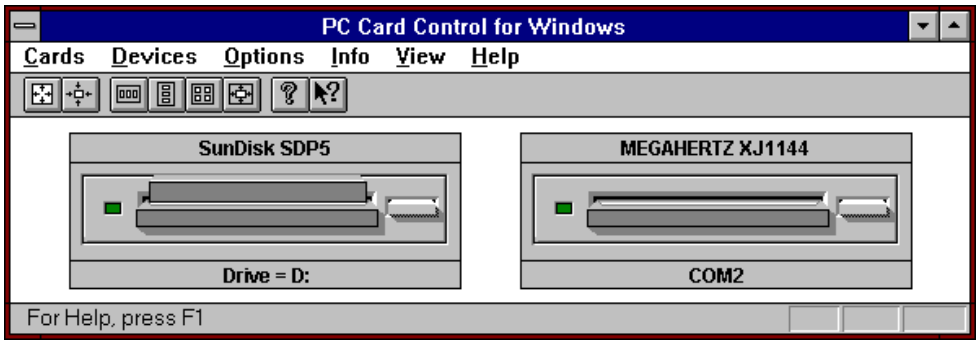
CardWare 2.5

User Manual



AWARD SOFTWARE INTERNATIONAL, INC.

ASIA * NORTH AMERICA * EUROPE

Revision History

Rev.	***Section***	***Description***	***Date***
2.5	New DOS PC card	First Ammended Draft	May 2, 1995
2.0	All	Release	June 6, 1994
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Reference	**Print Date**
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Introduction

What Is CardWare?

CardWare is a PCMCIA 2.10 total software solution. In general, this means that CardWare is designed to painlessly manage the complexity of plugging and unplugging the latest generation PCMCIA cards. Plus, with its advanced memory management, CardWare uses less valuable RAM to free up that vital resource for all of your applications.

More specifically, CardWare is a software package which offers two kinds of services to your PC:

1. CardWare provides an industry standard Application Programming Interface (API). This API allows third party software (network drivers, for instance) to communicate with PCMCIA cards in an orderly manner. The API consists of both Socket and Card Services and complies with revision 2.10 of the PCMCIA specification.

   This level of support requires third party software which can install and configure PCMCIA cards. Such software would then use CardWare services to manage the card(s).

2. CardWare can also install and configure PCMCIA cards on your system. This allows standard software, not just PCMCIA technology specific software, to access the card. This "Generic Installation" of PCMCIA Cards is performed by *PCEnable*.

Additionally, CardWare allows you to use storage cards (Memory Cards and PCMCIA ATA flashdisk and harddisk drives) as if they were normal floppy or hard disk drives. This is accomplished by *PC Disk*.

How to Use This Manual

Chapter 2 describes installing CardWare from within Windows while Chapter 3 describes installing from DOS. Both installations install both Windows and DOS versions of PC Card Control.

Chapter 4 provides an overview of how CardWare interacts with your computer system and your PCMCIA cards.

Chapter 5 discusses various types of PCMCIA cards (also called PC Cards).

Chapters 6 and 7 introduce you to PC Card Control for Windows and DOS, providing detailed instructions for both using PC Card Control and configuring PC Cards.

Finally, Chapter 8 includes several appendices, a troubleshooting section and a glossary.

Note: **Throughout this manual, you will find references to lines required in your CONFIG.SYS. One line in particular will include reference to a device driver described as, Sxxxxxx.exe". This is a generic reference to software which supports a specific type of socket controller: The x are specific to a certain type of controller while S" means Socket Services.**

If you need more detailed information, use CardWare's Online Help (see etting Help" in Chapter 6). This Online Help provides a uick-Tour" designed to cover all your questions as well as to provide index searches for the help you need.

See your Windows documentation for information about how to use Online Help.

A Word about CardWare in DOS and in Windows

Once, installed, CardWare works in the background in both DOS and Microsoft Windows. This means that both DOS and Windows applications can make use of your PCMCIA cards (PC Cards).

A Special Note about Windows

To gain the full benefits of CardWare, you should first familiarize yourself with Windows. This manual assumes you know how to use Windows and uses

Windows specific terminology throughout. For help with Windows, see your Windows documentation.

Mouse Terms

The following terms indicate specific mouse actions:

- ***Point*** means to move the mouse pointer to a specific object.
- ***Press*** means to press and hold down a mouse button.
- ***Release*** means to release a mouse button which is being pressed.
- ***Click*** means to quickly press and release the **left** mouse button while pointing to an object.
- ***Double-Click*** means to rapidly click the **left** mouse button twice while pointing to an object.
- ***Drag*** means to press the **left** mouse button while moving the mouse**.**
- ***Right-Click*** means to click the **right** mouse button while pointing to an object.

Keyboard Terms

The following terms indicate specific keyboard actions:

- ***Press*** means to press and release a specific key on your keyboard.
- ***Type*** indicates that you are to enter specific information on the keyboard.

General Terms

The following general terms are common to both the Windows® and DOS versions of CardWare. One notable difference will be in how Windows® and DOS highlight a letter in a word to indicate a shortcut, usually when the letter is pressed while the alternate key, lt', is also pressed, as in Alt-F. Windows® uses and underline as in iles" while, in DOS, CardWare will color the character differently. We will use the underline in this manual to indicate such a shortcut character.

Menus can have submenus. This means that a menu entry can have a menu of its own. For example, when you open the "Card" menu, you will notice that the menu entry allowing you to edit your PC Card configuration, "Edit...", is followed by three periods, an ellipsis. This indicates that choosing this entry will bring up another menu or window.

Note: **It is common usage to indicate a menu selection by referring also to the menu. For instance, the "Card" entry "Edit" is typically referred to as "Card | Edit". This designation will be used throughout this manual. See hoose" below for an example.**

- ***Choose*** or ***select*** means to pick a specific menu or object using the technique you are most comfortable with. For example, to choose the "Card | Edit" menu you can use either the mouse or the keyboard to open this menu (by pressing ALT+C, then E).

Resources in your package

Your CardWare package contains many resources to help you:

- This User Manual provides basic information about CardWare. Use it as your first information source.
- While using *PC ard Control*, you can press F1 to get Online Help. Use this if you are searching for specific topics or if you need help while using *PC ard Control*. Online Help provides help for nearly every dialog box used by *PC ard.*

Check the CardWare installation directory for a README file. This file contains the latest information about CardWare.

System Requirements

Component	Description
Microprocessor	80386 or higher
RAM	2MB
PCMCIA	At least one socket using one of the supported controller IC's (check the README file for the latest information)
Hard Disk	Approximately 1.5MB of free space
Floppy Disk	3.5" FDD drive (during install process)
Video	EGA or higher
DOS	Version 3.2 or newer. If using PCDISK, the version 5.0 or newer will be required.

Windows	Version 3.1 or newer

Notes:

C H A P T E 2

Windows Installation

This chapter describes how to install CardWare from Microsoft Windows™. The installation includes CardWare for DOS as well as for use with Windows. Even if you seldom use Windows with your PC Cards, this installation will give you every option necessary to install only those components you really need. If you do not use Windows, see Chapter 3, OS Installation".

Check the contents of your CardWare package.

- Make sure you have the correct equipment and operating system to install and run CardWare. See ystem Requirements" in Chapter 1.
- Make a backup of both CardWare diskettes.

What is Included with CardWare

- This User Manual
- CardWare software diskettes (2)

Installing CardWare

Before you install CardWare, it is important that you know the brand and type of your Computer / PCMCIA system.

The CardWare Windows installation program can only be run from within Microsoft Windows™. If you do not wish to use Windows, see Chapter 3, OS Installation" or Appendix D, *Installation Information* for a discussion of the files required and the changes necessary to your system boot files. The same section also describes how to uninstall CardWare.

> If CardWare was included with your computer system, it may already be installed. Before performing any of the steps described below, verify that the computer system manufacturer has not already installed CardWare.
>
> If you are replacing PC Card (PCMCIA) software from another vendor, it is very important that you remove the old software completely. See ninstalling Other PCMCIA Software" in Appendix D.

What Setup does

CardWare Setup is a powerful program which installs, updates or uninstalls CardWare on your computer system. It supports DOS 6.x multiple configuration boot menus and allows you to install only the components of CardWare which you really need.

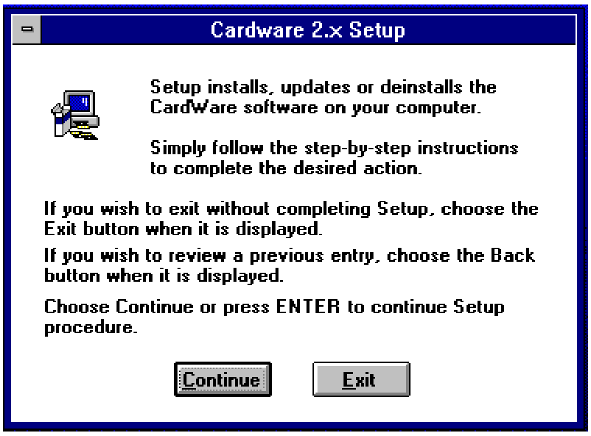
Setup will do the following:

1. Allow you to specify where CardWare is to be installed.
2. Copy both DOS and Windows CardWare files to your system.
3. Modify CONFIG.SYS and AUTOEXEC.BAT. Setup may also create a new entry in the [Menu] section of your CONFIG.SYS.
4. Create a CardWare group in your Windows Program Manager.

Starting Setup

To start the CardWare Setup program in Windows:

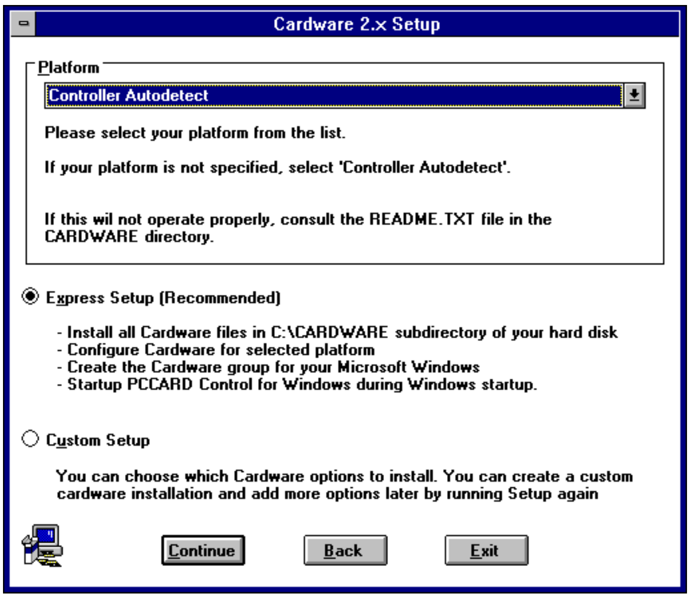
1. Start Windows.
2. Put the CardWare Disk 1 in a floppy drive (we assume drive A).
3. Choose "File | Run" from the Program Manager main menu.
4. In the command line text box, type "`A:\SETUP`", then choose OK. This opens the CardWare Installation dialog box.



After introducing itself, the Setup program begins by attempting to detect the presence of an earlier version of CardWare. If one is found, you will be given the following options:

- Reinstall: Choosing *Reinstall* will cause Setup to replace the current installed version of CardWare.
- Uninstall: Choosing *Uninstall* will remove CardWare from your system configuration. If you select this, Setup will make the necessary changes then terminate -- you will see none of the following.

When Setup continues to either install or reinstall, the program will provide complete instructions for its use. If, at any time, you become uncertain of your responses to any instructions, you will have the option of terminating Setup without completing the installation.



Platform

The platform is the type of computer/PCMCIA system on which you are installing CardWare. Setup attempts to automatically detect the platform. In most cases, your system will be eneric.” To change the platform, click the mouse on the list arrow at the right of the Platform selection window. This will open a list of more than twenty choices.

With the exception of the AST PowerExec and the NCR Safari, the default, Controller Autodetect should be sufficient

Setup Type

You are offered two types of installation:

1. Express Setup
2. Custom Setup

Express Setup

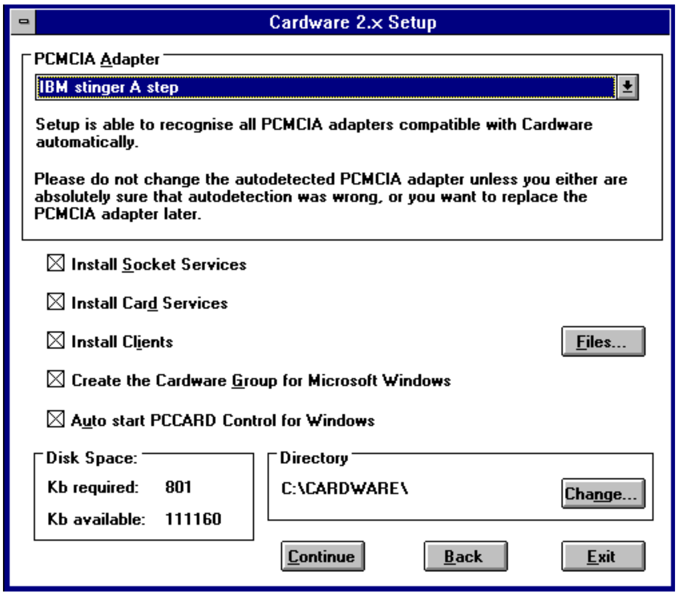
The *Express Setup* will install all CardWare features using the default drive ("C: ") and directory ("\CARDWARE"). You will **not** be prompted to select individual components.

You will be prompted about changing your system files, CONFIG.SYS and AUTOEXEC.BAT (see below). You can skip the following text up to the section titled, inishing the Installation”.

Custom Setup

The *Custom Setup* allows you to select:

1. the type of PCMCIA controller being used in your system (the default is *Controller Autodetect*),
2. which CardWare components to install, and
3. which drive and subdirectory to use.



PCMCIA Adapter

The the type of PCMCIA controller being used in your system. To view more selections, click on the arrow at the right of the list window. It is **not** recommended that this be altered from the *autodetect* unless you are certain it is error.

Install Socket Services

This provides underlying support for your adapter.

Install Card Services

This allows you to configure PCMCIA cards selectively.

Install Cli<u>e</u>nts

Clients are software applications which make use of Socket and/or Card Services.

Clicking on **iles...**” will open a window allowing you to select from:

1. Generic I/O Card Enabler: This is software designed to recognize I/O cards when they are inserted.
2. Generic Memory Card Enabler: This is software designed to recognize Memory cards when they are inserted.
3. PC Card Control for Windows: Main CardWare interface for configuring PCMCIA cards.
4. PC Card Control for DOS: This is the main CardWare interface for configuring PC Cards.
5. Online Help: Designed for exclusive use with PCCard Control for Windows.

Create the CardWare <u>G</u>roup for Microsoft Windows

This allows Setup to create a CardWare group in Windows. This is a convenience since it makes it easier to find CardWare.

