RealPC™ Installation and User's Guide

This guide refers to version 1.0 of RealPC

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Contents

Conventions

For clarity this guide uses the following typographical conventions:

This style	Refers to this
COMPUTER	Anything you type, exactly as it appears.
bold	Names of items that appear on the screen.
↵	Return or Enter key.
⌘, Esc…	Other special keys on the keyboard.
italics	References to other sections of the guide.

The following symbols identify special instructions:

This symbol	Refers to this
➤	A step in a procedure.
■	An item in a list of alternatives.
■	Important information.

Abbreviations

This guide uses the following abbreviations:

This abbreviation	Refers to this
Insignia	Insignia Solutions.
MS-DOS	Microsoft Disk Operating System for the IBM PC or compatible.
Macintosh	A PowerPC processor-based Macintosh computer or MacOS compatible.
PC	An IBM PC or compatible computer.
Windows	Microsoft Windows 3.11 or 95.

Introduction

Welcome to RealPC, the software that enables you to run PC games and applications on your Power Macintosh or Power Macintosh compatible.

Read this chapter for a quick overview of the features of RealPC, and then turn to *Installing RealPC*, page 7, to get started.

What is RealPC?

RealPC is the most cost effective way of running MS-DOS games and applications on your Macintosh.

It is also easy to add your own copy of Windows to RealPC, so you can run Windows games and applications.

RealPC is easy to use, and provides several unique features including:

■ Apple Guide help, to give you step-by-step assistance with setting up and using RealPC.

■ AppleScript support, to allow you to automate PC-based tasks from your Macintosh.

■ EasyLaunch, to let you run MS-DOS and Windows games and applications simply by double-clicking an icon on your Macintosh desktop.

■ Joystick support, so you can use your Macintosh joystick with PC games.

■ Drag and drop, for easy copying of information between PC and Macintosh applications.

RealPC emulates a Pentium-based PC with MMX technology, allowing you to run PC programs, including MS-DOS, Windows 3.x, and Windows 95 games and applications, alongside your existing Macintosh applications. It gives the same performance as you would expect from a PC, and the faster your Macintosh the faster the performance of RealPC.

Running MS-DOS applications

RealPC is provided with MS-DOS 6.22 already installed, so that you can immediately run MS-DOS games and applications on your Macintosh.

RealPC supports Sound Blaster and MMX, and allows you to use a Macintosh joystick, making it ideal for running MS-DOS games on your Macintosh.

Quake running on a Macintosh using RealPC

Adding Windows 3.x

You can easily add your own copy of Windows 3.x to RealPC to allow you to run Microsoft Windows applications on your Macintosh. RealPC incorporates specially-written display, sound, mouse, and printer drivers for Windows, to give PC performance and the flexibility of a display size of your choice.
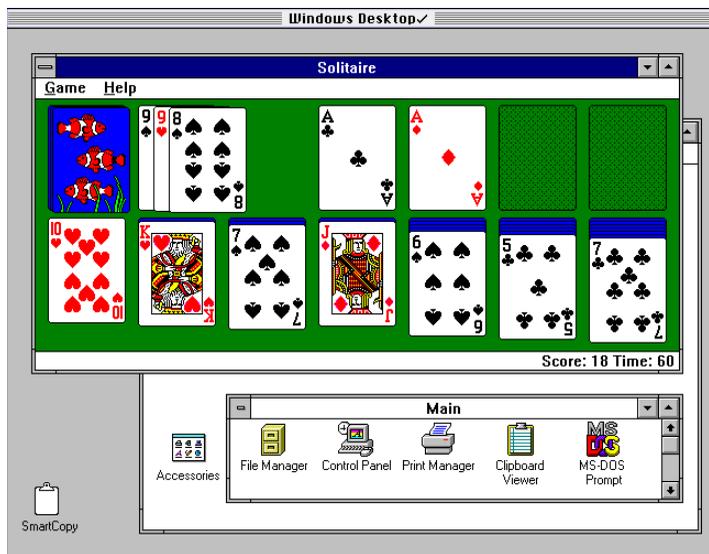
Windows 3.x running on a Macintosh using RealPC

If you want to take advantage of the extra features provided in Microsoft's latest version of Windows you can upgrade to Windows 95 from MS-DOS or Windows 3.x using a standard Windows 95 CD-ROM, or a set of Windows 95 installation disks. RealPC includes a special Windows display driver which gives enhanced display performance, and allows you to re-size the Windows desktop dynamically without restarting.

Windows 95 running on a Macintosh using RealPC

The Insignia TurboStart™ feature lets you quit from RealPC without exiting Windows 95. Windows 95 loads instantly the next time you run RealPC, and you can resume where you left off.

Key features of RealPC

The following key features of RealPC make running PC applications on your Macintosh as straightforward as running your existing Macintosh applications:

Full integration   RealPC is seamlessly integrated with your Macintosh. It includes clipboard linking to let you copy and paste graphics and text between your Macintosh and PC applications.

Moving data between your PC and Macintosh applications is no problem using the RealPC built-in file sharing. In addition, your PC programs can make use of your Macintosh peripherals, including your floppy disk drive, CD-ROM drive, sound, mouse, keyboard, joystick, microphone, serial ports, printers, SCSI devices, and network.

Networking

RealPC is fully network aware, and can take advantage of your Macintosh Ethernet or Token Ring connection to access other PCs on your network. RealPC includes Novell NetWare client and Microsoft Network client software. In addition, it supports most other PC network clients, to allow you to communicate with common network servers including Windows NT, Banyan VINES, DEC PATHWORKS, LANtastic, and Novell LAN WorkPlace.

Easy to use

RealPC is easy to use, in most cases easier than using a real PC. Insignia's EasyLaunch feature lets you run MS-DOS, Windows 3.x, and Windows 95 games and applications simply by double-clicking an icon on your Macintosh. And you can copy information between PC and Macintosh applications using drag and drop.

Setting up RealPC is easy too. Many changes that would require a hardware change on a PC can be made simply by changing options on the **RealPC Setup** dialog box.

If you are not already familiar with PCs this guide includes brief introductions to MS-DOS, Windows 3.x, and Windows 95 to help you get started. If you need more information you can use the RealPC Apple Guide help or Balloon Help to tell you what you need to do.

Requirements

Feature	Requirements
Macintosh	Any Power Macintosh or MacOS compatible.
System	System 7.1.2 or later.
Application memory size	Minimum: 16 Mbytes. Recommended: 24 Mbytes.
Hard disk space	50 Mbytes (MS-DOS), 60 Mbytes (Windows 3.x), 130 Mbytes (Windows 95).
CD-ROM drive	Any Macintosh compatible CD-ROM drive.

Installing RealPC
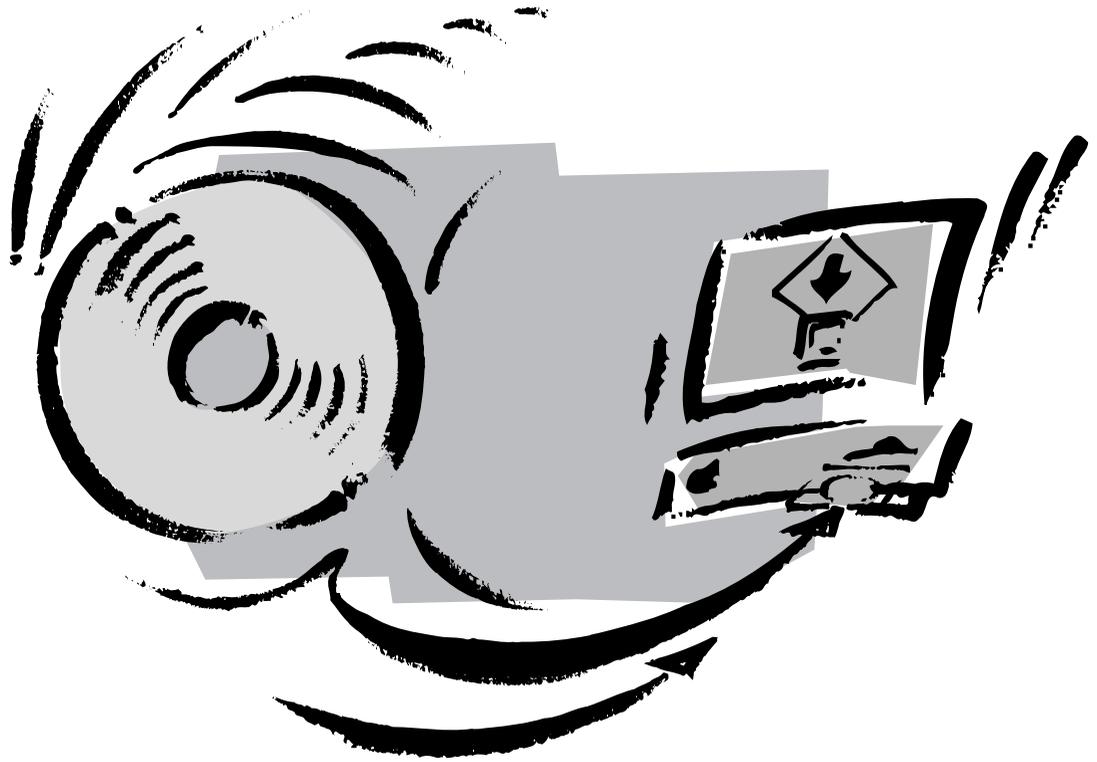
This chapter describes how to install RealPC on your Macintosh, and how to set it up to run MS-DOS applications. It also explains how to add Windows 3.x or Windows 95 using standard PC installation media.

RealPC is supplied on a CD-ROM. If your Macintosh does not have a CD-ROM drive you can connect an external CD-ROM drive, or use file sharing to connect to a Macintosh with a CD-ROM drive. Alternatively, a PowerBook can use SCSI disk mode to connect it to a Macintosh with a CD-ROM drive. Refer to your Macintosh documentation for more information about these options.

Installing RealPC

RealPC includes an installer which automatically installs all the files you need.

If the installation fails, set the **Extensions Manager** control panel to the system default and then try installing again.

> You will need about 50 Mbytes of free disk space for the default installation.

1 Read the ReadMe file
➤ Insert the RealPC installation CD.

Before proceeding we recommend you double-click the **ReadMe RealPC** icon on the installation CD-ROM for any important information that it was not possible to include in this guide.

ReadMe RealPC

2 Run the installer
➤ Double-click the **Installer** icon.

Installer

➤ When the welcome screen appears click **Continue**… to display the **Easy Install** dialog box.
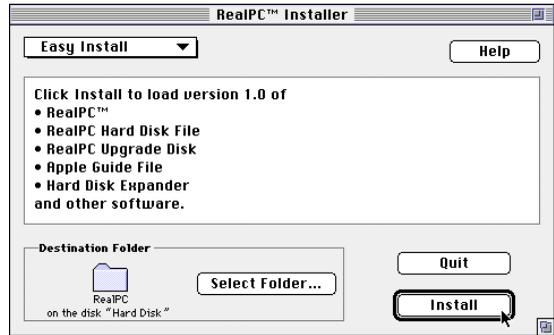
By default, the installer will install RealPC into a folder named **RealPC** on your startup disk.

➤ Click **Select Folder**… if you want to install RealPC in a different folder, and then click the **New** button if you want to create a new folder for RealPC.

➤ Click **Install** to proceed with the installation.

If you are installing on the startup disk, and applications are running, this dialog box appears:

➤ Click **Continue** to quit from other applications before installing. You will be prompted to save your work if necessary.

3 Create a hard disk file

This dialog box allows you to create a file to act as the hard disk for RealPC:

```
RealPC Hard Disk Files                    69 MB available
        ⊟ RealPC ▼
┌──────────────────────┐    ⊟ Hard Disk
│                      │↑   ┌─────────┐
│                      │    │  Eject  │
│                      │    └─────────┘
│                      │    ┌─────────┐
│                      │    │ Desktop │
│                      │↓   └─────────┘
└──────────────────────┘
Create New Hard Disk File:     ┌─────────┐
┌──────────────────────┐       │ Create  │
│RealPC Hard Disk File C│       └─────────┘
└──────────────────────┘       ┌─────────┐
                               │ Cancel  │
Size (MB): 40 ▼   Minimum Size: 13 MB
```
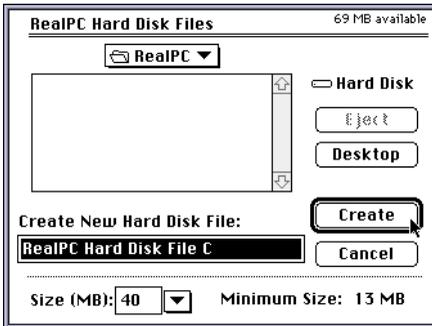
By default, the hard disk is created with the name **RealPC Hard Disk File C** and a size of 40 Mbytes, which is sufficient for MS-DOS.

If you want to install other applications you will need to increase the size. Refer to the user guides for the applications you want to install for help in choosing the size you need.

Alternatively you can increase the size later, using the HD Expander utility. Refer to *To change the size of a hard disk file*, page 45.
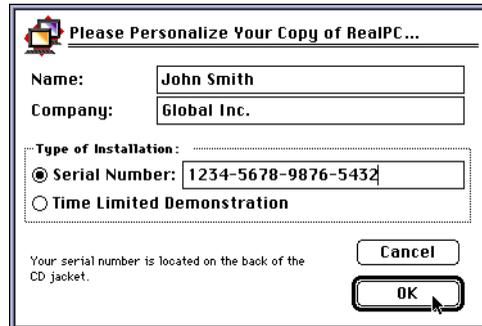
➤ Select the size for the hard disk file from the **Size** pop-up menu, or type the size into the box.

➤ Click **Create** to create the hard disk file.

The installer then copies the MS-DOS files to your hard disk:

```
═══════ Create New Hard Disk File: ═══════
Disk name: RealPC Hard Disk File C

▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨   ┌──────┐
                      │ Stop │
                      └──────┘
```

4 Personalize RealPC

This dialog box then appears, allowing you to personalize your copy of RealPC:

```
┌──────────────────────────────────────────────┐
│ 🔳  Please Personalize Your Copy of RealPC... │
├──────────────────────────────────────────────┤
│ Name:      ┌──────────────────────────────┐  │
│            │ John Smith                   │  │
│            └──────────────────────────────┘  │
│ Company:   ┌──────────────────────────────┐  │
│            │ Global Inc.                  │  │
│            └──────────────────────────────┘  │
│ ┌─Type of Installation:────────────────────┐ │
│ │ ◉ Serial Number: 1234-5678-9876-5432     │ │
│ │ ○ Time Limited Demonstration             │ │
│ └──────────────────────────────────────────┘ │
│ Your serial number is located on the back of the  ┌────────┐ │
│ CD jacket.                                        │ Cancel │ │
│                                                   └────────┘ │
│                                                   ┌────────┐ │
│                                                   │   OK   │ │
│                                                   └────────┘ │
└──────────────────────────────────────────────┘
```

➤ Type in your name.

➤ Type in your company, or press the space bar.

➤ Enter the serial number from the back of the installation CD-ROM jacket.

If there is no serial number on the CD jacket see the enclosed Activation Card for details.

To run a full version of RealPC all three fields must be completed. Alternatively, click **Time Limited Demonstration** to evaluate RealPC for a limited period.

➤ Click **OK** to save your details.

Alternatively, if you want to install RealPC without personalizing it click **Later**. You will then be asked to personalize RealPC when you first run it.

This dialog box then confirms that installation was successful:

➤ Click **Quit**.

RealPC is now installed.

5 Run RealPC
➤ Double-click the **RealPC™** icon.

If you are using US system software the Registration program will then run, to help you register your copy of RealPC. Refer to *Registering RealPC*, page 11, for information about how to proceed.

The RealPC MS-DOS window then appears with the MS-DOS startup information.

To use MS-DOS
You can now run MS-DOS commands and programs by typing commands at the C:\> prompt.

For example, to see the files on the PC hard disk type:

DIR ⏎

Once you have installed a game or application you can run it simply by typing its name; for example:

QUAKE ⏎

What next?
If you want to use Windows with RealPC refer to *Installing Windows 3.x*, page 15, or *Installing Windows 95*, page 19.

For more information about using RealPC refer to *Running RealPC*, page 27, *Setting up RealPC*, page 39, and *Networking with RealPC*, page 133.

Registering RealPC

In the US or Canada you can use the RealPC Registration program, to make registering your copy of RealPC as straightforward as possible.

Registering your copy will entitle you to 30 days of free technical support and customer service from your first call, and it will also ensure that you are notified of future product upgrades.

Note that the Registration program only runs if you have a US system. To register RealPC outside the US or Canada please complete and return the registration card included in the package.

If you have a modem, the RealPC Registration program can save you effort by sending your registration information directly to Insignia, on a toll-free number.

Alternatively, you can choose to print out your registration details to make a pre-addressed form, which you can then fax or mail to Insignia to complete the registration.
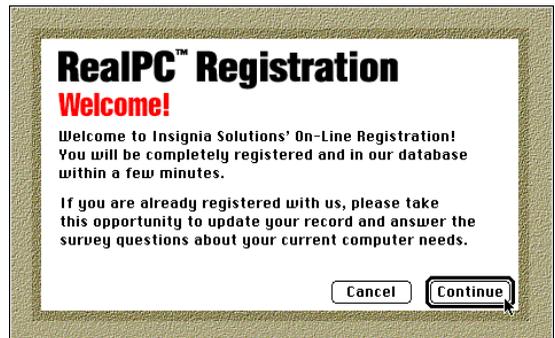
To register RealPC

Until you register your copy of RealPC, the Registration program runs automatically every time you run RealPC, and the following title screen appears:

➤ Click **Continue** to proceed with the registration.

The **Welcome** screen then appears:

➤ Click **Continue** to display the following screen:

RealPC™ Registration
Turn Your Modem On!

Our On-Line Registration requires that your modem be on and connected to an outside phone line.

If you don't have access to a modem, you can still use this On-Line Registration to enter your information. When you have finished, you will have the option to print your registration. You can then fax or mail your registration to us.

[Cancel] [**Continue**]

➤ If you are going to register by modem, turn on your modem now.

➤ Click **Continue** to display the **Contact Information** screen:

RealPC™ Registration
Contact Information   1 of 3

Name	John Smith		State		Zip	
Title			Country		
Company	Global Inc.		Phone		
Industry	No Selection		Fax		
Address			E-mail		
			Model	Don't Know	
City			[Cancel]	[**Next**]

Your name and company will already have been filled in from the data you entered earlier, but you can change these if you wish.

➤ Complete the screen with your name and address, and your other contact information, so that we can keep you updated with information about RealPC.

➤ Click **Next** to display the **Additional Information** screen:

RealPC™ Registration
Additional Information   2 of 3

What type of work do you do?
[Other   ▼]

If other, please specify
[|]

What single reason made you buy RealPC?
[ ]

[Previous] [Cancel] [**Next**]

➤ Complete the screen with the requested information.

➤ Click **Next** to display the **Purchasing Information** screen:

RealPC™ Registration
Purchasing Information   3 of 3

How did you purchase your Insignia Solutions' product?
[Don't Know   ▼]

When did you buy RealPC?
[Don't Know   ▼]

Number of Macintosh computers at your work site?
[Don't Know   ▼]

[Previous] [Cancel] [**Done**]

➤ Select your answers from the pop-up menus.

➤ Click **Previous** to review your other information, or **Done** when you have completed all three information screens.

This screen then lets you choose how to send the registration information to us:
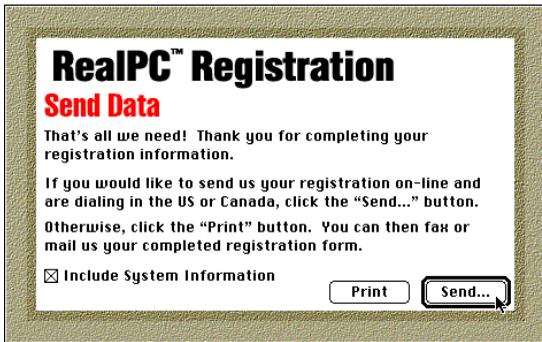

The Registration Program can read your computer model, system version, and RAM size. If you prefer not to send us this information, click **Include System Information**, so that the check box is not checked.

Then proceed as described in the following sections, depending on whether you want to send the registration by modem, or print it.

➤ Click **Send**… if you have a modem connected to a telephone line, and you would like to send your registration information electronically.

This dialog box then lets you specify which port your modem is connected to:
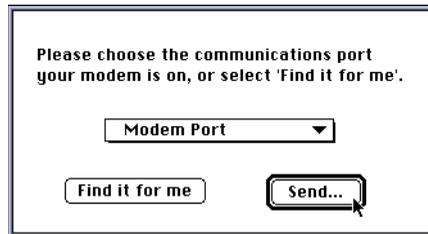
➤ Click **Find it for me** to set up the port automatically.

➤ Click **Send**… to send the registration information by modem.

If there is a problem using the modem you will be given the opportunity to print the information so that you can fax or mail it.

To print your registration information

➤ Choose **Print** in the **Send Data** screen if you want to print out a copy of your registration information, and fax or mail it to us.

This screen allows you to choose a printer before printing:
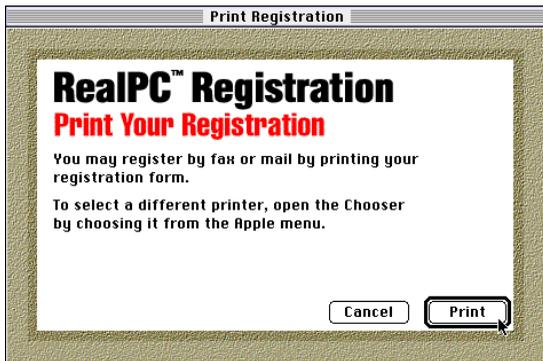
➤ When you have selected the printer click **Print** to proceed with printing the information as a single pre-addressed sheet of paper.

➤ Fax the information to the toll free number specified on the sheet, or fold it as directed and mail it to the pre-printed address to complete your registration.

Installing Windows 3.x

This section describes how to install Windows 3.x using a standard set of Windows installation disks available from most PC suppliers.

Ensure that your hard disk is at least 50 Mbytes to upgrade to Windows 3.x; refer to *To change the size of a hard disk file*, page 45.

❚ You must install Windows 3.x in the `C:\WINDOWS` directory.

Before upgrading your hard disk file it is recommended that you make a backup copy of it using the Finder's **Duplicate** command.

1 Install the Windows files

➤ Ensure you do not have a CD in the CD-ROM drive.

➤ Insert the first Windows installation disk into the Macintosh floppy disk drive.

➤ Type the following command at the MS-DOS `C:\>` prompt:

`A:SETUP` ⏎

The Windows Setup program runs and the following screen is displayed:

➤ Press ⏎ to set up Windows.

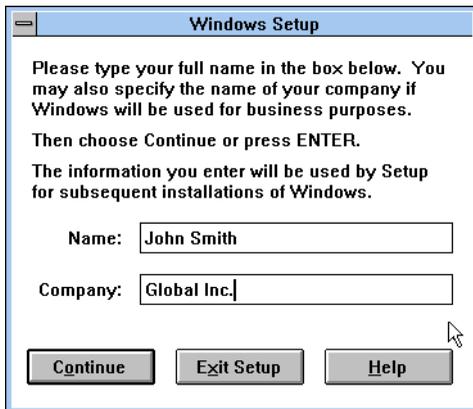The following screen then lets you choose the Setup method:
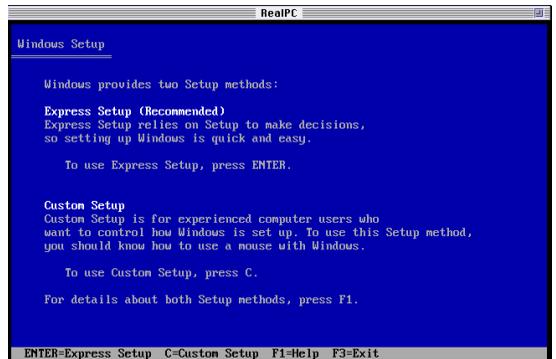
➤ Press ⏎ to run the recommended Express Setup.

The Windows Setup program then copies the files from the installation disks.

When a message appears asking you to insert the next installation disk:

➤ Eject the current installation disk by choosing **A:SuperDrive** from the RealPC **Eject** menu, or press ⌘ Shift 1.

➤ Insert the next installation disk, as specified.

➤ Press ↵ to continue the installation.

Windows then starts and the following dialog box allows you to personalize your copy of Windows:

```
┌─────────────────────────────────────────────┐
│ ▬             Windows Setup                   │
├─────────────────────────────────────────────┤
│ Please type your full name in the box below.  You │
│ may also specify the name of your company if   │
│ Windows will be used for business purposes.    │
│                                               │
│ Then choose Continue or press ENTER.          │
│                                               │
│ The information you enter will be used by Setup │
│ for subsequent installations of Windows.       │
│                                               │
│    Name:    │John Smith            │          │
│                                               │
│ Company:    │Global Inc.│          │          │
│                                      �        │
│  ┌──────────┐  ┌──────────┐  ┌──────────┐    │
│  │ Continue │  │Exit Setup│  │   Help   │    │
│  └──────────┘  └──────────┘  └──────────┘    │
└─────────────────────────────────────────────┘
```

➤ Select **Emulate PC Mouse** from the RealPC **Setup** menu to use the mouse, or type ⌘ M.

➤ Enter your name and company and click **Continue**.

You are then asked to confirm the information.

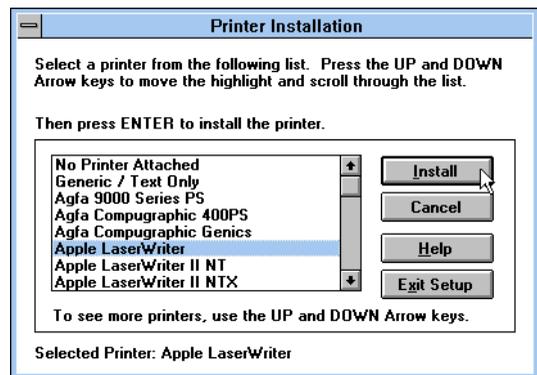➤ Click **Continue** to proceed.

The Windows Setup program then copies the Windows files from the installation disks.

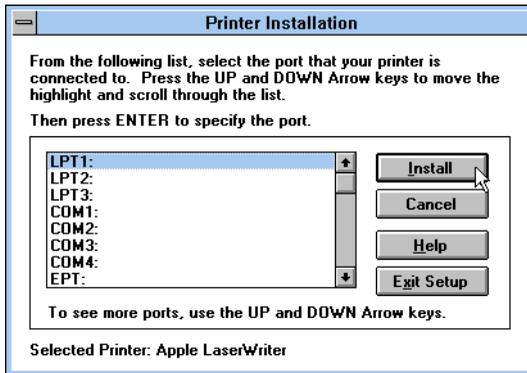The following dialog box prompts you to change disks when necessary:

```
┌─────────────────────────────────────────────┐
│ ▬             Windows Setup                   │
├─────────────────────────────────────────────┤
│  ▱▱      Please Insert the disk labeled        │
│                                               │
│         Microsoft Windows 3.1 Disk #4          │
│                                               │
│                into Drive A:                   │
│                                               │
│   Press ENTER or choose Continue when ready.   │
│                                               │
│  ┌──────────┐  ┌──────────┐  ┌──────────┐    │
│  │ Continue │  │   Exit   │  │   Help   │    │
│  └──────────┘  └──────────┘  └──────────┘    │
└─────────────────────────────────────────────┘
```

➤ Eject the previous installation disk as before and insert the next installation disk.

➤ Click **Continue** to continue.

The following dialog box then lets you set up a printer for use with Windows:

```
┌─────────────────────────────────────────────┐
│ ▬           Printer Installation              │
├─────────────────────────────────────────────┤
│ Select a printer from the following list.  Press the UP and DOWN │
│ Arrow keys to move the highlight and scroll through the list. │
│                                               │
│ Then press ENTER to install the printer.      │
│ ┌────────────────────────────┬─┐ ┌─────────┐│
│ │No Printer Attached          │▲│ │ Install ││
│ │Generic / Text Only          │ │ └─────────┘│
│ │Agfa 9000 Series PS          │ │ ┌─────────┐│
│ │Agfa Compugraphic 400PS      │ │ │ Cancel  ││
│ │Agfa Compugraphic Genics     │ │ └─────────┘│
│ │Apple LaserWriter            │ │ ┌─────────┐│
│ │Apple LaserWriter II NT      │ │ │  Help   ││
│ │Apple LaserWriter II NTX     │▼│ └─────────┘│
│ └────────────────────────────┴─┘ ┌─────────┐│
│  To see more printers, use the UP and DOWN Arrow keys.│Exit Setup││
│                                   └─────────┘│
│ Selected Printer: Apple LaserWriter           │
└─────────────────────────────────────────────┘
```

➤ Select **Apple LaserWriter** in the list of printers and click **Install**.

The following dialog box then lets you specify which port your printer is connected to.
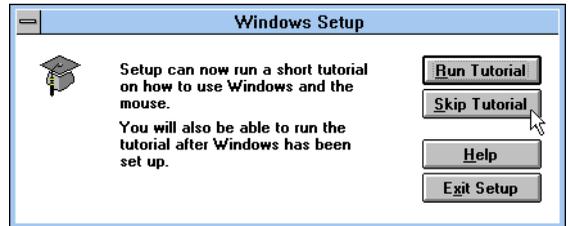
Printer Installation

From the following list, select the port that your printer is connected to. Press the UP and DOWN Arrow keys to move the highlight and scroll through the list.

Then press ENTER to specify the port.

LPT1:
LPT2:
LPT3:
COM1:
COM2:
COM3:
COM4:
EPT:

Install
Cancel
Help
Exit Setup

To see more ports, use the UP and DOWN Arrow keys.

Selected Printer: Apple LaserWriter

➤ Select **LPT1:** and click **Install**.

The Windows Setup program then sets up the Windows desktop and displays the following dialog box.

Setup Applications

Setup needs to know the application name for:

C:\DOS\EDIT.COM

Select the application name from the following list, and choose OK, or press ENTER to continue.

MS-DOS Editor
None of the above

OK   **Cancel**   **Help**

➤ Click **OK** to continue.

Windows then allows you to run a tutorial about using Windows.

➤ Click **Run Tutorial** to see the tutorial or **Skip Tutorial** to proceed without the tutorial.

Windows Setup

Setup can now run a short tutorial on how to use Windows and the mouse.

You will also be able to run the tutorial after Windows has been set up.

Run Tutorial
Skip Tutorial
Help
Exit Setup

This dialog box then confirms that the installation is complete:

Exit Windows Setup

Windows 3.1 is now set up.

Remove any floppy disks from your drives.

You need to restart your computer so that all installed options can take effect.

After restarting, type WIN at the MS-DOS prompt to start Windows.

Reboot   **Return to MS-DOS**
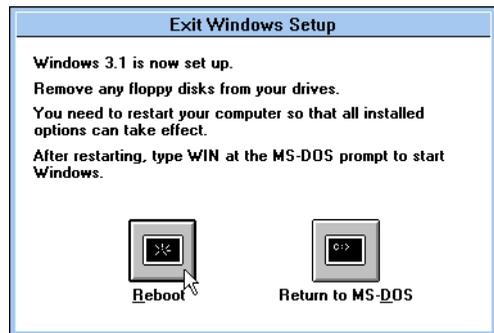
➤ Eject the installation disk from the drive and click **Reboot** to restart RealPC.

The RealPC MS-DOS window then appears, displaying the standard MS-DOS startup information.

2 Run Windows

➤ Type the following command at the MS-DOS
   `C:\>` prompt:

`WIN` ⏎

After the welcome screen Windows plays a
chime to tell you that Windows is starting, and
the Windows desktop will be displayed.

➤ Press ⌘M to use the optimized Windows
   mouse pointer.

What next?

For more information about using Windows 3.x
refer to *Using Windows 3.x*, page 99.

Installing Windows 95

If you want to take advantage of the additional features in Windows 95 you can install from MS-DOS or Windows 3.x, or upgrade from Windows 3.x, using a standard Windows 95 CD-ROM, or a set of Windows 95 installation disks.

Note that Windows 95 is supplied on DMF-format disks. To read these you need System 7.6 or later, or version 2.0.7 or later of Apple's PC Exchange control panel.

Before upgrading your hard disk file it is recommended that you make a backup copy of it using the Finder's **Duplicate** command.

Ensure that your hard disk is at least 120 Mbytes to install Windows 95; refer to *To change the size of a hard disk file*, page 45.

∎ You must install Windows 95 in the `C:\WINDOWS` directory.

1 Start the installation

If you are installing Windows 95 from CD-ROM:

➤ Start RealPC.

➤ Select **Emulate PC Mouse** to allow you to control the setup process.

➤ Insert the CD-ROM into your Macintosh CD-ROM drive.

➤ If you are upgrading from Windows 3.x start Windows 3.x and choose **Run** from the Program Manager **File** menu.

➤ Type `F:\SETUP` ⏎.

If you are installing Windows 95 from a set of floppy disks:

➤ Insert the first Windows 95 installation disk into your disk drive.

➤ Start RealPC.

When a message appears asking you to insert the next installation disk:

➤ Eject the current installation disk by choosing **A:SuperDrive** from the RealPC **Eject** menu, or press ⌘ Shift 1.

➤ Insert the next installation disk, as specified.

➤ Press ⏎ to continue the installation.

2 Run the Setup program

The Windows 95 Setup program will then run.

➤ When the Software License Agreement is displayed click **Yes** to proceed.

You will then be given the opportunity to exit from other Windows applications.

➤ Press Alt Tab to display the SmartCopy icon, then press Alt F4 to quit from SmartCopy. Repeat this procedure for any other running applications.

➤ Click **OK** to continue.

➤ When asked where to install Windows select **C:\Windows** and click **OK**.

➤ When asked if you want to save your system files select **Yes** and click **OK**.

➤ When the **Setup Options** dialog box is displayed select **Typical** and press **OK**.

➤ When the **Analyzing Your Computer** dialog box is displayed select **Sound, MIDI, or Video Computer Card** and click **OK**.

➤ When the **Get Connected** dialog box is displayed select only those items that you wish to use and click **OK**.

➤ When the **Windows Components** dialog box is displayed select **Install the most common components** and click **OK**.

➤ When the **Startup Disk** dialog box is displayed select **Yes** only if you want to create a Startup Disk, otherwise select **No** and click **OK**.

The Windows 95 Setup program then copies the files for Windows 95. This will take several minutes.

Windows 95 will then restart.

➤ Press ⌘M to use the mouse.

The Windows 95 Setup program then sets up the components of Windows 95.

3 Set up Microsoft Exchange
This dialog box then prompts you to set up Microsoft Exchange.

➤ Follow the screens to install the Microsoft Exchange options you require.

4 Complete the installation
Finally this dialog box confirms that installation has been successful:

➤ Click **OK** to restart with Windows 95.

The installation is now complete.

5 Set up Windows 95 for use with TurboStart

Finally set up Windows 95 for use with the TurboStart feature.

If you have the original version of Windows 95:

➤ From the Windows 95 desktop click **Start**, then click **Settings** and **Control Panel**.

➤ In the **Control Panel** folder double-click the **System** icon.

➤ Click the **Device Manager** tab.

➤ Click **View devices by connection**.

➤ Double-click the **Advanced Power Management Support** icon.

➤ Select **Settings**.

➤ Check the **Enable power management support** box. Do not select any of the other boxes.

➤ Click **OK** on this and the next dialog box.

➤ Click **Yes** to restart Windows 95.

If you have the later version of Windows 95:

➤ From the Windows 95 desktop click **Start**, then click **Settings** and **Control Panel**.

➤ In the **Control Panel** folder double-click the **Power** icon.

➤ Check the **Allow Windows to manage power use on this computer** box.

➤ Click **OK**.

➤ Click **Yes** to restart Windows 95.

RealPC is now fully set up to run Windows 95.

What next?

For more information refer to *Using Windows 95*, page 115.

Installing additional RealPC options

The **Custom Install** option provides additional installation options.

To install selected files

➤ Run the installer and choose **Custom Install** from the installer's pop-up menu.
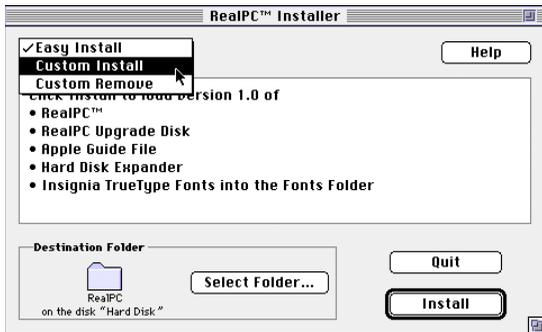
This dialog box shows the features you can install:
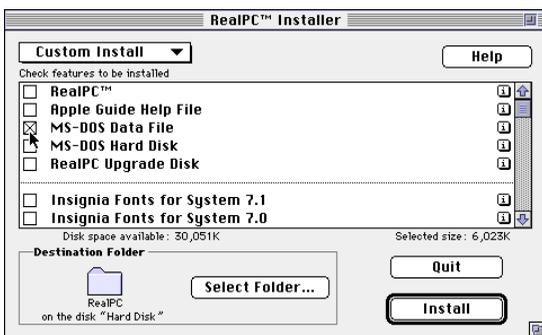
➤ Click the checkbox for each item you want to install.

For more information about each item refer to the table opposite.

➤ Click **Install** to install the selected items.

Hard Disk Expander will be installed into the **RealPC** folder, and the other utilities will be installed into the **Utilities** folder in the **RealPC** folder.

To remove selected files

➤ Run the installer and choose **Custom Remove** from the installer's pop-up menu.

➤ Click the checkbox for each item you want to remove.

➤ Click **Remove** to remove the selected items.

To get information about an item

➤ Click the ℹ️ information icon to the right of the item.

Information about the item will be displayed; for example:
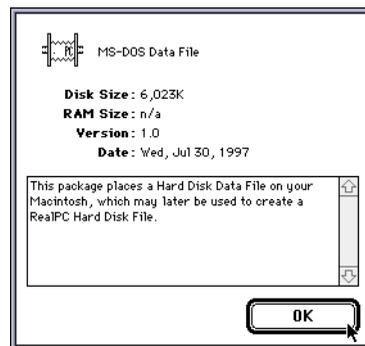
The table below gives information about each of the installation options:

Select this option	To do this
RealPC	Install the RealPC application.
Apple Guide Help File	Install help for use with Apple Guide.
MS-DOS Data File	Install a data file for creating a `C:` hard disk file containing MS-DOS.
MS-DOS Hard Disk	Create a new `C:` hard disk file containing MS-DOS.
RealPC Upgrade Disk	Create a new `D:` hard disk file containing the Insignia upgrade utilities.
Insignia Fonts for System 7.1/7.0	Install TrueType fonts to give the correct IBM extended character set when copying or printing text from RealPC.
Insignia Fonts for System 6	Install bitmap versions of the Insignia fonts.
MacIPX	Install the Macintosh IPX NetWare protocol stack.
DECnet Address Override Utility	Install a utility to enable the DECnet protocol to be used with your Macintosh Ethernet card.

Select this option	To do this
Hard Disk Expander	Install a utility to change the size of an existing hard disk file.
PowerBook Utilities	Install the ~don't rest and ~rest utilities to disable or enable the rest mode of PowerBooks, which can otherwise reduce the performance of RealPC.
SharePC	Install a utility to set up RealPC on a file server so that it can be run simultaneously by several users.

The components of RealPC

The **Easy Install** option creates a folder
containing the following files:
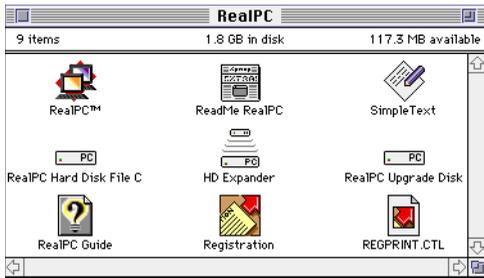
- **RealPC™** is the RealPC application.

- **ReadMe RealPC** contains additional
  information about RealPC.

- **SimpleText** is the application used to read
  the ReadMe file.

- **RealPC Hard Disk File C** is a bootable
  hard disk file for use by RealPC.

- **HD Expander** is a utility to change the size
  of an existing hard disk file; for more
  information refer to *To change the size of a
  hard disk file*, page 45.

- **RealPC Upgrade Disk** is a hard disk file
  containing utilities to upgrade hard disk files
  and install Insignia drivers.

- **RealPC Guide** is the Apple Guide help file.

