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# Windows 95 & NT

## Configuration Help



**By Marc Goetschalckx**

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# Chapter 1. System Files

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## MSDOS.SYS

### Editing the MSDOS.SYS File

The MSDOS.SYS is a hidden, read-only, system file in the root directory of the boot disk, so you must first turn off these attributes before you can edit the file with an ASCII editor such as Notepad or Wordpad. You can use the Windows Explorer or the command line program ATTRIB to change the file attributes. After saving your changes, you must reset the file attributes and reboot the system for the changes to take effect.

```
Attrib -h -r -s
Notepad msdos.sys
Attrib +h +r +s
```

The general format of the MSDOS.SYS file is similar to INI files, with keys listed in sections with section headers given inside square brackets.

```
[section]
name=value
```

You may have to add a parameter to the Options section, if the parameter is currently set to the default value and not explicitly listed. Be careful not to add a second parameter line for the same parameter. MSDOS.SYS will typically contain a large number of comment lines containing nothing but lowercase x's. These lines are required in order to make the file size larger than 1024 bytes. Valid information may be stored both before and after these comment lines, so check the file carefully.

### Suppressing the Windows Startup Splash Screen

You can prevent the display of the Windows logo startup splash screen by setting the logo parameter in the Options section to zero. This option is particularly useful to leave the bios and boot messages of the various hardware components in your system displayed on the screen during the boot process. It is recommended that you disable the splash screen after installing new hardware or when you have hardware problems.

```
[Options]
Logo=0
```

See also **LOGO.SYS** on how to modify or replace or animate the Windows logo startup splash screen.

## Suppressing the Scandisk Initial Disk Scan

You can control whether and when ScanDisk scans the hard disk on boot up by setting the autoscan parameter in the Options section.

### [Options]

**AutoScan={0|1|2}**

**0: do not scan**

**1: scan if irregular shutdown (default)**

**2: scan every boot up**

Windows 95 OSR2 resets a bit in the Master Boot Record (MBR) every time Windows shuts down normally. If this bit has not been reset, Scandisk will run the next time that you boot the system. If you have a third party scan utility you may wish to use it instead of Scandisk and thus to disable Scandisk at boot up. If your hard disk is having problems, you may wish to test it every time you boot the system.

You may have to add the AutoScan parameter to the Options section, if it is currently set to the default value of one and not explicitly listed.

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## WIN.COM

WIN.COM is the program that actually starts Windows.

## Command Line Parameters

You can request a list of all the startup parameters with the following command:

**win /?**

You can execute this command from a DOS box or from the Run command on the Start menu. You will see a list of startup parameters similar to the following list.

### Starts Windows.

**WIN [/D:[F][M][S][V][X]]**

**/D Used for troubleshooting when Windows does not start correctly.**

**:F Turns off 32-bit disk access.**

**Equivalent to SYSTEM.INI file setting:**

**32BitDiskAccess=FALSE.**

**:M Enables Safe mode.**

**This is automatically enabled during Safe start (function key F5).**

**:N Enables Safe mode with networking.**

**This is automatically enabled during Safe start (function key F6).**

**:S Specifies that Windows should not use ROM address space between**

**F000:0000 and 1 MB for a break point.**

**Equivalent to SYSTEM.INI file setting:**

**SystemROMBreakPoint=FALSE.**

**:V Specifies that the ROM routine will handle interrupts from the hard**

**disk controller.**

**Equivalent to SYSTEM.INI file setting: VirtualHDIRQ=FALSE.**

**:X Excludes all of the adapter area from the range of memory that Windows scans to find unused space.**

**Equivalent to SYSTEM.INI file setting: EMMEExclude=A000-FFFF.**



# Chapter 2. Windows Installation

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## Setup (Windows 95 only)

### Clean Registry Mode

The Windows 95 Setup program has a wide variety of switches that you can use to control the execution of this setup program. You can list the various switches by booting to DOS mode and then running the Windows 95 Setup program with the `/?` switch. However, not all switches are listed.

One unlisted switch is the `/p` switch which lets you pass instructions directly to the detection manager.

In order to skip the Registry during hardware auto-detection, you need to specify the `/p` switch with the "f" option. This is called the Clean Registry mode, and it causes the root branch of the Registry to be cleaned before the detection starts. Note that this switch only works when you run `SETUP` from the DOS prompt, it does not work if the graphical user interface portion of Windows 95 has already been started. Give the following command at the DOS prompt

```
SETUP /p f
```

### Verbose Mode

The Windows 95 Setup program has a wide variety of switches that you can use to control the execution of this setup program. You can list the various switches by booting to DOS mode and then running the Windows 95 Setup program with the `/?` switch. However, not all switches are listed.

You can use the `/g=<n>` switch to control the amount of information displayed by the detection program during its execution. Note that this switch only works when you run `SETUP` from the DOS prompt, it does not work if the graphical user interface portion of Windows 95 has already been started. Give the following command at the DOS prompt

```
SETUP /g={0,1,2,3}
```

The default setting is 0, which does not generate any information at all. The highest level of reporting is level 3, which shows all the resources used by the devices that have been detected as well as showing a progress bar. If the computer is having a

problem during the detection process, then this level will show which devices have been loaded as they are detected.

---

## Internet Services Manager (Windows NT Only)



The Internet Services Manager is used to configure the Peer Internet Services for Windows NT 4.0 Workstation, such as FTP, Gopher, and HTTP. The filename is INETMGR.EXE and it is located in the `\Winnt\System32\inetsrv` directory. To configure Internet services for Windows NT 4.0 Server, use the Internet Services Manager.



The Internet Manager is not available in Windows 95. Some third party utilities are available to provide FTP host service under Windows 95. All versions of Windows have a command-line FTP client. There are also third party utilities available for GUI FTP client software, such as **WSFTP** from Ipswitch, and FTP host service, such as WSFTP Pro from Ipswitch. Microsoft FrontPage 98 includes both an HTTP and FTP host services for Windows 95.

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## Dial-Up Networking and Scripting Tool

### Introduction

The Dial-Up Networking combined with the Dial-Up Scripting tool allows the automated connection to external computers and networks.

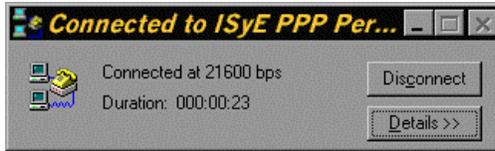
The implementation of Dial-Up Scripting is slightly different between Windows 95 and Windows NT 4.0. Windows 95 itself has three different versions, the original one installed with Windows 95, the newer version available with the ISDN Accelerator Pack and the service release OSR2, and the newest version available from the Microsoft web site. Windows NT 3.51 implemented this feature in still a different way. Windows 95 and Windows NT 4.0 share the same scripting language, while Windows NT 3.51 used a different language. This is important for users who upgraded to Windows NT 4.0 from Windows NT 3.51 since the upgrade procedure preserved the old scripts and dial-up scripting methods.

### Different versions for the Various Operating Systems

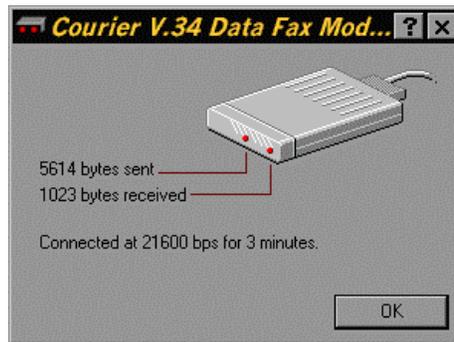
#### *Windows 95 Original Version*

The original version of the Dial-Up Networking utility displayed the status of the active connection in a window and with a modem icon in the tray area, with lights flashing to indicate data sent and received. An example of this window is shown in Figure 1. Opening the modem icon displays a larger window that reports the number of bytes sent and received during the current session. An example of this window is shown in Figure 2.

The new version displays the active connection with a window and with an icon showing two computers in the tray area and the computers flash to indicate data sent and received. Opening the modem icon shows a window that combines those two statistics. An example of this window is shown in Figure 4.

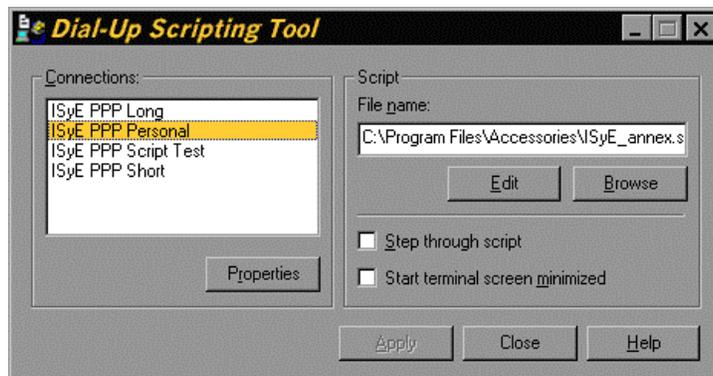


**Figure 1. Status of a Dial-Up Networking Active Connection**



**Figure 2. Bytes Sent and Received of a Dial-Up Networking Active Connection**

The Dial-Up Scripting Tool is also called Scriptor after its file name SCRIPTER.EXE. In the original version Dial-Up Networking the script file was attached with the dialog window shown in Figure 3.

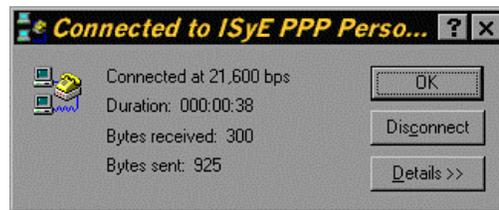


**Figure 3. Dial-Up Networking Scripting Tool**

## **Windows 95 Updated Version of Dial-Up Networking**

The Dial-Up Scripting Tool is built into the updated version of the Dial-Up Networking utility. An updated version of the Dial-Up Networking utility is included in the Microsoft ISDN 1.1 Accelerator Pack. This pack can be downloaded from the Microsoft web site at [www.microsoft.com/windows/software/isdn.htm](http://www.microsoft.com/windows/software/isdn.htm) as file MSISDN11.EXE. The newer version is also included in the OSR2 (OEM Service Release 2).

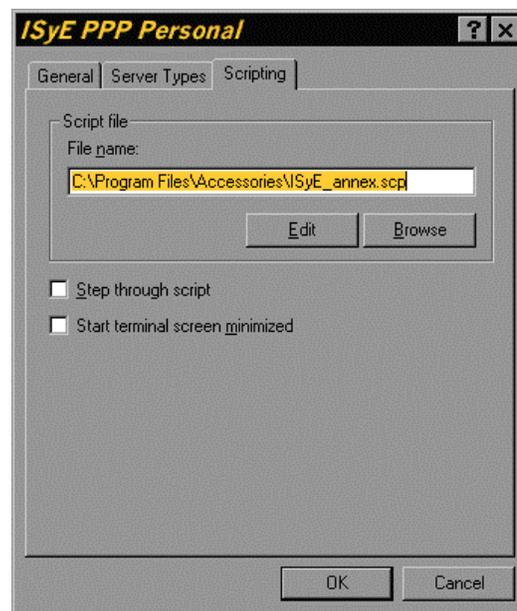
The new version combines the two windows with the connection duration and the sent/received bytes of the original version into a single window, which is shown in Figure 4.



**Figure 4. Combined Statistics of a Dial-Up Networking Active Connection**

The updated version allows you to connect to a service provider without having to click OK at the Connect To window. Open the Dial-Up Networking and select Settings from the Connection menu and deselect *Prompt for info before dialing*.

The new version also incorporates the same functions as Scripter did, such as linking a Dial-Up Networking profile with a script, stepping through a script, etc... During the installation of the new version the file SCRIPTER.EXE is deleted without warning.



**Figure 5. Dial-Up Networking Scripting Tab**

To install the updated version of the Dial-Up Networking utility when you are running the original version of Windows 95 install the ISDN pack. If you do not want to keep the ISDN utilities, you can delete them in the standard way. Select the Add/Remove Programs applet in the Control Panel, click on the Windows Setup tab, select the Communications\Details and deselect the Microsoft ISDN 1.1 Accelerator Pack. After you have confirmed all your choices, the ISDN Accelerator Pack will be removed, but the update version of the Dial-Up Networking will not be removed.

## Windows NT 4.0

The Dial-Up Scripting Tool is built into the Dial-Up Networking utility. The script file is attached with the dialog window shown in Figure 6 when you press the Script tab.

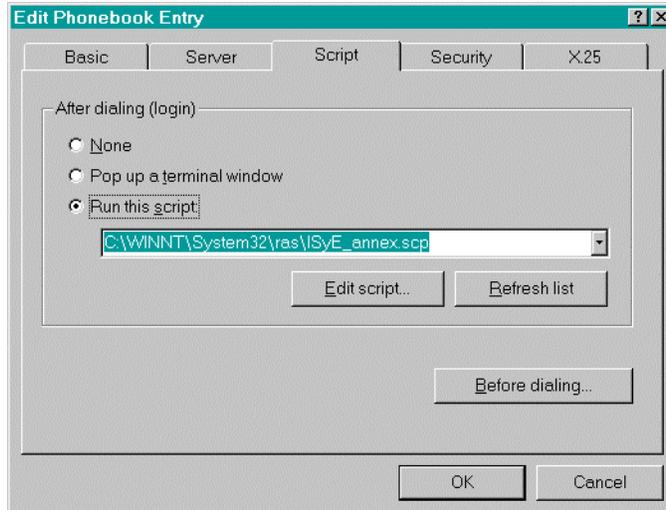


Figure 6. Dial-Up Networking Scripting Tab in Windows NT

The Dial-Up Monitor will display the number of bytes sent and received and other characteristics of the current communications session.

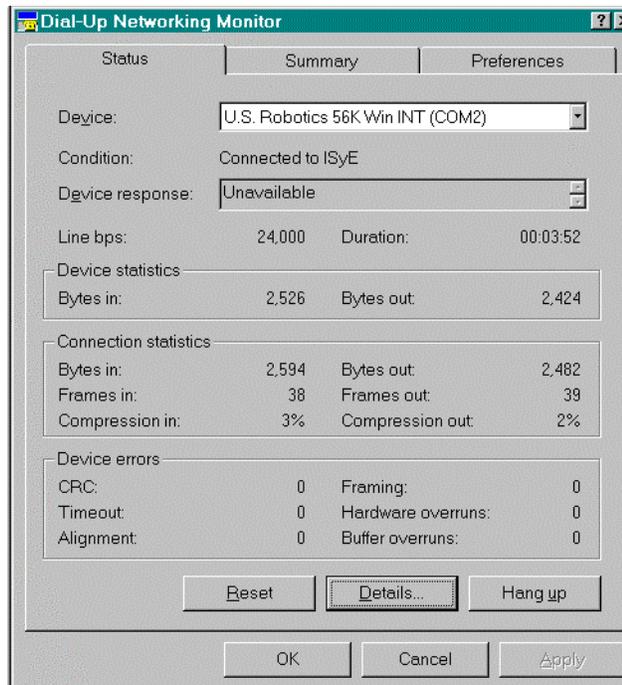


Figure 7. Dial-Up Networking Monitor in Windows NT

## Dial-Up Connection Automation Scripts (\*.SCP)

Windows 95 provides several standard Dial-Up Connection scripts. For example, to connect to CompuServe, the script CIS.SCP has been provided. To connect to other Internet service providers, you might have to modify one of the provided PPP or SLIP scripts.

The Script language is documented in the Dial-Up Scripting Tool's Help file and in the Microsoft Word file Script.doc.. For Windows 95 this file is stored in the directory \Program Files\Accessories\. For Windows NT 4.0 this file is stored in the directory \Winnt\System32\Ras\.

Two examples of script files are given next. The first one connects with the PPP protocol by dialing the host computer.

*Code Listing 1. PPP Dial-Up Connection Script with no Call Back*

```
proc main
  waitfor "Annex username:" until 5
  transmit "your_user_name^M"
  waitfor "Annex password:" until 5
  transmit "your_user_password^M"
  waitfor "your_system_prompt" until 15
  transmit "ppp^M"
endproc
```

A more secure alternative consists of the client contacting the server and requesting a connection. The server then calls back the client at a pre-arranged telephone number.

