

Phoenix[®]

Phoenix Technologies Ltd.



Card Executive[™] 2.0 for NT
User's Guide

Version 2.0

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Introduction

Windows NT currently has very limited support for PC Cards. Windows NT requires PC Cards to be plugged in when the system is started so that they are recognized and configured by the NT driver. The cards cannot be removed until you shut down the system.

With Card Executive 2.0 for NT, you can insert and remove cards in your portable while it is still running. Card Executive recognizes and configures the cards with no interruption of service. You can continue to use your favorite application. No data or services are lost.

Card Executive can run on portable computers that use a variety of different PC Card controllers. Card Executive software functions on Windows NT 4.0 platforms.

This document covers the installation, features, and operation of Card Executive 2.0 for NT software. For information on previous versions of Card Executive software, please refer the earlier revisions of this document.

Summary of Features

Card Executive 2.0 for NT supports the following features.

- PC Card Specification 5.0 compliant (including support for Proposal 187 extensions)
- Card Executive contains a single socket service for all Intel 365 compatible controllers such as Intel 365, Vadem VG469, and others. In addition, it supports PCI to PC Card, and PCI to CardBus bridge chips. Card Executive supports up to four sockets.
- Provides a client driver interface for Card Services functions, 16 bit PC Card support, 32 bit PC Card support (CardBus), 3V, DMA and dynamic resource management using NT services.
- Contains generic modem PC Card and generic ATA/SRAM Card support along with 3Com, SMC, NE2000, and IBM Token Ring LAN client drivers, IDE CD-ROM support and Adaptec SCSI card support. A Card Executive for NT Toolkit is available for porting of point enabler drivers to client drivers.
- Provides information about the current PC Card sockets in use and their contents.
- Automatic installation of PC Card driver software with minimum user interaction.
- PC Card diagnostics that customize Card Executive for your notebook computer.
- Works with Phoenix Power Management utilities to manage Card Executive. PC Cards are logically removed and re-inserted into system causing it to suspend and resume activity.
- Provides German, French, Italian, Spanish, and Japanese international language support.

Audience

This manual is designed for portable computer users who are familiar with Windows conventions and terminology. Specifically, this includes users who want to:

- Use a variety of cards in their portable computer
- Dynamically remove and insert these cards
- Automatic recognition of the cards by the Windows NT operating system, eliminating the need to configure cards each time they are removed and inserted.
- Manage PC Card resources

If you are unfamiliar with the Windows user interface, you will probably want to spend some time learning the fundamental Windows conventions before you read this manual.

Contents of this Manual

The *Card Executive 2.0 for NT User's Guide* contains the following chapters.

Chapter 1 Installing Card Executive: describes how to install Card Executive and how to install Card Executive with the power management feature.

Chapter 2 Card Executive Overview: describes the basic features of Card Executive. It assumes that users are already familiar with Windows terminology and conventions.

Chapter 3 Using Card Executive: describes how to use the Card Executive program.

Chapter 4 Power Management Support Overview: describes the power management features in Card Executive.

Glossary: includes definitions for various terms used in the manual.

Conventions and Typefaces Used in This Manual

Choose	Within this manual, the term <i>choose</i> means to select a menu item by highlighting it with the cursor and pressing <Enter> or clicking on it.
SETUP <Enter>	Boldfaced courier type indicates text as it appears onscreen or in a program. It is used in text for instructions and for anything you must type literally (such as A:\SETUP to install a program).
KEY1+KEY2	This indicates a command that requires you press KEY1 and hold it down as you press KEY2 .
Bold text	Within text, bold-faced type indicates menu options and commands.
<i>Italic text</i>	Within text, italics indicate placeholders, class names, variables, and arrays. In syntax expressions, placeholders represent information that you must provide.
CUSTOM.H	Within text, capital letters represent the names of files and directories.



This icon indicates material you should take special notice of.

Related Documentation

You can obtain additional information about Phoenix Technologies' power management applications for Windows NT by reading the following documentation.

- *APM 2.0 User's Guide*, Phoenix Technologies Ltd., July, 1997.
- *BatteryScope 2.0 User's Guide*, Phoenix Technologies Ltd., February, 1997.
- *PowerPanel 2.0 User's Guide*, Phoenix Technologies Ltd., July, 1997.
- *Card Executive 2.0 for NT Supported Card List*, April, 1997

Additional Information

For additional information about other Phoenix products, visit our World Wide Web home page at <http://www.phoenix.com>.

Chapter 1 Installing and Setting Up Card Executive

Installing the Card Executive 2.0 for NT (also referred to as Card Executive) software involves installing Card Executive software, and verifying information about the Card Executive program and configuring a shortcut desktop icon to display on the Windows NT desktop.

This chapter describes:

- Installing the Card Executive software
- Un-installing the Card Executive software
- Upgrading from a previous version.
- Installing the optional Card Executive power management feature
- Verifying information about your version of the Card Executive program
- Setting up the Card Executive program for easy access from the desktop

To begin installing the components, however, your system must meet certain system requirements.

