

*Phoenix*<sup>®</sup>



APM 2.0 for NT  
User's Guide

Version 1.5

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When referring to this document, please refer to the title, APM 2.0 for Windows NT, Version 1.5 and publication date, August, 1997. For additional information about Phoenix products, visit our World Wide Web site at <http://www.phoenix.com>.

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# *Introduction*

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APM 2.0 for NT provides power management functionality for Windows NT 4.0 (also referred to as Windows NT in this document). A BIOS-independent power management solution, APM 2.0 helps to extend a portable computer's battery life and, thus, increase productivity. Fundamentally, APM 2.0 for NT provides BIOS independent power management under Windows NT 4.0. In addition, power manageable applications under Windows 95 are now power manageable under Windows NT.

APM 2.0 for NT displays a convenient graphical user interface that lets you access a variety of power management functions. By glancing at a single dialog box, you can quickly see if your computer's battery is reaching a critically low level. If your system supports two batteries, you can switch to the second battery with the click of a tab.

Offering functionality similar to Microsoft's built-in support for Windows 95, APM 2.0 for NT can be run alone or in conjunction with Phoenix Technologies' products for Windows NT. For example, you can install Card Executive™ 2.0 for NT which supports hot swapping PC Cards under Windows NT.

## *Summary of Features*

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Because APM 2.0 for NT is able to run on any notebook computer using an APM-aware BIOS, APM 2.0 for NT offers several advantages that the native Windows NT system doesn't provide. Specifically, APM 2.0 for NT provides the following functionality.

- Handles power management events and messages
- Detects when the system is idle and saves the battery life during these periods
- Broadcasts power management messages to applications
- Updates the system date and time when resuming from Suspend or Save to Disk mode
- Complies with the Win32 power management API requirements
- Provides a seamless 32-bit APM connection with the 32-bit Windows NT services
- Complies with APM Specifications, versions 1.0, 1.1, and 1.2
- Provides German, French, Italian, Spanish, and Japanese international language support

## *Audience*

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

- Use Windows 95 power management features on their NT machines
- Configure their machines to achieve maximum power management use of system devices

- Implement a BIOS-independent power management solution

## Contents of this Manual

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This APM 2.0 for NT User's Guide contains the following chapters.

**Chapter 1 Installing APM:** describes how to install the product and defines system requirements.

**Chapter 2 Using APM 2.0 for NT:** describes the basic features of the APM Windows user interface.

**Chapter 3 Power Management Modes:** describes the power management modes and how component devices can be power managed.

**Appendix A Keyboard Shortcuts:** describes the shortcut keys you can use to activate APM 2.0 for NT power management settings and messages.

**Appendix B APM 2.0 for NT Drivers and Messages:** describes the power management device drivers that APM 2.0 for NT installs and messages you might encounter as you install and run APM 2.0 for NT.

**Glossary:** includes definitions for various terms used in this manual.

## Conventions and Typefaces Used in This Manual

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Choose	Within this manual, the term <i>choose</i> means to select a menu item by highlighting it with the cursor and pressing <b>&lt;Enter&gt;</b> or clicking on it.
<b>SETUP &lt;Enter&gt;</b>	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 <b>A:\SETUP</b> to install a program).
<b>KEY1+KEY2</b>	This indicates a command that requires you press <b>KEY1</b> and hold it down as you press <b>KEY2</b> .
<b>Bold text</b>	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.
SETUP.EXE	Within text, capital letters represent the names of files and directories.



This icon indicates material you should take special notice of.

## Related Documentation

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

- *Card Executive 2.0 for NT User's Guide*, Phoenix Technologies Ltd., June, 1997
- *Card Executive for NT Supported PC Card List*, August, 1997

## *Additional Information*

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For additional information about APM 2.0 for NT as well as other Phoenix products, visit our World Wide Web home page at <http://www.phoenix.com>.



# Chapter 1 Installing APM 2.0 for NT

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Installing APM 2.0 for NT is a simple procedure. The installation program automatically installs the application, configures your system, and loads several drivers that APM 2.0 for NT needs to obtain power management information. Once you have installed APM 2.0 for NT, you can also install additional Phoenix Technologies' Windows NT software.