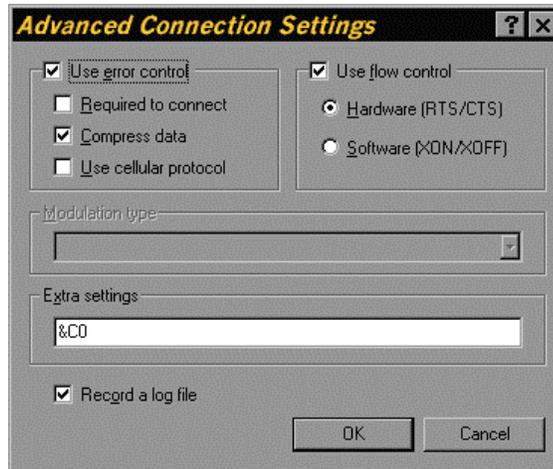
*Code Listing 2. PPP Dial-Up Connection Script with Call Back*

```
proc main
  waitfor "Annex username:" until 5
  transmit "your_user_name^M"
  waitfor "Annex password:" until 5
  transmit "your_user_password^M"
  waitfor "Access Code: " until 25
  transmit "your_user_accesscode^M"
  waitfor "RING"
  transmit "ATA^M"
  waitfor "Annex username:" until 25
  transmit "your_user_name^M"
  waitfor "Annex password:" until 25
  transmit "your_user_password^M"
  waitfor "your_system_prompt" until 25
  transmit "ppp^M"
endproc
```

In order for this script to work, the modem will have to ignore the DTR signal so that the script does not terminate when the server breaks the connection. This can be achieved by setting a modem connection setting to &C0.

1. Double-click the Modem applet in the Control Panel
2. Click on the modem that will be used and click on the Properties button
3. Select the Connection tab

4. Press the Advanced Button
5. Type &C0 in the settings field, where the last token is the numeral zero not the letter O
6. Press on all the OK buttons until you are back at the Control Panel



**Figure 8. Advanced Modem Connection Settings**

Note that the same dialog box can also be used to specify that a log file records all connection commands and connections.

## Required Installation Sequence

When changing or installing dial-up hardware or software the following installation sequence has to be followed. If the sequence is not followed exactly, then functions and tools seem to fail without explanation.

For example, changing a modem might require that Dial-Up Networking is reinstalled. In turn the Dial-Up Scripting Tool does no longer work after the Dial-Up Networking has been reinstalled. The Dial-Up Scripting Tool shows that the correct script is applied to the Dial-Up Networking connection icon, but when you double-click the connection icon, Dial-Up Networking does not log you on and after the time out interval disconnects.

So the correct installation sequence is:

1. Modem
2. Dial-Up Adapter in Networks
3. Dial-Up Networking in Communications of Add/Remove Programs
4. Dial-Up Scripting Tool (Windows 95 Only)

The first three correspond to applets in the Control Panel. For Windows 95, the Dial-Up Scripting Tool is installed with the following steps:

1. In Control Panel, select the Add/Remove Programs applet.
2. Select the Windows Setup tab and click Have Disk

3. Type the path of the RNAPLUS.INF file and click OK. For example, if you have the Windows 95 CD-ROM, the path is

**<drive>:\Admin\Apptools\Dscript\Rnaplus.inf**

where <drive> is the letter corresponding to the CD-ROM drive.

4. Click on the "SLIP and Scripting for Dial-Up Networking" check box to select it and click Install.

In Windows 95, the Dial-Up Scripting Tool is by default installed in the \Program Files\Accessories directory. In Windows 95, this should also be the location of the scripts.

For Windows NT 4.0, the Dial-Up Scripting Tool is built in and so the above procedure is not required. The script files should be stored in the \Winnt\System32\Ras directory.

If you do not have the Windows 95 CD-ROM, you can download the Dial-Up Scripting Tool from Microsoft's web site at [www.microsoft.com/windows/software/admintools.htm](http://www.microsoft.com/windows/software/admintools.htm) and click on "Dial-Up SLIP and Scripting Support"

## Redialing

Many times it is convenient if the computer attempts to establish a communication connection at a later time automatically, when the communication line is currently busy. Setting the redialing properties is done in different dialog windows for Windows 95 and Windows NT.

You can also set the redial parameters by editing the Registry keys *EnableRedial*, *RedialTry*, and *RedialWait*.

### Windows 95

Starting the dialog window for setting some of the user preferences for the Dial-Up networking is very confusing and tricky at best. Start Windows Explorer and select the Dial-Up networking folder in the left pane. A new top-level menu command appears, called Connections. This top-level menu command disappears when you select any other folder than Dial-Up Connections. When select the Connections command the dialog window shown below will be displayed.

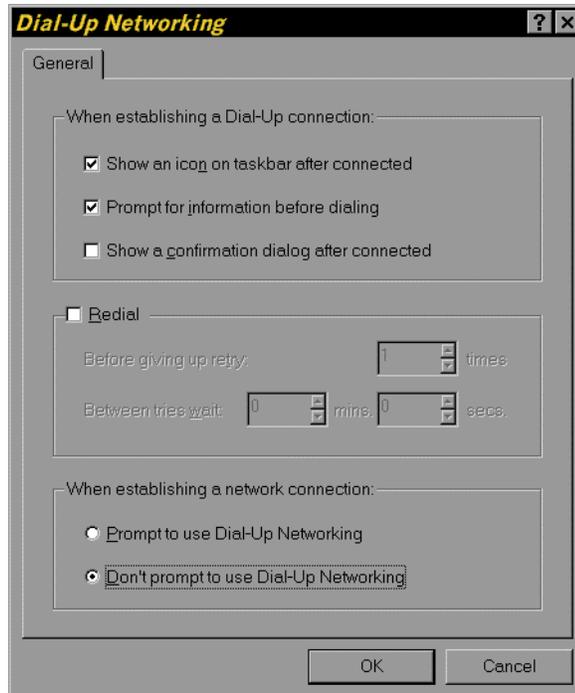


Figure 9. User Preferences Dialog Window for Dial-Up Networking in Windows 95

## Windows NT

Click on My Computer on the Windows desktop, then on Dial-Up Networking, and then on the More button and select User Preferences. You can then set the redialing properties in the dialog box. Note that in Windows NT you can specify Redial on Link Failure, which you cannot do in Windows 95.

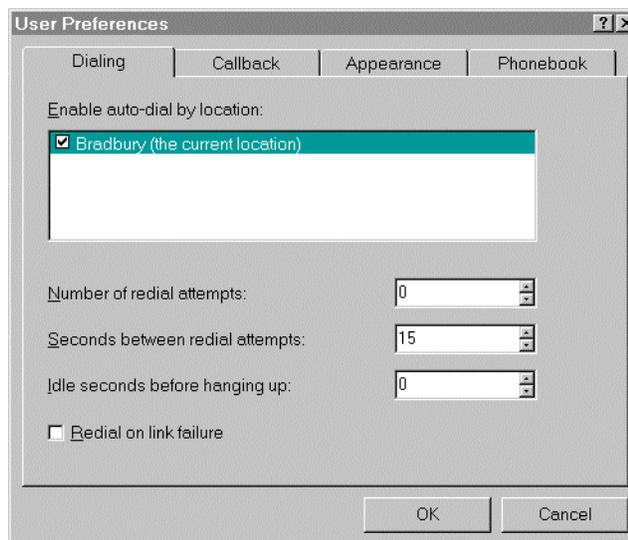


Figure 10. User Preferences Dialog Window for Dial-Up Networking in Windows NT

## Dialing Properties

The Dialing Properties allows you to specify the rules for accessing long distance and international phone numbers depending on your current location. You can have different rules for different locations, such as at the office, at home, or in a hotel room. Each set of rules can be saved and restored as a dialing profile.

Due to the proliferation of cellular phones and second, and third, phone lines per household for Internet access, many areas in the country do no longer follow the simple rules of seven digit local phone numbers and one plus ten digit long distance phone numbers. The Telephony applet in Service Pack 4 for Windows NT and in Windows 98 allows you to define the area code rules applicable in your area. The Dialing Properties window of the Telephony applet is illustrated in Figure 11 and the Area Code Rules window is illustrated in Figure 12.

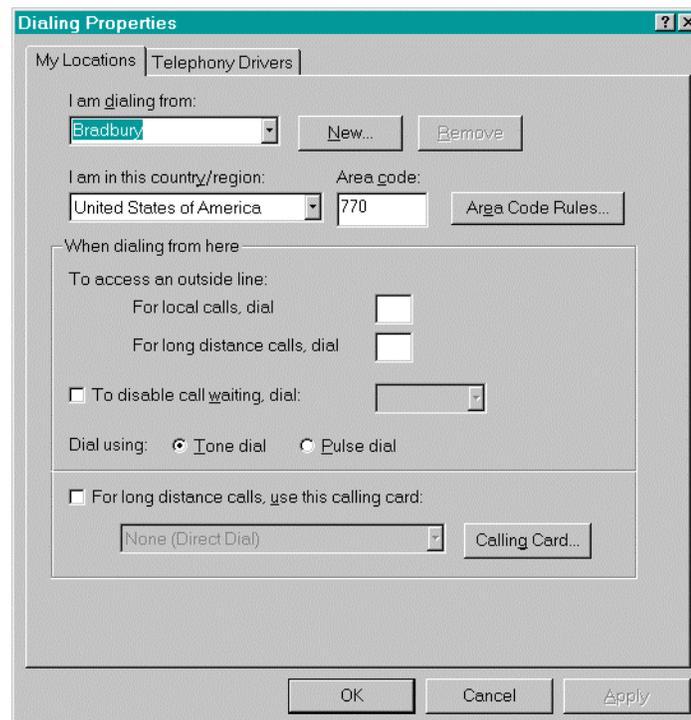
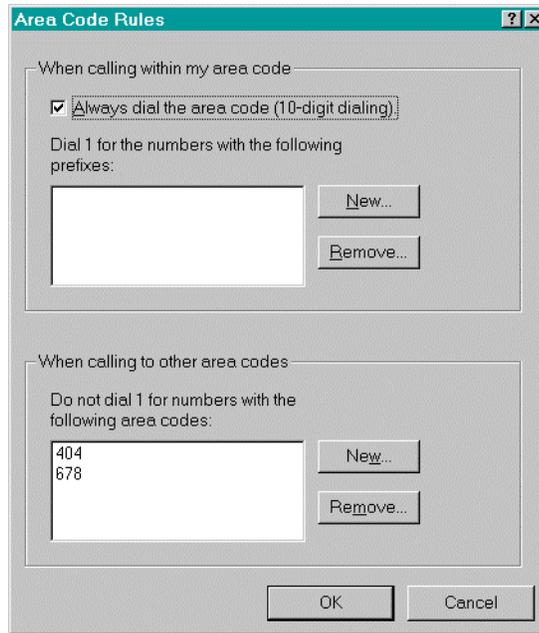


Figure 11. Dialing Properties in the Telephony Applet of Windows NT



**Figure 12. Area Code Rules in Windows NT**

For Windows 95 the Dialing Properties are reached from the Modems applet in the Control Panel. It does not allow you to have ten digit local phone numbers or long distance phone numbers inside your area code. The Modem applet is illustrated in Figure 13 and the Dialing Properties window of the Modems applet is illustrated in Figure 14.



**Figure 13. Modems Applet in Windows 95**

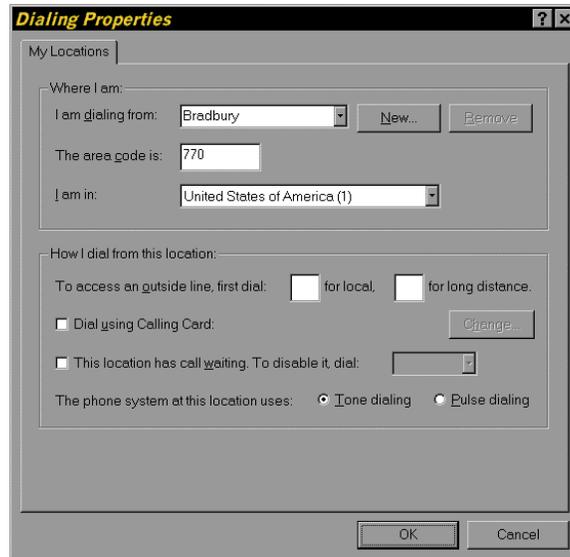


Figure 14. Dialing Properties in Windows 95

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## Direct Cable Connection

There are several ways to connect two or more computers together so that they can access each other's files and printers. If you want to connect only two computers and only want to access the files, then you can use a null-modem or parallel cable and the Direct Cable Connection software included in Windows 95. This is without doubt the most inexpensive way, but also has the most limitations. The Direct Cable Connection software most likely not installed with your original Windows 95 setup. Its default location is the Accessories folder.

To install the Direct Cable Connection, run the Add/Remove Programs applet in the Control Panel, click the Windows Setup tab, select Communications, press the Details button and check Direct Cable Connection. You will also need Dial-Up Networking, so make sure that this option is checked as well. You need to install this software on both computers. The Direct Dial Connection applet will appear in the Control Panel. You now can connect both computers with either a null-modem serial or parallel cable.

Run the Direct Dial Connection applet on both computers and decide which computer will be the host and which will be the guest. The guest computer will gain access to the host computer's files. You can disconnect and reverse the roles of guest and host at any time. The drives of the host computer will be visible in their own Explorer-like window, but not in Explorer itself or in other applications. So the usefulness of this connection method is very limited.

A much more intuitive and powerful connection can be established by installing an Ethernet network card in each computer and connecting them using one of the network protocols such as NetBEUI, TCP/IP, or IPX/SPX.

---

# Fax

## Introduction

The fax subsystem allows you to send faxes directly from Windows if you have a modem with fax capabilities installed. The different operating systems have different fax components. In addition, there are several commercial applications that provide more extensive fax capabilities.

Once installed, the settings for the fax component can be modified from the Fax applet in the Control Panel.

## Windows 95



The fax component can be setup during the Windows installation or at a later time from the Install Add/Remove Programs applet in the Control Panel. Select the Windows Setup tab and check the Microsoft Fax box.

Installing Microsoft Outlook 98 after the Microsoft Fax service has been installed will disable the fax service. The Fax printer still appears in the list of installed printers, but the Fax applet in the Control Panel has been removed. You can still print to the Fax printer from within your application but no fax will actually be sent.

## Windows NT



The fax component does not come on the original Windows NT CD-ROM but can be downloaded from the Microsoft Web site. Different versions are available for the different processor supported by Windows NT. For Intel processors the fax component archive can be downloaded from [http://www.microsoft.com/fax\\_i386.exe](http://www.microsoft.com/fax_i386.exe).

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# Using Device Drivers of Previous Versions

## Windows 95

Occasionally you will find that Windows 95 does not have a driver for the particular hardware that you have installed in your system, especially if the hardware is old or very specialized. In that case, you may be able to use the device driver that came with Windows 3.1 or with your hardware.

1. Bring up the Control Panel and select the Add New Hardware applet.
2. When Windows asks if it should look for new hardware, select the No option. It is assumed that you previously tried the Yes option and Windows 95 could not detect your hardware.
3. Select the type of device you are installing. Select the nearest type if no type matches exactly your hardware or select Other Devices.
4. In the hardware dialog, press the Have Disk button. Insert the floppy disk with the Windows 3.1 driver and point Windows 95 to the floppy disk and press OK.

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# Identifying Windows Versions

## Windows 95

At the current time Windows 95 comes in two major versions. The original Windows 95 released in 1995 and the OSR2 (OEM Service Release 2). The latter comes only preinstalled on some computer systems purchased after May 1997, it cannot be purchased as an upgrade or a software product. There exists also a Service Pack upgrade for the original Windows 95.

To identify the version of Windows 95 on your system, open the Control Panel and click on the System control applet. Select the General page of the resulting System Properties dialog and you will see a long version number below the words Microsoft Windows 95. The original release has the version number 4.00.950, and the OSR2 has the version number 4.00.95B. If you applied the Windows 95 Service Pack 1 to the original release, the version number shown will be 4.00.950a.

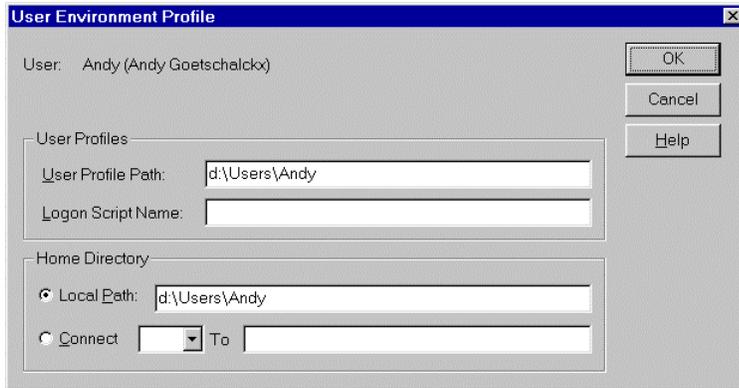
The major difference between the original release and OSR2 is FAT32. FAT32 is a 32-bit file system that avoids much of the wasted disk space inherent in the original 16-bit FAT, the file system used by DOS and the original Windows 95. FAT also cannot support hard disk larger than 2 GB, while FAT32 can handle such large disks with ease. On the other hand, no other operating system can access a disk that uses FAT32, not DOS, not Windows NT, and not even the original release of Windows 95. The full extend of the differences between the OSR2 and the original release of Windows 95 have not been determined, and you should use extra caution in applying tricks and tips developed for the original release of Windows 95.

