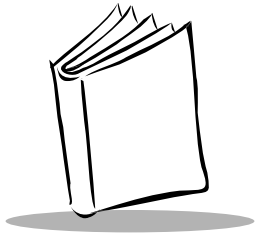
Figure 11-5. Radio Test Menu

Set IP Address: If you need to ping a different Access Point or Host, use this option to set the IP address that gets pinged during the Ping Test (option 2). To do this, type **S** to select Set IP Address. This opens the Ping Test utility in the NED editor. Follow the instructions in the file to locate and set the IP Address. Save the file and exit NED.

Set Net ID: Use this option to change the Network ID. This is necessary if you are testing several different Access Points with different IDs.

To change the Net ID:

1. Press **N** to select the option from the Radio Test menu.
2. Locate the line `net_id 1XX` and change the ID to the correct one.
3. Save the file, then exit.
4. Exit the menus until you are at the DOS prompt.
5. Reboot the terminal. You must reboot the terminal or the new ID will not be applied.



Appendix A
Specifications

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PPT 4300 Series Specifications

Size/Weight

- 10.75” x 8.1” x 1.25 - 2.5” (27.3 cm x 20.57 cm x 3.18-6.35 cm)
- 2.86 lbs, without battery (1.3 kg)
- uses 1.0 lb battery (.45 kg)
- ergonomically designed

Architecture

- IBM PC-AT compatible

Processor

- AMD Elan SC310
- 33 MHz clock rate

Memory

- RAM
  - 4 MB standard, expandable to 16 MB
- Flash
  - 256 KB for BIOS
  - 2 MB file system expandable to 16 MB

Expansion

- Two PCMCIA (PC Card) Type II slots

Communications

- Spectrum 24™ wireless LAN (uses one PCMCIA slot)
  - 1 Mbps (Spring Protocol) radios and 2 Mbps (802.11) radios available.
- TCP/IP protocols

I/O Ports

- RS232 serial interface
- IrDA port

Power

- Field-replaceable NiMH battery pack
  - 2100 mAH capacity (nominal) at 12.0v
  - smart battery technology
- External DC adapter
- Internal trickle charger
- External fast battery charger

Power Management

- Power Management features:
  - Run/Doze/Sleep/Off modes
  - automatic CPU slowdown during periods of inactivity
  - automatic control of display and keyboard backlight
- Hot swap battery
- Low battery indicator
- On-screen battery meter

Display

- DSTN VGA color LCD
- 7.2” diagonal (18.29 cm)
- 640 x 480 VGA resolution
- 256 color
- CCFT backlit
- Adjustable contrast and brightness

Digitizer

- PPT 4300-00E and PPT 4300-S0E: Electromagnetic digitizer with 1000 dpi minimum resolution. Screen responds only to electromagnetic pen.
- PPT 4300-00R: Resistive digitizer with 150 dpi minimum resolution. Screen responds to passive stylus or touch.

Integral Keyboard

- Notebook-style elastomeric keyboard
- Backlit
- Spill resistant
- External keyboard port

Integrated Scanner (PPT 4300-S0E only)

- SE 1223 Scan Engine
- Scanning angle of the single beam is 42° ± 2° (standard version)
- Scan frequency is 36 scans per second.
- Scanning Depth of Field from 3-5 inches (bar code size 5 mil) to 36 inches (bar code size 55 mil).
- Maximum width of field is 13.83 inches (35.1 cm) from the center point. See *Appendix E* for further information.

Software Environment

- PC-compatible BIOS
- Power Management support
- PCMCIA (PC Card) support
- Citrix *WINFRAME*™ DOS client running ICA3 protocol, with 16 colors
- Terminal Emulations: TN3270, TN5250 and VT220

Standard and Optional Accessories

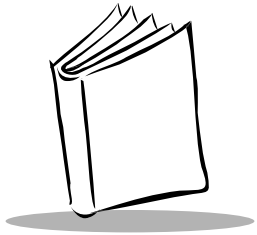
- 12” (30.5 cm.) Carrying strap
- 60” (1.52 m.) adjustable Shoulder strap
- Plastic stand
- DC adapter
- Electromagnetic pen (PPT 4300-00E and PPT 4300-S0E) or Plastic Stylus (PPT 4300-00R)
- Carrying case
- Battery chargers (4-slot and 1-slot)
- Additional battery packs

Environmental Characteristics

- 0°C to 40°C operating/-20°C to 60°C non-operating
- 10 to 85% relative humidity, non-condensing
- Designed to withstand a 1 meter drop to a non-yielding surface
- Wipeable, spill resistant
- Resistant to most common chemicals found in hospitals

Regulatory Approvals

- North American: CSA, UL, FCC
- International: VDE, CE, C-TICK,



Appendix B
Key Mapping for Terminal Emulators

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Default Key Maps for Terminal Emulators

The terminal comes with four default key maps for terminal emulation: two for the VT220 emulation, one for the TN3270 emulation, and one for the TN5250 emulation. Your facility may also provide one or more custom key maps for any terminal emulation, up to a total of three custom key maps.

The `keymap.cfg` file defines the default key map for a host. This is the key map that is used when you first establish a connection to the host. To change key maps temporarily during an active session, press **<Shift-Alt-O>** on the terminal to display the Terminal Emulation Options screen. Press a highlighted character to select a key map. For more information on this screen, and on other emulation-specific options, see Chapter 4, *Using the Terminal Emulators*.

VT220 Key Map

We offer two VT220 emulation key mappings: a standard VT220 key map, and a non-standard key map for use with some applications. Default VT220 key maps are shown in Table B-1. Use the non-standard mapping with any application that starts mapping function keys at **<F6>** rather than **<F1>**. See Table B-5 for the Function and Key Labels required for creating a custom key map.

3270 Key Map

The default 3270 key map is shown in Table B-2. See Table B-6 for the Function and Key Labels required for creating a custom key map.

5250 Key Map

The default 5250 key map is shown in Table B-3. See Table B-7 for the Function and Key Labels required for creating a custom key map.

Default VT220 Key Map

Table B-1. Default VT220 Keys and Functions

VT220 Function	Std VT220	Non-Std VT220	Key String
F6	F6	F1	[17~
F7	F7	F2	[18~
F8	F8	F3	[19~
F9	F9	F4	[20~
F10	F10	F5	[21~
F11	F11 or Ctrl-F1	F6	[23~
F12	F12 or Ctrl-F2	F7	[24~
F13	Ctrl-F3	F8	[25~
F14	Ctrl-F4	F9	[26~
F15 (Help)	F5 or Ctrl-F5	Ctrl-F1 or Ctrl-F6 or Ctrl-F10	[28~
F16 (Do)	Ctrl-F6	Home	[29~
F17	Ctrl-F7	F10	[31~
F18	Ctrl-F8	F11	[32~
F19	Ctrl-F9	F12	[33~
F20	Ctrl-F10	Shift-F1	[34~
PF1	F1	Shift-F2	OP
PF2	F2	Shift-F3	OQ
PF3	F3	Shift-F4	OR
PF4	F4	Shift-F5	OS
Compose character	Alt-C	Alt-C	not supported
Disconnect	Shift-Alt-X	Shift-Alt-X	local
Delete (Boxed X)	Backspace	Backspace	BS
Find	Insert (Ins)	Shift-F12	[1~
Insert Here	Home	Insert (Ins)	[2~
Previous	End	(PgUp)	[5~

Table B-1. Default VT220 Keys and Functions

VT220 Function	Std VT220	Non-Std VT220	Key String
Next	(PgDn)	End	[6~
Remove	(PgUp)	Delete (Del)	[3~
Return	Enter	Enter	CR or CR/LF
Select	Delete (Del)	Shift-F11	[4~
Linefeed	Ctrl-J	Ctrl-J	LF
TAB	Tab (⇤→)	Tab (⇤→)	HT
		PgDn	[7~
Aux. keypad 0	Alt-0	Alt-0	\033Op
Aux. keypad 1	Alt-1	Alt-1	\033Oq
Aux. keypad 2	Alt-2	Alt-2	\033Or
Aux. keypad 3	Alt-3	Alt-3	\033Os
Aux. keypad 4	Alt-4	Alt-4	\033Ot
Aux. keypad 5	Alt-5	Alt-5	\033Ou
Aux. keypad 6	Alt-6	Alt-6	\033Ov
Aux. keypad 7	Alt-7	Alt-7	\033Ow
Aux. keypad 8	Alt-8	Alt-8	\033Ox
Aux. keypad 9	Alt-9	Alt-9	\033Oy
Aux. keypad -	Alt--	Alt--	\033Om
Aux. keypad ,	Alt-,	Alt-,	\033Ol
Aux. keypad .	Alt-.	Alt-.	\033On
Aux. keypad Enter	Alt-Enter	Alt-Enter	\033OM

Default 3270 Key Map

Table B-2. Default 3270 Keys and Functions

3270 Function	Terminal Key
Attention	Alt-A
Disconnect from host	Shift-Alt-X
Backspace	Backspace (←)
Clear	Alt-C or PgDn
Delete	Delete (Del)
Duplicate	Alt-D
Enter	Enter
Erase End of Field	End
Erase Input	Ctrl-Backspace
Field Mark	Alt-F
Home	Home
Insert	Insert (Ins)
Mono Case	Alt-M
Newline	Ctrl-Enter or Ctrl-J
Pen TAB	Alt -T
Pen Select	Alt-S
Reset	Ctrl-R, PgUp or Esc (Fn-F1)
Tab	Tab ($\overset{\|<-}{->\|}$)
Back-Tab	Shift-Tab ($\overset{\|<-}{->\|}$)
PF1 to PF12	F1 to F12
PF13 to PF24	Shift-F1 to Shift-F12
PA1 to PA3	Alt-F1 to Alt-F3
¬	Alt- - (dash), or Shift-6
¢	Alt-4
|	Alt-\

Default 5250 Key Map

Table B-3. Default 5250 Keys and Functions

5250 Function	Terminal Key
Attention	Esc
Disconnect from host	Shift-Alt-X
Clear	Alt-C
Delete	Alt-D
Error Reset	Ctrl
Erase Input	Alt-Backspace
Field Advance	Tab
Field Backspace	Shift-Tab
Field Exit	Home
Field Minus	Alt-- (hyphen)
Field Plus	Alt-= (equals)
Help	End
Home	Alt-Home
Newline	Alt-Enter
Pen Select	Alt-S
Sys Request	SysReq (Fn-Del)
TestReq	Alt-T
F1 - F12	F1 - F12
F13 - F24	Shift-F1 - Shift-F12
| (long vertical bar)	Alt-\
¢ (cent sign)	Alt-4
¬	Alt-6

Custom Key Mapping

You can create up to three custom key maps for a terminal, for any of the three available terminal emulations. Custom key maps can be defined as part of the terminal's configuration. Sample versions of these files are available from Symbol.

You can assign a custom key map to a host on the Host Choice List (see *Creating the Host Choice List* on page 7-15). You may also select a custom key map as an option on the Terminal Emulation Options screen (**<Shift-Alt-O>**): once defined, custom key maps appear on the Terminal Emulation Options screen, listed under the appropriate emulator, with the name you gave it in the `keymap.cfg` file, and a highlighted number. Press the highlighted number to select the custom key map. The default key maps for TN3270, TN5250, and VT220 also remain available as options.

How to Create a Custom Key Map

To create a custom key map:

1. Make a backup copy of the `keymap.cfg` file (`usr/appl/awte/keymap/keymap.cfg`).
2. Open the `keymap.cfg` file in the NED text editor (type: `ned usr/appl/awte/keymap/keymap.cfg`).
3. Enter the key map customizations you want, as shown in Figure B-1. Table B-4 displays the functions and keys available for re-mapping and default key mappings for each emulation we currently support.

   Each custom keymap begins with `newKeyMap`, followed by the terminal emulation type, and the name of the custom key map, in parentheses. You must group all function definitions together, followed by all key mappings within a `newKeyMap` definition.

   For example, Figure B-1 shows this entry: `newKeyMap(3270, "CKT 3270");`. Here, the custom key map is for a 3270 emulation called `CKT 3270`. Map the custom keys as shown in Figure B-1. See *Key Function Labels for Custom Key Mapping* on page B-13 for more detailed information on mapping specific keys.

Note: *You only need to map the keys that are different from the default key mapping for the emulation. Figure B-1 shows part of a sample* `keymap.cfg` *file.*

```
//================================================
// EXAMPLE for VT220:
// new key mapping for VT220 called 'CKT vt220'
// ================================================
newKeyMap(VT220,"CKT vt220");
fcn_vt220_home  = "\x1b[H";         // add a new vt220 function
key_alt_home = fcn_vt220_home;    // map it to ALT-<HOME>
key_alt_b = fcn_vt220_f6;             // maps F6 function to Alt-B

// ================================================
// EXAMPLE for 3270:
// new key mapping for 3270 called "CKT 3270"
// ================================================
newKeyMap(3270, "CKT 3270");
key_sysreq = fcn_3270_sysreq;         // map <SYSREQ> to SysReq function
key_ctrl_backspace = fcn_3270_none; // unmap CTRL-<BACKSPACE> key

//================================================
// EXAMPLE for 5250:
// new key mapping for 5250 called "CKT 5250"
// ================================================
newKeyMap(5250,"CKT 5250");
key_alt_r = fcn_5250_error_reset;   // map Error Reset to ALT-r
```

Figure B-1. Custom Key Mapping in keymap.cfg

4. Save `keymap.cfg` and reboot the terminal. After the terminal boots, and you have started a Terminal Emulator session, press **<Shift-Alt-O>** to display the Terminal Emulation Options screen. The new custom key map should be available and selectable.

Keys Available for Re-Mapping

The keys listed in Table B-4 are available for re-mapping. *Keys that are not listed are not available for re-mapping*. The first column lists the keys that the user would press and the second column represent the key's corresponding label used in the `keymap.cfg` file.

Limitations: Some key combinations are not available. You cannot re-map:

- any **<Shift-Alt>** key combinations (*e.g.*, **<Shift-Alt-X>**)
- **<Fn-F2>** to **<Fn-F12>**

Also, there are fours pairs of keys that the system BIOS regards as identical. If you re-map one of these keys, you also re-map the matching key. They are:

- KEY_CTRL_M equals KEY_ENTER
- KEY_CTRL_I equals KEY_TAB
- KEY_CTRL_J equals KEY_CTRL_ENTER
- KEY_CTRL_H equals KEY_BACKSPACE

Note that if you map a function to the **<Ctrl>** key in 3270 or 5250, you cannot map any other **<Ctrl>** key combination for that key map (e.g., **<Ctrl-A>**). Doing so causes an error that prevents the terminal emulator from starting.