A<u>u</u>to Start PCCARD Control for Windows

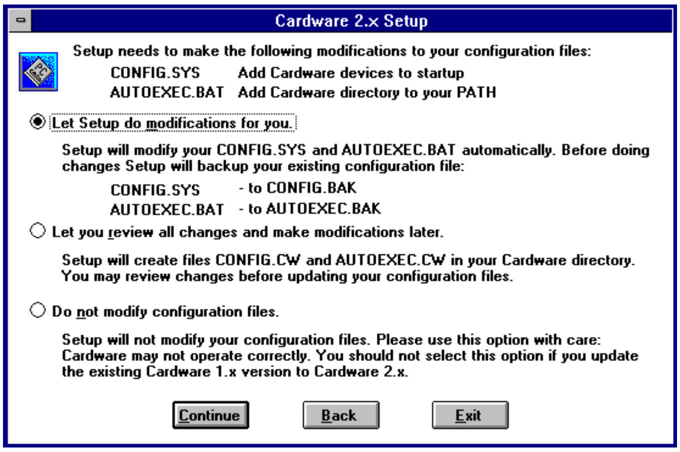
This allows CardWare to be active each time you begin a Windows session.

Directory

Selecting "**Change...**" will allow you to specify the destination drive and subdirectory for the CardWare files.

Modifying Your System Files

The final step in the installation and setup of CardWare is to modify your system boot files, AUTOEXEC.BAT and CONFIG.SYS. Setup will offer you three choices.



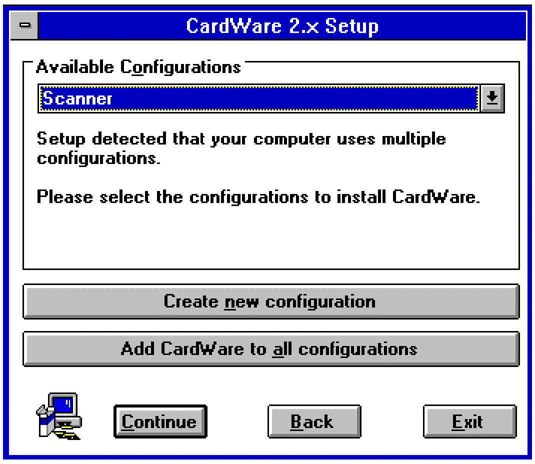
1. **Let Setup do modifications for you**
   This option allows Setup to make all necessary changes and to back-up the originals, changing their extension to **.BAK**.

2. **Let you review all changes and make modifications later.**
   No changes made but modified versions of both will be copied to the installation directory and have the extension **.CW** appended. You can then inspect the proposed changes and make them yourself later.

3. **Do not modify configuration files.**
   Please use this option with care. Otherwise, CardWare may not be able to function properly.

Multiple Configurations

Many users of MS/PC-DOS 6.0 and later have taken advantage of the ability to boot-up into a menu of system configuration options. This is because many non-Windows applications, notably games, require different memory configurations and/or special drivers. It is also true that, to conserve memory in general, infrequently used drivers, scanner drivers for instance, can be selected or not by menu instead of having to rewrite the CONFIG.SYS and re-boot. The CardWare Setup can detect these multiple configurations and install itself selectively, according to your preferences.



If you have multiple configurations, you will be presented with three choices:

1. You may select to add CardWare to one of your current configurations by selecting it from the list.
2. You may have CardWare create a new, special configuration for itself.
3. You may have CardWare added to all of your configurations. Since you will probably always want access to your PC cards, this will be your best choice.

Finishing the Installation

Click on "Continue" to complete the installation, then change diskettes when instructed to do so.

If Setup cannot detect a memory manager such as EMM386.EXE, QEMM386.SYS, etc, you will be reminded that, if one is added later, you must configure it NOT to use certain areas of memory which must be reserved for CardWare use. See Appendix D for an example CONFIG.SYS modification and see CWINI.TXT (installed into the CardWare subdirectory) for more information. If a memory manager is detected, then Setup will automatically make the correct changes for you.

Remember, if you allow Setup to alter your configuration files, you will need to quit Windows and re-boot your computer before CardWare can become active. If Setup does not alter your configuration files, CardWare will not function until all necessary changes are implemented.

Notes:

C H A P T E R 3

DOS Installation

What Install Does

The CardWare DOS install program is a powerful program which installs, updates or uninstalls CardWare for DOS on your computer system.

Install will do the following:

1. Allow you to specify where CardWare is to be installed.
2. Copy CardWare files to your system.
3. Modify CONFIG.SYS and AUTOEXEC.BAT.
4. Install Windows™ components of CardWare to your system, if you desire.

Along the way, you will need to know the brand and type of your computer / PCMCIA system. You will also be given the option for either an express or a custom installation. The express installation will provide the most common CardWare configuration. On the other hand, the custom installation will allow you to specify which files are to be installed, where they are to be installed and to control what system files are updated.

Using Install

The Install program uses the bottom row of the screen to display the keyboard commands for each installation screen. Generally, each screen which presents you with options which have one or more of the following types of fields:

1. List box: A list box will initially be displayed as a wide box with a down arrow, "↓", in the right corner and containing a single line of text. When it is active for use, the line of text will be highlighted and the flashing underline cursor will appear at the end of the line. To open the list box

when active, press the down arrow on the keyboard. A small scroll box of selections will open. Simply use the arrow keys or the mouse to maneuver to the correct selection and press Enter.

2. Radio button: There is never just one radio button. Radio buttons are used when only one of two or more choices can be selected. Radio buttons are displayed as empty parentheses, “( )”, or as parentheses surrounding a dot, “(•)”, when an item has been selected. Use the arrow keys or the mouse to select.

3. Check box: A check box is used when an item can either be selected or not. A check box is displayed as empty brackets,]”, or brackets surrounding an ” when an item has been selected. Use the arrow keys to move about a list of check boxes, press the space bar to either select or un-select.

4. Edit box: An edit box is a field where you can enter and edit a line of text. Type the text as usual, using the arrow keys to move about the text, the backspace key to delete the character before the cursor, the delete key deletes the character at the cursor. Edit boxes also support an insert mode and edit highlighting with the mouse. Press Enter when finished or Alt-B to abort any changes.

In general, you use either the Tab key or a mouse click to move from field to field within a screen. If one letter of the text used to identify a field is highlighted, pressing that letter while the Alt key is being pressed will move you directly to that field. When all the fields are configured as you wish, pressing Enter will accept the entries and take you to the next screen. Pressing Alt-B will move you back one screen while Alt-X will abort the installation program.

NOTE: **Finally, to run Install, you will need at least 520 Kbytes of free memory.**

Starting Install

To start the CardWare DOS installation program:

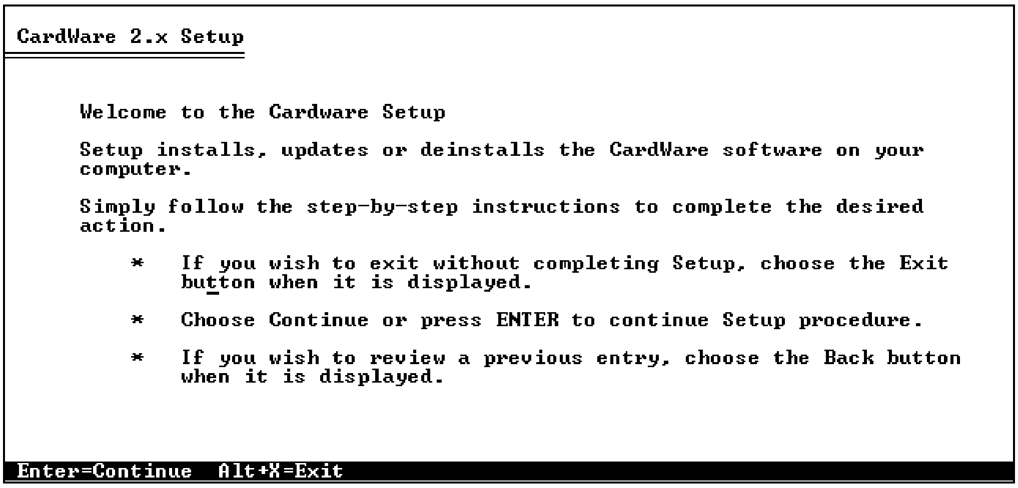
1. Place the first CardWare diskette in your floppy drive (we will assume drive A:)

2. Make the drive the current drive. Do this by typing:

```
A: <Enter>
```

3. Next, enter:

```
INSTALL <Enter>
```



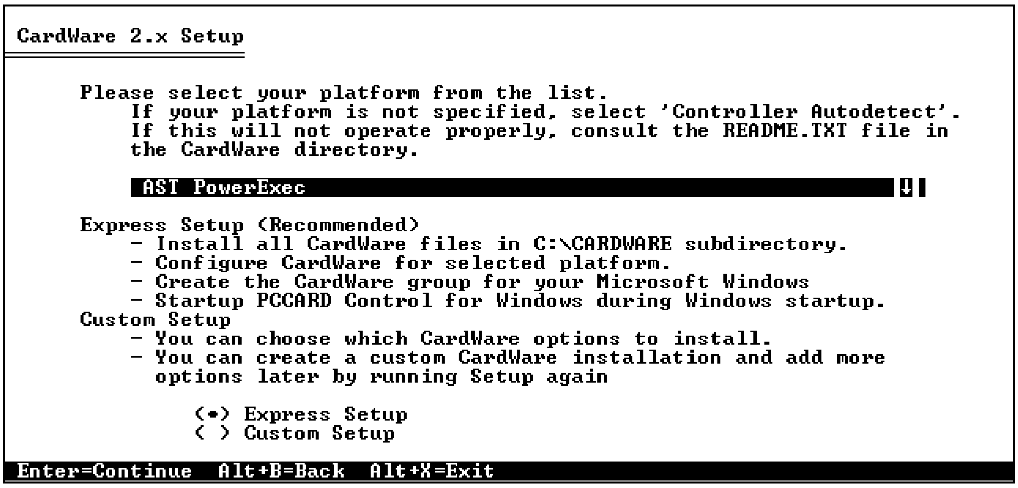
Installation Choices

While Install is starting, it will attempt to determine if CardWare has already been installed. If it has, you will be asked if you wish to reinstall or remove, einstall”, CardWare. If einstall” is chosen, Install will delete the CardWare files, remove its subdirectory and modify your system boot files, CONFIG.SYS and AUTOEXEC.BAT, to remove all references to CardWare.

The rest of this chapter will discuss what happens when you perform an installation.

Installing CardWare for DOS

The first installation screen allows you to select your computer platform and the type of setup you wish performed.



Platform

Install provides a list box of computers and/or card readers specifically supported by this version of CardWare. If your system is not listed, select ontroller Autodetect”.

Setup Type

The same screen will allow you to choose between two different types of setup:

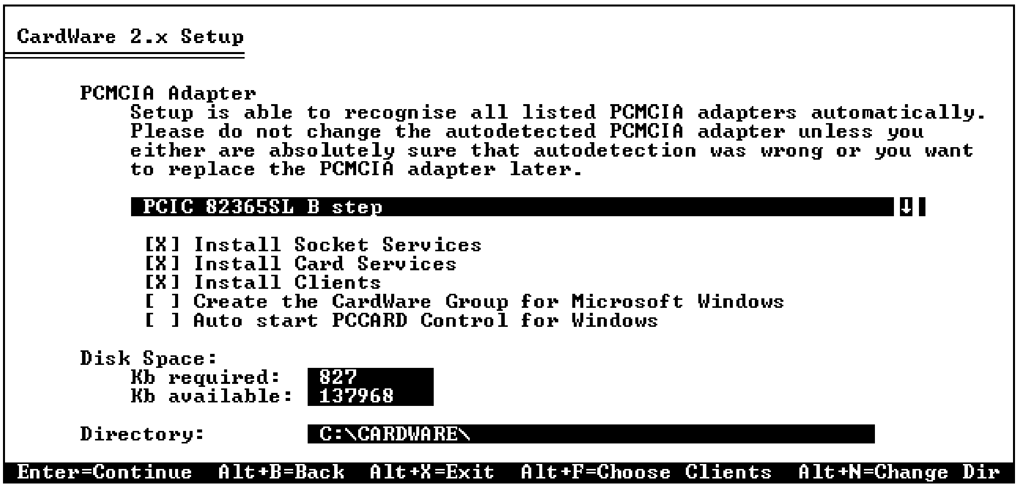
1. Express Installation
2. Custom Installation

Express Installation (Recommended)

This is an installation based on the most common defaults for your platform/controller combination. It will simply allow Install to create the default subdirectory on your C: drive, copy all files to that directory and to make the necessary changes to your CONFIG.SYS and AUTOEXEC.BAT (see below).

Custom Installation

This selection will allow you to tailor CardWare to your particular system. You will be allowed to select the specific type of PCMCIA adapter in your system, what files are actually installed and where the files are to be installed.



PCMCIA Adapter

While this list box provides a list of adapters to choose from, it is generally NOT a good idea to change the entry displayed. This is because Install advanced diagnostics has already detected the adapter type. We recommend that you change the adapter only if you are certain the autodetection is in error of if you know you will be installing another PCMCIA controller.

Installation Options

The next five check boxes allow you to select which services you wish installed.

Install Socket Services

Socket Services is PCMCIA compatible software which directly supports the hardware adapter and provides standard software control of the adapter. Ordinarily, this should always be installed. If your system includes a

proprietary, and unsupported, adapter with PCMCIA Release 2.10 compatible Socket Services, then you may not need to install the CardWare Socket Services. In this event, no other CardWare dri vers will load and CardWare will not be functioning.

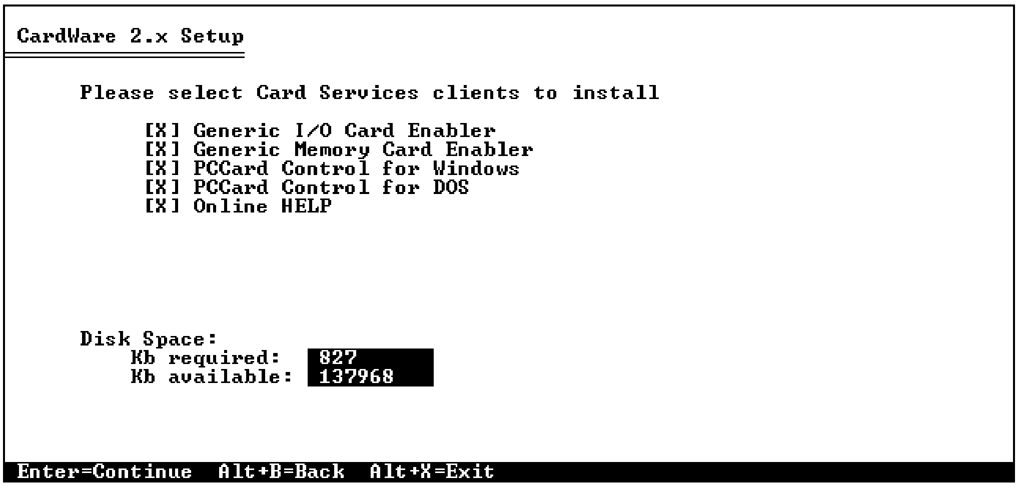
Install Card Services

Card Services is PCMCIA compatible software which provides standard software control of PC cards. Again, this ordinarily should be installed. If you will be using a special PC card or one with it own proprietary software, then you may not need to install the CardWare Card Services. On the other hand, you may find these services to be indespensible and well worth their inclusion.