---

# User Manager (NT Only)

## Roaming and Local Profiles

A users is said to have a roaming profile if the User Profile Path is explicitly specified in the User Environment profile. If the path is left blank, the profile is stored in directory with the name of the user in the Profiles directory of the Windows directory. One advantage of having a roaming profile with User Profile Path equal to the User Home Directory is that all files related to this user are now grouped in one directory tree and the backup of user files and settings is much easier. For example, the personal mail files created by Microsoft Outlook are stored by default in the User Profile Path. A disadvantage is that the user now has some directories created by the system in their Home Directory such as Desktop and Start Menu.



**Figure 15. User Environment Profile**



# Chapter 3. Registry

---

## Introduction

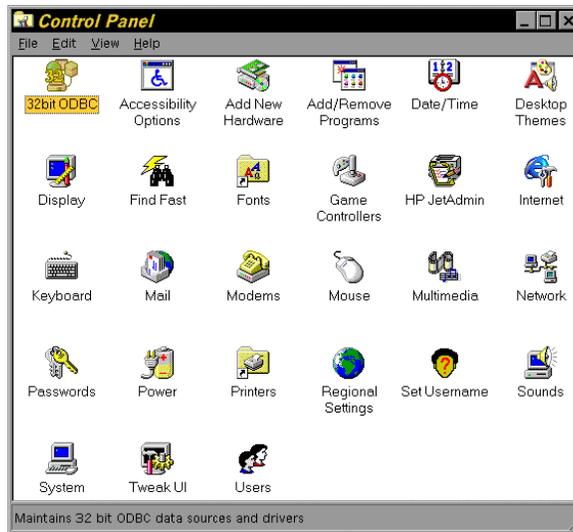
The Registry is the database which controls virtual every aspect of the Windows 95 appearance and execution. The Registry is the replacement for the WINDOWS.INI and SYSTEM.INI files in Windows 3.1. It contains also most settings and switches for Windows 95 compatible applications. The Registry thus replaces also the various application specific INI files.

The Registry is stored in the files SYSTEM.DAT in the Windows directory and USER.DAT in the respective user profiles directories. On logon the values in the Registry get updated from the policy file CONFIG.POL.



Modifying the Registry directly might make either Windows 95 or applications unusable. Hence, the Registry should only be modified by knowledgeable users. The Registry can be edited directly by the Registry Editor. This program is a very powerful but extremely dangerous tool for modifying the Registry. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

Many, but not all, settings in the Registry can be changed more safely by the applets in the Control Panel. The Control Panel displays or hides applets depending on the machine configuration, so your Control Panel might look different from the one shown in the Figure 16. The user policies can be edited with the POLEDIT.EXE program.



**Figure 16. Control Panel**

More information on the Registry and the user policies can be found in the Windows Resource Toolkit help files.

## REGEDIT.EXE and REGEDT32.EXE

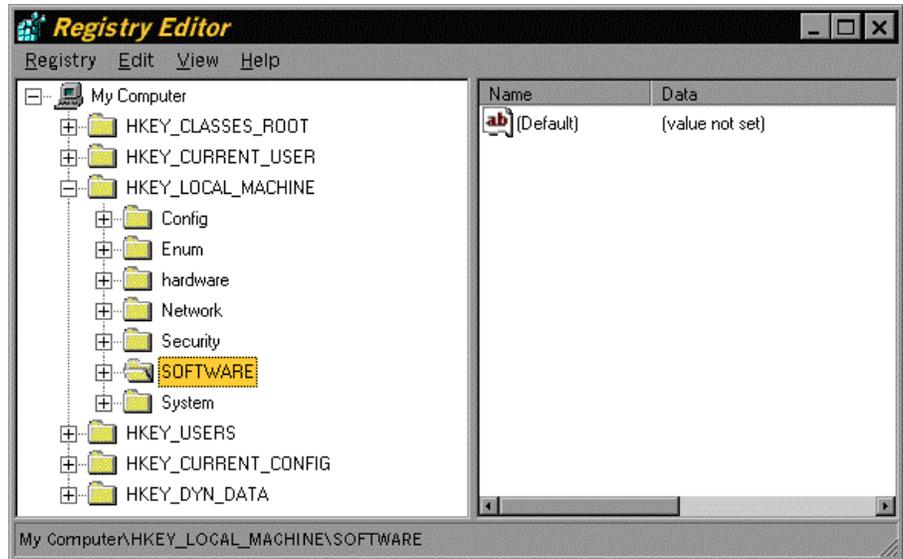


The Registry can be edited directly by the Registry Editor. This program is a very powerful but extremely dangerous tool for modifying the Registry. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

### **Windows 95**

For Windows 95 the Registry Editor program has the file name REGEDIT.EXE.

REGEDIT shows the Registry in the same format and uses the same user interface as the Explorer. REGEDIT, displaying the six root classes and the first level expansion of *HKEY\_LOCAL\_MACHINE*, is shown in Figure 17.



**Figure 17. REGEDIT Initial Screen**

Often a key depending on the current configuration of Windows 95 has to be modified. The current configuration is stored in *HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion* and its subkeys. For Windows NT systems the path to the current configuration substitutes *Windows NT* for *Windows*. A Windows 95 system should not have a key named *Windows NT*. In all following instructions, substitute *Windows* for *Windows NT* if you are modifying a Windows 95 system.

### **Windows NT 4.0**

Originally, Windows NT users were advised to use the REGEDT32.EXE program instead of the REGEDIT.EXE program. The REGEDIT.EXE program was provided solely for compatibility reasons on Windows NT systems and could crash your system. It is not clear if the current versions of REGEDIT.EXE have the same errors. REGEDT32.EXE uses the MDI window arrangement, while REGEDIT shows the Registry in the same format and uses the same user interface as the Explorer. REGEDT32, displaying the six root classes in their associated windows and the first level expansion of HKEY\_LOCAL\_MACHINE, is shown in Figure 18.

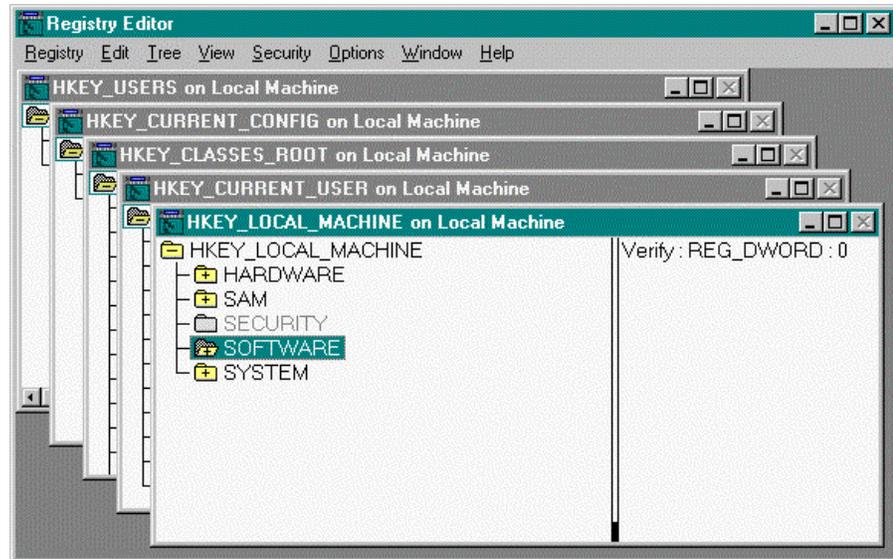


Figure 18. REGEDT32 Initial Screen

Often a key depending on the current configuration of Windows NT has to be modified. The current configuration is stored in *HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows NT\CurrentVersion* and its subkeys. For Windows 95 systems the path to the current configuration substitutes *Windows* for *Windows NT*. Since Windows NT systems have both a *Windows* and *Windows NT* key, extreme care must be taken to put the keys in the correct place in the Registry. This place depends from key to key.

### Editing the Registry Interactively

Most interactive modifications to the Registry are made in one of two ways: you can change the value of an existing key or you can add a new key, including the key name, data type, and value.

To enter a key value, just double click on the key and dialog window will be displayed with the current value. Enter the new value and press the OK button.

To add a new key, select the Add command from the Edit menu. Enter the name of the new key, the data type, and, finally, the key value, and then press the OK button. Pressing Cancel will let you undo the current change. Any change to the Registry can make your system unbootable, so if you have any doubts press Cancel and leave the Registry unchanged.

### Editing the Registry with REG files

The REGEDIT program allows the merging of configuration settings stored in a text file into the Registry. The default extension for such files is *.REG*. An example of such a REG file is given in the next code. When you double click on the REG file REGEDIT will insert the keys into the Registry.

```
REGEDIT4
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Java VM\Security]
"EditCustomPermissions"=hex:01,00,00,00
```

## Silent Merging of .REG files

The REGEDIT program allows the merging of configuration settings stored in a text file into the Registry. The default extension for such files is *.REG*. In the default operation mode, Windows 95 displays a dialog box at the end that indicates that the information was successfully merged into the Registry. This dialog box requires clicking the OK button or pressing the ENTER key before execution continues.

You can avoid the confirmation dialog box and the required key stroke our mouse click by adding the switch /S, for silent operation, to the command. For example, the following command merges the registration file without displaying the confirmation dialog box. This feature is especially useful for remote or network based installation procedures.

```
REGEDIT /S FILENAME.REG
```

Note that many Microsoft SETUP programs, such as for Excel, and WinWord, have a /Q switch for "quiet" mode.

## Editing the Registry with INF files

If you do not have access to the REGEDIT program, because it might have been removed by the system administrator, you can still enter new keys and values in the Registry from a text file. The new keys or key values are inserted in a hardware installation file. The default extension for such files is *.INF*. An example of such an INF file is given in the next code. Right-click on the INF file and select Install from the menu choices to insert the keys into the Registry.

```
[version]  
signature="$CHICAGO$"
```

```
[DefaultInstall]  
AddReg=AddTheseKeys
```

```
[AddTheseKeys]  
HKLM,"Software\Microsoft\Windows\CurrentVersion\Uninstall\Twea  
kUI",DisplayName,,"TweakUI"
```

## Finding the Windows 95 CD-ROM Key

To install or reinstall Windows 95 from the CD-ROM, the key on the sleeve of the CD-ROM is required. REGEDIT can be used to retrieve this key from the Registry, but is easier with the System Properties applet in Control Panel.

Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion\ProductId*

The key contains a numeric string with groups of five, three, seven, and five digits. The three and seven digit groups are the CD-ROM key.

If you are using Microsoft Plus!, there will be also a key for the CD-ROM key of Microsoft Plus!.

Many users simply write the CD-ROM key directly onto the label side of the CD-ROM itself, using a felt-tip marker. This practice might not be safe, since there is always a chance that the solvents in the marker's ink could damage the surface of the CD-ROM over time.

## Finding the Windows Plus! CD-ROM Key

To install or reinstall Microsoft Plus! from the CD-ROM, the key on the sleeve of the CD-ROM is required. REGEDIT can be used to retrieve this key from the Registry, but is easier with the System Properties applet in Control Panel.

Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\Current Version\Plus! ProductId*

The key contains a numeric string with groups of five, three, seven, and five digits. The three and seven digit groups are the CD-ROM key.

There will be also a key for CD-ROM key for Windows 95.

## Shared DLLs

If an application uses a common or shared DLL it must increase the usage counter of that DLL in the Registry. During uninstallation, the application must decrease the usage counter of a common or shared DLL. Most of the time, shared DLLs are located in the Windows subdirectories, such as System and System32. Large suites of applications are prime candidates to have shared DLLs that are not located in the Windows subdirectories. For example, the DLLs for the spell checking in the Microsoft Office suite are located in the Common Files subdirectory of Microsoft Office. Sometimes, obsolete DLLs remain on your hard drive and with a positive usage counter in the Registry even if all the applications that used them have been uninstalled. You can set the usage counter of this DLL to zero by editing the Registry directly.

Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\Current Version\SharedDLLs*
3. A list of all the shared DLLs with the full path to the location where they are stored on your hard disk and with their usage counter is displayed. Double click on the name of the obsolete DLL and set its value to zero.

---

# Windows Operation

## Removing Items from the Add/Remove Program List

When executed from the Add/Remove Programs applet found in the Control Panel, the install program for a Windows 95 application will store instructions for removing that application from the system. Windows 95 shows a list of the programs that can be removed by Windows 95 in the Install/Uninstall box of the Add/Remove Programs applet of Control Panel. If you choose to remove the application, then will be deleted from your hard disk and its name will be deleted from the program list. However, if you have deleted a program manually by deleting the files and/or directory from your hard drive without going through the Add/Remove applet, then Windows 95 can no longer delete those programs automatically and these programs will remain in the list.

The programs can be deleted from the list by directly editing the Registry. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\Current Version\Uninstall*
3. A list of the programs that Windows 95 assumes it can uninstall is shown.
4. Highlight the folder of the program you want to remove from the Add/Remove list and press the DELETE button.

## Removing Items from the Run MRU Program List

The Run command on the Start menu lets you run any program by typing in its name and necessary command line parameters. The commands that you run in this way are stored in the Registry. Each time you use a command that has already been stored, it moves to the top of the list. When the list gets to full, commands are removed from the end. The list can contain 26 commands, indicated with a letter from a to z. Thus, the most recently used (MRU) commands stay on the list. If you don't use the Run command, the list can contain commands from very long time ago, dating all the way back to the installation of Windows 95. The list can also contain commands with erroneous parameters or powerful system level commands that you do not want to execute with an inadvertent mouse click.

Modifying the MRU command list can be done by editing the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_CURRENT\_USER\Software\Microsoft\Windows\Current Version\Explorer\RunMRU*
3. A list of the programs that have been run from the Run command is shown.

4. Highlight the letter of the program you want to remove from the MRU list and press the DELETE button.

A word of caution is necessary here. Be careful not to delete the *Default* value or the MRUList value.

If you want to delete all the commands in the MRU list, then the process can be automated by creating and saving an empty MRU list in a Registry file and then merging this file with the Registry. Create a new file with Notepad or any other text editor and give it the name CleanMRU.reg. The extension *reg* signals the explorer that this file is a Registry file to be merged into the Registry. The following lines would completely clean the MRU list

**Code Listing 3. Clean MRU command list Registry file**

```
REGEDIT4
[HKEY_CURRENT_USER\Software\Microsoft\Windows\Current
Version\Explorer\RunMRU]
"a"=""
"MRUList"="abcdefghijklmnopqrstuvwxy"
"b"=""
"c"=""
"d"=""
"e"=""
"f"=""
"g"=""
"h"=""
"i"=""
"j"=""
"k"=""
"l"=""
"m"=""
"n"=""
"o"=""
"p"=""
"q"=""
"r"=""
"s"=""
"t"=""
"u"=""
"v"=""
"w"=""
"x"=""
"y"=""
"z"=""
```

Double click the file in Explorer to launch it. If everything completes successfully, you will get a message the contents of the file have been merged into the Registry. You need to restart Windows so that your changes can take effect.

## Unloading Dynamic Link Libraries on Program Termination

Many programs load and use dynamic link libraries (DLL) during their execution. If these programs get terminated prematurely or even normally, the DLL might remain loaded in memory. When developing DLLs this causes a problem, because the

compiler and linker will not be able to write the new version of the DLL to the disk, since the old version of the DLL is still in use.

Under Windows 95, you can make the Explorer unload the DLLs after the termination of the program by setting a key in the Registry. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\Current Version\Explorer*
3. Click the right mouse button in the open area of the right panel and select the New String item from the menu.
4. Type *AlwaysUnloadDll* exactly for name of the new key entry and press the Enter key.
5. Double click the new key entry to open the Edit String dialog box and enter a value from 1.

You can also unload DLLs by shutting down and restarting the Explorer. The easiest way to do this is to log off and log on as a different user, if network extensions or different user profiles are enabled.

## Disabling Advanced Power Management

If Advanced Power Management (APM) is enabled, when you exit Windows 95 the system will be automatically shut down. This requires computer systems with a Plug and Play BIOS that supports APM features. This is usually the case for laptop computers.

You can control the APM features through the System applet in the Control Panel. Click the Device Manager tab and expand the System Devices item from the device list and double click Advanced Power Management. Click the Settings tab and set or remove the check mark from the "Enable power management support" to enable or disable the APM features.

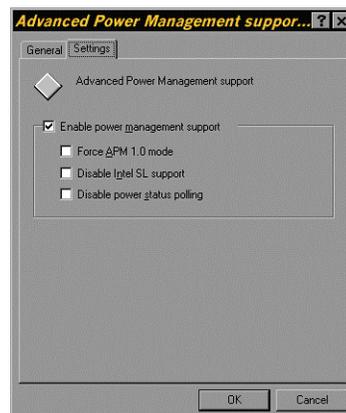
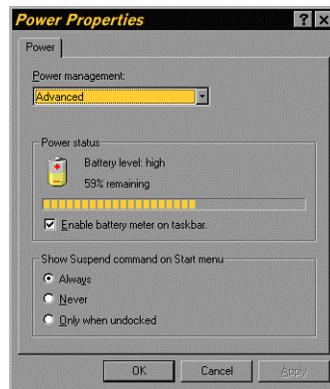


Figure 19 . Advanced Power Management Settings

If APM is enabled, a Power applet will appear in the Control Panel. Many laptops have proprietary APM features and display a corresponding applet in the Control Panel.