## System Requirements

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The recommended minimum system for running APM 2.0 for NT includes the following components:

- Windows NT 4.0

## Installing APM 2.0 for NT

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To install APM 2.0 for NT on your Windows NT system, follow these steps:

1. Insert the APM 2.0 for NT installation disk in the floppy disk drive.
2. Click the **Start** button on the Windows NT taskbar.
3. Choose **Run** from the Windows NT Start menu.
4. Type: **A: SETUP . EXE**

The APM 2.0 for NT installation program automatically installs the necessary system files. Once you have APM 2.0 for NT installed, you're ready to use the application.

## Un-installing APM 2.0 for NT

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To un-install APM 2.0 for NT, if you have already installed APM 2.0 for NT on your Windows NT system, follow these steps:

1. Insert Disk 1 of the APM 2.0 for NT into the floppy disk drive. **Note:** If you are using a CD-ROM to install the software, insert the CD-ROM and run **UNINSTL.EXE** from the appropriate path.
2. Click the **Start** button on the Windows NT taskbar.
3. Choose **Run** from the Windows NT Start menu.
4. Type **A: \UNINSTL . EXE** where A: is the name of the floppy disk drive. **Note:** If you are using a CD-ROM to install the software, use the drive letter of the CD-ROM instead of A:.

5. After **UNINSTL.EXE** is finished executing, reboot your system to completely remove APM 2.0 for NT.

The un-installation program doesn't automatically remove any shortcuts that you may have created while running APM 2.0 for NT. You must manually remove any shortcuts to the APM 2.0 for NT program by dragging the shortcut to the Recycle Bin.

## *Upgrading Windows NT*

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If you are using APM 2.0 for NT, then you need to follow specific procedures when you upgrade Windows NT. If you upgrade your system from Windows NT 3.51 to Windows NT 4.0, or if you install Windows NT Services Packs, follow these steps:

1. Insert the APM 2.0 for NT installation disk in the floppy disk drive.
2. Click the **Start** button on the Windows NT taskbar.
3. Choose **Run** from the Windows NT Start menu.
4. Insert Disk 1 and type: **A:\UNINSTL.EXE**. **Note:** If you are using a CD-ROM to install the software, then insert the CD-ROM and run **UNINSTL.EXE** from the appropriate path. The APM 2.0 for NT installation program will detect that APM 2.0 for NT is already installed and will prompt you to un-install the software in preparation for the upgrade. Follow the instructions on your screen for un-installing APM 2.0 for NT.
5. After **UNINSTL.EXE** has finished executing, reboot your system to prepare APM 2.0 for NT for the Windows NT upgrade.
6. Upgrade Windows NT using the procedure outlined in the Windows NT User's Manual.
7. After the Windows NT upgrade is complete, reboot your machine.
8. Re-install APM 2.0 for NT software as described in the section "Installing APM 2.0 for NT" above.
9. After APM 2.0 for NT is installed, reboot your machine to re-activate APM 2.0 for NT.

## *Verifying Information About APM 2.0 for NT*

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The APM 2.0 for NT installation program places an APM 2.0 for NT icon in the Windows NT Control Panel. To view platform and version information about APM 2.0 for NT, follow these steps:

1. Click **Start**, point to **Settings**, and click **Control Panel** to display the Windows NT Control Panel.
2. From the Windows NT Control Panel, left-click on the APM 2.0 for NT icon to open the APM 2.0 for NT dialog box. (You can also right-click on the APM 2.0 for NT icon to open the APM 2.0 for NT drop-down menu. Then choose **Open** from the APM 2.0 for NT menu.)
3. Click the About tab to display the About page.

The About page tells you the version of APM you are running and identifies your operating system version and platform.

Figure 1. APM 2.0 for NT About Page



## *Configuring a Shortcut APM 2.0 for NT Desktop Icon*

Although you can access the APM 2.0 for NT tabbed dialog boxes by clicking the taskbar icon, you can also configure a shortcut icon on the Windows NT desktop. To configure the Shortcut to the APM 2.0 for NT desktop icon, follow these steps:

1. From the Windows NT Control Panel, right-click on the APM 2.0 for NT icon. 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 **Yes** to create a shortcut icon appears on the Windows NT desktop.