System Requirements

The recommended minimum system for running Card Executive includes the following components:

- A 486 or Pentium computer with PC Card sockets
- Microsoft Windows NT 4.0 (Workstation or Server)
- At least 5MB of free hard disk space available on your computer

Installing the Card Executive Software

Before you install Card Executive, back up the following Windows NT files:

- HAL.DLL
- PCMCIA.SYS
- DISK.SYS
- CDROM.SYS

If you already have a previous version of Card Executive installed in the system, please refer to the section, *Upgrading a Previous Version of Card Executive*, for directions on how to upgrade your system. To install Card Executive 2.0 for NT for the first time on a system:

1. Insert Disk 1 of the Card Executive software into drive A:. **Note:** If your installation media is a CDROM, then insert the CDROM into the CDROM drive.
2. Click the **Start** button on the Windows NT Taskbar.
3. Choose **Run...** and enter **A:\SETUP.EXE**. **Note:** If your installation media is a CDROM, use the drive letter of the CDROM drive instead of 'A:\'
4. Follow the directions displayed in the Card Executive 2.0 for NT installation program. You will have to specify a pathname in which Card Executive 2.0 will install itself.
5. Reboot your system when prompted by the setup program. Once the system is running again, you can use the Card Executive software.

The installation program backs up and then overwrites the HAL.DLL, PCMCIA.SYS, DISK.SYS, and CDROM.SYS files. In addition, the installation program automatically places an icon, Card Executive 2.0 for NT, in the Windows NT Control Panel.

Un-Installing the Card Executive Software

If you already have a version of Card Executive installed in the system, you can un-install that software by following the steps below:

1. Insert Disk 2 of the Card Executive software into drive A:. **Note:** If your installation media is a CDROM, then insert the CDROM into the CDROM drive.
2. Click the **Start** button on the Windows NT Taskbar.
3. Choose **Run...** and enter **A:\UNINSTL.EXE**. **Note:** If your installation media is a CDROM, use the drive letter of the CDROM drive instead of 'A:\'
4. Follow the directions displayed in the Card Executive 2.0 for NT un-installation program.
5. Reboot your system when prompted by the setup program.

The un-installation program can not automatically remove any shortcuts that you may have created while running Card Executive. You must manually remove any shortcuts to the Card Executive program by dragging the shortcut to the recycling bin.

Upgrading a Previous Version of Card Executive

If you already have a version of Card Executive installed in the system, you must upgrade your system to the current version.

1. Un-Install the previous version of Card Executive software. Please follow the steps outlined in the section, *Un-Installing the Card Executive Software*, given earlier in this chapter.

2. Once the system has been rebooted, you can install Card Executive for NT. Please follow the steps outlined in the section, *Installing the Card Executive Software*, given earlier in this chapter. Since you have un-installed the previous version of Card Executive, the steps in the installation section can be used.
3. Once the system has been rebooted again, you can use Card Executive for NT

Installing the Card Executive Power Management Feature

APM 2.0 and Phoenix PowerPanel 2.0 provide power-management functionality for your PC Card sockets. For more information about these products, refer to the *APM 2.0 User's Guide* and *PowerPanel 2.0 User's Guide*.

Verifying Information About Card Executive

After you install all the software components and Card Executive, it is a good idea to verify the version number and other information about the Card Executive program.

To verify information about Card Executive:

1. From the Windows NT Taskbar, choose **Start**, then **Settings**, then **Control Panel**. The Windows NT Control Panel appears.
2. From the Windows NT Control Panel, click on the Card Executive icon with the right mouse button. A drop-down list box appears. Select **Open** from the drop-down list box to display the Card Executive control panel.

or

Double-click on the Card Executive icon in the Control Panel. The Card Executive control panel appears.

3. Choose the About tab. The About tab page appears with statistics about the Card Executive software.

Figure 1. About Tab Page on the Card Executive Control Panel



As a shortcut for verifying information about the Card Executive program, double-click on the PC Card icon on the Windows NT Taskbar.

Configuring a Shortcut Card Executive Desktop Icon

Although you can access the Card Executive tabbed dialog boxes by double-clicking the Taskbar icon, you can also configure a shortcut icon on the Windows NT desktop. To configure the Shortcut to Card Executive desktop icon, follow these steps:

1. From the Windows NT Control Panel, click on the Card Executive icon with the right mouse button. A drop-down list box appears.
2. Choose **Create Shortcut**. A message appears indicating that Windows cannot create a shortcut in the Windows NT Control Panel and asking whether you want to create the shortcut on the desktop instead.
3. Click on the **Yes** button. A shortcut icon appears on the Windows NT desktop. See Figure 2.

Figure 2. Shortcut to Card Executive Desktop Icon



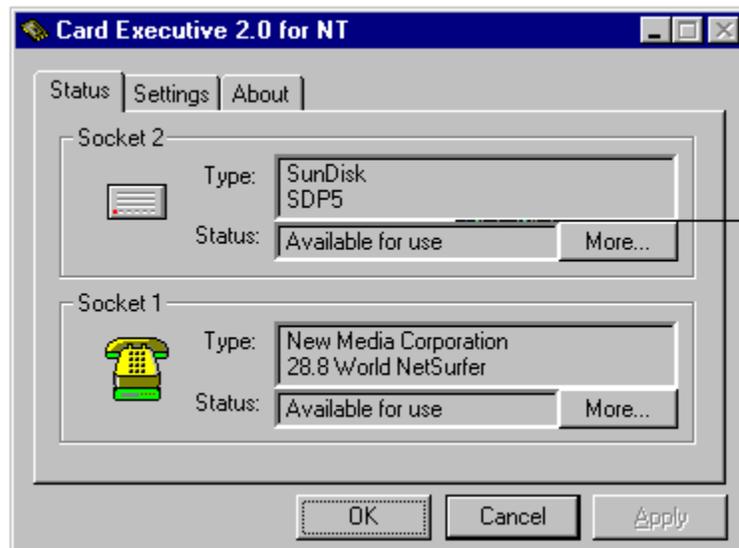
Using the Shortcut Card Executive Desktop Icon