Install Clients

Clients are software which attach themselves to Card Services and act as enablers and/or a user interfaces. An enabler is used to identify a PC card type, to allocate/deallocate resources for its use when it is inserted/removed and to initialize the card. A user interface provides PC card status information to the user as well as allow the user to manage the use of PC cards.

Pressing Alt-F allows you to select which clients are to be installed.



CardWare provides five Card Services clients:

1. Generic I/O Card Enabler: This is software designed to recognize I/O cards when they are inserted.
2. Generic Memory Card Enabler: This is software designed to recognize Memory cards when they are inserted.
3. PC Card Control for Windows: Main CardWare interface for configuring PCMCIA cards.

4. PC Card Control for DOS: This is the PCCARD interface for DOS.
5. Online Help: Designed for exclusive use with PCCard Control for Windows.

Directory

Typing Alt-N opens an edit box where you can specify both the drive and directory where CardWare is to be installed.

Modifying Your System Files

The final step in the installation and setup of CardWare is to modify your system boot files, AUTOEXEC.BAT and CONFIG.SYS. You will be offered the choice of making the changes or not.

```
CardWare 2.x Setup

     Setup needs to make the following modifications to your configuration
     files:
         CONFIG.SYS    - Add CardWare devices to startup procedure.
         AUTOEXEC.BAT  - Add CardWare directory to your PATH variable.
     * Let Setup do the modifications for you.
         Setup will modify your CONFIG.SYS and AUTOEXEC.BAT automatically.
         Before doing changes Setup will backup your existing configuration
         file: CONFIG.SYS - to CONFIG.BAK, AUTOEXEC.BAT - to AUTOEXEC.BAK.
     * Let you review all changes and make modifications later.
         Setup will create files CONFIG.CW and AUTOEXEC.CW in your CardWare
         directory. You may review changes before updating your configuration.
     * Do not modify configuration files.
         Setup will not modify your configuration files. Please use this op-
         tion with care: CardWare may not operate correctly. You should not
         select this option if you update the existing CardWare 1.x version.

      (•) Let Setup do the modifications for you.
      ( ) Let you review all changes and make modifications later.
      ( ) Do not modify configuration files.

Enter=Continue  Alt+B=Back  Alt+X=Exit
```

If you allow Install to make the necessary modifications, a copy of each original, unmodified file will be copied to the root directory with the extension .BAK. For example, CONFIG.BAK will represent your CONFIG.SYS before CardWare changes were made.

If you DO NOT allow Install to make the changes, Install will place samples of each in the CardWare destination directory, leaving the originals unchanged. Later, you can review these proposed changes and make a decision about implementing new system files.

Completing the Installation

When the installation of CardWare is complete and your system files updated, remove the CardWare distribution diskette from your floppy drive. Then, you must reboot your computer to activate CardWare. It will not be necessary to reboot if you have not updated your AUTOEXEC.BAT and CONFIG.SYS.

If Setup cannot detect a memory manager such as EMM386.EXE, QEMM386.SYS, etc, you will be reminded that, if one is added later, you must configure it NOT to use certain areas of memory which must be reserved for CardWare use. See Appendix D for an example CONFIG.SYS modification and see CWINI.TXT (installed into the CardWare subdirectory) for more information. If a memory manager is detected, then Setup will automatically make the correct changes for you

C H A P T E 4

CardWare, PCMCIA and Your Computer

This chapter will discuss how CardWare, using the resources provided by your computer, makes PCMCIA work for you. As you will see, CardWare operates in the background, making every effort to simplify your use of PC Cards. It does this by attempting to automatically recognize and configure any card inserted into your PCMCIA slot.

CardWare has two main objectives:

1. Simplicity
2. Compatibility

In spite of the well-documented PCMCIA 2.10 standards, not all PC Cards are perfectly compatible. CardWare attempts to recognize and configure as many PC Cards as is possible. Even when it does not fully recognize a card, CardWare will still attempt to configure it. CardWare also gives you every opportunity to fine-tune its ability to recognize a given card.

The next chapter, Chapter 5, will introduce you to the types of PC Cards most commonly used today and, where appropriate, the Device Resources commonly associated with them.

Finally, in Chapters 6 and 7 you will meet CardWare Card Control for Windows and DOS. Here you will learn to individually tailor your PC Card to your system and vice versa.

Terminology

Several expressions are used in the following chapters to describe how CardWare recognizes and configures PC Cards. While the Glossary defines most of the terminology used within this manual, there are several key concepts to understanding how CardWare works.

- **CIS**: Most new PCMCIA-compliant PC Cards contain a Card Information Structure (*CIS*) providing information about the card, what it does and what resources it needs to function.

- **Registered**: A PC Card is said to be *Registered* if the information used to identify the card when inserted has been recorded in an internal database by CardWare.

- **System Resources**: *System Resources* are system memory ranges, I/O ranges and IRQ levels. When a card is inserted, CardWare will assign resources to the card from the pool of available resources.

- **Device**: *Device* is the name used to identify a collection of *system resources* that the PC Card uses once it is configured. For instance, a COM port, such as COM1, is a device which uses memory range 3F8-3FFh and IRQ 4 as *system resources*.

- **Device Definitions**: CardWare also records a list of *ssociated Device Definitions*” in the database. This list is an ordered preference list which CardWare will use to configure a *device* from the available System Resources.

- **nstalling a PCMCIA Card**” (also referred to as onfiguring a PC Card”) in your system means:

  1. Mapping memory ranges from the PCMCIA Card into the system memory space.
  2. Mapping I/O ranges from the PCMCIA Card into the system I/O space.
  3. Routing an Interrupt from the PCMCIA Card to a system Interrupt.

By default, CardWare tries to auto-configure all PCMCIA cards inserted in your system. In most cases, CardWare will determine the correct setup for your card. Beyond this, CardWare gives you the ability to change the configuration of each card. For this purpose you would use *PC Card Control.*

Key Concepts

You also can use *PC Card Control* to instruct CardWare **not** to configure the card. This is useful if your card comes with its own software for configuring the card.

To understand how CardWare recognizes and configures PC Cards, it is important to be familiar with the following three key concepts:

1. **Configured**: A card is said to be *Configured* if it is installed in your system and successfully set up.

2. **Auto Configured**: A card is said to be *Auto Configured* if the Generic I/O Card Enabler *(PCEnable)* determines how to install the card and uses this information for setting up the card**.**

3. **Generic**: A card is said to be *Generic* if it is a Fax/Data or ATA PC Card and has a data field which informs CardWare of its function.

Beeps

Beeps (tones emitted from your computer's tiny speaker) are the standard method CardWare uses to notify you that certain events have occurred.

What the Beeps Mean

Most of the time, CardWare operates in the background without interrupting normal system behavior. In its default configuration, CardWare uses the system speaker to signal the recognition and configuration of PC Cards when they are installed. Beeps sounded by CardWare are:

1. A single beep signaling the insertion of a PC Card.
2. A second, slightly higher pitched beep is sounded to indicate that the PC Card has been recognized by the generic card enabler (*PCEnable*).
3. Finally, a third beep is sounded at an even higher pitch when the recognized PC Card is configured using an associated Device Definition.
4. A two tone warning is sounded twice **if** a recognized PC Card cannot be configured because none of the associated Device Definitions are available or the CIS was bad. This warning is made after the initial two beeps have signaled card insertion and recognition.

> The use of beep tones to signal card insertion, recognition and configuration may be disabled by the card display and configuration utility (PC Card Control). The current state of any installed PC Card can be determined by viewing the program's display. While in Windows, beeps can also be replaced with wave files (see Chapter 6, C Card Control for Windows”).

How CardWare Recognizes a PC Card

When you insert a PC Card into your system, CardWare reads the Card Information Structure (CIS) from the Card. The CIS normally supplies specific information about the type of card (e.g. LAN or Modem), and how the card can be configured. If CardWare can read the CIS, it will not be able to recognize or configure the card.

Next, CardWare searches its internal database for a **Specific** record for this card. If such an entry exists, CardWare will try to configure the card with one of the Device Definitions associated with it.

If no record exists, CardWare checks whether the card is **Generic**. If it is, CardWare will try to configure the card with one of the Device Definitions associated with generic cards. If this fails, CardWare will try to *Auto-Configure* the card.

If the card is neither *Specific* nor *Generic*, CardWare will try to **Auto-Configure** the card. In this case CardWare will attempt to configure the card with one of the Device Definitions already defined (but not associated). If this fails, CardWare tries to create a Device Definition on the fly and to configure the card with this new device definition.

First-Time Insertion of a PC Card

There are three possibilities when a new PC Card is inserted for the first-time:

1. The card is a **generic** type of PC Card and, if the resources are available, is automatically installed by CardWare.

   CardWare can recognize modem and ATA flashdisk or harddisk cards as generic cards.

2. The card is **Auto-Configured** by CardWare because either a generic card could not be configured with the associated Device Definitions (because the requested resources are not available), or the card is not generic (such as a LAN card).

3. The card could **not** be configured because either the requested resources are not available, or the CIS structure on the card does not include enough information to recognize the card and to register it for future use.

PC Card is a eneric Card”

Many, but not all, PC Cards contain standard information which CardWare can read. One piece of information that may be present is the type of function performed by the PC Card. If CardWare recognizes a new PC Card as a fax/data modem or as an ATA flashdisk or harddisk, it configures the card according to Device Definitions associated with these generic card types. By default, modems are setup as the next available COM port, and ATA flashdisks and harddisks are connected to the logical drive letter assigned to the PC Card socket where the card was inserted.

The Device Definitions associated with generic modems are changed by the card display and configuration utility (*PC Card Control for Windows*). This procedure is described in Chapter 6 and the CardWare Online Help.

PC Card is uto-Configured”

Some PC Cards can be recognized even if they do not include all the required CIS information. These cards will be Auto-Configured by default. You have to ensure that the software which is intended to use these cards is configured according to these settings. If you are running *PC Card Control*, you can determine the settings by right-clicking on the device name which is displayed below the socket (see Chapter 6). From DOS you can type `DOSCARD /D` to get this information.

If a card has enough information in the CIS to be recognizeable each time it is inserted, it is possible, by carefully using *PC Card Control* (see Chapters 6 and 7), to configure the card properly. This would have the effect of inserting it into CardWare internal database and making it a **Specific** card.

If you want a card **not** to be Auto-Configured by CardWare, use *PC Card Control* to change the way CardWare tries to configure the card. You are also able to tell CardWare not to configure the card at all. This is necessary if the card comes with its own software. This procedure is described later in Chapters 6 and 7 and in the CardWare Online Help.

PC Card is ot Recognizable”

Some PC Cards (which are not truly PCMCIA compliant) cannot be recognized because there is not enough information on the card to act as a unique identifier.

Resources Not Available

Even if a PC Card is recognized, it may not be possible to configure it. This occurs if system resources described in the associated Device Definitions are not available when the PC Card is inserted. This usually indicates that the resources described in the Device Definition(s) are currently in use by another PC Card or system peripheral.

As an example, imagine a fax/modem PC Card is inserted that has been associated with the Device Definitions COM1 and COM2. If the system already has a COM1 device installed on the motherboard and another PC Card in a different socket that is configured as COM2, then the newly inserted card cannot be configured.

On the other hand, you may change the card definition to use COM3 or COM4 (if you can do so on your system) using the card display and configuration utility (*PCCard*). Or, you can remove the mouse or modem board already installed to make COM1 or COM2 available to the PC Card.

Of Mice, Serial Ports and System Resources

However, removing the mouse is not an attractive alternative -- especially in Windows. A mouse has traditionally been connected to a standard serial port such as COM1 or COM2. Unfortunately, using a fax/modem on COM3 or COM4 may still cause a conflict with a mouse. This is true of a mouse on COM1 and a fax/modem on COM3 or a mouse on COM2 and a fax/modem on COM4. The problem is that COM3 and COM4 are newly supported personal computer devices and each uses a vital resource, an IRQ, previously reserved for COM1 and COM2, respectively. What makes this unfortunate is that IRQs *cannot be shared!*

A example of what could happen is your mouse freezing when you send or receive a fax. If you are in Windows, you cannot get your mouse to function without quitting then restarting Windows.

It is possible to avoid this problem in Windows by configuring Windows to let COM 3 and 4 use different IRQs. To change your port settings in Windows:

1. Open the Control Panel (usually found in your Main Windows group) and select "Ports". This will provide you with icons for ports COM1-4.

2. Choose the port you wish to reconfigure.

3. Next, select "Settings". This will allow you to configure the baud rate, data bits, etc. Refer to your fax/modem documentation for the correct settings.

4. Then, select "Advanced". This will provide a menu allowing you to set the base I/O address for the selected COM port in addition to the IRQ. The I/O address probably will not need to be changed. The most common IRQ selection for either COM3 or COM4 is IRQ 5. Other useful IRQ are 10 and 11.

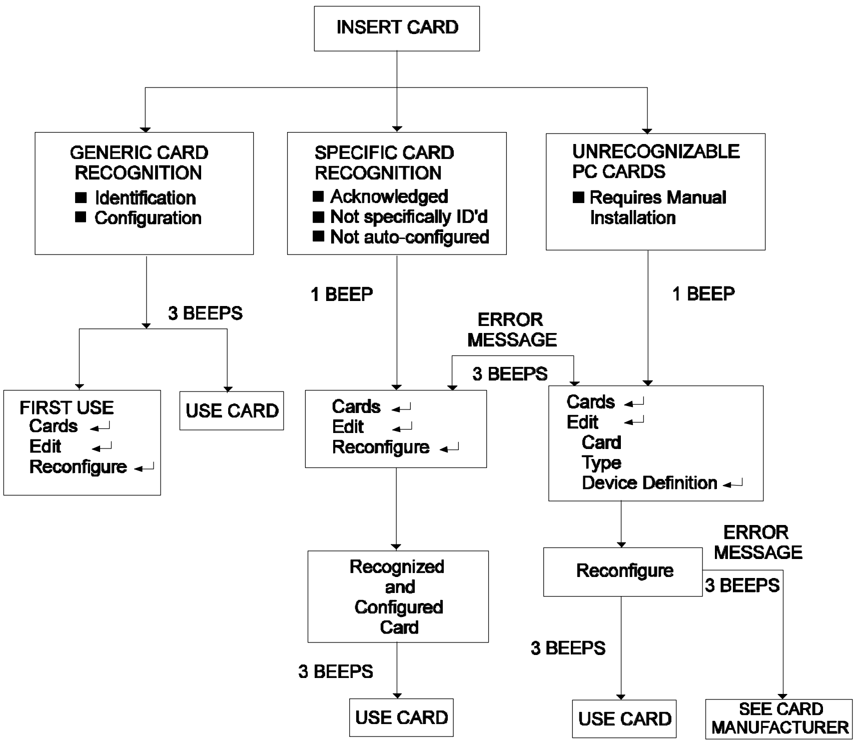
5. Select "OK" and complete the configuration.