- **Registration** and **REGPRINT.CTL** are the
  registration utilities installed if you have US
  system software; refer to *Registering RealPC*,
  page 11.

Other files on the installation CD

The RealPC installation CD contains a number of additional useful files for use with RealPC. You can install these on your Macintosh from the installation CD.

Extras

The **Extras** folder contains the following items:
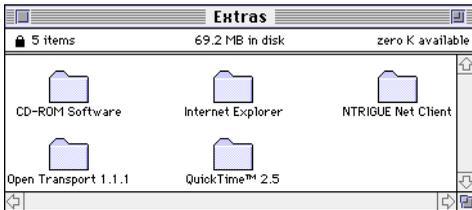
- **CD-ROM Software** is a folder containing an installer for the Apple CD-ROM extensions to provide support for Macintosh/PC dual-format CD-ROMs.

- **Internet Explorer** is an installer for the Macintosh version of Internet Explorer, Microsoft's browser for the World Wide Web.

- **NTRIGUE Net Client** contains an installer for a demo version of the NTRIGUE Net Client for Macintosh, which will allow you to access NTRIGUE servers across a TCP/IP network from your Macintosh.

- **Open Transport 1.1.1** contains an installer for the Open Transport networking software, which is recommended for better performance and greater functionality.

- **QuickTime™ 2.5** contains an installer for the latest version of QuickTime. To play MIDI files from RealPC you need the **QuickTime Musical Instruments** and **QuickTime PowerPlug** extensions which you can install with this installer.

PC Extras

The **PC Extras** folder contains installers for the additional Internet utilities and network clients provided with RealPC; refer to *Using Internet utilities*, page 174, for more information.

Documentation

The **Documentation** folder contains the following files:
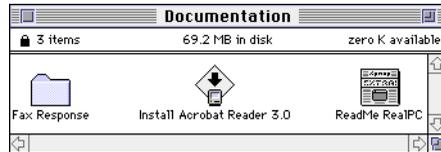
- **Fax Response** contains copies of the Insignia fax response sheets, in Adobe Acrobat format, providing additional information about using other networking packages with RealPC.

- **Install Acrobat Reader 3.0** is an installer for Adobe Acrobat on the Macintosh. For information about installing Acrobat refer to *To install Acrobat Reader, Microsoft Internet Explorer, PKZIP, Shockwave, or Stuffit*, page 168.

- **ReadMe RealPC** is a copy of the RealPC read-me file.

Upgrading from Virtual PC

You can upgrade to RealPC from Virtual PC. RealPC is compatible with hard disk files created by Virtual PC, so you can continue to use applications and documents you created with Virtual PC.

To install RealPC
Proceed as described in *Installing RealPC*, page 8.

To use a Virtual PC hard disk file
➤ Choose **RealPC Setup** from the **Setup** menu to display the **RealPC Setup** dialog box.

➤ Click the **Hard Disks** button to display the **Hard Disks** panel.
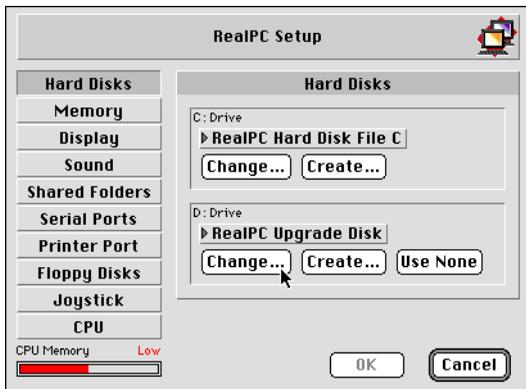
➤ Click the **Change…** button in the **D: Drive** section. This dialog box allows you to select the Virtual PC hard disk file to use:
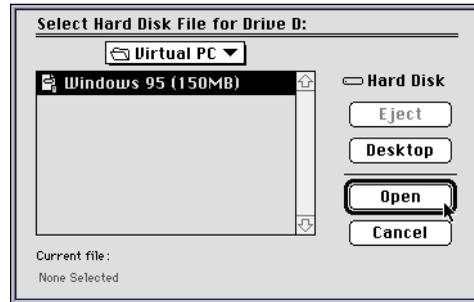
➤ Select the Virtual PC hard disk file and click **Open**.

➤ Click **Restart** to restart RealPC with the new drive.

Running RealPC

This chapter describes how to run RealPC, and use it to run
Windows and MS-DOS applications on your Macintosh.

Running RealPC

When you run RealPC you get a PC in a window on your Macintosh, so that you can run PC applications at the same time as using your Macintosh applications.

To run RealPC
➤ Double-click the **RealPC** icon.

RealPC™

The MS-DOS window appears and the standard MS-DOS startup information is displayed.

For more information about using MS-DOS refer to *Using MS-DOS*, page 81.

To show the files on the C: drive
➤ Type the following command at the MS-DOS C:\> prompt:

DIR ⏎

To get help on MS-DOS
➤ Type the following command at the MS-DOS C:\> prompt:

HELP ⏎

For more information refer to *Getting help on MS-DOS (MS-DOS and Windows 3.x only)*, page 86.

To run RealPC with a specific startup hard disk file
➤ Drag the hard disk file icon and drop it onto the RealPC icon.

RealPC Hard Disk File C   RealPC™

The hard disk file will be set up as drive C:, overriding the previous selection.

For example, you could have two hard disk files, one with Windows 3.x and one with Windows 95, and use this method to select which one to use.

Restarting RealPC

To restart RealPC
➤ Choose **Restart RealPC** from the **Setup** menu.

This dialog box warns you that work can be lost if you have not exited from PC applications or saved files before restarting:

Restart will cause any unsaved work in a PC application to be lost. Are you sure you want to Restart?

Restart | Cancel

Click **Cancel** to cancel the command or **Restart** to restart RealPC.

> If you are running Windows 95 click the **Start** button, click **Shut Down…**, and then click **Yes**, to shut down Windows 95 before restarting RealPC.

> If you are running Windows 3.x you should close all Windows applications and exit Windows before restarting RealPC.

Quitting from RealPC

To quit from MS-DOS or Windows 3.x

➤ Close any PC applications you are using and quit from Windows 3.x.

➤ Choose **Quit** from the **File** menu.

```
File
  Printouts      ▶
  Page Setup...

  Quit      ⌘Q
```

This dialog box appears:

```
✋  Quitting will cause any unsaved work in
    a PC application to be lost.
    Are you sure you want to Quit?

              [ Quit ]   [ Cancel ]
```

➤ Choose **Quit** to quit from RealPC, or **Cancel** to continue using RealPC.

To quit from Windows 95

If you have installed Windows 95 an additional **TurboStart** option becomes available. This saves your work so that Windows 95 loads instantly the next time you run RealPC, and you can resume where you left off.

➤ Choose **TurboStart** from the **File** menu.

```
File
  Printouts      ▶
  Page Setup...

  Quit        ⌘Q
  TurboStart  ⌘T
```

Alternatively, if you choose **Quit** from the **File** menu this dialog box appears:

```
✋  Selecting TurboStart quits RealPC and automatically
    activates TurboStart for your next session.  Quit
    exits RealPC without activating TurboStart.  Cancel
    returns to Windows 95.

        [ TurboStart ]   [ Quit ]   [ Cancel ]
```
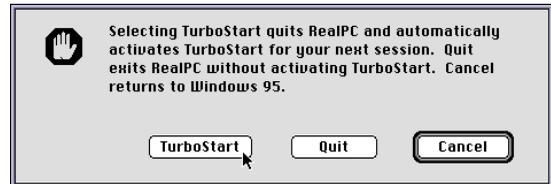
➤ Choose **TurboStart** to use TurboStart.

Alternatively you can exit without using TurboStart by clicking the Windows 95 **Start** button and then clicking **Shut Down**…. When you next run RealPC, Windows 95 will be restarted in the usual way.

> TurboStart requires additional space on your Macintosh hard disk of 1 Mbyte more than the PC memory setting.

Getting help

RealPC includes Apple Guide help, to give you step-by-step instructions on the most important features of RealPC as you work.

The Apple Guide help uses the **RealPC Guide** file in the **RealPC** folder on your hard disk.

RealPC also includes Balloon Help, which gives a brief explanation of each of the RealPC menu commands and dialog boxes.

To use Apple Guide
➤ Choose **RealPC Guide** from the help menu:

The **RealPC Help** window appears:
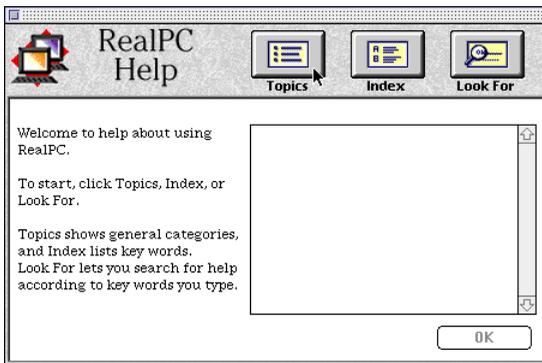
➤ Click one of the following buttons to choose what you want to do:

Click this	To do this
	Choose from a list of topics, organized by subject.
	Look up a topic in an alphabetical list.
	Type in the topic you need help with.

To choose from a list of topics
➤ Click **Topics** in the **RealPC Help** window.

A list of topic areas is displayed.

➤ Select a topic area to display a list of topics, and then select the phrase you want to know about:
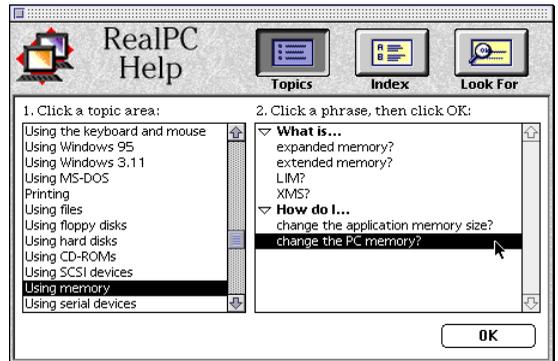
➤ Choose **OK** to see help.

The help consists of a series of panels, which tell you what to do:

How do I change the PC memory?

When you first install RealPC a recommended PC memory configuration is set up for you.

If you need to change it proceed as follows.

To begin, click the right arrow.
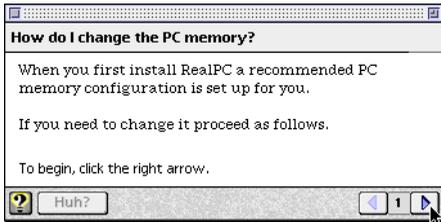
➤ Follow the instructions on each panel.

Where appropriate, areas of the screen will be highlighted to help you:
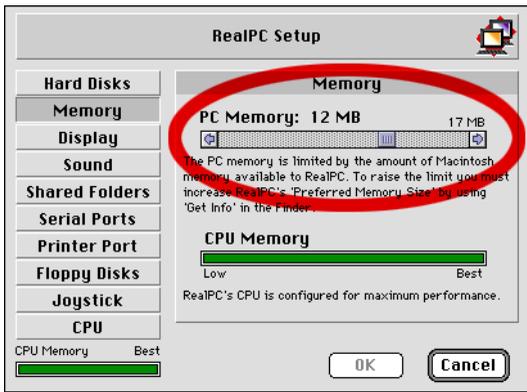
➤ When you have finished click the close box to exit from Apple Guide.

To choose a topic from the index

➤ Click **Index** in the **RealPC Help** window to display the help index.
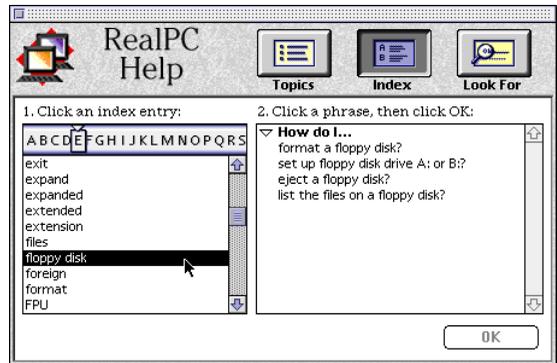
➤ Move the marker to the initial letter you are interested in.

➤ Select an index entry to display a list of topics, and then select the phrase you want to know about.

To look for a topic

➤ Click **Look For** in the **RealPC Help** window.

➤ Type in the topic you want to know about to display a list of the available topics, and then select the phrase you want to know about.

To get Balloon Help

You can also use Balloon Help to give you information about the RealPC menus, menu commands, and dialog boxes.

➤ Choose **Show Balloons** from the Balloon Help menu.

To get help about an item move the mouse pointer over it.

Getting help on MS-DOS and Windows

You can also get help on using MS-DOS and Windows.

For more information refer to *Getting help on MS-DOS (MS-DOS and Windows 3.x only)*, page 86, *Getting help on Windows 3.x*, page 106, and *Getting help on Windows 95*, page 122.

Using the keyboard and mouse

RealPC can use the various Macintosh keyboards to produce all the keys and key combinations you need to run PC applications.

The IBM 101-key keyboard

The illustration below shows the layout and keycap engravings of the 101-key US IBM keyboard emulated by RealPC.

The table opposite lists the Macintosh keyboard keys, or key combinations, needed to produce all the keys on this keyboard that do not correspond directly to Macintosh keys.

The following keys are used by the Macintosh to enter accented characters. To enter one of these key combinations in RealPC you need to press the key combination twice:

Alt E, Alt I, Alt U, and Alt N.

To use a PowerBook keyboard

Some PowerBook keyboards do not have function keys or a numeric keypad. RealPC therefore provides two special modes to enable these keys to be entered.

➤ Press ⌘F to select Function mode, which lets you type function keys.

➤ Press ⌘K to select Keypad mode, to let you use the PC keypad.

➤ Press the same keys again to cancel the mode.

The PC mouse

The PC mouse usually has two buttons. RealPC uses the Macintosh mouse button as the left PC mouse button. The right mouse button is obtained by using keypad =, or ⌘R (or Enter on PowerBooks).
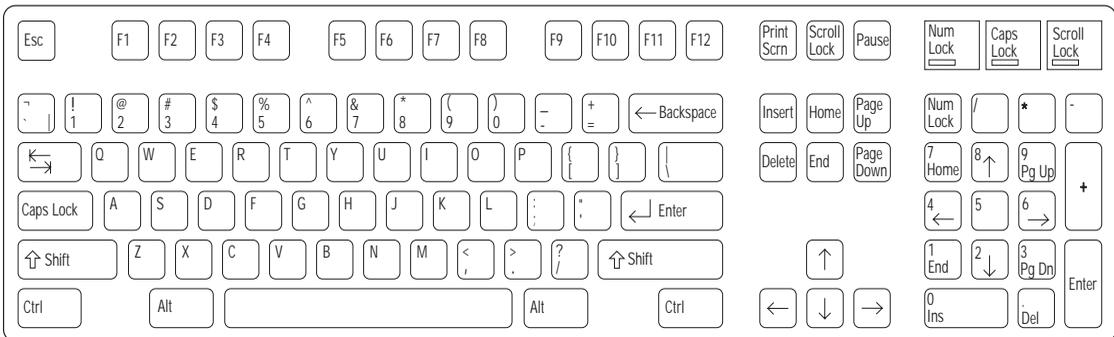
IBM 101-key keyboard

PC key	Extended keyboard	Standard keyboard	PowerBook keyboard Normal mode	Function mode(⌘F)
Alt	option	option	option	
Right Alt (Alt Gr)	right option	⌘ ←	⌘ ←	
Backspace	delete	delete	delete	
Break	control pause (F15)	control ⌘ keypad /	control ⌘ \	
Ctrl	control	control	control	
Ctrl right	right control	⌘ ↓	⌘ ↓	
Delete	del	⌘ D	⌘ D	
End	end	⌘ L	⌘ L	
Escape	escape	escape or ⌘ E	escape or ⌘ E	
F1 to F9	F1 to F9	⌘ keypad 1 to 9	⌘ 1 to 9	1 to 9
F10	F10	⌘ keypad 0	⌘ 0	0
F11	F11	⌘ keypad .	⌘ -	
F12	F12	⌘ keypad enter	⌘ =	
Home	home	⌘ O	⌘ O	
Insert	⌘ I	⌘ I	⌘ I	
Page Up	page up	⌘ U	⌘ U	
Page Down	page down	⌘ W	⌘ W	
Pause	pause (F15)	⌘ keypad /	⌘ \	
Print Scrn	print screen (F13)	⌘ keypad = or ⌘ P	⌘ [or ⌘ P	
Scroll Lock	scroll lock (F14)	⌘ keypad clear	⌘]	
Shift right	right shift	⌘ →	⌘ →	
Right mouse button	keypad = or ⌘ R	keypad = or ⌘ R	enter or ⌘ R	

PC keypad key	NumLock off	NumLock off	Normal mode	Keypad mode (⌘K)
Del	keypad .	keypad .		. (period)
End	keypad 1	keypad 1		1
Enter	keypad enter	keypad enter		enter
Home	keypad 7	keypad 7		7
Ins	keypad 0	keypad 0		0
Num Lock	keypad clear or numlock	keypad clear or numlock	⌘ N	⌘ N
Pg Up	keypad 9	keypad 9		9
Pg Dn	keypad 3	keypad 3		3
↑	keypad 8	keypad 8		8
↓	keypad 2	keypad 2		2
←	keypad 4	keypad 4		4
→	keypad 6	keypad 6		6
/	/	/	⌘ /	
*	*	*	⌘ '	
+				+
-				-

Using CD-ROMs, floppy disks, and SCSI disks

RealPC allows you to read PC-format CD-ROMs, 3.5-inch floppy disks, and SCSI disks, using your Macintosh drives.

By default, drive F: is set up as the Macintosh CD-ROM drive, drive A: is set up as the Macintosh internal floppy disk drive, and drive E: will be used if you have a PC-compatible SCSI drive.

To show the files on a CD-ROM
MS-DOS

➤ Type the following command at the MS-DOS C:\> prompt:

DIR F: ⏎

Windows 3.x

➤ Run **File Manager**, by double-clicking its icon in the **Main** program group.

➤ Click the **f** CD-ROM icon in the toolbar:

Windows 95

➤ Double-click the **[F:]** CD-ROM icon in the **My Computer** folder:
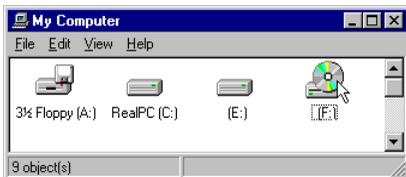
To run CD-ROM applications
➤ Follow the instructions supplied with the CD-ROM.

To eject a CD-ROM
➤ Choose the CD-ROM drive from the **Eject** menu:
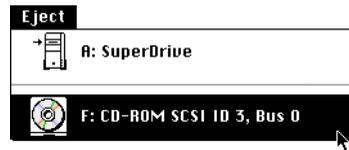
You may not be able to eject the CD-ROM if it is being shared, or if a file on it is in use by a Macintosh application. In this case either turn file sharing off, or close the Macintosh application.

To eject a dual-format CD-ROM you may also need to eject the Macintosh partition from the Macintosh desktop by dragging it to the Trash.

To show the files on a floppy disk

MS-DOS

➤ Type the following command at the MS-DOS `C:\>` prompt:

`DIR A:` ⏎

Windows 3.x

➤ Run **File Manager**, by double-clicking its icon in the **Main** program group.

➤ Click the **a** floppy disk icon in the toolbar:

Windows 95

➤ Double-click the **[A:]** floppy disk icon in the **My Computer** folder:

To eject a floppy disk

➤ Choose the appropriate floppy disk drive from the **Eject** menu:
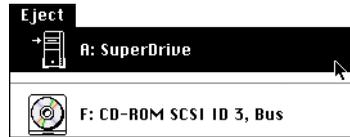
You can also eject a floppy disk by typing one of the following key combinations:

Type this	To eject a disk in
⌘ Shift 1	Internal drive 1.
⌘ Shift 2	Internal drive 2.
⌘ Shift 0	External drive.

To eject a SCSI disk

➤ Choose the SCSI drive from the **Eject** menu:
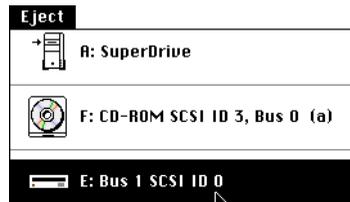
Setting up RealPC

This chapter describes how to build a PC to the specification you want, using RealPC to emulate the PC's ports, disks, memory, and display.

Using the Setup dialog box

Using the **RealPC Setup** dialog box you can change the configuration of several features of RealPC in one go, and then click the **OK** button to make the changes you have specified.

To display the **RealPC Setup** dialog box choose **RealPC Setup**… from the **Setup** menu:

Click a button on the left (or use the arrow keys) to show the current configuration of that feature of RealPC, or to change it:

Click this	To change this
Hard Disks	The emulated PC hard disk drives.
Memory	The amount of PC memory available.
Display	The display memory, Windows desktop size, and number of colors.
Sound	The Sound Blaster and MIDI emulation.

Click this	To change this
Shared Folders	The Macintosh folders set up as PC drives.
Serial Ports	PC serial ports settings.
Printer Port	Printing options.
Floppy Disks	The emulated PC floppy disk drive.
Joystick	The emulation of a PC joystick using a Macintosh joystick.
CPU	The MMX, FPU, and CPU emulation settings.

These options are described in greater detail in the following pages.

Restarting RealPC

After changing hard disks or PC memory, which would correspond to a hardware change on a real PC, RealPC has to be restarted, and the **OK** button in the **RealPC Setup** dialog box changes to **Restart** to warn you.

➤ Click **Restart** to restart with the new configuration you have specified.

Setting up disk drives

PCs identify the different types of disk drive using the drive letters `A:` to `Z:`.

The table below shows the significance of the different drive letters and how they are set up when you first install RealPC.

You can set up the floppy disk drive `A:`, the hard disk drives `C:` and `D:`, and the shared folders `E:`, `G:`, and `H:`, using the **Floppy Disks**, **Hard Disks**, and **Shared Folders** panels in the **RealPC Setup** dialog box.

Drive letters

The number of drives available is specified by the value of `LASTDRIVE` in the `CONFIG.SYS` file. The default setting, `LASTDRIVE=Z`, makes drives up to `Z:` available.

To use shared folders you need a `HOST.SYS` entry in the `CONFIG.SYS` file. The `FSADRIVE` command specifies which drives you want to use as Mac/PC shared folders in MS-DOS or Windows 3.x.

By default the `AUTOEXEC.BAT` file includes the line:

`C:\INSIGNIA\FSADRIVE E: G: H:`

to make drives `E:`, `G:`, and `H:` available as Mac/PC shared folders. To provide additional shared folders in MS-DOS or Windows 3.x add additional drives to `FSADRIVE`.

Drive	Default	Description
`A:`	Internal	The floppy disk drive.
`C:`	RealPC Hard Disk File C	The startup, or boot, hard disk drive.
`D:`	RealPC Upgrade Disk	Additional hard disk drive.
`E:`	RealPC	Mac/PC shared folder.
`F:`	CD-ROM drive	Default for CD-ROM drive.
`G:`, `H:`	RealPC	Mac/PC shared folders.

Setting up the floppy disk drive

By default, PC drive A: is set up as the Macintosh internal SuperDrive.

To set up the PC floppy disk drive

➤ Display the **Floppy Disks** panel in the **RealPC Setup** dialog box.
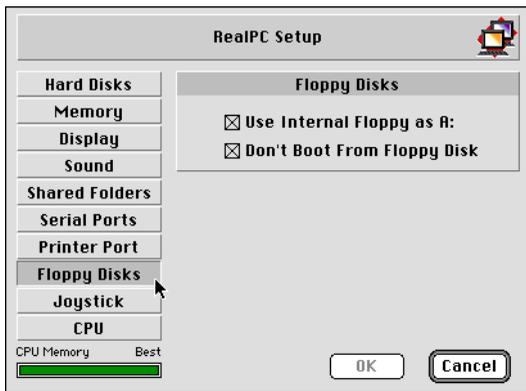
➤ Check the **Use Internal Floppy as A:** box to use the Macintosh internal SuperDrive as drive A:.

➤ Check the **Don't Boot From Floppy Disk** box to prevent RealPC from attempting to boot from a floppy disk, if you restart with a disk in the drive.

Which disks to use

The recommended floppy disks to use are 3.5-inch high-density disks. These are identified by a second window, opposite the write-protect window.

Second window

720 Kbyte
Double density

1.44 Mbyte
High density
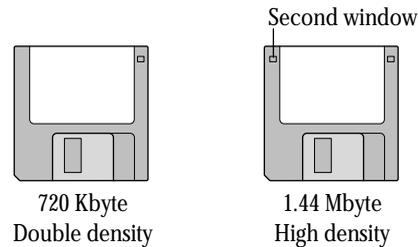
▌ You cannot use Macintosh format floppy disks for the PC floppy disk drive.

On a PC, a double density (720 Kbyte) 3.5-inch disk can be formatted as 1.44 Mbytes, but it will not be recognized as a valid PC disk by your Macintosh. Likewise, a high density 3.5-inch disk will only be accepted if it is the correct 1.44 Mbyte format.

▌ To use PC 1.6 Mbyte DMF-format floppy disks you need System 7.6 or later, or version 2.0.7 or later of Apple's PC Exchange control panel.

Setting up hard disk drives

RealPC emulates each PC hard disk using a single file on the Macintosh.

`. PC`
RealPC Hard Disk File C

The individual files within a RealPC hard disk file are accessible only from within RealPC and you cannot list them directly from the Finder.

RealPC hard disk files can be attached to and detached from either of the PC drives C: and D: without affecting the information stored within the hard disk file.

You can use SoftWindows hard disk files as drive C: or D: with RealPC.

You can also use hard disk files from Virtual PC or the Apple Compatibility Card as drive D:.

RealPC will attempt to boot from a floppy disk in drive A: when restarted, unless **Don't Boot from Floppy Disk** is selected in the **Floppy Disks** panel of the **RealPC Setup** dialog box.

To see which hard disk files are set up as drives C: and D:

➤ Display the **Hard Disks** panel in the **RealPC Setup** dialog box.
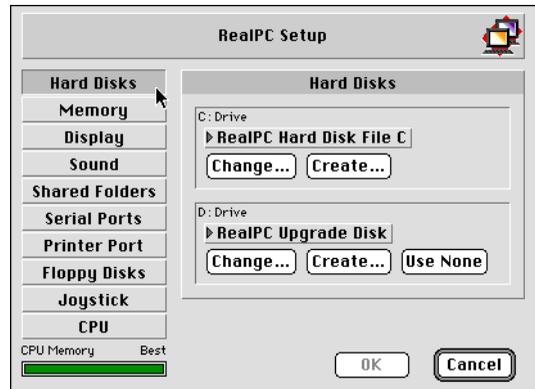
This shows the name of the hard disk file selected as the C: and D: drives, or **None Selected** if there is no D: drive.

➤ Click the ▷ button to the left of the filename to display the full path of the hard disk file:

To choose the hard disk file for
C: or D:

➤ Display the **Hard Disks** panel in the **RealPC Setup** dialog box.

➤ Click the **Change…** button in the **C: Drive** or **D: Drive** section, as appropriate.

The following dialog box lets you select the hard disk file to use:
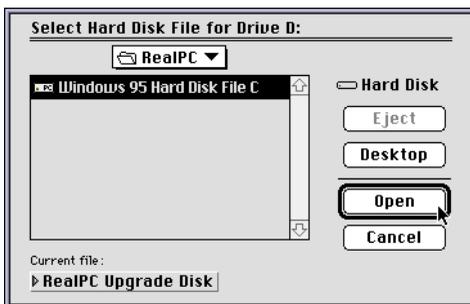
➤ Select the hard disk file you want to use and click **Open**.

In addition to RealPC hard disk files you can select SoftWindows hard disk files, Virtual PC hard disk files (D: drive only), or Apple Compatibility Card container files (D: drive only).

➤ Click **Restart** to restart RealPC with the new drive you have specified.

To detach the hard disk file
from D:

➤ Display the **Hard Disks** panel in the **RealPC Setup** dialog box.

➤ Click the **Use None** button in the **D: Drive** section.

➤ Click **Restart** to restart RealPC with no D: drive.

Changing the size of hard disk files

The **HD Expander** utility, installed in the **RealPC** folder, allows you to:

- Increase the size of a hard disk file up to 505 Mbytes.

- Decrease its size to remove unused space.

To change the size of a hard disk file

➤ Quit from RealPC if the hard disk file you want to expand is set up as the C: or D: drive.

If the hard disk file contains valuable data make a backup before proceeding.

You may need free disk space equivalent to the size of the hard disk file, even if you are reducing its size.

➤ Double-click the **HD Expander** icon:

HD Expander

This dialog box appears:

Select RealPC Hard Disk File To Resize:

🖿 RealPC ▼

📼 **RealPC Hard Disk File C**
📁 Utilities

⊂ Hard Disk

Eject
Desktop
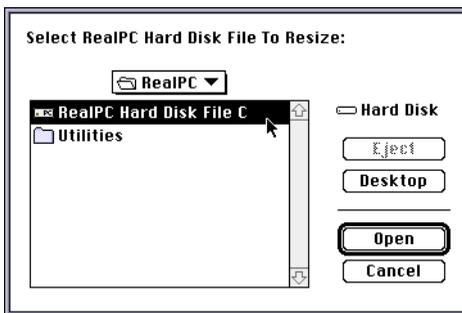
Open
Cancel

➤ Select the hard disk file you want to expand, and click **Open**.

Alternatively, you can drag the hard disk file icon and drop it onto the **HD Expander** icon.

The **Hard Disk Expander** window shows the current size of your hard disk file.

➤ Enter the new size, and click **Expand**:

RealPC Hard Disk Expander

Hard Disk: "RealPC Hard Disk File C"
On Volume: "Hard Disk"   Select Disk...

New Size: 70   (MB)   Expand
Current Size: 15 MB
Maximum (est.): 505 MB   Quit

The maximum size of a hard disk file is 505 MB.
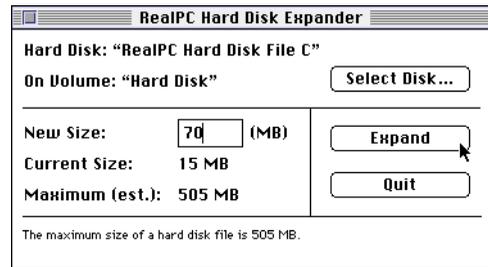
HD Expander changes the size of your hard disk file, defragmenting it first if necessary:

Condensing Hard Disk...
Defragmenting disk contents
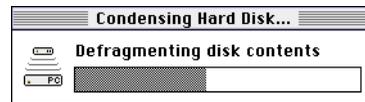
➤ When the hard disk file has been resized click **Select Disk…** to select another hard disk file to expand, or **Quit** to quit from the HD Expander.

Creating new hard disk files

When you first install RealPC two hard disk files are created to act as the C: and D: drives for RealPC.

The C: drive, called **RealPC Hard Disk File C**, contains the startup files and MS-DOS.

The D: drive, called **RealPC Upgrade Disk**, contains additional utilities to upgrade hard disk files and install the Insignia drivers.

You can change the size of a hard disk file using the HD Expander utility; for more information refer to *Changing the size of hard disk files*, page 45.

You can use the **Custom Install** option in the RealPC installer to create additional copies of these hard disk files at any time.

Alternatively you can create C: or D: drives from within RealPC, using the **Hard Disks** panel in the **RealPC Setup** dialog box. This command allows you to create either bootable disks, for use as a C: drive, or non-bootable empty hard disk files, for use as a D: drive. In each case you can specify the size of the file you want to create. For more information refer to *To create a new hard disk file from RealPC*, opposite.

To create a new C: hard disk file using the installer

➤ Insert the first installation CD and double-click the **Installer** icon.

➤ When the **Welcome** screen appears click **Continue**… to display the **Easy Install** dialog box.

➤ Choose **Custom Install** from the pop-up menu to display the **Custom Install** dialog box:
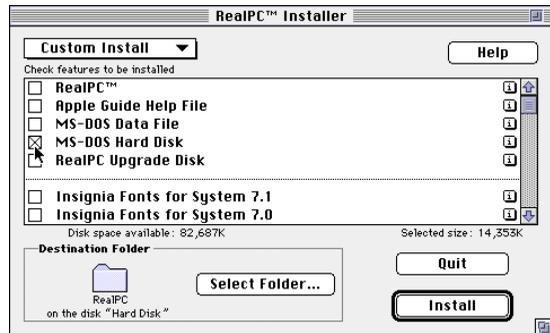
➤ Select the **MS-DOS Hard Disk** option to create a bootable C: drive hard disk file.

➤ Click **Install** to install the hard disk you have selected.

This dialog box appears:

RealPC Hard Disk Files   80 MB available
[RealPC ▼]
HD Expander   ⬜ Hard Disk
HDData
ReadMe RealPC   [Eject]
RealPC Guide   [Desktop]
RealPC Hard Disk File C
                                   [Create]
Create New Hard Disk File:
RealPC Hard Disk File C   [Cancel]

Size (MB): 40 [▼]   Minimum Size: 14 MB
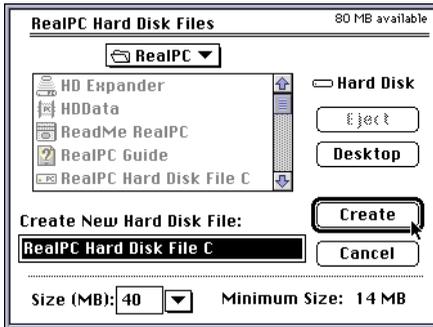
➤ Enter a name for the new hard disk file.

➤ Select the size for the hard disk file from the **Size** pop-up menu, or type the size into the box.

➤ Click **Create** to create the hard disk file.

The installer then copies files to the new hard disk file.

Finally this dialog box informs you when the hard disk file has been copied successfully:

Installation was successful. If you are finished, click Quit to leave the Installer. If you wish to do additional installations, click Continue.

[Continue] [Quit]

➤ Click **Quit** to quit from the installer.

The first time you use a new C **:** drive an update utility will run automatically to prepare it for use with RealPC.

To create a new hard disk file from RealPC

You can create a new hard disk file from within RealPC using the **Hard Disks** panel in the **RealPC Setup** dialog box.

If you are creating a new C **:** drive you will need to have installed the **HDData** file using the installer's **MS-DOS Data File** option in the **Custom Install** dialog box.

➤ Display the **Hard Disks** panel in the **RealPC Setup** dialog box.

➤ Click the **Create**… button in the **C: Drive** or **D: Drive** section, as appropriate.

This dialog box appears:

RealPC Hard Disk Creation   26397 KB Free
[RealPC ▼]
HD Expander   ⬜ Hard Disk
HDData
ReadMe RealPC   [Eject]
RealPC Guide   [Desktop]
RealPC Hard Disk File C
                                   [Create]
Create Hard Disk File for
New Hard Disk File C   [Cancel]

Size (MB): 40 [▼]   Bootable disk
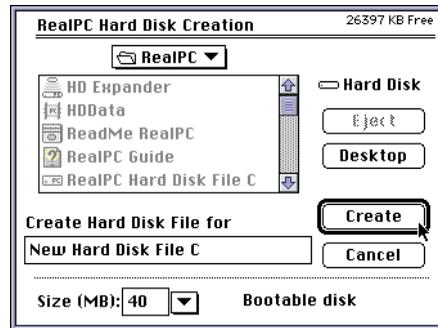
If necessary this dialog box lets you locate the **HDData** file:

Please locate the "HDData" File:
[RealPC ▼]
HDData   ⬜ Hard Disk
                                   [Eject]
                                   [Desktop]
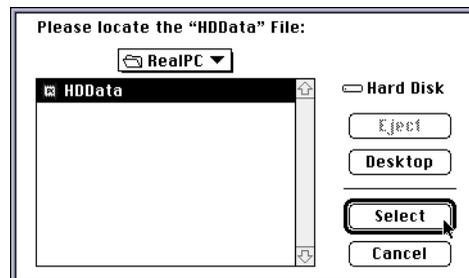
                                   [Select]
                                   [Cancel]

➤ Locate the **HDData** file and click **Select**.

➤ Enter a name for the new hard disk file.

➤ Select the size from the pop-up menu. The options available will depend on the amount of free space on your Macintosh hard disk.

➤ Click **Create** to create the hard disk file you have specified.

RealPC will then need to be restarted to use the new drive you have created.
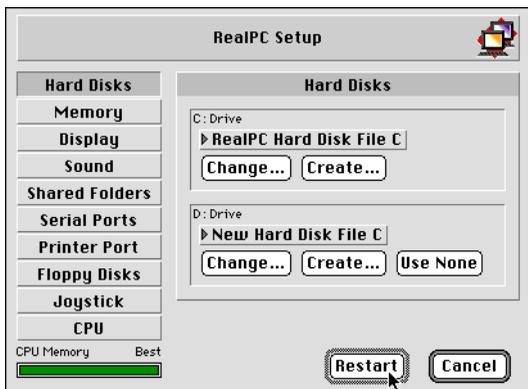
➤ Click **Restart** to restart RealPC with the new drive you have created.

The first time you use a new C: drive an update utility will run automatically to prepare it for use with RealPC.

Sharing PC files between RealPC and the Macintosh

RealPC lets you designate one or more Macintosh folders to be used as PC drives.

You can then work with files in these shared folders using either Macintosh or MS-DOS and Windows applications.

To see which Macintosh folders are set up as PC drives
➤ Choose **RealPC Setup**… from the **Setup** menu.

The **RealPC Setup** dialog box is displayed.

➤ Click the **Shared Folders** button.

The **Shared Folders** panel shows the PC drives currently set up as Macintosh folders:
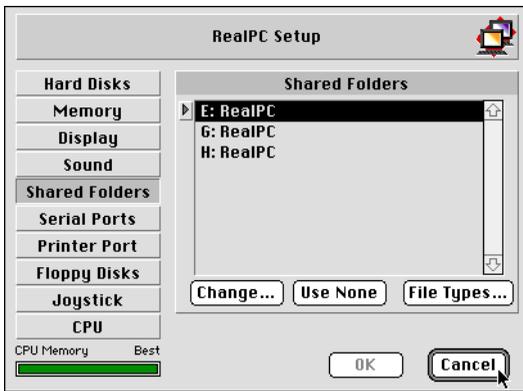
Initially drives E:, G:, and H: are set up as the **RealPC** folder.

➤ Click on the ▶ button to the left of the drive letter to display the full path of the folder:

To set up a Macintosh folder as drive E:
➤ Drag the folder and drop it onto the RealPC window.
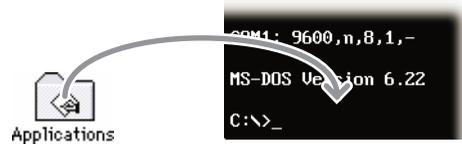
To set up a Macintosh folder as a PC drive
➤ Click the **Shared Folders** button in the **RealPC Setup** dialog box to display the **Shared Folders** panel.

➤ Select the PC drive you want to set up and click **Change**… (or double-click the PC drive):
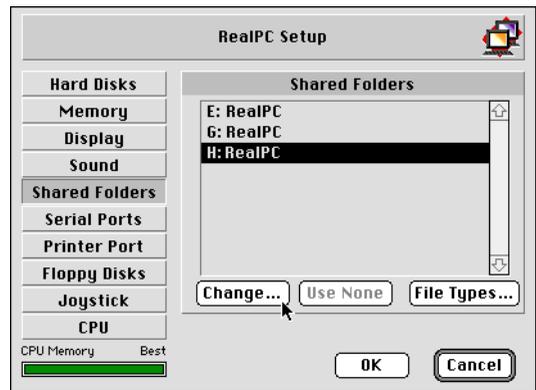
This dialog box lets you select the folder to use and the PC drive you want to assign it to.

➤ Select the Macintosh folder you want to use, so that its name appears in the **Use** button below the list of files.

➤ Click the button to use the folder you have selected.

You can make more drive letters available for Mac/PC shared folders if necessary; refer to *Drive letters*, page 41.

To copy a PC file to the Macintosh

➤ In RealPC, copy the file to a drive which has been set up as a shared folder.

For example, if the **RealPC** folder is set up as drive E:, copy the file to the E: drive. In MS-DOS you would do this with a command such as:

```
COPY C:\MYFILE.TXT E: ⏎
```

You will then see the file in the **RealPC** folder.

To run a PC file from the Macintosh

PC files saved from RealPC to a shared folder on the Macintosh will automatically run RealPC if you double-click them, and then run the appropriate PC application.

For example, you can create a batch file to run a game, and then copy the file to a shared folder. Double-clicking the file icon will then launch RealPC and run the game.

In MS-DOS this works for files with .BAT, .EXE, or .COM extensions.