**Figure 2. APM  
2.0 for NT  
Desktop Icon**



## *Using the Shortcut APM 2.0 for NT Desktop Icon*

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You can use the APM 2.0 for NT shortcut icon on the Windows NT desktop to

- Access the APM 2.0 for NT tabbed dialog boxes
- Display the Shortcut icon's properties and change the icon that appears on the desktop

To access the APM tabbed dialog boxes from the desktop,

1. Double-click the APM 2.0 for NT icon, or
2. From the APM dialog box, double-click on the Power Status tab to view the current power management status of your system.

See Chapter 2 for a description of the APM 2.0 for NT Power Status information.

## *Additional Phoenix Products for Windows NT*

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For information about additional Phoenix products for Windows NT, visit our Web site or refer to the documents listed in the "Related Documentation Section" in the Introduction of this manual.

# Chapter 2 Using APM 2.0 for NT

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APM 2.0 for NT gathers critical information from your portable computer, processes it, and displays the information on the screen in a format that's easy to understand. Designed to familiarize you with the main features of the APM 2.0 for NT user interface, this chapter:

- Describes the taskbar icon
- Describes the tabbed dialog boxes
- Describes the power management features

To view the tabbed dialog boxes,

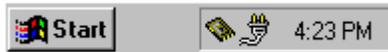
- Double-click the left mouse button on the power management icon on the tasktray, or
- Double-click the left mouse button on the APM desktop icon

## Using the Power Management Taskbar Icon

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The user interface consists of a power management icon on the tasktray as well as the tabbed dialog boxes displaying power management controls and settings.

**Figure 3. Power Management Icon**



## Battery Icon Display

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The power management taskbar icon changes according to the system's power status. If a portable computer is running on AC power, the taskbar icon consists of a power cord. If a portable computer is running on battery power, the power management icon consists of a battery which displays the battery level. The color of the battery changes from green to yellow and to red as the battery diminishes in capacity from 70 percent to 20 percent to less than 20 percent. The following table indicates the relationship between the color of the battery icon and the capacity of the battery.

**Table 1. Battery Icon Display**

Color	Percent of charge remaining
Green	100% to 70%
Yellow	69% to 20%
Red	Less than 20%

From the Windows NT taskbar, you can perform the following tasks:

- Position the mouse pointer over the taskbar icon to display battery information as a tooltip
- Double click the left mouse button to display the APM 2.0 for NT Control Panel, or
- Double click the right mouse button to enter Suspend mode

### *Power Management Taskbar Icon Tooltip*

---

If the AC adapter is plugged into the portable computer, the power management icon consists of a plug plus a power cord. The power management icon tooltip displays the following battery information when the mouse pointer moves over the icon:

- Percent of battery capacity remaining
- Time remaining until the battery is fully discharged, if available
- Charging status - high, low, or critical

## *Viewing the Power Management Information*

---

Once you open APM 2.0 for NT, you can easily navigate through the individual tabbed pages. Some of the pages function as dialog boxes in which you can select power management options; others display power management information. To access the APM 2.0 for NT tabbed pages,

- Double-click the left mouse button on the APM 2.0 for NT desktop or shortcut icon,
- Right-click on the APM 2.0 for NT desktop icon and choose **Open** from the APM 2.0 for NT menu, or
- Double-click the left mouse button on the APM 2.0 for NT icon in the tasktray.

Click the folder tabs to move through the APM 2.0 for NT power management dialog boxes.

Figure 4. APM 2.0 for NT Power Management Dialog Box



## Viewing Power Status Information

The Power Status page displays the System and Battery Status information. Depending on the number of batteries your system supports, APM 2.0 for NT displays one or more battery property tabs. If your system's BIOS is APM 1.2 compliant, you can view the status of more than one battery.