You can use the Card Executive shortcut icon on the Windows NT desktop to:

- Access the Card Executive control panel
- Display the shortcut icon properties

To access the Card Executive control panel from the desktop, double-click the left mouse on the Card Executive icon. To check the status of a card while the system is running, double-click on the Shortcut to Card Executive icon from the Windows NT desktop. The Card Executive 2.0 for NT control panel appears. When a PC Card is in the PC Card socket and it is properly working, the status for the card is listed as Available for Use. See Figure 3.

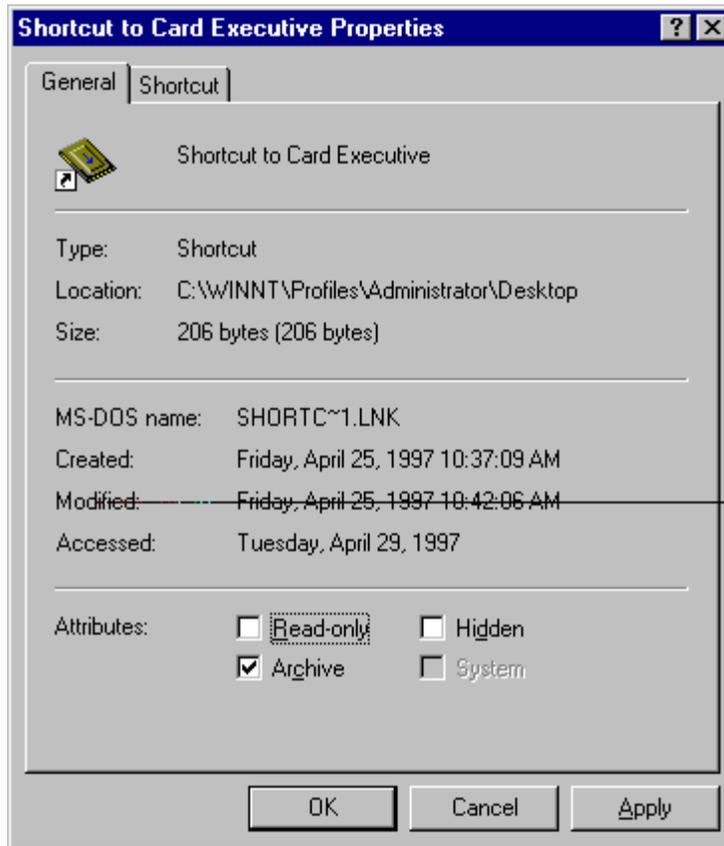
Figure 3. Card Executive 2.0 for NT Control Panel



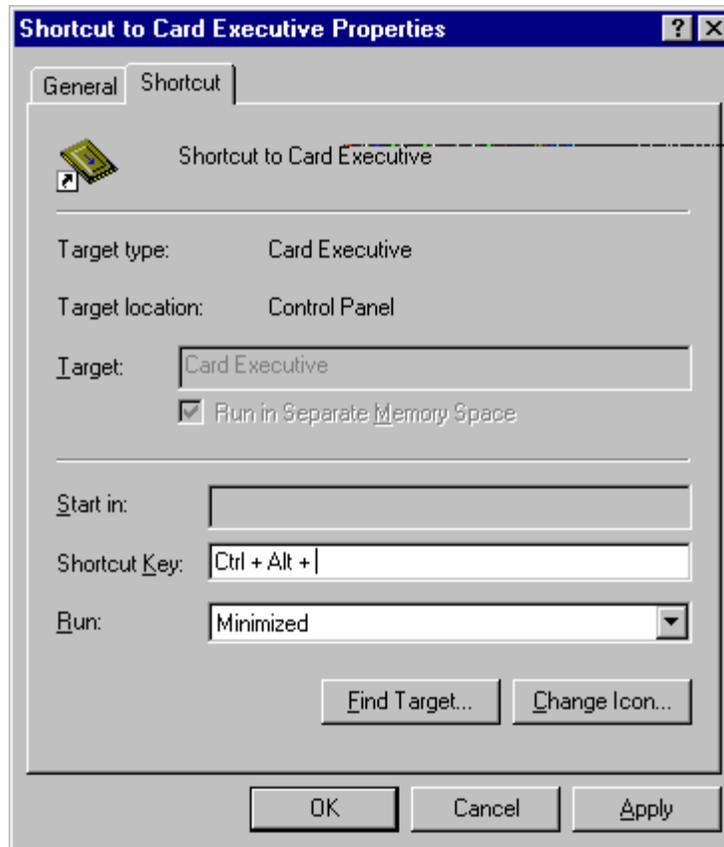
To display properties for the Card Executive shortcut icon:

1. Position the cursor over the Card Executive Shortcut icon.
2. Double-click the right mouse button. The Shortcut to Card Executive Properties dialog box appears. See Figure 4.
3. Choose either the **General** tab for general information about the shortcut or the **Shortcut** tab to change the icon properties.