To copy a Macintosh file to RealPC

➤ Put the file in a folder you have set up as a shared folder.

For example, if the **RealPC** folder is set up as drive E:, you can make a file available on the PC drive E: by putting it in the **RealPC** folder.

To specify the type of files created in shared folders

You can choose what types of Macintosh documents are created when RealPC creates MS-DOS files in Macintosh shared folders.

➤ Click the **Shared Folders** button in the **RealPC Setup** dialog box to display the **Shared Folders** panel.

➤ Click **File Types**.

This dialog box allows you to specify how files are created:

PC File Creation on Macintosh Volumes
- ◉ **Automatically Select File Type**
- ○ **Ask for File Type on File Creation**
- ○ **Always Use File Type** `TEXT`

[Cancel]   [**OK**]
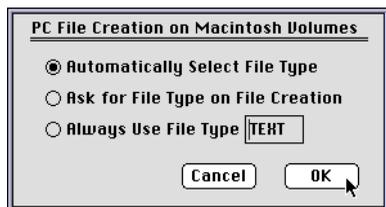
➤ Choose **Automatically Select File Type** to assign standard RealPC file icons to the files you create, based on their extension:

Document icon	Used to identify	Assigned to these extensions
PCFA	MS-DOS programs.	`.COM` or `.EXE`
PCFL	PC binary files.	`.BIN`, `.DVR`, `.OBJ`, `.OVL`, `.OVR`, or `.SYS`
TEXT	MS-DOS data files.	All other extensions.

MS-DOS data files can be recognized by most Macintosh applications, including SimpleText, MacWrite Pro, Microsoft Word, Claris Works, Excel, and WordPerfect.

➤ Choose **Ask for File Type on File Creation** if you want to be prompted to enter the four-character type to be used each time a file is written to a shared drive from RealPC. This dialog box appears:

Creating File "spool"
- ○ **Automatically Select File Type**
- ◉ **Ask for File Type on File Creation**
- ○ **Always use File Type:** `TEXT`

[**OK**]
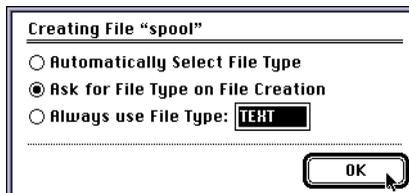
Enter the file type for the file you are creating. Alternatively, choose one of the options **Automatically Select File Type** or **Always use File Type** to specify the file type automatically and change the preferences for all subsequent files created by RealPC.

➤ Choose **Always use File Type** if you want to use a specified file type for every file regardless of its extension. The default type is TEXT, but you can specify any other four-character type.

MS-DOS and Windows 3.x filenames

MS-DOS and Windows 3.x use filenames of the form:

`name.ext`

where `name` is eight characters or less, and `ext` is three characters or less.

Also, filenames can only include the letters A–Z, the digits 0–9, and the following symbols:

`_ ^ $ ~ ! # % & - { } ( ) @ ' ´`

RealPC automatically converts Macintosh filenames to a valid name when you copy them to a shared folder.

For example, if you list the files on the E: drive the file:

ReadMe RealPC

will be given a name such as:

`READMERE.28^`

If you are working in a mixed PC/Macintosh environment it is recommended you create filenames according to the conventions described above so they stay the same when copied to or from shared drives.

Windows 95 filenames

Windows 95 supports long filenames, which can contain up to 250 characters. The maximum length of Macintosh filenames is 31 characters, and you will not be allowed to save a Windows 95 file to a shared folder if its name contains more than 31 characters.

Some Windows applications automatically add a four-character extension to the filename you specify, in which case the maximum length is 27 characters.

Some Windows 95 applications cannot be installed in a shared folder because they include files which contain more than 31 characters. If necessary, install onto a RealPC hard disk file instead.

To create additional shared folders in Windows 95

By default only drives E:, G:, and H: are provided in Windows 95. To set up additional drives:

➤ Open the **Windows Explorer**.

➤ Choose **Map Network Drive** from the **Tools** menu.

➤ Enter the name of the Macintosh folder you want to map, in the format:

`\\FSA_X\disk\folder`

where X is the drive letter you want to map, $disk$ is the name of the Macintosh hard disk, and $folder$ is the name of the Macintosh folder.

Setting up CD-ROM drives and SCSI devices

RealPC allows you to read data CD-ROMs which are compatible with the Microsoft CD-ROM Extensions (MSCDEX) as PC drives. The files on a CD-ROM can be read just like the files on any other drive.

By default PC drive `F:` is set up as the Macintosh CD-ROM drive.

If you have other PC-compatible SCSI devices attached to your Macintosh, these will be recognized when RealPC starts up, using the ASPI drivers.

They can then be used by running the appropriate PC software. For example, a SCSI disk drive will be assigned a drive icon in the Windows 95 **My Computer** folder:

Removable
Disk (J:)

> To have full access to dual-format CD-ROMs from RealPC on an Apple Macintosh you need version 5.1.7 or later of the Apple CD-ROM driver. This version is supplied with RealPC on the installation CD, in the **Extras** folder.

Setting up CD-ROM drives
MS-DOS and Windows 3.x

The CD-ROM is automatically set up by the batch file `USECD` which runs the following `MSCDEX` command:

`MSCDEX /D:CDROM$$$ /L:F /M:12 /V`

This assigns the CD-ROM to drive `F:`.

For information about other options available with the `MSCDEX` command type the following command at the MS-DOS `C:\>` prompt:

`HELP MSCDEX ⏎`

For example, you can set up the CD-ROM drive as drive `G:` with the command:

`MSCDEX /D:CDROM$$$ /L:G /M:12 /V`

If the CD-ROM drive does not work, check that your `CONFIG.SYS` file includes the line:

`DEVICE=C:\INSIGNIA\CDROM.SYS`

and restart Windows 3.x.

For more information refer to *Configuring MS-DOS*, page 94.

Windows 95

Windows 95 uses a CD-ROM driver `ISLCDROM.PDR`, which is loaded automatically on startup.

Setting up SCSI devices
MS-DOS and Windows 3.x

SCSI devices are automatically set up by the following lines in the CONFIG.SYS file:

```
device=c:\insignia\aspidos.sys
device=c:\insignia\aspidisk.sys /d
```

Windows 95

By default Windows 95 is set up with a 32-bit CD-ROM driver, which gives optimum performance when reading CDs.

If you also want to access SCSI devices from Windows 95 you need to replace this driver as follows:

➤ Rename the file ISLCDROM.PDR, in the C:\WINDOWS\SYSTEM\IOSUBSYS folder, to ISLCDROM.BAK.

➤ Click the **Start** button, point to **Settings**, and then click **Control Panel**.

➤ Double-click the **Add New Hardware** icon.

➤ When the **Add New Hardware** dialog box appears click **Next>**.

➤ When asked if you want Windows to search for your new hardware select **No** and click **Next>**.

➤ From the list of **Hardware types** select **SCSI controllers** and click **Next>**.

➤ In the list of SCSI controllers select **Insignia SCSI Adaptor** and click **Next>**.

➤ Accept the default settings by clicking **Next>**.

➤ Click **Finish**.

➤ When asked for the location of file SWINSCSI.MPD enter C:\WINDOWS\SYSTEM and click **OK**.

Windows 95 will then install the Insignia SCSI controller.

➤ When asked if you want to shut down your computer click **Yes**.

RealPC will now quit.

➤ Restart **RealPC**.

You will now be able to access SCSI devices.

Setting up memory

When you first install RealPC a recommended PC memory configuration is set up for you, and you should not normally need to change this.

If necessary, you can configure the PC memory using the following procedure:

➤ Increase the RealPC application memory size.

➤ Change the RealPC PC memory configuration in the **Memory** panel of the **RealPC Setup** dialog box.

Any of the available memory not used for PC memory is allocated to the CPU Memory, which is used to improve the performance of RealPC.

These steps are described in greater detail in the following sections.

Expanded memory

RealPC provides extended memory, the type used by most current PC applications.

If your application specifies that it needs expanded memory, also referred to as LIM or EMS (Lotus, Intel, Microsoft Expanded Memory Specification), you can allocate some of the memory to expanded memory using the EMM386 expanded memory emulator. For example, to use 2 Mbytes of extended memory as expanded memory include this line in the CONFIG.SYS file:

DEVICE=C:\DOS\EMM386.EXE 2048

To change the application memory size

➤ Select the **RealPC** icon.

➤ Choose **Get Info** from the Finder's **File** menu.

This dialog box shows the Minimum and Preferred sizes to be used for RealPC; for example:
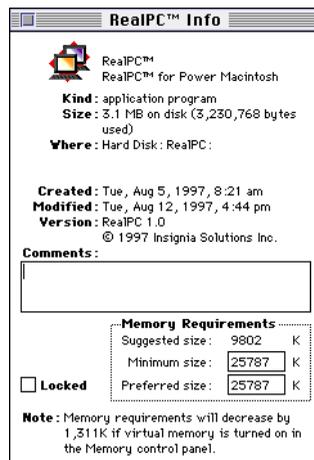
For each 1 Mbyte of additional PC memory you want to use you need to increase the Minimum and Preferred memory sizes by 1030 Kbytes.

The amount of memory you need also depends on the size of the Windows desktop, and the number of colors used for it. For best performance allocate as much memory as possible to RealPC.

➤ Click the close box, in the top left corner of the **RealPC Info** dialog box, to use the size you have set.

To see the amount of PC memory

➤ Display the **Memory** panel in the **RealPC Setup** dialog box.

The **Memory** panel shows the current amount of PC memory:
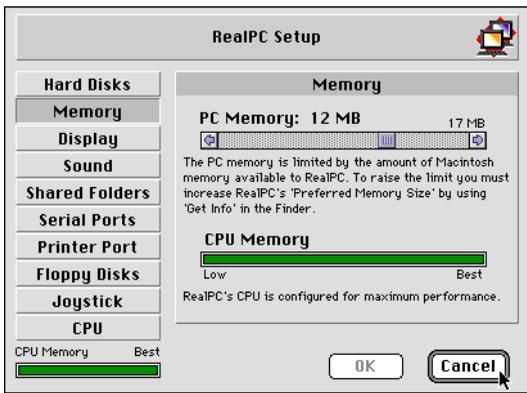
To change the PC memory

➤ Display the **Memory** panel in the **RealPC Setup** dialog box.

➤ Drag the slider or use the left and right arrow keys to select the amount of memory:
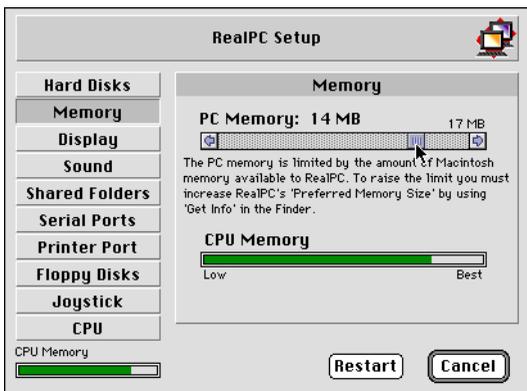
You can choose any amount of PC memory up to the amount of available memory, as shown by the maximum setting of the slider.

For best performance the **CPU Memory** indicator should be at **Best**. If you set the **PC Memory** too high you will be warned that this will reduce the performance of RealPC:
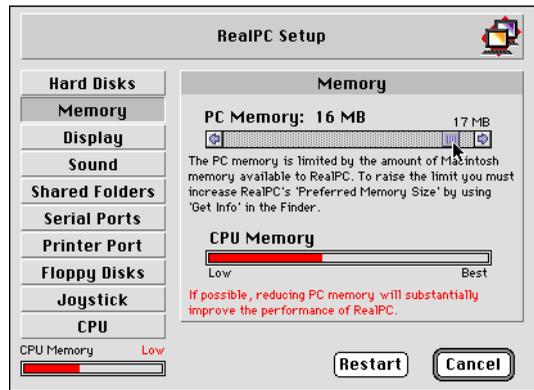
In this case increase the total amount of memory available by increasing the application memory size; refer to *To change the application memory size*, page 55.

➤ Click **Restart** to restart RealPC with the memory configuration you have selected.

Setting up the display

In MS-DOS RealPC emulates a VESA 2.0 standard Super Video Graphics Array (SVGA) display, which provides a resolution of 640 x 480 or 640 x 400 with 256 colors, or 800 x 600 or 1024 x 768 with 16 colors.

You can choose the amount of memory allocated to the display using the **Display** panel in the **RealPC Setup** dialog box.

To change the display memory
➤ Display the **Display** panel in the **RealPC Setup** dialog box.

➤ Choose the amount of memory from the **Video Memory** pop-up menu.
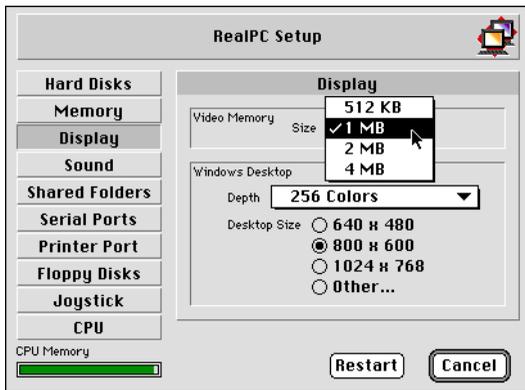
To use more colors or a larger desktop size you may need to increase the **Video Memory** setting.

If this reduces the **CPU Memory** below the **Best** setting, make more memory available by increasing the application memory size; refer to *To change the application memory size*, page 55.

To make the whole of the RealPC window visible
➤ Choose **Full Screen DOS** from the **Setup** menu. This hides the menu bar and displays the MS-DOS window in the centre of the full screen.

To display the menu bar when the menu bar is hidden hold down the ⌘ key, or type ⌘B to toggle it on and off.

If you are running Windows the command changes to **Best Window Position**.

➤ Choose **Best Window Position** to move the Windows desktop to the position on the screen that gives optimum performance.

Setting up the Windows desktop

RealPC includes a Windows Display Driver that improves the performance of Windows graphics. It also allows you to run Windows in a window of any size, up to 1600 x 1200.

To select the size of the Windows desktop

➤ Choose the size you want from the **Windows Desktop** submenu or the **Setup** dialog box.

If you are running Windows 95 the desktop will be resized immediately. If you are running Windows 3.x the changes take effect when you next run Windows.

To specify the Windows desktop size and position

➤ Choose **Other**… from the **Windows Desktop** submenu on the **Setup** menu or the **Setup** dialog box.

The **Windows Setup** window is displayed, to allow you to specify the size and position of the Windows desktop, and, for Windows 3.x, the number of colors to use.

The Macintosh menu bar is hidden so that you can use the full Macintosh screen if you wish.

You can move the **Windows Setup** window to the position you want it on the screen by clicking on any part of the window and dragging to the position you want.


```
═══════════════════ Windows Setup ═══════════════════
Windows Desktop Setup

        Windows Desktop Dimensions

    Width   640
    Height  480
    Depth   256 Colors          ▼

Drag, Re-size and Zoom this window to setup the position of the Windows Desktop on the
Macintosh Desktop. Unlike other Macintosh windows, you can drag this window by simply
clicking on it.


Note :
Changes will not take effect until you    [    OK    ]    [ Cancel ]
restart Windows.
```
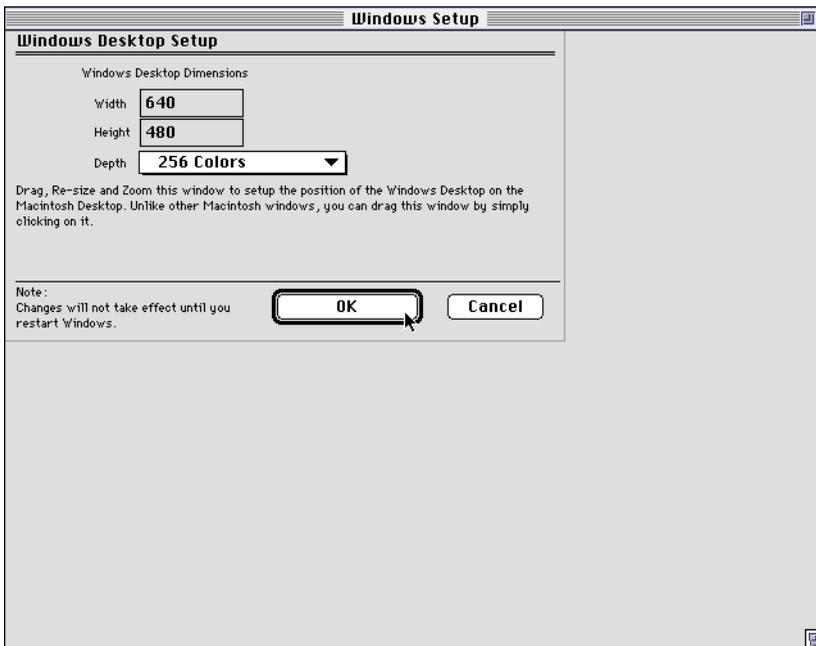
To move the Windows desktop
➤ Hold down the option and ⌘ keys.

The cursor changes to a 🖐 symbol.

➤ Drag the window to the position you want.

To change the size of the
Windows 95 desktop
➤ Hold down the option and ⌘ keys.

➤ Move the mouse pointer to the lower right corner of the Windows 95 desktop.

The cursor changes to a ⌸ symbol.

➤ Drag the window to the size you want.

To zoom the Windows 95
desktop to fill the screen
➤ Hold down the option and ⌘ keys.

➤ Move the mouse pointer to the top right corner of the Windows 95 desktop.

The cursor changes to a 🔲 symbol.

➤ Click on the window to zoom it to fill the screen.

Alternatively you can choose **Zoom** from the **Windows Desktop** submenu on the **Setup** menu.

> To use a larger desktop you may need to increase the **Video Memory** setting. If this reduces the **CPU Memory** below the **Best** setting, make more memory available by increasing the application memory size; refer to *To change the application memory size*, page 55.

To restore the Windows 95
desktop to its original size.
➤ Hold down the option and ⌘ keys.

➤ Move the mouse pointer to the top right corner of the screen, so the pointer changes to a 🔲 symbol.

➤ Click on the window.

Alternatively, hold down the ⌘ key to display the menu bar and choose **Zoom** from the **Windows Desktop** submenu on the **Setup** menu.

To select the number of colors
for MS-DOS and Windows 3.x
➤ Select the number you want from the **Depth** pop-up menu.

For best performance set the **Number of colors** and your Macintosh **Monitors** control panel to the same setting. The **256 Colors** option is optimal.

> To use more colors you may need to increase the **Video Memory** setting.

To select the number of colors
for Windows 95

➤ Click **Start**, then click **Settings** and **Control Panel**.

➤ Double-click the **Display** icon in the **Control Panel** folder:

Display

➤ In the **Display Properties** dialog box click the **Settings** tab.

➤ Select **16 Color**, **256 Color**, **High Color** (thousands of colors), or **True Color** (millions of colors) from the **Color palette** drop-down list box, as required.

For best performance set the **Color palette** and your Macintosh **Monitors** control panel to the same setting. The **256 Color** option is optimal.

> To use more colors you may need to increase the **Video Memory** setting. If this reduces the **CPU Memory** below the **Best** setting, make more memory available by increasing the application memory size; refer to *To change the application memory size*, page 55.

➤ Click **OK** to change the number of colors.

Setting up sound

RealPC emulates a PC with both a Sound Blaster card (MS-DOS and Windows) and a generic Windows sound card (Windows only). Either or both can be used to play sound using the Macintosh sound system.

To provide Sound Blaster support

➤ Display the **Sound** panel in the **RealPC Setup** dialog box.

➤ Select the **Sound Blaster** support you want from the **Sound Blaster** pop-up menu.
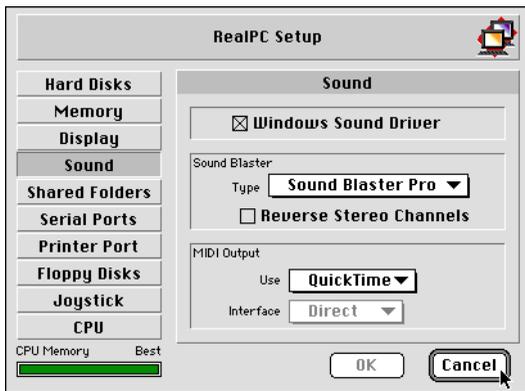
For best results choose **Sound Blaster Pro**. If your software supports **Sound Blaster 16** choose this option for optimum sound quality, although this may reduce performance.

For more information refer to *Using Sound Blaster in MS-DOS and Windows 3.x* opposite, or *Using Sound Blaster in Windows 95*, page 62.

> The **Windows Sound Driver** box should normally be left checked, whether or not you select Sound Blaster.

To disable Sound Blaster

➤ Display the **Sound** panel in the **RealPC Setup** dialog box.

➤ Choose **None** from the **Sound Blaster** pop-up menu.

Using Sound Blaster in MS-DOS and Windows 3.x

RealPC's Sound Blaster emulation is configured as follows:

I/O address: 220

Interrupt (IRQ): 5

DMA channel (8 bit): 1

DMA channel (16 bit): 5 (Sound Blaster 16 only)

The MPU-401 General MIDI port present on the Sound Blaster 16, and emulated when Sound Blaster Pro is in use, uses I/O address 330.

Some MS-DOS based games look at the MS-DOS BLASTER environment variable to determine which type of Sound Blaster card is present. This can be set by one of the following statements in AUTOEXEC.BAT if it is required every time you boot RealPC:

Sound Blaster Pro

```
SET BLASTER=a220 i5 d1 t4
```

Sound Blaster 16

```
SET BLASTER=a220 i5 d1 h5 p330 t6
```

Note that the settings must agree with the Sound Blaster card selected in the **RealPC Setup** dialog box.

Using Sound Blaster in Windows 95

Both Sound Blaster cards emulated by RealPC are plug-and-play devices, and will automatically be recognized by Windows 95. This also means that if you change between the emulated cards in the **RealPC Setup** dialog box and restart Windows 95 the correct Sound Blaster driver will automatically be loaded for whichever card is in use. RealPC's MPU-401 MIDI device is also a plug-and-play device.

If both the **Windows Sound Driver** and **Sound Blaster** options are selected in the **RealPC Setup** dialog box then Windows behaves like a PC with two separate sound cards installed. These sound cards are totally independent of one another and can, if you wish, be used simultaneously.

Specifying the default playback device

To specify the default playback device used by Windows programs for audio output change the **Preferred device** option for **Playback** in the **Audio** tab of the **Multimedia** control panel. The following options are available:

Preferred device	Description
Insignia Native Playback	Insignia's Windows Sound Driver
Sound Blaster Playback (220)	Sound Blaster Pro
SB16 Wave Out [220]	Sound Blaster 16

Other audio devices in the selection list can be used if the preferred device is busy when another application wants to do audio output, or if the preferred device does not support an audio format required by an application but which is supported by another device on the list (which would be the case if CD audio quality output was required but Sound Blaster Pro was the preferred device, and the Windows Sound Driver was also enabled).

In general the Windows Sound Driver will produce clearer audio than the Sound Blaster emulation where simple streaming audio is required, such as playing .WAV files using MediaPlayer. On faster Macintoshes however the difference becomes less marked or disappears altogether.

Because RealPC does not provide recording support via Sound Blaster emulation the **Preferred device** for **Record** in the **Audio** tab of the **Multimedia** control panel should always be set to **Insignia Native Record**.

To specify the default device used by Windows programs for MIDI output change the selected device in the **MIDI** tab of the **Multimedia** control panel. Up to four devices may be listed depending on whether the Windows Sound Driver is enabled, and which if any Sound Blaster card is enabled:

Preferred device	Description
Insignia WAVE & MIDI Sound System	Recommended if the Windows Sound Driver is enabled.
MPU-401 Compatible	Recommended if the Windows Sound Driver is not enabled.
Creative Labs Sound Blaster Pro	Not recommended.
Internal OPL2/OPL3 FM Synthesis	Not supported.

Games written to run under Windows 95 will generally use Microsoft's new DirectSound interface to produce audio output. This can produce sound output using both digital audio and MIDI devices and is supported by both the Windows Sound Driver and both Sound Blaster emulations.

The preferred device for DirectSound output is the same as that specified in the **Audio** tab of the **Multimedia** control panel.

Large video clips played back using ActiveMovie may lose synchronization between the sound and video when using the Windows Sound Driver (the sound will complete before the video does). The same clip should play correctly if the Sound Blaster device is specified as the preferred device for audio playback.

Setting up MIDI

RealPC allows you to play PC MIDI files with the Macintosh sound system, using the **QuickTime** and **QuickTime Musical Instruments** extensions in your Macintosh **Extensions** folder. For information about installing these refer to *Other files on the installation CD*, page 25.

To play MIDI files using QuickTime

➤ Display the **Sound** panel in the **RealPC Setup** dialog box.

➤ Choose **QuickTime** from the **MIDI Output Use** pop-up menu.
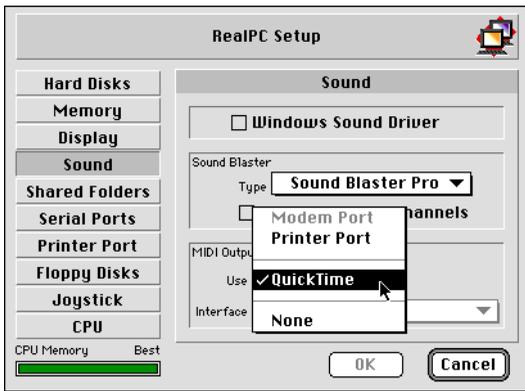
This is the default setting.

To play MIDI files to an external MIDI device

➤ Set the MIDI device to 38400 baud, 8 data bits, no parity, 1 stop bit.

➤ Connect the device to an unused Macintosh serial port, using a suitable serial cable or a Macintosh MIDI interface.

➤ Display the **Sound** panel in the **RealPC Setup** dialog box.

➤ Choose **Modem Port** or **Printer Port**, as appropriate, from the **MIDI Output Use** pop-up menu.

➤ Choose **Serial Cable** from the **Interface** pop-up menu if you are connecting via a direct serial connection to a MIDI device such as a keyboard.

If necessary set **COM1:** or **COM2:** to **None** to make the port available.

Alternatively, if you are connecting to a MIDI device via a Macintosh MIDI translator box (such as Altech Systems' MIDI Interface for Macintosh) choose **0.5 MHz MIDI Interface**, **1.0 MHz MIDI Interface**, or **2.0 MHz MIDI Interface** from the **Interface** pop-up menu depending on the clock speed of the device.

To play MIDI files in Windows 95

For the best results set up Windows 95 as described in *Playing sound in Windows 95*, page 130.

Setting up serial ports

The RealPC serial ports can be used to connect modems, printers, and other kinds of serial devices to your Macintosh computer's serial (modem or printer) ports.

To use a serial device with RealPC you need:

■ An external serial device, internal modem, or network device that can be connected to a Macintosh serial port.

■ A suitable cable.

■ PC software that communicates via a serial port.

■ COM1: or COM2: assigned to the Macintosh serial port.

To display the current serial port settings
➤ Display the **Serial Ports** panel in the **RealPC Setup** dialog box.

This shows the Macintosh port assigned to the PC ports COM1: and COM2:, and the device type connected to each port:
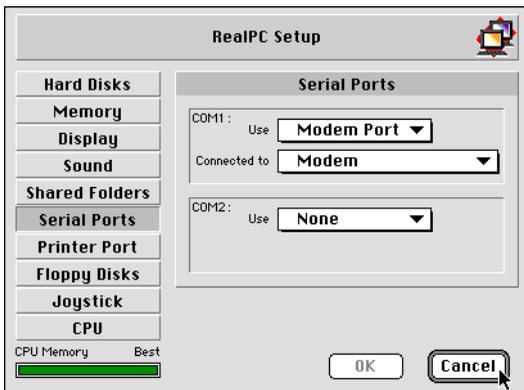
To set up a serial port
➤ Display the **Serial Ports** panel in the **RealPC Setup** dialog box.

➤ Choose the option from serial port's **Use** pop-up menu.

The following options are available:

Select this option	To do this
Modem Port, Printer, Port, Printer/Modem Port[†], or Upper/Lower PC Card Slot[†]	Use the specified Macintosh port.
None	Leave the port unassigned.
Text File… (COM1: and COM2: only)	Send output to a Macintosh text file document. No input is allowed.

[†] PowerBook only.

If either Macintosh port is already in use the corresponding option will be dimmed on the pop-up menu.

The **Connected to** pop-up menu allows you to specify the type of device connected to the port. This provides the following options:

Select this option	For
Modem	To connect to a modem.
Another computer	To connect to another computer.
Printer	To connect to a printer.
Printer requiring flowcontrol	To connect to a slow serial printer using handshaking to avoid losing data.

For details of these options refer to *Serial device options* opposite.

To save output to a file
➤ Choose **Text File** from the **COM1:** or **COM2: Use** pop-up menu.

This dialog box allows you to specify the file to save the output as:
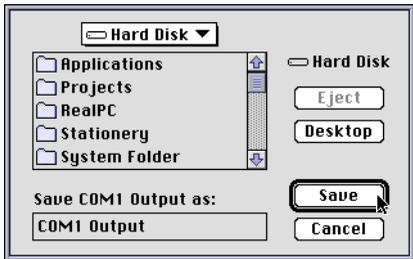
➤ Enter a name for the text file and click **Save** to create the file.

The filename is displayed in the **Serial Ports** panel of the **RealPC Setup** dialog box:
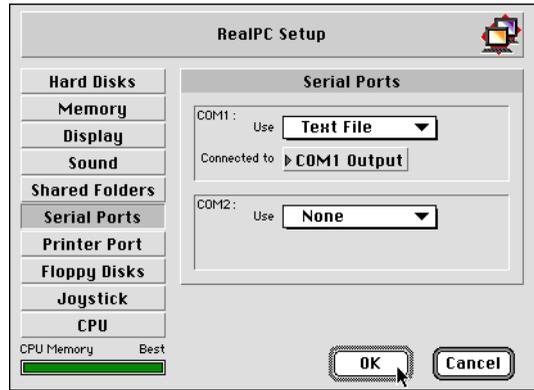
Each time you send output to the serial port it will be added to the end of the file.

Serial port specifications

Data rates

RealPC supports the following serial port transmission rates, in bits per second:

300   1200   2400   4800   7200

600   1800   3600   9600   19200

Higher rates up to 38400 may work, depending on your system.

The data transfer rates which RealPC can handle depend on the speed of your Macintosh. In general, note the following:

■ When sending data from RealPC any data rate (baud rate) can be used.

■ When receiving data into RealPC choose a lower data rate if you are running on a slower Macintosh.

You can trade off speed for block size – at higher speeds keep the data block size small (100-200 bytes).

If the incoming data rate is too high some of the data may be lost and serial communications programs will not be able to connect. Reduce the rate if you have problems.

Protocols

Supported serial port transmission protocols:

Parity: Even, Odd, None, Mark, or Space.

Data bits: 5, 6, 7, or 8.

Stop bits: 1, 1.5, or 2.

Default settings

By default, COM1: is set up by the following MODE command in the AUTOEXEC.BAT file:

MODE COM1:9600,n,8,1

This gives the following communications settings:

9600 baud, no parity, 8 data bits, 1 stop bit.

These settings can be changed with another MODE command.

Serial device options

This section gives details of the different serial device options in the **PC Serial Ports** dialog box.

Modem

Hayes-compatible modems and MS-DOS communications programs work well with RealPC. Most modems that work with Macintosh applications will also work with MS-DOS software running in RealPC.

Not all such communications programs will work, because some of them depend upon reading the status of, or receiving signals from, lines that the Macintosh serial port does not have.

PC-compatible computers have five handshake lines: RTS, CTS, DSR, DTR, and DCD, whereas the Macintosh serial ports have just two: Input Handshake and Output Handshake.

Printer

If you are using a serial printer with RealPC, and your PC program is sending output directly to it, you should make sure that you have the correct cable. The printer may need to be configured to match the serial port settings of RealPC; refer to *Serial port specifications* opposite.

Problems with serial printing may be due to handshaking; that is, the interchange of signals between the program and the printer to ensure that data is not sent before the printer can accept it.

Printer requiring flow control

This option converts XON/XOFF software handshaking into hardware handshaking as far as the PC program is concerned. This is only needed because most PC programs use hardware handshaking and a few devices, especially printers, use only software handshaking.

If you are using the correct cable to your printer, and both printer and PC program use hardware handshaking, you should print successfully.

If you have printing problems, try to configure your printer and PC program to use software handshaking.

If your program cannot be configured for software handshaking, make sure that the printer is using XON/XOFF and select **Printer requiring flow control** from the appropriate **Connected to** pop-up menu in the **PC Serial Ports** dialog box. RealPC will then convert the software signals sent by the printer into emulated hardware signals that your PC program can understand.

Other devices

Other serial devices may or may not work, depending on their requirements and how configurable they are. Almost any device that uses software flow control will work.

Another computer

Select this option to connect to another computer.

Cables
The Apple Peripheral-8 cable or equivalent will work for connecting an Apple modem, an ImageWriter II, or LaserWriter printer to a serial port. For other modems use a Macintosh-to-Hayes cable. For other printers use a Macintosh-to-ImageWriter I cable.

Limitations
Programs that do not work well are those that are extremely timing-sensitive or that rely on serial port lines that are not available on the Macintosh serial port.

RealPC has no access to the DSR, DCD, or RI signals, and the RTS line cannot be set up due to the lack of lines. Instead, RealPC makes the DSR and RLSD/DCD lines have the same status as the DTR line. RI is always set to off.

> Copy-protection locks, also known as dongles, do not work on RealPC due to unavoidable timing variations in its processing of serial port signals through the Macintosh serial port driver.

Setting up a joystick

RealPC allows you to use a Macintosh joystick with MS-DOS and Windows programs, such as games, that use a joystick.

To use a Macintosh joystick

➤ Install the Macintosh joystick software in the usual way.

➤ Turn off the joystick mapping features, so that the joystick does not control the mouse or keyboard.

➤ Display the **Joystick** panel in the **RealPC Setup** dialog box:
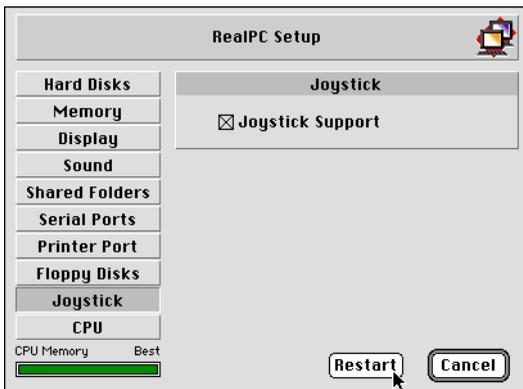
➤ Select **Enable Joystick Support** and click **Restart** to restart RealPC to use a joystick.

Setting up the CPU emulation

RealPC allows you to select how the CPU emulation is performed, to achieve the highest possible performance with different applications.

To see the CPU emulation settings

➤ Display the **CPU** panel in the **RealPC Setup** dialog box:
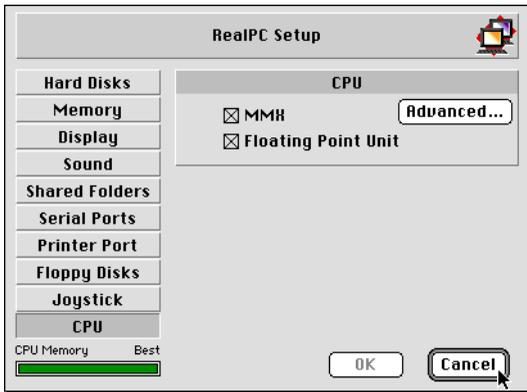
To disable the FPU

You may need to disable the FPU if you are running a PC application which is written to use the FPU, and which does not appear to run properly with the emulated math co-processor. The Macintosh math co-processor has a different precision than the Pentium FPU, so there may be a few applications that do not run properly.

➤ Display the **CPU** panel in the **RealPC Setup** dialog box.

➤ Uncheck the **Floating Point Unit** option.

➤ Check **Restart** to restart RealPC without FPU emulation.

To disable the MMX instruction set

If MMX is not required, unchecking the **MMX** option may improve performance.

To select advanced CPU options

➤ Display the **CPU** panel in the **RealPC Setup** dialog box.

➤ Click **Advanced**… to display the advanced CPU options:
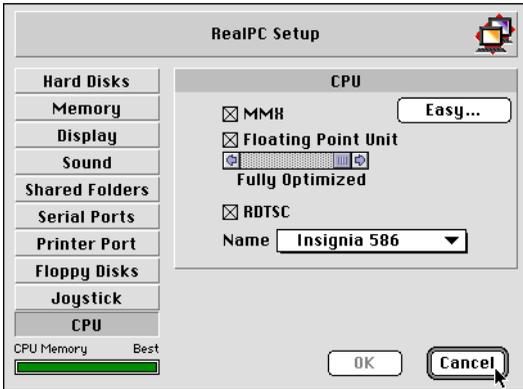
The options are explained in the following table:

Option	Description
MMX	Emulates the MMX instruction set. Unchecking this option may improve performance if MMX is not required.
Floating Point Unit	Allows you to adjust the level of optimization. The fastest setting, **Fully Optimized**, is recommended for most applications.
RDTSC	Required for some applications, including NASCAR 2. Unchecking this option may improve performance if it is not required.
Name	Can be set to **Insignia 586** (recommended for highest performance) or **Industry Standard** (required by some applications, including NASCAR 2 and Power Chess).

Setting up printing

RealPC allows you to print to any printer connected to your Macintosh, and take full advantage of all of its features, including color.

RealPC provides an Insignia Printer Driver, which allows you to print from PC applications to any Macintosh printer.

If you have a PostScript printer you can get improved performance and quality using the RealPC **PostScript** option.

If you want fast draft printing or to print from MS-DOS RealPC also provides an **Epson LQ-2500** option, which emulates a dot-matrix printer on any Macintosh printer.

RealPC also provides a **Direct Printing** option, to allow you to print directly to a PC printer using an appropriate Macintosh printer driver selected in the Chooser.

For more information about printing from MS-DOS, Windows 3.x, or Windows 95 refer to *Printing from MS-DOS*, page 89, *Printing from Windows 3.x*, page 109, or *Printing from Windows 95*, page 127.

To see the printer emulation options

➤ Display the **Printer Port** panel in the **RealPC Setup** dialog box.

This shows the current printer emulation:
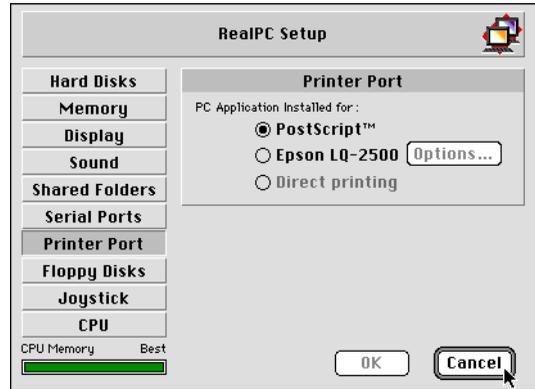
To choose the printer emulation

➤ Display the **Printer Port** panel in the **RealPC Setup** dialog box.

➤ Select the option you want to use.

The options are explained in the following sections.

PostScript

This is the default option. Choose this if your Macintosh has access to a PostScript printer, such as a member of the Apple LaserWriter family, and you are using a PostScript Windows printer driver or one of the few MS-DOS applications that support PostScript. RealPC will send the output to the printer without conversion.

Epson LQ-2500

Choose this option for most MS-DOS applications, or if you want to emulate an Epson LQ-2500 on any Macintosh printer. RealPC will convert the output and format it appropriately for the printer selected in the Macintosh Chooser.

This option supports the IBM extended character set, including graphics characters, and you should choose this if you want to use the **Print Screen** command or the PRINT command from MS-DOS.

The **Epson LQ-2500** option uses the Insignia fonts to give the correct fonts when printing, and these are installed automatically by the Easy Install option. If you need to install them refer to *Installing additional RealPC options*, page 22.

Direct Printing

Choose this option to print to a PC printer using an appropriate Macintosh printer driver selected in the Macintosh Chooser.

Macintosh printer drivers are available for a wide range of PC printers from Infowave Wireless Messaging Inc. They can also supply a cable to connect a PC printer to a Macintosh. For more information contact their Web site at:

http://www.gdt.com

The **Direct Printing** option will only be available if a PC printer driver is selected in the Macintosh Chooser; otherwise it will be grayed out. To use direct printing you should also select an appropriate printer driver in the MS-DOS application or Windows.

To set Epson LQ-2500 emulation options

➤ Select **Epson LQ-2500** in the **Printer Port** panel of the **RealPC Setup** dialog box.