**Figure 20 . Power Properties Control Panel Applet**

If Windows 95 does not recognize that your system supports APM features then the Advanced Power Management entry under Systems Devices will not appear. In that case there you cannot change any settings or enable APM. The Power applet in the Control Panel will not be displayed.

## Restoring Missing Drives

If you have compressed a whole drive and then add a hard drive or CD-ROM drive to your system, then not all drive letters might show up in the Explorer.

When you compress an entire drive, DriveSpace gives the host drive's original letter to the compressed drive and assigns the host drive a new letter, several letters past the last letter actually in use. For example, if you compress all of drive D: and the last actual drive is E:, the host drive might get assigned the letter I:. When Windows steps through the list of drives, it has to skip the letters between E: and I:. It appears that each bit in the NoDrives Registry key represents a drive letter and a set bit means that the drive should be ignored. For instance, the value 192 expressed in binary format is 11000000. Considering drive A: as rightmost and working toward the left, you'll find that the two bits that are set to 1 represent drives G: and H: and those drive letters will be suppressed. The NoDrives key is undocumented, so its use might change in future releases of Windows.

You can restore the display of missing drives by editing the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
`HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\Current Version\Policies\Explorer`
3. Double click on the key *NoDrives* and enter a value of 0 to display all drive letters or enter a binary value where each suppressed drive is

represented by a 1 and each displayed drive by a zero, starting with drive A: from the right.

## Automating Windows Logon (NT Only)

When you are developing, testing, or running an NT system at home, you might want the system to perform an automatic logon each time it boots. This saves time if you crash the system regularly or bring it down and back up as part of a debug and test process. However, an automatic logon leaves your system wide open to unauthorized access and you should very carefully consider the implications. Do not implement this process on a production server or a machine accessible by more than just you.

Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows NT\Current Version\Winlogon
3. Double click on the key *AutoAdminLogon* and change the value to 1
4. Verify that the *DefaultDomainName* and *DefaultUserName* are correct.
5. Click the right mouse button in the open area of the right panel and select the New String item from the menu.
6. Type *DefaultPassword* exactly for name of the new key entry and press the Enter key.
7. Double click on the key *DefaultPassword* and set its value to the correct password for the default user

## Displaying an Unauthorized Access Message before Logon

You can add a logon announcement indicating that unauthorized access to your server or workstation is prohibited. To successfully prosecute system break-ins, the courts require that you announce that your system may only be accessed by users with a valid account. In addition, you cannot say "Welcome" during logon, because the welcome is interpreted by the courts as giving blanket permission to anyone to access your system. You can display a legal notice announcement box before logon, and the user has to specifically press OK before he or she can enter their username and password.

Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key *HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows NT\Current Version\Winlogon*
3. Double click on the key *LegalNoticeCaption* and change its value to the desired text, e.g., "This is a private Corporation server"
4. Double click on the key *LegalNoticeText* and change its value to the desired text, e.g., "Unauthorized Access Prohibited"

If you are using the Windows 95 operating system, substitute "Windows" for "Windows NT" in the above registry key.

Note that the FTP server, that is part of the Internet Services Manager, allows you to set specific access rights and logon messages for users of the FTP service on your system. The above messages are intended for users that log on locally.

## Shutdown without Logon (NT Only)

You can add a Shutdown button to the logon screen so that anyone can shut down the system before logging in. This is a dangerous modification, because unauthorized users might interrupt the normal operation of the system. This equivalent to unauthorized users having access to the power switch of your system.

Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key *HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows NT\Current Version\Winlogon*
3. Double click on the key *ShutdownWithoutLogon* and change its value to the 1

## Automatic Program Execution

When starting Windows 95 and Windows NT and logging on as user several programs are executed automatically. The sequence and the location of the information depend on which operating system you are using. You may want to disable temporarily or permanently the execution of one or more of these programs and you may have to check all of the listed locations to find the command that activates the program.

### Windows 95

The following files, folders, or registry locations specify the sequence in which drivers and programs will be loaded and executed on startup of Windows 95 and logging by a user.

1. CONFIG.SYS
2. AUTOEXEC.BAT
3. WIN.INI *load* and *run* commands
4. *C:\Windows\Profiles\Start Menu\Program\Startup* folder if there is only one set of user settings or *C:\Windows\Profiles\Username\Start Menu\Program\Startup* folder, when multiple user settings are allowed.
5. *HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run* and *HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion\RunServices* keys in the Registry

## Windows NT

The following Control Panel applets, folders, or registry locations specify the sequence in which drivers and programs will be loaded and executed on startup of Windows NT and logging by a user.

1. Services Applet in the Control Panel for all services with the automatic start attribute
2. *C:\Winnt\Profiles\Username\Start Menu\Program\Startup* folder.
3. *HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run* key in the Registry

## Redialing Dial-Up Networking Connections

You specify the behavior of Windows 95 when Dial-Up networking finds a busy line by editing the registry directly.

Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Select *HKEY\_CURRENT\_USER\RemoteAccess*
2. Enable or disable redialing by setting *EnableRedial* to either one or zero, respectively
3. If redialing is enabled, then you can specify the number of redials in *RedialTry* from 1 (01 00 00 00) to 99 (63 00 00 00). You can set the time interval between redial attempts by *RedialWait* from 0 minutes and seconds (00 00 00 00) to 119 minutes and 59 seconds (3b 00 77 00). Note that the seconds are in the leftmost byte and the minutes in the third byte.

A much safer way to specify the redial parameters is by executing the Connections command from the Windows Explorer main menu when the Dial-Up networking folder is selected.

---

## Windows 95 User Interface

### Tweak

Tweak is a Control Panel applet that is included in the PowerToys utilities pack and is available from the Microsoft web site with URL <http://www.microsoft.com>. The Tweak utility provides a graphical user interface to set a variety of Registry variables. As with all the utilities in the PowerToys utilities pack, Tweak is not an official Microsoft product and as such is not supported by Microsoft. The PowerToys pack is updated regularly by Microsoft, so download a new version every six months or so. The following figure shows the window of the 1996 version of the Tweak applet.

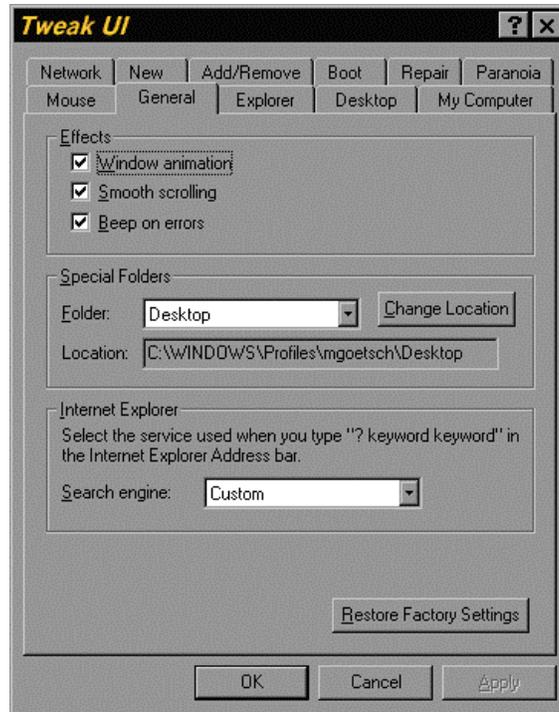


Figure 21. Tweak Applet of the Control Panel

## Changing the Product Name (Windows 95 Only)

For Windows 95 only, the product name “Windows 95” is displayed in the About box of every application that comes with Windows 95. You can change this product name by directly editing the Registry. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion*
3. Double click on the key *Version* and enter the new name. There is a length limit on the string.

## Changing the Licensee Information

When Windows 95 is being installed, it asks for the name and organization of the user. This information is then displayed in the *About* dialog of every application that comes with the Windows 95 operating system. If you purchased a computer with Windows pre-installed, this information might refer to the hardware vendor and not to you. This information can be changed by directly editing the Registry. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.

2. For Windows 95, go to the key  
*HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion*
3. For Windows NT 4.0, go to the key  
*HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion*
4. Double click on the key *RegisteredOwner* and enter the new owner name
5. Double click on the key *RegisteredOrganization* and enter the new owner organization name

For Windows 95 only, you can also personalize the information displayed in the System applet of the Control Panel by modifying the **OEM** information.

## Child Menu Pop-Up Delay

Windows 95 shows list of menu items when the Start button is pressed, which allow the user to select programs and documents from the corresponding sub menus. The delay for the sub menus to show up can be adjusted by adding an item in the Registry. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key *HKEY\_CURRENT\_USER\CONTROL PANEL\DESKTOP*
3. Click the right mouse button in the open area of the right panel and select the New String item from the menu.
4. Type *MenuShowDelay* exactly for name of the new key entry and press the Enter key.
5. Double click the new key entry to open the Edit String dialog box and enter a value from 1 for the shortest delay (fastest display of the sub menus) up to 10 for the longest delay (slowest display). Most power users will prefer a value of 1.

This parameter can also be set with the Tweak control panel applet. The Tweak utility is included in the PowerToys pack available from the Microsoft web sit.

## Changing the Default Shell Icons

### **Shortcut Shell Icon**

Windows 95 indicates by default with a short black arrow whether a particular icon is a shortcut to an object or the object itself. It achieves this by overlaying the original icon of the object with a shortcut overlay icon. You can change the shortcut overlay with the Tweak control panel applet. The Tweak utility is included in the Powertoys pack available from the Microsoft web sit.

If you do not have Tweak installed, you can still change the shortcut overlay icon by editing the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\Current Version\explorer\Shell Icons*
3. You will see a list of parameters indicated with numbers. Each parameter indicates the icon Windows 95 uses for a particular function. Parameter 29 refers to the shortcut overlay icon.
4. Double click on the 29 key to set the shortcut overlay icon of your choice, e.g.,  
`"29"="C:\\Windows\\System\\Shell32.dll,28"`

Adjust the above value for the location of the Windows directory on your system and be sure to use double back slashes. Shortcut overlay icons should have enough transparent area so that the original underlying icon shows through. Icons numbered 28 through 30 in the SHELL32.DLL in the Windows directory are clearly intended to function as shortcut overlay icons. Icon number 29 is the default black arrow on white background. You do not have to use the icons in SHELL32.DLL. You can use icons from any executable or dynamic link library. Other possible choices are a bent arrow (COMCTL32.DLL,0), a blue spot (MMSYS.CPL,25), and a slashed circle "no" symbol, (SYSDEM.CPL,5).

If you change the shortcut overlay icon using the Tweak control panel applet then the changes take effect immediately. If you change it by editing the Registry directly, then you will need to force Explorer to read its icons again, otherwise Explorer will use the old icons from the icon cache and you won't see any changes. One way to do this is to change the color depth or number of simultaneous colors in the Display Properties dialog and then to restart Windows and finally to set the color depth back to its original value and restart Windows again. You can also delete the file called ShellIconCache in the Windows directory and then restart the computer.

## **Default Shell Icons**

The above technique for the shortcut shell icon is also applicable to the other shell icons that Windows uses. In the following table the default icons used by Windows or by Microsoft Plus! are listed. Windows uses icons from the file SHELL32.DLL, while Microsoft Plus! mostly uses icons from the file COOL.DLL.

Finally, if you are using the desktop themes in the Microsoft Plus! pack, even though the Shell Icons Register key will show that the default shell icons for *My Computer*, *Network Neighborhood*, and *Recycle Bin* are drawn from the COOL.DLL file, there is a setting somewhere else in the Registry that overrides those three icons with the specific icons for that theme.

**Table 1. Default Shell Icons and Source Files**

<b>Index</b>	<b>Type</b>	<b>Function</b>	<b>Default</b>	<b>Plus!</b>
1	Explorer	Microsoft network	Unknown	cool.dll,31
2	Explorer	Application	Shell32.dll,2	Shell32.dll,2
3	Explorer	Closed folder	Shell32.dll,3	cool.dll,11
4	Explorer	Open folder	Shell32.dll,4	cool.dll,18
5	Explorer	5.25-inch disk drive	Shell32.dll,5	cool.dll,9
6	Explorer	3.5-inch disk drive	Shell32.dll,6	cool.dll,8
7	Explorer	removable drive	Shell32.dll,7	Shell32.dll,7
8	Explorer	hard disk drive	Shell32.dll,8	cool.dll,0
9	Explorer	network drive	Shell32.dll,9	cool.dll,1
10	Explorer	Off-line network drive	Shell32.dll,10	cool.dll,29
11	Explorer	CD-ROM drive	Shell32.dll,11	cool.dll,10
12	Explorer	RAM drive	Shell32.dll,12	Shell32.dll,12
13	Desktop	Entire network	Shell32.dll,13	cool.dll,13
14				
15	Desktop	My computer	Shell32.dll,15	cool.dll,16
16	Control Panel	Printer	Shell32.dll,16	cool.dll,22
17	Desktop	Network neighborhood	Shell32.dll,17	cool.dll,18
18	Desktop	Network workgroup	Shell32.dll,18	cool.dll,17
19	Start Menu	Programs	Shell32.dll,19	cool.dll,4
20	Start Menu	Documents	Shell32.dll,20	cool.dll,2
21	Start Menu	Settings	Shell32.dll,21	cool.dll,6
22	Start Menu	Find	Shell32.dll,22	cool.dll,3
23	Start Menu	Help	Shell32.dll,23	cool.dll,25
24	Start Menu	Run	Shell32.dll,24	cool.dll,5
25	Start Menu	Suspend	Shell32.dll,25	cool.dll,33
26	Explorer	Eject PC (undock)	Shell32.dll,26	cool.dll,32
27	Start Menu	Shut down	Shell32.dll,27	cool.dll,7
28	Explorer	Shard Folder	Shell32.dll,28	cool.dll,34
29	General	Shortcut arrow	Shell32.dll,29	Shell32.dll,29
30	General			
31	Desktop	Empty recycle bin	Shell32.dll,31	cool.dll,20
32	Desktop	Full recycle bin	Shell32.dll,32	cool.dll,21
33	Explorer	Dial-Up networking folder	Shell32.dll,33	cool.dll,27
34	Explorer	Desktop folder	Shell32.dll,34	Shell32.dll,34
35	Control Panel	Control panel	Shell32.dll,35	cool.dll,20
36	Start Menu	Program group folder	Shell32.dll,36	cool.dll,4
37	Control Panel	Printers folder	Shell32.dll,37	cool.dll,19
38	Start Menu	Fonts folder	Shell32.dll,38	cool.dll,14
39	Start Menu	Taskbar	Shell32.dll,39	Shell32.dll,39
40	Explorer	Music CD	Shell32.dll,40	cool.dll,26

## Restoring Explorer's Default Column Layout

You change the width of the various columns used to display file details in the Explorer by dragging the column header borders. The Explorer saves those column widths for each individual user in the Registry, so that a user always gets the same column widths from session to session.

If you want to restore the default column layout, you must destroy the key in the Registry where Explorer remembers the column widths. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
*HKEY\_CURRENT\_USER\SOFTWARE\Microsoft\Current  
Version\Explorer*
3. Click the key *DirectoryCols* entry and press the Delete key. Confirm that you want to delete this key.
4. Exit the REGEDIT program. When you launch the Explorer again the column widths will be restored to their default values.

## Password Protection using the Screen Saver

To disable the password protection provided by the screen saver without access to the control panel, you will need to edit the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

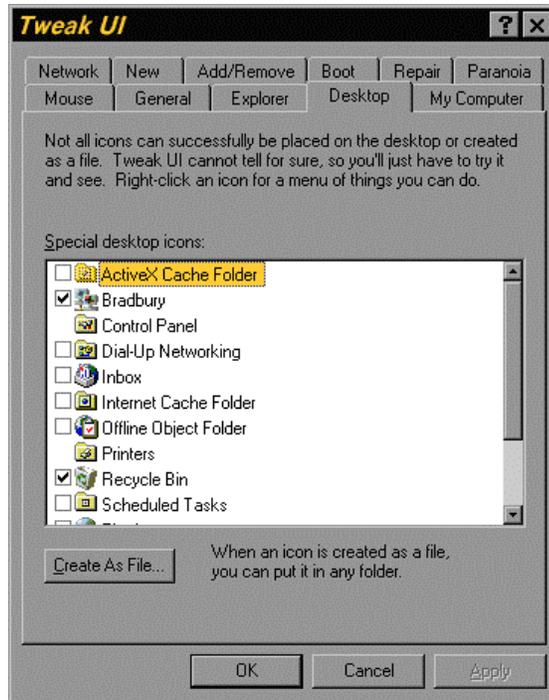
1. Start the REGEDIT.EXE program.
2. Go to the key *HKEY\_CURRENT\_USER\CONTROL PANEL\DESKTOP*
3. You will see a list of parameters.
4. Double click on the *ScreenSaveUsePassword* parameter and change its value from 1 for password protected to 0 for not password protected.