Figure 4. Shortcut to Card Executive Properties Dialog Box, General Tab



The General tab displays general information about the Card Executive shortcut including location and file attributes.

Figure 5. Shortcut to Card Executive Properties Dialog Box, Shortcut Tab

On the Shortcut tab, you can create shortcut keys that let you access Card Executive quickly.

Chapter 2 Card Executive Overview

The Card Executive provides PC Card (PCMCIA) capability to Windows NT. Through its socket services interface, the Card Executive software runs on all notebooks that use a variety of different PC Card controllers. The Card Executive software adds a socket and card services interface to Windows NT, hot swapping support for PC Cards, a user interface, power management support for PC Cards, and user-level functionality.

Supported PC Cards

Card Executive provides support for many cards with generic drivers. However, specific cards have been tested to make sure they are supported under Card Executive. The *Card Executive 2.0 for NT Supported PC Card List* provides a detailed list of those PC cards supported for:

- Hot swapping mode
- Point enabler mode

It is very important that you know what mode the card you are using is operating in. The mode for the card is listed in the *Card Executive 2.0 for NT Supported PC Card List*. If the card is operated in the incorrect mode, the system operation will become unstable. If the card you are using is not on the *Card Executive 2.0 for NT Supported PC Card List*, you must assume the card is running in point enabler mode. Of course, it is recommended that you only use cards on the *Card Executive 2.0 for NT Supported PC Card List*.

Hot Swappable Cards

Hot swappable cards are those cards that can be recognized and enabled on a hot insertion. In addition the card can be hot removed without affecting the operation of Windows NT. Also, if you have installed APM 2.0 for NT, then you will be able to properly power manage the notebook system and the PC Card socket.

Cards Recognized in Point Enabler Mode

Cards recognized in point enabler mode are those cards that can be inserted or removed only when the system is shut down. They are recognized only when the system is started again. If you insert or remove a card recognized in point enabler mode while the system is on, the operation of the system will become unstable.

Cards recognized in point enabler mode can not be properly power managed in the system. You must disable power management on your notebook computer if you wish to run a PC Card in point enabler mode.

Card Executive consists of four critical layers of software. These layers give Card Executive the full hot swapping capability for hot swap supported cards. The following are the four software layers in Card Executive:

- Socket Services
- Card Services
- Client Drivers
- Card Executive Control Panel

Socket Services

Card Executive software implements a PC Card compliant Socket Services driver that supports all of the major PC Card controllers on the market today. One socket can be used for all Intel 365 compatible controllers. In addition, Card Executive supports the following controllers:

- Vadem VG469
- Cirrus Logic 6710, 6720, 6729, 6730, 6832
- Texas Instruments 1130 / 1131 / 1250
- O2 Micro OZ6729 / OZ6832 / OZ6836
- Ricoh 465, 466, 476

Two controllers are supported for a maximum of four sockets. If more than one controller is used, each controller must have the same number of sockets.

Card Services

The Card Services layer is required to manage system resources, interact with PC Card client drivers and to assist with the display of card status and information. Client drivers call Card Services functions to implement hot swapping for PC Cards. The Card Services features include:

- PC Card Specification 5.0 compliant (including Proposal 187 extensions)
- 16 bit PC Cards
- 32 bit PC Cards, commonly referred to as CardBus cards
- 3V PC Cards
- DMA
- Dynamic resource management using NT services
- Card Status and Information functions

Client Drivers

The client drivers are specific for each type of PC Card. There are certain client drivers built-in to your Card Executive software. If the driver for your card is not included with the Card Executive package, you must obtain the client driver from the PC Card manufacturer. It is important to know the mode in which the driver for the PC Card is operating in. Card Executive includes “hot swapping mode” client drivers for modems, ATA, SRAM, NE2000 LAN, 3Com LAN, SMC LAN, IBM Token Ring, and Adaptec SCSI PC Cards. You can hot swap these PC Cards; their client drivers are PC Card compatible. A client driver software development kit (SDK) is available for porting of point enabler mode drivers to how swapping mode drivers. Point enabler mode drivers are drivers that only recognize PC Cards that are inserted when the system is off.

Card Executive Control Panel

The Card Executive Control Panel can be used to display status and information about the PC Cards in your notebook’s PC Card sockets. The Card Executive Control Panel can be invoked from the Windows NT Control Panel or by double-clicking the Card Executive icon in the taskbar. Please refer to Chapter 3, *Using the Card Executive Program* for more details on how to use the Card Executive Control Panel.

Chapter 3 Using the Card Executive Program

Using the Card Executive program involves the following procedures:

- Inserting and removing PC Cards
- Monitoring the Card Executive program from Windows NT Taskbar and the Windows NT Control Panel
- Enabling or disabling configuration messages

Inserting and Removing a PC Card from the System

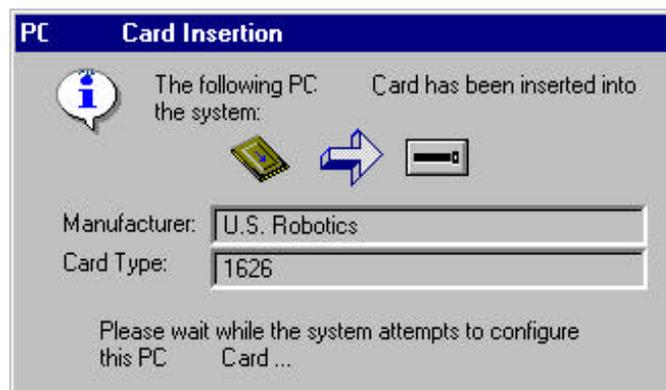
For certain cards, you can either insert or remove a card from your portable system without powering off the system. This procedure is referred to as “hot swapping.” If you are not using a card that can be hot-swapped, you must power off the system before inserting the card. For a list of cards that can be hot-swapped, refer to the *Card Executive 2.0 for NT Supported Card List*.