Table B-4. Keys Available for Re-mapping

Key	Label
<Del>	KEY_DELETE
<End>	KEY_END
<Home>	KEY_HOME
<Ins>	KEY_INSERT
<PgUp>	KEY_PGUP
<PgDn>	KEY_PGDN
<CTRL-Del>	KEY_CTRL_DELETE
<CTRL-End>	KEY_CTRL_END
<CTRL-Home>	KEY_CTRL_HOME
<CTRL-Ins>	KEY_CTRL_INSERT
<CTRL-PgUp>	KEY_CTRL_PGUP

Table B-4. Keys Available for Re-mapping (Continued)

Key	Label
<CTRL-PgDn>	KEY_CTRL_PGDN
<ALT-Del>	KEY_ALT_DEL
<ALT-End>	KEY_ALT_END
<ALT-Home>	KEY_ALT_HOME
<ALT-Ins>	KEY_ALT_INSERT
<ALT-PgUp>	KEY_ALT_PGUP
<ALT-PgDn>	KEY_ALT_PGDN
<F1> to <F12>	KEY_F1 to KEY_F12
<CTRL-F1> to <CTRL-F12>	KEY_CTRL_F1 to KEY_CTRL_F12
<SHIFT-F1> to <SHIFT-F12>	KEY_SHIFT_F1 to KEY_SHIFT_F12
<ALT-F1> to <ALT-F12>	KEY_ALT_F1 to KEY_ALT_F12
<SHIFT-CTRL-F1> to <SHIFT-CTRL-F12>	KEY_SHIFT_CTRL_F1 to KEY_SHIFT_CTRL_F12
<CTRL-A> to <CTRL-Z>	KEY_CTRL_A to KEY_CTRL_Z
<ALT-A> to <ALT-Z>	KEY_ALT_A to KEY_ALT_Z
<ALT-0> to <ALT-9>	KEY_ALT_0 to KEY_ALT_9
<ALT-->	KEY_ALT_MINUS
<ALT-=>	KEY_ALT_EQUAL
<ALT-;>	KEY_ALT_SEMICOLON
<ALT-,>	KEY_ALT_COMMA
<ALT-.>	KEY_ALT_PERIOD
<ALT-/>	KEY_ALT_SLASH
<ALT-\>	KEY_ALT_BACKSLASH
<CTRL-->	KEY_CTRL_MINUS
<CTRL-\>	KEY_CTRL_BACKSLASH
<Tab> (or <Ctrl-I>)	KEY_TAB (or KEY_CTRL_I)
<Back Tab>	KEY_BACKTAB

Table B-4. Keys Available for Re-mapping (Continued)

Key	Label
<Back Space> (or <CTRL-H>)	KEY_BACKSPACE (or KEY_CTRL_H)
>CTRL-Backspace>	KEY_CTRL_BACKSPACE
>ALT-Backspace>	KEY_ALT_BACKSPACE
<Up Arrow>	KEY_UP
<CTRL-Up Arrow>	KEY_CTRL_UP
<CTRL>	KEY_CTRL (3270 and 5250 only)
<ALT-Up Arrow>	KEY_ALT_UP
<Down Arrow>	KEY_DOWN
<CTRL-Down Arrow>	KEY_CTRL_DOWN
<ALT-Down Arrow>	KEY_ALT_DOWN
<Left Arrow>	KEY_LEFT
<CTRL-Left Arrow>	KEY_CTRL_LEFT
<ALT-Left Arrow>	KEY_ALT_LEFT
<Right Arrow>	KEY_RIGHT
<CTRL-Right Arrow>	KEY_CTRL_RIGHT
<ALT-Right Arrow>	KEY_ALT_RIGHT
<ENTER> (or <CTRL-M>)	KEY_ENTER (or KEY_CTRL_M)
<CTRL-ENTER> (or <CTRL-J>)	KEY_CTRL_ENTER (or KEY_CTRl_J)
<ALT-ENTER>	KEY_ALT_ENTER
<SYSRQ>	KEY_SYSREQ
<BREAK>	KEY_BREAK
<ESCAPE>	KEY_ESCAPE

Key Function Labels for Custom Key Mapping

Tables B-5, B-6 and B-7 show default key map function and key labels for TN3270, TN5250 and VT220 emulations. These are the basis of the default key maps available from the Terminal Emulation Options screen **<Shift-Alt-O>**.

The first column of each table lists emulator-specific functions. The second column specifies the keys to press to execute those functions.

Use the emulator-specific functions and key labels in the `keymap.cfg` file that you edit to make key mapping changes.

Note: *Any key not given a new function in* `keymap.cfg` *will perform its default function. This means you are not required to re-map every key. Only re-map the keys that you wish to change from the default.*

When you assign a function to a new key, the existing key remains active. For example, for a 3270 emulation, the default for the **Clear** function is the **<PgDn>** key. You can map **<Alt-C>** to perform the **Clear** function, however **<PgDn>** will also still function as **Clear** unless you re-map it.

To unmap a default key map assignment, use `FCN_x_NONE` (where `x` is `3270`, `5250` or `VT220`). For example, in the 3270 emulation, if you want `KEY_ALT_C` to perform the `FCN_3270_CLEAR` function and the `KEY_PGDN` key (which performs the `FCN_3270_CLEAR` function by default) to do nothing, `keymap.cfg` would list:

```
KEY_ALT_C = FCN_3270_CLEAR;

KEY_PGDN = FCN_3270_NONE;
```

Creating new VT220 functions

Table B-7 describes all the standard VT220 functions — every possible standard key string that can be transmitted from a VT220 terminal. However, you may occasionally want a terminal key to send a non-standard escape string. For example, you may want the **<Home>** key to send out a key string of: `\x1b[H`.

You can create new VT220 function labels in the `keymap.cfg` file and assign strings to them so that when those functions are invoked in the terminal, corresponding strings are sent to the host. Space reserved for new function strings is limited to 256 bytes. At an estimated 5 bytes per new function string, you can add approximately 50 new functions to the existing VT220 function list.

In `keymap.cfg`, place new function entries immediately after the header line of a section, before the first `KEY_` entries for the section. The first token in the line is the function name which must start with `FCN_VT220_`. The second token, separated by an equal sign from the function name, is a character sequence (in double quotes) to send to the host when the new function is invoked.

For characters with no symbolic representation, use `\xnn` where the `nn` is the two digit hexadecimal value of the character (*e.g.*, **<Tab>** is `\x09`; **<ESCAPE>** is `\x1b`). If you want to represent the characters "`\x`" in a string, use `\x5cx`. For a double quote in the string, use `\x22`. For example, consider the new **<Home>** function mentioned above and a hypothetical "hello world" function. The `keymap.cfg` entries for a key map called "My VT220" would look like:

```
newKeyMap(VT220, "My VT220");

FCN_VT220_HOME ="\x1b[H";

FCN_VT220_HELLO ="hello world";

...

KEY_HOME =FCN_VT220_HOME;

KEY_ALT_G =FCN_VT220_HELLO;
```

The second new function `FCN_VT220_HELLO,` when invoked, will send a "hello world" string to the host. Then later in the section, the **<Home>** and **<Alt-G>** keys are mapped to these functions in the same manner as the standard, provided functions. Now, if you use the "My VT220" custom key map, **<Home>** and **<Alt-G>** transmit "`\x1b[H`" and "`hello world`" to the host, respectively.

VT220 Values for Key Mapping

Table B-5. VT220 Values for Key Mapping

Function Label	Key String[a]	Default Key Label
FCN_VT220_BACKSPACE	\x08	KEY_BACKSPACE
FCN_VT220_CLOSE_SESSION	local	KEY_SHIFT_ALT_X
FCN_VT220_DELETE	\x7f	KEY_CTRL_BACKSPACE
FCN_VT220_DOWN	\x1b[B or \x1bOB[b]	KEY_DOWN
FCN_VT220_F6	\x1b[17~	KEY_F6
FCN_VT220_F7	\x1b[18~	KEY_F7
FCN_VT220_F8	\x1b[19~	KEY_F8
FCN_VT220_F9	\x1b[20~	KEY_F9
FCN_VT220_F10	\x1b[21~	KEY_F10
FCN_VT220_F11	\x1b[23~	KEY_CTRL_F1 or KEY_F11
FCN_VT220_F12	\x1b[24~	KEY_CTRL_F2 or KEY_F12
FCN_VT220_F13	\x1b[25~	KEY_CTRL_F3
FCN_VT220_F14	\x1b[26~	KEY_CTRL_F4
FCN_VT220_HELP	\x1b[28~	KEY_CTRL_F5 or KEY_F5
FCN_VT220_DO	\x1b[29~	KEY_CTRL_F6
FCN_VT220_F17	\x1b[31~	KEY_CTRL_F7
FCN_VT220_F18	\x1b[32~	KEY_CTRL_F8
FCN_VT220_F19	\x1b[33~	KEY_CTRL_F9
FCN_VT220_F20	\x1b[34~	KEY_CTRL_F10
FCN_VT220_FIND	\x1b[1~	KEY_INSERT
FCN_VT220_INSERT_HERE	\x1b[2~	KEY_HOME
FCN_VT220_APPL_KP0	\x1bOp	KEY_ALT_0
FCN_VT220_APPL_KP1	\x1bOq	KEY_ALT_1
FCN_VT220_APPL_KP2	\x1bOr	KEY_ALT_2
FCN_VT220_APPL_KP3	\x1bOs	KEY_ALT_3

Table B-5. VT220 Values for Key Mapping

Function Label	Key String[a]	Default Key Label
FCN_VT220_APPL_KP4	\x1bOt	KEY_ALT_4
FCN_VT220_APPL_KP5	\x1bOu	KEY_ALT_5
FCN_VT220_APPL_KP6	\x1bOv	KEY_ALT_6
FCN_VT220_APPL_KP7	\x1bOw	KEY_ALT_7
FCN_VT220_APPL_KP8	\x1bOx	KEY_ALT_8
FCN_VT220_APPL_KP9	\x1bOy	KEY_ALT_9
FCN_VT220_APPL_KP_MINUS	\x1bOm	KEY_ALT_MINUS
FCN_VT220_APPL_KP_COMMA	\x1bO	KEY_ALT_COMMA
FCN_VT220_APPL_KP_PERIOD	\x1bOn	KEY_ALT_PERIOD
FCN_VT220_APPL_KP_ENTER	\x1bOM	KEY_ALT_ENTER
FCN_VT220_NEWLINE	\x0a	KEY_CTRL_ENTER
FCN_VT220_NEXT_SCREEN	\x1b[6~	KEY_PGDN
FCN_VT220_PF1	\x1bOP	KEY_F1
FCN_VT220_PF2	\x1bOQ	KEY_F2
FCN_VT220_PF3	\x1bOR	KEY_F3
FCN_VT220_PF4	\x1bOS	KEY_F4
FCN_VT220_PREV_SCREEN	\x1b[5~	KEY_END
FCN_VT220_REMOVE	\x1b[3~	KEY_PGUP
FCN_VT220_RETURN	\x0d or \x0d\xoa[c]	KEY_ENTER
FCN_VT220_RIGHT	\x1b[C or \x1bOC[b]	KEY_RIGHT
FCN_VT220_LEFT	\x1b[D or \x1bOD[b]	KEY_LEFT
FCN_VT220_SELECT	\x1b[4~	KEY_DELETE
FCN_VT220_132_SHIFT_LEFT_10	local[d]	KEY_CTRL_LEFT
FCN_VT220_132_SHIFT_LEFT_EDGE	local	KEY_SHIFT_CTRL_LEFT
FCN_VT220_132_SHIFT_RIGHT_10	local	KEY_CTRL_RIGHT

Table B-5. VT220 Values for Key Mapping

Function Label	Key String[a]	Default Key Label
FCN_VT220_132_SHIFT_RIGHT_EDGE	local	KEY_SHIFT_CTRL_RIGHT
FCN_VT220_TAB	\x09	KEY_TAB
FCN_VT220_UDK1	user defined[e]	KEY_SHIFT_F6
FCN_VT220_UDK2	user defined	KEY_SHIFT_F7
FCN_VT220_UDK3	user defined	KEY_SHIFT_F8
FCN_VT220_UDK4	user defined	KEY_SHIFT_F9
FCN_VT220_UDK5	user defined	KEY_SHIFT_F10
FCN_VT220_UDK6	user defined	KEY_SHIFT_CTRL_F1
FCN_VT220_UDK7	user defined	KEY_SHIFT_CTRL_F2
FCN_VT220_UDK8	user defined	KEY_SHIFT_CTRL_F3
FCN_VT220_UDK9	user defined	KEY_SHIFT_CTRL_F4
FCN_VT220_UDK10	user defined	KEY_SHIFT_CTRL_F5
FCN_VT220_UDK11	user defined	KEY_SHIFT_CTRL_F6
FCN_VT220_UDK12	user defined	KEY_SHIFT_CTRL_F7
FCN_VT220_UDK13	user defined	KEY_SHIFT_CTRL_F8
FCN_VT220_UDK14	user defined	KEY_SHIFT_CTRL_F9
FCN_VT220_UDK15	user defined	KEY_SHIFT_CTRL_F10
FCN_VT220_UP	\x1b[A or \x1b0A	KEY_UP
FCN_VT220_NONE		

a. VT220 Key Strings: These are the character strings that the terminal sends to the host when the function is invoked. The '\x' means that the following two characters represent the hex value of one character. For example, \x1b represents the escape character (hex 1b).
b. The key string in this case depends on the terminal's cursor_mode, as set by the host. If the terminal is in normal (ansi) cursor mode, then it uses the first of the two keystrings listed. If the terminal is in application cursor mode, then it uses the second key string.
c. The key string sent by the terminal when the <Return> key is pressed. It is determined by the newlinemode setting. If newlinemode is ***on****, the terminal uses the first of the two listed keystrings. If newlinemode is* ***off****, the terminal uses the second key string.*
d. Functions marked with a key string of ***local*** *are local commands to the VT220 emulator and do not send any messages to the host.*
e. These are User Definable Keys (UDKs), the keys that a VT220 application may define and use.