To prevent the loading of the screen saver, hold down the SHIFT key while Windows 95 is starting. This will prevent the automatic loading of any programs in the StartUp menu.

## Removing Standard Icons from the Desktop

Windows 95 has a number of standard icons, such as My Computer, Network Neighborhood, and Recycle Bin that can not be moved off the desktop and that cannot be deleted without destroying the access to the feature or the function they represent.

Tweak can remove these standard icons from your desktop, except the My Computer. Start the Tweak applet in the Control Panel and select its Desktop tab. All the standard icons can be marked for display. Tweak also allows the standard icons to be converted to file based shortcuts, which then can be placed in any desktop.



**Figure 22. Displaying Common Desktop Icons with Tweak**

However, the name of the standard icons can be changed to more accurately reflect your environment. For instance, My Computer can be replaced by the name of your computer and Network Neighborhood can be replaced by the name of the work group or domain. To change the name of these icons, press and hold down the mouse cursor on the name until this name is shown in edit mode. Make your changes and press *Enter* to save this name.

The names are stored in the Registry with the OLE control ID and can be changed by editing the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key `HKEY_LOCAL_MACHINE\SOFTWARE\Classes\CLSID`
3. You will see a list of control IDs for various registered controls. Find the Key with the current name of the standard icon you want to rename. Double click the key to open the Edit String dialog box and to edit its value.

## Stretching Wallpaper

Microsoft Plus! can stretch a centered wallpaper image to fill the screen. The easiest and safest way is to select the Display applet in the Control Panel and then select the Plus! tab. Check the box titled *Stretch desktop wallpaper to fit the screen* at the bottom of the dialog box. This dialog box is illustrated in Figure 23. You can also right-click on the desktop, select the Properties from the pop-up menu, and then click on the Plus! tab.



**Figure 23. Control Panel Display Applet Dialog Box for the Plus Tab**

You can also force Windows to stretch the centered bitmap by editing the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key *HKEY\_CURRENT\_USER\CONTROL PANEL\DESKTOP*
3. You will see a list of parameters.
4. Double click on the "WallpaperStyle" parameter and change its value from 0 for not stretched to 2 for a stretched bitmap.

Note that Microsoft Plus! is required to be installed on your system for either method.

## Displaying or Hiding the Speaker Icon

Sometimes an application causes the speaker icon to disappear from the right end of the Windows Taskbar. The display of the speaker icon can be controlled from the Multimedia applet in the Control Panel. Select the Audio tab and check the box *Show volume control on the taskbar*. The dialog box is illustrated in Figure 24.

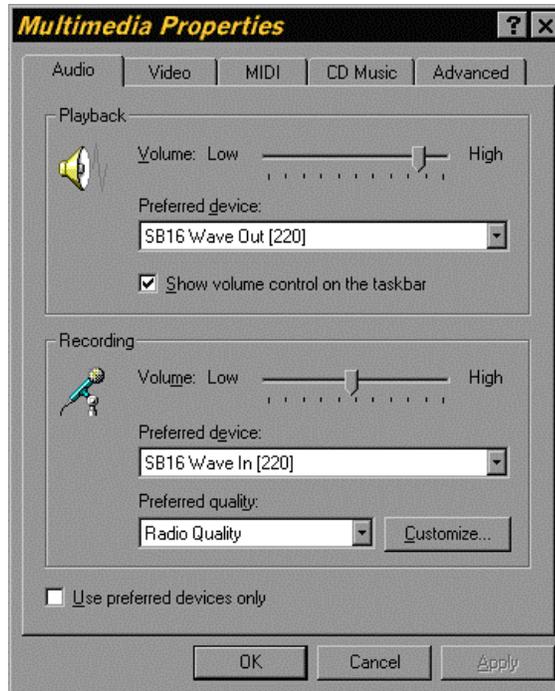


Figure 24. Multimedia Applet Audio Tab

## Windows 95 Only



For Windows 95 only, editing the Registry directly can also control the display of the speaker icon. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key  
`HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\Applets\System Tray\Services`
3. Double click on the "Services" parameter and change its value from 3 for speaker icon hidden to 7 for speaker icon shown.

## Numeric Tails in DOS File Names

When Windows generates a short DOS file name, obeying the 8.3 file name convention, from a long file name, it uses the first six characters from the long file name followed by a tilde (~) and a numeric constant to break possible ties in the short file name. The tilde and the numeric constant are called numeric tails. You change this default behavior of Windows by modifying the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.

2. Go to the key  
*HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\Control\FileSystem*
3. Click the right mouse button in the open area of the right panel and select the New Binary Value item from the menu.
4. Type *NameNumericTail* exactly for name of the new key entry and press the Enter key.
5. Double click the new key entry to open the Edit Binary Value dialog box and enter a value from 0.
6. Restart Windows

The next time Windows will create a short file name, it will use the first 8 non-blank characters of the long file name. The system will still use numeric tails to avoid duplicate file names.

## Displaying Program Specific Icons in Explorer

For some file types, Windows Explorer displays a specific icon, while for other file types the generic icon is used. Explorer will display a file specific icon if this file type is registered. Most programs will register their data file types automatically when you either install the program or run the program for the first time. You can register file types or edit the registration information at any time manually from the Explorer.

1. Start Explorer
2. Select the Options command from the View menu and then click the File Types tab.
3. Press the New button for a new file type or select the file type and press the Edit button for an existing file type
4. Enter the type of data file in the description field and enter the extension in the extension field.
5. Press OK twice to confirm your selections.

### ***Animated Cursor File Icons***

For the animated cursors in the Cursor directory of the Windows directory, the icon to be displayed depends not only on the animated cursor file type but should also be different for each animated cursor file. To display the correct icon next to each file the Registry must be edited with a script. Create the following script exactly and save it with the name ANICUR.REG.

**Code Listing 4. Registry Script File to Register Animated Cursor Icons**

```
REGEDIT4
[HKEY_CLASSES_ROOT\anifile]
@="Animated Cursor"
[HKEY_CLASSES_ROOT\anifile\DefaultIcon]
@="%1"
```

Now launch ANICUR.REG from Explorer and then restart the Explorer. The icon of each animated cursor should be displayed next to each ANI file, representing the animated cursor contained in that file.

## Assigning Sounds to Events for Individual Programs

### ***Standard Microsoft Windows 95 Installed***

You change the sounds assigned to eight events for each individual program by modifying the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key *HKEY\_CURRENT\_USER\AppData\Themes\Apps*
3. To add a new program to the list, click the right mouse button on Apps and select New Key and then type a new program name such as FREECELL. To edit the sounds for the events associated with a program in the list double click on the application name.
4. To add a new event and associated sound, again click the right mouse button on the name of the application and select New Key. Type the name of the event for which you would like to add a sound. The events you can choose from are: *Open, Close, Maximize, Minimize, RestoreDown, RestoreUp, MenuCommand, and MenuPopup*.
5. Click on each event to which you would like to add a sound. Choose a sound from the list of sounds or press *Browse* and select a different sound file.

### ***Microsoft Plus! Themes Installed***

If any Microsoft Plus! Themes are installed, then you can add a specific sound to about 20 different program events. You can preview and edit the sounds assigned to each event by pressing the Preview Sounds button in the Themes applet of the Control Panel. Each Theme can have a different sound file for each program event. The Preview dialog box is shown in the next figure.

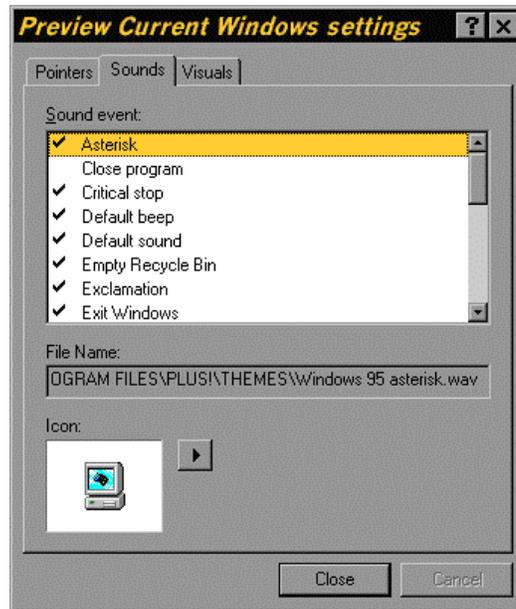


Figure 25. Sounds Preview in the Themes Applet of the Control Panel

## Modifying Internet Explorer Auto-Search

Internet Explorer lets you perform an auto-search by typing go followed by your keywords in the address bar of the browser. The default search uses Microsoft/Yahoo! as the search engine. You can use a different default search engine by editing the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDIT.EXE program.
2. Go to the key *HKEY\_CURRENT\_USER\Software\Microsoft\Internet Explorer/SearchUrl*
3. Double-click on the *Default* key and type in the auto-search text string from Table 2 that corresponds to your preferred search engine. The change will take effect immediately, even if Internet Explorer is running.

Table 2. Auto-Search Strings for Internet Explorer

Search Site and Engine	Auto-Search String
AltaVista	www.altavista.digital.com/cgi-bin/query?pg=q&q=%s
Excite	www.excite.com/search.gw?search=%s
Hotbot	www.hotbot.com/?MT=%s
Infoseek	guidep.infoseek.com/Titles?qt=%s
Lycos	www.lycos.com/cgi-bin/pursuit?query=%s
Magellan	searcher.mckinley.com/searcher.cgi?query=%s
Microsoft Internet Explorer default	home.microsoft.com/access/autosearch.asp?p=%s
Yahoo! (Microsoft IE auto-search)	msie.yahoo.com/autosearch?p=%s
Yahoo! (plain search)	search.yahoo.com/bin/search?p=%s

If your favorite search engine is not list in the table above, you can devise an auto-search string yourself. Navigate to the search site of your choice and start a single search on any phrase and watch the address line in the browser. When it changes to display the search string, click on it and press Ctrl-C to copy it to the Clipboard. Now paste the resulting string into any text editor such as Notepad. It will be one long line. The first part of your auto-search string is portion starting after http:// and up through and including the question mark. It identifies the location of the search engine. The next portion is the text preceding your search phrase, which indicates to the search engine that what follows is the search string. To complete the auto-search string, add %s to the end of the line. %s is the format code or place holder for a string in the programming languages C and C++ and during an actual search your key phrase will inserted in this place. Now follow the instructions above to modify the Registry with this auto-search string. There is no guarantee that this will work with every search engine, but it is worth a try.

## Modifying Default Bootup Run of CHKDSK /F



The default behavior of Windows NT at boot-up is to check every NTFS partition for the presence of the "Dirty Bit" and to run CHKDSK /F when the Dirty Bit has been set for this partition. Running CHKDSK /F takes a long time and permanently modifies the files on your system. You may want to delay the execution of CHKDSK /F for a short time while you attempt to retrieve some the file fragments. You can override the default behavior at boot-up with the CHKNTFS command utility. You can force or prevent the running of CHKDSK /F for any NTFS partition or restore the behavior again to its default. The relevant Registry entry is

*HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\BootExecute*

Normally it is set to

*autocheck autochk \**

To prevent CHKDSK /F from running for NTFS partition D: the entry becomes:

*autocheck autochk \*  
autocheck autochk /k:D*

To force CHKDSK /F for drive D: when the Dirty Bit was not set the entry becomes

*autocheck autochk \*  
autocheck autochk /m:D*

The CHKNTFS utility is a much safer and easier method to modify the Registry entry. More information can be found in the CHKNTFS section in command line programs.

---

# Command Processor (DOS Command Prompt)

## Enabling File Name Completion (Windows NT only)



When using the command processor in the DOS window, you can have Windows NT complete the file name for you by pressing the Tab key when you have partially typed in a file name or directory handle. This is similar to the Unix ability to complete a filename when you press the Esc key after typing in a partial filename. The version in Windows NT is actually more advanced in that it will cycle through multiple file names that match your partial specification. For example, if you entered "edit filename" and press the Tab key repeatedly, the system will replace "filename" with the fully qualified filenames that match this pattern in your directory such as "filename.txt", "filename.doc", and "filename2.txt". When you have found the filename that you want, just press Enter to proceed.

You can specify which character is used to complete the partial filename by editing the Registry directly. Editing the Registry should be done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

1. Start the REGEDT32.EXE program.
2. Go to the key *HKEY\_CURRENT\_USER\Software\Microsoft\Command Processor\CompletionChar*
3. Double click the key and set its value to 9 for the Tab character to be used.

## Setting the Default Color for the Command Processor (Windows NT only)



You can control the default foreground and background color used in the command processor windows. The default value is 0F for a standard white text on a black background. You can replace this value with a two digit hexadecimal number, in which the first digit selects a background color and the second a foreground color. Table 3 shows the hexadecimal values for the 16 standard colors. A value of F0 would give black text on a white background, 02 would use green text on a black background, and 1E would display yellow text on a blue background.

**Table 3. Hexadecimal Values for Standard Colors**

Color	Value	Color	Value
black	0	dark gray	8
blue	1	bright blue	9
green	2	bright green	A
cyan	3	bright cyan	B
red	4	bright red	C
magenta	5	bright magenta	D
brown	6	yellow	E
light gray	7	white	F

You can specify what color combination is used as the default colors in the command processor windows by editing the Registry directly. Editing the Registry should be

done only by experienced users and with extreme care and the Registry should always be exported or backed up before any changes are made.

4. Start the REGEDT32.EXE program.
5. Go to the key *HKEY\_CURRENT\_USER\Software\Microsoft\Command Processor\DefaultColor*
6. Double click the key and set its value to two digit hexadecimal number corresponding to color combination to be used

---

## System Performance

### Systems Performance Data List

The performance statistics reported by the System Monitor are maintained in the Registry. To view a snapshot of the data, launch the REGEDIT program and navigate to the *HKEY\_DYN\_DATA\PerfStats\StatData*. You will see a long list of values that correspond to the items available for tracking by the System Monitor.

The names and descriptions for these items are stored elsewhere in the Registry at *HEKY\_LOCAL\_MACHINE\System\CurrentControlSet\control\PerfStats\Enum*.

You can update these values by pressing the F5 key repeatedly. However, the System Monitor provides a much more readable view of the same data, without the danger of accidentally changing some essential item in the Registry.



# Chapter 4. Resources

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## Repair Disk

A repair disk allows you to boot from a floppy in case of a catastrophic failure with the Registry.

### Installing the Emergency Recovery Utility

#### *Windows 95*



The Emergency Recovery Utility (ERU) to create a repair disk is included on the Windows 95 CR-ROM, but is not automatically installed during the Windows installation. You can execute it directly from the Windows CD-ROM, but it is more convenient to copy it to your hard drive.

1. Create a directory called ERU under the Windows directory. You can substitute any valid directory name for the ERU directory in these instructions if you so desire.
2. Insert the Windows 95 CD-ROM in your CD-ROM drive and copy all files from the directory R:\Other\Misc\ERU to the \Windows\ERU directory, where R: is the drive letter indicating your CD-ROM drive.

#### *Windows NT*



The utility to create a repair disk is automatically copied to the Windows directory during the installation, but no shortcut to the utility is inserted in the Administrative Tools folder. It is most convenient to add a shortcut to the Emergency Repair Utility to this folder.

1. Navigate with Explorer to display the Administrative Tools folder in the Administrator Profile.
2. Open up a second copy of Explorer and navigate to the Windows directory. Find the file RDISK.EXE, which is the Emergency Recovery Utility.
3. Press and hold down the right button of the mouse and drag the file to the Administrative Tools folder in the first Explorer. When asked, select the "Create Shortcut Here" option.

# Creating a Repair Disk

## Windows 95



The following instructions are only valid for creating a emergency repair disk under Windows 95. The Emergency Recovery Utility to create a repair disk is included on the Windows 95 CR-ROM, but is not automatically installed during the Windows installation. You can execute it directly from the Windows CD-ROM, but it is more convenient to copy it to your hard drive.

1. Format a floppy, making sure to check "Copy System Files" in the Format dialog box, since the floppy has to bootable.
2. Run the Emergency Repair Utility by executing the ERU.EXE program. The program will overwrite all the information previously saved to the floppy with the current system information. The Emergency Recovery Utility is shown in Figure 26.