### System Status Information

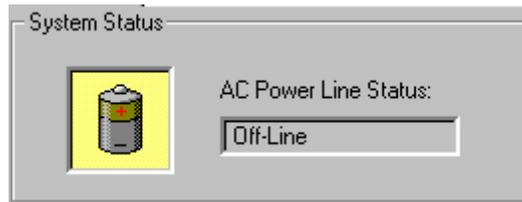
If your system is attached to an AC power supply,

- A plug icon is displayed to the left of the AC Power Line Status box, and
- The AC Power Line Status indicates that the computer is on-line.

If your system is running on battery power,

- A battery icon is displayed to the left of the AC Power Line Status box, and
- The AC Power Line Status indicates that the system is off-line.

**Figure 5. System Battery Status**



## *Battery Status Information*

---

By glancing at the Battery Status section of the Power Status page, you can quickly tell the overall status of your portable computer's batteries. APM 2.0 for NT presents battery information in numerical, graphical, and text format. As the status of the battery changes, the information is updated dynamically.

For each battery, APM 2.0 for NT

- Displays percent of battery capacity remaining until the battery is fully drained,
- Graphically represents the percent of battery capacity remaining on a horizontal battery gauge, and
- Indicates whether the battery's overall status is charging, high, low, or critical.

On certain portable computers, APM 2.0 for NT also calculates the estimated battery time remaining before the battery is fully drained and displays this information in hours and minutes. Whether this feature is available depends on your notebook computer.

As the battery discharges,

- The background color on the Percent of Charge Remaining box gradually changes from green to yellow to red, and
- The horizontal battery gauge empties from right to left.

The description of the battery's status helps to ensure that your system is operating as desired. For example, when your computer is plugged into an AC power supply, and the battery is not fully charged, the battery's status should indicate that the battery is charging. If this message is not displayed, then check the AC line connection to your portable computer.

As you glance at the gauge, you can quickly see the status of your system's battery and replace the battery before it becomes completely discharged. If your system supports two batteries, you can see the status of the second battery simply by clicking the Secondary battery tab.

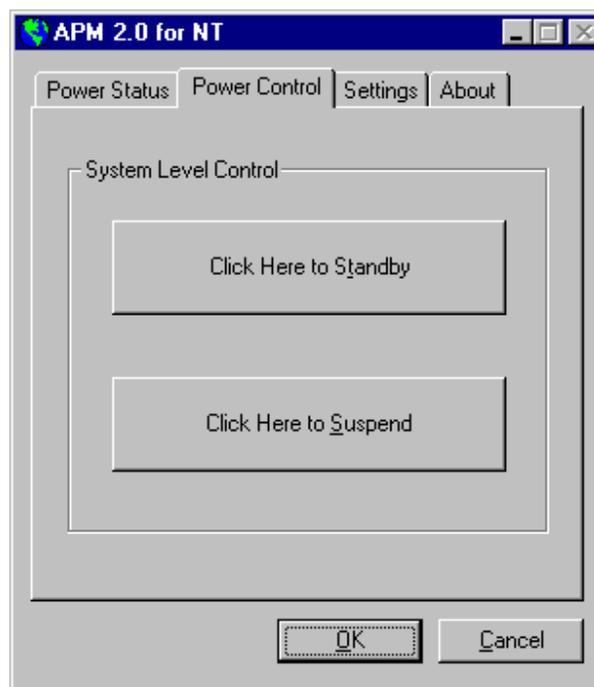
## Changing System Power Modes

The Power Control page lets you change system power modes. Two system power modes are available.

- Click System Standby to activate Standby mode.
- Click Suspend to activate Suspend mode

**NOTE:** Not all portable computers support the System Standby mode.

**Figure 6. Power Control Dialog Box**



Refer to Chapter 3 for detailed information about power management modes available on your system.