3270 Values for Key Mapping

Table B-6. 3270 Values for Key Mapping

Function Label	Default Key Label
FCN_3270_ANGLE_SIGN	KEY_ALT_MINUS (can be remapped) KEY_SHIFT_6 also produces an Angle sign and cannot be remapped.
FCN_3270_ATTENTION	KEY_ALT_A
FCN_3270_BACKSPACE	KEY_BACKSPACE
FCN_3270_BACKTAB	KEY_BACKTAB
FCN_3270_CENT_SIGN	KEY_ALT_4
FCN_3270_CLEAR	KEY_PGDN
FCN_3270_CLOSE_SESSION	KEY_SHIFT_ALT_X
FCN_3270_CURSOR_SELECT	KEY_ALT_S
FCN_3270_DELETE	KEY_DELETE
FCN_3270_DOWN	KEY_DOWN
FCN_3270_DUPLICATE	KEY_ALT_D
FCN_3270_EEOF	KEY_END
FCN_3270_ENTER	KEY_ENTER
FCN_3270_ERASEINPUT	KEY_CTRL_BACKSPACE
FCN_3270_FIELD_MARK	KEY_ALT_F
FCN_3270_HOME	KEY_HOME
FCN_3270_INSERT	KEY_INSERT
FCN_3270_LEFT	KEY_LEFT
FCN_3270_LONG_VERT_BAR	KEY_ALT_BACKSLASH
FCN_3270_MONOCASE	KEY_ALT_M
FCN_3270_NEWLINE	KEY_CTRL_ENTER
FCN_3270_PA1	KEY_ALT_F1
FCN_3270_PA2	KEY_ALT_F2
FCN_3270_PA3	KEY_ALT_F3

Table B-6. 3270 Values for Key Mapping

Function Label	Default Key Label
FCN_3270_PF1	KEY_F1
FCN_3270_PF2	KEY_F2
FCN_3270_PF3	KEY_F3
FCN_3270_PF4	KEY_F4
FCN_3270_PF5	KEY_F5
FCN_3270_PF6	KEY_F6
FCN_3270_PF7	KEY_F7
FCN_3270_PF8	KEY_F8
FCN_3270_PF9	KEY_F9
FCN_3270_PF10	KEY_F10
FCN_3270_PF11	KEY_F11
FCN_3270_PF12	KEY_F12
FCN_3270_PF13	KEY_SHIFT_F1
FCN_3270_PF14	KEY_SHIFT_F2
FCN_3270_PF15	KEY_SHIFT_F3
FCN_3270_PF16	KEY_SHIFT_F4
FCN_3270_PF17	KEY_SHIFT_F5
FCN_3270_PF18	KEY_SHIFT_F6
FCN_3270_PF19	KEY_SHIFT_F7
FCN_3270_PF20	KEY_SHIFT_F8
FCN_3270_PF21	KEY_SHIFT_F9
FCN_3270_PF22	KEY_SHIFT_F10
FCN_3270_PF23	KEY_SHIFT_F11
FCN_3270_PF24	KEY_SHIFT_F12
FCN_3270_PEN_TAB	KEY_ALT_T
FCN_3270_RESET	KEY_PGUP

Table B-6. 3270 Values for Key Mapping

Function Label	Default Key Label
FCN_3270_RIGHT	KEY_RIGHT
FCN_3270_SYSREQ	KEY_ALT_Q
FCN_3270_TAB	KEY_TAB
FCN_3270_UP	KEY_UP
FCN_3270_NONE	

5250 Values for Key Mapping

Table B-7. 5250 Values for Key Mapping

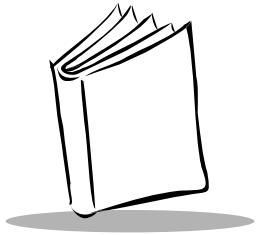
Function Name	Default Key
FCN_5250_ANGLE_SIGN	KEY_ALT_6
FCN_5250_ATTENTION	KEY_ESCAPE
FCN_5250_BACKSPACE	KEY_BACKSPACE
FCN_5250_CENT_SIGN	KEY_ALT_4
FCN_5250_CLEAR	KEY_ALT_C
FCN_5250_CF1	KEY_F1
FCN_5250_CF2	KEY_F2
FCN_5250_CF3	KEY_F3
FCN_5250_CF4	KEY_F4
FCN_5250_CF5	KEY_F5
FCN_5250_CF6	KEY_F6
FCN_5250_CF7	KEY_F7
FCN_5250_CF8	KEY_F8
FCN_5250_CF9	KEY_F9
FCN_5250_CF10	KEY_F10
FCN_5250_CF11	KEY_F11
FCN_5250_CF12	KEY_F12
FCN_5250_CF13	KEY_SHIFT_F1
FCN_5250_CF14	KEY_SHIFT_F2
FCN_5250_CF15	KEY_SHIFT_F3
FCN_5250_CF16	KEY_SHIFT_F4
FCN_5250_CF17	KEY_SHIFT_F5
FCN_5250_CF18	KEY_SHIFT_F6
FCN_5250_CF19	KEY_SHIFT_F7
FCN_5250_CF20	KEY_SHIFT_F8

Table B-7. 5250 Values for Key Mapping

Function Name	Default Key
FCN_5250_CF21	KEY_SHIFT_F9
FCN_5250_CF22	KEY_SHIFT_F10
FCN_5250_CF23	KEY_SHIFT_F11
FCN_5250_CF24	KEY_SHIFT_F12
FCN_5250_CLOSE_SESSION	KEY_SHIFT_ALT_X
FCN_5250_CURSOR_SELECT	KEY_ALT_S
FCN_5250_DELETE	KEY_DELETE
FCN_5250_DOWN	KEY_DOWN
FCN_5250_DUPLICATE	KEY_ALT_D
FCN_5250_ENTER	KEY_ENTER
FCN_5250_ERASEINPUT	KEY_ALT_BACKSPACE
FCN_5250_ERROR_RESET	KEY_LEFT_CONTROL
FCN_5250_FIELD_ADVANCE	KEY_TAB
FCN_5250_FIELD_BACKSPACE	KEY_BACKTAB
FCN_5250_FIELD_EXIT	KEY_HOME
FCN_5250_FIELD_MINUS	KEY_ALT_MINUS
FCN_5250_FIELD_PLUS	KEY_ALT_EQUAL
FCN_5250_HELP	KEY_END
FCN_5250_HOME	KEY_ALT_HOME
FCN_5250_INSERT	KEY_INSERT
FCN_5250_LEFT	KEY_LEFT
FCN_5250_LONG_VERT_BAR	KEY_ALT_BACKSLASH
FCN_5250_NEWLINE	KEY_ALT_ENTER
FCN_5250_ROLL_UP	KEY_PGUP
FCN_5250_ROLL_DOWN	KEY_PGDN
FCN_5250_RIGHT	KEY_RIGHT

Table B-7. 5250 Values for Key Mapping

Function Name	Default Key
FCN_5250_SYSREQ	KEY_SYSREQ
FCN_5250_TESTREQ	KEY_ALT_T
FCN_5250_UP	KEY_UP
FCN_5250_NONE	



Appendix C
Hardware Components

Appendix Contents

Installing a Strap C-3
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Installing a Strap

Terminals are manufactured with fittings for attaching a strap. You may attach a strap to the terminal using Strap Mounting Bosses located at the top and bottom. Two sizes are available: a 12" (30.5 cm.) non-adjustable strap, and a 60" (1.52 m.) adjustable Shoulder Strap. To install a strap:

1. Remove the plugs from the Strap Mounting Bosses. Save the plugs so that you can use them again if the strap is removed.
2. Using a Phillips screwdriver and one of the screws provided, screw one end of the strap into the Strap Mounting Boss at the top of the terminal.
3. Screw the other end of the strap into the Strap Mounting Boss at the bottom.

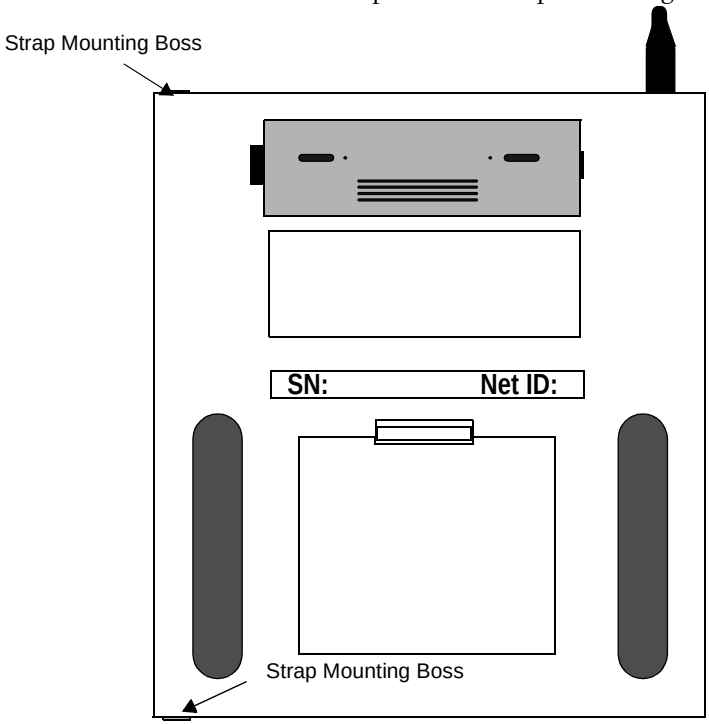
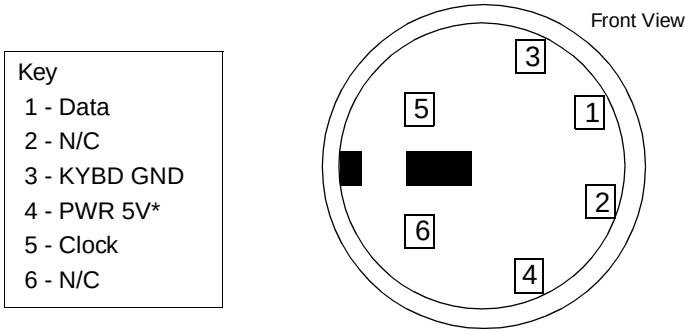


Figure C-1. Rear View of Terminal with Mounting Bosses Shown

Connectors and Pin-out Information

External Keyboard connector: allows you to attach the terminal to a Symbol low power external keyboard.



*On the PPT 4300-00R this value is PWR 3.3V.

Figure C-2. External Keyboard Connector Pin-out

Serial port connector: The serial port operates in RS232 mode. The Key in the diagram below shows the connector pin-out for the PPT 4300:

Figure C-3. Serial Port Connector Pin-out for PPT 4300

External power supply connector: used to attach the terminal to an external power source (instead of using the battery pack). In North America, only use a Symbol-approved 18V DC adaptor, and be sure to leave the battery pack in place. Other adapters are available for use outside of North America. Contact your Symbol representative for information.

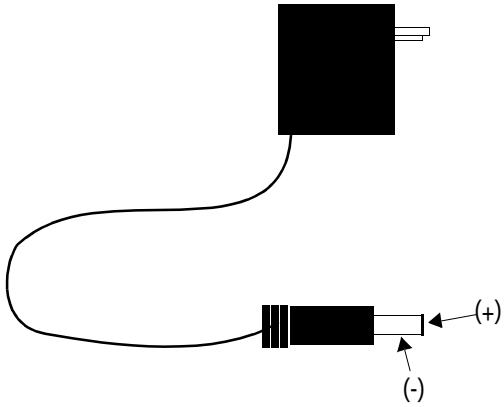
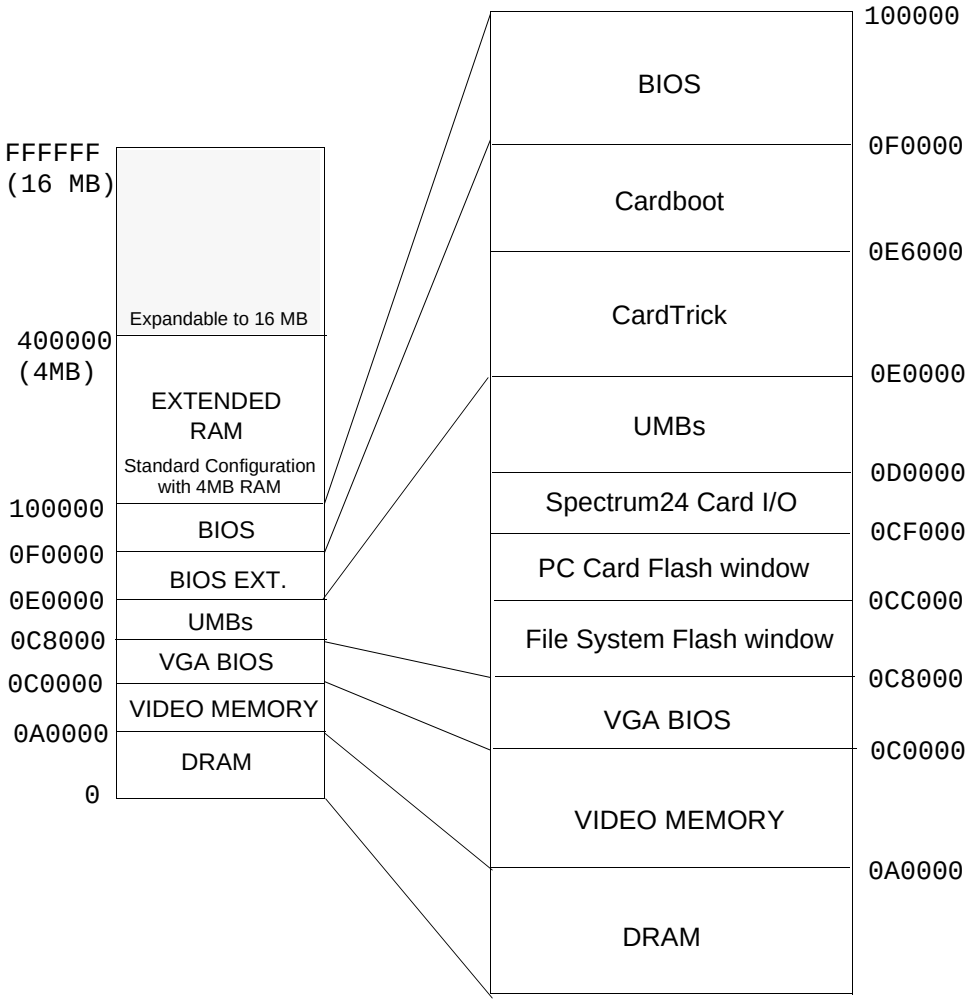


Figure C-4. External Power Supply Connector Pin-out

Detailed Memory Map



IRQ Allocation

Table C-1. IRQ Allocation

IRQ	Allocation
IRQ0	Timer
IRQ1	Keyboard Controller
IRQ2	Chain to second 8259
IRQ3	COM2 IrDA UART
IRQ4	COM1 Internal UART
IRQ5	Pen Input: EM COM4 UART or Resistive I/O Port
IRQ6	unavailable
IRQ7	unavailable
IRQ8	Real Time Clock
IRQ9	unavailable
IRQ10	unavailable
IRQ11	unavailable
IRQ12	PCMCIA Controller
IRQ13	unavailable
IRQ14	Shared: PCMCIA & COM3 Scanner UART
IRQ15	PCMCIA Controller

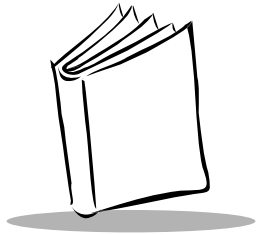
I/O Map

Table C-2. I/O Map

Hex Range	Usage
000-00F	8237 DMA #1
020-021	8259 PIC #1
040-043	8253 Timer
060-063	8255 PPI (XT)
060-064	8742 Controller (AT)
070-071	CMOS RAM & NMI Mask Reg. (AT)
080-08F	DMA Page Registers
0A0-0A1	8259 PIC #2 (AT)
0A0-0AF	NMI Mask Register (XT)
0C0-0DF	8237 DMA #2 (AT — word mapped)
0F0-0FF	80287 Numeric Processor (XT)
1F0-1FF	Hard Disk — used for ATA PCMCIA Cards
220-227	Resistive Pen Input
218, 228-22F	Flash File System Page Registers
2B0-2BF	EGA
2C0-2CF	EGA
2D0-2DF	EGA
2E8-2EF	COM4 Serial Port — EM Pen Input
2F8-2FF	COM2 Serial Port IrDA
300-31F	Spectrum24 Card
378-37F	Parallel Printer
3B0-3BB	MDA
3BC-3BF	Parallel Printer
3C0-3CF	EGA

Table C-2. I/O Map (Continued)

Hex Range	Usage
3D0-3DF	CGA
3F0-3F7	Floppy Disk — NOT AVAILABLE
3E8-3EF	COM3 Serial Port — Scanner
3F8-3FF	COM1 Serial Port — External



Appendix D
PPT 4300 Software Files

Appendix Contents

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PPT 4300 Software Files

This appendix provides the details of the software files that accompany the v2.43 release of the PPT 4300 series BIOS. This section lists the files that are loaded onto a PPT 4300's internal flash file system.