➤ Click **Options** to set up the Epson LQ-2500 emulation options.

These correspond to the most important options available on the Epson LQ-2500:

Country

Allows up to 12 special characters to be printed, depending on the country selected. If you are using an application designed for a different national language, select the language you want to use from the pop-up menu.

Auto Line-Feed (LF)

Prints a line feed after every carriage return. If your printed output has unwanted double spacing the application is already including line feeds and you should uncheck this option.

Condensed

Condenses the characters horizontally to 60%. Check this option if you want to fit 132 column printing across the width of US letter size or A4 paper.

Pitch

Choose the pitch setting you want from the pop-up menu.

Pica, the default, gives 10 characters per inch and is the recommended setting.

Elite (12 characters per inch) and **15 pitch** (15 characters per inch) reduce the horizontal spacing to fit more characters on a line. The character size and line spacing are set by the **Mono Spaced** font size.

Proportional selects proportional printing.

Mono Spaced Font and Proportional Font

By default, two LQ-2500 fonts are selected which emulate the character sets and spacing of the monospaced and proportional fonts found on an LQ-2500. Alternatively, you can select any font on your Macintosh for either of these two fonts. For best results you should use only monospaced fonts (such as Courier or Monaco) for the **Mono Spaced Font** option. The font size chosen for the **Proportional Font** option should be similar to that already chosen for the monospaced font, because the size selected for the monospace font governs the character size and line spacing of the proportional font as well.

Page Length

Specifies the length of the printed area to the nearest 0.5 inches.

The **Page Length** is initially set to the length of the paper selected in the **Page Setup** dialog box; for example, 11 inches for US Letter paper.

Left Margin

Specifies the number of columns used for the left margin. At the default **Pica** pitch there are 10 columns per inch.

You can ignore this option if you are using an application, such as a word processor, which sets the margins itself.

Right Margin

Specifies the number of columns to be used for the right margin. The right margin will only need to be set if the application is assuming a narrower page width and the lines of print are wrapped round, or the application is assuming a wider page width and the lines of print run over the paper edge.

International usage

To use MS-DOS software in countries outside the USA and English-speaking Canada you may need to adjust it for the different keyboard layouts, screen display character sets, and printer character sets required in each country.

RealPC includes a special KEYBOARD.SYS file, and custom Windows DLL files, to configure MS-DOS and Windows to match the layouts of international Macintosh keyboards.

To use an international keyboard for MS-DOS

➤ Type the following line (or include it in your AUTOEXEC.BAT file):

KEYB *XX*,,C:\INSIGNIA\KEYBOARD.SYS ⏎

where *XX* represents the code for the keyboard that you wish to install (see the table opposite). The two-letter code is followed by two commas then the path to the KEYBOARD.SYS file. Note that the only space in the line is just after KEYB; there is no space between the two commas.

Some programs, such as Microsoft Windows 3.x, look at the PC hardware directly rather than at the MS-DOS settings and so will ignore the installed KEYBOARD.SYS driver.

The countries and the codes are as follows:

Country	Code	Country	Code
Belgium	BE	Netherlands	NL
Brazil	BR	Norway	NO
Canadian French	CF	Poland	PL
Czech Republic	CZ	Portugal	PO
Slovak Republic	SL	Spain	SP
Denmark	DK	Sweden	SV
Finland	SU	Switzerland (French)	SF
France	FR	Switzerland (German)	SG
Germany	GR	United Kingdom	UK
Hungary	HU	United States	US
Italy	IT	The former Yugoslavia	YU
Latin America	LA		

If there is no obvious \ (backslash) key on the keyboard you can obtain a \ character as follows:

➤ Hold down option (Alt), and type 9 and 2 on the numeric keypad.

On Macintosh keyboards with no numeric keypad press ⌘K to select Keypad mode, and then use the normal numeric keys.

To use an international keyboard for Windows 3.x

➤ Double-click the **International** icon in the Windows **Control Panel** window.

International

The **International** dialog box will be displayed.

➤ Click the down arrow to open the **Keyboard Layout** drop-down list box, and select the layout you require.
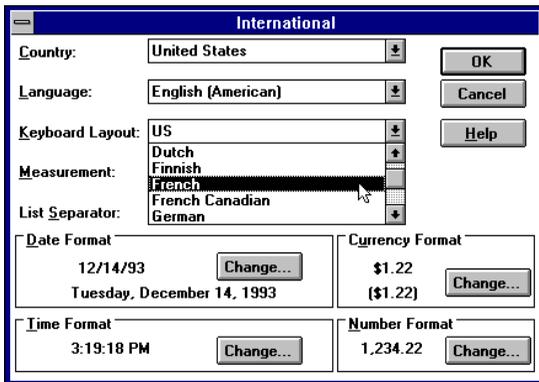
➤ Click **OK**.

The following dialog box lets you select the appropriate installed keyboard driver:
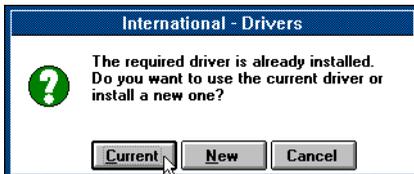
➤ Click **Current** to use the installed driver you have selected.

To use an international keyboard for Windows 95

➤ Click **Start**, then click **Settings** and **Control Panel**.

➤ Double-click the **Keyboard** icon in the **Control Panel** folder.

Keyboard

The **Keyboard Properties** dialog box is displayed.

➤ Click the **Language** tab to display the **Language** panel.

➤ Click **Add…** to display the **Add Language** dialog box.

➤ Select the language you want to use from the drop-down list box, and click **OK**.
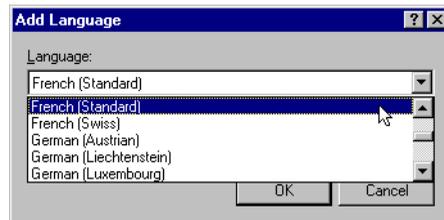
➤ Click **Set as Default** to choose it as the default language.

➤ Click **OK**.

To set up international printing
The following options are available for international printing.

Epson LQ-2500 printing

The RealPC Epson LQ-2500 emulation is complete, including the printer's international character sets. The LQ-2500 fonts provided include the IBM Extended Character Set graphics.

When you set options in the **Epson LQ-2500 Emulation Options** dialog box you are setting up the initial defaults of the printer, just as if you used the control panel of a real LQ-2500. These initial settings may be changed by your MS-DOS program.

If your MS-DOS software takes complete control of the printer, including margin settings, pitch setting, and character set selection, then you should only need to change the options if the default settings are incorrect.

PostScript or direct printing

For MS-DOS software that prints via PostScript or directly to an attached PC-compatible printer, the LQ-2500 settings are ignored and will not affect your printouts.

To set up MS-DOS for Denmark or Norway
To get the ø and Ø characters needed by Danish and Norwegian users in printouts and when using copy and paste:

➤ In the CONFIG.SYS file add the lines:

```
COUNTRY=045,850,C:\DOS\COUNTRY.SYS
DEVICE=C:\DOS\DISPLAY.SYS CON=(EGA,850,1)
```

➤ In the AUTOEXEC.BAT file add the lines:

```
NLSFUNC
MODE CON CODEPAGE PREPARE=((850)C:\DOS\EGA.CPI)
MODE CON CODEPAGE SELECT=850
KEYB DK,850,C:\INSIGNIA\KEYBOARD.SYS
```

➤ You must then restart RealPC.

The above example is for Denmark; for Norway, replace the country code 045 with 047 and the keyboard code DK with NO.

Setting up RealPC for multiple users

To install a multi-user pack
The following procedure describes how a system administrator should set up a multi-user pack.

➤ Install and personalize RealPC for your company.

➤ Duplicate and distribute the installed RealPC and hard disk file to users. If installation is to be server-based, only distribute the hard disk file.

If RealPC is going to be run from a server:

➤ Install SharePC using the **Custom Install** installation option; refer to *Installing additional RealPC options*, page 22.

➤ Run SharePC from the **Utilities** folder within the **RealPC** folder, and when prompted for an application select RealPC.

Now the specified number of users will be able to run RealPC from the server.

To share data files for creating RealPC hard disk files
You can provide the RealPC **HDData** file on a server to allow any RealPC user on the network to build their own bootable (C: drive) hard disk files.

To install this file use the installer's **Custom Install** option **MS-DOS Data File**; refer to *Installing additional RealPC options*, page 22.

Each user will then be able to build their own bootable hard disk files from within RealPC using the following procedure.

➤ Choose **PC Hard Disks**… from the **Setup** menu and proceed with creating a new hard disk file.

➤ When prompted to locate the HDData file, select the file on the file server.

Optimizing the performance of RealPC

This section explains how to set up RealPC to obtain the best possible performance from your PC applications.

Application memory

The main factor affecting the performance of RealPC is the amount of memory available to it. For information about changing this refer to *To change the application memory size*, page 55.

Increasing the application memory will allow you to increase the **PC Memory** setting within RealPC, which will improve the performance of PC applications.

For details of the latest information on recommended settings for different amounts of physical memory see the RealPC ReadMe file.

For optimum performance of RealPC the **CPU Memory** indicator should be at **Best**; refer to *To change the PC memory*, page 56.

Memory-hungry PC applications such as Windows 95 and Microsoft Excel may benefit from as much as 15 Mbytes or more of PC memory.

The Windows mouse pointer

For best performance with Windows use the Macintosh mouse pointer, which you can select by holding down the ⌘ key and choosing **Mac Mouse** from the **Setup** menu.

The Windows desktop

The performance of the Windows desktop is optimal when the whole window is visible on the screen, unobscured by another window. Pressing ⌘B places the window in the best position.

For best performance the **Monitors** control panel should be set to 256 or 16 colors, and the Windows desktop should match this.

When the Windows desktop is optimal, and you are using the Windows mouse pointer, a ✓ is displayed in the title bar.

≣ **Windows Desktop**✓ ≣

Alternatively, if the title bar is not visible press ⌘ and option to change the mouse pointer to a hand. The hand pointer includes a dot to indicate whether the Windows desktop is optimal:

   🖐   🖐

Optimal   Non-optimal

The performance of RealPC will decrease slightly as the size of the Windows desktop is increased.

Other factors

The following other factors also have a significant effect on the performance of RealPC.

Macintosh performance

The performance of your Macintosh will directly determine the performance of RealPC.

Level 2 Cache

If your Power Macintosh does not already include Level 2 Cache you can achieve an increase in performance of up to 30% by having it installed.

Other Macintosh applications

Other applications running on your Macintosh, in particular those that check the network regularly, can slow down RealPC.

Macintosh extensions

You may find a performance improvement if you turn off any unnecessary extensions using **Extensions Manager**, as these can use system memory. Try restarting your Macintosh with the Shift key held down, to turn all extensions off, and see if there is a significant improvement in performance.

MS-DOS

Over time the PC hard disk may become fragmented. To restore performance run the MS-DOS DEFRAG utility.

Macintosh hard disk

Defragmenting the Macintosh hard disk, using an appropriate Macintosh disk utility, may also improve performance.

Using MS-DOS

This chapter describes the original operating system for PCs, called MS-DOS. RealPC includes version 6.22 of MS-DOS, and this chapter explains the basics of how MS-DOS works and how to use it.

For more information about MS-DOS, read any good book about MS-DOS, such as *DOS for Dummies* from IDG books or the *Microsoft MS-DOS User's Guide*.

Running MS-DOS

When you start RealPC MS-DOS will automatically start, or you can run MS-DOS from within Windows. This section explains how to run MS-DOS from Windows 3.x or Windows 95, and shows the main features of the RealPC MS-DOS window.

To display the RealPC MS-DOS window from Windows 3.x

➤ Double-click the **MS-DOS Prompt** icon in the **Main** program group:

Program
Manager

To exit from Windows 3.x to the RealPC MS-DOS window

➤ Choose **Exit Windows**… from the Program Manager **File** menu.

The following dialog box appears:

➤ Choose **OK** to exit from Windows to the RealPC MS-DOS window.

To display the RealPC MS-DOS window from Windows 95

➤ Click **Start**, then choose **MS-DOS Prompt** from the **Programs** submenu on the **Start** menu:

To exit from Windows 95 to the RealPC MS-DOS window

➤ Click the **Start** button, then click **Shut Down**….

➤ Select **Restart the computer in MS-DOS mode**:

➤ Click **Yes** to proceed.

The RealPC MS-DOS window

The diagram below shows the main features of
the RealPC MS-DOS window.

The C:\> prompt at the bottom of the screen is
the basic user interface of MS-DOS. The
underscore next to the prompt is the cursor,
which shows where text will appear when you
type.

To use the mouse in MS-DOS
➤ Choose **Emulate PC Mouse** from the **Setup**
  menu.

To restore the normal Macintosh mouse at any
time type ⌘M.
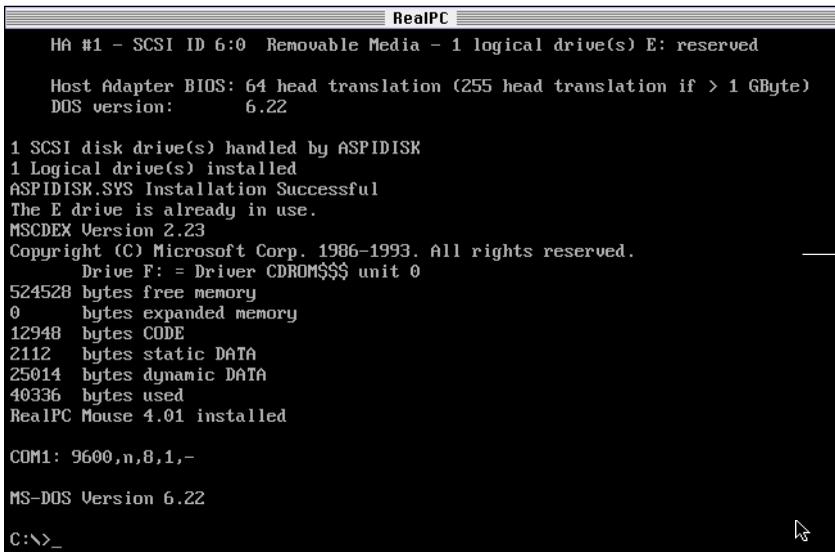
```
========================= RealPC =========================
    HA #1 - SCSI ID 6:0  Removable Media - 1 logical drive(s) E: reserved

    Host Adapter BIOS: 64 head translation (255 head translation if > 1 GByte)
    DOS version:      6.22

1 SCSI disk drive(s) handled by ASPIDISK
1 Logical drive(s) installed
ASPIDISK.SYS Installation Successful
The E drive is already in use.
MSCDEX Version 2.23
Copyright (C) Microsoft Corp. 1986-1993. All rights reserved.
        Drive F: = Driver CDROM$$$ unit 0
524528 bytes free memory
0      bytes expanded memory
12948  bytes CODE
2112   bytes static DATA
25014  bytes dynamic DATA
40336  bytes used
RealPC Mouse 4.01 installed

COM1: 9600,n,8,1,-

MS-DOS Version 6.22

C:\>_
```

RealPC MS-DOS window

MS-DOS basics

On the Macintosh you perform operations on files and folders by manipulating their icons with the mouse or by selecting menu commands from the Finder. In MS-DOS you perform such operations by typing an MS-DOS command at the `C:\>` prompt.

Note that you must press ⏎, or Return, after every command you type.

If you have entered a valid command, MS-DOS will carry out the operation you requested. If you have mistyped the command or used an invalid command you will see:

```
Bad command or file name
```

MS-DOS displays this whenever it does not recognize something.

For information on the MS-DOS commands, and how to use them, see *Getting help on MS-DOS (MS-DOS and Windows 3.x only)*, page 86.

The following table gives some basic information about MS-DOS in terms of the equivalent Macintosh information you are already familiar with:

Macintosh	*MS-DOS*
A file is represented by an icon: Draft report	A file is represented by a filename of up to 8 characters followed by an extension of up to 3 letters: `REPORT1.TXT`

The icon shows the type of the file:
 	
Draft report Sales graph
	The extension (often) shows the type of the file:
	
	`REPORT.TXT`
	`PICTURE.BMP`

Disks are represented by icons on the desktop: Hard Disk Letters	Disks are represented by drive letters: Hard disks: `C:  D:` Floppy disk drive: `A:`

Macintosh	*MS-DOS*
Programs you can run are represented by application icons:	Program files are identified by a `.EXE` or `.COM` extension:
	`EDIT.EXE`
TeachText	Batch files contain commands you can run:
	`INSTALL.BAT`
The highest level of the filing system is the disk window:	The highest level of the filing system is called the Root, and is referred to in commands as:
Hard Disk / 1 item / 484 MB in disk / 13.7 MB avail / System Folder	`C:\`
You see the contents of a drive by opening its window:	You see the contents of a drive by selecting it, for example by typing:
	`A:` ↵
Letters / 2 items / 585K in disk / 201K availa / First draft report / Sales graph	and then listing the files:
	`DIR` ↵
Files are organized into folders:	Files are organized into directories. You identify the file by specifying the drive, list of directories, and filename, separated by \ characters:
Reports	`C:\REPORTS\REPORT1.TXT`
You copy a file by dragging it from one disk window to another.	You copy a file by using the `COPY` command:
Hard Disk / 72.9 MB in disk / Sales graph	`COPY C:\REPORT1.TXT A:` ↵

Getting help on MS-DOS (MS-DOS and Windows 3.x only)

MS-DOS includes a comprehensive help system which you can use to display information about MS-DOS commands, and the procedures for using MS-DOS.

To use the mouse with MS-DOS
➤ Choose **Emulate PC Mouse** from the **Setup** menu.

To restore the normal Macintosh mouse at any time type ⌘M.

To display information about an MS-DOS command
➤ Type the following at the `C:\>` prompt:

command /? ↵

where *command* is the name of the command.

For example, to get help on the `DIR` command type:

`DIR /?` ↵

To display the MS-DOS help
➤ Type the following command at the `C:\>` prompt:

`HELP` ↵

The **Command Reference** menu will be displayed as shown below.

➤ Click on the entry you want to know about, or move the cursor to it using the cursor keys and press ↵.

The help page will be displayed.

```
================================ RealPC ================================
   File  Search                                                   Help
                   ┌ MS-DOS Help: Command Reference ┐
                                                                         ↑
 Use the scroll bars to see more commands. Or, press the PAGE DOWN key. For
 more information about using MS-DOS Help, choose How to Use MS-DOS Help
 from the Help menu, or press F1. To exit MS-DOS Help, press ALT, F, X.

 <What's New in MS-DOS 6.22?>

 <ANSI.SYS>              <EMM386.EXE>            <Multi-config>
 <Append>               <Erase>                 <Nlsfunc>
 <Attrib>               <Exit>                  <Numlock>
 <Batch commands>       <Expand>                <Path>
 <Break>                <Fasthelp>              <Pause>
 <Buffers>              <Fastopen>              <Power>
 <Call>                 <Fc>                    <POWER.EXE>
 <Cd>                   <Fcbs>                  <Print>
 <Chcp>                 <Fdisk>                 <Prompt>
 <Chdir>                <Files>                 <Qbasic>
 <Chkdsk>               <Find>                  <RAMDRIVE.SYS>
 <CHKSTATE.SYS>         <For>                   <Rd>
 <Choice>               <Format>                <Rem>
 <Cls>                  <Goto>                  <Ren>
 <Command>              <Graphics>              <Rename>                 ↓
 <Alt+C=Contents> <Alt+N=Next> <Alt+B=Back>            C  00006:002
```

Copying, pasting, and using drag and drop

When RealPC is in text mode, text can be copied from and pasted into the RealPC MS-DOS window, or moved using drag and drop.

To copy text from the RealPC MS-DOS window

➤ Select the text you want to copy, by holding down the mouse button and dragging over the text in the RealPC MS-DOS window, as shown below.

To select the whole window choose **Select All** from the RealPC **Edit** menu.

➤ Choose **Copy** from the RealPC **Edit** menu.

Holding down the option key when choosing **Copy** replaces return characters with spaces, so that the text will be treated by a word processor as a single paragraph.

➤ Switch to the application you want to paste into and choose **Paste** from the Macintosh application's **Edit** menu.


```
                              RealPC

C:\>dir

 Volume in drive C is REALPC
 Volume Serial Number is F400-104E
 Directory of C:\

COMMAND  COM        54,645 07-11-97   4:51p
AUTOEXEC BAT           472 07-04-97  12:57p
CONFIG   SYS           392 07-04-97  12:57p
DOS          <DIR>         07-11-97   4:51p
SUPPDISK     <DIR>         07-11-97   4:51p
INSIGNIA     <DIR>         07-11-97   4:57p
        6 file(s)         55,509 bytes
                       5,967,872 bytes free

C:\>_
```

To drag text from the RealPC MS-DOS window

➤ Select the text you want to copy, by holding down the mouse button and dragging over the text in the RealPC MS-DOS window, as shown below.

To select the whole window choose **Select All** from the RealPC **Edit** menu.

➤ Drag the selected text to an open document in a Macintosh application that supports drag and drop, such as **SimpleText**.

Dragging to a Finder window creates a text clipping file:

text clipping

If you selected the whole window click inside the selection to deselect it.

To paste text into the RealPC MS-DOS window

➤ Select the text you want to copy.

➤ Choose **Copy** from the application's **Edit** menu.

➤ Switch to RealPC.

➤ Choose **Paste** from the RealPC **Edit** menu.

The text will be typed into the RealPC window at the current cursor position.

To drag text into the RealPC MS-DOS window

➤ Select the text you want to copy.

➤ Drag the text and drop it onto the RealPC window.

The text will be typed into the RealPC window at the current cursor position.

Printing from MS-DOS

Most MS-DOS applications give best results when set up for a dot-matrix printer. RealPC emulates the widely-used Epson LQ-2500 printer on any Macintosh printer.

RealPC also provides a **Direct Printing** option, to allow you to print directly to a PC printer using an appropriate Macintosh printer driver selected in the Chooser.

In addition, RealPC can drive a PC serial printer connected to a serial port on the Macintosh so that your application can print directly to it.

The options on the **Printouts** submenu on the **File** menu allow you to specify when printing from your Windows program is sent to the printer.

File	
Printouts ▶	Send to Printer
Page Setup…	Cancel
Quit ⌘Q	✓Auto-Send…
	Wait for 'Send'

Auto-Send… specifies that printing is automatically sent to the Macintosh printer; this is the default setting.

Wait for 'Send' specifies that output should not be sent until you select **Send to Printer**.

To set up printing to any Macintosh printer

➤ Choose **RealPC Setup**… from the **Setup** menu and click the **Printer Port** button to display the currently-selected printer support:

RealPC Setup	
Hard Disks	**Printer Port**
Memory	PC Application Installed for :
Display	○ PostScript™
Sound	◉ Epson LQ-2500 [Options…]
Shared Folders	○ Direct printing
Serial Ports	
Printer Port	
Floppy Disks	
Joystick	
CPU	
CPU Memory Best	[OK] [Cancel]

➤ Select the **Epson LQ-2500** option and choose **OK**.

➤ Follow the instructions supplied with your MS-DOS application to configure it to print to an Epson LQ-2500.

LQ-2500 printing is suitable for most MS-DOS software which typically produces an 80- or 132-character wide, plain text printout.

If your application presents you with a number of Epson options, choose the first of the following options that is available:

- LQ-2500
- LQ-1000
- LQ-1500, v2 ROM
- LQ-1500
- FX-105
- Epson printer

RealPC emulates the PC parallel printer port, called LPT1:, so if you need to specify the port used select LPT1:. This port is also referred to as the parallel port.

The LQ-2500 can print up to 132 columns. Note that using the standard fonts this is too wide for a US letter size (or A4) sheet. In this case choose the **Condensed** option; refer to *To set Epson LQ-2500 emulation options*, page 73. Alternatively, use landscape mode, or set a percentage reduction with the **Page Setup**… command on the **File** menu.

> To get the margins you want you may need to adjust the margins specified in the MS-DOS application, the RealPC **Epson LQ-2500 Emulation Options** dialog box, and the Macintosh **Page Setup** dialog box.

To print from an MS-DOS application that supports PostScript to a PostScript printer

A small number of MS-DOS applications support printing to a PostScript printer.

➤ Select the PostScript printer connected to your Macintosh or to your network in the Macintosh Chooser.

➤ Choose **RealPC Setup** from the **Setup** menu and click the **Printer Port** button to display the currently-selected printer support:

➤ If necessary, select **PostScript** and choose **OK**.

➤ Follow the instructions supplied with the application to configure the software for printing to a generic PostScript printer.

To set up direct printing to a PC printer

Macintosh printer drivers are available for a wide range of PC printers from Infowave Wireless Messaging Inc. They can also supply a cable to connect a PC printer to a Macintosh. For more information contact their Web site at:

`http://www.gdt.com`

➤ Select the appropriate printer driver in your Macintosh Chooser.

➤ Choose **RealPC Setup** from the **Setup** menu and click the **Printer Port** button to display the currently-selected printer support:

➤ Select **Direct Printing** and choose **OK**.

➤ Configure your MS-DOS application to print to your PC printer.

To print from MS-DOS

➤ Choose the appropriate command to print from your MS-DOS application.

The application will first print to the RealPC printing buffer. The PostScript information will then be sent to the Macintosh printer. At this point the print dialog box for the Macintosh printer will be displayed.

➤ Click **Print** to send the print job to the printer.

To print to a serial printer

You can also print from a PC application to a serial printer by connecting it to the Macintosh modem or printer port with a suitable cable, such as a Mac Plus to ImageWriter II cable. You then use the **Serial Ports** panel in the **RealPC Setup** dialog box to assign COM1: to the Macintosh port connected to the printer; refer to *Setting up serial ports,* page 65.

If your MS-DOS program does not let you print to the serial port you can achieve this by typing this command at the MS-DOS C:\> prompt before running the program:

MODE LPT1:=COM1: ⏎

This redirects data sent to the LPT1: port so that it goes to the COM1: port instead. You may also need to set the correct baud rate.

Installing and running MS-DOS applications

To install an MS-DOS application you should follow the installation instructions in the manual supplied with the application.

MS-DOS software is typically supplied on one or more floppy disks, and to install the program you copy the files from these disks to your PC hard disk. To simplify the installation process most MS-DOS programs provide a batch file which automatically copies the files for you. The batch file is typically called SETUP.BAT or INSTALL.BAT and you run it by typing SETUP or INSTALL at the A:\> prompt.

To install from floppy disks

The simplest way of installing PC software is to install directly from 3.5-inch installation disks.

A typical sequence would be as follows:

➤ Choose **RealPC Setup**… from the **Setup** menu, and click the **Floppy Disks** button to display the current settings.

➤ Check that **Use Internal Floppy as A:** is checked to use the Macintosh internal floppy disk drive for drive A:.

➤ Insert the first installation disk.

➤ Follow the instructions supplied with the software. For example, you may be instructed to type:

A:INSTALL ↵

or

A:SETUP ↵

If at any stage during the installation you need to change disks, eject the current disk by choosing it from the **Eject** menu (or press ⌘ Shift 1, ⌘ Shift 2, or ⌘ Shift 0 to eject a disk from the internal, second internal, or external drive, respectively).

> Some applications suggest you can copy all the required files onto your hard disk before installation. Only do this if the user guide for the application recommends it, and follow the instructions precisely.

Choosing where to install

The installation program will typically give you the choice of where to install the files it is copying from the installation disks.

Choose drive C: or D:, and make sure that the files you are installing will fit on the corresponding hard disk file.

To do this check the disk space requirements specified in the PC application's manual, and display the available hard disk space by typing the following command at the MS-DOS C:\> prompt:

CHKDSK ↵

Note that 1048576 bytes = 1 Mbyte.

If necessary, you can create more space using the Hard Disk Expander utility; refer to *To change the size of a hard disk file*, page 45.

Note that some PC application installer programs will only install onto a hard disk. Also, some programs will assume that drives `E:` to `Z:` are a PC network, and install additional networking software if you specify these drives.

To run an MS-DOS application

Most MS-DOS applications are run by typing the name of a `.BAT` or `.EXE` file at the `C:\>` prompt. For example:

`QUAKE.EXE` ⏎

To run an MS-DOS application from the Macintosh

RealPC's EasyLaunch feature lets you run a PC application simply by double-clicking an icon on your Macintosh.

➤ Set up the `E:` drive as a Macintosh shared folder.

For more information refer to *Sharing PC files between RealPC and the Macintosh*, page 49.

➤ Create a batch file to run the application.

➤ Copy the batch file to the `E:` drive, with a command such as:

`COPY C:\RUNGAME.BAT E:` ⏎

You can now automatically run RealPC, and then run the MS-DOS application, by double-clicking the icon.

Configuring MS-DOS

MS-DOS uses two configuration files, `CONFIG.SYS` and `AUTOEXEC.BAT`, in the root directory `C:\`.

You can alter either file by using a text editor. For information about using the MS-DOS editor to do this refer to *Editing configuration files*, page 96. Before doing so, we recommend that you make copies of the original files. The default `CONFIG.SYS` and `AUTOEXEC.BAT` files are shown below, and are also provided in the `INSIGNIA` directory.

CONFIG.SYS

This is a text file that contains commands that configure the PC's hardware components. When MS-DOS starts, it carries out the commands in `CONFIG.SYS` before it does anything else.

```
rem
rem             CONFIG.SYS
rem             Copyright 1997 Insignia Solutions PLC. All rights reserved.
rem
FILES=30
BUFFERS=30
device=c:\dos\himem.sys /TESTMEM:OFF
device=c:\insignia\host.sys
device=c:\insignia\cdrom.sys
device=c:\insignia\aspidos.sys
device=c:\insignia\aspidisk.sys /d
REM device=c:\insignia\aspicd.sys /d:cdrom$$$ /norst
device=c:\dos\setver.exe
lastdrive=z
STACKS=9,256
```

AUTOEXEC.BAT

This is a file that MS-DOS runs immediately after carrying out the commands in `CONFIG.SYS`. It can contain any commands you want to be executed whenever you start up the system. You can also include statements in this file that tell MS-DOS where to look for specific commands.

```
@echo off
rem
rem              AUTOEXEC.BAT
rem              Copyright 1997 Insignia Solutions PLC. All rights reserved.
rem
path C:\windows;c:\insignia;c:\dos
path %path%;c:\insignia\softnode;c:\insignia\softnode\netbatch
path %path%;c:\novell
path %path%;c:\nwclient;c:\
if exist c:\windows\iexplore\mail\nul path %path%;c:\windows\iexplore\mail
set TEMP=C:\DOS
c:\insignia\fsadrive e: g: h:
call c:\insignia\usecd.bat
c:\insignia\mouse.com
mode com1:9600,n,8,1
prompt $p$g
ver
```

Editing configuration files

MS-DOS includes a simple screen editor which you can use to create, edit, and print plain text files. You can choose editing commands from menus, and edit text using the mouse. The MS-DOS editor is particularly useful for editing MS-DOS batch programs and files, such as AUTOEXEC.BAT and CONFIG.SYS.

To use the mouse with the MS-DOS editor
➤ Choose **Emulate PC Mouse** from the **Setup** menu.

To restore the normal Macintosh mouse at any time type ⌘M.

To run the MS-DOS editor
➤ Type the following command at the C:\> prompt:

EDIT *filename* ⏎

where *filename* is the name of the file you want to edit.

Alternatively, type EDIT ⏎ with no filename to create a new file.

For example, to edit the AUTOEXEC.BAT configuration file type:

EDIT AUTOEXEC.BAT ⏎

The file will then be displayed in the MS-DOS editor window, as shown below.
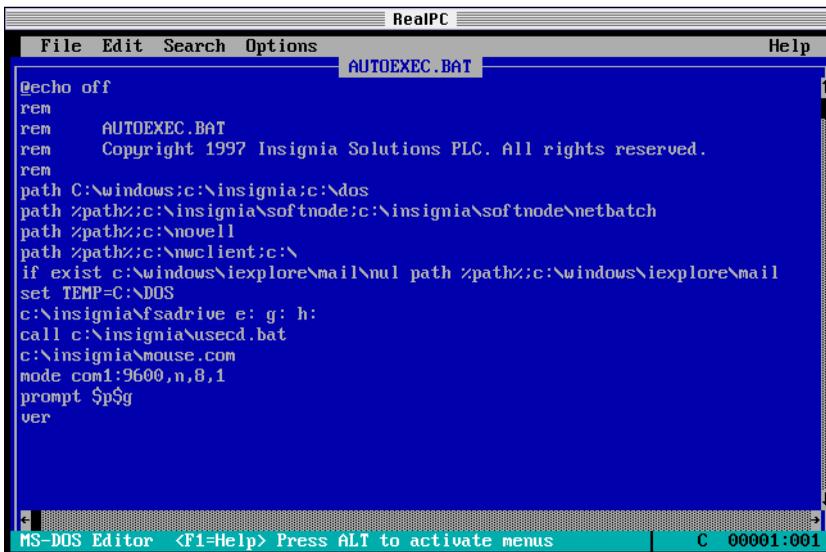
```
═════════════════════════ RealPC ═════════════════════════
  File  Edit  Search  Options                          Help
═══════════════════════ AUTOEXEC.BAT ═════════════════════
@echo off
rem
rem      AUTOEXEC.BAT
rem      Copyright 1997 Insignia Solutions PLC. All rights reserved.
rem
path C:\windows;c:\insignia;c:\dos
path %path%;c:\insignia\softnode;c:\insignia\softnode\netbatch
path %path%;c:\novell
path %path%;c:\nwclient;c:\
if exist c:\windows\iexplore\mail\nul path %path%;c:\windows\iexplore\mail
set TEMP=C:\DOS
c:\insignia\fsadrive e: g: h:
call c:\insignia\usecd.bat
c:\insignia\mouse.com
mode com1:9600,n,8,1
prompt $p$g
ver



MS-DOS Editor  <F1=Help> Press ALT to activate menus      C  00001:001
```

Editing configuration files Using MS-DOS

To edit the file

➤ Position the cursor using the cursor keys, or by moving the mouse and clicking.

➤ Type to insert text at the cursor.

➤ Drag to select text. Whatever you type will then replace the selected text, or you can delete it by pressing delete.

➤ Use the **Cut**, **Copy**, **Paste**, and **Clear** commands from the MS-DOS editor's **Edit** menu in exactly the same way as you would use the equivalent commands in Macintosh applications.

You will be prompted to save the file before exiting if you have made any changes to it.

➤ Click **Yes**, or press ⏎, to save the changes and exit from the MS-DOS editor.

To use the MS-DOS editor on a black and white Macintosh

For best results when using a monochrome Macintosh screen you can reconfigure the MS-DOS editor so that the cursor and selected items in the menus are more visible.

➤ Run the MS-DOS editor.

➤ Choose **Display** from the editor's **Options** menu.

➤ Use the tab and arrow keys to select a foreground color of white and a background color of black.

➤ Press ⏎ to use the options you have specified.

Using Windows 3.x

This chapter explains how to run Windows 3.x and use it to install and run Windows applications.

It includes a short tutorial to help you become familiar with using Windows.

Running Windows 3.x

Ensure that Windows 3.x is installed; refer to *Installing Windows 3.x*, page 15, for details.

To start Windows

➤ Type the following command at the `C:\>` prompt:

`WIN` ⏎

After the Windows welcome screen the Windows desktop will be displayed, as shown below.

A ✓ appears in the title bar when the Windows desktop is running at optimum performance; for more information refer to *Optimizing the performance of RealPC*, page 79.

To use the mouse

As you move the Macintosh mouse pointer onto the RealPC window it automatically changes to the Windows mouse pointer, so that you can switch freely between Windows and Macintosh applications.

To improve performance the Windows mouse pointer is slightly reduced in size.

➤ Choose **Emulate PC Mouse** from the **Setup** menu if you prefer to work with the full size mouse pointer.

Graphics performance will be reduced, and the ✓ will not be displayed in the title bar, when using the full size mouse pointer.

Right mouse button

To get the right mouse button of a PC mouse press keypad = or ⌘R (or Enter on PowerBooks).

To exit from Windows 3.x

➤ If necessary, double-click the **Program Manager** icon to display the **Program Manager** window.

Program
Manager

➤ Choose **Exit Windows…** from the Program Manager **File** menu.

The following dialog box appears:

➤ Choose **OK** to exit from Windows to the RealPC MS-DOS window.

For more information about the MS-DOS window refer to *Using MS-DOS*, page 81.

Windows 3.x basics

Windows 3.x is a graphical user interface for PCs. It gives you an easier way of moving around the MS-DOS structure of files and directories, and provides some extra facilities for managing the system.

If you are familiar with running applications on your Macintosh you should not experience too much difficulty using Windows. Many of the

techniques of using the mouse and resizing and moving windows are almost identical in both systems.

The following diagram gives a brief description of the most important components of Windows.

Program Manager is always active when you are working with Windows. You can use **Program Manager** to start other applications and organize applications into logical groups.

The applications in the **Control Panel** allow you to change the configuration of Windows. Any changes you make are stored in the Windows initialization file WIN.INI.

Print Manager allows you to define default printers, connect to printers on a network, change the configurations of printers, and manage the active printing of files.

Maximize button enlarges the window to fill the entire desktop.

Control menu box provides commands to manipulate or close the window.

Minimize button reduces the window to an icon on the desktop.

File Manager is a tool for managing files and directories in a graphical fashion. You can use **File Manager** to view all your files and directories, and copy, move, delete, and rename files.

MS-DOS Prompt lets you switch to MS-DOS, keeping your Windows session running.

Clipboard Viewer allows you to look at the contents of the Windows clipboard.

A group icon is a minimized group window, comparable to a closed folder in the Macintosh Finder. Group icons are usually located along the lower edge of the **Program Manager** window.

Tutorial

This tutorial is designed to help you become familiar with using RealPC by installing and running a typical Windows application, and printing from Windows.

It is based on the award-winning Windows program WinPost, which is supplied with your RealPC package. WinPost lets you create simple reminders which you can leave on your Windows desktop. It is a PC shareware application, so if you like it and decide to continue using it please send the author the registration fee, as described in its on-line manual.

1 Run Windows
➤ At the MS-DOS C:\> prompt type:

WIN ⏎

After the Windows welcome screen the Windows desktop will be displayed.

2 Run Setup
Most Windows applications are installed from the Windows Program Manager using a standard Windows setup procedure.

➤ Choose **Run**… from the Program Manager **File** menu:

File	
New...	
Open	Enter
Move...	F7
Copy...	F8
Delete	Del
Properties...	Alt+Enter
Run...	
Exit Windows...	

The **Run** dialog box appears.

The WinPost installer and its associated files are supplied in the C:\WNPST directory.

➤ Type:

C:\WNPST\SETUP

Run
Command Line:
C:\WNPST\SETUP
☐ Run Minimized
OK Cancel Browse... Help
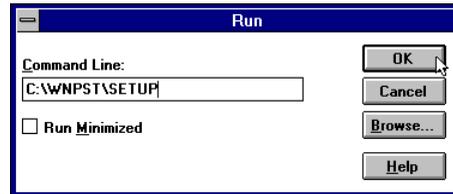
➤ Click **OK** to run the Setup program.

3 Specify where to install WinPost
This dialog box allows you to specify the directory into which WinPost should be installed:

WinPost Installation
Setup will install this application into the following directory, which it will create on your hard disk.
If you want to install the application in a different directory and/or drive. Type the name of the directory below:
Copy to: C:\WINPOST
Ok Cancel

➤ Click **OK** to install in the WINPOST directory on your RealPC hard disk file.

The files are then copied to the directory you specified.

4 Finish the installation

Finally, this dialog box informs you when the installation is complete:
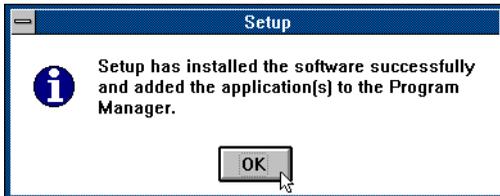
➤ Click **OK** to return to the Program Manager.

The installation creates a new WinPost group in the Program Manager, containing three icons:
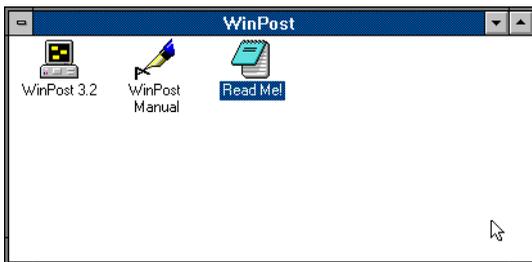
- **WinPost 3.2** is the WinPost application.

- **WinPost Manual** provides documentation for WinPost. Double-click the icon to display the document so that you can read it or print it out.