## Changing System Power Settings

The Settings dialog box lets you change system power settings and enable system power management messages. You can activate one or more of the following options:

- Power management level
- Low battery warning
- Confirmation message about System Suspend

**Figure 7. Power Management Settings Dialog Box**



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### *Selecting Power Management Levels*

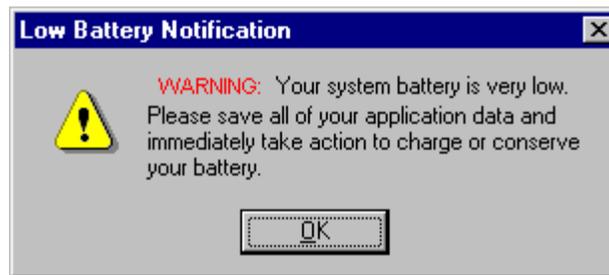
Power management includes three levels:

- Advanced - APM 2.0 for NT and the BIOS work together to achieve maximum system power savings.
- Standard - Only the BIOS provides power management services.
- Off - Power management mode is disabled, and no power management is in effect. The system continues to use full power for all devices.

---

### *Activating the Low Battery Warning Message*

If you want to receive a warning message when your system's battery capacity is at a critical level, check the Enable Low Battery Warning power setting. When the message appears, click OK to close the message box. This message serves as a reminder that the battery needs to be replaced before valuable information is lost. When this message appears, you could have less than 10 minutes to replace the battery or to save any documents you are writing before you power down the computer.

**Figure 8. Low Battery Warning Message**

### *Confirming System Suspend Mode*

On certain portable computers you have the ability to enable the System Suspend confirmation message from the Settings property page. If you enable the System Suspend message from the Settings property page, APM 2.0 for NT displays a notification message before your system enters Suspend mode. When this message appears,

- Click Suspend to enter Suspend mode
- Click Cancel to resume normal system operation

If this message is ignored, the system automatically enters Suspend mode after 59 seconds have elapsed since the message first appeared. (**Note:** On some systems, you may have fewer than 59 seconds before the system enters Suspend mode.) Refer to Chapter 3 for detailed information about Suspend mode.

**Figure 9. System Suspend Confirmation Message**



# Chapter 3 Power Management Modes

---

From the user interface, you can select the power management modes that APM 2.0 for NT implements. This chapter describes the power management modes your system uses when APM 2.0 for NT is installed and the types of components that can be power managed. Depending on the configuration of your system, different devices can be power managed.

APM 2.0 for NT provides both system-wide power management and automatic component power management. System-wide power management involves controlling the power usage of the system as a whole by changing the power consumption based on inactivity timers. Component power management, such as device Standby, provides power control of individual components. Management of high-powered components such as the video subsystem and the hard disk motor contribute significantly to power savings.

When using APM 2.0 for NT, you have the ability to control system-wide power management through the APM 2.0 for NT Control Panel. Component power management settings are handled in the BIOS setup screen for your notebook computer. For information about your computer's setup options, refer to your notebook computer's user manual.

## System Power Management

---

A system having power management capabilities can control power to devices in order to achieve maximum performance and extend battery life.

APM 2.0 for NT communicates with the power management component in the BIOS in order to control power to various devices, such as the parallel and serial ports, hard disk drive, video/LCD, and PC Card slots.

### On Mode

---

The default system mode, On mode is the normal state of the system. If power management is disabled, the system remains in this state until power is turned off. The CPU runs at the speed specified in the BIOS SETUP screen. Each component operates according to the power consumption constraints specified in the BIOS SETUP screen.

### Idle Mode

---

Triggered by a lack of CPU and system activity, idle mode is a system mode that automatically switches CPU speed. When system activity is detected, the CPU runs at the maximum speed specified in the BIOS SETUP screen. When no system activity occurs, the CPU speed is automatically dropped to an idle speed which is also referred to as CPU Idle.

APM 2.0 for NT communicates with the APM BIOS's idle function to slow or stop the processor clock during any CPU idle periods.

## *Standby Mode*

---

Triggered by lack of system or device activity, Standby controls the power to specific OEM-defined devices. The devices can include keyboard, CPU, video subsystem, mouse, hard drive, floppy drive, serial and parallel ports, and PCMCIA slots. When the system enters Standby mode, the hard disk and video enter a low power state, and the CPU clock and the processor are stopped.

Standby attempts to reduce maximum power consumed by the system short of a full system Suspend. The CPU clock is reduced to the Standby CPU speed specified in the BIOS SETUP or, system permitting, the CPU clock is stopped. Any system activity returns the system to the power ON state.