Inserting a PC Card in the System

To insert a PC Card in to your portable computer, grasp the card at the outer edges and insert the card into an empty slot. Card Executive displays the PC Card Insertion dialog box with a message indicating that the card has been inserted.

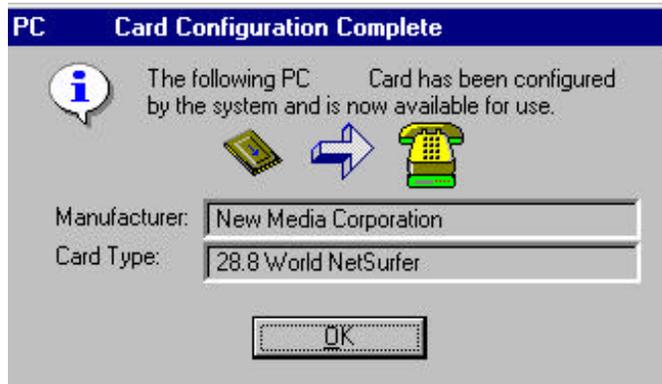
The name of the card manufacturer and the card type are displayed as the system attempts to find the correct driver to configure the card. Each card has its own icon. There are different icons for ATA / SRAM cards, LAN cards, SCSI cards, modem cards, and all other cards.

Figure 6. PC Card Insertion Dialog Box



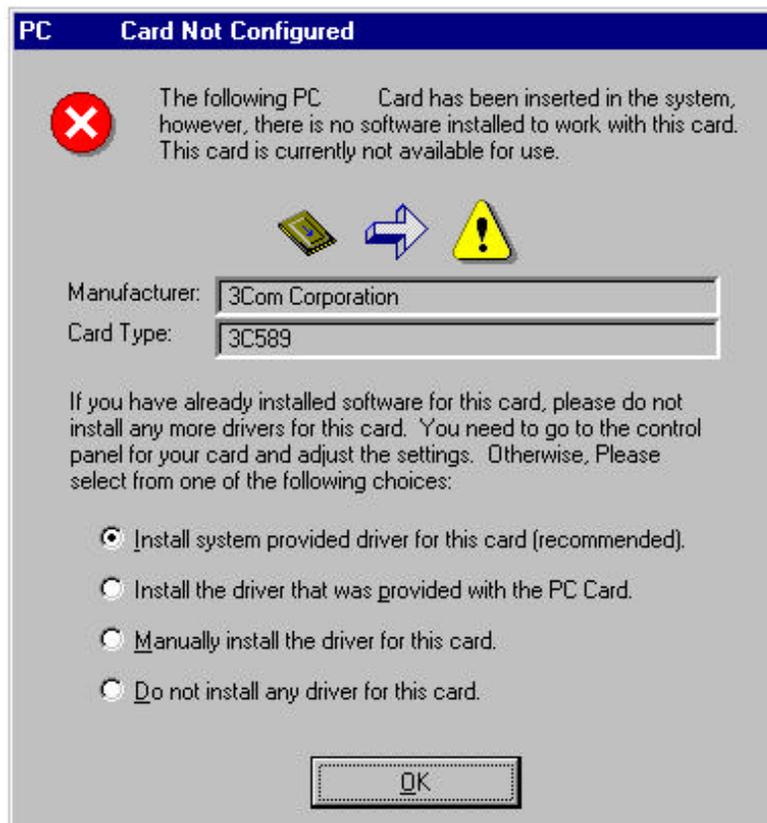
If the card has been configured properly by a client driver, the PC Card Configuration Complete dialog box is displayed with a message indicating the card is ready for use by the system. The card type icon indicates the type of card detected by the software. Figure 7 shows the PC Card Configuration dialog box.

Figure 7. PC Card Configuration Complete Dialog Box



If the Card Executive software cannot find a client driver already installed for use with this card, the PC Card Not Configured dialog box appears. See Figure 8. A message is displayed indicating the card is not configured. You can automatically install PC Card driver software from this dialog box.

Figure 8. PC Card Not Configured Dialog Box



Installing PC Card Software

When you install a new PC Card into the PC Card socket, the dialog box shown in Figure 8 will be displayed. From this dialog box, you can automatically install the driver for the PC Card inserted. You can select from the following choices.

Note: Some options may be disabled based on the drivers available.

1. **Install system provided driver for this card (recommended).** This is the recommended selection. You can use this selection to automatically install the driver for the card. After making this selection, you may be prompted to provide certain information such as the directory name. Follow the directions given for the card driver you are trying to install. Whenever possible, use the default selection to minimize configuration issues.

If Card Executive detects a conflict in configuration settings of the driver, Card Executive will inform you of a driver error, and it will let you try different driver settings.

2. **Install the driver that was provided with the PC Card.** You can use this option if you wish to use the driver provided with the PC Card instead of the system provided driver. In some cases, the driver provided with the PC Card may be a newer driver than that provided by Card Executive 2.0. Contact your PC Card manufacturer for more information.