ROM-DOS

The PPT 4300 series terminal uses Datalight's ROM-DOS as an operating system. ROM-DOS is an MS-DOS compatible operating system. Note that a terminal includes only a subset of the most commonly-used ROM-DOS features and commands. For a complete list of supported ROM-DOS commands, see page D-19.

Table D-1. ROM-DOS Files

File	Function
\dos\ata.sys	Driver for PCMCIA cards with ATA interface.
\dos\display.sys	Driver for supporting additional display character sets.
\dos\ega.cpi	Code page information file character set for EGA displays.
\dos\emm386.exe	DOS extended memory driver. Allows use of UMBs (upper memory blocks). Relies on `himem.sys`.
\dos\himem.sys	DOS extended memory (XMS) driver. Allows use of XMS.
\dos\keyb.com	TSR that remaps keyboards for other languages.
\dos\keyboard.sys	Keyboard remapping data file.
\dos\ned.exe	"New EDitor" (NED). A full screen text editor.

CardSoft Files

Installation of these Card and Socket Services files onto a PPT 4300 series terminal is optional. If they are installed, the following files will be present in the file system, in `\usr\cardsoft`.

Table D-2. CardSoft Files

File	Function
\usr\cardsoft\atadrv.exe	Driver for ATA cards. Defines two drive letters.
\usr\cardsoft\cardid.exe	Driver reads card configuration and identifies drivers required for cards.
\usr\cardsoft\cardid.ini	Configuration file for cardid.exe.
\usr\cardsoft\cardinfo.exe	Utility that shows information about PC cards.
\usr\cardsoft\cbdas.clb	Card Library File.
\usr\cardsoft\cs.exe	Card Services TSR.
\usr\cardsoft\csalloc.exe	Card Services resource allocation TSR.
\usr\cardsoft\csalloc.ini	Configuration file for csalloc.exe.
\usr\cardsoft\dlink.clb	Card Library File. For DLink network cards.
\usr\cardsoft\ftl.exe	Flash Translation Layer. File system driver for linear flash.
\usr\cardsoft\genata.clb	Card Library File for generic ATA cards.
\usr\cardsoft\genmodem.clb	Card Library File for generic modem cards.
\usr\cardsoft\ibm3270.clb	Card Library File for IBM's 3270 card.
\usr\cardsoft\ibmlan.clb	Card Library File for IBM's LAN adapter card.
\usr\cardsoft\ibmtok.clb	Card Library File for IBM's Token Ring Adapter card.
\usr\cardsoft\intellan.clb	Card Library File for Intel's LAN card.
\usr\cardsoft\linksys.clb	Card Library File for Link System's LAN card.
\usr\cardsoft\linksys2.clb	Card Library File for second Link System LAN card.
\usr\cardsoft\mcformat.exe	Memory card formatting utility used to initialize linear flash cards.
\usr\cardsoft\mtddrv.exe	Memory Card Driver. Creates two drive letters.
\usr\cardsoft\mti2p.exe	Memory Technology Driver for Intel Type 2+ Flash cards.
\usr\cardsoft\mtsram.exe	Memory Technology Driver for SRAM cards.

Table D-2. CardSoft Files

File	Function
\usr\cardsoft\proxim.clb	Card Library File for Proxim Lan card.
\usr\cardsoft\wd.clb	Card Library File for Western Digital disk cards.
\usr\cardsoft\socketea.clb	Card Library File for Socket Communications LAN adapter.
\usr\cardsoft\sscirrus.exe	Socket services for Cirrus ship set.
\usr\cardsoft\sundisk5.clb	Card Library File for Sundisk/Sandisk 5 MB ATA cards.
\usr\cardsoft\tdklan2.clb	Card Library File for TDK LAN adapter cards.
\usr\cardsoft\xircom.clb	Card Library File for Xircom LAN adapter cards.

TCP/IP

TCP/IP is a standard set of networking protocols that control how data is passed between computers on a network. The terminal comes with TCP/IP software installed, and uses it to communicate with the network. The Terminal Emulators use a custom TCP/IP stack. The Citrix ICA client uses Novell's TCP/IP Transport software. For information on configuring TCP/IP, see Chapter 4, *Standard Terminal Configuration*. Table B-3 describes the TCP/IP software.

Table D-3. TCP/IP Files

File	Function
\net\net.cfg	Configuration file for Novell LAN Workplace for DOS.
\net\lsl.com	Link Support Layer program for Novell LAN Workplace for DOS.
\net\hosts	Configuration file for Novell LAN Workplace for DOS. TCP/IP address resolution file with hosts and address mappings.
\net\services	Configuration file for Novell LAN Workplace for DOS. TCP/IP port numbers for network services.
\net\slaodi.exe	Network driver for Spectrum24 Spring RF LAN card, ODI interface.
\net\sl8odipc.exe	Network driver for Spectrum24 802.11 RF LAN card, ODI interface.
\net\tcpip.exe	Network driver for Novell LAN Workplace for DOS. TCP/IP protocol TSR.
\net\resolv.cfg	Configuration file for Novell LAN Workplace for DOS. Domain name services host name resolution configuration.

Table D-3. TCP/IP Files

File	Function
\net\odipkt.com	Network driver. Provides a packet driver interface to ODI drivers.
\net\protocol	IP protocol table, configuration file for TCP/IP.
\usr\appl\awte\tn_tcpip.exe	Telnet-TCP/IP driver for terminal emulators.

Citrix ICA Client for DOS

The Citrix ICA Client for DOS is a DOS-based application that runs on a PPT 4340 terminal and provides remote access to Windows applications running on a Citrix WinFrame or MetaFrame Server. The Citrix ICA Client for DOS connects to the server so that users can display and use the applications on the terminal. Most software that can be run on a Windows NT server (v3.51 or higher) can be accessed on a PPT 4340 terminal using Citrix ICA. For more information on this, see Chapter 8, *The Citrix ICA DOS Client*.

If you do not intend to use the terminal to communicate with a Citrix server, you can remove the Citrix ICA Client for DOS software from the internal flash file system. See Chapter 3, *Software Installation*.

Table D-4. Citrix ICA Client for DOS Files

File	Function
\usr\wfclient\module.ini	Configuration file for Citrix ICA client.
\usr\wfclient\icaredu.ddl	Citrix client support library.
\usr\wfclient\netcpnov.ddl	Citrix client support library.
\usr\wfclient\nrtcpnov.ddl	Citrix client support library.
\usr\wfclient\pdcomp.ddl	Citrix client support library.
\usr\wfclient\pdcrypt.ddl	Citrix client support library.
\usr\wfclient\pdrfram.ddl	Citrix client support library.
\usr\wfclient\tdtcpnov.ddl	Citrix client support library.
\usr\wfclient\uicwin.ddl	Citrix client support library.
\usr\wfclient\uierror.ddl	Citrix client support library.
\usr\wfclient\appsrv.ini	Configuration file for Citrix ICA client.
\usr\wfclient\uihelp.ddl	Citrix client support library.
\usr\wfclient\uiiniw.ddl	Citrix client support library.

Table D-4. Citrix ICA Client for DOS Files

File	Function
\usr\wfclient\vdcdm30.ddl	Citrix client support library.
\usr\wfclient\vdcm.ddl	Citrix client support library.
\usr\wfclient\vdcom30.ddl	Citrix client support library.
\usr\wfclient\vdcpm30.ddl	Citrix client support library.
\usr\wfclient\vdtw30.ddl	Citrix client support library.
\usr\wfclient\wdica30.ddl	Citrix client support library.
\usr\wfclient\wfclient.exe	Citrix client.
\usr\wfclient\wfclient.hlp	Citrix client help support.
\usr\wfclient\wfclient.ini	Configuration file for Citrix ICA client.
\usr\wfclient\wfeng.ddl	Citrix client support library.

Terminal Emulators

Symbol provides terminal emulation software for running TN3270, TN5250 and VT220 sessions over Telnet and TCP/IP. If you do not use Terminal Emulators, you can remove these applications from the flash file system. See Chapter 3, *Software Installation*. For information on Terminal Emulators, see Chapter 7, *The Terminal Emulators*.

Table D-5. Terminal Emulator Files

File	Function
\usr\appl\awte\awte.exe	TN327-/TN5250/Telnet VT220 terminal emulators. Requires the tn_tcpip.exe file.
\usr\appl\awte\keymap\keymap.cfg	Host Choice List and keyboard mapping information for terminal emulators.
\usr\appl\awte\tn_tcpip.exe	Telnet-TCP/IP driver for terminal emulators.

Utilities

The terminal includes the utilities and miscellaneous configuration files and drivers shown in Table B-6:

Table D-6. Utilities Files

File	Function
\ppt4300.ini	A system configuration file that defines settings for terminal emulators and system utilities.For a detailed description of this file, see *Settings in ppt4300.ini* on page 7-4.
\autoexec.bat	A batch file that ROM-DOS runs immediately after carrying out the commands in the config.sys file. It loads the drivers necessary for running applications and communication.
\config.sys	The terminal's current set of boot configuration commands. The default config.sys file provides a menu and loads required device drivers when the terminal boots up.
\command.com	System command processor (DOS prompt).
\command.hlp	System command help.
\menu.bat	Utility menu options.
\wfcname.ini	A configuration file that defines the name of the terminal to the WinFrame or MetaFrame server. The terminal uses this file for the Citrix ICA Client for DOS.
\ibmbio.com	Hidden system file. Do not erase.
\ibmdos.com	Hidden system file. Do not erase.
\bin\ctrlpnl.exe	Control Panel configuration utility.
\bin\off.com	Turns the terminal off.
\bin\sfinit.exe	System Function initialization driver.
\bin\sftsr.com	System Function driver. Used to support Direct Access Panel icons for system information display, battery warning windows and other functions.
\bin\touch.com	Touch panel driver for PPT 4300-00R series terminals (resistive digitizer versions). Standard int 33 mouse driver functions, with special extensions to access Direct Access Panel icons directory.
\bin\mutohpen.com	Touch panel driver for PPT 4300-00E and PPT 4300-S0E series terminals (electromagnetic digitizer versions). Standard int 33 mouse driver functions, with special extensions to access Direct Access Panel icons directory.

Table D-6. Utilities Files

File	Function
\bin\ismutoh.com	Utility that tests for the existence of a Mutoh controller.
\bin\keypadb. exe	Keyboard delta table loader.
\bin\kbwedge. com	Scanner driver.

Files Included on a PPT 4300 Utilities PC Card

This section lists the files that are loaded onto a standard PPT 4300 Utilities PC card (Dec/98 release).

Root Directory

The PPT 4300 Utilities PC card includes these files in the `root` directory:

Table D-7. Root Directory Files

File	Purpose/Parameters
\autoexec.bat	A batch file that ROM-DOS runs immediately after carrying out the commands in config.sys. It loads the drivers necessary for running applications and communication.
\config.sys	The boot configuration file. It loads required device drivers when the terminal boots up.
\menu.bat	Main menu batch file.
\ppt4300.ini	The configuration file for system utilities. See *Settings in ppt4300.ini* on page 7-4 for detailed information on this file.
\command.com	System command processor (DOS prompt).
\command.hlp	System command help.

Arc Directory

The PPT 4300 Utilities PC card includes these files in the `arc` directory:

Table D-8. Arc Directory Files

File	Purpose/Parameters
\arc\winm243.bin	A version of the v2.43 BIOS. If you upgrade the BIOS, the new BIOS is installed from this file.

Bin Directory

The PPT 4300 Utilities PC card includes these files in the `bin` directory:

Table D-9. Bin Directory Files

File	Purpose/Parameters
\bin\ctrfa.sys	A driver that provides an interface to a file system in an internal flash partition. It allows the flash file system to be formatted and used. Use it if you have an internal flash expansion module and you want to access it as two or more drives rather than one contiguous file system. See *Partitioning a Flash Expansion Module* on page 3-26 for more information. When it boots, a PPT 4300 Utilities PC card loads `ctrfa.sys` from its `config.sys` file, to allow formatting of the terminal's standard flash file system. The PPT 4300 Utilities PC card loads `ctrfa.sys` with no command line parameters. If you have a terminal with a flash expansion module, you may need to edit `config.sys` on the PPT 4300 Utilities PC Card. This will ensure that `ctrfa.sys` includes parameters that match the layout (size, location) of the expanded flash file system.
\bin\ctrlpnl.exe	The Control Panel utility for configuring a PPT 4300 series terminal.
\bin\dlfmt.exe	This is a ROM-DOS utility used for formatting the flash file system. It is normally invoked by the install script. Usage: `DLFMT <drive> <parameters>` Parameters: /C - Don't confirm before formatting a disk. /M - Force a write to a RAM disk. /V - Prompt for a volume label after format. /Dx - <x> is the number of root directory entries. Default is 240. Max: 512, Min: 64 /Px - Preserves <x> KBytes at start of media for a ROM image. Existing images are preserved. Max: 896. The default number is 0. Use /P0 to format over an existing image.