- **Read Me!** is a document which gives additional information about WinPost.

For more information about the components of Windows you may want to read *Windows 3.x basics*, page 102.

To run WinPost

➤ Double-click the **WinPost 3.2** icon.

The first time you run WinPost, a shareware registration notice is displayed informing you that you can evaluate WinPost for 21 days.

➤ Click **OK** to dismiss the notice.

The WinPost program is now running and its icon is displayed at the bottom of the RealPC desktop.

To create a new note

➤ Double-click the **WinPost** icon on the Windows desktop.

An empty **Note** window appears.
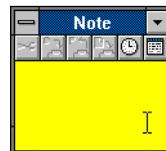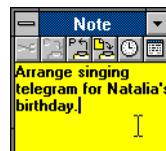
➤ Type in the information you want to remember.

The buttons along the top of the note provide useful functions. For example, the first three are cut, copy, and paste just like the equivalent commands in Macintosh programs.

To move the note Window

➤ Drag the **Note** window by its title bar.

To display the WinPost menu

➤ Click the **WinPost** icon on the Windows desktop.

Some of the commands on the WinPost menu are described below.

For more information about all the commands refer to the **WinPost Manual** file.

To print from a Windows application

You can print from Windows applications to the printer available to your Macintosh, as set in your Macintosh Chooser.

To illustrate printing from Windows try printing the note you have created.

Before printing you need to ensure that RealPC is set up for the Macintosh printer you want to use. For more information refer to *Printing from Windows 3.x*, page 109.

To print a note

➤ Click the control menu button, in the top left corner of the **Note** window, to display the control menu.

➤ Choose **Print this note**… from the control menu.
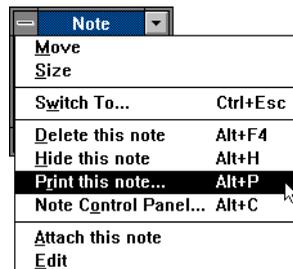
Alternatively, you can use the key shortcut Alt P (using the Macintosh option key as Alt).

➤ When the **Print** dialog box appears click **OK** to print the note.

A few seconds after Windows has finished printing, the printouts will automatically be sent to your Macintosh printer.

Getting help on Windows 3.x

Windows 3.x comes with a comprehensive on-line help system. It is a convenient way of looking up information about a task you are performing, a feature you want to know more about, or a command you want to use.

To use Windows Help
Windows Help is available whenever you see a **Help** command button or a **Help** menu in the menu bar.

➤ Select the command you want from the **Help** menu.

The commands are explained in the following table:

Command	What it displays
Contents	An alphabetical list of all Help topics available for the active application.
Search For Help On	A dialog box for locating information about a specific topic.
How To Use Help	Information on using Windows Help.
About (application)	Information about the active application (registration details, version number, and so on).

To run the Windows Tutorial
➤ Choose **Windows Tutorial** from the Program Manager's **Help** menu.

To do the Windows tutorial you will need to have a desktop of at least 640 x 480, otherwise you will be informed that you need at least a VGA display.

For more information
For more information about using Windows refer to any good book on Windows, such as *Windows for Dummies* from IDG books or the *Microsoft Windows User's Guide and User's Reference*.

Copying, pasting, and using drag and drop in Windows 3.x

RealPC includes an Insignia utility called SmartCopy, which transfers text and graphics between the Macintosh and Windows clipboards, so that you can copy or cut and paste freely between Macintosh and Windows applications.

SmartCopy

When you move the mouse pointer out of the RealPC window the **SmartCopy** icon changes to show whether text or graphics is ready to paste into a Macintosh application:

SmartCopy

When you move the mouse pointer into the RealPC window the **SmartCopy** icon changes to show whether text or graphics is ready to paste from a Macintosh application:

SmartCopy

To copy text or graphics from Windows to the Macintosh

➤ Select the text or graphics you want to copy from the Windows application.

➤ Choose **Copy** from the Windows application's **Edit** menu:
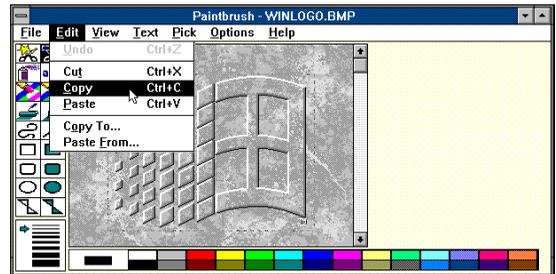
The text or graphics is put onto the Windows clipboard.

➤ Switch to the Macintosh application you want to use.

SmartCopy transfers the text or graphics to Macintosh format on the clipboard.

➤ Choose **Paste** from the Macintosh application's **Edit** menu to paste in the text or graphics you copied.

To copy text or graphics from the Macintosh to Windows

➤ Select the text or graphics you want to copy.

➤ Choose **Copy** from the Macintosh application's **Edit** menu.

➤ Switch to RealPC.

SmartCopy translates the text or graphics to Windows format on the Windows clipboard, and you can use the **Clipboard Viewer** to view it.

➤ Choose **Paste** from the **Edit** menu of the Windows application you want to use, to paste the text or graphics in.

To drag text from the Macintosh to Windows

➤ Select the text you want to copy.

➤ Drag the text and drop it onto a Windows document in RealPC.

The text will be typed into the document at the current cursor position.

To copy graphics from the Windows desktop to the Macintosh

➤ Hold down the ⌘ key.

The Windows mouse pointer changes to the Macintosh mouse pointer.

➤ Press the mouse button, and drag to draw a rectangle enclosing the section of the Windows desktop you want to copy.

➤ Choose **Copy** from the RealPC **Edit** menu.

The graphics will be put on the Macintosh Clipboard and you can use **Show Clipboard** on the Macintosh **Edit** menu to display it.

To drag graphics from the Windows desktop to the Macintosh

➤ Hold down the ⌘ key.

The Windows mouse pointer changes to the Macintosh mouse pointer.

➤ Press the mouse button, and drag to draw a rectangle enclosing the section of the Windows desktop you want to copy.

➤ Drag the selected area to an open document in a Macintosh application that supports drag and drop.

If you drag to a Finder window the graphic is saved as a picture clipping file:

picture clipping

Printing from Windows 3.x

RealPC allows you to print to any printer connected to your Macintosh, and take full advantage of all of its features, including color.

RealPC provides an Insignia Printer Driver, which allows you to print from Windows applications to any Macintosh printer.

If you have a PostScript printer you can get improved performance and quality using the RealPC **PostScript** option.

RealPC also provides an **Epson LQ-2500** option, which emulates a dot-matrix printer on any Macintosh printer, if you want fast draft printing.

RealPC also provides a **Direct Printing** option, to allow you to print directly to a PC printer using an appropriate Macintosh printer driver selected in the Chooser.

The options on the **Printouts** submenu on the **File** menu allow you to specify when printing from your Windows program is sent to the printer.
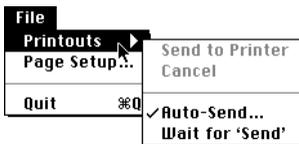
Auto-Send… specifies that printing is automatically sent to the Macintosh printer; this is the default setting.

Wait for 'Send' specifies that output should not be sent until you select **Send to Printer**.

To set up printing to any Macintosh printer

➤ Select the printer connected to your Macintosh or to your network in the Macintosh Chooser.

➤ Double-click the **Control Panel** icon in the Windows **Main** program group.

➤ Double-click the **Printers** control panel icon to display the **Printers** dialog box:
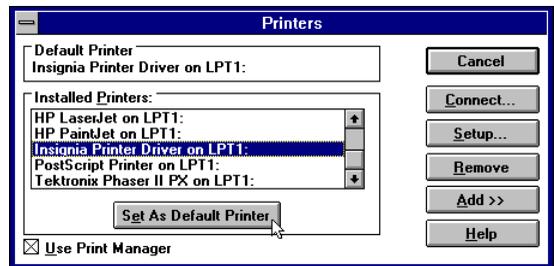
The currently-selected printer is shown in the **Default Printer** box at the top of the dialog box.

➤ Check that this is set to **Insignia Printer Driver on LPT1:**.

➤ Click **Cancel** to close the dialog box.

The Insignia Printer Driver does not support Windows shared printers.

To set up printing to a
PostScript printer

➤ Select the PostScript printer connected to
your Macintosh or to your network in the
Macintosh Chooser.

➤ Choose **RealPC Setup** from the **Setup** menu
and click the **Printer Port** button to display
the currently-selected printer support:
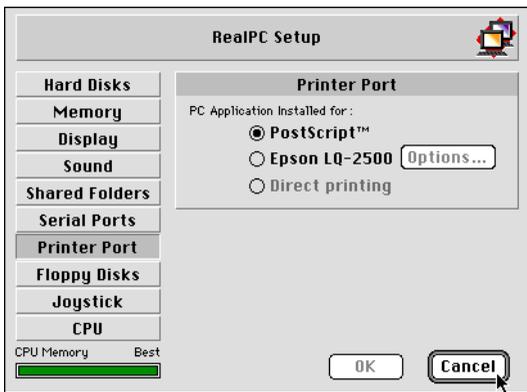
➤ If necessary, select **PostScript** and choose
OK.

➤ Double-click the **Control Panel** icon in the
Windows **Main** program group.

➤ Double-click the **Printers** control panel icon
to display the **Printers** dialog box:
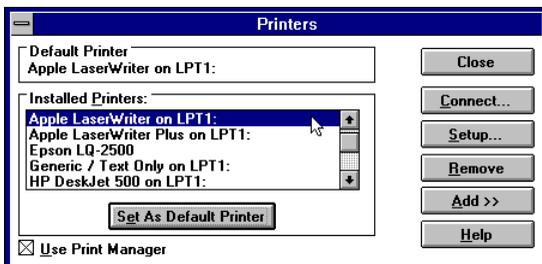
The currently-selected printer is shown in the
Default Printer box.

➤ Select **Apple LaserWriter on LPT1:** and
click **Set As Default Printer**.

➤ Click **Close** to close the dialog box.

To set up printing using Epson
LQ-2500 emulation

➤ Choose **RealPC Setup** from the **Setup** menu
and click the **Printer Port** button to display
the currently-selected printer support:
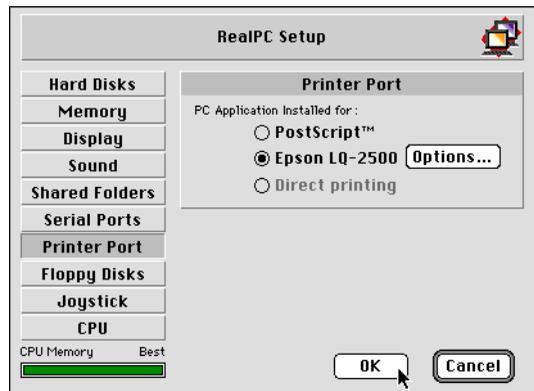
➤ Select **Epson LQ-2500** and choose **OK**.

➤ Double-click the **Control Panel** icon in the
Windows **Main** program group.

➤ Double-click the **Printers** control panel icon
to display the **Printers** dialog box.

➤ Select **Epson LQ-2500 on LPT1:** and click
   Set As Default Printer.

```
┌─────────────────── Printers ───────────────────┐
│ ┌─Default Printer──────────────────┐  ┌───────┐ │
│ │ Epson LQ-2500 on LPT1:           │  │ Close │ │
│ └──────────────────────────────────┘  └───────┘ │
│ ┌─Installed Printers:──────────────┐  ┌────────┐ │
│ │ Apple LaserWriter on LPT1:     ▲ │  │Connect.│ │
│ │ Apple LaserWriter Plus on LPT1:│  └────────┘ │
│ │ Epson LQ-2500 on LPT1:          │  ┌────────┐ │
│ │ Generic / Text Only on LPT1:    │  │ Setup. │ │
│ │ HP DeskJet 500 on LPT1:       ▼ │  └────────┘ │
│ └──────────────────────────────────┘  ┌────────┐ │
│                                        │Remove  │ │
│       ┌─────────────────────────┐      └────────┘ │
│       │ Set As Default Printer  │      ┌────────┐ │
│       └─────────────────────────┘      │ Add >> │ │
│                                        └────────┘ │
│ ☒ Use Print Manager                    ┌────────┐ │
│                                        │ Help   │ │
│                                        └────────┘ │
└──────────────────────────────────────────────────┘
```
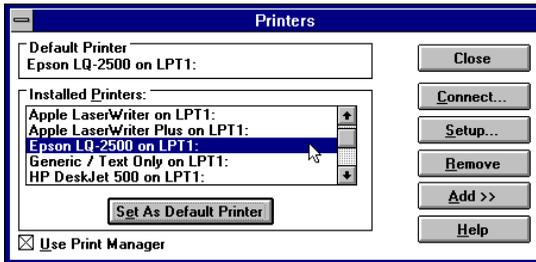
➤ Click **Close** to close the dialog box.

To set up direct printing to a PC printer

Macintosh printer drivers are available for a
wide range of PC printers from Infowave
Wireless Messaging Inc. They can also supply a
cable to connect a PC printer to a Macintosh.
For more information contact their Web site at:

`http://www.gdt.com`

➤ Select the appropriate printer driver in your
   Macintosh Chooser.

➤ Choose **RealPC Setup**… from the **Setup**
   menu and click the **Printer Port** button to
   display the currently-selected printer
   support:

```
┌──────────────────── RealPC Setup ────────────────┐
│                                                   │
│ ┌────────────┐  ┌──────── Printer Port ────────┐  │
│ │ Hard Disks │  │ PC Application Installed for: │  │
│ ├────────────┤  │   ○ PostScript™              │  │
│ │  Memory    │  │   ○ Epson LQ-2500 [Options…] │  │
│ ├────────────┤  │   ● Direct printing          │  │
│ │  Display   │  │                              │  │
│ ├────────────┤  └──────────────────────────────┘  │
│ │  Sound     │                                    │
│ ├────────────┤                                    │
│ │Shared Folders│                                  │
│ ├────────────┤                                    │
│ │Serial Ports│                                    │
│ ├────────────┤                                    │
│ │Printer Port│                                    │
│ ├────────────┤                                    │
│ │Floppy Disks│                                    │
│ ├────────────┤                                    │
│ │ Joystick   │                                    │
│ ├────────────┤                                    │
│ │   CPU      │                                    │
│ └────────────┘                                    │
│ CPU Memory    Best                                │
│ ▓▓▓▓▓▓▓▓▓▓▓▓▓          ┌────┐  ┌────────┐          │
│                       │ OK │  │ Cancel │          │
│                       └────┘  └────────┘          │
└───────────────────────────────────────────────────┘
```
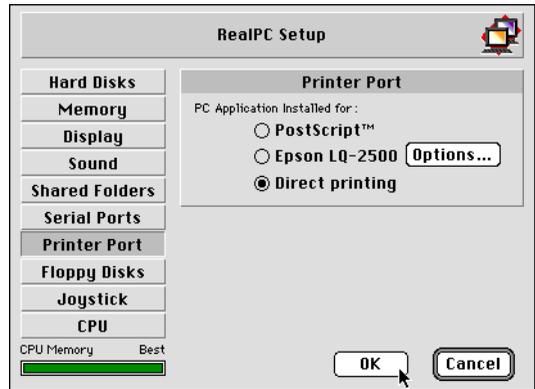
➤ Select **Direct Printing** and choose **OK**.

➤ Double-click the **Control Panel** icon in the
   Windows **Main** program group.

➤ Double-click the **Printers** control panel icon
   to display the **Printers** dialog box.

➤ Select an appropriate printer driver for your
   PC printer, and click **Set As Default
   Printer**.

➤ Click **Close** to close the dialog box.

To print from Windows 3.x

➤ Print from the Windows application;
   typically you do this by choosing **Print**…
   from the **File** menu.

The application will first print to the RealPC
printing buffer. The printing information will
then be sent to the Macintosh printer. At this
point the Print dialog box for the Macintosh
printer will be displayed.

➤ Click **Print** to send the print job to the
   printer.

Playing sound in Windows 3.x

RealPC emulates Sound Blaster and Windows sound, allowing you to play Windows waveform or MIDI files on your Macintosh. These are identified with `.WAV` and `.MID` extensions, respectively.

RealPC also supports ADPCM decompression, to allow ADPCM sound files to be played in RealPC.

You can choose an interesting sound for each of the events that can occur in Windows using the **Sound** control panel.

To use Windows sound you need to have **Windows Sound Driver** or **Sound Blaster** checked in the **Sound** panel of the **RealPC Setup** dialog box; refer to *Setting up sound*, page 61.

To adjust the volume and balance of RealPC sound output you should use the controls in the **Macintosh Sound** control panel.

To set up Windows 3.x to play MIDI files

To play MIDI files using the Macintosh sound system you need to have the **Midi Output** pop-up menu set to **QuickTime** in the **Sound** panel of the **RealPC Setup** dialog box, and you need to have the Macintosh **QuickTime** and **QuickTime Musical Instruments** extensions installed.

To play a sound or MIDI file from Windows 3.x

➤ Open the **Accessories** program group window by double-clicking the **Accessories** icon in the Program Manager:

Accessories

➤ Run the Media Player, by double-clicking the **Media Player** icon in the **Accessories** window:

Media Player

The **Media Player** window is displayed.

➤ Choose **Open…** from the Media Player **File** menu, and select a waveform file, such as **chord.wav**, or a MIDI file, such as **canyon.mid**:
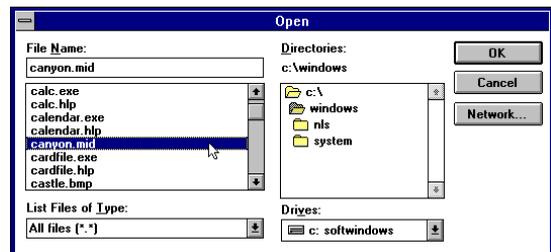
➤ Click **OK** to load the waveform.

➤ Click the Media Player play button to play the waveform:

Media Player - CHORD.WAV (stopped)

File   Device   Scale   Help

1

► | II | ■ | ▲ | Scale: Tracks

➤ Choose **Exit** from the **File** menu to exit from Media Player.

To set sounds for Windows 3.x events

➤ Open the **Control Panels** window, by double-clicking the **Control Panels** icon in the Main program group.

➤ Double-click the **Sound** icon:

Sound

The **Sound** control panel is displayed.

➤ Select the Windows event you want to identify with a sound.

The **Files** list shows the current waveform file assigned to that event, or **<none>** if no sound is played.

Sound

Events: Files: OK
Asterisk   <none>   Cancel
Critical Stop   chimes.wav
Default Beep   chord.wav   Test
Exclamation   ding.wav
Question   [..]   Help
Windows Exit   [system]
Windows Start   [-a-]
                           [-c-]

☒ Enable System Sounds   c:\windows

➤ Select the waveform file you want to use.

➤ Click **Test** to play the sound.

➤ When you have set up the sound you want to play for each event click **OK** to exit from the control panel.
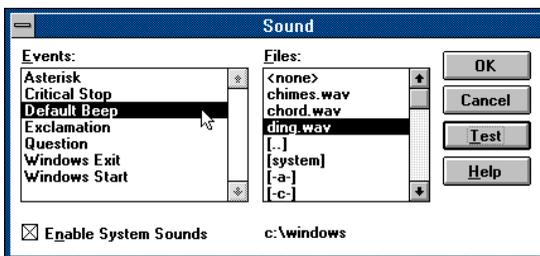
Installing and running Windows 3.x applications

Most Windows applications are installed using the standard Windows setup procedure. Provided you have a CD-ROM or standard 3.5-inch disks for your Windows application, the procedure is similar to installing software on your Macintosh.

To install a Windows application

➤ Insert the application's installation CD-ROM or floppy disk into the Macintosh drive.

➤ Choose **Run**… from the Program Manager **File** menu.

➤ Follow the application's installation instructions. For example, you may be instructed to type A:SETUP.
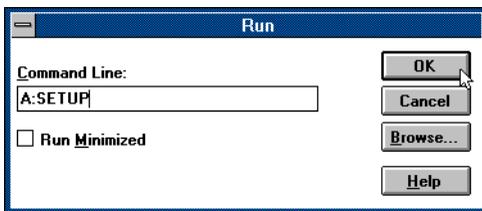
➤ Click **OK** to start the installation.

As the installation proceeds, dialog boxes similar to the one shown below will prompt you for information needed for the installation.

To run a Windows application

➤ Double-click the application icon in the appropriate program group.

For example, to run Solitaire, supplied with Windows, proceed as follows:

➤ Double-click the **Games** program group icon to open it.

➤ Double-click the **Solitaire** icon to run Solitaire.

To run a Windows 3.x application from the Macintosh

RealPC's EasyLaunch feature lets you run a PC application simply by double-clicking an icon or your Macintosh.

➤ Set up the E: drive as a Macintosh shared folder.

For more information refer to *Sharing PC files between RealPC and the Macintosh*, page 49.

➤ Create a batch file to run the application.

➤ Copy the batch file to the E: drive.

You can now automatically run RealPC, and then run the Windows application, by double-clicking the icon.

Using Windows 95
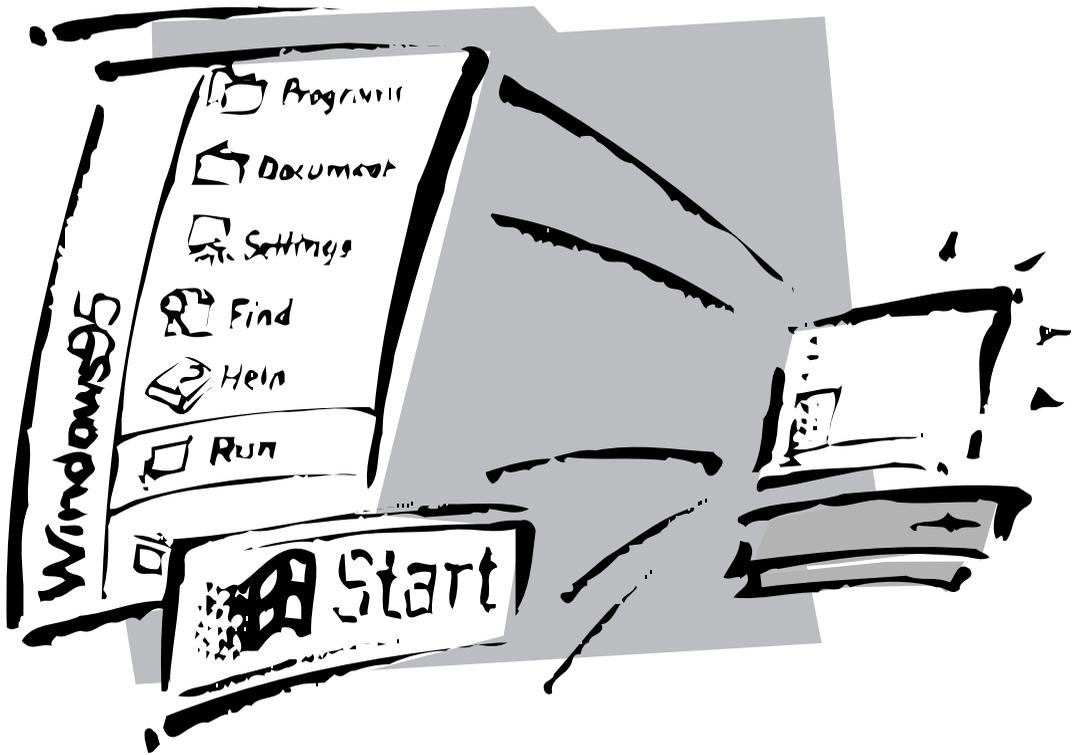
This chapter explains how to run Windows 95, and gives information about working with Windows 95 and running Windows applications.

It includes a short tutorial to introduce you to the procedures for working with Windows 95.

Running Windows 95

Ensure that Windows 95 is installed; refer to *Installing Windows 95*, page 19, for details.

Windows 95 starts in seconds with TurboStart, and you can resume your work where you left off when you quit.

The first time you run RealPC the Windows 95 desktop will be displayed as shown below.

A ✓ appears in the title bar when the Windows 95 desktop is running at optimum performance; for more information refer to *Optimizing the performance of RealPC*, page 79.

To use the mouse

As you move the Macintosh mouse pointer onto the RealPC window it automatically changes to the Windows mouse pointer, so that you can switch freely between Windows and Macintosh applications.

To improve performance the Windows mouse pointer is slightly reduced in size.

➤ Choose **Emulate PC Mouse** from the **Setup** menu if you prefer to work with the full size mouse pointer.

Graphics performance will be reduced, and the ✓ will not be displayed in the title bar, when using the full size mouse pointer.

Right mouse button

To get the right mouse button of a PC mouse press keypad = or ⌘R (or Enter on PowerBooks).

To exit from Windows 95

The recommended way to quit from Windows 95 is to use **TurboStart**; refer to *To quit from Windows 95*, page 30.

However, if you specifically want to exit from Windows 95 proceed as follows:

➤ Click the **Start** button, then click **Shut Down**….

This dialog box lets you choose how to shut down:

➤ Click **Yes** to choose the first option and shut down Windows 95.

RealPC will then automatically quit.

Windows 95 basics

The following diagram gives a brief introduction to the most important components of Windows 95. It also gives a summary of the options available from the **Start** menu.

Double-click the **My Computer** icon to show the drives attached to the PC.

My Briefcase is used to keep multiple versions of a file in sync.

Online Services contains demos from Internet service providers.

Minimize button reduces the window to a button on the taskbar.

Maximize button enlarges the window to fill the entire desktop.

Network Neighborhood shows the network resources available.

Inbox is your in-tray for sending and receiving electronic mail.

The **Recycle Bin** stores deleted files like the Macintosh **Trash**.

The Internet lets you access the Internet and World Wide Web.

Click the **Start** button to perform an action from the **Start** menu; see below.
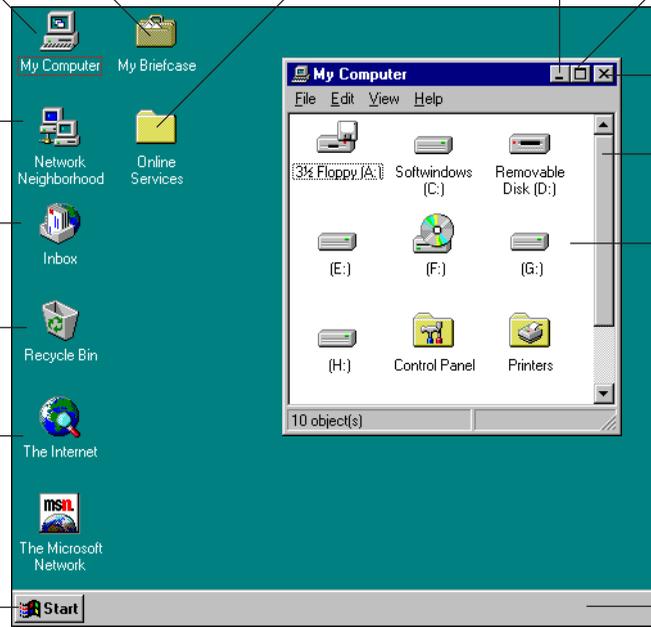
Close button closes the window.

Scroll bar.

The **My Computer** window shows an icon for each drive attached to the PC. Double-click an icon to show the files on the drive.

The **Taskbar** shows a button for each open window; click a button to switch to the corresponding window.

Programs displays the programs on your system. It also gives you access to the MS-DOS prompt.

Settings lets you change system settings.

Help gives help on Windows 95.

Click **Shut Down…** to shut down Windows 95, or exit to MS-DOS.
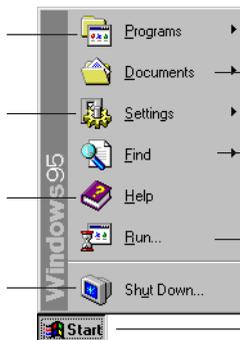
Documents displays a list of previously opened documents.

Find helps you find a file or folder.

Click **Run…** to run an MS-DOS or Windows program, or execute a command.

Click the **Start** button to display a menu of commands for using Windows 95.

Tutorial

This Tutorial is designed to help you become familiar with using RealPC by installing and running a typical Windows application, and printing from Windows.

It is based on the award-winning Windows program WinPost, which is supplied with your RealPC package. WinPost lets you create simple reminders which you can leave on your Windows desktop. It is a PC shareware application, so if you like it and decide to continue using it please send the author the registration fee, as described in its online manual.

1 Run Setup

Most Windows 95 applications are installed by running a standard Windows setup procedure.

The installer and its associated files are supplied in the `C:\WNPST` folder.

➤ Click the **Start** button on the taskbar, and then click **Run**….

The **Run** dialog box appears.

➤ Type:

`C:\WNPST\SETUP`

➤ Click **OK** to run the setup program.

2 Specify where to install WinPost

This dialog box allows you to specify the directory into which WinPost should be installed:

➤ Click **OK** to install in the `WINPOST` directory on your RealPC hard disk file.

The files are then copied to the directory you specified.

3 Finish the installation

This dialog box informs you when the installation is complete:
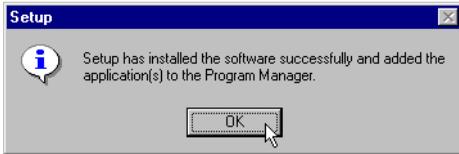
➤ Click **OK** to return to the Windows desktop.

The installation creates a new WinPost folder containing the following shortcuts:

These are like Macintosh aliases to the actual files.

- **WinPost 3.2** is a shortcut to the WinPost application.

- **WinPost Manual** is a shortcut to documentation for WinPost. Double-click the icon to display the document so that you can read it or print it out.

- **Read Me!** is a shortcut to additional information about WinPost.

When you install a Windows application the installer usually creates shortcuts for the application, and for any other programs or documents you might need to use with it. Often these are put in a separate folder.

For more information about the components of Windows 95 you may want to read *Windows 95 basics*, page 118.

To run WinPost

➤ Double-click the **WinPost 3.2** shortcut icon.

WinPost 3.2

The first time you run WinPost, a shareware registration notice is displayed informing you that you can evaluate WinPost for 21 days.

➤ Click **OK** to dismiss the notice.

The WinPost program is now running and its icon is displayed in the taskbar at the bottom of the Windows desktop:

To display the WinPost menu

➤ Point to the WinPost icon in the taskbar and press keypad = or ⏎R (or Enter on PowerBooks).

This is equivalent to clicking the right PC mouse button.

A pop-up menu appears above the taskbar.

Some of the commands on the WinPost menu are described opposite. For more information about all the commands refer to the **WinPost Manual** file.

To create a new note

➤ Display the WinPost menu, as described in the previous section.

➤ Choose **Default** from the **Create a note** submenu:
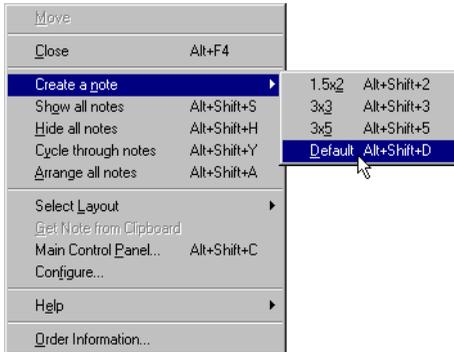
An empty **Note** window appears.
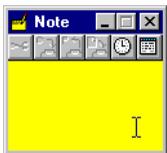
➤ Type in the information you want to remember.

The buttons along the top of the note provide useful functions. For example, the first three are cut, copy, and paste just like the equivalent commands in Macintosh programs.

To print from a Windows application

You can print from Windows applications to the printer available to your Macintosh, as set in your Macintosh Chooser.

To illustrate printing from Windows try printing the note you have created.

Before printing you need to ensure that RealPC is set up for the Macintosh printer you want to use. For more information refer to *Printing from Windows 95*, page 127.

To print a note

➤ Click the control menu button, in the top left corner of the **Note** window, to display the control menu.

➤ Choose **Print this note**….
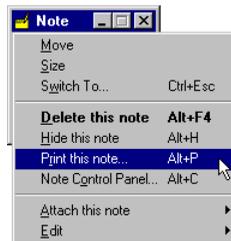
Alternatively, you can use the key shortcut Alt P. Note that you should use the Macintosh option key as Alt.

➤ When the **Print** dialog box appears click **OK** to print the note.

A few seconds after Windows has finished printing, the printouts will automatically be sent to your Macintosh printer.

Getting help on Windows 95

Windows 95 includes a comprehensive help system, with answers to most problems you are likely to have.

To display Windows Help
➤ Click the **Start** button, then click Help.

The Windows Help window appears showing the list of help topics.

To find help from the contents
➤ Click the **Contents** tab to show the help topics grouped by subject.

➤ Click a book icon to display the contents of that book.

➤ Click a help topic icon and then click **Display** to display help on that topic:
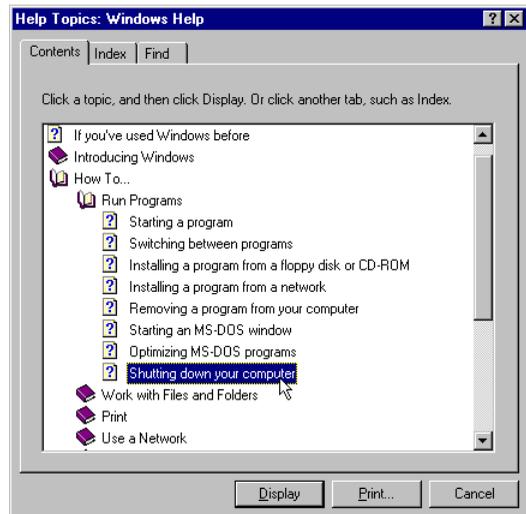
The Windows help topic will be displayed:

To find help from the index

➤ Click the **Index** tab to show an alphabetical list of topics.

➤ Click a help topic and then click **Display** to display help on that topic.

To find help topics containing a word or phrase

➤ Click the **Find** tab, and then type in the word or phrase you want to find.

A list of matching topics will be displayed.

➤ Click a help topic and then click **Display** to display help on that topic.

To get help on an item on the screen

➤ Point to the item and press the = key on the numeric keypad.

This is equivalent to clicking the right PC mouse button.

A **What's This?** box appears.

➤ Click **What's This?** to display an explanation of the item.

Copying, pasting, and using drag and drop in Windows 95

RealPC includes an Insignia utility called SmartCopy, which transfers text and graphics between the Macintosh and Windows clipboards, so that you can copy or cut and paste freely between Macintosh and Windows applications.

When SmartCopy is running its icon appears at the right end of the taskbar:

When you click the mouse button with the pointer outside the RealPC window the **SmartCopy** icon changes to show whether text or graphics is ready to paste into a Macintosh application:

When you click the mouse button with the pointer inside the RealPC window the **SmartCopy** icon changes to show whether text or graphics is ready to paste from a Macintosh application:

To copy text or graphics from Windows 95 to the Macintosh

➤ Select the text or graphics you want to copy from the Windows application.

➤ Choose **Copy** from the Windows application's **Edit** menu:

The text or graphics is put onto the Windows clipboard.

➤ Switch to the Macintosh application you want to use.

SmartCopy translates the text or graphics to Macintosh format on the clipboard.

➤ Choose **Paste** from the Macintosh application's **Edit** menu to paste in the text or graphics you copied.

To copy text or graphics from the Macintosh to Windows 95

➤ Select the text or graphics you want to copy.

➤ Choose **Copy** from the Macintosh application's **Edit** menu.

➤ Switch to RealPC.

SmartCopy translates the text or graphics to Windows format on the Windows clipboard, and you can use the **Clipboard Viewer** to view it.

➤ Choose **Paste** from the **Edit** menu of the Windows application you want to use, to paste the text or graphics in.

To drag text from the Macintosh to Windows 95

➤ Select the text you want to copy.

➤ Drag the text and drop it onto a Windows document in RealPC.

The text will be typed into the document at the current cursor position.

To copy graphics from the Windows 95 desktop to the Macintosh

➤ Hold down the ⌘ key.

The Windows mouse pointer changes to the Macintosh mouse pointer.

➤ Press the mouse button, and drag to draw a rectangle enclosing the section of the Windows desktop you want to copy:

➤ Choose **Copy** from the RealPC **Edit** menu.

The graphics will be put on the Macintosh
Clipboard and you can use **Show Clipboard**
on the Macintosh **Edit** menu to display it:

To drag graphics from the Windows 95 desktop to the Macintosh

➤ Hold down the ⌘ key.

The Windows mouse pointer changes to the
Macintosh mouse pointer.

➤ Press the mouse button, and drag to draw a
rectangle enclosing the section of the
Windows desktop you want to copy.

➤ Drag the selected area into the open window
of a Macintosh application that supports
drag and drop.

If you drag into a Finder window the graphic
will be saved as a Picture Clipping file:

picture clipping

Printing from Windows 95

RealPC allows you to print to any printer connected to your Macintosh, and take full advantage of all of its features, including color.

By default RealPC is set up to use the Insignia Printer Driver, which allows you to print from Windows applications to any Macintosh printer.

If you have a PostScript printer you can get improved performance and quality using the RealPC **PostScript** option.

The **Epson LQ-2500** option emulates a dot-matrix printer on any Macintosh printer, if you want fast draft printing.

The **Direct Printing** option allows you to print directly to a PC printer using an appropriate Macintosh printer driver selected in the Chooser.

The options on the **Printouts** submenu on the RealPC **File** menu allow you to specify when printing from your Windows program is sent to the printer.
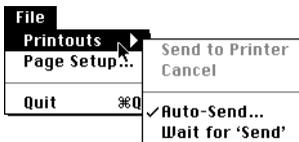
Auto-Send… specifies that printing is automatically sent to the Macintosh printer; this is the default setting.

Wait for 'Send' specifies that output should not be sent until you select **Send to Printer**.

To set up printing to any Macintosh printer

➤ Select the printer connected to your Macintosh or to your network in the Macintosh Chooser.

➤ In Windows 95 click **Start**, then click **Settings** and **Printers**.

The available printers are shown in the **Printers** folder:
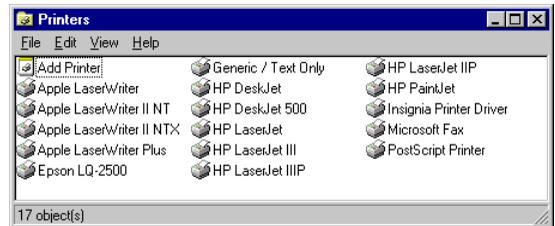
➤ Select **Insignia Printer Driver** and choose **Set As Default** from the **File** menu.

The Insignia Printer Driver does not support Windows shared printers.

To set up printing to a PostScript printer

➤ Select the PostScript printer connected to your Macintosh or to your network in the Macintosh Chooser.

➤ Choose **RealPC Setup** from the **Setup** menu and click the **Printer Port** button to display the currently-selected printer support:
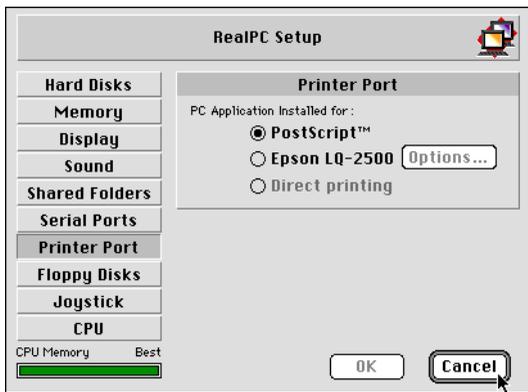
➤ If necessary, select **PostScript** and choose **OK**.

➤ In Windows 95 click **Start**, then click **Settings** and **Printers** to display the **Printers** folder.

➤ Select **Apple LaserWriter**, and choose **Set As Default** from the **File** menu.

To set up printing using Epson LQ-2500 emulation

➤ Choose **RealPC Setup** from the **Setup** menu and click the **Printer Port** button to display the currently-selected printer support:
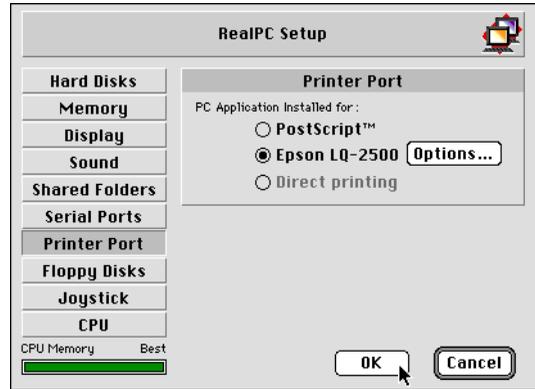
➤ Select **Epson LQ-2500** and choose **OK**.