At this point, choosing this COM resource for your fax/modem will be recognized at the I/O address and IRQ desired. See Chapter 6, C Card Control for Windows” for more information about I/O addresses, IRQs and configuring PC Cards.

> Fortunately, the current trend has been to build computers with a dedicated mouse port entirely separate from any COM port. If your mouse connects to the computer using a circular, not a rectangular or D-shape, connector, you probably have such a port. The only concern then would be to **not** associate any PC Card with IRQ 12.

PC Card Recognition Flow Chart

The following flow chart provides an overview of the steps taken by CardWare as it attempts to register each type of PC Card for the first time.



Using Battery Operated Computers

PC Cards are very new technology. While more and more computers are being designed to be PCMCIA compliant, some are not. The idea of simply plugging-in a pocket-sized card (i.e., a fax/modem, hard drive, etc.) without having to disassemble your computer is catching on quickly.

However, there are some cautions to this lug and play.” Just as you wouldn't pull the plug to your VCR from the electrical outlet while recording a TV program, you don't want to allow the lug” to be pulled on your card while it is live or connected to your computer.

Advanced Power Management

Many battery-operated computers have a system known as Advanced Power Management (APM) which monitors system activity, shutting down various components (and even the computer itself) whenever they have been idle for a set period of time. This can make a significant difference in the length of time you can work before having to recharge the battery.

Many APM equipped computers are PC Card ware”. This means that they can detect when a PC Card is present and can notify CardWare and other PC Card support software when system power is about to be turned off. If your computer and system software does not support this feature, we suggest that you disable *suspend mode* while you are using your PC Cards.

C H A P T E R 5

Types of PC Cards

This chapter will introduce you to common types of PC Cards. Chapter 6 describes configuring your PC Cards with PC Card Control for Windows™ and includes a discussion about assigning *System Resources* for *Device Definitions*.

CardWare recognizes nearly all types of PC Cards, including SCSI, Sound and Video cards, but the four most common types are:

1. Fax/modem cards
2. LAN cards
3. ATA flashdisk and harddisk cards
4. Memory Cards

As we saw in Chapter 4, CardWare attempts to configure a PC Card whenever one is inserted. You can view the status of your cards in both DOS and Windows™:

1. In DOS, use the DOSCARD command to display the *Device Definition* being used or run PCCARD for a text-mode graphical representation of your cards.
2. In Windows™, double click on the *PC Card Control* icon. This will open a graphical representation representing the number of available sockets and the cards plugged into each. Displayed below each occupied socket will be text identifying the type of device detected (such as a fax/modem) and the *System Resource* associated with it (such as COM3).

NOTE: ***Please see also the CARDINFO.TXT file for the latest information about several PC Cards and their recommended settings.***

Fax/Modem Cards

A modem card can be inserted into the PC Card socket either *before* or *after* turning on your system. If you insert the modem card *before* turning your system on, you will hear three beeps at the end of the POST messages signifying that the card has been successfully installed and is now active. If the card is inserted at the DOS prompt or while running Windows, the system will also sound three beeps on successful recognition.

Your modem PC Card will be automatically recognized and installed as a modem if it has a valid CIS which conforms to the PCMCIA Committee's Standard, revision 2.10. If your CIS is not valid, or has been damaged, the card cannot be configured by CardWare.

> If your modem is a generic modem, it will not appear by name in the Card list when you choose the "Cards | Edit...Any Card" command. If you want to change the configuration for a generic modem, edit the associations for the 'Generic Modem' card (see Chapter 6).

If more than one *Device Definition* is associated with a specific or generic fax/modem, CardWare will attempt to dynamically configure the card, trying each *Device Definition* in the same order as it appears in CardWare internal database. For example, if you associated the card with COM1, COM4 and COM3 respectively then, when the card is inserted, CardWare will attempt to first configure the card as COM1. If COM1 is being used by another device (mouse, printer, etc.), the software will next attempt to configure the card as COM4 and COM3 (if necessary). Hence, there will never be a resource allocation conflict between devices as can happen with ISA cards with physical jumpers or DIP switches.

> None of the 3rd party fax and telecommunication programs being sold today are able to detect the difference between an ISA BUS modem and a modem PC Card. This means that you should insert your modem prior to running any 3rd party fax or telecommunication software. Removing or   ot Swapping" of PC Cards during the operation of a such a software package (i.e. replacing the modem with a different type of card) is not recommended.

Network Adapter Cards

A LAN card can be inserted into the PC Card Socket either *before* or *after* turning on your system. If you insert the LAN card *before* turning your system on, you will hear two beeps at the end of the POST messages signifying that the card has been successfully recognized. If the card is inserted at the DOS prompt, the system will sound two beeps on successfully recognition.

By default, LAN cards are set to Do Not Config]”, and CardWare will not attempt to configure them. CardWare issue three beeps if a given LAN card has been setup to be auto-configured or its software has already been loaded.

NOTE: **If you plan to run LAN cards while in Windows, it is important that the LAN card be inserted before Windows is loaded. This is a result of the manner by which Windows allocates and recognizes resources. Also, depending on the type of network software you are using, the network software must be running prior to Windows being loaded. This will allow Windows to recognize the availability of a LAN and reserve the resources.**

Since none of the current network software is designed to support PC Card Hot Swapping, you must NEVER remove the LAN card while connected to the network. When connected to the network, logout prior to removing the card from the socket.

When configured by CardWare, LAN cards behave as conventional ISA BUS LAN adapters, allowing PC Card LAN adapters to be used with existing network driver software. Your LAN PC Card will be automatically recognized and installed as a LAN if it has a valid CIS conforming to the PCMCIA Committee's Standard rev 2.10. If your CIS is not valid, or has been damaged, the card cannot be configured by CardWare.

If you want to change the configuration for a LAN card, see chapter 6, C Card Control for Windows”. By default, LAN cards are not configured by CardWare. If configured otherwise, CardWare will attempt to dynamically configure the card using the Device Definitions in the same order as they appear in the Associations box displayed for the card by *PC Card Control*.

For example, if you assigned LAN1, LAN3 and LAN2 to a card, when the card is inserted, the software will attempt to first configure the card as LAN1. If LAN1 is being used by another device (perhaps by another LAN adapter), then the software will next attempt to configure the card as LAN3. Unlike ISA cards, there will never be a resource allocation conflict between devices.

If your PC card already comes with client software which does not require CardWare to configure the card, associate the [Do not configure] Device Definition with the card. This prevents you from being prompted to configure this card in the future.

ATA Flashdisk and Harddisk Cards

An ATA Flashdisk or Harddisk card can be inserted into the PC Card Socket either *before* or *after* turning on your system. If you insert the ATA card *before* power on, you will hear three beeps at the end of the POST messages signifying that the card has been successfully installed and is now active. If the card is inserted at the DOS prompt or while running Windows, the system will also sound three beeps on successful recognition.

Your ATA PC Card will be automatically recognized and installed as a disk drive if it has a valid CIS which conforms to the PCMCIA Committee's Standard 2.10. If the card CIS is not valid, or has been damaged, it cannot be configured by CardWare.

If your ATA drive is a generic drive, its name will not appear in the Cardlist when you choose the "Cards | Edit...Any Card" command. If you want to change the configuration for a generic drive, edit the associations for the 'Generic ATA Disk' card.

If you want to change the configuration for an ATA PC card, see chapter 6, C Card Control for Windows." CardWare will attempt to dynamically configure the card using the Device Definitions in the same order as they appear in the Associations box for the card.

If your drive is not already partitioned and formatted, you must use the PCPREP utility (see Appendix B, sing PCPREP") before you can use your drive. This is because ATA flashdisks and harddisks require a special format which is not supported by the DOS and Windows disk format commands. **DO NOT** use DOS format or the Windows File Manager to prepare these cards.

Memory Cards

A memory card can be inserted into the PC Card Socket either *before* or *after* turning on your system. If you insert the memory card *before* turning your system on, you will hear three beeps at the end of the POST messages

signifying that the card has been successfully installed and is now active. If the card is inserted at the DOS prompt or while running Windows, the system will also sound three beeps on successful recognition.

Using SRAM Cards

You can use SRAM cards the same way you use diskettes.

> If your SRAM card is not already formatted, you must use the PCPREP utility (see Appendix B, sing PCPREP") or the FORMAT command before you can copy files to your Memory card. You can also use the Windows File-Manager for Formatting and Copying.

Using FLASH Cards

If you want to use FLASH Memory cards, you must use the Microsoft Flash-File-System II (FFS I). FFS I is not part of the CardWare package and must be purchased separately from Microsoft.

If you have already installed FFS I, install the MS-FLASH.SYS driver after PCDISK.EXE in your CONFIG.SYS. Your CONFIG.SYS should look like this:

```
DEVICE = C:\CARDWARE\DPMS.EXE
DEVICE = C:\CARDWARE\SSxxxxxx.EXE
DEVICE = C:\CARDWARE\PCCS.EXE
DEVICE = C:\CARDWARE\PCRM.EXE /AUTODETECT
DEVICE = C:\CARDWARE\PCENABLE.EXE
DEVICE = C:\CARDWARE\PCDISK.EXE
DEVICE = C:\MSTOOLS\MS-FLASH.SYS
```

If your FLASH card is already formatted, you can use it the same way you use diskettes. The procedure for copying and deleting files on a FLASH card is the same as with a SRAM card. You can also use the Windows File-Manager.

> If your FLASH card is not already formatted, you must use the MEMCARD utility which comes with your Flash-File-System to Partition and Format your FLASH card (Consult the MEMCARD manual for further information). You **can not** use the DOS FORMAT command, the Windows File Manager or the PCPREP utility for this purpose.

PC Card Resource Requirements

This section will list the devices associated with each type of PC Card and their default resource requirements.

Fax/Modem Cards

Fax/Modem cards are a type of serial port.

Associations
COM1, COM2, COM3, COM4

I/O Range
3F8h, 2F8h, 3E8h, 2E8H

Length (Bytes)
8

Memory Range
None

IRQ
[None], [Any], 2 - 15

Defaults:
COM1: 3F8h, 8 Bytes, [None] memory range, IRQ 4

COM2: 2E8h, 8 Bytes, [None] memory range, IRQ 3

COM3: 3E8H, 8 Bytes, [None] memory range, IRQ 4

COM4: 2E8h, 8 Bytes, [None] memory range, IRQ 3

Network Adapter Cards

Network cards are commonly referred to as LAN1, LAN2, etc. However, since there are a number of Network topographies, protocols and architectures, there are a wider range of resources available for this type of card. By default, a network card will be set to Do not configure]".

I/O Range
[None], [Any], 100h - 3E0h

Length (Bytes)
8, 16, 32, 64

Memory Range
[None], [Any], C800h - CE00h

Length (Kbytes)
[None], 4, 8, 16, 32, 64

IRQ
[None], [Any], 2 - 15

Defaults
LAN1: 300h, 32 Bytes, [None] memory range, IRQ 5

LAN2: 300h, 32 Bytes, D000h, 16 Kbytes, IRQ 5

IBM 3270: 2D0h, 16 Bytes, CE00h, 8 Kbytes, IRQ 9

ATA Flashdisk and Harddisk Cards

The standards defining this type of PC Card are an extension to the standards for conventional fixed disk drives. As such, the principal requirement for configuring such a device is to allocate it a drive letter.

I/O Range
[Any]

Length (Bytes)
16

Memory Range
[None]

IRQ
[None]

Defaults
The above are the defaults and cannot be changed.

Memory Cards

Just as the ATA settings above are fixed, so too are those allocated to memory cards. Please note that while memory cards should be automatically detected and configured, CardWare will display nknown” for the card *Type*.

C H A P T E 6

PC Card Control for Windows

This chapter will describe how to use PC Card Control for Windows. The emphasis here will be PC Card configuration as well as configuring CardWare to work as you wish it to.

PC Card Control is a Windows™ application providing complete and intuitive control for your PC Cards. It presents you with a graphical representation of the PC Card socket(s), the PC card(s) you have inserted and how it/they are configured. PC Card Control allows you to configure your cards and to define new Device Definitions.

Perhaps the most powerful feature of PC Card Control for Windows™ is the Advisor. The Advisor feature simplifies the card configuration process by offering you the lists of resources which the PC Card itself requires. This allows you to quickly determine an available configuration and to select it. Later, and each time the card is inserted, the Advisor will check available resources and post a warning to you if there is a conflict.

Getting Help

CardWare has a powerful Online Help system which provides detailed information for all topics. You can get help by choosing "Help" from the main menu or by simply pressing the function key 'F1' whenever you need help.

If you do not know how to use help, choose the "How to Use Help" menu entry.

If you press 'Shift-F1', the cursor will change to a question mark and you can point to the region for which you need help.

Viewing PC Card Control for Windows

One of the objectives of PC Card Control is to allow you to quickly glance at your CardWare window to see the status of your PC Cards. To accomplish this, CardWare provides you with a graphical representation of your PCMCIA slots and any recognized cards currently inserted.

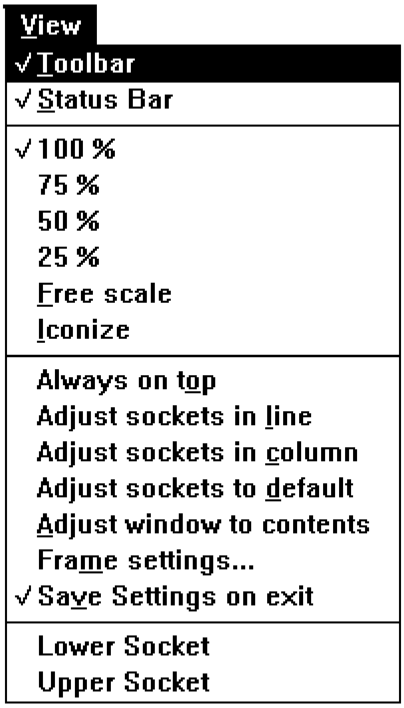
To be even more convenient, CardWare also allows you to change the size and placement of your view of the slots. This is not the same as re-sizing a window within Windows. CardWare provides several different sized images of the slots and cards themselves.

There are two ways of changing the size of PC Card:

1. Using the View menu
2. Using the Toolbar

View Menu

The View menu item is opened by typing Alt-V or by clicking the mouse directly on the main menu item iew”.



Toolbar

The toolbar is a row of buttons which allow quick access to some of the items displayed in this menu. When checked, the toolbar is displayed below the main menu. When not checked, the display area used by CardWare will be smaller. See sing the Toolbar” below.

Status Bar

The status bar is an area which displays information about the current view. When checked, the status bar is displayed at the bottom of the PC Card Control window. When not checked, the display area used by CardWare will be smaller.

Scaling

The check mark indicates the current sizing as percentage of the default size.

Free Scale allows you to manually enter the size as a percent.

Inconize changes the size to that of an icon and places the window in the lower left hand corner of the desktop. The icon still graphically represents the

sockets and any cards in them. Only the menus are missing. Double-click on the icon to restore PC Card.