Table D-9. Bin Directory Files

File	Purpose/Parameters
\bin\fload.exe	This utility loads and programs the BIOS flash. The only required parameter is the file name of the BIOS image.
\bin\kbwedge.com	Scanner driver.
\bin\keypadb.exe	Keyboard delta table loader.
\bin\mutohpen.com	The pen driver for the for PPT43X0-X0E series terminals (electromagnetic digitizer and pen). Standard int 33 mouse driver functions, with special extensions to access touch panel icons.
\bin\ismutoh.com	A utility that tests for the existence of a Mutoh controller.
\bin\s24ver.bat	A utility that checks the version of the Spectrum24 radio card firmware.
\bin\noport.com	A utility that disables the serial port.
\bin\off.com	A command that turns a PPT4300 series terminal off.
\bin\rs232.com	A utility to enable the serial port in RS232 mode. To use the serial port as an RS232 port, run this utility (usually from the `autoexec.bat` file). It has no command line parameters.
\bin\scanner.com	A driver required for using a terminal with a tethered scanner.
\bin\sfinit.exe	System function initialization utility.
\bin\sftsr.com	System function driver. Used to support touch panel icons for contrast control and other functions.
\bin\touch.com	The pen driver for PPT43X0-00R series terminals (resistive digitizer). Standard int 33 mouse driver functions, with special extensions to access touch panel icons.
\bin\unzip.exe	The install application uses this Info-ZIP utility to unzip archived and compressed files from the `ppt4300.red` file. For command line parameters, type `unzip` at the command line, and press **<Enter>**. The Info-Zip web-site is at *http://www.cdrom.com/pub/infozip*.
\bin\vid_invr.com	Sets the display to inverse video.
\bin\vid_norm.com	Sets the display to normal video.

Table D-9. Bin Directory Files

File	Purpose/Parameters
\bin\zip.exe	An application that compresses files.

Docs Directory

The PPT 4300 Utilities PC card includes these files in the `docs` directory:

Table D-10. Docs Directory Files

File	Purpose/Parameters
\docs\release.bio	BIOS release notes.
\docs\release.txt	This file describes the set of software included with this distribution for the Symbol PPT 4300 Series Mobile Terminal.

DOS Directory

The PPT 4300 Utilities PC card includes the following files in the `dos` directory. See the ROM-DOS documentation for more complete descriptions.

Table D-11. DOS Directory Files

File	Purpose/Parameters
\dos\ata.sys	The ROM-DOS driver for ATA flash cards.
\dos\attrib.com	A DOS utility to change a file's read/system/hidden attributes.
\dos\choice.com	A DOS menu utility, used to get user input.
\dos\comm.exe	A simple RS-232 communications program.
\dos\country.sys	Information about country conventions.
\dos\display.sys	Driver for supporting additional display character sets.
\dos\ega.cpi	Code page information file character set for EGA.
\dos\emm386.exe	DOS extended memory driver. Loaded to allow use of UMBs (upper memory blocks). Relies on himem.sys.

Table D-11. DOS Directory Files

File	Purpose/Parameters
\dos\find.com	A DOS utility to filter and display only lines that contain a specified string.
\dos\format.com	A DOS utility to format disks (including ATA flash cards).
\dos\himem.sys	DOS extended memory (XMS) driver. Loaded to allow use of XMS.
\dos\keyb.com	TSR that remaps the keyboard for other languages.
\dos\keyboard.sys	Keyboard remapping data file.
\dos\label.com	A DOS utility to put a volume label on a disk.
\dos\mem.exe	A DOS utility to show system memory.
\dos\mode.com	Sets system device modes.
\dos\more.com	Pages text files to screen.
\dos\ned.exe	"New EDitor". Full screen editor for use with text configuration files.
\dos\release.dos	Release notes for PPT 4300's ROM-DOS sub-set.
\dos\remdisk.exe	Remote disk facility. A device driver for clients.
\dos\remquit.com	Remote disk facility. Tells remote end (server) to exit server program.
\dos\remserv.exe	Remote disk facility server program.
\dos\sys.com	Installs system files onto a disk.
\dos\transfer.exe	Transfers files via serial port.
\dos\vdisk.sys	A RAM disk driver. Installation is sped up by using a RAM disk for temporary files.
\dos\xcopy.com	Copies files and subdirectories.
\dos\xdel.com	Deletes files and directory structures.

Install Directory

The PPT 4300 Utilities PC card includes these files in the `install` directory:

Table D-12. Install Directory Files

File	Purpose/Parameters
\install\biosver.bat	Utility for identifying which BIOS version the terminal is running.
\install\disk.id	A file that identifies an installation software version. It is required by the `install.exe` file.
\install\install.bat	The Install menu batch file.
\install\install.dat	A software installation utility data file. It provides information to the `install.exe` file on what the `ppt4300.red` file contains, and where to install files.
\install\install.exe	An application with a user interface. It extracts software from the `ppt4300.red` file.
\install\ppt4300.red	A compressed archive of standard PPT 4300 files.
\install\format\install.dat	Software installation utility data file.
\install\format\install.exe	Software installation utility.
\install\format\disk.id	Software installation utility data file.

Net Directory

The PPT 4300 Utilities PC card includes these files in the `net` directory:

Table D-13. Net Directory Files

File	Purpose/Parameters
\net\hosts	Configuration file for Novell LAN Workplace for DOS. TCP/IP address resolution file with hosts and address mappings.
\net\lsl.com	Link Support Layer program for Novell LAN Workplace for DOS.
\net\net.cfg	Configuration file for Novell LAN Workplace for DOS.

Table D-13. Net Directory Files

File	Purpose/Parameters
\net\odipkt.com	Network driver. Provides a packet driver interface to ODI drivers.
\net\protocol.ini	Stores the Spectrum24 settings for the Microsoft TCP/IP stack.
\net\release.lan	Release notes for LAN software.
\net\resolv.cfg	Configuration file for Novell LAN Workplace for DOS. Domain name services host name resolution configuration.
\net\services	Configuration file for Novell LAN Workplace for DOS. TCP/IP port numbers for network services.
\net\slaodi.exe	Network driver for Spectrum24 Spring RF LAN card, ODI interface.
\net\sl8odipc.exe	Network driver for Spectrum24 802.11 RF LAN card, ODI interface.
\net\tcpip.exe	Network driver for Novell LAN Workplace for DOS. TCP/IP protocol TSR.

Test Directory

The PPT 4300 Utilities PC card includes these files in the `test` directory:

Table D-14. Test Directory Files

Test Utility	Purpose/Parameters
\test\all.bat	Batch file that runs a series of diagnostic tests automatically.
\test\ccfttest.com	CCFT backlight test.
\test\ccfttst.bat	CCFT menu batch file.
\test\cga.bgi	A driver for Check-It video testing.
\test\ckbat.bat	Battery test menu batch file.
\test\ckbat.exe	The Smart Battery test.
\test\ckbat.ini	Smart Battery test configuration.
\test\ckcom.exe	Check-It serial port test.

Table D-14. Test Directory Files

Test Utility	Purpose/Parameters
\test\ckel.com	Utility to test the electro-luminescence (EL Panel) device. It looks for the PPT 4300 BIOS and then runs and places a banner on the screen saying how to end. It then loops, toggling the EL panel off and on. It has no command line parameters.
\test\ckffs.com	Utility to report file system flash device configuration.
\test\ckkbd.exe	Check-It keyboard test.
\test\ckmem.exe	Check-It memory test.
\test\cksys.exe	Check-It system test.
\test\ckvers.com	Utility to report the software version level of key software components.
\test\ckvid.exe	Check-It video test.
\test\conttest.com	LCD panel contrast test.
\test\conttst.bat	LCD panel menu batch file.
\test\egavga.bgi	A driver for Check-It video testing.
\test\el_test.com	EL panel test.
\test\herc.bgi	A driver for Check-It video testing.
\test\initbat.exe	Utility to initialize the smart battery registers.
\test\initbat.ini	Configuration file for initbat.exe.
\test\ip.bat	Batch file utility to set IP addresses for ping test command line.
\test\radio.bat	Radio test menu batch file.
\test\release.tst	Release notes for the test utilities.
\test\s_info.exe	A Spectrum 24 test utility for displaying radio status.
\test\s_util.exe	A Spectrum 24 test utility.
\test\test.bat	A test menu batch file.
\test\touchtst.exe	A touch panel test utility.
\test\video.bat	A video menu batch file.
\test\viewlogs.bat	Batch file display Check-It reports and journals.
\test\wattcp.cfg	Waterloo TCP/IP ping configuration.

Table D-14. Test Directory Files

Test Utility	Purpose/Parameters
\test\ckirda.com	Tests the IrDA port. You can put it into receive (default) or transmit mode. The transmit mode loops and sends a test string. The receive mode dumps whatever comes in on the IrDA port to the screen, with no error correction or detection. You can tell it to use any of the four COM: ports; it doesn't use interrupts. Normally it checks for the PPT 4300 BIOS, and exits if it's not there. The `/p` command line parameter over-rides this. Parameters: `ckirda [/t | /r] [/p] [/1 | /2 | /3 | /4]` [/t] transmitter mode [/r] receive mode [/p] PC override. Allows use with a standard PC serial port (16550) and external IrDA converter. [/1, /2, /3, /4] Com port number. Corresponding addresses are `0x3f8`, `0x2f8`, `0x3e8`, `0x2e8`. The default is `ckirda /r /1`. Normally you'd use one PPT 4300 running `ckirda /t` and another running `ckirda`.

`\test\ping.com`	Waterloo TCP/IP ping utility. It uses `wattcp.cfg`. Parameters:
	`PING [-c] [-s] [-d] hostname [length] [number]`
	[-c] Cisco mode, sends ping packets as quickly as they are acknowledged.
	[-s] Sequence mode. Sends ping packets once per second.
	[-d] Turns debugging output on. Can be useful to find out if the arp sequence succeeds while trouble shooting.
	[-i ip_address] Sets the terminals's IP address. Useful for batch file processing.
	[hostname] Host to ping. DNS is supported if the nameserver= parameter is set in the `wattcp.cfg` file. Otherwise, use decimal dotted notation (*e.g.*, 192.1.2.65).
	[length] Size of packets to send. Minimum length is 64, maximum length is 1514.
	[number] Number of packets to send.
	Examples:
	This will ping the host once, with a packet size of 75 bytes:
	`ping 192.99.16.1 75`
	This will ping the host one hundred times, once per second, with a packet size of 75 bytes: `ping 192.99.16.1 75 100`

ROM-DOS Commands

The PPT 4300 Utilities PC Card has a more complete version of Datalight's ROM-DOS software than a PPT 4300 series terminal. ROM-DOS supports the command line options listed below. Commands marked with an asterisk are available on the PPT 4300 Utilities PC card, but not on the terminal. For complete information on these commands, refer to the Datalight ROM-DOS documentation.

?	A `config.sys` command that directs ROM-DOS to pause for confirmation before processing a command.
@	Suppresses the display of a single batch file command line.
;	Placed at the beginning of non-executing lines in a batch file (similar to REM).
ATTRIB*	Display or modify the attributes associated with a file.
BREAK	Turns on or off the ability to stop program execution at a non-I/O point.
BUFFERS	Sets the number of internal data buffers.
CALL	A batch subcommand that invokes execution of a secondary batch file.
CHDIR	Change Directory command (also CD). Changes the working directory.
CHKDSK*	Check Disk command. Checks integrity of data on a disk and displays information.
CLS	Clear Screen command. Clears all information from the display.
COMMAND	Starts a second DOS command processor.
COPY	Copies files from one storage location to another.
CTTY*	Change Teletype. Changes the default terminal interacting with ROM-DOS.
DATE	Displays date from the system's internal calendar, and allows you to modify it.
DEL	Deletes a specified file.
DEVICE	Installs a device driver into ROM-DOS.

DEVICEHIGH	A `config.sys` command that loads a device into the upper memory area, if available.
DIR	Lists the contents of a specific directory.
DISKCOPY*	Copies the contents of one floppy disk to another of the same type.
DOS	Installs ROM-DOS into High Memory area (HMA).
ECHO	Batch subcommand for turning on or off the display of batch execution on the monitor.
ERASE	Erases specified files (same as DEL).
EXIT	Exits nested running of ROM-DOS within another program.
FCBS	Specifies the number of File Control Blocks (FCBS) open at one time.
FDISK*	Initialize and partition a hard disk for DOS.
FILES	Sets the maximum number of files that can be open at one time on the system.
FIND*	Works as a filter to display only lines that contain a specified string.
FOR	Batch command for performing one ROM-DOS command on a set of files.
FORMAT*	Initializes a disk so that ROM-DOS can access files on that disk.
GOTO	Batch subcommand for moving control to a specified line in the batch file.
HELP*	Lists all available ROM-DOS commands along with brief descriptions.
IF	Batch subcommand that performs a command based on a specified condition.
INCLUDE	A `config.sys` menu configuration command. It allows instructions in one configuration block to be included with instructions in another configuration block.
INSTALL	Loads terminate and stay resident (TSR) programs during `config.sys` processing.

KEYB* Allows altering of the keyboard layout for a different language. This command is not available on the terminal itself, but it is available on the PPT 4300 Utilities PC Card.

LABEL* Creates, changes or deletes a disk volume label. This command is not available on the terminal itself, but it is available on the PPT 4300 Utilities PC Card.

LASTDRIVE Sets the maximum number of drives.

LOADHIGH Batch subcommand or command line command. Loads a program into the upper memory area, if available.

MENUCOLOR `config.sys` menu configuration command. Allows setting of text and background colors for start-up menu.

MENUDEFAULT `config.sys` menu configuration command. Sets the default menu item choice and time-out value for making a selection.

MENUITEM `config.sys` menu configuration command. Specifies an item to be placed on the start-up menu displayed during system reboot.

MKDIR Make Directory command (also MD). Creates a new subdirectory.

MODE* Modifies the operation of a printer, serial port and active video display.

MORE* Displays a text file one screen at a time.

NEWFILE Allows continuation of `config.sys` processing from a new file.

NUMLOCK Sets the NUMLOCK keyboard key to on or off when your computer starts.

PATH Displays current command search path(s). You can use it to specify a new path line.

PAUSE Batch command that causes execution to halt until a key is pressed.

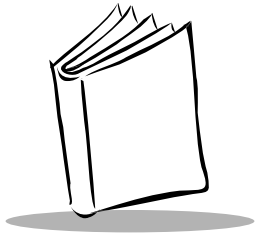
PRINT* Prints a list of files, up to ten files.

PROMPT Resets the appearance of the system prompt line.

REM Remark. Placed at the beginning of a non-executing line in a batch file.

REN Rename. Used to rename files.

RMDIR	Remove directory command (also RD). Deletes a specified subdirectory.
SET	Sets environment variables and command processor strings.
SHARE*	Installs the capabilities for file sharing and file locking on the hard disk.
SHELL	Allows selection of a boot program other than the default `command.com` command processor.
SHIFT	A batch subcommand that shifts replaceable parameters one position to the left.
SORT*	Sorts a text file and displays output to a standard device.
SUBMENU	A `config.sys` menu configuration command. Defines a menu item that represents a secondary menu.
SWITCHES	Allows special `config.sys` file options.
SYS*	Transfers the hidden system files to a specified drive.
TIME	Displays the current time from the system's internal clock, and allows you to modify it.
TREE*	Displays the path of each directory on a specified drive.
TYPE	Displays the contents of a text file on the display.
VER	Displays current version of ROM-DOS on the display.
VERIFY	Displays the current VERIFY state or sets the VERIFY state to on or off.
VOL	Displays the volume label on a disk.
XCOPY*	Copy multiple files or subdirectories.
XDEL*	Deletes files and subdirectories, including subdirectories.