➤ In Windows 95 click **Start**, then click **Settings** and **Printers** to display the **Printers** folder.

➤ Select **Epson LQ-2500**, and choose **Set As Default** from the **File** menu.

To set up printing to a PC printer

Macintosh printer drivers are available for a wide range of PC printers from Infowave Wireless Messaging Inc. They can also supply a cable to connect a PC printer to a Macintosh. For more information contact their Web site at:

`http://www.gdt.com`

➤ Select the appropriate printer driver in your Macintosh chooser.

➤ Choose **RealPC Setup** from the **Setup** menu and click the **Printer Port** button to display the currently-selected printer support:
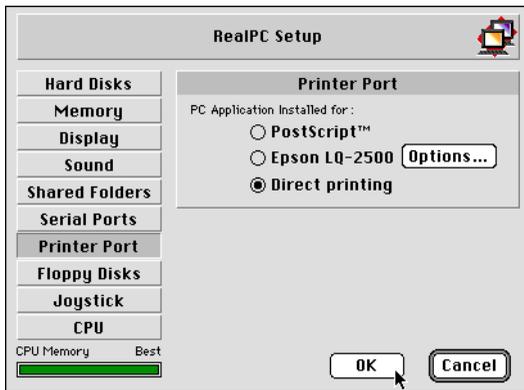
➤ Select **Direct Printing** and choose **OK**.

➤ Click **Start**, then click **Settings** and **Printers** to display the **Printers** folder.

➤ Select an appropriate printer driver for your PC printer, and choose **Set As Default** from the **File** menu.

To print from Windows 95

➤ Print from the Windows application; typically you do this by choosing **Print**… from the **File** menu.

The application will first print to the RealPC printing buffer. The printing information will then be sent to the Macintosh printer. At this point the **Print** dialog box for the Macintosh printer will be displayed.

➤ Click **Print** to send the print job to the printer.

Playing sound in Windows 95

RealPC emulates Sound Blaster and Windows sound, allowing you to play Windows waveform or MIDI files on your Macintosh. These are identified with `.WAV` and `.MID` extensions, respectively.

RealPC also supports ADPCM decompression, to allow ADPCM sound files to be played in RealPC.

You can choose an interesting sound for each of the events that can occur in Windows using the **Sound** control panel.

To use Windows sound you need to have **Windows Sound Driver** or **Sound Blaster** checked in the **Sound** panel of the **RealPC Setup** dialog box; refer to *Setting up sound*, page 61.

To adjust the volume and balance of RealPC sound output you should use the controls in the **Macintosh Sound** control panel.

To set up Windows 95 to play MIDI files

To play MIDI files using the Macintosh sound system you need to have the **Midi Output** pop-up menu set to **QuickTime** in the **Sound** panel of the **RealPC Setup** dialog box, and you need to have the Macintosh **QuickTime** and **QuickTime Musical Instruments** extensions installed. For details refer to *Other files on the installation CD*, page 25.

To play a sound or MIDI file from Windows 95

➤ Click the **Start** button and click **Programs**, **Accessories**, **Multimedia**, and **Media Player**.
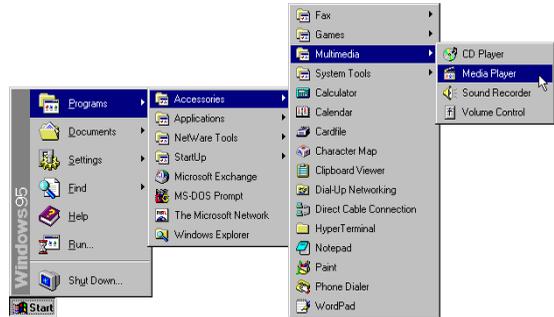
The **Media Player** window is displayed.

➤ Choose **Open…** from the Media Player **File** menu, and select a waveform file, such as **Chord**, or a MIDI file, such as **Beethoven's Fur Elise**:
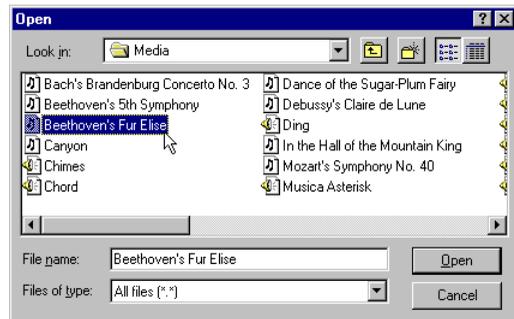
➤ Click **Open** to load the file.

➤ Click the Media Player play button to play the file:

```
Beethoven's Fur Elise - Media Player (playing)    _ □ ×
File  Edit  Device  Scale  Help

0:00  0:15  0:30  0:45  1:00  1:15  1:30  1:45  2:00  2:15     2:35
| II |  ■ | ▲ |  |◄◄| ◄◄ | ►► |►►|  | ▲ | ▲ |  | 00:19 (min:sec) |
```

➤ Choose **Exit** from the **File** menu to exit from Media Player.

To set sounds for Windows 95 events

➤ Open the **Control Panel** folder, by choosing **Control Panel** from the **Settings** submenu on the **Start** menu.

➤ Double-click the **Sounds** icon:

Sounds

The **Sound Properties** dialog box is displayed.

➤ Select the Windows event you want to identify with a sound.

The **Name** drop-down list box shows the current waveform file assigned to that event, or **(none)** if no sound is played.

```
Sounds Properties                                  ? ×
 Sounds

  Events:
  ┌────────────────────────────────────────┐
  │ ▢ Windows                              ▲ │
  │   ◄ Asterisk                             │
  │      Close program                       │
  │   ◄ Critical Stop                        │
  │   ◄ Default Beep                         │
  │   ◄ Default sounds                       │
  │   ◄ Exclamation                          │
  │   ◄ Exit Windows                       ▼ │
  └────────────────────────────────────────┘

  ─ Sound ────────────────────────────────────
  Name:                         Preview:
  ┌─────────────────────────┐
  │ Ding                   ▼ │     ◄╡     ► ■
  └─────────────────────────┘
  | Browse... |  | Details... |

  ─ Schemes ──────────────────────────────────
  ┌─────────────────────────────────────────┐
  │                                        ▼ │
  └─────────────────────────────────────────┘
                        | Save As... |  | Delete |

            |   OK   |   | Cancel |   | Apply |
```
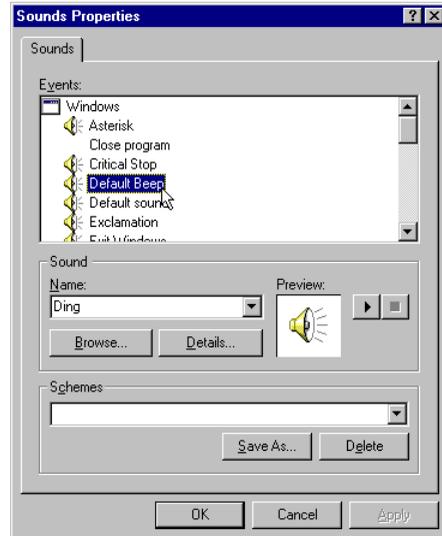
➤ Select the waveform file you want to use.

➤ Click **Preview** to play the sound.

➤ When you have set up the sound you want to play for each event click **OK** to exit from the dialog box.

Installing and running Windows 95 applications

Most Windows 95 applications are installed using the standard Windows setup procedure. Provided you have a CD-ROM or 3.5-inch disks for your Windows application, the procedure is similar to installing software on your Macintosh.

To install a Windows application

➤ Insert the application's installation CD-ROM or floppy disk into the Macintosh drive.

➤ Click **Start**, then click **Settings** and **Control Panel**.

➤ Double-click the **Add/Remove Programs** icon.

This dialog box appears:

➤ Click **Install…** to start the installation.

The installation program locates the installer on the disk you inserted:
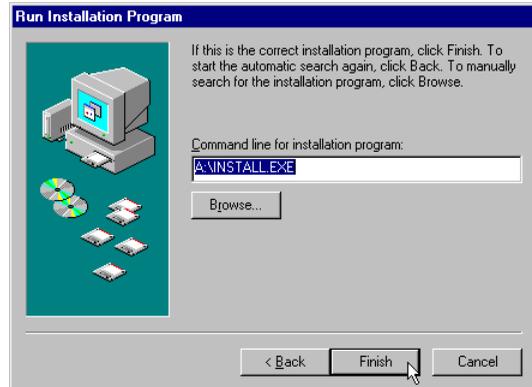
➤ Click **Finish** to run the installer.

As the installation proceeds, dialog boxes will prompt you for any information needed for the installation.

To run a Windows application

➤ Click **Start**, then click **Programs**.

➤ Point to the folder containing the program, and then click the program.

To run a Windows 95 application from the Macintosh

RealPC's EasyLaunch feature lets you run a PC application simply by double-clicking an icon on your Macintosh.

➤ Set up the E**:** drive as a Macintosh shared folder.

For more information refer to *Sharing PC files between RealPC and the Macintosh*, page 49.

➤ Copy the application file to the E**:** drive.

You can now automatically run RealPC and Windows 95, and then run the Windows application, by double-clicking the icon.

Networking with RealPC
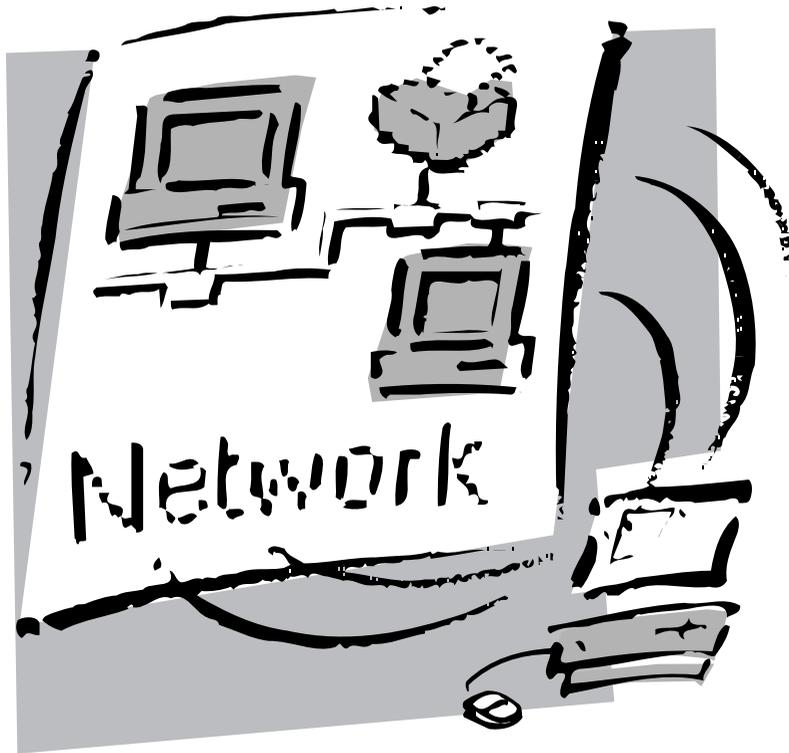
RealPC includes Insignia's network drivers to enable you to share files with other PCs, or run multi-user applications on a network.

This chapter gives full details of how to set up networking within MS-DOS, Windows 3.x, and Windows 95.

Introduction

RealPC offers you the same network functionality as any PC, enabling you to install a wide variety of PC networking packages. This is achieved using Insignia's network drivers which operate over both Ethernet and Token-Ring networks.

As the installation of PC network packages differs between MS-DOS/Windows 3.x and Windows 95, this chapter begins with a brief description of the network interfaces supported within RealPC followed by instructions on how to install PC networking packages within these operating systems.

Network interfaces

In a PC networking environment, the operating system does not communicate directly with the network card itself, but through a software interface called a network driver. Modern network drivers and communication protocols are written to common interface standards, allowing multiple protocol stacks to be used with any network interface driver written to the same standard.

Currently the most popular standards are the Network Driver Interface Specification (NDIS, developed by Microsoft and 3COM), and the Open DataLink Interface (ODI, developed by Novell and Apple).

Another driver standard is Winsock, which is one of the most popular PC network interfaces for TCP/IP applications.

RealPC is supplied with the following drivers for both Ethernet and Token-Ring networks:

- NDIS, V3.1 miniport, Windows 95 only.

- ODI, 16-bit real mode.

- Winsock, V1.1, 16-bit and 32-bit.

All the RealPC networking drivers are stored in the C:\INSIGNIA directory, and have the following filenames:

Network driver	Filename
Ethernet NDIS	ISETH.SYS
Token-Ring NDIS	ISTOK.SYS
Ethernet ODI	ETHERSPC.COM
Token-Ring ODI	TOKENSPC.COM
Winsock (16-bit)	WINSOCK.DLL
Winsock (32-bit)	WSOCK32.DLL

Since the Insignia ODI and NDIS drivers access the same physical network interface they cannot be used simultaneously.

Requirements for network support

RealPC network drivers (NDIS, ODI, Winsock) work with both of Apple's Classic and Open Transport network architectures. The preferred network architecture for RealPC is Open Transport (v1.1.1 and above), the installer for which can be found on the RealPC installation CD. Please consult the Open Transport readme file for system requirements.

If you are planning to use the DECnet protocol you will need to override your built-in Ethernet address. Refer to *DECnet Address Override*, page 166, for details.

Networking with MS-DOS and Windows 3.x

The following section describes the configuration of networking within MS-DOS and Windows 3.x.

RealPC is supplied with 16-bit Winsock (V1.1) support pre-installed. This allows any Winsock-compliant application to be used without re-configuring Windows 3.x.

If you need to access local area network servers Windows 3.x should be configured to use the RealPC ODI network drivers. The configuration and use of the Insignia ODI drivers are outlined in the following sections.

Using Insignia ODI drivers

In order to support any networking protocols from within Windows 3.x, the Insignia ODI driver must first be loaded from MS-DOS. However, the ODI driver cannot simply be loaded in isolation as it is only part of a *network environment* which must be loaded in entirety to provide network connectivity.

RealPC is supplied with the MS-DOS component of the Novell NetWare 4 client pre-installed in the `C:\NWCLIENT` directory. This client not only provides access to Novell NetWare servers,

but also the necessary files to enable other networking protocols to be supported within Windows 3.x.

In general the following stages are required to provide network support within Windows 3.x:

- Load the ODI system files from MS-DOS.

- Configure the ODI system to support the required network client.

- Install the required network client.

- Ensure that Windows 3.x is configured to support the new client.

These are explained in detail in the following sections.

Loading the ODI system files from MS-DOS

The ODI system can be started by using the following sequence of steps from within the `C:\NWCLIENT` directory:

➤ Start the Link Support Layer with the command:

`LSL` ⏎

The Link Support Layer should load and display its configuration as shown below:

```
C:\NWCLIENT>lsl
NetWare Link Support Layer v2.16 (950417)
(C) Copyright 1990-1995 Novell, Inc. All Rights Reserved.
BUFFERS 8 4210
MEMPOOL 8192
The configuration file used was "C:\NWCLIENT\NET.CFG".
Max Boards 4, Max Stacks 4
Buffers 8, Buffer size 4210 bytes, Memory pool 8192 bytes.
```

➤ Start the Insignia ODI driver for the Ethernet or Token-Ring network by typing one of the following commands:

ETHERSPC ↵

or

TOKENSPC ↵

The Insignia ODI driver will also display its configuration, which may vary, on startup as shown below.

➤ The above drivers may be added to your C:\AUTOEXEC.BAT file.

Configure the ODI system to support the required network client

The Insignia ODI drivers are configured by the C:\NWCLIENT\NET.CFG file. By default this is set to support both Ethernet and Token-Ring, with the frame types set to ETHERNET_802.2 and TOKEN-RING, respectively, for both Novell NetWare and Microsoft Networking. If your network has different characteristics you will need to edit the file to select the appropriate options.

To change the options:

➤ Comment out the current setting by inserting a semicolon in front of the line and removing the semicolons from the lines you require.

Refer to *Configuring ODI drivers*, page 157, for more details.

ODI to NDIS converter

Some Windows 3.x network clients simply cannot support ODI drivers, most however will support NDIS. Novell supply an NDIS to ODI converter (ODINSUP) as part of the NetWare 4 client which provides an interface between NDIS protocol stacks and the ODI system. With this utility you may run NDIS networking packages, such as Microsoft Client 3.0 and LAN Manager with RealPC ODI drivers.

ODINSUP works by registering itself with the Link Support Layer as an ODI protocol stack, while appearing to NDIS protocol stacks as an NDIS driver.

ODINSUP can be found in the NWCLIENT directory.

```
C:\NWCLIENT>etherspc
Insignia Ethernet MLID v2.00E (950908).
(C) Copyright 1991-1995 Insignia Solutions Inc. All Rights Reserved.
IRQ 10, Node Address 800690895E2 L
Max Frame 1514 bytes, Line Speed 10 Mbps, Bus ID 0
Board 1, Frame ETHERNET_802.2, LSB Mode
Board 2, Frame ETHERNET_II, LSB Mode
Board 3, Frame ETHERNET_SNAP, LSB Mode
Board 4, Frame ETHERNET_802.3, LSB Mode
```

Configuring NDIS

Because `ODINSUP` is loaded before any of the NDIS software it does not know which frame types will be used by NDIS applications. It is therefore necessary to enable all generally used frame types in the `NET.CFG` file.

Example

The following example shows the `NET.CFG` file for LAN Manager on Ethernet, using the NetBEUI (SMB) protocol:

```
Link Support
    Buffers 10 1518


Protocol ODINSUP
    Bind ETHERSPC
    Buffered

Link Driver ETHERSPC
    Frame ETHERNET_802.2
    Frame ETHERNET_802.3
    Frame ETHERNET_II
    Frame ETHERNET_SNAP
    Protocol SMB F0 ETHERNET_802.2
```

Starting NDIS

To start the NDIS system proceed as follows:

➤ First start the ODI system in the usual way, by typing:

```
LSL ⏎
ETHERSPC ⏎
```

➤ Start the ODI Support Layer by typing:

```
ODINSUP ⏎
```

Setting up Novell NetWare with MS-DOS or Windows 3.x

The Novell NetWare 4 client supplied with RealPC is already set up for use with MS-DOS or Windows 3.x.

The `NET.CFG` file is supplied set up for both Ethernet and Token-Ring, with the default frame types set to `ETHERNET_802.2` and `TOKEN-RING_802.2` respectively.

If your network has different characteristics you will need to edit the file to select the appropriate options. To change the options, comment out the current setting by inserting a semicolon in front of the line, and remove the semicolons from the lines you require.

➤ Edit the `C:\AUTOEXEC.BAT` file to include the following lines:

```
CD C:\NOVELL
LSL
ETHERSPC
ISIPXODI
VLM /PS=servername
CD:
L:
```

where *servername* is the name of the server you want to use.

Replace `ETHERSPC` by `TOKENSPC` if you are using Token-Ring.

For information about editing files under MS-DOS refer to *Editing configuration files*, page 96.

➤ Restart Windows.

Batch files `ETHER.BAT` or `TOKEN.BAT` are provided in the `C:\INSIGNIA` directory, which will execute the above steps with a single command.

To list the servers

Once you have connected to the server you can list the servers on the network by typing the following command at the file server prompt:

`NLIST` ⏎

A list of available servers will be displayed.

Installing Microsoft Network client

This section describes how to configure Microsoft Network Client 3.0 to work correctly with RealPC. It includes setup instructions for both the NetBEUI and TCP/IP protocols.

Ensure your Macintosh can connect to the network card by selecting **Ethernet** or **Token-Ring** in the **AppleTalk** control panel in Open Transport or **EtherTalk** or **TokenTalk** in the **Network** control panel in Classic AppleTalk. (If this cannot be accomplished please consult your information services department or call Apple Technical Support at 1-800-SOS-APPL for assistance).

When using Microsoft Network Client 3.0 with the TCP/IP protocol in RealPC, simultaneous IP (Internet protocol) connections are only possible on a Power Macintosh using Open Transport 1.1.1 (in the **PC Extras** folder on the RealPC CD-ROM) through Open Transport's Multisession IP feature. This configuration requires that a separate IP configuration be used in the Microsoft Network Client 3.0 than what is used on the Macintosh.

The Open Transport Multisession IP feature will not work with RealPC when running on a Power Macintosh with a version of Open Transport earlier than 1.1.1 or with Classic AppleTalk. In order to use the TCP/IP protocol from RealPC on a Power Macintosh using an earlier version of Open Transport or Classic AppleTalk, MacTCP or TCP/IP must be disabled. (If you do not disable MacTCP or TCP/IP, you will get error messages which state that the Protocol IP and Protocol ARP are already in use.)

To disable MacTCP or TCP/IP, either use the **Extensions Manager** control panel, or drag the **MacTCP** (or **TCP/IP**) Control Panel out of the **Control Panels** folder and place it on the Desktop (or any folder except for the **Control Panels** and **Extensions** folders). You must restart your Macintosh for this change to take effect.

These instructions assume that you have RealPC installed and that you are familiar with the MS-DOS Editor. You will also need to have the RealPC CD-ROM available.

1. Start RealPC.

2. Insert the RealPC CD-ROM into your CD drive.

3. On the Macintosh desktop drag the icon of the folder **mscInt3** in the **PC Extras**:**clients** folder on the RealPC CD, onto the **RealPC** window. This will assign this folder to drive E:.

4. Create a new folder on your RealPC hard disk by typing the following at the command prompt:

```
MKDIR msclnt3 ↵
```

5. Copy the contents of the folder on the RealPC CD to your **RealPC Hard Disk File** by typing the following at the command prompt:

```
COPY E:\*.* c:\msclnt3 ↵
```

You are now ready to install the Microsoft Network Client.

6. The CONFIG.SYS file must be modified to initially remove the **Mac/PC Shared folder** feature. This will be replaced later. Type the following:

```
EDIT C:\CONFIG.SYS ↵
```

Delete the following line:

```
device=C:\Insignia\host.sys
```

7. The AUTOEXEC.BAT file must be modified to initially remove the **Mac/PC Shared folde**r feature. Type the following:

```
EDIT C:\AUTOEXEC.BAT ↵
```

Delete the following line:

```
c:\insignia\fsadrive e: g: h:
```

8. If you have installed Windows 3.x, the Novell NetWare configuration needs to be removed from the Windows step. Use the following procedure to do so:

➤ At the C:\> prompt, type WIN ↵.

➤ Double-click the **Windows Setup** icon in the **Main** program group.

➤ Select **Change System Settings**… from the **Options** menu.

➤ Using the pull-down menu for Network, select **No Network Installed**.

➤ Click **OK**.

➤ Click **Continue**.

➤ Click **OK**.

➤ Select **Exit** from the **Options** menu to exit from Windows.

9. Restart RealPC by selecting **Restart RealPC** from the **Setup** menu.

10. At the command prompt type the following:

```
c:\msclnt3\setup ↵
```

11. At the first screen, press ↵ to continue.

12. The next screen prompts you for the location where Microsoft Network Client should be installed. Select the default, C:\NET, and press ↵.

13. When prompted to select an adapter from the list below, select the final option, **ODI/ NDIS Support Driver** (this will be setup later).

14. When prompted, enter your username for your network (this information usually is supplied by a system administrator or information systems department).

15. The next dialog is used to change some of the setup options, such as the Mail and Sharing options. If help is required in choosing the proper options, press 1 or refer to the network administrator for your Microsoft Network.

➤ Select **Change Names** and modify entries per the network administrator.

➤ Select **Change Setup Options** and modify entries per the network administrator.

16. To setup Microsoft Network Client to use the NetBEUI protocol, proceed to Step 17. To setup the client software to use the TCP/IP protocol, proceed to Step 18. To setup the client software to use both the NetBEUI and TCP/IP protocols, proceed to Step 19.

17. If the network driver needs to be initialized using the NetBEUI protocol, do the following:

➤ Select **Change Network Configuration** at the **Setup Options** screen. The ODI/NDIS Support Driver will be selected.

➤ Use the Tab to switch to the **Installed Network Adapter(s) and Protocol(s)** menu.

➤ Select **NWLink IPX Compatible Transport** and Tab back to the **Options** menu.

➤ Select **Remove** and press ↵.

➤ Select **Microsoft NetBEUI** and press ↵.

➤ Select **Network configuration is correct** and press ↵.

➤ Select **The listed options are correct** and press ↵.

➤ Setup will now prompt you for the location of ODINSUP.COM. Type the following in the location box:

C:\NWCLIENT ↵

➤ Proceed to step 20.

18. If the network driver needs to be initialized using the TCP/IP protocol, do the following:

➤ Select **Change Network Configuration** at the **Setup Options** screen. The ODI/NDIS Support Driver will be selected.

➤ Use the Tab to switch to the **Installed Network Adapter(s)** and **Protocol(s)** menu.

➤ Select **NWLink IPX Compatible Transport** and Tab back to the **Options** menu.

➤ Select **Remove** and press **Enter**.

➤ Select **Microsoft TCP/IP** and press **Enter**.

➤ Use the Tab to switch to the **Installed Network Adapter(s)** and **Protocol(s)** menu.

➤ Select **Microsoft TCP/IP** and Tab back to the **Options** menu.

➤ Select **Change Settings** and press **Enter**.

➤ You will need to configure your IP information before proceeding. If help is required, refer to the network administrator for your Microsoft or TCP/IP network.

➤ Select **Settings are correct** and press ⏎.

➤ Select **Network configuration is correct** and press ⏎.

➤ Select **The listed options are correct** and press ⏎.

➤ Setup will now prompt you for the location of ODINSUP.COM. Type the following in the location box:

C:\NWCLIENT ⏎

➤ You will be prompted to enter the path to the OEM driver setup. Type the following in the location box:

C:\msclnt3 ⏎

➤ Proceed to step 20.

19. If the network driver needs to be initialized using the NetBEUI and TCP/IP protocols, do the following:

➤ Select **Change Network Configuration** at the **Setup Options** screen.

➤ The ODI/NDIS Support Driver will be selected.

➤ Use the Tab to switch to the **Installed Network Adapter(s) and Protocol(s)** menu.

➤ Select **NWLink IPX Compatible Transport** and Tab back to the **Options** menu.

➤ Select **Remove** and press ⏎.

➤ Select **Microsoft NetBEUI** and press ⏎.

➤ Select **Add Protocol** and press ⏎.

➤ Select **Microsoft TCP/IP** and press ⏎.

➤ Use the Tab to switch to the **Installed Network Adapter(s) and Protocol(s)** menu.

➤ Select **Microsoft TCP/IP** and Tab back to the **Options** menu.

➤ Select **Change Settings** and press ⏎.

➤ You will need to configure your IP information before proceeding. If help is required, refer to the network administrator for your Microsoft or TCP/IP network.

➤ Ensure that the settings are correct and press ⏎.

➤ Select **Network configuration is correct** and press ⏎.

➤ Select **The listed options are correct** and press ⏎.

➤ Setup will now prompt you for the location of `ODINSUP.COM`. Type the following in the location box:

`C:\NWCLIENT` ⏎

➤ You will be prompted to enter the path to the OEM driver setup. Type the following in the location box:

`C:\msclnt3` ⏎

➤ Proceed to Step 20.

20. Setup will complete the installation.

21. When prompted to restart or press the F3 key, press F3 to exit without restarting. You will now need to make changes to the configuration files.

22. The `AUTOEXEC.BAT` file must be modified to load the ODI drivers. Type the following:

`EDIT C:\AUTOEXEC.BAT` ⏎

Add the following lines at the beginning of the file (if using Token-Ring network enter `TOKENSPC` in place of `ETHERSPC`):

```
cd C:\NWCLIENT
LH lsl
LH etherspc
cd ..
```

Add the following lines after `C:\NET\net start`:

```
c:\insignia\devlod.com
c:\insignia\host.sys
c:\insignia\fsadrive e: g: h:
```

Save the changes made to the `AUTOEXEC.BAT` file.

23. The `CONFIG.SYS` file must be modified to load the Microsoft protocol manager drivers. Type the following:

`EDIT C:\CONFIG.SYS` ⏎

Modify the `CONFIG.SYS` file so that it matches the working example that follows:

```
FILES=30
BUFFERS=15,0
DOS=high,umb
FCBS=20,0
device=c:\dos\himem.sys /TESTMEM:OFF
device=c:\insignia\host.sys
device=c:\insignia\cdrom.sys
device=c:\insignia\aspidos.sys
device=c:\insignia\aspidisk.sys /d
REM device=c:\insignia\aspicd.sys /d:cdrom$$$ /
    norst
device=c:\dos\setver.exe
lastdrive=z
STACKS=9,256
DEVICE=C:\NET\ifshlp.sys
```

Save the changes made to the `CONFIG.SYS` file.

24. The `NET.CFG` file must be modified. Type the following:

`EDIT C:\NWCLIENT\NET.CFG` ⏎

Modify your `NET.CFG` file to read as follows if running on an Ethernet network:

```
PROTOCOL ODINSUP
     BIND ETHERSPC
     BUFFERED

LINK DRIVER ETHERSPC
     FRAME Ethernet_802.2
     FRAME Ethernet_II
     FRAME Ethernet_SNAP
     FRAME Ethernet_802.3
     Protocol SMB F0 ETHERNET_802.2
     PROTOCOL IP 800 ETHERNET_II
     PROTOCOL ARP 806 ETHERNET_II
```

Modify your `NET.CFG` to read as follows if running on a Token-Ring network:

```
PROTOCOL ODINSUP
     BIND TOKENSPC
     BUFFERED

LINK DRIVER TOKENSPC
     FRAME TOKEN-RING
     FRAME TOKEN-RING_SNAP
     PROTOCOL SMB f0 TOKEN-RING
     PROTOCOL IP 800 TOKEN-RING_SNAP
     PROTOCOL ARP 806 TOKEN-RING_SNAP
```

Save the changes made to the `NET.CFG` file.

25. The `PROTOCOL.INI` must be modified to set the correct bindings. Type the following:

`EDIT C:\NET\PROTOCOL.INI` ⏎

Change all occurrences of `ODINSUPMAC` to `ETHERSPC` (for Ethernet) or `TOKENSPC` (for Token-Ring).

Add the following sections to the end of the `PROTOCOL.INI` (for an Ethernet network):

```
[Link Driver]
data=FRAME Ethernet_802.3
data=FRAME Ethernet_802.2
data=FRAME Ethernet_II
data=FRAME Ethernet_SNAP
```

Add the following sections to the end of the `PROTOCOL.INI` file (for a Token-Ring network):

```
[Link Driver]
data=FRAME TOKEN-RING
data=FRAME TOKEN-RING_SNAP
```

Save the changes made to the `PROTOCOL.INI` file.

26. Remove any floppy diskettes or CD-ROM and restart RealPC by selecting **Restart RealPC** from the **Setup** menu.

RealPC should now be configured correctly to work with Microsoft Network Client 3.0.

Installing non-supplied network clients

Whichever network client you wish to install it is best to follow the manufacturer's installation instructions. Configure the client to use ODI drivers wherever possible.

During the network client's installation process you may be asked if you want Windows to be updated to support the client. This will allow network printers and services to be accessed from within the Windows environment. It is strongly recommended that this is done. Refer to the network client's installation documentation for more information.

Networking with Windows 95

The following section describes the configuration of networking within Windows 95.

Windows 95 can be configured to use either the RealPC NDIS or ODI network drivers. It is recommended that the NDIS drivers are used where possible as they are Windows 95 specific and offer the best performance. Note also that some third-party clients and protocol stacks must be installed via NDIS drivers. The configuration of the Insignia NDIS and ODI drivers are outlined in the following sections.

RealPC is supplied with both 16-bit and 32-bit Winsock (1.1) support pre-installed. This allows any Winsock-compliant application to be used without re-configuring Windows 95. If you need to access local area network servers, Windows 95 must be re-configured to access the host's network device, either via NDIS or ODI.

If you wish to use MacIPX and also to have NetWare connectivity within RealPC, Windows 95 must be set up using the Insignia ODI drivers and Novell's NetWare 4 client. For more information refer to *Simultaneous protocol support*, page 163.

To use Insignia NDIS drivers

To use the RealPC NDIS driver with the standard Microsoft Windows 95 clients, follow the instructions below. To use the NDIS driver with other Windows 95 network clients, follow the application installation instructions, installing the Insignia NDIS driver as described below when required.

➤ Ensure that the Windows 95 upgrade CD is available to RealPC.

➤ Click the **Start** button, point to **Settings**, and then click **Control Panel**.

➤ Double-click the **Network** icon in the **Control Panel** folder.

Network

The **Network** dialog box is displayed.

➤ If any existing drivers are displayed, select them and click **Remove**.
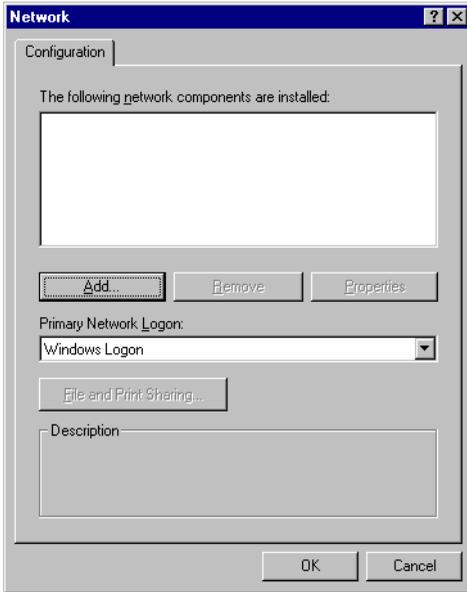
➤ Click **Add**….
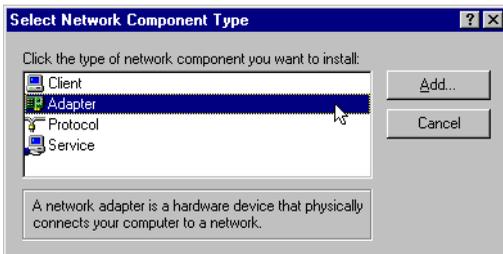
➤ Select **Adapter** and click **Add**….

A number of network adapter cards will be presented.
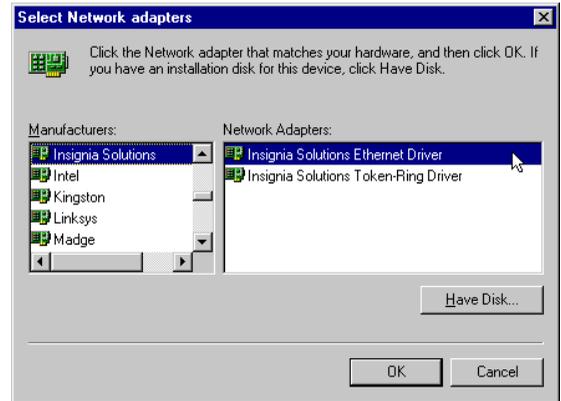
➤ Select **Insignia Solutions**.

➤ Select **Ethernet Driver** or **Token-Ring Driver**, as appropriate, and click **OK**.

The **Network** dialog box should now include the following items:

> Ensure that **Enhanced Mode (32 bit and 16 bit) NDIS driver** is selected.
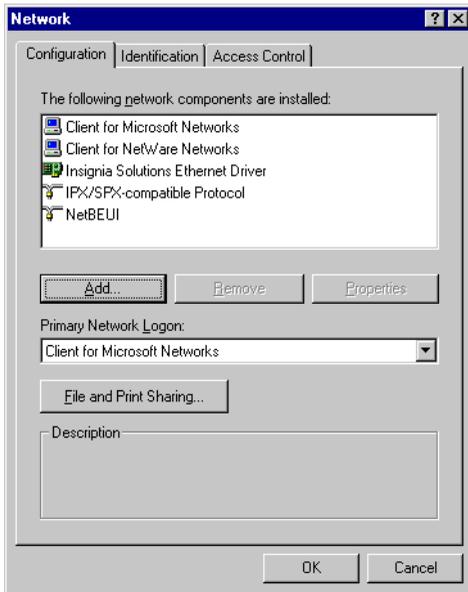
Windows 95 adds the IPX/SPX and NetBEUI protocols and the Microsoft and NetWare clients by default.

The RealPC network driver can be configured to be either NDIS (default) or ODI. To ensure that the NDIS driver has been chosen:

➤ Select the Insignia Network Driver and click **Properties**.
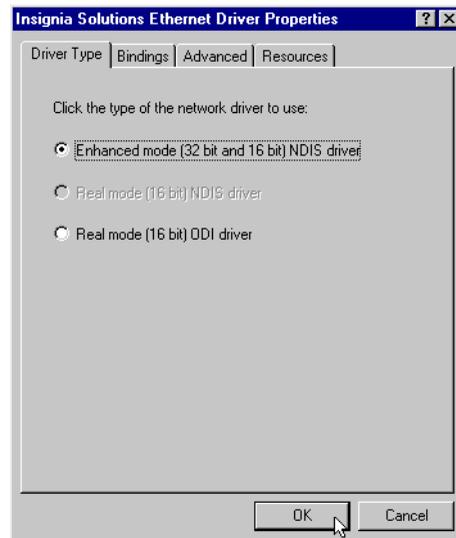
➤ Click **OK** to return to the **Network** dialog box.

➤ If you require additional protocols and clients add these in a similar way.

➤ Remove any protocols and clients you do not need, and click **OK**.

➤ Select the **Identification** tab.

Windows 95 will now download the appropriate software and drivers. You may be prompted to supply the location of the Insignia network drivers, in which case specify C:\INSIGNIA.

The following dialog box will then appear:
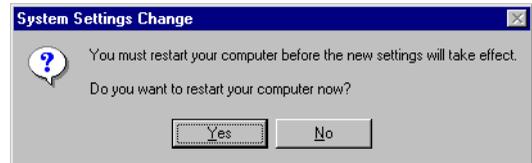
➤ Click **Yes** to restart Windows 95.

After restarting Windows 95, double-click the **Network Neighborhood** icon on the Windows 95 desktop to list the servers and machines that are visible to your computer.

Network Neighborhood

To view all the network resources available to your machine, double-click the **Entire Network** icon.

➤ Select a unique **Computer name**, the **Workgroup** you wish to be a member of, and a **Computer Description** for RealPC.

Other users identify your RealPC installation from these settings. An informative **Computer name** and **Computer Description** can help when attempting to share network resources.

➤ Once you are sure that the configuration is complete click **OK**.

➤ When a dialog box appears asking you to confirm the resource allocation for the driver, accept the default (IRQ 10), and click **OK**.

To use Insignia ODI drivers

This section describes how to configure Windows 95 to use the Insignia ODI drivers, although this is not the recommended solution.

▌ You should use this option if you are not using MacIPX. If you are using MacIPX refer to *To install the Novell NetWare Workstation VLM Shell* below.

▌ TurboStart is not available if you are using ODI networking with Windows 95.

➤ Follow the steps described in the *To use Insignia NDIS drivers*, page 146, but select the **Real mode (16 bit) ODI driver** from the list of supported network drivers in the **RealPC Network Driver Properties** dialog box.
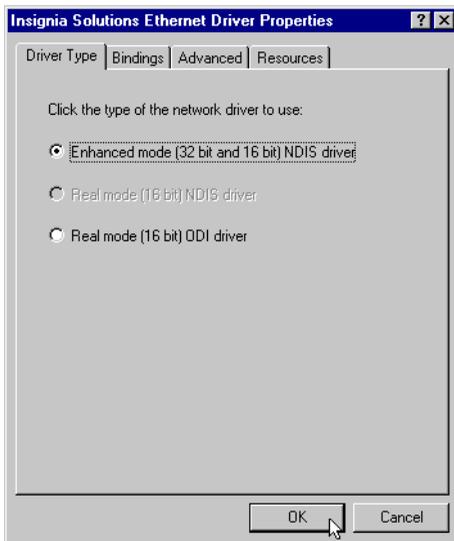
➤ When asked whether you want to restart Windows 95 click **No**.

Even though Windows 95 has now been set up as required, the Insignia ODI driver needs to be configured to support the protocols and clients selected.

The Insignia ODI drivers are configured through the `C:\WINDOWS\NET.CFG` file. By default this is set to support both Ethernet and Token-Ring, with the frame types set to ETHERNET_802.2 and TOKEN-RING, respectively, for both Novell NetWare and Microsoft Networking; these are the same default protocols as those chosen by Windows 95 during the network set-up.

If your network has different characteristics you will need to edit the `NET.CFG` file to select the appropriate options. To change the options, comment out the current setting by inserting a semicolon in front of the line and remove the semicolons from the lines you require. Refer to *Configuring ODI drivers*, page 157, for more details.

To install the Novell NetWare Workstation VLM Shell

This section describes how to add Novell's Workstation Shell (VLMs) network support to Windows 95. You should only use this option if you are using MacIPX.