Always on top
Checking this will allow CardWare to always be visible. Even when you are using another Windows application, the card and slot representation will be visible.

Adjust sockets in line
Checking this places the sockets side-by-side.

Adjust sockets in column
Checking this places the sockets one above the other. This is the default.

Adjust sockets to default
This places the sockets in a column, returns the sockets to their default size and sizes the window to the socket size. If you have multiple sockets, but not all are visible, selecting this will place all into view.

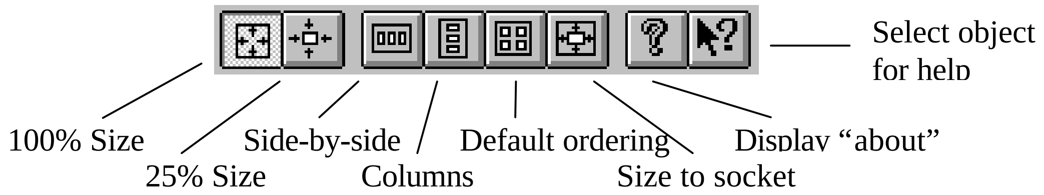
Adjust window to contents
This sizes the window such that the sockets are centered with the window at its minimum size.

Frame settings
Selecting this pops-up a window with the current settings for size, location and alignment of the sockets.

Save settings on exit
Checking this will cause CardWare to use the last settings each time Windows and CardWare are re-started.

Lower socket
This entry allows you to view the settings of the lower socket image.

Upper socket
This entry allows you to view the settings of the upper socket image.



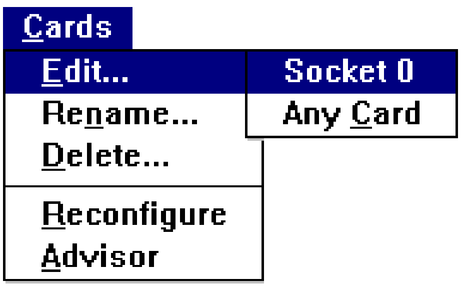
Toolbar

The toolbar is a row of buttons with icons representing shortcuts to common functions for scaling and aligning images of your PCMCIA slots.

Configuring New or Unrecognized Cards

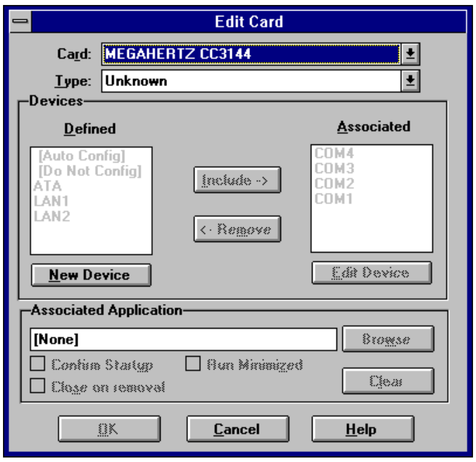
Whenever configuring (or reconfiguring) a PC Card, you might find it convenient to refer to Chapter 5, C Card Resource Requirements".

Configuring a new or unrecognized PC Card is a six step process:



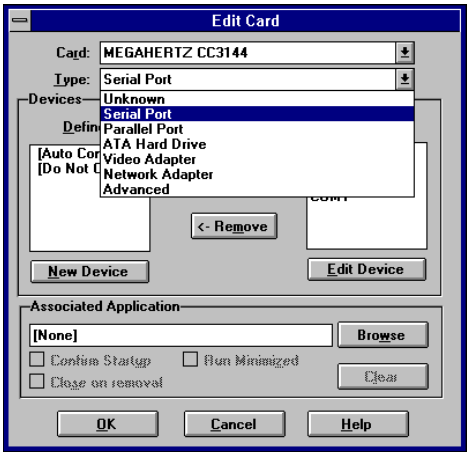
1. Choose "Cards | Edit" from the main menu (you can also double click on the card name). You are given the choice of editing a card currently inserted in one of the sockets or any card or card type currently available in the CardWare database.

   "Any Card" will present a dialog box which allows you to choose a specific card to edit.



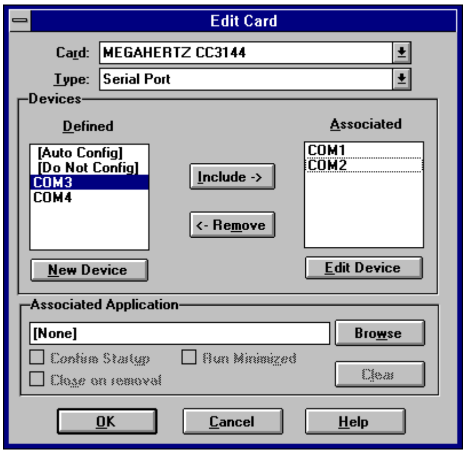
2. Select the card you wish to edit from the "Card" field. If there is a card already inserted, CardWare will attempt to determine its name and its type. If it can determine either, then you will not be able to alter the *Card* field.

   Click on the arrow to the right to drop open a scroll box listing cards available in the CardWare database.



3. To change the type of the card choose the appropriate "Type" for the card. If the card has already been recognized by CardWare, you will **NOT** be able to change the type. If it is *Unknown*, you will need to select the correct type.

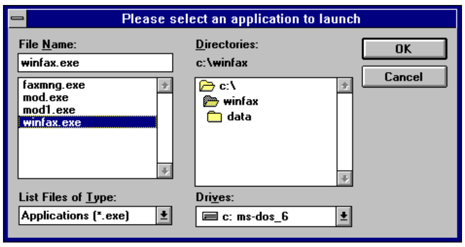
   To create a new type of card, select a type similiar to your card, then select “New Device” below the “Defined” box. See “Defining New Device Definitions” below for a description of how to assign resources to a device.



4. Next, you need to associate Device Definitions with the card -- in this context, a Device Definition is simply a listing of the system resources the card will use. If the card is generic, it will already have devices associated with it.

5. You move the Device Definitions from the "Defined" to the "Associated" box and vice versa by simply double-clicking on the Device Definition, or by selecting a Device Definition and clicking the "Include" or "Remove" button.

   ***REMEMBER: If your card comes with its own configuration software, select "[Do Not Config] ". This will permit your software to correctly control the card*.**



6. Finally, you have an opportunity to associate an application with this card. This means that you can select an application which you would like to be automatically started whenever the card is inserted. For instance, you might associate fax/data communications software with a

To associate an application, either directly enter the path and startup command or select rowse’ to locate the application.

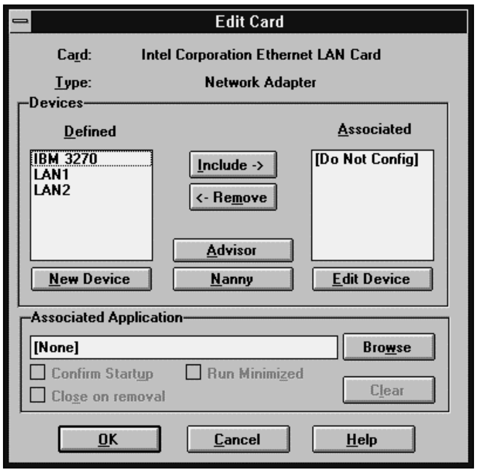
Finally, you have the options of running the application minimized (for instance, for background reception) and closing it when the card is removed. When you have checked the appropriate boxes and are satisfied with the card configuration, select K”. The next time the card is inserted, it will be fully configured and ready to go.

There are two important things to remember about associating devices with a PC Card:

1. CardWare will try to configure the card in the order the Device Definitions appear in the "Associated" box.
2. The system resources referenced by the Device Definition(s) must be available -- which means:
    a) they must have been placed under the control of CardWare (see below, ssigning System Resources for Device Definitions”),
    b) they must be physically present in the system,
    c) they must not be in use by another device, and
    d) they must match any requirement the card may have. (Please check the CARDINFO.TXT file in your CardWare directory for information about your card.)

If you have edited a card which is currently in use, you must tell CardWare that you want to reconfigure it. For this purpose, select the "Cards econfigure" option from the main menu or simply click on the card image displayed in the socket.

Reconfiguring a Card

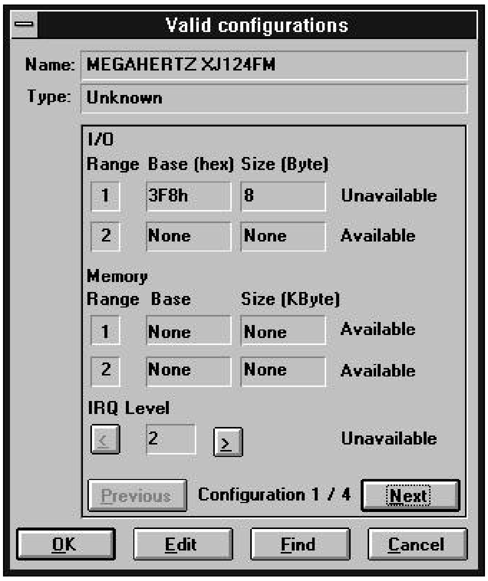


When you select Edit for a socket containing a recognized card, you are given the opportunity to perform all of the functions described above for a new card. On the other hand, you will notice that the *Edit Card* screen is slightly different. There are two additional buttons between the *Defined* and *Associated* lists:

1. Advisor
2. Nanny.

Advisor

The CardWare Advisor, also reachable by way of ards | Advisor”, displays the list of valid configurations associated with the card. There can be any number of possible configurations.



The information displayed for each valid configuration is information which CardWare has gathered from the PC Card itself as well as from CardWare’s own database. The number of available configurations is noted near the bottom of the window, between the *Previous* and *Next* buttons. Use those buttons to page between the configurations.

The information displayed in these windows cannot be altered. However, you may find that one or both of the arrows associated with the IRQ Level is not grayed-out. If you can toggle the IRQ values, this indicates that the card supports mulitple IRQs. This may be important if you wish to create a new configuration.

Edit

This button allows you to directly edit the available resources. See ptions | Resources”, Resources below.

Find/Create

Pressing the *Find* button will cause CardWare to search all available configurations for one for which all required resources are currently available in your system. If one is found, the *Find* button will change into *Create*. Pressing Create will all you to define a new device setting (See efining New Device Definitions” below).

Once a new device definition has been defined, the PC Card must be reconfigured by either selecting ile | Reconfigure” or double-clicking on the symbol of the card displayed by CardWare.

Nanny

The *Nanny* function only is available if the installed card is **not** configured. When active, the *Nanny* allows you to have the CardWare advisor automatically determine a valid device setting and to configure the card and update the CardWare database immediately.

Reconfigure

The ards | Reconfigure” menu selection causes CardWare to immediately attempt to configure or reconfigure a card inserted into the selected slot.

CardWare will run through the list of associations attempting to find the correct combination of available resoucrs.

Advisor

The ards | Advisor” selection provides immediate configuration status information about a card in a given socket and allows you to edit the card as described above.

Options

CardWare provides several additional features which allow you to tailor *PC Card Control* to your preferences. Type lt-O’ or click on the ptions” menu item.

Resources

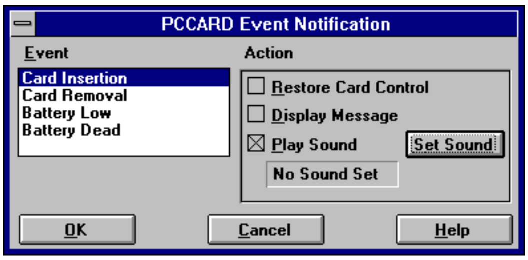
Selecting this displays a chart containing information about resources available to the system, highlighting those being used. This chart can be used when configuring unrecognized cards or unique device settings. See below, efining New Device Definitions”.

Event Notifications

As already discussed in Chapter 4, CardWare uses beeps to notify you when cards are inserted or removed. Selecting *Event Notifications* allows you to instruct CardWare to interrupt your work in Windows when certain events occur. These events are:

1. Card insertion/removal
2. Battery low or dead

CardWare can perform as many as three actions with each event.



1. It can restore the CardWare Card Control window.
2. It can display an appropriate message.
3. It can play a wave file.

Wave files, files with the .WAV extension, are Windows compatible sounds. By selecting *Set Sound*, you can associate wave files with each event. You may also find it convenient to turn the DOS beeps off (see below).

Card Services Options

CardWare allows you to specify how long CardWare will try to reconfigure a card before it times-out and quits trying. The default is 3000 milliseconds.

DOS Beeps Off

When this is checked, the DOS beeps will be suppressed. If you have assigned wave files with card events, you may wish to turn the DOS beeps off.

Defining New Device Definitions

Again, you may find it convenient to refer to Chapter 5, C Card Resource Requirements”. There are three situations in which you may define a Device Definition:

1. To create a new Device Definition for a card you are currently defining
2. To create a new Device Definition for a card that has already been defined. It may have been configured and you wish to change that configuration, or you were told that it could not be configured because the required system resources are not available.
3. To edit an existing Device Definition (e.g. changing memory base address or IRQ)

If you want to create a new Device Definition choose "Devices ew" from the main menu.

You need to give the new Device Definition a name and to select the Type of device from the "Type" list. When you have entered the name and selected the type, skip to subsection “*Assigning System Resources for Device Definitions*”, below.

If you are editing an existing Device Definition (having selected "Devices dit" from the main menu), you only need to select the name of the Device Definition you wish to edit from the "Name" list box. Then you will reassign the system resources (that are to be changed) to this Device Definition. The system resource fields will display their current assignments for your convenience.

Assigning System Resources for Device Definitions

One or more of the following system resources will be required depending on the type of Device Definition.

Please bear in mind that this manual must assume that the PC Card you wish to define and associate includes complete documentation. Such documentation would naturally include the data referred to below. This is especially important if the card is not generic and/or does not completely conform to the PCMCIA specifications of revision 2.10.

Specifying I/O Ranges or I/O Addresses

I/O resources required by a device are specified by a base address and, in some cases, a length. Some device types such as serial ports use a fixed number of I/O ports. For these types of devices, the length is implied and *PC Card Control* does not allow a length to be specified. The base address of an I/O range is entered using a drop-down combo box. This address is specified in hexadecimal, typically between 100H and 3FFH. The length of an I/O range is specified in bytes, typically as a power of two between 1 and 32.

If the Device Definition type permits an I/O range to be entered, but the definition does not require an I/O range, then both the address and length must be set to [None]. If the definition allows the I/O range to be located wherever space is available, then the length should be set to the size required and the address to [Any].

Some devices may require multiple I/O ranges. *PC Card Control* allows a Device Definition to have up to two I/O ranges. If a Device Definition uses two I/O ranges, the base address for both ranges must be specified. **The [Any] entry may not be used when multiple I/O ranges are specified**.

Specifying Memory Ranges

Memory resources required by a device are specified using a base address and a length.

The base address is entered using a drop-down combo box. This entry is specified in hexadecimal as an Intel x86 segment value, typically in the range of

A000H to F000H. The length is also entered using a drop-down combo box. This entry is expressed in decimal in KByte units, typically as a power of two between 4 and 64.