If you select this option, you must insert the PC Card driver diskette in drive A: and click OK. You may be prompted to provide certain information such as path names. Follow the directions given for the card driver you are installing. Whenever possible, use the default selection to minimize configuration issues.

If Card Executive 2.0 detects a conflict in configuration settings of the driver, Card Executive 2.0 will inform you of a driver error and let you try different driver settings.

3. **Manually install the driver for this card.** This selection is only recommended for advanced users who have extensive experience with installing device software under Windows NT. If you select this option, you will have to select the type of PC Card you are installing. Card Executive will display the appropriate control panel for the type of PC Card you have inserted. Manually install the driver from the control panel.

Note: Card Executive will not be able to effectively determine if you make configuration errors while installing the driver. If the card does not work properly, you will need to adjust the configuration settings manually.

4. **Do not install any driver for this card.** If you make this selection, the driver installation process will be aborted.

Removing a PC Card from the System

You can only remove cards that are operating in the “hot swapping” mode. Please refer to the *Card Executive 2.0 for NT Supported Card List* to find out if the card you are using is a “hot swappable” card. If you remove a card that is not operating in the “hot swapping” mode, your system will become unstable. When you remove a “hot swapping” card from the system, the PC Card Removal Complete dialog box shown in Figure 9 is displayed. All of the insertion, removal, or configuration dialog boxes can be enabled or disabled through the Settings tab in the Card Executive 2.0 for NT Control Panel.

Figure 9. PC Card Removal Complete Dialog Box

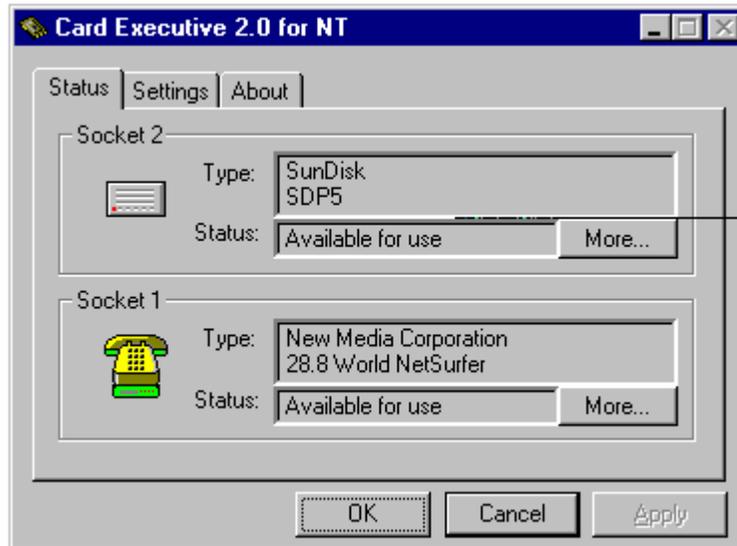


Monitoring the Card Executive Program

You can monitor the status of the Card Executive program from the Windows NT Taskbar or from the Card Executive 2.0 for NT Control Panel.

To monitor the status of the Card Executive program from the Windows for NT Control Panel:

1. From the Windows NT **START** menu, choose **Settings** and then **Control Panel**. The Windows NT Control Panel appears.
2. Double-click the **Card Executive** icon. The Card Executive 2.0 for NT Control Panel appears. See Figure 10.

Figure 10. Card Executive Control Panel Showing the Status Tab

To monitor the status from the Taskbar:

1. Move the cursor over the Card Executive icon in the Windows NT Taskbar. The type of cards in the PC Card sockets are displayed in the tooltip that appears in a balloon above the icon. Figure 11 shows the Card Executive icon in the Windows NT Taskbar. If no card is inserted, the word “empty” appears instead in a balloon above the icon.

Figure 11. Card Executive Icon in the Windows NT Taskbar

2. Double-click the icon to display the status of the cards. The Card Executive control panel appears showing the card manufacturer, card name and type, and whether the card is available for use. See Figure 10.

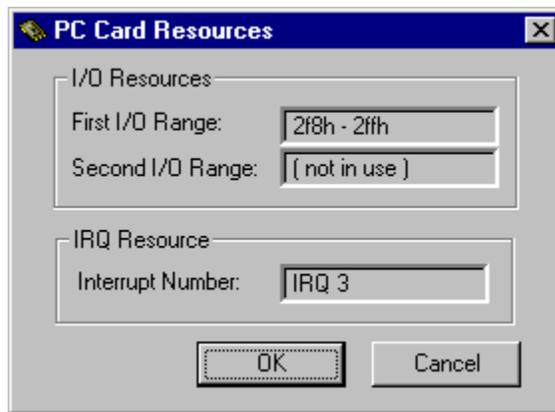
Up to four sockets are supported by the software. Note that the card manufacturer and product name are read from the PC Card’s CIS structure. If the status of the card is “Not Available for Use”, then the driver for the PC Card is not properly installed or configured. In this case, you should go to the Control Panel for the type of card present, and install the driver for the card, or reconfigure the driver if it is already installed. If the status is “Available For Use,” then the card is properly configured and can be used in the system. When a card is “Available For Use,” you can also display the resources being used by the card.