You may wish to consult your NetWare system administrator for the correct frame type to use.

➤ Run Windows 95.

➤ When the message `Starting Windows 95…` appears, press ⌨F8 (⌘ `keypad` 8 on the Macintosh).

➤ Select **Command Prompt only** and press ⏎ to proceed.
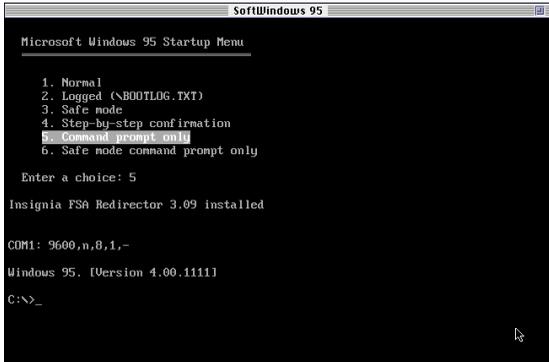
➤ Choose **RealPC Setup…** from the **Setup** menu, and click the **Shared Folders** button.

➤ Set up the E: drive as the **nw4cInt** folder on the RealPC installation CD. It is located in the **PC Extras** folder in the **clients** folder.
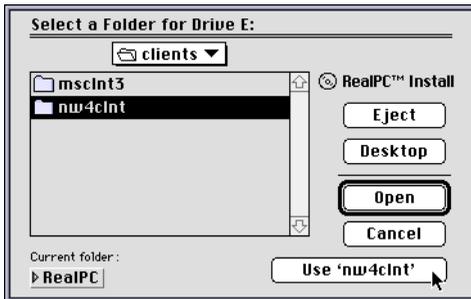
➤ At the MS-DOS C:\> prompt type:

E: ⏎

➤ Type INSTALL ⏎.
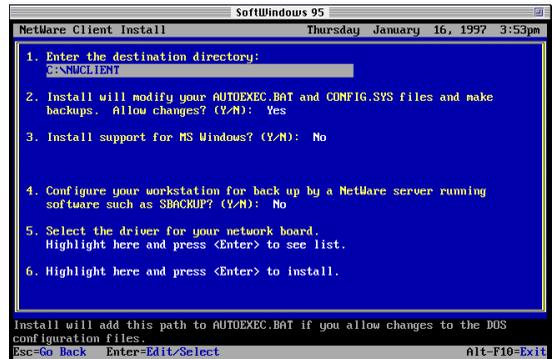
➤ Using the ↑ and ↓ keys to navigate through this screen, select the following options:

1. Select the default option: C:\NWCLIENT.

2. Select the default option: **Yes**.

3. Select **Yes** for Windows support and specify the Windows directory.

4. Select the default option: **No**.

5. Press ⏎ to display the list of available drivers. Scroll down to the bottom of the driver list, select **OTHER DRIVERS**, and press ⏎.

➤ In the following dialog box enter
  `C:\INSIGNIA` and press ↵.

```
                 Insert The Driver Disk

Insert the Drivers diskette or your third party driver
diskette.  A driver diskette must have the file
DRIVERS.DOS or have an INS file for each of the drivers
on the disk.

If the driver disk can be found in a different place,
type the new path below:

  C:\INSIGNIA_

Press <Enter> when ready or <Escape> to cancel.
```
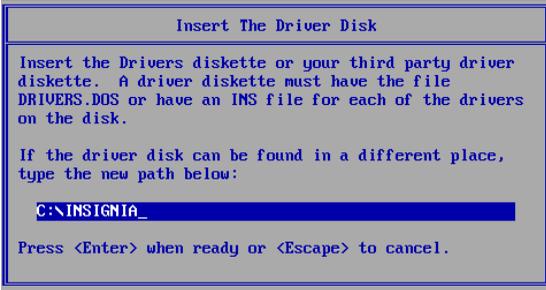
➤ Select the appropriate ODI driver (Ethernet
  or Token-Ring) and press ↵.

```
                    Network Board

Insignia Solutions Ethernet ODI Driver
Insignia Solutions Token-Ring ODI Driver
OTHER DRIVERS
```

➤ Select which frame type you wish to use.

```
          Settings for Insignia Solutions Ethernet ODI Driver

Media Frame Type(s)              FRAME Ethernet_802.2
```
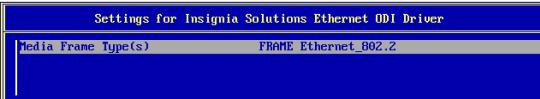
➤ When you have selected the required value
  press F10 (⌘ Keypad-0 on the Macintosh)
  to save.

```
════════════════════════ SoftWindows 95 ════════════════════════
NetWare Client Install               Wednesday  January  22, 1997  4:21pm

 1. Enter the destination directory:
    C:\NWCLIENT

 2. Install will modify your AUTOEXEC.BAT and CONFIG.SYS files and make
    backups.  Allow changes? (Y/N):  Yes

 3. Install support for MS Windows? (Y/N):  Yes
    Enter MS Windows user directory:  C:\WINDOWS
    Highlight here and Press <Enter> to customize.

 4. Configure your workstation for back up by a NetWare server running
    software such as SBACKUP? (Y/N):  No

 5. Select the driver for your network board.
    Insignia Solutions Ethernet ODI Driver

 6. Highlight here and press <Enter> to install.

When you press <Enter> the file copy and automatic configuration will begin.

Esc=Go Back    Enter=Edit/Select                              Alt-F10=Exit
```

➤ Select option 6 and press ↵ to install.

Various files will be copied onto your hard disk.

➤ If prompted to **Use version on installation
  diskette**, select **No**.

```
Use version on installation diskette?

No
Yes
```

➤ When the installation is complete choose
  Reset RealPC from the **Setup** menu to
  restart RealPC.

On restarting, Windows 95 will encounter the following problem. This is because the Windows 95 component of the Netware Client has not yet been installed:
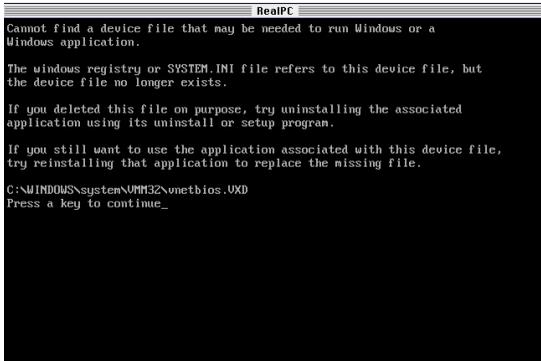
➤ Press any key to continue.

When Windows 95 has started double-click the **Network** icon in the **Control Panel** folder.

➤ Click **Add**….

➤ Select **Client** and click **Add**….

➤ Select **Novell** and select **Novell Netware (Workstation Shell 4.0 and above)**.
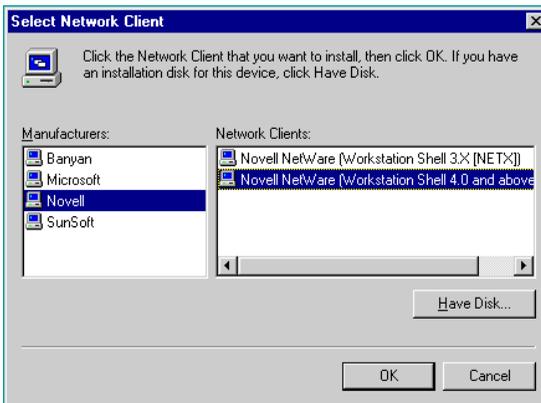
➤ Click **OK**.

➤ Select the **Identification** tab and identify your RealPC as described earlier.

The **Network** control panel now shows the items you have installed:
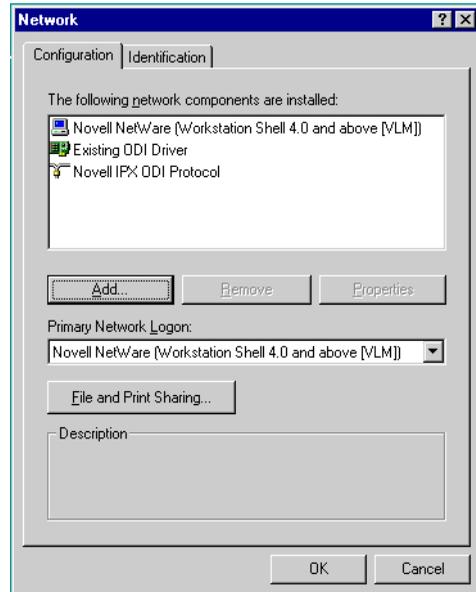
➤ Click **OK**.

Windows 95 will now download the appropriate software to your hard disk.

For changes to take effect you will be asked whether you wish to restart Windows 95.

➤ Click **Yes**.

PPP connections with Microsoft Dial-Up Adapter

This section describes how to configure PPP with Windows 95.

These instructions assume that you have Windows 95 installed and running.

➤ Insert the Microsoft Windows 95 upgrade CD-ROM.

Setting up the appropriate drivers

➤ Click the **Start** button, point to **Settings**, and then click **Control Panel**.

➤ Double-click the **Network** icon in the **Control Panel** folder.

➤ When the **Network** dialog box appears, select **Adapter** and click **Add**….

➤ Select **Microsoft** from the **Manufacturers** list, select **Dial-Up Adapter** from the **Network Adapter** list and click **OK** to add it.

➤ From the **Network** dialog box, click **Add**…. Select **Protocol** and click **Add**….

➤ Select **Microsoft** from the **Manufacturers** list, select **TCP/IP** from the **Network Protocols** list and click **OK** to add it.

➤ Highlight **TCP/IP** and click **Properties**.

➤ If your Internet Service Provider automatically assigns an IP address each time you dial in, leave the defaults. If your ISP requires that you specify your IP configuration, click **Specify an IP address** to complete the IP Address and Subnet Mask according to the ISP's configuration instructions.

Also complete the DNS Configuration Gateway and set the WINS Configuration to **Disable WINS Resolution** according to the ISP's configuration instructions.

If you are logging into a Microsoft network via modem:

➤ Verify the Identification items by clicking on the **Identification** tab and completing the Computer Name and Workgroup fields. Also, turn on File Sharing by clicking on **File** and **Print Sharing**.

➤ Highlight **Client for Microsoft Networks** and click on **Properties**.

➤ Check the box to **Log on to Windows NT domain** and enter your domain.

Auto detecting your modem

➤ From the **Control Panels**, select **Modems** and **Add**…, **Next>**, and let it Auto Detect your Modem. Click on **Dialing Properties** and complete the fields.

➤ In **My Computer**, double-click on **Dial-Up Networking**. If the setup Wizard does not start automatically, double-click on **New Connection**.

➤ Click on **Next>**, name your connection and select your modem.

➤ Click on **Next>**. Enter your Area Code and Phone Number and click on **Next>**. Click on **Finish** to create your connection.

➤ In **My Computer**, select **Your Connection**. Enter your **User Name** and **Password**. Verify your phone number and click on **Connect**.

When the connection is made, RealPC will be configured to work with your Internet applications.

Troubleshooting

If you cannot Connect or Ping, verify the IP addresses in your **Network** Control Panel.

Configuring NDIS drivers

The Windows 95 registry holds various configuration settings for the RealPC NDIS drivers. Although these settings *can* be modified by editing the registry, the preferred approach is by the **Network** icon within the Windows 95 **Control Panel**. The network settings can be viewed by performing the following steps:

➤ Click the **Start** button, point to **Settings**, and then click **Control Panel**.
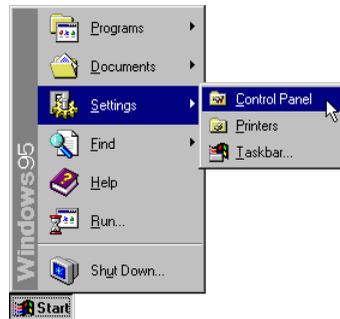
➤ Double-click the **Network** icon in the **Control Panel** folder.

Network

To access the RealPC NDIS driver's **Advanced** settings:

➤ Select the RealPC NDIS driver and click on **Properties**.
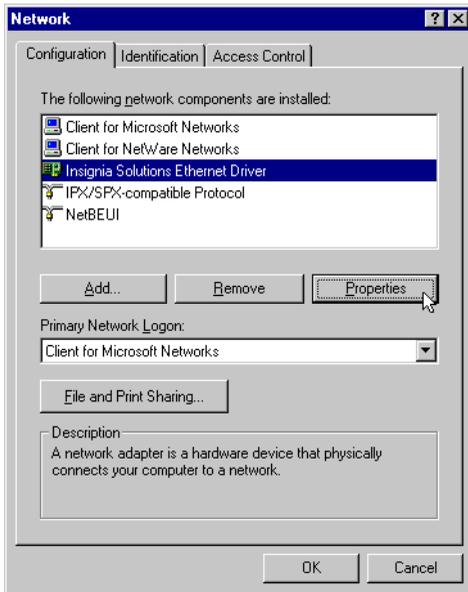
➤ Select the **Advanced** tab to view the NDIS driver's settings:
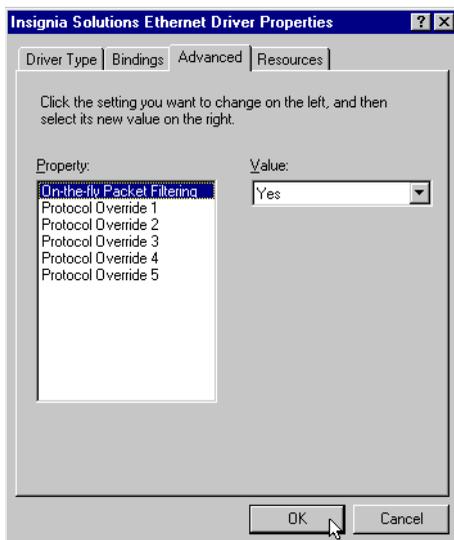
The following **Advanced** settings are defined; note that some are Token-Ring specific.

Maximum Packet Size (Token-Ring only)

This option allows the RealPC Token-Ring NDIS driver to be configured to support a smaller packet size defined by the host's network device. By default this is set to 4096 bytes. Note that a size greater than that supported by the host will be ignored.

On-the-fly Packet Filtering

In normal operation the RealPC NDIS drivers filter received packets on-the-fly. That is, that they only receive packets of protocol types which they have previously transmitted. In some circumstances this could cause a slight degradation in performance, and the functionality of the NDIS drivers can be changed to disable this on-the-fly filtering technique. Disabling this functionality can stop network packets being received by Windows 95 if care is not taken.

If **On-the-fly Packet Filtering** is disabled valid Protocol Overrides *must* be supplied.

Ring Speed (Token-Ring only)

The RealPC Token-Ring NDIS driver uses whatever the host Token-Ring network card is configured to. This advance setting is provided for information only.

Protocol Override 1–5

Five Protocol Override settings are provided. These force the RealPC NDIS drivers to enable the selected protocol types.

The following table shows how to enable specific frame/protocol types:

Frame Type	Value format	Example
Ethernet_II	xxxx	0806
Ethernet_802.2	xx	F0
Ethernet_802.3	FF	FF
Ethernet_SNAP	AAxxxxxx	AA008137
Token-Ring	xx	E0
Token-Ring_SNAP	AAxxxxxx	AA000800

Where x represents a hex digit.

Note that ALL protocols must be added. For example, to enable TCP/IP you must enable both IP (0800) and ARP (0806). If **On-the-fly Packet Filtering** is enabled the protocol overrides are ignored.

Configuring ODI drivers

The ODI system is configured through a single file, NET.CFG.

The NET.CFG file is divided up into sections, each of which provides parameters to configure a different part of the ODI system. Each section of the file begins with a section heading at the start of the line, followed by a series of tab-indented configuration options under the section heading.

The following example shows a simple NET.CFG file:

```
LINK SUPPORT
        BUFFERS 8 1500
        MEMPOOL 8192
LINK DRIVER ETHERSPC
        FRAME ETHERNET_II
        PROTOCOL IPX 8137 ETHERNET_II
```

These sections are described in detail below.

LINK SUPPORT

The **LINK SUPPORT** section of the NET.CFG file is used to configure the Open Data-link Interface Link Support Layer (LSL.COM). This section is only needed when protocols require a non-default configuration.

LINK DRIVER

The **LINK DRIVER** section is the most important part of the `NET.CFG` file for configuring RealPC. The options set in this section govern the interface between the driver and the rest of the system, the protocols registered with the network interface, and the format of packets transmitted and received. There are also numerous other configuration options associated with the network interface card, but most of these are not relevant to RealPC.

The following options are the most important for RealPC:

FRAME

Syntax: `FRAME frame-type`

This configuration option enables a particular frame type.

PROTOCOL

Syntax: `PROTOCOL name protocolID frame-type`

This configuration option enables a particular protocol to be used with a particular frame type. The RealPC ODI driver will only receive network packets for those protocols enabled within the `NET.CFG` file.

MAX PACKET SIZE

Syntax: `MAX PACKET SIZE value`

Some platforms limit the size of packets which can be transmitted. This option is only offered to resolve any platform-specific limitations which may occur in the future.

The default sizes are as follows:

Network	Default max packet size
Ethernet	1514
Token-Ring	4210

Example

A sample `LINK DRIVER` section is as follows:

```
LINK DRIVER ETHERSPC
      FRAME ETHERNET_802.2
      FRAME ETHERNET_II
      FRAME ETHERNET_802.3
      FRAME ETHERNET_SNAP
      PROTOCOL IPX 8137 ETHERNET_II

LINK DRIVER TOKENSPC
      FRAME TOKEN RING
      FRAME TOKEN RING_SNAP
      PROTOCOL IPX 8137 TOKEN-RING_SNAP
      MAX PACKET SIZE 4210
```

The FRAME lines in this LINK DRIVER section allow all four Ethernet and two Token-Ring frame types to be used with the driver. It is recommended that you always include all frame types in the LINK DRIVER section to allow the driver to transmit and receive frames in any of the common hardware packet formats. Note that the order of the lines is not significant. A configuration such as this prevents any FRAME and PROTOCOL mismatches occurring, and also makes configuring both ODI and NDIS (over ODI via the ODINSUP shim) identical.

The MAX PACKET SIZE option limits the size of any packets being transmitted and is only provided to solve platform-specific implementations in which the host is not able to transmit full size raw packets.

Since the RealPC ODI drivers (ETHERSPC, TOKENSPC) and the other Novell ODI components all obtain their configuration data from the NET.CFG file, it is important that they all reference the same NET.CFG file. It is recommended that all the ODI components are loaded from the directory which contains the NET.CFG file, usually C:\NWCLIENT. For example:

```
CD \NWCLIENT
LSL
ETHERSPC
IPXODI
VLM
```

Configuration issues
IRQ level

Some network client software needs to know the interrupt number of the ODI driver during installation and configuration. RealPC ODI and NDIS drivers use IRQ 10 (decimal).

ODI frame types

The following sections provide information on the FRAME types and PROTOCOL entries required in the NET.CFG file for common network clients and RealPC.

Windows 95/Microsoft LAN Manager/ Windows for Workgroups

```
PROTOCOL SMB FO ETHERNET_802.2
PROTOCOL SMB FO TOKEN RING
```

Novell NetWare

```
PROTOCOL IPX EO ETHERNET_802.2
PROTOCOL IPX 8137 ETHERNET_II
PROTOCOL IPX 8137 ETHERNET_SNAP
PROTOCOL IPX O ETHERNET_802.3
PROTOCOL IPX EO TOKEN RING
PROTOCOL IPX 8137 TOKEN RING_SNAP
```

Novell's Protocol Burst support

Although by default this feature is disabled, it is possible to increase the performance of the NetWare 4 client within RealPC by enabling Novell's Protocol Burst support for use with the RealPC ODI driver. This should only be enabled when accessing NetWare 4 servers via the NetWare 4 client as no increase in performance will be seen in other circumstances.

To enable Protocol Burst support the RealPC `NET.CFG` file must be edited. Remove the `;` (semi-colon) at the beginning of the following line:

```
; MAX IPG = 1
```

Change the value of `PB BUFFERS` from 0 to 7.

Protocol Burst support will now be enabled whenever the NetWare 4 VLM client is loaded.

TCP/IP connectivity

```
PROTOCOL IP 800 ETHERNET_II
PROTOCOL ARP 806 ETHERNET_II
PROTOCOL IP 800 TOKEN RING_SNAP
PROTOCOL ARP 806 TOKEN RING_SNAP
```

Banyan VINES

```
PROTOCOL VINES BAD ETHERNET_II
PROTOCOL VINES BC TOKEN RING
```

Where two or more protocols of the same frame type are provided for the network client, all must be present in the `NET.CFG` file for the client to work correctly. For example, for the Microsoft network client to work over TCP/IP, and for access to NetWare servers to be enabled, the following must be defined in the Ethernet section of the `NET.CFG` file:

```
LINK DRIVER ETHERSPC
   FRAME ETHERNET_II
   PROTOCOL IP 800 ETHERNET_II
   PROTOCOL ARP 806 ETHERNET_II
   PROTOCOL IPX 8137 ETHERNET_II
```

Troubleshooting ODI

Link Support Layer

No problems should be encountered when loading the Link Support Layer. If an error does occur, the most likely cause is an incorrect entry in the `LINK SUPPORT` section of the `NET.CFG` file.

The ODI driver

Several problems could cause the Insignia ODI driver to report a failure at load time. The following are common faults and solutions:

ODI driver cannot find the host's adapter

The message shown below indicates that the Insignia ODI driver has failed to initialize or find the host's network device:

```
C:\NWCLIENT>etherspc
Insignia Ethernet MLID v2.00E (950908).
(C) Copyright 1991-1995 Insignia Solutions Inc.
All Rights Reserved.
IRQ 10, Node Address 800690895E2 L
Max Frame 1514 bytes, Line Speed 10 Mbps, Bus ID 0
Board 1, Frame ETHERNET_802.2, LSB Mode
Board 2, Frame ETHERNET_II, LSB Mode
Board 3, Frame ETHERNET_SNAP, LSB Mode
Board 4, Frame ETHERNET_802.3, LSB Mode
Could not find a host Ethernet card.
ETHERSPC-DOS-6: The adapter did not initialize.
ETHERSPC did not load.
```

Ensure that the specified topology (Ethernet/Token-Ring) is supported on your Macintosh.

ODI driver is loaded twice

The second attempt at loading the ODI driver will produce error output similar to the following:

```
C:\NWCLIENT>etherspc
Insignia Ethernet MLID v2.00E (950908).
(C) Copyright 1991-1995 Insignia Solutions Inc.
All Rights Reserved.
ETHERSPC-DOS-7: You need another ETHERSPC driver
section in the NET.CFG file in order to load the
LAN driver again.
```

The Insignia ODI drivers can only be loaded once. If you need to reload the ODI driver simply unload the previous instance first with the command:

ETHERSPC U ⏎

Token-Ring line speed

The line speed for Token-Ring should be configured on your Macintosh since it cannot be configured from within the Insignia ODI drivers. The value displayed is the default and has no significance; see below.

```
Insignia Token Ring MLID v2.00E (950908).
(C) Copyright 1991-1995 Insignia Solutions Inc.
All Rights Reserved.
IRQ 10
Max Frame 4210 bytes, Line Speed 4 Mbps, Bus ID 0
Board 1, Frame TOKEN RING, MSB Mode
Board 2, Frame TOKEN RING_SNAP, MSB Mode
```

RealPC Winsock drivers

RealPC is supplied with Winsock 1.1 compliant drivers. RealPC will run Winsock-based applications without any modification. No configuration is required within the Windows environment. Unlike third-party Winsock drivers, which require a PC-based TCP/IP stack, the RealPC Winsock drivers use the Macintosh's TCP/IP stack for all network activity. This not only removes the need for a third-party PC-based TCP/IP stack, but also reduces the overall amount of memory used within RealPC to provide Winsock support.

The Insignia Winsock drivers are pre-installed within the Windows system and are ready to use. Copies are also provided in the `C:\INSIGNIA` directory. Note that since the RealPC Winsock drivers use the Macintosh TCP/IP protocol stack they both share the same IP address.

The installation of third-party TCP/IP protocol stacks replace the Insignia Winsock drivers and will require full configuration (unique IP address etc). To restore the Insignia Winsock drivers simply copy them from the `C:\INSIGNIA` directory and overwrite those in `C:\WINDOWS` and `C:\WINDOWS\SYSTEM`.

Insignia Winsock drivers can be used by any Winsock-compliant applications.

Simultaneous protocol support

As the RealPC networking functionality generally uses PC protocol stacks within RealPC, there can be conflicts between protocol resources (such as the port, socket, sequence numbers etc) when trying to use the same protocol stack from your Macintosh. RealPC, however, provides support for simultaneous protocol support for IPX and TCP/IP protocols.

Simultaneous IP connections

This section describes how to configure simultaneous TCP/IP network connections from Windows running in RealPC and the MacOS environment. Open Transport TCP/IP is not provided by Insignia Solutions Inc. but is included with MacOS 7.5.x and later.

Apple Open Transport

Apple Open Transport TCP/IP 1.1.1 running on a Power Macintosh has a feature called Multisession IP that allows the MacOS to make IP connections while other applications, such as RealPC, make separate IP connections simultaneously. This setup requires a separate IP address for the MacOS and a separate one for the TCP/IP application running in RealPC. With this feature, the user may install TCP/IP packages such as Novell LAN WorkPlace for Windows 95 in RealPC without conflicting with the TCP/IP software in the MacOS.

The Open Transport TCP/IP can be configured to use the Ethernet, Token-ring or Apple IP configurations to get to the Internet. It can also use Open Transports PPP 1.0 which configures a modem for TCP/IP connections. The latest version of Open Transport PPP can be downloaded from Apple Computer's web site. Regardless of the way TCP/IP is accessing the Internet or an intranet, the Insignia WinSock will still be able to provide a simultaneous IP connection through it.

The Insignia WinSock

Apple Open Transport TCP/IP 1.1.1 allows the user to run TCP/IP-compatible applications on your Power Macintosh. These applications will also allow the user to run WinSock 1.1-compatible applications in RealPC simultaneously with MacOS TCP/IP applications. This feature is only available when the Insignia `WINSOCK.DLL` and `WSOCK32.DLL` files are installed properly.

The Insignia `WSOCK32.DLL` is a 32-bit WinSock that uses the IP stack provided by the Apple TCP/IP software. It will allow WinSock 1.1-compatible Windows applications, such as web browsers and FTP software, to connect to the Internet. The IP information configured in Open Transport TCP/IP is used by the Windows application.

Configuration

Refer to installation instructions from Apple Computer to install and configure Open Transport TCP/IP 1.1.1.

The Insignia WinSock was written specifically for the IP stack in the MacOS provided by Open Transport TCP/IP. When RealPC is installed, the Insignia `WSOCK32.DLL` is in `C:\WINDOWS\SYSTEM` and the Insignia `WINSOCK.DLL` is in `C:\WINDOWS`.

No further configuration is needed in Windows provided the TCP/IP is configured correctly in the MacOS.

If, for some reason, these file are no longer in these locations, they may be copied from the RealPC Upgrade Disk.

➤ Choose **RealPC Setup**… from the **Setup** menu, to display the **Hard Disks** panel.

➤ In the **D: Drive** section click the **Change**… button, and select the **RealPC Upgrade Disk**.

➤ Click **Restart** to restart RealPC with the new `D:` drive.

Use Windows Explorer to copy the both the `WSOCK32.DLL` and `WINSOCK.DLL` files from the `D:\INSIGNIA` directory to the correct directories on the `C:` drive:

```
C:\WINDOWS\WINSOCK.DLL
C:\WINDOWS\SYSTEM\WSOCK32.DLL
```

Restart Windows 95 to reinitialize the WinSocks:

➤ Click on the **Start** menu, select **Shutdown**.

➤ Select **Restart the computer?** and click **Yes**.

RealPC should now be configured correctly for simultaneous IP connections.

Simultaneous IPX connections

Simultaneous protocol support for IPX is achieved by using Novell's MacIPX protocol stack. When using MacIPX it is necessary for RealPC to use a modified version of Novell's PC IPX protocol stack, `ISIPXODI.COM` instead of the original `IPXODI.COM`. As a result of this, MacIPX can only be used when the NetWare 4 client is being used, whether from Windows 95 or Windows 3.x.

To install MacIPX on the Macintosh

➤ Run the RealPC installer.

➤ Choose **Custom install**, and select the **MacIPX** option.

To configure MacIPX

➤ Choose **Control Panels** from the menu.

➤ Open the MacIPX control panel by double-clicking its icon.

MacIPX

The MacIPX control panel will be displayed:
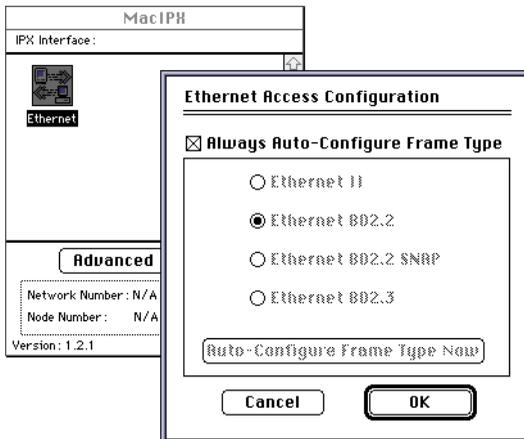
➤ Select the frame type which matches that defined in your NET.CFG file in your Windows environment.

DECnet Address Override

The DECnet protocol requires the Ethernet card you use in your Macintosh to have a particular address based on the area and node you have been assigned in your DECnet network by your system administrator.

To override the default address first install the DECnet Address Override utility as follows:

➤ Run the RealPC installer, and select **DECnet Address Override Utility** in the **Custom Install** dialog box.

This installs the utility in the **Utilities** folder.

To run the utility:

➤ Double-click the **DECnet Address Override** icon:

DECnet Address Override

➤ Click **Change Address**….
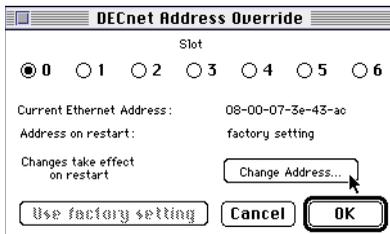
➤ Enter the area and node given to you by your system administrator, and click **Generate**.

➤ Click **OK** to save the new address.

➤ Restart your Macintosh to use the new address.
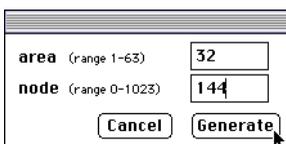
Using RealPC with the Internet
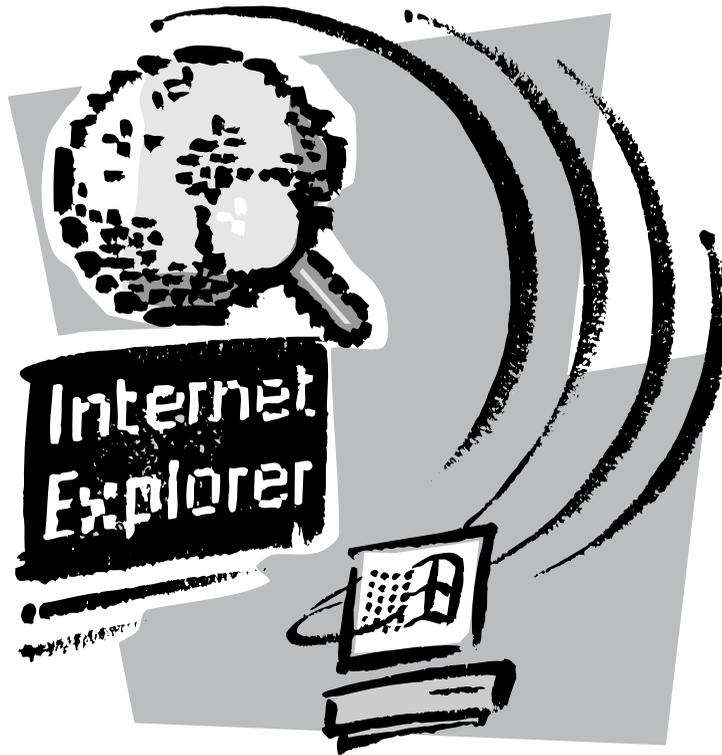
RealPC includes Microsoft Internet Explorer, and supports ActiveX and Java to give you full access to Web sites that use these features.

RealPC also provides a range of Internet utilities, to allow you to access the World Wide Web from RealPC, and to download PC files from the Internet.

This chapter explains how to install and run Internet Explorer, and shows how to use it to access up-to-the-minute support from Insignia or Microsoft. It also describes how to use the demonstration version of the NTRIGUE Net Client for Macintosh provided with RealPC, to allow you to run Windows applications on an NTRIGUE server via the Internet.

Installing the Internet utilities

The **PC Extras** folder on the RealPC installation CD includes a number of PC Internet utilities which you can install once you have installed Windows 3.x or Windows 95. The utilities are provided in the following folders:

Folder	Utility
Acrobat	Acrobat Reader.
Clients	Microsoft and NetWare clients (refer to *Networking with RealPC*, page 133).
MSIE3.01	Microsoft Internet Explorer.
MSVIEW95	Windows 95 viewers.
PKZIP	PKZIP for MS-DOS and Windows.
Shockwav	Shockwave viewers.
Stuffit	Stuffit for Windows.

To install any of these utilities you first need to set up the **PC Extras** folder as a shared folder, so you can access the files from RealPC. You should then follow the instructions for installing the individual utilities, as appropriate.

To set up PC Extras as a shared folder

➤ Drag the **PC Extras** folder on the **RealPC™ Install** CD, and drop it on the RealPC window:

You can now access the Internet utilities on drive E:.

To install Acrobat Reader, Microsoft Internet Explorer, PKZIP, Shockwave, or Stuffit

➤ Double-click the **My Computer** icon on the Windows 95 desktop.

➤ Double-click the **E:** drive icon.

➤ Double-click the appropriate folder icon.

➤ Double-click the utility's installer icon.

➤ When the **License Agreement** dialog box appears click **Yes**.

➤ If asked which components of the utility you want to install, click **Yes** to install all components.

➤ If asked where you want to install the utility, click **OK** to accept the default location.

The utility is now installed onto your hard drive.

➤ When asked if you want to restart your computer, click **Yes** to restart RealPC.

To install the Microsoft Word Viewer

➤ Double-click the **My Computer** icon on the Windows 95 desktop.

➤ Double-click the **E:** drive icon.

➤ Double-click the **MSView95** folder icon.

➤ Double-click the **Wd95vw71** icon.

➤ When the License Agreement dialog box appears click **Yes**.

The necessary installation files are copied to your hard disk.

➤ Click **Continue** to install the Word Viewer.

➤ When asked where you want to install the Word Viewer, click **OK** to accept the default location.

➤ When the installation dialog box appears click the **Installation** button to start the installation.

The Word Viewer is now installed onto your hard drive.

If an error message appears saying that setup could not open a temporary file, click **Ignore**.

You can run the Word Viewer by clicking **Start**, then **Programs**, **Word Viewer**.

To install the Microsoft Excel Viewer

➤ Double-click the **My Computer** icon on the Windows 95 desktop.

➤ Double-click the **SoftWindows (C:)** drive icon.

➤ Select **File > New > Folder** from the drive menu.

➤ Enter **excelvwr** as the name of the new drive.

➤ Double-click the **E:** drive icon.

➤ Double-click the **MSView95** folder icon.

➤ Move the mouse pointer over the **Excelvwr** icon, hold down the = key on the numeric keypad, drag the icon to the **excelvwr** folder, and release the = key.

➤ Select **Copy here** from the menu that appears.

The file is copied to your C: drive.

➤ Double-click the **excelvwr** icon on the C: drive.

The file is expanded to two further files.

➤ Click the **Start** button and select **MS-DOS Prompt** from the **Programs** menu.

➤ At the C:\> prompt enter:

```
CD C:\EXCELVWR ↵
XL95VIEW.EXE -d ↵
```

The file is extracted into two new folders, **Disk1** and **Disk2**.

➤ In Windows 95 double-click the **Disk1** icon in the **excelvwr** folder.

➤ Double-click the **Setup** icon to run the setup program.

➤ When the License Agreement dialog box appears click **I Agree**.

➤ When the installation dialog box appears click the **Installation** button to start the installation.

The Excel Viewer is now installed onto your hard drive.

You can run the Excel viewer by clicking **Start**, then **Programs**, **Microsoft Excel Viewer**.

Running Microsoft Internet Explorer

Once you have installed Microsoft Internet Explorer you can use it to access the World Wide Web.

Before running Internet Explorer your Macintosh needs to be connected to the Internet, either via a direct TCP/IP connection, or via a dial-up connection using PPP or SLIP.

To run Microsoft Internet Explorer from Windows 3.x

➤ Double-click the **Internet Explorer** icon in the Microsoft Internet Explorer program group:

Internet
Explorer

The following dialog box is displayed to allow you to set up Internet Explorer as your default browser:

➤ Click **Yes** to make Internet Explorer your default browser.

Internet Explorer will run and connect to the Microsoft home page by default:

To run Microsoft Internet Explorer from Windows 95

➤ Double-click the **The Internet** icon on the Windows 95 desktop.

The Internet

➤ When the first dialog box appears click **Next** to get connected.

➤ When asked which set-up option you require, select **Current** and click **Next**.

➤ Click **Yes** to make Internet Explorer your default browser.

Internet Explorer will run and connect to the Microsoft home page by default.

To get support on Insignia products
➤ Enter the following address in the Internet Explorer address field:

`http://www.insignia.com/`

➤ Press ⏎.

The Insignia technical support page will be displayed:

From this page you can:

■ See a list of Macintosh, UNIX, or NTRIGUE technical support documents.

■ Search for a document.

■ Browse through all the titles of the technical support documents.
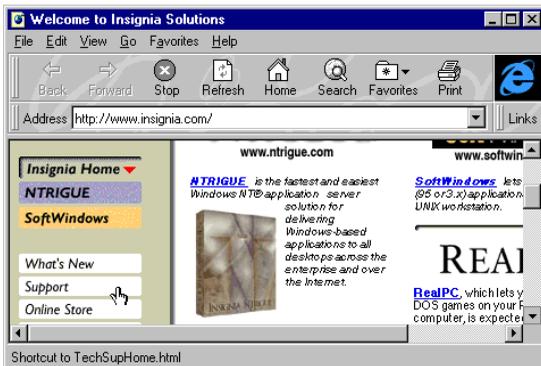
Getting Microsoft support

You can also use Internet Explorer to access Microsoft's World Wide Web support page, to get support on using Windows and other Microsoft products.

To reach Microsoft's support site

➤ Enter the following address in the Internet Explorer address field:

http://www.microsoft.com/support/

➤ Press ⏎.

After a short delay the Microsoft support home page will be displayed:

➤ Click on the button corresponding to the support topic you are interested in.

Using Internet utilities

RealPC includes several Internet utilities to help you work with the Internet.

You can install these utilities from the **PC Extras** folder on the installation CD. For more information refer to *Installing the Internet utilities*, page 168.

To run them from Windows 95 click the **Start** button, then click **Programs**:
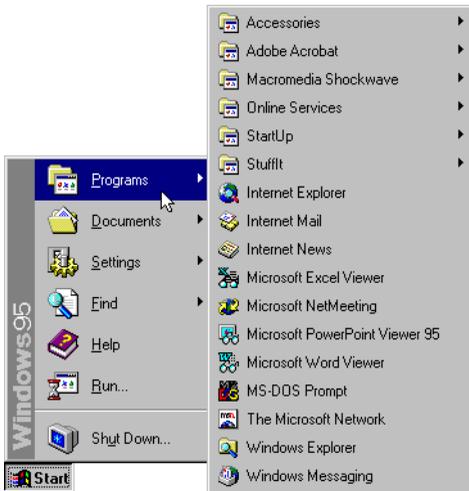
To run them from Windows 3.x open the appropriate program group and double-click the application's icon.

For more information about each utility double-click the Read-Me file icon in the appropriate folder on the C: drive.

Compressing and expanding files

These utilities allow you to compress files, to save time when sending them as attachments to email, or to expand files that you have received with email or downloaded from the Internet.

PKZIP, from PKWARE, compresses and expands files using the popular .ZIP format:
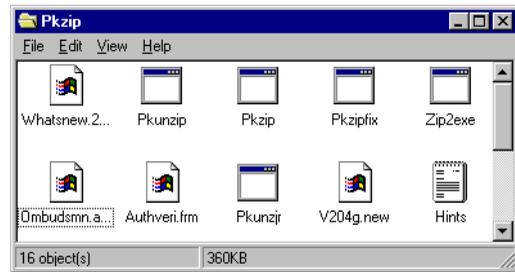
For more information contact PKWARE's Web site at:

http://www.pkware.com

Stuffit Expander expands and decodes files in a variety of formats, including Stuffit (.SIT), UUENCODE (.UUE), and Binhex (.HQX):

For more information contact Aladdin Systems' Web site at:

http://www.aladdinsys.com

Viewing files in different formats

A range of viewers are provided, to enable you to view files you have downloaded from the Internet, even if you do not have the application that created them.