If the device type permits a memory range to be entered, but the definition does not require a memory range, both the address and length must be set to [None]. If the definition allows the memory range to be located wherever space is available, the address should be set to [Any] and the length set to the size required.

If a device requires a second memory range, enter this data on the "Memory Range 2" line as you did on line 1.

Specifying IRQ Levels

IRQ levels required by a device are specified by a single value. This value is specified in decimal and range from 2 to 15. The IRQ value is set using the same kind of combo-box as used to set the I/O and memory ranges.

Different types of devices traditionally use certain IRQ's. For example, serial port devices typically use IRQ4 for COM1 and COM3, and IRQ3 for COM2 and COM4. If a device (or its device driver) require a specific IRQ level, it must be set using the IRQ field.

If the device and its driver can use any IRQ level, the IRQ field should be set to [Any]. If an IRQ level is not required by a Device Definition, it should be set to [None].

Notes:

C H A P T E 7

PC Card Control for DOS

PC Card Control: DOS vs. Windows

In nearly every respect, PC Card Control for DOS is identical to the Windows™ version. The most obvious differences relate to the differences in operating modes between real-mode, character-based DOS and the protected-mode, high-resolution graphics of Windows.

PC Card Control for DOS is a single-tasking application which allows you to configure your PC Cards. As such, it only lacks the obvious ability to always be available, even while working with other applications, as well as lacking the enhanced Advisor capabilities of the Windows™ version. This does **not** mean that CardWare is only active in DOS when using PC Card Control. Rather, CardWare is activated every time you boot your computer and continues to actively monitor your PCMCIA system while your system is on. PC Card Control is your DOS PCMCIA system configuration utility.

Starting PC Card Control for DOS

PC Card Control will be installed into your CardWare subdirectory on the hard drive you selected during Install. The basic startup command would be:

```
[drive]:\[path]PCCARD <Enter>
```

For example, using the installation defaults, you would type:

```
C:\CARDWARE\PCCARD <Enter>
```

where,

```
[drive]   = C
[path]    =\CARDWARE\
```

Using PC Card Control for DOS

PC Card Control for DOS responds to both the keyboard and the mouse (if a Microsoft Mouse™-compatible DOS mouse driver is installed).

Keyboard

Along the bottom of the screen you will see some general help for keyboard commands.

Alt-X Exit

Pressing the ’ while holding down the Alt key will terminate the session and return you to DOS.

F6 Next Socket

The F6 key allows you to toggle between the sockets displayed on the screen.

F10 Menu

The F10 key activates the main menu on the top line of the screen. Use the left and right arrow keys to highlight a menu entry, pressing Enter to select it. Inside a menu you can use the up and down arrow keys to highlight a selection, again pressing Enter to activate it. Press the Esc key to close any menu or dialog Window.

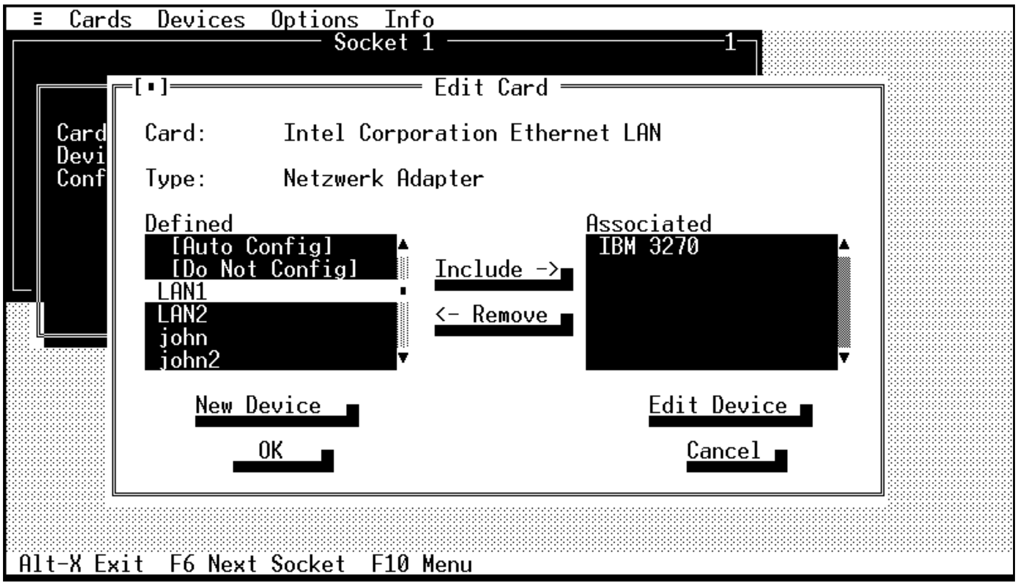
Mouse

Use the mouse as you would in Windows. You can click on a socket window to bring it to the front. If you press and hold the mouse button on the top line of a socket window, you can drag it about on the screen. Release the button to

place it. Click on menu items to select them or click on the keyboard help on the bottom of the screen to select those commands.

Configuring PC Cards

There are five steps involved in configuring a new PC Card.



1. From the main menu choose "Cards | Edit". You have the choice of editing a card inserted in one of the available sockets, or choosing a card out of all available cards currently inserted in an available slot, or any card currently available in the CardWare database.   "Any Card" will present a dialog box which allows you to choose the card you want to edit.

2. Select the card to edit from the "Card" field. Clicking on the arrow on the right opens a list box of card types. If there is a card already inserted, CardWare will attempt to determine its name and its type. If it can determine either, then you will not be able to alter that field.

3. To change the type of the card, choose the appropriate "Type" for the card. If the card has already been recognized by CardWare, you will **NOT** be able to change the type.

4. Next, you need to specify the PC Card Device Definition associations -- in this context, a Device Definition is simply the specification of the system resources the card will use. If the card is generic, it will already have devices associated with it.

5. You can move the Device Definitions from the "Defined" to the "Associated" box and vice versa by simply double-clicking on the Device Definition, or by selecting a Device Definition and clicking the "Include" or "Remove" button.

   REMEMBER: If your card comes with its own configuration software, select "[Do Not Config] ". This will permit your software to correctly control the card.

   There are two important things to remember about associating devices with a PC Card:

6. CardWare will try to configure the card in the order the Device Definitions appear in the "Associated" box.
7. The system resources referenced by the Device Definition(s) must be available -- which means:
   a) they must have been placed under the control of CardWare (see below, ssigning System Resources for Device Definitions”),
   b) they must be physically present in the system,
   c) they must not be in use by another device, and
   d) they must match any requirement the card may have. (Please check the CARDINFO.TXT file in your CardWare directory for information about your card.)

If you have edited a card which is currently in use, you must tell CardWare that you want to reconfigure it. For this purpose, select the "Cards econfigure" option from the main menu.

To create a new device configuration, click on *New Device*. To inspect or modify a device configuration, click a on *Edit Device* or, from the Main Menu, click on evices | Edit”.

Device Configuration

There are three situations in which you may define a Device Definition:

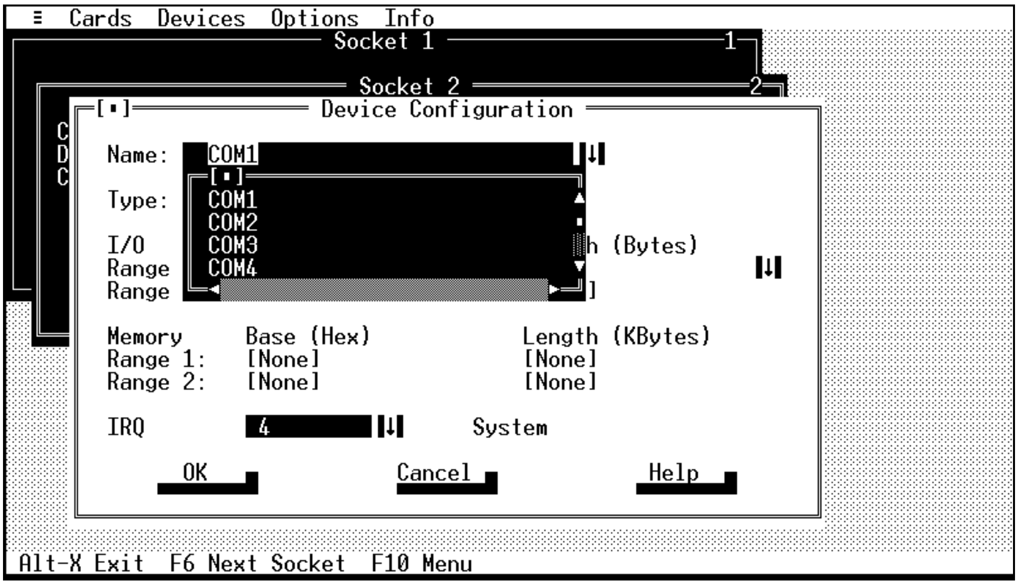
1. To create a new Device Definition for a card you are currently defining

2. To create a new Device Definition for a card that has already been defined. It may have been configured and you wish to change that configuration, or you were told that it could not be configured because the required system resources are not available.

3. To edit an existing Device Definition (e.g. changing memory base address or IRQ)

If you want to create a new Device Definition choose "Devices ew" from the main menu.

You need to give the new Device Definition a name and to select the Type of device from the "Type" list. When you have entered the name and selected the type, skip to subsection “*Assigning System Resources for Device Definitions*”, below



If you are editing an existing Device Definition (having selected "Devices dit" from the main menu), you only need to select the name of the Device Definition you wish to edit from the "Name" list box. Then you will reassign the system resources (that are to be changed) to this Device Definition. The system resource fields will display their current assignments for your convenience.

Assigning System Resources for Device Definitions

One or more of the following system resources will be required depending on the type of Device Definition.

Please bear in mind that this manual must assume that the PC Card you wish to define and associate includes complete documentation. Such documentation would naturally include the data referred to below. This is especially important if the card is not generic and/or does not completely conform to the PCMCIA specifications of revision 2.10.

Specifying I/O Ranges or I/O Addresses

I/O resources required by a device are specified by a base address and, in some cases, a length. Some device types such as serial ports use a fixed number of I/O ports. For these types of devices, the length is implied and *PC Card Control* does not allow a length to be specified. The base address of an I/O range is entered using a drop-down combo box. This address is specified in hexadecimal, typically between 100H and 3FFH. The length of an I/O range is specified in bytes, typically as a power of two between 1 and 32.

If the Device Definition type permits an I/O range to be entered, but the definition does not require an I/O range, then both the address and length must be set to [None]. If the definition allows the I/O range to be located wherever space is available, then the length should be set to the size required and the address to [Any].

Some devices may require multiple I/O ranges. *PC Card Control* allows a Device Definition to have up to two I/O ranges. If a Device Definition uses two I/O ranges, the base address for both ranges must be specified. **The [Any] entry may <u>not</u> be used when multiple I/O ranges are specified**.

Specifying Memory Ranges

Memory resources required by a device are specified using a base address and a length.

The base address is entered using a drop-down combo box. This entry is specified in hexadecimal as an Intel x86 segment value, typically in the range of A000H to F000H. The length is also entered using a drop-down combo box. This entry is expressed in decimal in KByte units, typically as a power of two between 4 and 64.

If the device type permits a memory range to be entered, but the definition does not require a memory range, both the address and length must be set to [None]. If the definition allows the memory range to be located wherever space is available, the address should be set to [Any] and the length set to the size required.

If a device requires a second memory range, enter this data on the "Memory Range 2" line as you did on line 1.

Specifying IRQ Levels

IRQ levels required by a device are specified by a single value. This value is specified in decimal and range from 2 to 15. The IRQ value is set using the same kind of combo-box as used to set the I/O and memory ranges.

Different types of devices traditionally use certain IRQ's. For example, serial port devices typically use IRQ4 for COM1 and COM3, and IRQ3 for COM2 and COM4. If a device (or its device driver) require a specific IRQ level, it must be set using the IRQ field.

If the device and its driver can use any IRQ level, the IRQ field should be set to [Any]. If an IRQ level is not required by a Device Definition, it should be set to [None].

Options

Selecting the *Options* entry from the Main Menu will allow you to toggle the OS Beeps Off/On" setting. This simply toggles on or off the speaker beep tones used by CardWare to indicate card insertion, configuration status and card removal.

Info

Selecting *Info* allows you to get information about the current version of PC Card Control for DOS as well as version information about Client software using CardWare services. These clients are typically PC Disk and PC Enable.

Notes:

C H A P T E R 8

Appendices

A. Using DOSCARD

DOSCARD is a DOS utility that displays the revision of the installed software and the current configuration of any installed PC Cards.

Syntax: `DOSCARD [/H] [/D] [/S:n]`

where: `/H` Print the help text

`/D` Detailed information with card configuration

`/S:n` Specifies the zero based socket number n if only information about this socket should be displayed (default: display information about all sockets).

B. Using PCPREP

PCPREP is a DOS utility which partitions and formats SRAM cards and ATA flashdisk and harddisk cards. PCPREP should **NOT** be run within a Windows DOS box.

PCPREP can **not** be used on FLASH cards. For FLASH cards you have to use special utilities which come with your Flash File System (e.g. MEMCARD.EXE for Microsoft's FFS-II).

If you have a clean, unformatted SRAM or ATA Flashdisk or Harddisk card, you must prepare those cards for use with your system.

Following is a step by step description which assumes the drive letter E: is assigned to the socket. If you do not know which drive letter is assigned to the socket, use the DOSCARD utility to determine the drive letter assigned.

1. Insert the card in the socket.
2. Type `'PCPREP E:'`.
3. PCPREP now starts to prepare your card. You must **not** format your card with a FORMAT command after executing PCPREP.
4. Your card is now ready for use in your system.

NOTE **NEVER remove a PC Card while PCPREP is formatting it!**

NOTE: **If your system requires an ATA Harddisk drive to be formatted like a floppy disk (without partition table), you can use the '/F' switch (e.g. 'PCPREP E: /F'). Also note that it is not recommended to use this switch for normal operation.**

C. Using PCRM

PCRM is a DOS utility that allows initialization of resources which are available to Card Services.

PCRM is placed in your CONFIG.SYS file. When activated at boot-up, it reads the [RESOURCES] section of the CARDWARE.INI file and initializes Card Services.

If the /AUTODETECT switch is used, PCRM automatically detects free COM ports, free LPT ports and free IRQ's.

NOTE: **Do not try to load PCRM high. This is unnecessary and can hang your system. It is not necessary to load PCRM high, because it only initializes the Card-Services resource table and <u>it does not</u> stay resident.**

Syntax:
```
DEVICE=PCRM [/H] [/F=FILE.INI|NONE]
[/AUTODETECT][/[X]MEM=base,length,share]
[/[X]I/O=base,length,share,lines]
[/[X]IRQ=level,share]
```

where:

`/H`	Print the help text
`/AUTODETECT`	Enable autodetection features
`/F=FILE.INI`	Specifies an alternative .INI file name (default: CARDWARE.INI, located in directory where your CardWare files have been installed.)
`/F=NONE`	Do not process any .INI file)
`/MEM`	Add length bytes of memory at base with share
`/I/O`	Add length bytes of I/O at base with share and lines
`/IRQ`	Add IRQ level with share
`/XMEM`	Exclude length bytes of memory at base with share
`/XI/O`	Exclude length bytes of I/O at base with share and lines
`/XIRQ`	Exclude IRQ level with share

D. Installation Information

CardWare is the sum of several individual components. By taking a modular approach to PCMCIA support, CardWare allows you to select which pieces you really need.