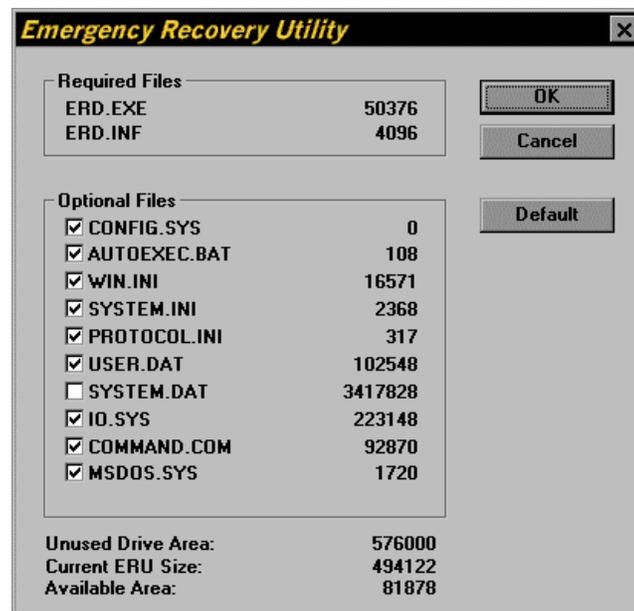


Figure 26. Emergency Repair Utility Window (Floppy Disk)

To use the created repair disk and restore the system files, restart your computer with the repair disk in the floppy drive.

You should run the ERU to update your emergency recovery disk any time before making significant changes to your system, such as installing application suites or Internet browsers. It is best to keep several generations of the emergency recovery disk. That way, if your most recent changes cause problems, you can replace the files with their previous versions.

It is also useful to copy some essential command line utilities to the repair disk, such as FDISK.EXE to investigate your hard disk partitions, CHKDSK.EXE to validate floppy and hard disk drives, FORMAT.EXE to format floppy and hard disk drives, FC.EXE to compare files, SYS.COM to reinstall a boot sector on your hard drive, and a small ASCII text editor.

Note that the Emergency Repair Utility does not copy the common system part of the Registry, stored in the file SYSTEM.DAT, to the floppy because this file exceeds the storage capacity of a 1.4 MB floppy. If you copy the systems files to a directory on a different hard disk, then the SYSTEM.DAT file will be copied.

Also the Emergency Repair Utility copies the default user part of the Registry, stored in the file USER.DAT in the Windows folder to the repair disk. If you have enabled different profiles for different users, then the corresponding USER.DAT files, which are stored in the various user folders in the Profiles folder of the Windows folder, will not be copied to the repair disk.

These two omissions limit significantly the usefulness of the created repair disk. It is strongly recommended that you follow a rigorous backup procedure to allow the restoration of your system after a catastrophic failure of the Registry or the hard drive.

## Windows NT



The following instructions are only valid for creating an emergency repair disk under Windows NT. The utility to create a repair disk is automatically copied to the Windows directory during the installation, but no shortcut to the utility is inserted in the Administrative Tools folder. It is most convenient to add a shortcut to the Emergency Repair Utility to this folder.

1. Run the Emergency Recovery Utility by executing the RDISK program and select the "Update Repair Information" option.
2. Insert the repair disk in your floppy drive and select the "Create Repair Disk" option. The program will overwrite all the information previously saved to the floppy with the current system information.

To use the created repair disk and restore the system files, restart your computer with the repair disk in the floppy drive.



You should run the RDISK to update your emergency recovery disk any time before making significant changes to your system, such as installing application suites or Internet browsers. It is best to keep several generations of the emergency recovery disk. That way, if your most recent changes cause problems, you can replace the files with their previous versions.

It is strongly recommended that you follow a rigorous backup procedure to allow the restoration of your system after a catastrophic failure of the Registry or the hard drive.

---

## Cabinet Files (\*.CAB)

Cabinet files are compressed archives of a set of files. Archives are files that contain other files. Typically the files in an archive are compressed. Archives usually have file names ending with CAB, ZIP, LZH, ARJ, or ARC, depending on how they were created. Archives make it easy to group files and make transporting and copying these files faster. Compressed archives also reduce the space required to store a set of files on a hard disk or floppy disk. Most of the Windows 95 files are stored in cabinet files. Other Microsoft applications are also distributed using cabinet archives. The default extension of cabinet files is CAB. Viewing or extracting individual files from the cabinet archives can be accomplished with the following two methods.

## Viewing and Extracting from Cabinet Files (GUI)

The Microsoft PowerToys utility collection contains a Cabinet file viewer, called CabView. The PowerToys utility pack is available from the Microsoft web site with URL "<http://www.microsoft.com>". The cabinet file view is a shell extension that makes CAB files look like folders. Once the CAB file viewer is installed, it works invisibly.

Double clicking on a CAB file opens it as if it were folder. At that time you can view the contents of the cabinet and you can copy individual files from the cabinet archive with the same techniques as inside the Explorer. You cannot however add files to cabinet or delete files from the cabinet.

## Extracting Files from Cabinet Files (DOS)

The EXTRACT utility allows you to extract a file from a CAB cabinet archive file. Using the following command

```
EXTRACT d:\path\archive.cab filename.ext
```

will extract the specified file from the cabinet file and place it in the current directory. If you want to extract files and place them in a directory different from the current one at the /L switch followed by the target directory name where you want to place the file.

```
EXTRACT d:\path\archive.cab filename.ext /L c:\targetdirectory.
```

Note that the space between the /L switch and the target directory is required. Like for all DOS commands, if the target directory name contains embedded spaces or other special characters, then it must be enclosed in quotation marks.

---

## Shortcuts (\*.LNK)

Every item below Programs on a Start menu and every object you have placed on the desktop is a shortcut. Windows relies heavily on shortcuts to make its operation appear more intuitive and requiring fewer mouse clicks. When you double click on a shortcut, the target of the shortcut will be executed. If the target is a program, the program will be launched and if the target is a data file, then the data file will be opened in the associated application. Utilities such as the Norton Navigator create even more shortcuts to customize the environment and remember most recently used files for each user. Each shortcut occupies about one kilobyte of disk space.

If you want to execute more than one program with a single shortcut, the general solution in Windows is to create a batch file, which contains the command lines to launch one or more programs and to set the target of the shortcut to this batch file.

In Windows NT only, you can launch multiple programs from a single shortcut by separating the commands in the target by an ampersand sign. For example, the following text in the target field will launch both Explorer and Write.

```
C:\WinNT\System32\CMD.EXE /C "explorer.exe&write.exe"
```

Under the Windows NT command processor, the ampersand character functions as a command separator in the command stack. You can string together commands separated by ampersands and they will all be executed. The example shown above actually launches and instance of CMD.EXE, the Windows NT command processor. The /C command line switch indicates that this instance of the command processor



should execute the remainder of the command line and then terminate. Further information on the Windows NT command processor and command stacks can be found in the section on **command separators**.



If the target file is moved or renamed, the connection between the shortcuts pointing to it and the file is broken. If you delete the target file, the shortcut remains on the disk creating confusion and occupying disk space needlessly. Shortcuts have the default extension *Ink*.

## Shortcut Keys

The Shortcut page of the Properties dialog for every shortcut contains an item labeled *Shortcut Key*. Shortcut keys are effective only for shortcuts that are located on the desktop or in the Start menu. The only way to determine the shortcut key for a given shortcut is to open its Properties dialog. It is very easy to inadvertently reuse a particular shortcut key combination. The following table shows a list of possible shortcut keys for popular programs. You can create a small text file in your home directory with a list of shortcut keys that you have assigned.

Each user can assign an individual shortcut key to a particular program by assigning the keys to the shortcuts in the Program folder of the their Profile folder. The programs corresponding to these shortcuts are displayed when the Programs command on the Taskbar is selected. The path to this folder in Explorer is *C:\Windows\Profiles\UserName\Start Menu\Programs*, where each user has to substitute their logon name for *UserName*.

Shortcut Key	Application
Ctrl-Alt-D	DOS
Ctrl-Alt-E	Ecco
Ctrl-Alt-M	Mail (Eudora)
Ctrl-Alt-P	PowerPoint
Ctrl-Alt-Q	Quicken
Ctrl-Alt-V	Visio
Ctrl-Alt-W	Word
Ctrl-Alt-X	Excel
Ctrl-Alt-Z	WinZIP

## Finding All Shortcuts to a File

You can use the Find command to locate all the shortcuts pointing to a particular file. Select the Find command from the Start menu or from the Tools menu in Explorer. Select the Advanced tab and choose Shortcut from the Of Type list. In the Containing Text field type the name of the file or the directory name. Make sure that the Case Sensitive option is not checked under the Options menu and then click Find Now. A list of all the shortcuts pointing to your specific target file or directory will be generated. The Find command dialog box is illustrated in Figure 27. There might be many more than you expected.

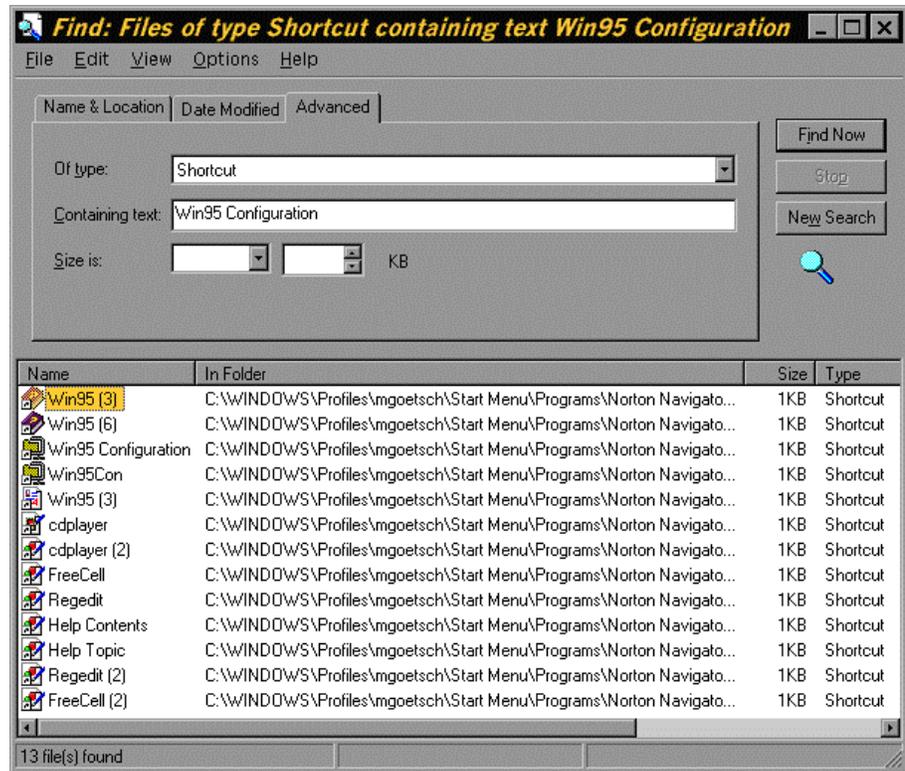


Figure 27. Find All Shortcuts to a File Dialog Box

## Splash Screens

### LOGO.SYS

This file contains a 320 horizontal by 400 vertical pixels by 256 color bitmap which is shown while Windows is starting up. The original screen shows the Windows 95 logo on a cloud background and the animated bar at the bottom.

You can prevent the display of the startup screen by setting the logo parameter in the Options section of the MSDOS.SYS file to

```
[Options]
Logo=0
```

You can also replace the startup screen by a new bitmap. This bitmap has to have the same 320 by 400 by 256 colors dimensions. Windows stretches the bitmap horizontally to twice its width, while keeping the vertical scale unchanged.

The standard logo screen has a color bar across the bottom that appears to move. This animation is produced by cycling the colors assigned to the last 20 entries in the 256 color palette. If the bitmap is changed and then saved, then the animation disappears. To restore the animation, load LOGO.SYS into Debug and enter the following commands at the prompt:

## E CS:132 EC W Q

You can create a full screen animation by expanding the areas that are painted with these last 20 colors. Start by loading the existing logo bitmap in Paint or any other bitmap editing tool. Erase everything except the animated color bar at the bottom. Use the dropper tool in Paint to pick up the color from a rectangular section of the color bar. Then paint something else on the screen with that color. All the objects painted with that color will change color along with the animated color bar.

See **LOGOS.SYS** for the bitmap notifying the user that it is safe to turn off the computer. See **LOGOW.SYS** for the bitmap notifying the user that Windows is in the process of shutting down the computer.

## LOGOW.SYS

This file contains a 320 horizontal by 400 vertical pixels by 256 colors bitmap which is shown while the Windows is shutting down. The original screen shows the message "Please wait while your computer is shutting down. Windows stretches the bitmap horizontally to twice its width, while keeping the vertical scale unchanged.

See **LOGO.SYS** for the bitmap used during Windows startup. See **LOGOS.SYS** for the bitmap notifying the user that it is safe to turn off the computer.

## LOGOS.SYS

This file contains a 320 horizontal by 400 vertical pixels by 256 color bitmap which is shown when Windows has completed its shut down procedure. The original screen shows the message "You can now safely turn off your computer." Windows stretches the bitmap horizontally to twice its width, while keeping the vertical scale unchanged. If the user selects shut down but leaves the computer running, the LOGOS.SYS bitmap will remain on the screen and can be used to display messages like "Back after lunch."

See **LOGO.SYS** for the bitmap used during Windows startup. See **LOGOW.SYS** for the bitmap notifying the user that Windows is in the process of shutting down the computer.

---

## User Policies (\*.POL)

### STANDARD.POL

This file contains the user policy settings for a standard security system. The file can be found on the Windows 95 CD in the directory \ADMIN\RESKIT\SAMPLES\POLICIES. You can use this file as a basis for the standard security settings on your system. The file can be edited with the System Policy Editor POLEDIT.EXE.

See also **MAXIMUM.POL** for the file containing user policy settings for a more restricted security system.

## MAXIMUM.POL

This file contains the user policy settings for a more restricted security system. The file can be found on the Windows 95 CD in the directory `\ADMIN\RESKIT\SAMPLES\POLICIES`. You can use this file as a basis for the restricted security settings on your system. The file can be edited with the System Policy Editor `POLEDIT.EXE`.

See also **STANDARD.POL** for the file containing user policy settings for a standard security system.

---

## CD-ROM Keys

### Finding the Windows 95 CD-ROM Key

To install or reinstall Windows 95 from the CD-ROM, the key on the sleeve of the CD-ROM is required. `REGEDIT` can be used to retrieve this CD-ROM key from the Registry, but is easier with the System Properties applet in Control Panel.

Open the System Properties applet in the Control Panel. Go to the General tab. The Registered to field contains a numeric string with groups of five, three, seven, and five digits. The three and seven digit groups are the CD-ROM key.

If you are using Microsoft Plus! there will be two of these CD-ROM numbers, the top is for Windows 95, the bottom one for Microsoft Plus!. This CD-ROM key is also included in the Registry

Many users simply write the CD-ROM key directly onto the label side of the CD-ROM itself, using a felt-tip marker. This practice might not be safe, since there is always a change that the solvents in the marker's ink could damage the surface of the CD-ROM over time.

---

## AutoRun Files (\*.INF)

### Changing the Icons for Drives in the Explorer

The purpose of AutoRun files is to let Windows automatically install or run a CD-ROM when it is inserted into the drive. But the AutoRun files can also be used to change the drive icon used in the Explorer.

1. Create a file named `AUTORUN.INF` in the root directory of each hard disk or partition for which you want to customize the drive icon.
2. Insert a line with the text `"[autorun]"`
3. Insert a line immediately after the previous line, which contains the text `"icon="` followed by the name of any executable (\*.EXE) or dynamic link library (\*.DLL) that contains icons. Follow the name by a comma and the zero based index of the desired icon in that file.
4. Save the AutoRun file. Open Explorer and press F5 to update the drive.

`PIFMGR.DLL` and `SHELL32.DLL` are dynamic link libraries that contain lots of icons. You can preview the icons, by right clicking on any DOS program, choose Properties from the menu, select the Program tab and then press the Change Icon button. You will initially see a list of icons contained in `PIFMGR.DLL`.

You can also preview icons by right clicking on any shortcut, choose Properties from the menu, select the Shortcut tab and then press the Change Icon button.

For example, to change the drive icon to the fifth icon in SHELL32.DLL the AUTORUN.INF file might look like this:

```
[autorun]
icon=c:\windows\system\shell32.dll,4
```

---

## Personalizing Your System (OEM) (Windows 95 Only)



Many systems include an OEM logo and support information that you can view by opening the Windows 95 Control Panel and launching the System applet. You can substitute a personal logo and support information to identify your company or the user.

The logo is saved in a bitmap in the Windows system directory in a file called OEMLOGO.BMP. The bitmap has a maximum size of 180 horizontal pixels by 114 vertical pixels and a color depth of 4, 8, or 24 bits. If your bitmap exceeds these dimensions, then it will not be displayed. If the bitmap color depth exceeds the color depth of your display, then Windows will have to approximate in the bitmap. To avoid these approximation artifacts, make the bitmap the same color depth as your display. Windows will treat all pixels that match the color of the bottom-left pixel as transparent. This allows you to display seemingly non-rectangular images. If you want to keep the image rectangular with its own background, the easiest solution is to create the bitmap with a one-pixel wide border in a color that is not used in the bitmap. Save the bitmap in the Windows system directory under the name OEMLOGO.BMP.