Displaying PC Card Resources

The resources being used by a PC Card can be displayed in the Card Executive Control Panel. The PC Card should be configured and the status should be “Available for Use.” To display card resources for a given PC Card:

1. Double-click the **Shortcut to Card Executive** from the desktop or double-click the **Card Executive** icon from the Windows NT Control Panel. The Card Executive 2.0 for NT Control Panel appears. See Figure 10.
2. Choose the **Status** tab.
3. Click the **More...** button of the PC Card for which you want to display resources. The PC Card Resources dialog box is displayed. See Figure 12. The following resource information is listed:
 - I/O resources, range of I/O resources used
 - IRQ resources, interrupt number used

Figure 12. Card Executive Resources Dialog Box



Enabling or Disabling Card Executive Settings

You can enable or disable Card Executive settings to:

- Display information status messages
- Display the Card Executive icon in the taskbar
- Use modem cards

Enabling or Disabling System Messages

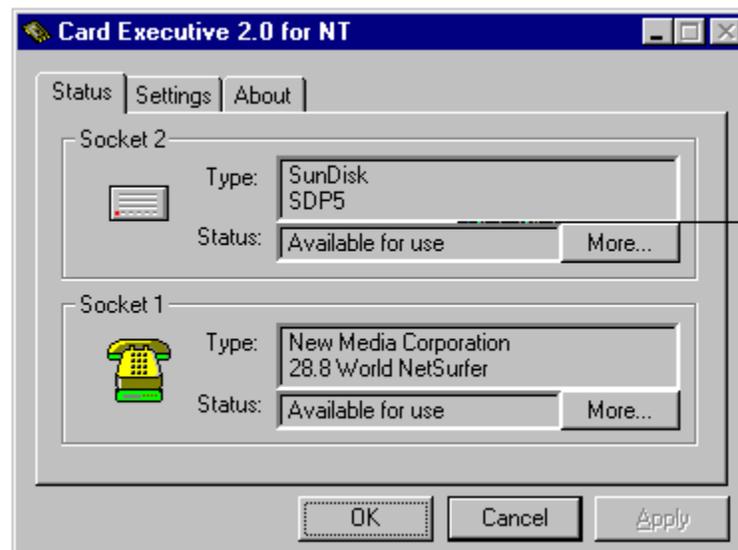
System messages are displayed when the system is started or when activity occurs after the portable has been in an idle state. You can enable or disable the messages that appear about cards when:

- The system is started
- A card is either inserted or removed while the system is running
- Power management related messages
- Audio for all the messages

To enable or disable the information messages:

1. Double-click the **Shortcut to Card Executive** from the desktop or double-click the **Card Executive** icon from the Windows NT Control Panel. The Card Executive 2.0 for NT Control Panel appears.

Figure 13. Card Executive 2.0 for NT Control Panel



2. Choose the **Settings** tab. The General Settings displayed by Card Executive are listed. See Figure 14.

Figure 14. Card Executive 2.0 for NT Control Panel Showing the Settings Tab



3. Check or uncheck the General Settings you want to appear while you use the system. For example, if you want to enable insertion and configuration messages to appear when the system is started, the Enable insertion/configuration messages at bootup setting should be checked. These informational messages will appear when cards are inserted when the system starts. See Figures 6-9.

Showing the Card Executive icon in the taskbar

The last General Setting show in Figure 14 allows you to add or remove the Card Executive icon in the taskbar. To add or remove the icon to the taskbar:

1. Check or uncheck the “Show icon in taskbar” setting. Check the box to show the icon, and uncheck the box to remove the icon
2. Click **Apply** to activate the setting.

Selecting the COM Port for Modem Cards

You can select the COM port that will be assigned to the modem cards inserted in the system, based on insertion order or socket order. If the COM port is unavailable — for example, if the port is being used by motherboard devices, the port is grayed and cannot be selected.

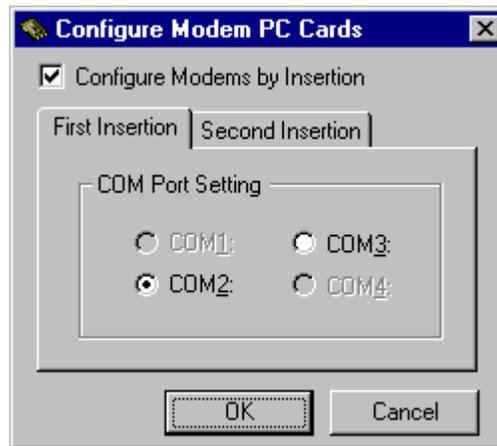
To configure the modem card by insertion:

1. Double-click on the **Card Executive** icon in the Windows NT Control Panel or the **Card Executive** shortcut icon on the desktop. See Figure 15.

Figure 15. Shortcut to Card Executive Desktop Icon

The Card Executive 2.0 for NT Control Panel appears. See Figure 10.

2. Choose the **Settings** tab.
3. Click the **Configure Modems...** button. The Configure Modem PC Cards dialog box appears. See Figure 16.

Figure 16. Configure Modem PC Cards Dialog Box

3. Check the **Configure Modem by Insertion** setting. The title of the tab changes to First Insertion.
4. Choose the COM port setting you want the card to use and click the **OK** button. The card will use that port when first inserted into the portable.