This section will cover:

- Removing other brand PC Card (PCMCIA) software
- Each component
    - What it does
    - How to use it
    - How it relates to the other components
- Modifying your CONFIG.SYS and AUTOEXEC.BAT (before and after)
- Socket and Card Services only
- Disabling and removing CardWare
- Installing PC Card Control into Microsoft Windows™

Uninstalling Other PCMCIA Software

The CardWare installation programs can detect and replace earlier versions of CardWare but they cannot remove another brand PC Card software if you replace it with CardWare.

This manual will describe two other known and documented PCMCIA software installations and how to remove them. These packages are from Phoenix Technologies, Ltd. and SystemSoft Corporation. Whether you are using one of these or a software package from another software company, the most effective method of removal will be to use their own uninstallation, if one exists. Otherwise, you should check the documentation included with the software for instructions for removal. Failing that, your next best choice will be to contact the publisher technical support.

In general, you will need to inspect your CONFIG.SYS and either delete or remark-out the lines loading the software. By emark-out”, we mean to add the letters EM ” at the beginning of each line. Note that a space must follow the ’.

PCM3+

The Phoenix Card Manager Plus version 3 installation will add some or all of the following lines to your CONFIG.SYS:

```
DEVICE=C:\PCMPLUS\CNFIGNAM.EXE /DEFAULT
DEVICE=C:\PCMPLUS\PCMSS.EXE
DEVICE=C:\PCMPLUS\PCMCS.EXE
DEVICE=C:\PCMPLUS\PCMRMAN.SYS
DEVICE=C:\PCMPLUS\PCMSCD.EXE
DEVICE=C:\PCMPLUS\PCMATA.EXE
DEVICE=C:\PCMPLUS\PCMFFCD.EXE
DEVICE=C:\PCMPLUS\MS-FLASH.SYS
```

Note, that the above assumes the default drive and directory are used; yours will look differently depending on your selections during installation.

Additionally, PCM3+ includes PCMWIN.EXE. This provides the Windows® interface for PCM3+ and you should remove it from the Startup Group and/or from the un=" line in your Windows® WIN.INI.

CardSoft

CardSoft from SystemSoft will add the some or all of the following lines to your CONFIG.SYS:

```
DEVICE=C:\CARDSOFT\SSxxxxxx.EXE
DEVICE=C:\CARDSOFT\CS.EXE
DEVICE=C:\CARDSOFT\CSALLOC.EXE
DEVICE=C:\CARDSOFT\ATADRV.EXE
DEVICE=C:\CARDSOFT\MTSRAM.EXE
DEVICE=C:\CARDSOFT\MTAA.EXE
DEVICE=C:\CARDSOFT\MTAB.EXE
DEVICE=C:\CARDSOFT\MTI1.EXE
DEVICE=C:\CARDSOFT\MTI2.EXE
DEVICE=C:\CARDSOFT\MTDDRV.EXE
DEVICE=C:\CARDSOFT\SSMSFLSH.SYS
DEVICE=C:\CARDSOFT\CARDID.EXE
INSTALL=C:\CARDSOFT\CS_APM.EXE
```

Note, that the above assumes the default drive and directory are used; yours will look differently depending on your selections during installation. Also note that the first line contains Sxxxxx.EXE". The xxxxx" are replaced with letters indicating the Socket Controller used in your system.

CardSoft Windows support is managed by SSCOMM.EXE, SSVCD.EXE, SSVRDD.386 and SSWINCS.EXE. You will need to see that they are removed from your Windows files. To remove the CardSoft modifications, place a semicolor or delete the lines referring to the CardSoft files. NOTE that there are two lines which have had a semicolor placed in

front. These should remain in the file and have the semicolons remove. The following is an example of CardSoft modifications to SYSTEM.INI.

```
[Boot]
comm.drv=C:\CARDVIEW\SSCOMM.DRV

;comm.drv=comm.drv


[386Enh]
device=C:\CARDWIZ\SSVRDD.386
device=C:\CARDWIZ\SSVCD311.386
device=C:\CARDWIZ\PCCARD.386
EMMEXCLUDE=D000-DFFF
device=C:\CARDVIEW\SSVRDD.386
device=C:\CARDVIEW\SSVCD.386

;device=*vcd
```

Configuring CardWare

CardWare is composed of a set of files which perform specific functions. CardWare files may be loaded as:

1. Device drivers by including a 'DEVICE=' line followed by the program start up commands in your CONFIG.SYS.
2. Normal DOS TSR programs loaded from the DOS command line.

The files must be loaded as device drivers if you need support for PC Cards which store files (i.e. static-RAM and flash memory cards, or ATA flashdisk or harddisk cards). The file that provides support for such devices *(PCDisk)* can *only* be loaded from the CONFIG.SYS file, *not* from the DOS command line.

If you will be using PC Cards most of the time, we suggest you load the CardWare files from the CONFIG.SYS file.

CardWare Files

The following CardWare files are listed in their proper order of usage.

DOS Protected Mode Manager (DPMS.EXE)

The protected mode manager uses the DOS Protected Mode Specification (DPMS) to install and manage CardWare software in high memory. This driver allows CardWare to operate with an absolute minimum usage of memory below 640K.

Socket Services (SSxxxxxx.EXE)

This is the software which supports the PCMCIA controller used in your computer. CardWare includes support for many controllers; see the README.TXT for a description of which file is required for each supported controller. In general, each Socket Services file name begins with S'. Can be loaded in high memory.

Card Services (PCCS.EXE)

This is the software which enables PCMCIA-compliant Card Services. Can be loaded into high memory.

Resource Manager (PCRM.EXE)

As described above, PCRM.EXE performs a one-time resource inventory and communicates its findings to Card Services. **Cannot be loaded into high memory.**

PC Card Enabler (PCENABLE.EXE)

This is software which detects PC Card insertion/removal and manages the process of card configuration/resource allocation. PCENABLE is a lient application" because it uses the API provided by Socket and Card Services. If your PC Card has its own enabling software, you would ordinarily use that instead of PCENABLE.

PCENABLE.EXE requires that Socket and Card Services be loaded before it is activated. Can be loaded into high memory.

Memory Cards and ATA Harddisk and Flashdisk (PCDISK.EXE)

PCDISK.EXE is used to provide access to ATA harddisk and flashdisk cards. This includes services such as formatting and partitioning as well as mediating simple reads and writes.

PCDISK **must** be loaded in the CONFIG.SYS. It also must be loaded **after** all of the above. This means that if you will be using such cards, all of the above software must be loaded by way of the CONFIG.SYS.

The syntax for loading PCDISK is:

```
DEVICE=[d:][path]PCDISK.EXE [/QUEUE=nn]
```

`/QUEUE=` Specifies the number of concurrent erasures for cards that support background erasure (1-9)

Default: `/QUEUE=1`

Example CONFIG.SYS Modification

This section will provide a before and after look at an example CONFIG.SYS. Beyond the obvious addition of the CardWare command files, you will also note a change to the EMM386.EXE memory manager.

There are three special, and very important, points to observe about the modified listing:

1. If you are using, or plan to use, FLASH memory cards, you must use the Microsoft Flash-File-System II (FFS I). FFS I is not part of the CardWare package and must be purchased separately from Microsoft.

   If you have already installed FFS I, install the MS-FLASH.SYS driver <u>after</u> PCDISK.EXE in your CONFIG.SYS. Typically, you would place the following line at the bottom of your CONFIG.SYS, after all of the other CardWare files:

   ```
   DEVICE = C:\MSTOOLS\MS-FLASH.SYS
   ```

2. The lines added to the CONFIG.SYS file are placed after any entries used to load memory managers such as Quarterdeck's QEMM, Qualitas' 386MAX or Microsoft EMM386. They **MUST** also be placed <u>after</u> any entries which load Power Management software.

3. Please compare the third line of both CONFIG.SYS listings. You will notice that an area of memory has been excluded from the EMM386.EXE memory manager. If you are using any memory management software (QEMM, 386MAX, NetRoom, EMM386, etc), you **MUST** instruct the manager to exclude the ROM Expansion area assigned to CardWare. Review the MEM= entries in the [Resources] sections of the initialization file (CARDWARE.INI) to determine the area(s) to exclude. See section *E. Assigning System Resources to CardWare* below for more information.

The following listing is an example of a fairly common CONFIG.SYS.

```
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE RAM
BUFFERS=10,0
FILES=30
FCBS=4,0
DOS=HIGH,UMB
LASTDRIVE=I
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /e:512 /p /f
```

The next listing is the same, but with the CardWare files added:

```
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE RAM X=CF00-D7FF
```

```
BUFFERS=10,0
FILES=30
FCBS=4,0
DOS=HIGH,UMB
LASTDRIVE=I
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /e:512 /p /f

REM ---- THE FOLLOWING FILES HAVE BEEN ADDED FOR CARDWARE
DEVICE=C:\CARDWARE\DPMS.EXE
DEVICE=C:\CARDWARE\SSxxxxxx.EXE
DEVICEHIGH=C:\CARDWARE\PCCS.EXE
DEVICE=C:\CARDWARE\PCRM.EXE/AUTODETECT
DEVICEHIGH=C:\CARDWARE\PCENABLE.EXE
DEVICEHIGH=C:\CARDWARE\PCDISK.EXE
REM ---- END OF THE CARDWARE FILES
```

If you have placed the CardWare files in a different subdirectory or drive, change all of the references above to 'C:\CARDWARE' with the appropriate drive and subdirectory (also known as the path). Be sure a backslash still separates the path from the filename as shown above.

The DPMS driver allows Socket Services (SSxxxxxx.EXE), Card Services (PCCS.EXE) and PC Enable to be loaded into extended memory. If you prefer using a memory manager, such as EMM386.EXE or QEMM386.SYS, which provides upper memory blocks (UMB), you can use the DEVICEHIGH statement to load all drivers high -- with the exception of PCRM, which does not stay. The ability to load the drivers high is exclusively a function of the memory manager ability to provide enough upper memory and it is very unlikely that the manager will be as successful as the DPMS driver. Remember you **cannot** load PCRM high, because it only initializes Card-Services and does **not** stay resident.

The above listing represents a complete installation of CardWare. For a minimal installation, see nstallation of Socket and Card Services Only" below.

Changes to Your AUTOEXEC.BAT

The CardWare path (usually 'C:\CARDWARE') should be added to your "PATH=" statement in your AUTOEXEC.BAT. The following is an example of a fairly common path statement:

```
PATH=C:\;C:\WINDOWS;C:\DOS
```

To add CardWare to the path, you would modify the above to read:

```
PATH=C:\CARDWARE;C:\;C:\WINDOWS;C:\DOS
```

Installation of Socket and Card Services only

If you need only the PCMCIA Application Programming Interface (API) and want CardWare not to enable the PC cards, you do not need to use PCENABLE.EXE and PCDISK.EXE. In that event, you would only need to add the following four lines in your CONFIG.SYS:

```
DEVICE=C:\CARDWARE\DPMS.EXE
DEVICE=C:\CARDWARE\SSxxxxxx.EXE
DEVICE=C:\CARDWARE\PCCS.EXE
DEVICE=C:\CARDWARE\PCRM.EXE /AUTODETECT
```

Recall that the DPMS driver allows the Socket and Card Services to be located in extended memory for a minimal impact on free DOS memory. Additionally, you can load both high using the DEVICEHIGH statement, but DPMS will probably free more memory. Remember you **cannot** load PCRM high, because it only initializes Card-Services and does **not** stay resident.

NOTE: **The lines added to the CONFIG.SYS file should be after any entries used to load memory managers such as Quarterdeck's QEMM, Qualitas 386MAX or Microsoft EMM386. They MUST also be placed after any entries which load Power Management software.**

WARNING!! **If you are using memory management software (QEMM, 386MAX, EMM386 etc), you MUST instruct the manager to exclude the ROM Expansion area assigned to CardWare. Review the MEM= entries in the [Resources] sections of the initialization file (CARDWARE.INI) to determine the area(s) to exclude.**

Disabling CardWare

To temporarily disable CardWare, follow this simple procedure:

- Modify your CONFIG.SYS file using a text editor capable of editing ASCII files without changing the format. Locate the following '`DEVICE=`' statements:

```
DEVICE=C:\CARDWARE\DPMS.EXE
DEVICE=C:\CARDWARE\SSxxxxxx.EXE
DEVICE=C:\CARDWARE\PCCS.EXE
DEVICE=C:\CARDWARE\PCRM.EXE /AUTODETECT
DEVICE=C:\CARDWARE\PCENABLE.EXE
DEVICE=C:\CARDWARE\PCDISK.EXE
```

- Insert '`REM `' at the beginning of each line. Note that there is a space after the letters '`REM`'. The case is irrelevant, but the space is required. '`REM `' turns each of the four `DEVICE=` lines into a remark line, thereby preventing the loading of your CardWare. Remember to save the file.

- Remove the PCCARD.EXE command from the 'run=' line of the WIN.INI. **DO NOT REMOVE** the entire line, just the "C:\CARDWARE\PCCARD.EXE" portion.

Re-enabling CardWare

To re-enable CardWare™, modify your CONFIG.SYS file using a text editor capable of editing ASCII files without changing the format. Locate the following '`REM DEVICE=`' statements:

```
REM DEVICE=C:\CARDWARE\DPMS.EXE
REM DEVICE=C:\CARDWARE\SSxxxxxx.yyy
REM DEVICE=C:\CARDWARE\PCCS.EXE
REM DEVICE=C:\CARDWARE\PCRM.EXE /AUTODETECT
REM DEVICE=C:\CARDWARE\PCENABLE.EXE
REM DEVICE=C:\CARDWARE\PCDISK.EXE
```

Delete the '`REM`' at the beginning of each line. Be sure to remove the space after the letters '`REM`'. ('`REM`' turned each of the '`DEVICE=`' lines into a remark line, thereby preventing the loading of your CardWare.)

Removing CardWare

Removing CardWare from your system requires the following steps:

1. Remove the following lines from the CONFIG.SYS file:

```
DEVICE = C:\CARDWARE\DPMS.EXE
DEVICE = C:\CARDWARE\SSxxxxxx.yyy
DEVICE = C:\CARDWARE\PCCS.EXE
DEVICE = C:\CARDWARE\PCRM.EXE /AUTODETECT
DEVICE = C:\CARDWARE\PCENABLE.EXE
DEVICE = C:\CARDWARE\PCDISK.EXE
```

2. Remove the CardWare directory from the path command in your AUTOEXEC.BAT file. In the following example, assume that 'C:\CARDWARE' is your CardWare directory:

   If path reads:

   ```
   PATH=C:\;C:\CARDWARE;C:\DOS
   ```

   Change to read:

   ```
   PATH=C:\;C:\DOS
   ```

   (If you installed CardWare in a different directory, substitute the name of that directory for 'CARDWARE').
3. Remove all files from your CardWare directory.
4. Remove PCCARD.EXE from your Windows Startup Group.
5. Remove the CardWare Group from your Windows Program Manager.