Appendix E
PPT 4300 with Integrated Scanner (PPT4300-SOE)

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The SE 1223 Scan Engine

Overview

The PPT 4300-S0E terminal is equipped with an integrated scanning module. The scanner laser engine model is SE 1223. This is a miniature visible-laser based scan engine that scans and processes bar codes into ASCII data.

The scan engine default settings are shown in Table E-2. For more detailed SE 1223 scan engine information, contact your Symbol support representative.

SE 1223 Technical Specifications

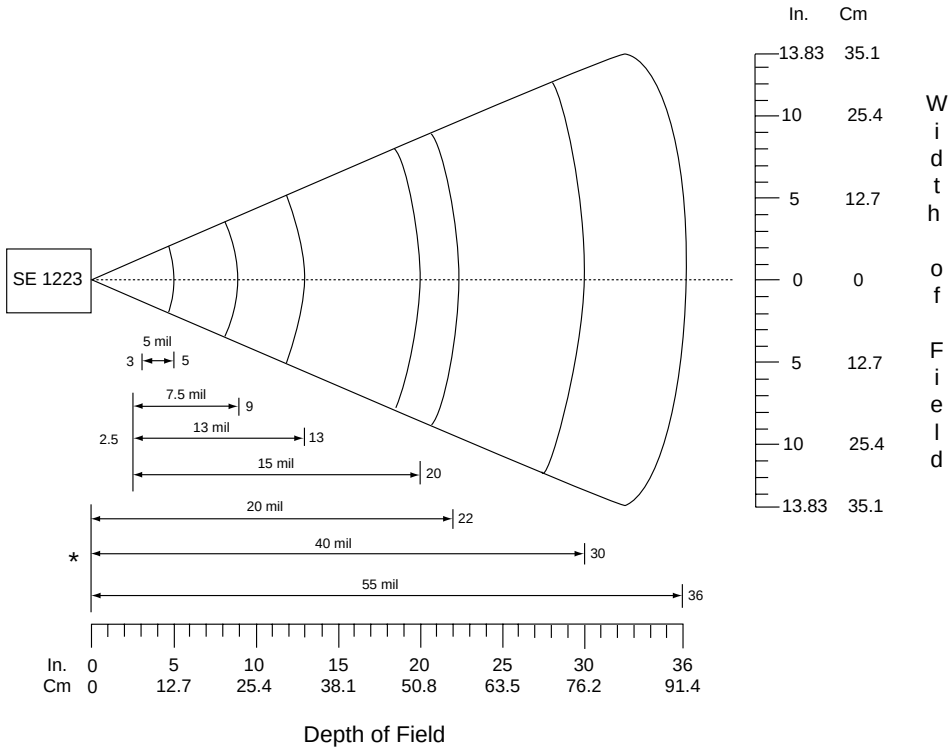
Table E-1. SE 1223 Technical Specifications

Item	Description
Scan Repetition Rate	35 (± 5) scans/sec (bidirectional)
Laser Power	0.8 mW ± 10%, 670 nm
Print Contrast	minimum 20% absolute dark/light reflectance measured at 675 nm.
Scan Angle	42° ± 2°
Skew Tolerance	± 65° from normal (see Figure E-1 on page E-4)
Pitch Angle	± 55° from normal (see Figure E-1 on page E-4)
Roll	± 20° from vertical (see Figure E-1 on page E-4)
Decode Depth of Field	See Figure E-1 on page E-4.
Ambient Light Immunity **Sunlight** **Artificial Light**	 8,000 ft. candles 86,112 lux 450 ft. candles 4,844 lux
Laser Class	Intended use in CDRH/IEC Class 2 devices.
Operating Temperature	-22° to 131°F -30° to 55°C
Storage Temperature	-40° to 140°F -40° to 60°C
Humidity	5% to 95% non-condensing

Note: *The scanner interrupts the terminal's radio transmission for up to three seconds. This does not affect the session with the host.*

Decode Zone (V_{cc} = 5V)

The standard SE 1223 decodes the symbols as shown in *Figure E-1* The figures shown are typical values. The minimum element width (or "symbol density") is the width in mils of the narrowest bar or space in the symbol. The maximum usable length of a symbol at any given range is shown below.



*Minimum distance determined by symbol length and scan angle

Figure E-1. Decode Zone

Default Scanner Settings

The SE 1223 is shipped with the default settings shown in Table E-2, below. Scanner parameter values are stored in non-volatile memory and are preserved even when the scanner is powered down.

You can change scanner settings for some parameters by scanning the appropriate bar codes. The new values replace the default settings in memory. Scanning the SET ALL DEFAULTS bar code resets all parameters to their default settings. To change the setting for any allowed options, contact your Symbol representative to get the correct configuration bar codes.

Do not change the Serial or Event Reporting Parameters or the scanner will be disabled.

Table E-2 Default Settings

Category	Parameter	Default	Notes
General Settings	Set Default Parameter	All Defaults	
	Beeper Tone	Medium Frequency	Cannot be changed.
	Laser On Time	3.0 sec	Cannot be changed.
	Aim Duration	0.0 sec	Not supported with the standard scanner module.
	Power Mode	Low Power	Will be set to Low Power by the `kbwedge.com`
	Trigger Mode	Level	Do not change this option.
	Time-out Between Same Symbol	1.0 sec	
	Beep After Good Decode	Enable	Cannot be changed using bar codes, but you can change it by running `kbwedge.com` from the command line with the /nosound option.
	Transmit “No Read” Message	Disable	

Table E-2 Default Settings

Category	Parameter	Default	Notes
General Settings	Parameter Scanning	Enable	
	Linear Code Type Security Levels	1	
	Bi-directional Redundancy	Disable	
UPC/EAN	UPC-A	Enable	
	UPC-E	Enable	
	UPC-E1	Disable	
	EAN-8	Enable	
	EAN-13	Enable	
	Bookland EAN	Disable	
	Decode UPC/EAN Supplementals	Ignore	
	Decode UPC/EAN Supplemental Redundancy	7	
	Transmit UPC-A Check Digit	Enable	
	Transmit UPC-E Check Digit	Enable	
	Transmit UPC-E1 Check Digit	Enable	
	UPC-A Preamble	System Character	
	UPC-E Preamble	System Character	
	UPC-E1 Preamble	System Character	
	Convert UPC-E to A	Disable	
	Convert UPC-E1 to A	Disable	

Table E-2 Default Settings

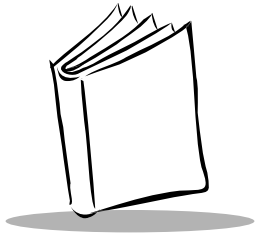
Category	Parameter	Default	Notes
UPC/EAN	EAN-8 Zero Extend	Disable	
	Convert EAN-8 to EAN-13 Type	Type is EAN-13	
	UPC/EAN Security Level	0	
	UPC/EAN Coupon Code	Disable	
Code 128	USS-128	Enable	
	UCC/EAN-128	Enable	
	ISBT 128	Enable	
Code 39	Code 39	Enable	
	Trioptic Code 39	Disable	
	Convert Code 39 to Code 32	Disable	
	Code 32 Prefix	Disable	
	Set Length(s) for Code 39	2-55	
	Code 39 Check Digit Verification	Disable	
	Transmit Code 39 Check Digit	Disable	
	Code 39 Full ASCII Conversion	Disable	
Code 93	Code 93	Disable	
	Set Length(s) for Code 93	4-55	

Table E-2 Default Settings

Category	Parameter	Default	Notes
Interleaved 2 of 5	Interleaved 2 of 5	Enable	
	Set Length(s) for I 2 of 5	14	
	I 2 of 5 Check Digit Verification	Disable	
	Transmit I 2 of 5 Check Digit	Disable	
	Convert I 2 of 5 to EAN 13	Disable	
Discrete 2 of 5	Discrete 2 of 5	Disable	
	Set Length(s) for D 2 of 5	12	
Codabar	Codabar	Disable	
	Set Lengths for Codabar	5-55	
	CLSI Editing	Disable	
	NOTIS Editing	Disable	
MSI Plessey	MSI Plessey	Disable	
	Set Length(s) for MSI Plessey	6-55	
	MSI Plessey Check Digits	One	
	Transmit MSI Plessey Check Digit	Disable	
	MSI Plessey Check Digit Algorithm	Mod 10/Mod 10	

Table E-2 Default Settings

Category	Parameter	Default	Notes
Data Options	Transmit Code ID Character	None	
	Prefix/Suffix Values Prefix Suffix 1 Suffix 2	 NULL LF CR	
	Scan Data Transmission Format	Data as is	
Serial Interface	Baud Rate	9600	***Do not change any of these Serial Interface settings or the scanner will be disabled.***
	Parity	None	
	Software Handshaking	Enable	
	Decode Data Packet Format	Unpacketed	
	Host Serial Response Time-out	2 sec	
	Stop Bit Select	1	
	Intercharacter Delay	0	
	Host Character Time-out	200 msec	
Event Reporting	Decode Event	Disable	***Do not change any of these Event Reporting settings or the scanner will be disabled.***
	Boot Up Event	Disable	
	Parameter Event	Disable	



Appendix F
International Keypads

Appendix Contents

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Configuring the Keypad using the NED editor F-11
Keyboard Layouts F-12

Overview

PPT 4300 series terminals are available with keypads and radios for certain other countries. Keypads for the following countries are currently available from Symbol:

- Denmark
- France
- Germany
- Italy
- Spain
- United Kingdom

The PPT 4300 Terminal Emulators support all of these languages, except for error messages. Contact your Symbol Sales representative for more specific information.

The terminal should already be configured for the correct keypad and radio when you receive it. In the event that it does not arrive configured, the following instructions will allow you to set the terminal for the correct country. There are two methods for changing the country configuration. The first method uses the PPT 4300 Utilities PC card installation menus to change the country configuration and will also re-install terminal software and drivers. The second method involves using the NED editor to change the `config.sys` file.

Note: *Be aware that the country set is ignored during the initial seconds of terminal boot up and when you boot from the Utility card.*

Caution

1. The terminal keypad elastomer must match the country configuration. If your terminal is already configured for the correct country, do not change it. If you change the country configuration, the characters that you press on the keypad may not match the characters that will be displayed on the screen. The terminal's model number includes a country code (*e.g.*, PPT43xx-xxxxxx-FR for a terminal with a French keyboard).

2. The radio for the specified country is installed at the factory. It meets the regulatory requirements for use in that country, and cannot be changed. The instructions in this section will not alter the country configuration of the radio.

Configuring the Keypad using the Utility Card

These procedures describe how to configure terminals for the correct international keypads using the Utility card menus.

1. Plug the terminal into an electrical outlet using a DC wall adapter to disable power management and prevent low battery interruptions during the process.
2. Remove the rubber plug from the Expansion Slot at the top of the terminal and insert the PPT 4300 Utilities PC card into the Expansion Slot, connector edge first. Press gently until the card is fully seated.
3. Boot the terminal from the PC card.
4. When you first boot from the Utilities card, you will be prompted to select a keyboard type, as shown in Figure F-1. After five seconds, the default choice is activated (Standard US Keyboard), and the Utility Card Main Menu appears as shown in Figure F-3.

   To select an international keyboard, select option 2 to display the list of international keyboards shown in Figure F-2.

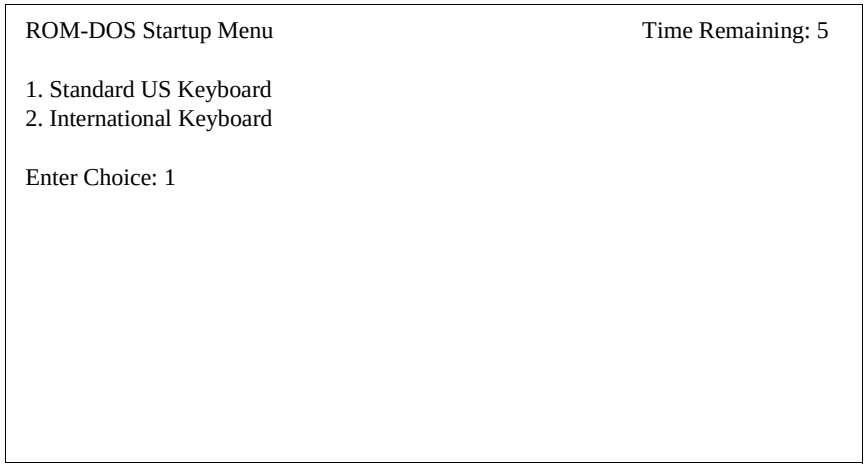


Figure F-1. Utilities Card Keyboard Selection

5. Select the international keyboard that you wish to use (*e.g.*, 7 for a UK keyboard).

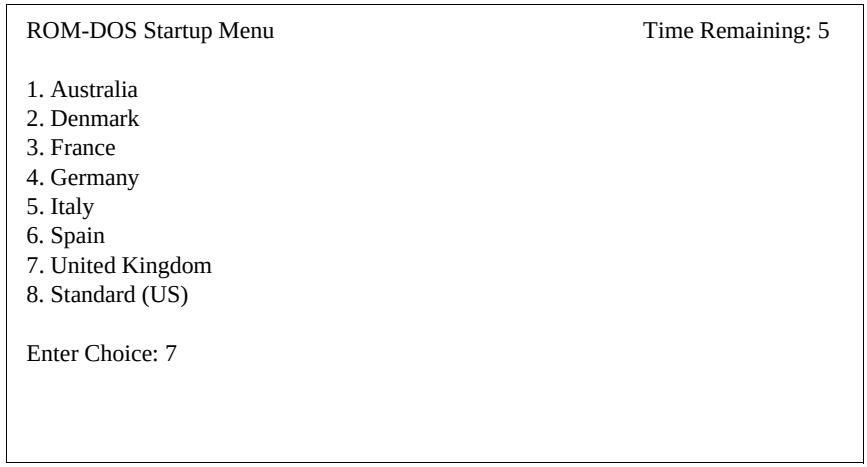


Figure F-2. Utilities Card International Keyboard List

6. After the keyboard menu disappears, the Utility Card Main Menu appears. Press **1** to select **Software Installation Menu**.