To configure the modem by socket order:

1. Repeat steps 1 and 2 from the procedure.
2. Uncheck the **Configure by Insertion** setting. The title of the tab changes to the socket you are configuring.
3. Check the COM port setting you want the card to use and click the **OK** button

Running PC Card Diagnostics

If a PC Card does not function in your system, you can use the PC Card Diagnostics program to determine the source of the problem. The PC Card Diagnostics program attempts to resolve any interrupt conflicts that might exist in your system. Interrupt conflicts are the primary cause of PC Card-related problems in portable computers. If you run the PC Card Diagnostics program and your card still does not function, contact your PC Card manufacturer. Note that you *must* remove any installed cards before running the PC Card Diagnostics program.

To run PC Card Diagnostics, follow these steps:

1. Double-click the Shortcut to Card Executive from the desktop or double-click the Card Executive icon from the Windows NT Control Panel. The Card Executive 2.0 for NT Control Panel appears.
2. Choose the Settings tab.
3. Click the **Run Diagnostics...** button. The PC Card Diagnostic wizard page appears.
4. Follow the PC Card Diagnostic wizard's instructions to complete running the PC Card Diagnostics. After running the PC Card Diagnostics, click finish. The system will reboot automatically.

Note: Before running the PC Card Diagnostics, be sure to save any open files or documents.

Figure 17. PC Card Diagnostics Wizard



Chapter 4 Power Management Support

The Card Executive 2.0 for NT software works with the Power Management software to power-manage PC Cards in the PC Card sockets of the notebook computer. With power management, PC Cards can operate in one of three modes:

- Suspend mode
- Resume mode
- Point-enabled mode

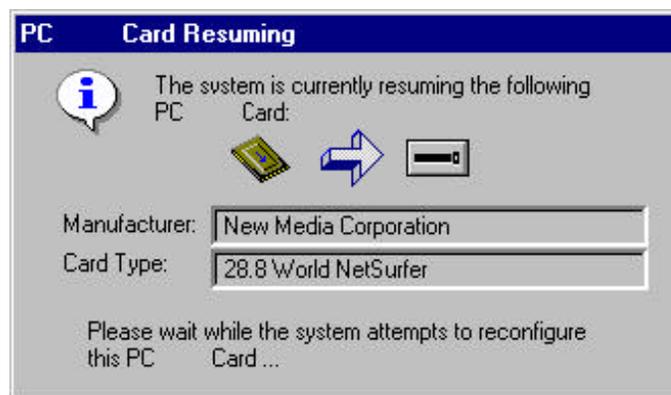
Cards Operating in Suspend Mode

When the notebook computer is in suspend mode, the PC Card socket is powered off. This event allows the maximum power savings in suspend mode.

Cards Operating in Resume Mode

When the system is resumed, the card is *logically* removed and then inserted again into the system. The PC Card Resuming dialog box is displayed on the screen. See Figure 18.

Figure 18. PC Card Resuming Dialog Box



When the card is logically inserted again into the system, this event causes the card to be reconfigured. The Card Executive software again searches for the correct driver to reconfigure the card. When the card is reconfigured, the PC Card Resume Complete dialog box is displayed. See Figure 19.

Figure 19. PC Card Resume Complete Dialog Box



Cards Operating in Point-Enabled Mode

Cards that operating in point-enabled mode use a piece of PC Card software that accesses the PC Card and PCMCIA controller directly. The PC Card software bypasses Card Services to recognize and configure PC Cards. Cards operating in point-enabled mode cannot be inserted or removed from the system unless the system is powered off. Also, these cards can not function properly with power management. You must disable your notebook's power management capability to properly use cards operating in point enabled mode.

Glossary

BIOS

The Basic Input Output System, or BIOS, is software built into a system, specifically in some type of read-only memory (ROM) device. The primary purpose of the BIOS is to test and initialize the system components and then to boot the operating system. The BIOS also provides the low-level input/output service routines for the various peripheral device connected to the computer. The BIOS can provide additional functionality to the system such as the support required for plug and play.

Card Services

The highest services level of the PC Card specifications responsible for resource and client management.

Device Driver

A program that interfaces I/O to a device. *See also, Driver.*

Driver

A software program that links a peripheral device with an operation system by translating and transmitting data so that the operating system knows how to handle the peripheral device. A driver is also referred to as a device driver.

Hot Swapping

The process of inserting or removing a PC Card into a PC Card slot while the computer system is running.

PCMCIA

Personal Computer Memory Card International Association – The organization of marketing and engineering professionals that defines the architecture of PCMCIA.

Plug and Play

An architecture designed by Compaq, Intel, and Microsoft that allows adapter cards to be configured instead of through dip switches and jumpers. Plug and play allows for devices in a system to be assigned resources— for example, hardware interrupts and I/O address space, without conflicting with other devices. Generally plug and play requires that devices support several possible resource configurations, in addition to system software, capable of controlling the device configuration.

Slot

See socket.

Point Enabler

A piece of PCMCIA software that accesses the PC Card and PCMCIA controller directly, bypassing Card Services, to recognize and configure PC Cards.

Socket

The receptacle into which PC Cards are inserted that connects them to the PC Card bus. A socket ensures proper PC Card matching.

Suspend

Suspend is a power-managed state in which the system devices are either powered off or consuming very little power.

Warm Boot

The process of reinitializing a computer system from a fully powered mode. In PCs, reinitializing a computer system is usually accomplished by pressing the Ctrl-Alt-Del keys simultaneously. Only a subset of system components is initialized during a warm boot.

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