**NOTE:** Certain notebook computers may not support Standby mode. Refer to your computer's user manual for instructions on settings the Standby timeout and other device timeouts.

## *Suspend Mode*

---

Triggered by no system activity, low battery, or user request through hardware or software, Suspend mode occurs if the Auto Suspend timer times out. Suspend can also automatically be entered when a very low battery is detected. In addition, the user may force the system to enter Suspend at any time by pressing the Suspend/Resume HotKey.

When the system enters Suspend mode, it either saves the system to DRAM (Standard mode) or to disk.

After the user presses the Suspend/Resume key, the system returns to the full power on state from Suspend mode within a few seconds. Upon a request to resume, the BIOS restores the states of all the devices and returns control to the application that was currently active when the system entered Suspend mode.

Currently, under Windows NT, system time is not updated after the computer resumes from Suspend mode. As a result, when the computer resumes from Suspend mode, the system time that's displayed on screen and used to time-stamp files is inaccurate. However, APM 2.0 for NT conveniently updates the time stamp for all applications and files.

## *Save to Disk Mode*

---

Triggered by no system activity, a low battery, or a user's request, Save to Disk is the ultimate power-saving state because all power is removed from the system when in this state. All CPU, DRAM, and peripheral device data is saved to the hard disk, and the system is power off. When power is turned back on, the system is restored to the exact point where it was when power was turned off.

## *Off Mode*

---

Triggered by user action or Save to Disk, Off mode prevents all power from being supplied to the system. Pressing the power on button restores power to the system.

## *Component Power Management*

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When the system enters Standby mode, various component devices can be power managed depending on the configuration of the individual system. This section describes a generic type of component power management. Please refer to your portable computer's user manual to find out which components can be power managed and how to set the timeouts for each device.

### *Disk Subsystem*

---

A user defined timeout value determines the amount of time the hard disk drive must be idle before the spindle motor is turned off. Any disk access will restart the hard disk motor and bring the disk subsystem back to full power mode. In addition, power to the drive can be completely turned off by the power management application if this control is available in the hardware platform.

### *Video Subsystem*

---

A user defined time-out determines when to power down the video panel and backlight. The power state is controlled by keyboard and/or mouse activity. If no keyboard or mouse activity occurs for the specified time period, the LCD panel and backlight are turned off. They are turned back on by any keyboard or mouse activity. A variety of other video and panel controls can be implemented depending on the hardware design and video BIOS support.

### *Serial Ports*

---

Power management of the Serial ports (COM1 and COM2/Modem) can be enabled by specifying a time-out value. If a time-out value is specified, the port is powered down after the specified time of inactivity is reached. If serial port power management is disabled, power to the port is disabled until a request to access the port is received. Once the port is active, power remains on at all times regardless of the timer value or inactivity.

### *Diskette Drive*

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Power management of the floppy disk can be enabled or disabled. When power management is enabled, the disk drive controller can be placed into low power mode

### *Parallel Port*

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The parallel port power management may be enabled by specifying a time-out value. If parallel port power management is disabled, the port remains active at all times. If a time-out value is specified, the port is powered down after the specified time of inactivity has elapsed.

## Other Devices

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Power management of other devices such as PCMCIA, sound cards, and CD-ROM drives must be supported by the hardware as well as the application software. If PCMCIA power management is supported, APM 2.0 for NT communicates with the Card and Socket Services software to suspend power to the card during a Suspend, and to resume power when the system power is returned. Refer to the *Card Executive Supported PC Card List* for a description of cards that have been tested for power management support with Phoenix's Card Executive for NT.

# Appendix A Keyboard Shortcuts

---

APM 2.0 for NT provides keyboard shortcuts that let you access system commands quickly. You can use the following keyboard shortcuts from the APM 2.0 for NT dialog boxes.

**Table 2. Keyboard Shortcuts**

<b>Shortcut Key</b>	<b>Description</b>
Alt + L	Enables Low Battery Warning
Alt + S	Activates Suspend mode
Alt + T	Activates Standby mode



# Appendix B Power Management Drivers and Messages

This chapter describes the APM 2.0 for NT drivers and driver installation messages. APM 2.0 for NT automatically loads several device drivers that transmit power management information to and from the BIOS. Table 3 lists the device drivers that support power management functionality and enable the APM 2.0 for NT software to communicate with the operating system. Depending on the configuration of your system, one or more of these drivers are installed.