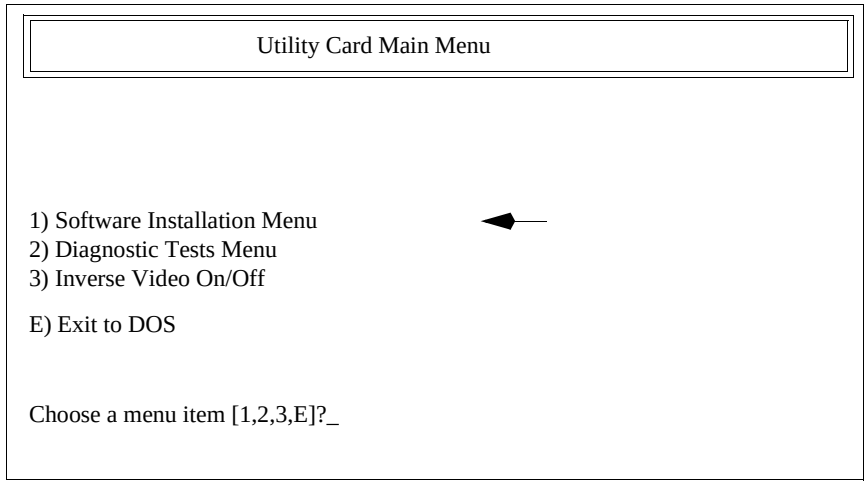


Figure F-3. Utilities Card Main Menu

7. At the Software Installation Menu, **press 1** to select **Run the PPT4300 Software Install Utility.** This loads the Software Installation Utility shown in Figure F-5.

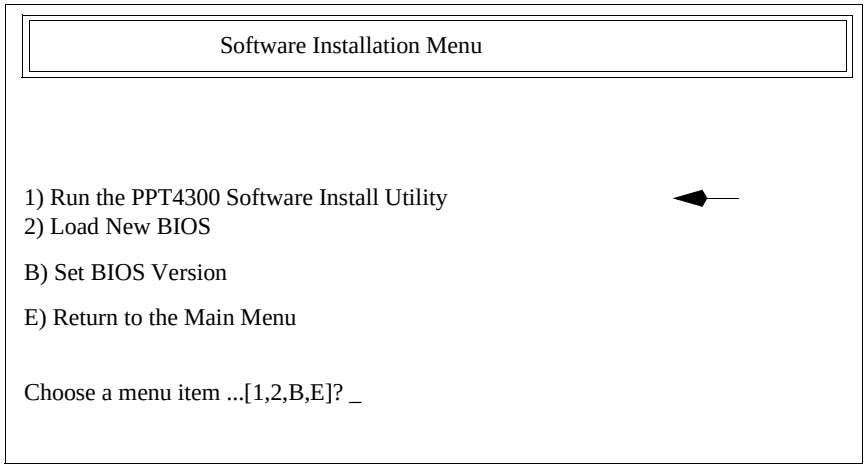


Figure F-4. Software Installation Menu

8. At the Software Installation Utility, select **Custom File (International Support) as shown in** Figure F-5.

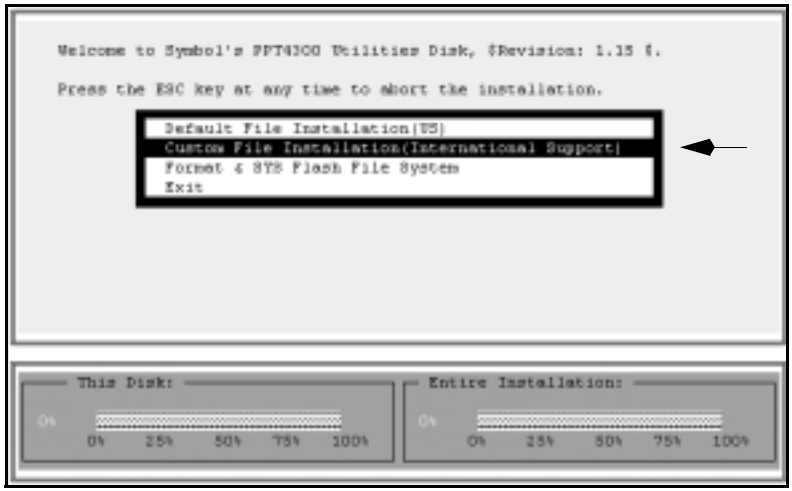


Figure F-5. Software Installation Utility

9. Select a software combination to install (*e.g.*, Normal Installation):

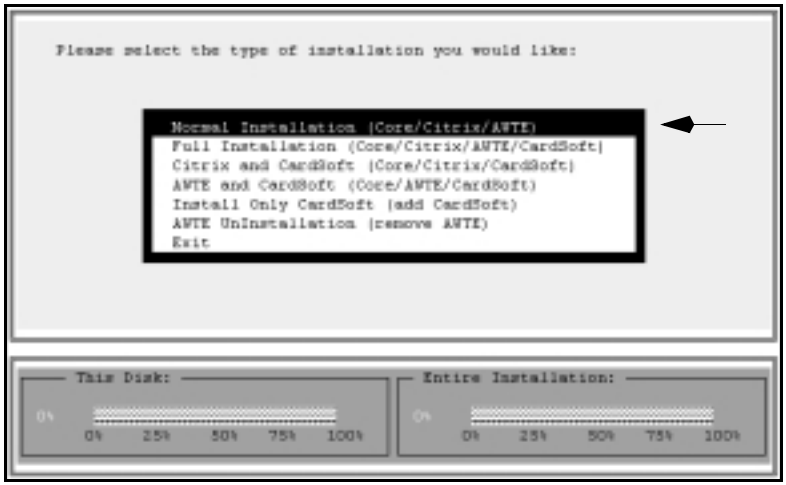


Figure F-6. Custom Software Installation

See Chapter 3, *Software Installation* for more information on installation options.

10. Keep the default digitizer detected by the software, or change the digitizer type as shown in Figure F-7.

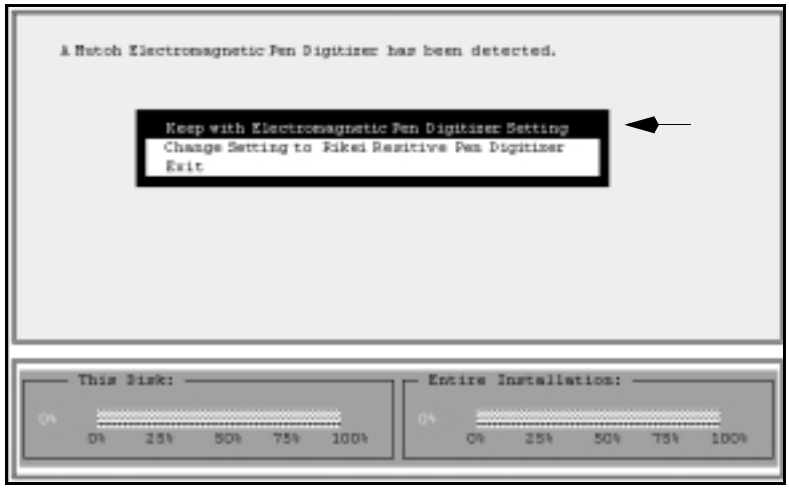


Figure F-7. Selecting the Digitizer Type

11. Next you will be prompted to install scanner support files. If you wish to install them, select **Yes**. Note that the **No** option is selected in Figure F-8.

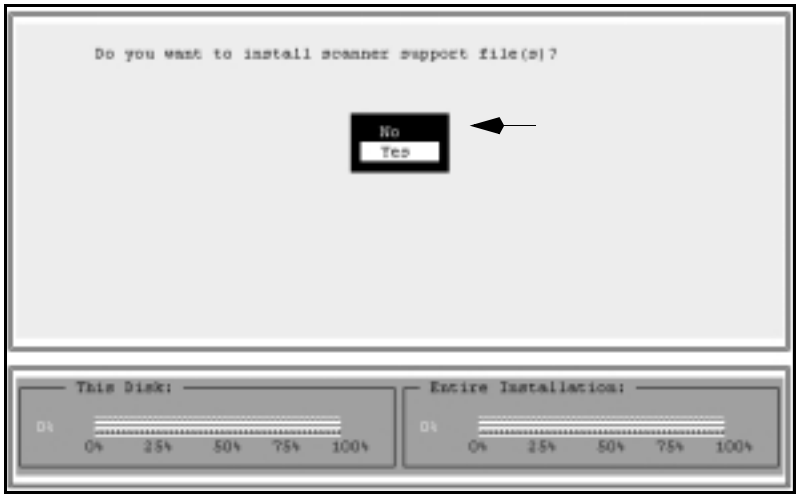


Figure F-8. Installing Scanner Support Files

12. To accept the default drive, select **No**. To select a different drive, select **Yes**.

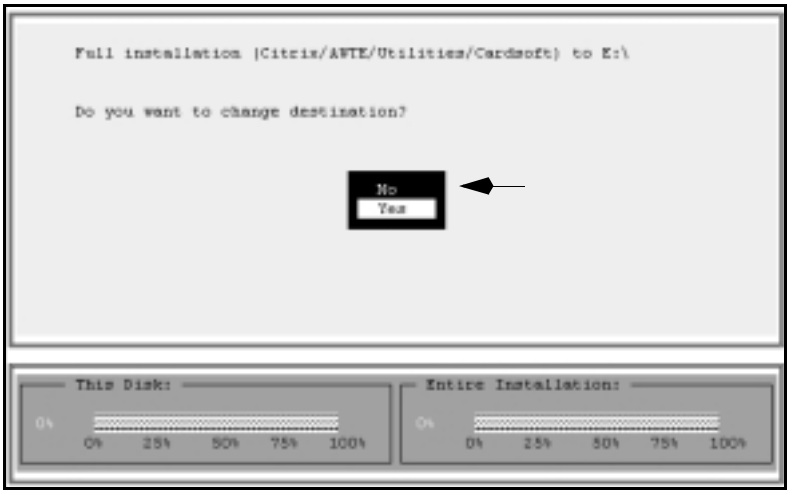


Figure F-9. Selecting a Destination Drive

13. You will be prompted to select the Country for the keyboard type, as shown in Figure F-10. Select the correct country.

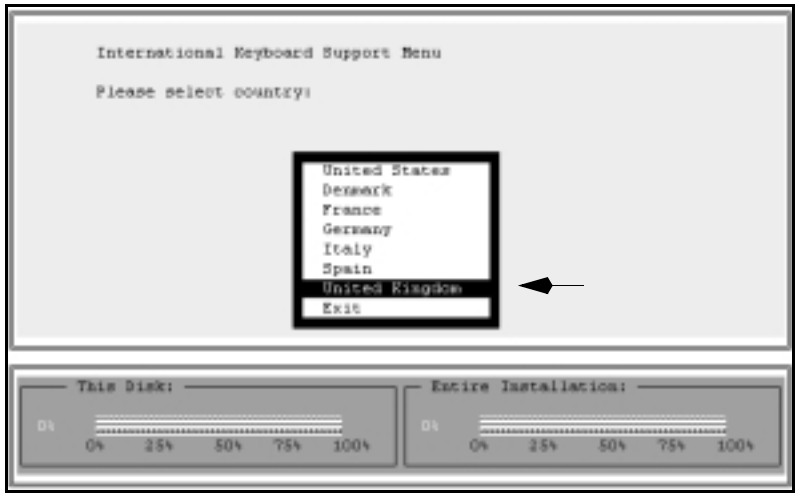


Figure F-10. Selecting a Keyboard Type

14. Select **Yes** at the prompt begin the installation process. The progress shows in bar graphs at the bottom of the screen, and takes a few minutes.

Figure F-11. Beginning the Installation

15. When the installation is complete, you will be asked if you want to return to the Installation Utility. Select **No** to return to the Software Installation menu.

    Do not attempt to view or use the installed files until you have rebooted the terminal.

16. Press **E** to return to the Utility Card Main menu, and then press **E** again to exit to the DOS prompt.
17. At the ROM-DOS prompt, type `off` and press **<Enter>** to power the terminal off. Remove the Utilities card, replace the rubber plug in the Expansion Slot, and power the terminal on normally.
18. Configure the terminal with correct IP addresses and other configuration settings following the procedures described in Chapter 4, *Standard Terminal Configuration*.

Note: *In regular video mode, the selected option appears with white letters printed on a dark background. However, if you are using inverted video, the selected option will be the option with dark letters on a light background.*

Configuring the Keypad using the NED editor

These procedures describe how to manually check or configure terminals for the correct international keypad using the DOS NED editor to change the `config.sys` file.

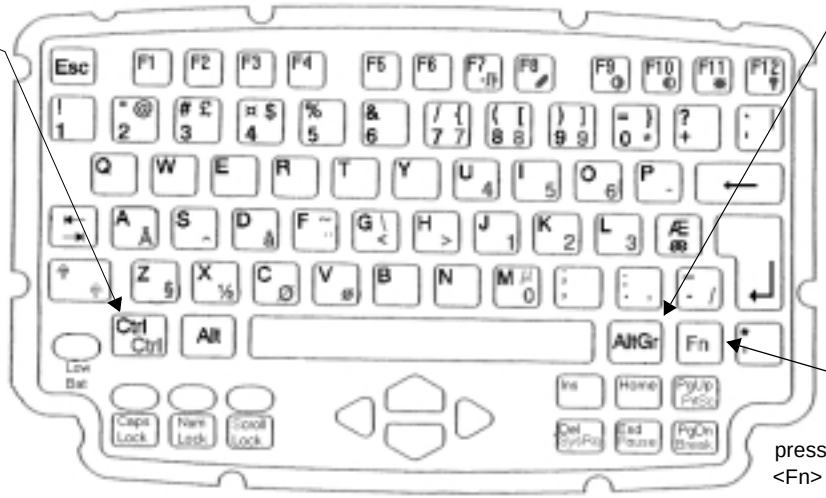
1. Boot the terminal to a command line prompt. To do this, watch for the ROM-DOS Startup Menu that appears as the terminal is booting. Press **3**, then press **<Enter>**.
2. Type `ned config.sys` and press **<Enter>**.
3. Find the following lines:
   ```
   [common]
   set INTL=us
   Rem Include=denmark
   DeviceHigh=c:\dos\ata.sys /acc.00 /i1f0
   ```
4. Erase the word `Rem` at the beginning of the line that specifies the country (**`Rem Include=denmark`**, in the example above).
5. Replace **`denmark`** with the country of choice as follows:
   - Denmark – `denmark`
   - France – `france`
   - Germany – `germany`
   - Italy – `italy`
   - Spain – `spain`
   - United Kingdom – `kingdom`

   Use the country code that matches the country identified in the terminal's model number.
6. Save the file by pressing **<Alt-F>** and then **S**. Exit the editor by pressing **<Alt-F>** and then **X**. This will return you to a DOS prompt.
7. Type `off` at the DOS prompt, then press **<Enter>**.
8. Restart the terminal by pressing the Power icon. The keyboard will be reprogrammed after the terminal finishes booting to an application or a DOS prompt.