The textual information is stored in a file called OEMINFO.INI in the Windows system directory. The file contains two sections. The first section specifies the general information, which will be displayed to the right of the logo. The next section specifies what is displayed in a scrolling dialog when you press the *Support Information* button. You must use sequential line numbers in this section, since Windows will stop displaying lines when the next line number is not found. There is no clear limit on the number of lines, but if you use more than a few hundred lines, there will be a noticeable delay before the *Support Information* dialog is displayed. A sample of the file is shown in the next code listing. Save the file in the Windows system directory under the name OEMINFO.INI.

### *Code Listing 5. OEMINFO.INI Sample File*

```
[general]
Manufacturer=Marc Goetschalckx
Model=Office computer

[Support Information]
Line1=Do not change or install any programs or applications
Line2=on this computer without notifying Marc Goetschalckx
```

The next time you open the Control Panel's System applet, you will see the bitmap and information that you have specified. Both files can be easily added to the installation and setup procedure to give all the computers in your organization a uniform appearance.

You can also personalize the information displayed in the About box of the applications that come with Windows by modifying the **Licensee Information**.

# Chapter 5. Programming

---

## Windows Version Detector

### Windows Detection Based on Environment Variables

The following statements in a batch file detect which version of Windows is currently running on the computer, without the use of temporary files. The environment variables (with lower case names) `windir`, `winbootdir`, and `os` are set by the Windows operating system during startup.

*Code Listing 6. Windows Detection in Batch Files*

```
@ECHO OFF
IF '%OS%' == 'Windows_NT' GOTO Done
SET windir=
SET winbootdir=
if '%windir%' == " SET OS=DOS
if '%OS%' == " IF '%Winbootdir%'==" SET OS=Windows_3.x
if '%OS%' == " SET OS=Windows_95
:Done
ECHO Operating system is %OS%
```

The execution of the batch file relies on the fact that if a user-created environment variable `WINDIR` exists, the first `SET` command deletes the contents. The Windows-created '`windir`' variable still exists. Upper and lower cases are distinguished in environment variables names in batch files, but the DOS `SET` command converts all variable names to upper case. So, there is no way for a user to create, change, or delete the '`windir`' (all lower case) variable using DOS commands.

---

## Temporary Directories

The Windows operating system and many applications make extensive use of one or more temporary directories. The temporary directories are indicated by the environment variables `TEMP` and `TMP`.

## Cleaning Up Temporary Directories

Some applications fail to clean up after themselves and delete the temporary files they have created in those temporary directories. After a while those directories may be filled with several tens to hundreds of megabytes of unneeded files. The process of cleaning up the temporary directories can be automated with the following command in the AUTOEXEC.BAT file.

```
DELTREE /y c:\temp\
```

Several important observations have to be made regarding the DELTREE command.

Be extremely cautious in using the DELTREE command since it will delete all files and directories indicated, even read-only, system, and hidden files and directories.

The '/y' option eliminates the request for confirmation if you want to delete the directory or one of its subdirectories. This is required for automated execution in a batch file. It also makes the destructive impact of the command much greater, since the user has no chance to interrupt the execution of the DELTREE command.

The trailing backslash in the path indicating the directory holding the temporary files is important, because without it the DELTREE command will delete all the files in the temporary directory and its subdirectories and remove the temporary directory. When the temporary directory is missing, some applications might fail to start.

Deleting temporary files should be done before Windows is started or after Windows has terminated. Once Windows and some of its applications are running, one or more temporary files might be in use by these applications and should not be deleted.

---

## Environment Variables

Many applications, especially older DOS applications use environment variables to store information on switches and directories.

### Changing Environment Variables Globally

When a DOS window is opened during the execution of Windows 95, it will get a copy of the environment variables initially specified in the AUTOEXEC.BAT file or set by Windows upon startup. This copy is called a local environment. A list of the currently active local environment variables can be displayed in the DOS box by the SET command without any parameters. Any environment variables added inside the DOS box are only valid and active during the execution of that particular DOS box. Once this box is closed the local environment is destroyed and its environment variables are discarded and not added to the global environment.

Environment variables specified in the AUTOEXEC.BAT file are included in the global environment, but changes to the AUTOEXEC.BAT file take only effect when Windows is restarted.

Sometimes it might be desired to add a variable to the global environment after Windows has been started. The WINSET command adds variables to the global environment after Windows has been started with the following syntax:

```
WINSET environment_variable_name=environment_variable_string
```

The syntax of the WINSET command is identical to that of the SET command. However the WINSET command without any parameters will not give a list of either the global or local environment.

The local environment of any DOS box active when WINSET is run still remains unaffected. But any DOS box opened after the WINSET command has been run will get a copy of the new environment variable.

WINSET can also be used to eliminate an AUTOEXEC.BAT file that only exists to set some environment variables. You must include WINSET commands in a batch file that is placed in the StartUp folder to set the environment variables automatically every time you start Windows.

WINSET is not automatically installed during the Windows installation. It is located on the CD-ROM in the directory ADMIN\APPTOOLS\ENVVARS. It can also be downloaded from the Microsoft web site. The recommend location for WINSET is the \WINDOWS\COMMAND directory. Since this directory is usually included in the executable path or the environment variable COMSPEC points to this directory, WINSET can be called from any DOS box or with Start\Run.

---

## Synchronization of Batch File Commands

### Sequential Execution of Batch File Commands

When executing a Windows 95 batch file, Windows 95 launches a Windows program and continues immediately with the execution of the next instruction in the batch file. This might cause more than one program to run simultaneously.

The START command with the '/W' switch provides a effective means to force sequential execution of batch file commands. Insert

#### **START /W**

in front of the batch line that launches an application and Windows 95 will wait until that application terminates before execution the next batch file line or command.

This technique can also be used to prevent the simultaneous execution of multiple instances of the same DOS program.

### Preventing Multiple Instances of a DOS Program

Many DOS programs were written without any thought for multitasking and file sharing. So running multiple instances of the same program might create undesirable side effects. You can use a batch file to prevent users from running multiple instances accidentally. Create a batch file DOSPROG.BAT as illustrated in the following code sample, where DOSPROG is the original name of the program's EXE file.

*Code Listing 7. Prevention of Multiple Instances of a DOS Program*

```
@ECHO Off
DIR "c:\DOSPROG is already running" /b
IF EXIST "c:\DOSPROG is already running" GOTO End
REM > "c:\DOSPROG is already running"
START <path>\DOSPROG$ /W
DEL "c:\DOSPROG is already running"
:End
```

Rename the original program's EXE file to DOSPROG\$.EXE. Add a command, identical to the next to last line in the above code listing, to your AUTOEXEC.BAT file to delete the semaphore file at start-up, so that you will start with a clean slate even if the DOS program crashes. Also edit all shortcuts that point to the executable file DOSPROG.EXE so they now point to the batch file DOSPROG.BAT.

When the batch file is executed, it first checks to see whether a zero-byte semaphore file is present in the root directory of C:\. If so, the program is already running and the batch file terminates. The DIR command, in its "bare" mode with the /b switch, generates the user notification with the zero-byte file's name as the message. If the semaphore file was not found, the batch file creates it and then launches the DOS program using the START command. The /W switch of the START command causes the START command to wait until the launched program terminates before returning control to the batch file. At this time the batch file executes the next line, which deletes the semaphore file. The system is now ready to run the DOS program again.

---

## Backing Up Your Files

### Instant Backups to a Different Disk

If you have a second hard disk on your computer or on a different computer connected to your computer over a network, then you can use the XCOPY32 program to perform very fast incremental backups. Create and execute a command file with the following commands:

```
@ECHO off  
CLS  
ECHO Incremental backup of personal files  
XCOPY32 C:\source D:\destination /C /D /R /S >  
D:\destination\incbacup.log
```

Source and destination are the directories with your personal files on the source and destination hard disks, respectively. The /S switch will include subdirectories, the /R will include read-only files too, the /D switch without a date will copy new or newer files only, and the /C switch will continue the operation even if an error occurred. Incbacup.log is the name of the log file created by XCOPY32 with the names of all the files it copied. Substitute the appropriate names for the source, destination, and log files on your computer system. For more information on the command line switches see the XCOPY32 command.

The second hard disk has to have sufficient disk space to hold your personal files. You can use the Task Scheduler included in Windows 95 or Windows NT to run the batch file at night to execute the incremental backup. You still need a more comprehensive backup strategy to backup your computer completely. But this method allows you to maintain a mirror image of your personal files effortlessly. The first time the command file executes, it may take an hour or more to complete the operation. But on successive executions, an incremental backup is created in a few minutes.

### Detection Files Changes

Many times it is important to record the current state of the file system or to compare the file system state before and after a program installation. By comparing snapshots

from before and after a new program installation or execution, you can determine which files were added, changed, or deleted. The following batch file will achieve this result.

```
DIR c:\ /ON /S /A >before.txt  
DIR c:\ /ON /S /S >after.txt  
FC /L /LB9999 before.txt after.txt > difference.txt
```

The before and after DIR commands create a file containing a list of all files on the C: drive, including subdirectories and hidden files and alphabetized by file name. The last command creates new file containing the list of files that have been added, changed, or deleted.

Note that the intermediate snapshot files can be very large, especially for the large hard drives in modern computers. The PC Magazine utility INCTRL3 detects changes to the files system in much the same way. But it stores its snapshots in a space-conserving format.

INCTRL3 also tracks changes to the Registry, which is extremely important in Windows 95 and Windows NT. Just comparing the files before and after a program installation without tracking changes in the Registry is most likely not sufficient to detect problems created by the new installation.

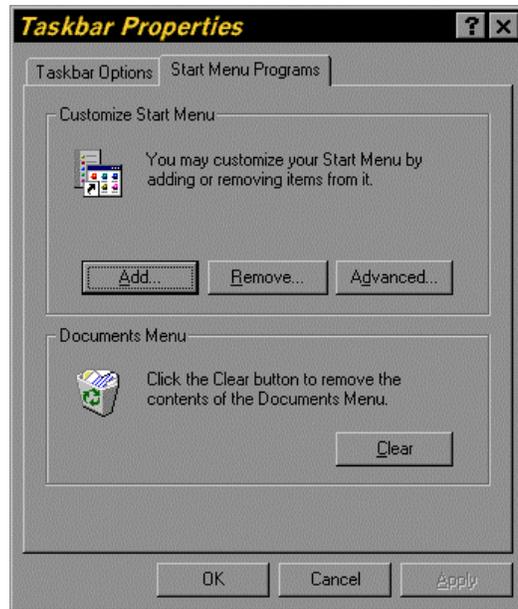
---

## Manipulating the System History Information

### Clearing the Recent Document List

Each time you modify a file associated with a modern Windows program, Windows adds that file's name to the document history list. This allows you to quickly reload files you have recently edited or accessed. This list can be accessed from the Start menu by selecting Documents. When the list fills up, the most recently used file name displaces the least recently used file name. However, anyone with access to your computer can see exactly what you have been doing by looking at this history list.

The easiest way to clear the document history list is to right-click on the Taskbar and select Properties from the popup menu. Click on the Start Menu Programs tab in the Properties dialog and the press the Clear button. The Properties dialog is illustrated in Figure 28.



**Figure 28. Taskbar Properties Dialog**

You can erase the file list that records which files you have most recently accessed automatically by adding the following commands to your AUTOEXEC.BAT file.

**DEL c:\Windows\Recent \*.lnk**

If you have enabled User Profiles on your system then the batch file command has to be changed to

**DEL C:\windows\Profiles\Username\recent \*.lnk**

Where *Username* is the user name you used on the logon screen. If you are using Windows NT, the windows directory is most likely C:\WinNT and you will have to adjust the above batch files accordingly.

However, since the AUTOEXEC.BAT file only gets executed when your system is rebooted, all files since the last reboot will be still included in the document history list. To clear the document history list while Windows is running, you can execute this command in a DOS box or delete all shortcuts in the *recent* directory using Explorer.

The TweakUI utility, which is part of Microsoft's free Powertoy utility set, includes the ability to clear the document history and other history list automatically at logon or during the current Windows session. However, TweakUI may not be compatible with all systems.

---

# Running System Dialogs from Batch Files (Windows NT Only)

## Using Rundll32 to Format a Floppy Disk

You can use the Rundll32 program in any scripting file or batch file to start the system dialog for formatting a floppy disk. The Rundll32.exe is placed in the \System or \System32 directories of Windows and is thus callable from any place on your system. Insert the following line in your batch file

**Rundll32 shell32.dll, SHFormatDrive**

You still must set all the formatting options interactively.

You can also use the same technique to format a floppy from a full programming language, since the *SHFormatDrive* function is not listed in the standard Windows API documentation.

You can also use Rundll32 to run Control Panel applets.

## Using Rundll32 to Run Control Panel Applets

You can use the Rundll32 program in any scripting file or batch file to start the applets in the control panel. A file with the .cpl extension contains one or more applets and each applet may display multiple pages or tabs. Using rundll32 you can launch any of the applets in the file and cause the applet to open on a particular page. The Rundll32.exe is placed in the \System or \System32 directories of Windows and is thus callable from any place on your system. Insert the following line in your batch file

**Rundll32 shell32.dll, Control\_RunDLL applet\_filename.cpl,  
@applet\_id, page\_id**

Where applet\_filename is the file containing one or more applets, applet\_id is the zero-based index of the applet in the applet file, and page\_id is the zero-based index of the page or tab in the applet. The Microsoft Knowledge Base states that the page numbers are one-based, but clearly some applets have a zero-based coding scheme, so some experimentation is required.

For example, to run the keyboard applet, which is the second applet within the Main.cpl file, you would use the following command

**Rundll32 shell32.dll, Control\_RunDLL, main.cpl, @1**

To run the Appearance page of the Display Properties dialog, which is the third tab of the only applet in the Desk.cpl file, you would use the following command

**Rundll32 shell32.dll, Control\_RunDLL, desk.cpl, @0, 2**

You still must set all the dialog options interactively.

You can also use Rundll32 to display the dialog to format a floppy disk.



# Chapter 6. Windows Applications

---

## CDPlayer

The CDPlayer is a multimedia application that plays audio CD's in the computer's CDROM drive through the computer's sound card.



*Figure 29. CDPlayer Multimedia Player Utility*

## 64 Kilobyte Limit on Track Information in CDPLAYER.INI

You can record volume and track data and CDPlayer stores this information in its CDPLAYER.INI file. However, like all INI files, CDPLAYER.INI has a 64 kilobytes limit. Normally, this is not a limitation for INI files, since few programs need 64 kilobytes of application settings and switches. It can however become a problem when the INI file is used as a poor man's database and this is exactly what CDPlayer does. CDPlayer stores several hundred bytes of information about each CD, where the exact length depends on the length of the track names used. There is no workaround for this limitation. If you have an extensive CD collection CDPlayer almost surely will run out of space in its INI file. Microsoft Access has a sample database for audio CD's without size restrictions, but of course it cannot play the CD in the CDROM drive.

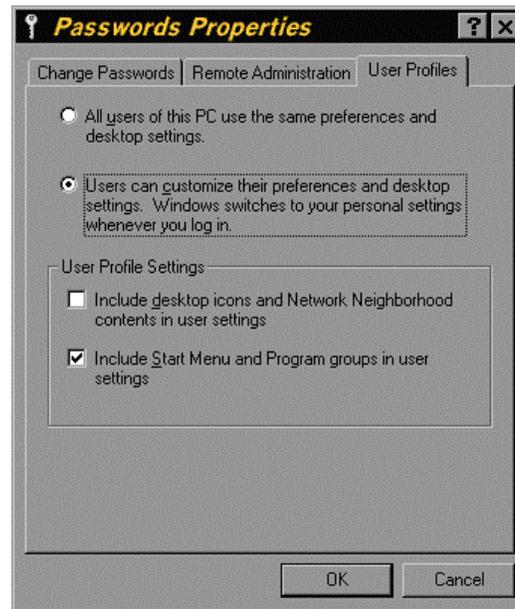
---

# Explorer

## Controlling the Initial Display of Explorer

When your computer is shared by several users, often each user has a particular home directory where all his or her documents, data files, and subdirectories are stored. It would be convenient if for each individual user the Explorer's initial display showed this user's home directory. This can be achieved by personalizing the properties of the target of the shortcut to Explorer in each user's Start Menu. This customization requires that each user can modify his or her Start Menu.

Select the Passwords applet from the Control Panel. Click the User Profiles tab and verify that different users can have different settings and that different users can customize their Start Menu. The User Profiles dialog window with these choices enabled is shown in the next figure.