Installing CardWare into Windows

This section will continue to assume that you have installed the CardWare files into the '\CARDWARE' subdirectory on your C: drive. If you have installed CardWare elsewhere, simply replace 'C:\CARDWARE' references to the correct drive and directory. All that remains, then, is to add PC Card Control for Windows, PCCARD.EXE, to one of your Windows groups (for convenience, we recommend the Startup group.) Starting from the Program Manager, the steps are:

1. Select "File | New"
2. Either directly enter 'C:\CARDWARE\PCCARD.EXE' or select "Browse" to locate PCCARD.EXE in the C:\CARDWARE directory.

E. Assigning System Resources to CardWare

In order for CardWare to operate, it must be assigned system resources. These resources are used for configuring PC Cards to avoid conflicts over system resources with other peripherals in your system. System resources include:

- system memory address space
- Interrupt ReQuest (IRQ) levels
- System I/O address space.

NOTE: **These system resources must be excluded from use by other system software such as memory managers and Windows.**

The CardWare initialization file (CARDWARE.INI) has a default [Resources] section. This section should be customized for the host system. The defaults provided may operate without modification. However, if you encounter any problems with PC Card recognition or configuration, improper resource assignment is the first item to check (see the CWINI.TXT file for more information).

It is possible (though not recommended) to edit the initialization file (CARWARE.INI) directly with a text-editor capable of editing ASCII files. PC Card Control offers a much better solution for modifying the system resources. Choose "Options esources" from the menu. Be careful when editing the file with a word processing program such as WordPerfect or Microsoft Word. These programs normally do not save files as ASCII and may damage the initialization file.

NOTE: **If you are using a memory manager, you must exclude any of the Expansion ROM area assigned to CardWare from the memory managed by that program. This is typically done by adding a command line argument to the DEVICE= line used to load the memory manager in the CONFIG.SYS. As an example, Microsoft EMM386 requires the argument X=mmmm-nnnn, where mmmm is the starting segment address and nnnn is the ending segment address of the area to be excluded. See your memory manager documentation for more information.**

F. Troubleshooting

Occasionally, troubles occur with new software because of incompatibilities with your system BIOS. We recommend that you confirm that you have the latest system software. Many portable computers have the BIOS in flash memory which can be easily updated. Most portable computer manufacturers provide special BBS support which allows you to down-load an updated BIOS via modem. PC Card support is an evolving area and some systems have better support in newer BIOS software. Older BIOS software with limited PC Card support may interfere with CardWare. In most cases, updating your BIOS to the latest release will reduce the potential for problems.

If Socket Services is loaded into a system that already has another socket services installed, a warning message is displayed. Socket Services continues initializing all other hardware, but does not disturb the previous socket settings.

If your system hangs immediately after Socket Services is loaded during CONFIG.SYS file processing, or if your system begins to behave erratically (i.e., beeping, etc.), power-off and restart with a cold boot.

If the PC Card in the socket is a non-memory card (e.g., modem or LAN adapter), attempts to read/write data in a file format will return an error. However, if an ATA card is loaded when a MemCard Erase (a function of MS-Flash) is issued, an *invalid media message* is received, and the card is totally erased.

Mouse Driver Interference

When movement of the mouse is erratic or interferes with PC Card activity, this is usually caused by assigning the card to the COM port corresponding to the mouse's COM port (e.g. COM1 and COM3, or COM2 and COM4).

PC Card Control does not notify you of low or Dead battery

For a 'low' or 'dead battery' beep warning to function, it must be enabled under the "Options vent..." main menu of PC Card Control panel. Also, make sure your speaker is not turned off.

Not Ready Reading Drive DOS Error (Reading a Flash Card)

Check to see if your Flash Card has been formatted. Is the Flash File System device driver in your CONFIG.SYS? The Flash Card may be damaged. Consult your card documentation.

PCPREP reports rror retrieving Driver Parameter Table”

This error will occur when PCPREP is run from within Windows. It is due to the limited manner by which Windows supports I/O control functions. Quitting Windows and running PCPREP from a conventional DOS prompt will fix the problem.

Cards not identified as same card between DOS and Windows Card Control

If this is an update installation, check to be sure you have updated the Windows ICON command line path for PCCARD.EXE rather than to an older version with the same file name.

No Beeps

Remove the card from the socket and make a visual inspection of the card and socket rails to insure that there is nothing that could obstruct a connection. If there is an obstruction, remove it and reinsert card FIRMLY. Also, make sure your speaker is not turned off.

No Beeps in Windows but Beeps in DOS

Open "Options vent..." menu in PC Card Control and confirm that Beeps are activated. Also, make sure your speaker is not turned off.

Erratic or Unstable Performance with a Desktop Card Reader

Such a card reader is dependent on the CMOS setup of the base computer. Especially important would be system bus speeds and I/O timings since the reader requires the use of a bus slot. Symptoms would be errors reported by CardWare while the system is booting and the CardWare drivers are loading or errors reported during normal operation.

G. Frequently Asked Questions

My system works fine when I first turn it on, but if I restart it by pressing the Ctrl, Alt and Delete keys at the same time, my PC Cards don't seem to work properly.

Some computer systems do not reset the PC Card socket controller when they are restarted using the Ctrl-Alt-Delete key sequence. Any configured PC Cards installed when the system is restarted may be incorrectly sensed by the system's BIOS to be peripherals that reside on the motherboard or in an adapter board installed in an expansion bus. The BIOS then believes it should handle the operation of these peripherals, creating a conflict with the CardWare software.

This situation may often be corrected by updating the system's BIOS. When a computer manufacturer realizes that the BIOS fails to reset the socket controller hardware, they typically release a BIOS update that fixes this problem. Until an updated BIOS is available, there are two possible solutions:

1. Remove all installed PC Cards before restarting your systems with the Ctrl-Alt-Delete key sequence, or
2. restart your system by cycling the power OFF and then back ON. Most computers have a Reset button which safely cycles power in such a manner.

What CIS information is used by CardWare to recognize the card?

Four pieces of information are included in three tuples. The information is stored in the following tuples:

1. Manufacturer ID
2. Function ID
3. Level 1 Version/Product Information tuple. Two pieces of Information are used from this tuple:
    a) Manufacturer's Name
    b) Product String

***What target platforms does the software work with currently*?**

Check the README file for information about which platforms are supported.

Do you support Type III cards?

CardWare supports Type III ATA drives.

How do you deal with a non-PCMCIA compliant card?

On card insertion, an end user will be notified that the information required to configure the card is not available, or cannot be read by the software. Only a single beep tone will occur indicating that the card was inserted but not recognized by the software.

How is hot swapping of cards handled?

An interrupt is generated by the system on insertion and removal of a PC Card. This interrupt is used to either flag that the card needs to be configured or released.

Can you boot from a PC Card?

The current PCMCIA specifications do not provide for booting from PC Cards. However, the PCMCIA committee is working to define a methodology which allows the DOS file structure to be read from a PC Card during boot.

Why isn't support for booting included in current platforms? What part of Socket Services must be included in the BIOS?

The PCMCIA software specifications are new enough so that in many cases the system vendors have not included the 4K of Socket Service support code in their current BIOS.

Eventually, we expect that all 4K of Socket Service code will migrate into part of the system BIOS. It is reasonable to expect that system vendors will hold off on integrating the Socket Service code into the BIOS until such time as it is possible to boot a system from a PC Card and to execute a program from a PC Memory Card.

What file formats do you support with memory cards?

Currently we are supporting DOS FAT, Microsoft Flash File System II and Datalight TrickACS.

How are you going to support new cards as they are released?

For a card to be PCMCIA 2.x compliant, it must have a Card Information Structure (CIS). Since our software uses the CIS information to configure the

card, any card which is PCMCIA compliant will automatically be recognized and supported by our software.

In addition, AWARD has established a Card Review Program designed to promote the review and testing of card manufacturers' CIS with CardWare.

How do you update the CARDWARE.INI file? What is the information format so that I (end-user) can modify or troubleshoot it?

When a card is configured specifically for the first time, CardWare stores this configuration information in the CARDWARE.INI file. CARDWARE.INI is an ASCII text file and is similar in structure to a conventional Windows INI file. This means that any simple ASCII text editor should be capable of editing it.

However, this does not mean that it should be altered by any means other than by CardWare itself. If you wish to attempt any manual change to this file, please first read the CWINI.TXT file included with the CardWare software. At the very least, you should always back-up the CARDWARE.INI file before attempting any changes.

H. Glossary

Adapter

The hardware which connects a computer bus to PC Card sockets.

Also: Certain PC Cards are commonly called adapters.

Associated

The description of the relationship between a Device Definition and a Card Definition. CardWare uses ***associated*** Device Definitions to determine how to configure a PC Card with the appropriate system resources.

See also: Association, System Resources

Association

Device Definitions are associated with Card Definitions. This association allows CardWare to configure a PC Card with the appropriate system resources.

See also: Device Definition, System Resources

ATA

Acronym for **AT A**ttachment specification. The industry standard for interfacing to Integrated Drive Electronics (IDE) hard drives and flash drives.

Auto-Configure

CardWare automatically attempts to configure each PC Card inserted. It does this by reading the CIS. If the CIS does not contain enough information, CardWare will attempt to logically configure the PC Card. However, even if successful, CardWare will not update CARDWARE.INI until the user employs *PC Card Control* to configure the card.

Card

A PCMCIA-compliant card. Also known as a PC Card.

See also: PC Card

Card Definition

Card Definitions are used by CardWare to determine how to configure a PC Card. A definition includes a card name, information from the Card Information Structure (CIS) that is used to recognize the card when it is inserted, and a list of associated Device Definitions.

See also: Configure, Card Information Structure, Associated, Device Definition

Card Information Structure

See CIS.

Card Type

The type of function performed by a PC Card. Examples are: ATA hard drive, Network Adapter, Parallel Port, Serial Port and Other.

See also: PC Card

CIS

The CIS (**C**ard **I**nformation **S**tructure) is a memory area inside certain PC Cards. This memory area is divided into Tuples (fields of data) which allow the system and application programs to know what is required to properly use that PC Card.

See also: Tuple

Configure

The act of programming a socket and PC Card for use in a system. When a PC Card is inserted, CardWare uses a card definition to recognize the card. Once a card is recognized, associated Device Definitions are used to determine the system resource required and how the card is configured.

See also: PC Card

Device

A term applied to a peripheral in a computer system. Examples are hard drives, serial ports and network adapters. Devices require system resources to perform the function they provide. CardWare calls the combination of system resources required by a device the Device Definition.

See also: Device Definition

Device Definition

A collection of system resources that a PC Card uses when it is configured by CardWare.

Device Type

The card type the Device Definition is intended to support. Card definitions may only be associated with Device Definitions of the same type. Different device types use different combinations of system resources.

See also: Associated

IDE

Acronym for **I**ntegrated **D**rive **E**lectronics. Used to describe hard drives with an on-board controller. The interface to the controller is described in the ATA specification.

Generic

PC Card's may contain information that allows CardWare to determine the type of function they perform. If this information is available, CardWare™ does not require that a specific card definition be developed to allow the card to be used. Instead, CardWare configures the card based upon a generic card definition appropriate to the card's type. Generic card recognition greatly reduces the number of specific card definitions required and allows a class of devices to be handled in a standard manner with automatic configuration from the first insertion.

Currently, CardWare recognizes two types of cards generically. These are ATA flash and hard drives and serial ports. All PC Cards recognized as ATA drives are automatically configured by CardWare using the Device Definitions associated with the ATA Drive card definition.

A number of PC Cards use a serial port interface. These cards include FAX/Data modems and GPS receivers. When CardWare detects the insertion of a FAX/Data modem, if the card has information identifying it as a serial port, CardWare uses the Device Definitions associated with the Generic Modem card definition to configure the PC Card.

GPS

Acronym for **G**lobal **P**ositioning **S**ystem. GPS is a navigational system using satellites. GPS receivers may be implemented as PC Cards. GPS PC Cards typically are built using a Serial Port for an interface.

Hot Spot

An area on the display screen where clicking with a mouse results in a move to another area of the help file. The cursor will change from an arrow to a small hand when positioned over a hot spot.

Hot Swap

Inserting a PC Card in the socket while the computer is powered on is called Hot Swapping. To insert a modem into the expansion channel bus inside your computer requires you to turn off the power (among other things).

Interrupts

Interrupts are used to get the system's attention. If a PC Card generates interrupts, CardWare configures the card socket to route the card's interrupt signal to an available **I**nterrupt **R**e**Q**uest (**IRQ**) level in the system.

See also: System Resources

I/O Ports

Ports have a port number, or address, and are used to pass information to or from peripheral devices. Port address space is separate from memory address space. CardWare configures PC Cards with I/O ports to use unoccupied port address space.

See also: System Resources

IRQ

See Interrupts.

Memory

Memory is the place used to store information while it is being used. Computer memory is organized as a number on individual locations each identified by an address. Memory address space is the sum of all of locations identified by an address. The memory address space is often much larger than the actual

amount of memory available to store data. CardWare configures PC Cards to use the unoccupied address space in what DOS refers to as the upper memory area.

See also: System Resources

PC Card

Term used to describe cards compliant with the PCMCIA PC Card Standard. About the size of a credit card, but varying in thickness, these cards plug into a 68-pin socket and expand the capability of your system. PC Cards can add additional storage using memory devices or ATA flash and hard drives. Other types of cards are specialized devices, such as modems, network adapters or GPS receivers. Some cards are actually interfaces through which your system can access even more devices.

PC Card Control

PC Card Control is the program for configuring your PC Cards. To start PC Card Control for Windows, click on the Icon in the CardWare group.

PCMCIA

Personal **C**omputer **M**emory **C**ard **I**nternational **A**ssociation has created and documented a series of specifications to allow you to plug in and use almost any compliant PC Card.

Recognized

To CardWare, recognized means that a PC Card is identified when it is inserted. A PC Card must be ***recognized*** before it can be configured using an associated Device Definition.

See also: Associated

Socket

The 68-pin receptacle into which the PC Card is inserted to make physical and electrical connection to the PC Card adapter.

See also: Adapter

System Resources

A system interacts with its world through three resources:

1. Memory
2. Interrupts
3. I/O ports.

Device Definitions describe the set of resources used by a PC Card once it is configured.

See also: I/O, Interrupts, Memory

Tuple

Tuples are special fields in the internal memory of certain PC Cards. PCMCIA-compliant tuples describe the configurable characteristics of Memory-Only and I/O Cards.

See also: CIS

WAV Files

A *WAV* (pronounced ave”) file is a file of digitized sound (like on a CD). Because the extension of the file name (the three characters following the period in the file name) is WAV (e.g. SOUNDS.WAV) these segments of sound have become known as WAV files.