Shockwave provides viewers for documents and Web sites created with Macromedia's products: Director, FreeHand, and Authorware:

For more information and sample files contact Macromedia's Web site at:

http://www.macromedia.com

Ppview32 is a viewer for documents in Microsoft PowerPoint format:

RealPC also includes Microsoft viewers for Excel and Word.

The **Acrobat Reader** allows you to read on-line versions of documents created in Acrobat (.PDF) format:
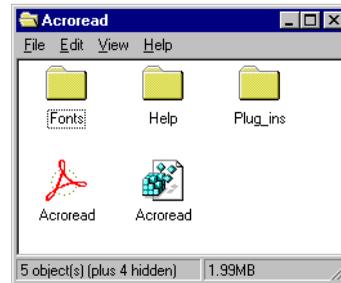
For more information about setting up your Web browser to recognize Acrobat Reader, and sample Acrobat files, contact Adobe's Web site at:

http://www.adobe.com

Playing sound files

RealAudio is a compact sound format for transmitting sound files over the Internet. On Windows 95 RealAudio is included with Internet Explorer. On Windows 3.x it is provided in the **RealAudio** program group:

To hear a sample sound double-click the **Example 1** or **Example 2** icons. For more information contact the RealAudio Web site at:

http://www.realaudio.com

Using the NTRIGUE Net Client for Macintosh

RealPC includes a demonstration version of the NTRIGUE Net Client for Macintosh, to allow you to access an NTRIGUE server across the Internet or via a TCP/IP network.

A Macintosh version of Microsoft Internet Explorer is provided on the first RealPC installation CD in the **Extras** folder.

To install the NTRIGUE Net Client

➤ Insert the RealPC installation CD.

➤ Open the **NTRIGUE Net Client** folder in the **Extras** folder.

➤ Double-click the installer icon.

➤ When the welcome screen is displayed click **Continue**… to display the **Easy Install** dialog box:
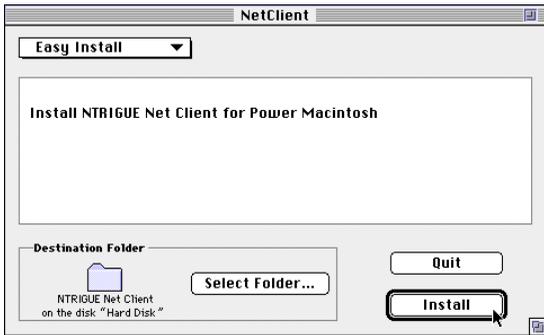
➤ Click **Install** to install the NTRIGUE Net Client.

➤ Refer to the Read-Me file for the serial number.

To connect to the Insignia demonstration NTRIGUE server

➤ Run a Web browser on your Macintosh, such as Netscape Navigator or Microsoft Internet Explorer.

➤ Connect to Insignia's home page at:

`http://www.insignia.com`
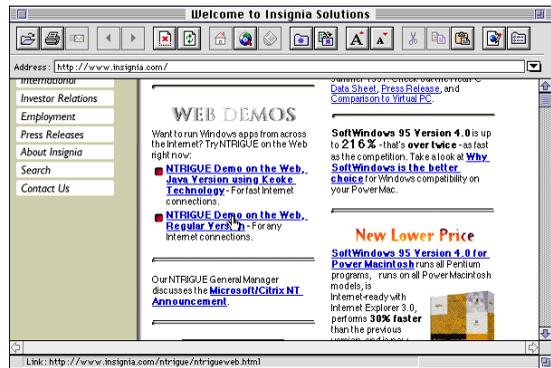
➤ Click **NTRIGUE Demo on the Web, Regular Version** to go to the NTRIGUE page and locate the **Connect to NTRIGUE** link:
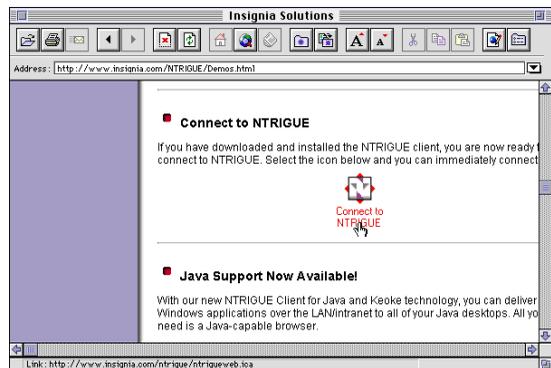
➤ Click on the link to make the connection.

The following dialog box will be displayed:
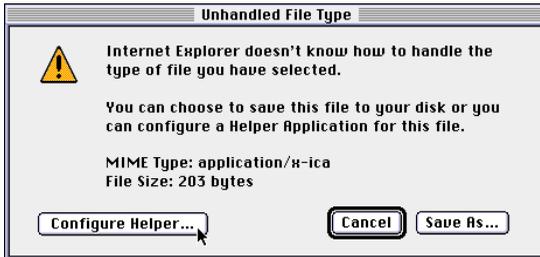
➤ Click **Configure Helper**… to associate the file with the Net Client application.

This dialog box appears:
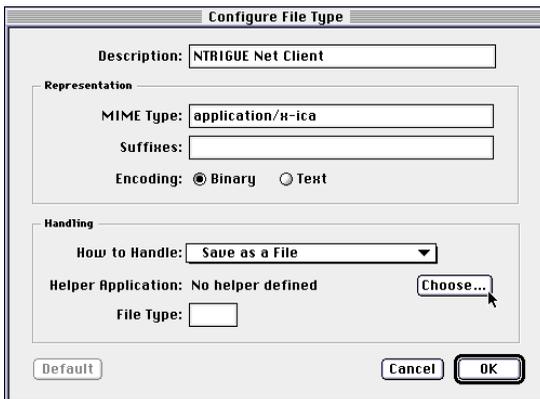
➤ Enter the description **NTRIGUE Net Client** and click **Choose**….

This dialog box allows you to choose the application:

➤ Locate the **Net Client** application and click **Select**.

➤ Click **OK** in the **Configure File Type** dialog box to save your association.

The association will be saved by your Web browser to enable you to access other NTRIGUE servers via the Internet.

You will be connected to Insignia's NTRIGUE server, and the Windows NT desktop will be displayed.

You can now run the Windows applications by double-clicking their icons on the desktop.

For more information about the NTRIGUE Net Client refer to the Acrobat version of the User Guide in the **NTRIGUE Net Client** folder on the first RealPC installation CD.

Scripting RealPC
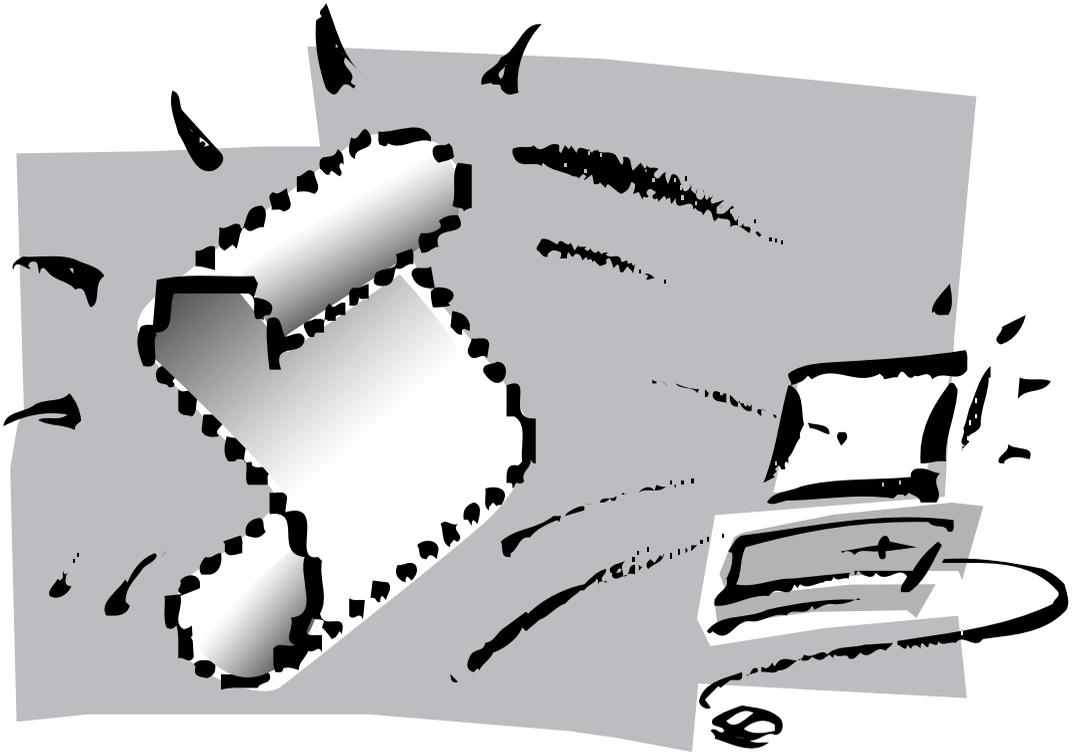
RealPC includes support for AppleScript, to allow experienced programmers to write scripts that run RealPC, execute commands, read information from the screen, or quit from RealPC.

To use AppleScript you need to install Apple's AppleScript software and the Script Editor.

This chapter provides several simple examples of using AppleScript with RealPC, and gives a full description of the AppleScript commands supported in RealPC.

For full information about using the AppleScript language and Script Editor refer to the documentation provided with AppleScript.

Using scripting

This section illustrates how you can use scripting by giving some simple scripting examples.

Running RealPC

The following script runs RealPC:

```
tell application "RealPC"
   run
end tell
```

Executing a command in the MS-DOS window

The following script executes the MS-DOS DIR command:

```
tell application "RealPC"
   write "DIR" & return
end tell
```

Alternatively, you can include a return in the string by writing:

```
write "DIR\r"
```

Reading information from the MS-DOS window

The following example copies line 22 of the MS-DOS window into the clipboard. It uses activate to bring the window to the front, and this should be used whenever copying or pasting text or graphics.

```
tell application "RealPC"
   activate
   write "DIR" & return
   set bounds of selection to {0,22,44,23}
   copy
end tell
```

The numbers in the selection list specify an area of the RealPC window in the format:

```
{left, top, right, bottom}
```

where *left* and *right* are the horizontal start and end in characters, and *top* and *bottom* are the vertical start and end in lines.

The following example gives the command DIR to RealPC. It then reads line 22 of the MS-DOS window, to get the hard disk space available, and displays it in a dialog box:

```
                6,281,216 bytes free

                   Cancel      OK
```

Note that the repeat section of the script keeps checking the result until it has stopped changing, to ensure that the DIR command has completed. It does this using the two variables TheResult and OldResult.

```
tell application "RealPC"
activate
  write "DIR" & return
  set bounds of selection to {0, 22, 44, 23}
  set OldResult to ""
  repeat
    set TheResult to contents of selection
    if character 1 of TheResult = space and
      TheResult = OldResult then exit repeat
    set OldResult to TheResult
  end repeat
  display dialog OldResult
end tell
```

Pasting into a Windows application window

The following script pastes the contents of the clipboard into the frontmost application in Windows:

```
tell application "RealPC"
  activate
  set key "Alt" to down
  set key "E" to down
  set key "Alt" to up
  set key "E" to up
  set key "P" to press
end tell
```

Running a Windows application

The following examples illustrate how to run RealPC, and then start a Windows application such as Paintbrush.

With Windows 3.x the script runs the application using an MS-DOS command:

```
tell application "RealPC"
  run
  activate
  write "WIN PBRUSH" & return
end tell
```

With Windows 95 the script runs the application using an MS-DOS command at the command prompt:

```
tell application "RealPC"
  run
  activate
  set key "F8" to press
  set key "5" to press
  set key "Return" to press
  write "WIN PBRUSH" & return
end tell
```

Here F8 displays the Load menu, 5 chooses the command prompt option, and Return loads the command prompt. Note that this example assumes that you are not using TurboStart.

Quitting from RealPC

The following example quits from RealPC:

```
tell application "RealPC"
  quit
end tell
```

Scripting reference

The following sections give reference information about the RealPC scripting commands.

Required suite

These must be supported by all applications which support high level events. They are:

quit

Quits RealPC.

For example:

```
tell application "RealPC"
   quit
end tell
```

run

Runs RealPC.

For example:

```
tell application "RealPC"
   run
end tell
```

Core suite

RealPC does not support the entire AppleScript Core Suite because many of the events in the suite have no relevance to RealPC.

get

Gets the data for an object.

The following example will return the location of the top left corner of the RealPC main window.

```
get position of window 1
```

The window number is ignored, and is only required for consistency with other scriptable applications.

set

Sets the data for an object.

data size

Returns the size of an object in bytes.

For example:

```
data size selection
```

application

The RealPC application itself.

The `application` has the following properties:

Property	Description

clipboard	The clipboard for the application. Returns a list containing the data in the clipboard. The clipboard can contain text or PICT data. To specify a particular type write:
	
	`get clipboard as text`
	
	or
	
	`get clipboard as picture`

frontmost	Returns `true` if RealPC is in the foreground, or `false` otherwise.

selection	The selection visible to the user. For example:
	
	`tell application "RealPC"`
	`   get contents of selection`
	`end tell`

name	Returns the name displayed in the MS-DOS window title bar. For example, a demo version would return:
	
	`RealPC - For Demonstration`
	`Purposes Only.`

version	Returns the RealPC major version number. This is 1.

window

The RealPC main window.

The `window` can have the following properties:

Property	Type	Description
closeable	Boolean, read-only	Does the RealPC window have a close box? Always `false`.
titled	Boolean, read-only	Does the RealPC window have a title bar? Always `true`.
resizable	Boolean, read-only	Is the RealPC window resizable? Always `false`.
position	QuickDraw Point, read/write	The location of the top left corner of the RealPC window.
contents	Text, read-only	The textual contents of the RealPC window. This contains an extra ⏎ at the end of each line to maintain the formatting with the script editor results window.

selection

The RealPC main window selection.

The `selection` can have the following properties:

Property	Type	Description
bounds	QuickDraw rectangle, read/write	Bounds of the current RealPC selection rectangle.
contents	Text, read-only	The contents of the RealPC selection rectangle.

Miscellaneous suite

This suite consists of standard Apple Events which do not belong to any other suite.

copy

Copy the selection to the clipboard.

For example:

```
tell application "RealPC"
   copy
end tell
```

paste

Paste the selection from the clipboard.

For example:

```
tell application "RealPC"
   paste
end tell
```

RealPC suite

This suite consists of custom events specific to RealPC

key

RealPC key.

This command has no properties.

Its syntax is:

```
set key named-key-form to keystate
```

The valid *keystate* values are as follows:

Keystate	Description
press	The key behaves as if pressed once and released.
down	The key behaves as if held down. If key is repeatable it will start auto-repeating on the keyboard.
up	The key behaves as if released. If the key was auto-repeating because it was in the down state for the required time it should stop.

Note that there is no way to guarantee the number of times that a character is repeated while the key is in the down state because this depends on how long it is held down.

The possible values of *named-key-form* are as follows:

0 to 9	Arrow Right	Insert	Shift
A to Z	Arrow Up	Num *	Shift, right
'	Caps Lock	Num +	Space
`	Ctrl	Num -	Tab
-	Ctrl, right	Num /	[
.	Del	Num 0 to Num 9	\
/	Delete	Num Lock	]
;	End	Page Down	`
=	Esc	Page Up	§
Alt	F1 to F9	Pause	
Alt Gr	F10	Print Scrn	
Arrow Down	F12	Return	
Arrow Left	Home	Scroll Lock	

The following example types a ⏎:

```
tell application "RealPC"
  set key "Return" to press
end tell
```

Note that you can use the `key` command to perform actions in Windows.

LaunchWindowsApp

Runs a Windows 95 application. Its syntax is:

```
LaunchWindowsApp command
```

where *command* is a string that could be entered in the
Windows 95 **Run**… dialog box. The command may need to
include a full pathname if the application is not in the current
directory.

This command is only valid in Windows 95 and is ignored in
Windows 3.x.

reset

Reset RealPC.

TurboStart

Quits from RealPC and activates TurboStart.

This command is only valid in Windows 95 and is ignored in
Windows 3.x.

write

Insert a text string into the keyboard buffer as if it were typed in
at the keyboard. Only normal ASCII characters can be entered in
this way. The key event (described below) is provided to enter
function keys, modifier keys and so on.

The following example gives a DIR command:

```
write "DIR\r"
```

Note that the \r produces a ⏎.

Troubleshooting

This chapter gives suggested solutions to problems that you may
encounter when running PC applications on your Macintosh with
RealPC.

It also includes details of the RealPC and MS-DOS error messages,
with explanations and suggested solutions.

Common problems

The following sections give solutions to the most commonly-encountered problems when using RealPC.

Using floppy disks

How do I eject a floppy disk?

Choose the appropriate drive from the **Eject** menu.

Alternatively, press ⌘ Shift 1, ⌘ Shift 2, or ⌘ Shift 0 to eject a disk from the internal, second internal, or external drive, respectively.

Using hard disks

How do I create a new hard disk?

Use the Customize option of the RealPC installer. Alternatively, use the **Hard Disks** panel in the **RealPC Setup** dialog box; refer to *Creating new hard disk files*, page 46.

How do I make a hard disk file larger?

Use the Hard Disk Expander utility; refer to *To change the size of a hard disk file*, page 45.

I get a Windows 3.x error message, after expanding a D: hard disk, saying that the swap file cannot be found

Recreate the swap file using the Virtual Memory dialog box in the **386 Drivers** Windows control panel.

Using CD-ROM

How do I read a PC CD-ROM?

Insert the CD-ROM, and then access it as drive F:.

How do I eject a CD-ROM?

Choose the CD-ROM drive from the **Eject** menu.

Using memory

How do I set up memory for PC applications?

Use the **Memory** panel in the **RealPC Setup** dialog box; refer to *Setting up memory*, page 55.

Using the mouse

The mouse pointer has disappeared

While the mouse is selected for use by MS-DOS applications it is not available to the Macintosh. To restore it type ⌘ M.

How do I get the right mouse button for PC applications?

Type keypad = or ⌘R (or Enter on PowerBooks).

Using keyboards

How do I get PC keys on the Macintosh keyboard?

Refer to *Using the keyboard and mouse*, page 34.

How do I set up a foreign keyboard in MS-DOS?

Use the MS-DOS KEYB command; refer to *International usage*, page 75.

How do I set up a foreign keyboard in Windows 3.x or Windows 95?

Refer to *International usage*, page 75.

Using the screen

How do I change the size of the RealPC MS-DOS window?

Choose **Full Screen DOS** from the RealPC **Setup** menu.

The RealPC screen becomes corrupted by my Macintosh screen saver

Make sure you are running the SmartCopy utility.

Using printers

How do I set up the COM and LPT ports?

Refer to *Setting up serial ports*, page 65, or *Setting up printing*, page 72.

How can I print from a PC application?

Refer to *Setting up serial ports*, page 65, or *Setting up printing*, page 72.

Printing is not working properly

Check that the correct port is selected in the PC application: LPT1: for a printer selected in the Macintosh Chooser, or COM1: or COM2: for a directly connected printer.

If you are using LPT1: check that Windows or the PC application is set to the correct printer option.

Check that you are using the Insignia Printer Driver, or that the PC application is set up for the same type of printer as the setting in the **Printer Port** panel of the **RealPC Setup** dialog box.

Check that the **Auto-Send…** command is specified to ensure that data is being sent to the printer, or choose **Send to Printer**; refer to Refer to *Printing from MS-DOS*, page 89, *Printing from Windows 3.x*, page 109, or *Printing from Windows 95*, page 127.

Using serial devices

How do I use the Macintosh serial ports with PC applications?

Refer to *Setting up serial ports*, page 65.

Configuring RealPC

Where are the RealPC preferences stored?

In the **RealPC Prefs** file in the **Preferences** folder in your Macintosh System Folder.

Running PC applications

How do I install PC software with RealPC?

Refer to *Installing and running MS-DOS applications*, page 92, *Installing and running Windows 3.x applications*, page 114, or *Installing and running Windows 95 applications*, page 132.

How do I run Windows?

Refer to *Running Windows 3.x*, page 100, or *Running Windows 95*, page 116.

How do I use MS-DOS commands?

Type them at the C:\> prompt; refer to *Using MS-DOS*, page 81.

How can I edit MS-DOS files?

Use the MS-DOS editor, EDIT; refer to *Editing configuration files*, page 96. Alternatively, you can use the Windows Notepad text editor.

I get an error "application requires a VGA display"

If you try to run some Windows applications, such as Microsoft Dinosaurs, after a default installation you may get this message. To solve this problem use the **Windows Desktop…** command to change the desktop size to 640 x 480.

MS-DOS errors

These errors appear in the RealPC MS-DOS window.

Error	Explanation	Suggestion
Invalid drive	If you are trying to access drive software needed to handle shared drives is not properly set up in your startup disk.	Refer to *Setting up hard disk drives*, page 43, or *Sharing PC files between RealPC and the Macintosh*, page 49.
Not ready error reading drive A	The drive is set to **Empty** or it has no disk in it.	Insert a disk.
Not ready error reading drive C	The hard disk file is corrupted (extremely rare).	Create a new startup disk using the **Hard Disks** panel in the **RealPC Setup** dialog box.
Not ready error reading drive D	No drive D: is selected, drive D: is set to **Empty**, or the hard disk file is corrupted (extremely rare).	Select a hard disk file.
Non System disk (or similar message)	If you see this message when RealPC is starting up it usually means that there is an MS-DOS disk (which is not a startup disk) in the floppy disk drive. This may be because you have been using PC Exchange to read an MS-DOS disk.	Eject the disk and restart RealPC. Alternatively, select **Don't Boot From Floppy** in the **Floppy Disks** panel of the **RealPC Setup** dialog box.

RealPC shared drive errors

These errors appear in the RealPC MS-DOS window and relate to the use of shared drives.

Error	Explanation	Suggestion
Illegal drive specification	The drive letter you are using for a shared drive is either missing or further along the alphabet than the limit set by LASTDRIVE.	Refer to *Sharing PC files between RealPC and the Macintosh*, page 49.
RealPC couldn't find that folder	This usually means that since the last time RealPC ran the shared drive folder or disk was moved or renamed.	Use the **Shared Folders** panel in the **RealPC Setup** dialog box to select a new folder.
RealPC couldn't read that folder	The folder specified for a shared drive cannot be read.	Check your access privileges.
That name is not a folder	Only folders or disks, not documents, can be used as shared drives.	

RealPC errors

These errors are displayed in a Macintosh dialog box.

RealPC licensing

Error	Explanation	Suggestion
Sorry, this demonstration version of RealPC has expired	Only relevant to demos.	Buy a full copy of RealPC.
Sorry - Incorrect Password	The password is incorrect.	Retype it.
Sorry - Incorrect type of Password	The password is incorrect.	You should retype the password.
Thank you for trying this demonstration version of RealPC	Only relevant to demos.	Buy a full copy of RealPC.
Both the 'Name' and 'Company Name' fields must be entered	You have omitted a field in the **Personalization** dialog box.	Enter the missing field.
Sorry - there are too many RealPC users. RealPC may quit in 2 minutes. Please save your work	Your concurrent use license allows a maximum number of simultaneous users of RealPC, and this number has been exceeded.	Save your files and try again later, or ask another user to quit.
Sorry - there are still too many RealPC users. RealPC has to quit now	The number of users has not decreased.	Buy another copy of RealPC.
The number of RealPC users is now below the limit. This copy will continue running	Another user has finished and you can now use RealPC.	

Error	Explanation	Suggestion
`Sorry - there are too many RealPC users. Please try again later`	The program already has the maximum number of users allowed by your particular license.	Save your documents and try again later, or ask another user to quit.
`Please enter your RealPC Password…`		Enter the password.

Note

If these errors occur regularly you may need to upgrade your software license to allow a larger number of users. For more information refer to *Product upgrades*, page 213.

Running RealPC

Error	Explanation	Suggestion
The RealPC CPU has encountered an illegal instruction	The MS-DOS program you are running has an illegal instruction in it and RealPC cannot process it.	Try again. If the error recurs reinstall the program. Try running the program in a slightly different way. If the error occurs consistently contact Insignia technical support.
Internal error in RealPC procedure	This is a rare, but fatal, error and there is no way to recover.	Restart RealPC and retry the operations that produced the error. If the error recurs contact Insignia technical support.
RealPC does not support a ROM BASIC	You have no bootable partition on your first hard disk drive.	Check the drive attached to C:.
RealPC is in a continuous reset state	The CPU is being continuously reset. A PC would lock up in this state, but RealPC will detect it. It has been caused by the application you are running.	If the problem persists, contact Insignia technical support.
Unknown type of video adapter currently in use	An earlier version of RealPC was used with a video adapter not supported in RealPC.	Only SVGA is available in RealPC.
RealPC has been damaged. Please reload the application from your original disk	The RealPC application must be reinstalled.	Refer to *Installing RealPC*, page 7.
Sorry – can't modify resources. Please make sure that your RealPC application is writable	The RealPC application is locked or on a read-only disk.	Unlock RealPC and try again.

RealPC hard disk files

Error	Explanation	Suggestion
Can't find …	This message will have named a hard disk file which cannot be found.	It may have been moved or renamed.
Document is not a RealPC hard disk file	The selected hard disk file is not a valid RealPC hard disk file or RealPC will not properly recognize a hard disk file.	Make sure you do not have QuickFolder or Shield INIT in your System Folder. Another application may have written into the document – only RealPC should do this.
The hard disk document name must not be empty	The hard disk filename in your RealPC settings file is blank.	Use the **Hard Disks** panel in the **RealPC Setup** dialog box to assign a valid hard disk file.
Locked or already in use:…	The hard disk file specified is either locked, in use by another user.	
RealPC could not create the new hard disk document	You probably do not have the correct access privileges on a file server, are using an anti-virus extension, or the size of the hard disk was not large enough for the MS-DOS software to be loaded.	Either change the access privileges, disable the anti-virus extension, or specify a larger Macintosh hard disk.
There isn't enough space for the new Hard Disk file	There is insufficient space on the selected Macintosh drive.	Make more space available on your hard disk or create a smaller RealPC hard disk file.

Memory

Error	Explanation	Suggestion
`Out of memory`	You are running close to the minimum amount of memory needed by RealPC.	Increase the application memory size; refer to *To change the application memory size*, page 55.
`RealPC couldn't allocate the requested number of Memory pages`	There is not enough memory available to provide the requested amount of Memory.	You can try allocating less. Refer to *Setting up memory*, page 55.
`RealPC couldn't use that drive`	RealPC has a memory problem in setting up the shared drive.	Refer to *Setting up memory*, page 55.

Floppy disk drives

Error	Explanation	Suggestion
`The IBM hardware-compatible floppy disk drive is no longer attached to this machine`	The floppy disk drive that was selected for drive A: has been removed since the last time RealPC ran.	Uncheck **Use Internal Floppy as A:** in the **Floppy Disks** panel in the **RealPC Setup** dialog box.

Network drives

Error	Explanation	Suggestion
`Mac files must be accessed from a folder`	A shared drive has been given a document name; only folders or disks are valid.	

Serial ports

Error	Explanation	Suggestion
Both serial port emulations cannot use the same serial port		Ensure that COM1: and COM2: are assigned to different ports.
One of the serial port emulations is configured to use your AppleTalk port	The port that you have requested for COM1: or COM2: on RealPC is already in use by AppleTalk.	Either use the Macintosh Chooser to disable AppleTalk or use the **Serial Ports** panel in the **RealPC Setup** dialog box to reassign COM1: or COM2:.
Unable to open the serial port output file	The file that you selected for use for the serial port output may be locked, or in use by another application or network user.	

Networking errors

PC software error messages

These error messages may appear in the RealPC MS-DOS window.

Error	Explanation	Suggestion
`A File Server cannot be found (vlm.com)`	You have the wrong frame type set.	Correct your `NET.CFG` file. Refer to *Configuring ODI drivers*, page 157.
`FATAL Could not find a host Ethernet/Token Ring board (etherspc/ tokenspc.com)`	You are running `etherspc.com/ tokenspc.com` when your Macintosh does not have an Ethernet/Token Ring board.	Check your Macintosh installation.
`FATAL Board failed to initialize correctly (etherspc/tokenspc.com)`	You are running `etherspc/ tokenspc.com` when your Macintosh does not have an Ethernet/Token Ring board, or there is an error with the board.	Check your Macintosh installation.
`Warning Protocol already in use. Protocol=IP, Frame=xx, PID=xx (etherspc.com/ tokenspc.com)`	Other software on your Macintosh is already using the TCP/IP protocol. Examples are Telnet, FTP, or Internet browsing software.	Quit from the Macintosh TCP/IP software. Alternatively, if the PC TCP/IP software is Winsock compliant, you can use the RealPC Winsock driver concurrently with the Macintosh TCP/IP software.
`Warning Protocol already in use. Protocol=IPX, Frame=xx, PID=xx (etherspc/ tokenspc.com)`	Other software on your Macintosh is already using the IPX protocol.	Select a different frame type in RealPC.

Specification

This chapter gives a full technical specification of RealPC.

General specification

Feature	Specification
Processor	Pentium MMX.
ROM BIOS	AT-compatible.
MS-DOS	Version 6.22.
Memory	640 Kbytes. Extended: up to 255 Mbytes.
Hard disk drives	Two drives, `C:` and `D:`.
Network drives	Multiple drives, `E:` to `Z:`.
Floppy disk drives	Drive `A:`.
Video	VESA standard Super Video Graphics Array (SVGA) supporting 640 x 480 256 colors, 640 x 400 256 colors, 800 x 600 16 colors, or 1024 x 768 16 colors.
Display	Color on a Macintosh with at least 16 colors or grayscales; otherwise monochrome.
Sound	Windows sound, Sound Blaster, and MIDI support. Samples: 8 or 16 bit, mono or stereo. Sample rates: 11.025, 22.05, or 44.1 kHz.
Windows desktop	Black & white, 16 colors, 256 colors, thousands, or millions. Size: 436 x 240 to 1600 x 1200.
Printer port	One port, `LPT1:`.

Feature	Specification
Printer	Insignia Printer Driver, PostScript printer, Epson LQ-2500 (132 columns), or direct printing with PowerPrint.
Serial ports	Two ports, COM1: and COM2:.
Keyboard	101-key, AT-style keyboard supported by any Macintosh keyboard.
Joystick	Macintosh compatible joystick.
Mouse	Microsoft Bus Mouse compatible.
CD-ROM drives	One drive; Microsoft CD-ROM extension software included.

Networking specification

Feature	Specification
Network drivers	ODI, NDIS, and WINSOCK.
Novell NetWare	NetWare 4.x client.
Microsoft networking	MS Client 3.0.
Compatible Ethernet or Token Ring hardware	Any Ethernet or Token Ring adapter and driver conforming to the Apple standard.

Refer to the **ReadMe RealPC** file for details of the supported Token Ring and Ethernet cards.

Glossary

Application icon
: In Windows, a graphic icon that represents a running application. This icon appears only after you start an application and reduce (minimize) it.

Application window
: In Windows, the window containing the work area and menu bar for an application. The name of the application appears at the top of the window.

ASPI
: Advanced SCSI Programming Interface. A standard developed by Adaptec to allow PCs to access a wide range of SCSI devices.

AUTOEXEC.BAT
: A special batch file that is executed each time a PC restarts.

Batch file
: A text file containing MS-DOS commands that can be executed to run the commands it contains as if they were typed in at the keyboard.

Boot
: The PC terminology for starting up the computer.

CD-ROM
: A read-only form of data storage, using standard Compact Disc media, capable of providing over 600 Mbytes of data.

CONFIG.SYS
: A special MS-DOS text file that contains commands to configure the MS-DOS operating system.

Control menu box
: An application running in Windows has a control menu box at the top left of the application window. This allows you to control the characteristics of the window and switch between applications.

Directory
: The PC name for a folder. As on the Macintosh, it can contain files and other directories.

Ethernet
: A widely used network system. The Ethernet cabling system and communications method have been standardized by the IEEE 802.3 committee and by ISO. Ethernet has a default frame type of Ethernet_802.2.

Ethernet II
: One of the standards that can be used on an Ethernet cabling system.

EtherTalk	Apple's data-link product that allows an AppleTalk network to be connected by Ethernet cables. It is an Apple Computer networking standard which is based on, and is compatible with, Ethernet.
Expanded memory	The LIM (Lotus, Intel, Microsoft) standard for extending the amount of memory available to PC applications beyond their original 640 Kbytes.
Extended memory	The XMS (Extended Memory Specification) for extending the amount of memory available to PC applications using 80286 or better protected mode.
Extension	The last part of an MS-DOS filename which can be used to specify the type of file. It consists of a period and up to three letters; for example, .BAT.
FDHD	An alternative name for the Macintosh SuperDrive.
Frame	A unit of information that is transmitted over the network. It is also referred to as a message packet. Your frame structure can differ depending on the frame type in use. You should ensure that your computer is configured for the appropriate frame type.
Frame type	A variation of a protocol, defining the internal structure of a packet. When setting up networking you need to ensure the correct frame type is selected for your network.
Group	A collection of applications, accessories, or documents within the Windows 3.x Program Manager.
IEEE (or ISO) 802.3	A standard developed for Ethernet networks, defining the physical cabling and software protocols. See *Frame type*.
Internet	An internet is an interconnected group of networks. When written as Internet it refers specifically to the information superhighway.
IPX	The Novell communication protocol, standing for Inter-network Packet eXchange. It creates, maintains, and terminates the connections between network devices (such as computer file servers and routers). It also addresses and routes the outgoing data packets across the network.

ISO 9660 standard	The official term for the High Sierra standard format for CD-ROMs.
Local Area Network	A Local Area Network (or LAN) consists of computers and shared devices connected to a single network transmission cable in a limited area, usually a single building or section of a building.
MIDI	Musical Instrument Digital Interface; a standard format for digitally encoding music.
MMX	A technology integrated with recent releases of Intel's Pentium processors to provide multimedia extensions for use by games, education, and entertainment software.
MS-DOS	Microsoft Disk Operating System; the original system software and filing system used on IBM PC or compatible computers.
NDIS	Network Driver Interface Specification, a standard defined by Microsoft and 3Com. It is the media- and protocol-independent driver standard used by network operating systems such as LAN Manager. RealPC includes NDIS drivers for Ethernet and Token Ring.
Network drive	A general name for disk drives that are treated by the PC as being on a different computer. Network drives cannot be formatted or partitioned.
Network number	A number which identifies a network in an internet, so that data can be sent to the correct destination. Ethernet and Token Ring networks have network numbers.
NetWare	Novell's operating system that runs on file servers and routers. It controls system resources and information processing on an entire network or inter-network.
NuBus	A standard expansion slot for Macintosh computers, which allows Token Ring or other cards to be added. Some Macintosh computers may require a PDS to NuBus adapter to allow them to accept NuBus cards.

ODI	Novell's Open Data-Link Interface. It supports media- and protocol-independent communications by providing a standard interface that allows multiple protocols to share a single network board without conflict. RealPC includes ODI drivers for Ethernet and Token Ring.
ODINSUP	A Novell converter program which allows the use of NDIS client applications, such as Microsoft LAN Manager, with ODI drivers.
Packet	A unit of information that has been formatted for transmission on a network. A packet contains not only data but also its destination and source.
PCI	Peripheral Component Interconnect, a standard for PC and Macintosh interface cards supported by recent Macintosh computers.
PDS	Processor Direct Slot. An expansion slot found in many Macintosh computers, the PDS provides direct connection to the processor. Some network cards are installed in the PDS rather than a NuBus or PCI slot.
Protocol	A set of procedural rules that permit the orderly exchange of information within and across a network. These rules govern the content, format, timing, sequencing, and error control of the messages being exchanged on a network.
RISC	Reduced Instruction Set Computer. A microcomputer architecture designed with a simpler instruction set to allow faster execution speeds to be achieved.
SCSI	Small Computer Systems Interface (pronounced 'scuzzy'), the industry standard for connecting peripheral devices to host computers. Most Macintosh computers have SCSI ports as standard.
SNAP	Sub Network Access Protocol frame type. There are SNAP frame types for both Ethernet and Token Ring. They are extensions of the basic 802.3 and 802.2 frame types, allowing more addressing flexibility.
Sound Blaster	A hardware sound interface for the PC developed by Creative Technology Ltd.

SuperDrive	The dual-format 3.5-inch floppy disk drive provided on all recent Macintosh computers. It can read, write, and format both Macintosh disks and MS-DOS disks.
SVGA	Super Video Graphics Array, an extension to VGA providing higher resolution and more colors.
SYSTEM.INI	A Windows initialization file.
TCP/IP	Transmission Control Protocol/Internet Protocol. A widely-used industry standard for connecting different types of computers. An internet is an interconnected set of networks.
Type	A four-character code which identifies the type of document created by an application on the Macintosh. RealPC allows you to specify what type code is allocated to the files it creates.
Token Ring	A network with a ring layout, where all network devices are connected in a daisy chain system and pass tokens from one attached device to another.
VESA	Video Electronics Standards Association, a widely-adopted set of display standards for PCs.
VGA	Video Graphics Array, the most widely-accepted standard for PC graphics displays.
Volume	An alternative name for a disk.
VRAM	Video Random Access Memory, memory used to store the displayed image. The amount of VRAM required depends on the display resolution and the number of colors.
WIN.INI	A Windows initialization file that allows you to customize your Windows environment.

Technical support

Insignia Solutions is committed to helping you get the most out of your software. As a registered customer of Insignia Solutions, you are entitled to free warranty support for your Insignia products.

The information below will be helpful if you need to call for technical assistance. Please take a moment to fill this out:

Software name:

Version:

Serial number:

Computer model:

RAM (Mbytes):

Operating system:

Before you call technical support, please follow this pre-call checklist so our support technicians can help you more quickly and efficiently:

➤ Consult the documentation included with your product. It should provide answers to many of your questions.

➤ Have your software serial number available when you call.

➤ Let the technician know whether the program worked correctly prior to the problem you are experiencing, and whether you made any changes to your computer environment.

➤ If possible, be prepared to reproduce the sequence of steps or use the application that demonstrates the problem.

➤ Make a note of any error messages that appeared.

Technical support contacts

USA/Canada

Phone:	(408) 327-6500
Fax:	(408) 327-6343
Fax response:	(408) 327-6295 or 800-876-3872
Internet:	mactech@isinc.insignia.com
World Wide Web:	http://www.insignia.com/

Technical support is available from 6am through 5pm, PST, Monday through Friday.

Europe, Middle East, Africa, and CIS countries

Phone:	+44 131 451 6900
Fax:	+44 131 451 6910
Internet:	support@isltd.insignia.com

Technical support is available from 9am through 5pm, UK time, Monday through Friday.

In other countries support is provided through the authorized dealer in your country.

Software registration

Software registration is the key to receiving the full benefits of Insignia Solutions' customer services. Please be sure to run the RealPC Registration program, or fill out and mail the Warranty Registration Card.

Periodically, Insignia Solutions will make available upgrade/update versions of certain programs at a modest charge to registered customers. As a registered customer, Insignia will notify you of upgrades/updates.

As a registered user, you will have full access to Insignia's customer service and technical support organizations.

Media replacement

Replacement CD-ROMs are available only if your Warranty Registration Card is on file. A charge applies in some circumstances.

Please contact our technical support organization to verify defective media. For information on how to contact us, refer to *Technical support contacts*, page 212.

Product upgrades

To upgrade your Insignia product, contact our sales and customer service representatives at the numbers listed below:

USA/Canada

Phone: 800-848-7677 or (408) 327-6000
Fax: (408) 327-6272
Internet: `maccs@isinc.insignia.com`

Customer service is available from 6am through 5pm, PST, Monday through Friday.

Europe, Middle East, Africa, and CIS countries

Phone numbers:

UK:	0800 667706
France:	0590 8201
Germany:	0130 81 40 90
Italy:	1678 77164
Netherlands:	060 225531
Sweden:	020 791480
Rest of region:	+44 131 458 6849
Fax:	+44 131 451 6981
Internet:	info@isltd.insignia.com

or contact your local software supplier.

Customer service is available from 9am through 5pm, UK time, Monday through Friday.

In other countries customer service is provided through the authorized dealer in your country.

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