Keyboard Layouts

Special characters on the keypad can be accessed using the following key combinations:

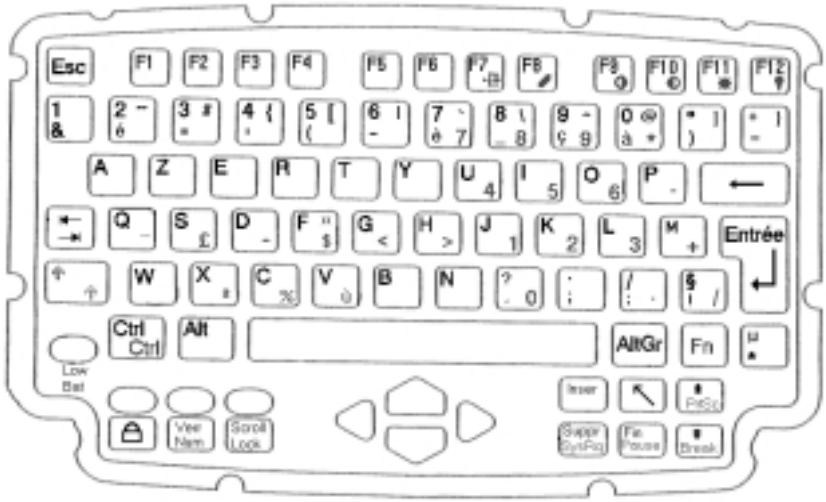
Some keypads put the left and right <Ctrl> on the same key. The right key is blue and the left key is black. To access the right (blue) <Ctrl> key,



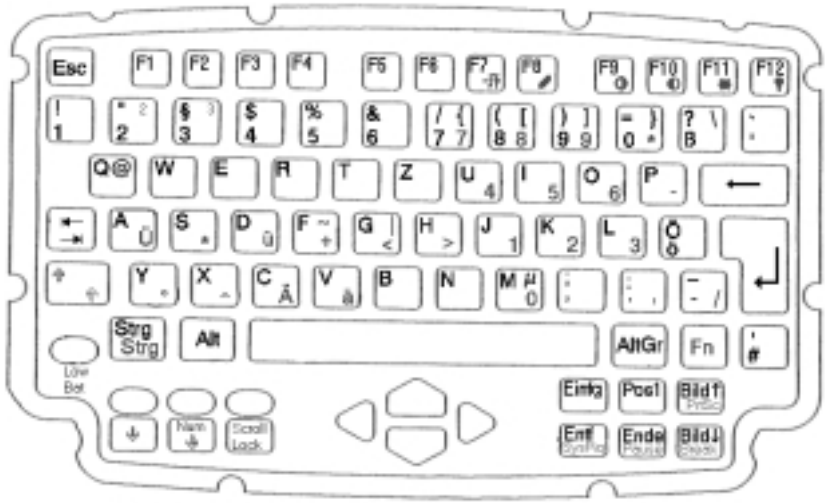
To access the green symbols, press and hold the <Alt-Gr> key then press the key with the green symbol.

To access the blue symbols, press and hold the <Fn> key then press the key with the blue symbol.

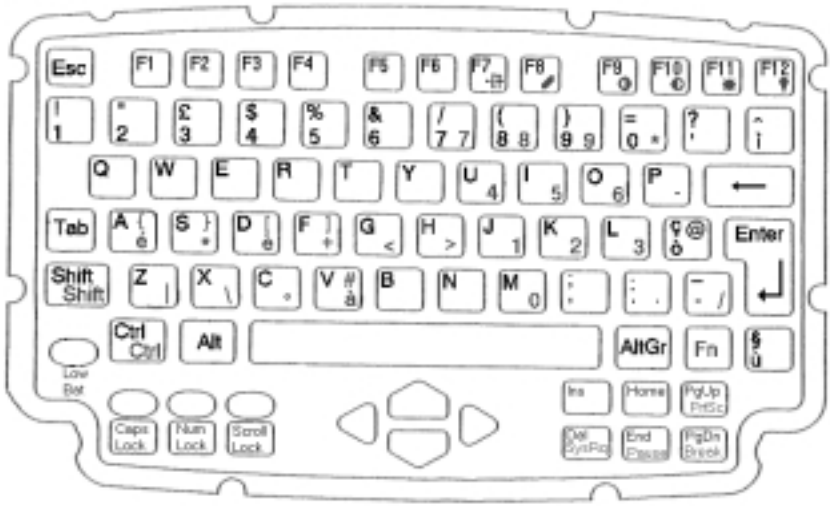
Denmark



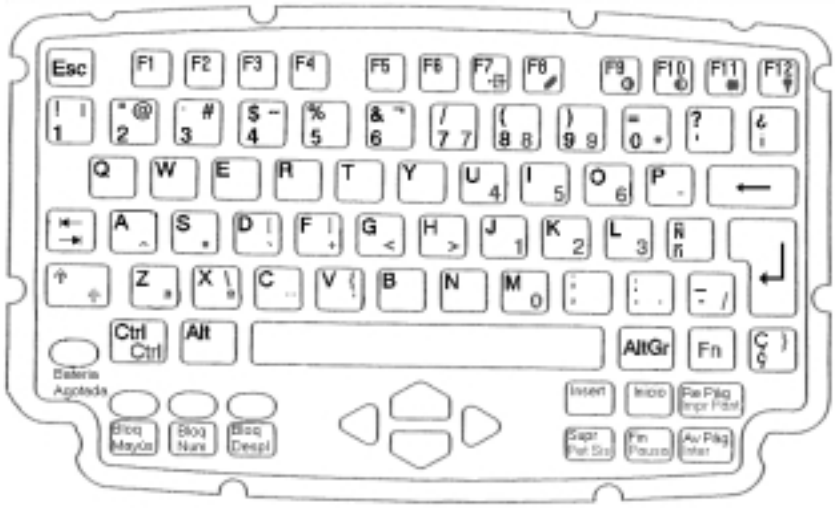
France



Germany

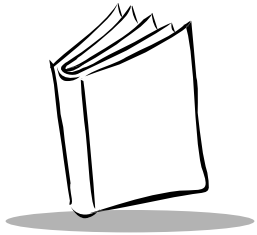


Italy



Spain

United Kingdom



Glossary

802.11

A radio protocol that may be used by the Symbol Spectrum24 radio card. Symbol Radio cards that use the 802.11 protocol also have an ESS ID.

AP

See Access Point.

Access Point

Access Point (AP) refers to Symbol's Spectrum24™ Ethernet Access Point. It is a piece of communications equipment that manages communications between the host computer system and one or more wireless terminals. An AP connects to a wired Ethernet LAN and acts as a bridge between the Ethernet wired network and IEEE 802.11 interoperable radio-equipped mobile units, such as a PPT 4340 terminal. The AP allows a mobile user to roam freely through a facility while maintaining a seamless connection to the wired network.

API

Application Programming Interface. An interface by means of which one software component communicates with or controls another. It usually refers to services provided by one software component to another, via software interrupts or function calls.

ASCII

American Standard Code for Information Interchange. A 7 bit code representing 128 letters, numerals, punctuation marks, and control characters. It is a standard data transmission code in the U.S.

Bar Code

A pattern of variable-width bars and spaces which represent numeric or alphanumeric data in machine-readable form. The general format of a bar code symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format. See **Symbology**.

BIOS

Basic Input Output System. A collection of ROM-based code with a standard API used to interface with standard PC hardware.

Boot

When you power up a computer, the first thing it does is to load the software that allows it to run, usually the operating system. This process is called booting. When PPT 4300 series terminals boot, they load the ROM-DOS operating system and execute any commands found in `command.com` and `autoexec.bat`.

Control Panel

The Control Panel is an application that has been installed on the PPT 4300 series terminal at the factory. It allows a System Administrator or Technical Support person to view and modify terminal configuration. See Chapter 5, *Operation*.

Decode

To recognize a bar code symbology (*e.g.*, Codabar, Code 128, Code 3 of 9, UPC/EAN, etc.) and analyze the content of the bar code scanned.

Direct Access Panel

The Direct Access Panel is a vertical row of icons located on the left side of the display window. It allows users to select from pre-defined options such as adjusting brightness and contrast, or displaying battery information. See Chapter 5, *Operation*.

DNS Server

The Control Panel allows you to set the IP address for a DNS Server, if used. This allows users to use server names, rather than IP addresses. It is set on the Network tab of the Control Panel.

Domain Name

The Control Panel allows you to set a Domain Name for the DNS Server, if used (*e.g.*, symbol.com). It is set on the Network tab of the Control Panel.

DOS

Disk Operating System. This is basic software that allows you to load and use software applications on your computer. PPT 4300 series terminals use a product called ROM-DOS. Also see *NetID*.

ESS ID

For terminals using Spectrum24 radios with the 802.11 protocol, an ESS ID allows facilities to limit which Access Points a PPT 4300 series terminal can communicate with. It is set on the Network tab of the Control Panel. The terminal can only communicate with Spectrum 24 Access Points that have matching ESS IDs. See the Spectrum24 documentation for more information.

Flash Memory

Flash memory is nonvolatile, semi-permanent storage that can be electronically erased in the circuit and reprogrammed. PPT 4300 series terminals use Flash memory to store the operating system (ROM-DOS), the terminal emulators, and the Citrix ICA Client for DOS.

Gateway Address

An IP address for a network gateway or router. A PPT 4340 terminal may be part of a subnet as specified by its IP address and Netmask. It can send packets directly to any node on the same subnet. If the destination node is on a different subnet, then the terminal sends the packet to the gateway first. The gateway determines how to route the packet to the destination subnet. This field is an option used by networks that require gateways.

Host Computer

A computer connected to a LAN that runs applications and stores data. A PPT 4340 terminal may communicate with one or more hosts; end-users use the terminal to execute applications and store data on the host computer.

Infrared

Electromagnetic waves whose frequency range is above that of microwave but below the visible spectrum. LAN systems based on this technology represent an emerging technology.

I/O Ports

Input/Output Ports. I/O ports are primarily dedicated to passing information into or out of the terminal's memory. PPT 4300 series terminals include Serial and IrDA (infrared) ports.

IP Address

A 32-bit address assigned to nodes on a TCP/IP network. The address is written as four octets separated with periods (dotted decimal format) that are made up of a network section, an optional subnet section, and a host section, *e.g.*, 199.24.34.03. Also see *Terminal IP Address*.

IPX/SPX

Internet Package Exchange/Sequential Packet Exchange. A communications protocol for Novell. IPX is Novell's Layer 3 protocol, similar to XNS and IP, and used in NetWare networks. SPX is Novell's version of the Xerox SPP protocol.

IrDA

An acronym for the Infrared Data Association. Infrared (IR) communication is based on technology similar to that used by television and entertainment remote control devices. IR offers a convenient, inexpensive and reliable way to connect computer and peripheral devices without the use of cables. IrDA is an international organization that has created and promoted an interoperable, low-cost, low-power, half-duplex, serial data interconnection standard that supports a walk-up, point-to-point user model that is adaptable to a wide range of applications and devices. IrDA standards support a broad range of computing, communications, and consumer devices. The PPT 4300 terminal includes an infrared port that conforms to IrDA standards.

LED

Light Emitting Diode. A low power electronic light source commonly used as an indicator light. It uses less power than an incandescent light bulb but more than a Liquid Crystal Display (LCD).

NetBeui

A non-routable LAN protocol that is an extension to NetBIOS. Used for IBM's OS/2-based LAN Manager and Microsoft's LAN Manager and Windows for Workgroups.

NetID

For terminals using Spectrum24 radios with the Spring protocol, a NetID allows facilities to limit which Access Points a PPT 4300 series terminal can communicate with. It is set on the Network tab of the Control Panel. The terminal can only communicate with Spectrum 24 Access Points that have matching NetIDs. See the Spectrum 24 documentation for more information. Also see *ESS ID*.

PC Card

A plug-in expansion card for laptop computers and other devices, also called a PCMCIA card. PC Cards are 85.6mm long x 54 mm wide, and have a 68 pin connector. There are several different kinds:

Type	Height	Common Use
Type I	3.3 mm	RAM or Flash RAM
Type II	5 mm	modems, LAN adaptors
Type III	10.5	Hard Disks

The expansion slot on a PPT 4300 series terminal will hold any Type I or Type II PC card.

PCMCIA

Personal Computer Memory Card Interface Association. See PC Card.

QWERTY

A standard keyboard commonly used on North American and some European PC keyboards. “QWERTY” refers to the arrangement of keys on the left side of the third row of keys.

RAM

Random Access Memory. Data in RAM can be accessed in random order, and quickly written and read.

ROM

Read-Only Memory. Data stored in ROM cannot be changed or removed.

ROM-DOS

The name of the licensed Disk Operating System loaded into the terminal’s flash file system.

Scanner

An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are:

1. Light source (laser or photoelectric cell) - illuminates a bar code.
2. Photodetector - registers differences in reflected light (more light reflected from spaces).
3. Signal conditioning current - transforms optical detector output into a digitized bar pattern.

Spring Radio Protocol

A radio protocol that may be used by the Symbol Spectrum24 radio card. Symbol Radio cards that use the Spring protocol also have an Net ID.

Subnet Mask

A number that the network uses to determine whether or not one device can communicate directly with another (*e.g.*, a terminal attempting to communicate with a host computer). In some cases, devices must communicate indirectly through a gateway. The network uses the subnet mask to compare the IP addresses of two devices and determine whether they will communicate directly or indirectly. For Citrix ICA and other applications, the subnet mask depends on your facility's IP address allocations. For the Terminal Emulators, your facility can usually use a default subnet mask (255.255.255.255), which means that the subnet mask is derived from the first 2 bits. However if your facility uses site-specific subnets, you may need to set a different subnet mask. It is set on the Network tab of the Control Panel.

Symbology

The set of structural rules and conventions used to represent data within a particular bar code (*e.g.*, UPC/EAN, Code 29, PDF417, etc.).

TCP/IP

TCP/IP is a set of networking protocols that control how data passes between computers on a network. A PPT 4300 series terminal comes with standard TCP/IP software installed, and uses it to communicate with the network. See Chapter 4, *Standard Terminal Configuration*.

Terminal

In this text, "terminal" refers to the PPT 4300 series wireless terminal. It can be set up to run as a stand-alone device, or it can be set up to communicate with a network, using wireless radio technology.

Terminal Emulation

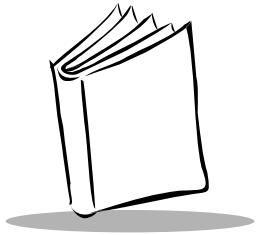
A “terminal emulation” emulates a character-based mainframe session on a remote non-mainframe terminal, including all display features, commands and function keys. The PPT 4300 series terminal supports Terminal Emulations in TN3270, TN5250 and VT220.

Terminal IP Address

The terminal’s network address. Networks use IP addresses to determine where to send data that is being transmitted over a network. An IP address is a 32-bit number referred to as a series of 8-bit numbers in decimal dot notation (*e.g.*, 199.24.34.03). The highest 8-bit number you can use is 254. It is set on the Network tab of the Control Panel.

Terminal Name

The Citrix ICA Client name for a terminal (up to 15 alphanumeric characters). It is set on the Network tab of the Control Panel.



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