**Table 3. APM 2.0 for NT Drivers**

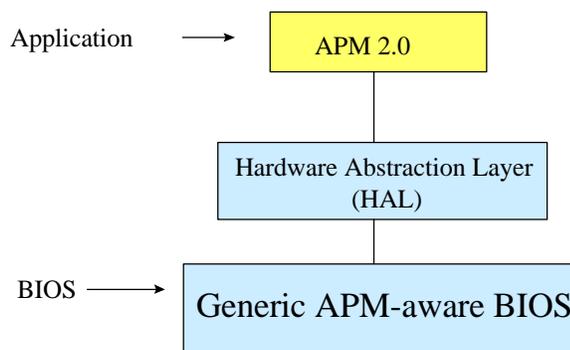
Name	Description
HAL	APM 2.0 for NT installs a customized version of Windows NT Hardware Abstraction Layer (HAL) which, together with the Windows NT kernel drivers, communicates power management messages to the APM BIOS.
POWER.SYS	An APM driver that APM 2.0 for NT installs. POWER.SYS provides communication services between APM 2.0 for NT, the BIOS power management services, and various device drivers
POWER.DLL	APM 2.0 for NT installs POWER.DLL to communication power management events to the Win32 subsystem.
POWER.EXE	APM 2.0 for NT installs POWER.EXE as a application that displays the battery information.

## APM 2.0 for NT Components

APM 2.0 for NT communicates with the Hardware Abstraction Layer (HAL) which interacts with a generic, APM-aware BIOS to implement power management events. The following diagram illustrates the relationship among APM 2.0 for NT, HAL, and the BIOS.

Note that if you decide to install Phoenix's Card Executive for NT so that the PCMCIA sockets can be power managed, APM 2.0 for NT must be installed first. Refer to the *Card Executive for NT User's Guide* for detailed information.

**Figure 10. APM 2.0 for NT Components**



## Driver Installation Messages

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Table 4 lists any driver installation messages you might encounter while installing or running APM 2.0 for NT.

**Table 4. Driver Installation Messages**

<b>Message</b>	<b>Solution</b>
Can not find entry point HALCallAPM32 in HAL.DLL	The HAL file required by APM 2.0 for NT has been replaced by another HAL file. This can typically happen during the upgrade process. Re-run SETUP.EXE and re-install the APM 2.0 for NT software.

# Glossary

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## **Advanced Power Management (APM) BIOS**

A logically-related group of routines that perform power management services, for example, returning battery information. Using APM functionality, the operating system (OS) and the power management (PM) system can communicate so as to reduce power consumption. For example, the OS can request that the PM place the computer in Suspend mode. A system having an APM BIOS can extend battery life and, therefore, enhance productivity.

## **Advanced Power Management (APM) 1.2**

Jointly authored by Intel and Microsoft, the APM Specification 1.2 defines the requirements and functionality of a software layer that supports power management and communicates with power manageable hardware devices. APM 2.0 provides the functionality listed in the APM specification 1.2.

## **Driver**

Also referred to as a device driver, a driver is a set of software routines that enable the operating system to talk to a device such as a printer.

## **Hardware Abstraction Layer (HAL)**

A set of Windows NT drivers designed to communicate power management messages to the APM-aware BIOS.

## **Hot Swap**

The process of inserting and removing a PC Card from a PC card slot while the system is running. The system is able to recognize and configure the card dynamically.

## **Standby Mode**

A mode in which the system saves power and prolongs battery life. In Standby mode, certain system devices, including the keyboard, CPU, video system, mouse, and floppy drive, can be powered down. Any system activity, for example, a modem ring or the press of a key, returns the system to the power on state.

## **Suspend Mode**

A power-saving mode, Suspend mode is triggered by a lack of system activity, a low battery, or a user request via hardware or software. When the system enters Suspend mode, it either saves the system to DRAM (Standard mode) or Save to Disk.



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