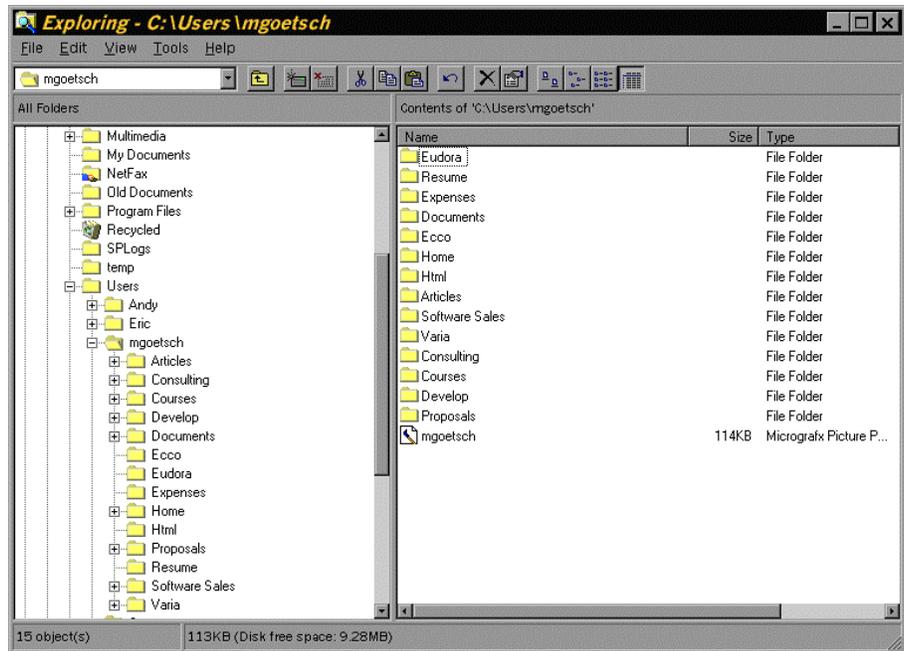


**Figure 30.** User Profiles Dialog Window of the Passwords Applet

Open the Explorer and navigate to `\Windows\Profiles\UserName\Start Menu\Programs`, where *UserName* is the name of each of the users on your system. Right click the entry for Explorer and select the Properties item from the menu. Click the Shortcut tab and change the switches after the command name in the Target Box to `/e,UserDirectory`. Press OK. For example, if each user has its own home directory under the directory `C:\Users`, the switches to show all the subdirectories for the user with name *mgoetsch* would then be:

```
c:\windows\explorer /e,c:\Users\Mgoetsch
```

The initial display of the Explorer with these switches is shown in the next figure.



**Figure 31. Explorer's Initial Display on a User's Directories**



Note that this does not control the initial display of Explorer, when it is activated by right clicking on the Start Menu and then selecting the Explore item. When you right click on the Start button, one of the menu items is *Explore* not Explorer. By selecting this item, you are asking to explore the Start menu folder itself and Explorer starts while showing the Start menu folder. The submenus of the Start menu are the folders in this view and the menu items are the shortcuts within the folders. The purpose of choosing Explore from the Start button's right-click menu is to rearrange items in the Start menu. This is the standard user interface convention in the Windows. In general, if you right-click an object in Windows a menu will be displayed with commands specific to the object that you right-clicked. Right-clicking any folder, including the Start menu folder, displays a menu of commands for working with that folder. If you have enabled different preferences and desktop settings for every user, then the Start menu for that individual user will be shown.

Many applications, such as Microsoft Word and Excel have an option that allows you to set the default document directory for each user to their home directory.

## Opening Files from the Send To Menu

Many configuration or initialization file types are just plain ASCII files and it would be very convenient if they could be edited easily. You can view or edit a file easily by double clicking on it only if that particular file type has been registered and a viewing or editing application has been specified. But these files might have many different file types and extensions.

The next easiest method is to copy the shortcut to an ASCII editor to the Send To folder. Notepad and Wordpad are examples of such ASCII editors. Then when you right-click on this file, or any file for that matter, and select *Send To* from its context menu, the ASCII editor will be part of the list. Just select the editor and the editor will be launched and open the file.

## Opening Data Files with a User Selected Application

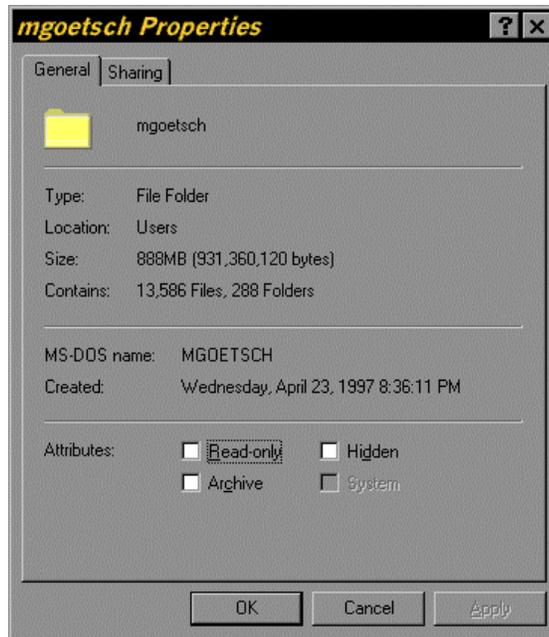
In the default configuration, right clicking on a data file in the Explorer brings up a context menu specific to that file type and that double clicking activates the default menu item. In most cases the default menu choice loads the data file into the application that is associated with its extension.

But some files might be opened by more than one application. For example, you might want to open a .DOC file into WordPad rather than launch the much larger Word for Windows. In other cases, an extension might have multiple meanings and associated applications.

If you hold down the shift key while you right click on the data file, then the additional item *Open with* is added to the context menu. This is much quicker than opening first the application and then to navigate to the data file in the *File Open* dialog.

## Determining the Size of a Folder's Contents

The easiest way to determine the size of a folder and all its subfolders is to select the folder and use the Properties command under the File menu. You can also select Properties from the popup menu that is displayed when you right-click on the folder. A dialog is displayed which first counts and then shows the amount of space occupied by, and the number of files, and the number of subfolders included in that folder. The dialog is illustrated in Figure 32.



*Figure 32. Dialog with the Size of the Contents of a Folder*

## Creating a Directory Locked to Explorer (Windows 95 only)

DOS allows certain characters in directory names that are not acceptable to Explorer. Usually this involves inserting one or more characters that created with the ALT key and number sequence in the directory name. Explorer will not open, delete, or rename such a directory. The characters unacceptable to Explorer are 158-159, 169, 176-224, 226-229, 231-240, 242-245, 247, 249, 251-252, 254-255.

The Explorer in Windows NT has no problems accessing such directories.

---

## FreeCell

The solitaire game variant FreeCell was the test application for Win32s, the 32 bit extensions and API to the 16 bit Windows 3.1. By default FreeCell was installed as a 32 bit application, so the user could verify that the 32 bit extensions were functioning correctly.



Figure 33. FreeCell Solitaire Game Variant

FreeCell has also been included in Windows 95 and Windows NT 4.0. However, the version supplied with Windows 95 is a 16 bit version.

There is a rumor that every one of its 65,536 different starting positions can be won.

## Playing FreeCell without a Mouse

While most users play FreeCell with the mouse, you can play the game in Windows 95 using only the keyboard. This can come in handy in situation where it is not possible to use the mouse, such as airline tray tables.

All keyboard commands have the same structure. You press first the number of the starting column or location and then the number of the destination column or location. The columns are numbered 1 through 8, the four free cells are numbered 0, and the home cells are numbered 9. You can press any digit twice to get a full look at all the cards in the column.

- to move cards from one column to another column, press the number of the starting column followed by the number of the destination column
- to move cards from a column to the home cells, press the number of the column, followed by the number 9
- to move the bottom card in a column to one of the four free cells, press the number of the starting column followed by the number 0
- to move a card back from the free cells to a column, press the number 0 repeatedly until the card that you want to move is highlighted, then press the number of the destination column. To move the card to the home cells, press the number 9.

---

# System Agent

## Windows 95 Plus! Only



The System Agent application allows the automated execution of tasks. It is mostly used to schedule system maintenance task such as disk defragmentation and disk error checking. A small icon at the right hand side of the task bar indicates that the System Agent is active. The System Agent application is installed as part of Windows 95 Plus!

If you purchase the Internet Explorer, version 4.0 or higher, then the **Task Scheduler** application is included. The Task Scheduler application has identical functionality as System Agent. During installation, Task Scheduler replaces completely the System Agent. All scheduled tasks and the taskbar icon remain unchanged.

---

# Task Scheduler

The Task Scheduler application allows the automated execution of tasks. It is mostly used to schedule system maintenance task such as backing up disks, disk defragmentation, and disk error checking. A small icon at the right hand side of the task bar indicates that the Task Scheduler is active. You can activate the Task Scheduler by clicking on the icon in the task bar or by clicking on My Computer and then on Scheduled Tasks. You can display, edit, and manage the tasks currently scheduled. An example of the Task Scheduler is shown in Figure 34.



*Figure 34. Scheduled Tasks Illustration*

The Task Scheduler application is included on the Internet Explorer CD-ROM, version 4.0 or higher. The Task Scheduler is not installed automatically when Internet Explorer is installed, but its installation must be started manually.

If you had installed the **System Agent**, which is part of Windows 95 Plus!, then during installation, Task Scheduler replaces completely the System Agent. All scheduled tasks and the taskbar icon remain unchanged.

---

# System Monitor

You will find the System Monitor application in the Systems Tools menu of the Accessories menu of the Programs menu.

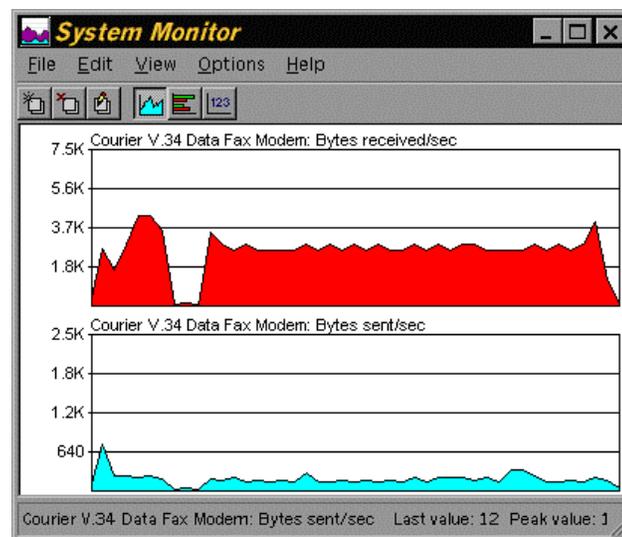
When you choose the Add Item from the Edit menu, a dialog box will be display listing several categories of items on the left and items within those categories on the right. The category list will include File System, Kernel, and Memory Manager. It

might also include one or more network related categories, such as Microsoft Network Client and Microsoft Network Server. The Modem category usually does not show up.

## Bytes Received and Sent by a Modem

In order for the modem performance to be monitor you must first specify a log file for the modem. Open the Modem applet in the Control Panel, click on the Properties button, select the Connection tab and press the Advanced button. Check the "Record a log file" box at the bottom of the dialog. When the modem is connected using a 32 bit communications program then an additional category will appear in the System Monitor with the modem driver's name. Possible items for the modem are "Bytes Received" and "Bytes Sent". Once you have selected these items, those settings will remain in your Systems Monitor, even when the modem is not in use.

The line graph for the number of bytes received and sent is illustrated in Figure 35.



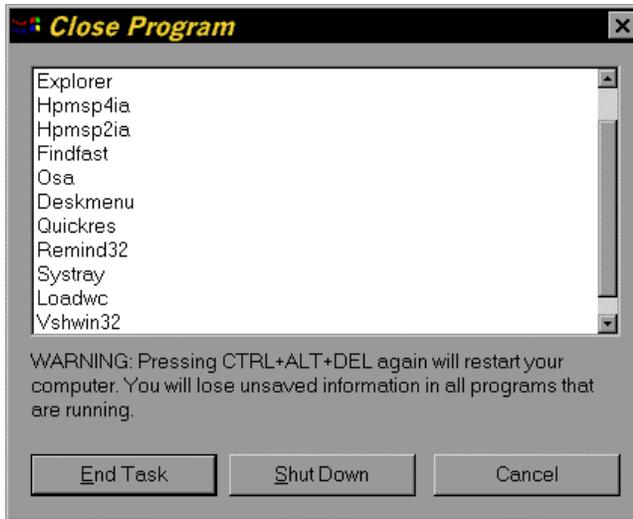
**Figure 35.** System Monitor of Bytes Received and Sent by a Modem

In Windows NT the number of bytes send and received in the current communications session can be displayed directly for the Dial-Up Monitor.

---

## Task Manager

The Task Manager is the application that displays the processes currently active and running on your computer. You can also use the Task Manager to shut down manually a process or application that is no longer responding. The Task Manager is always running, but you start the display of the Task Manager dialog by pressing simultaneously CTRL-ALT-DELETE. For Windows 95 the Task Manager dialog is shown immediately. This dialog is illustrated in Figure 36. For Windows NT the Task Manager dialog is one of the programs that can be started. This dialog is illustrated in Figure 37.



**Figure 36. Windows 95 Task Manager Dialog**

**Figure 37. Windows NT Task Manager Dialog**

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## WinHelp

WinHelp is the application that displays the help files on various topics and for various applications. Winhelp uses two main windows. The Help Contents window shows a list of topics in the current help file. The Help Topic window displays the current topic.

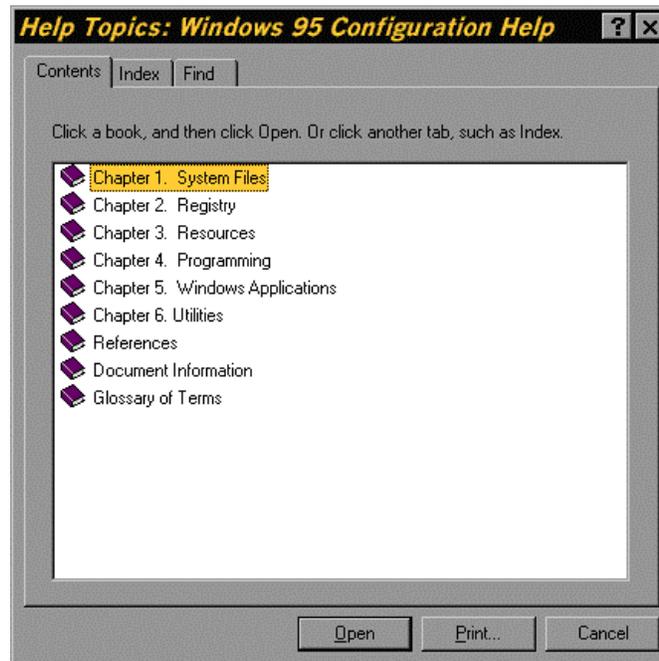


Figure 38. Help Contents Window Illustration

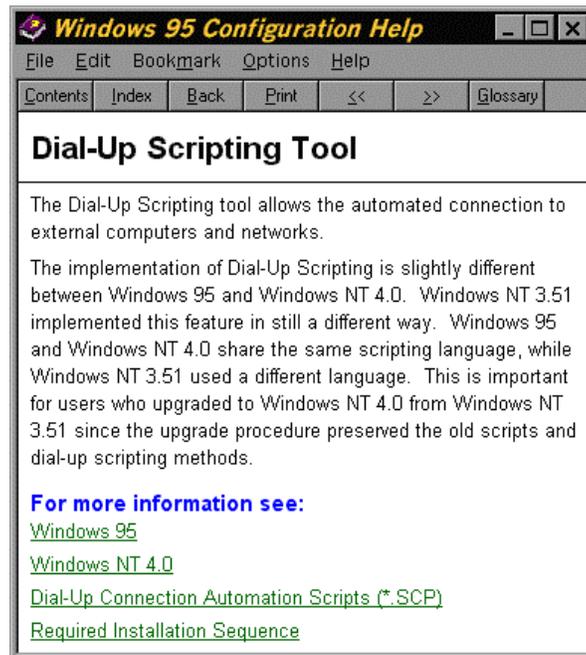


Figure 39. Help Topic Window Illustration

## Read Help File Topics Sequentially

Sometimes, you might want to read the Windows help file topics in a sequential sequence, like a conventional book, where one chapter follows another. Some help files have browse sequence buttons to do exactly that. You can still read the help file sequentially even if the help file developer did not provide this feature by editing the WIN.INI.

1. Find or create the section title [Windows Help]
2. Immediately after the section title, create the following setting

SeqTopicKeys=1

3. Restart Windows for the change to take effect

Pressing the following key combinations will navigate through the Windows help files:

Table 4. Keystrokes and Topic Navigation in WinHelp

Key Combination	Action
Ctrl-Shift-Right	next sequential topic
Ctrl-Shift-Home	first sequential topic
Ctrl-Shift-Left	previous sequential topic (Windows 95 Help only)
Back Button	previously viewed topic (not sequential)
Browse Buttons	previous and next sequential topic



# Chapter 7. Utilities

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## User Interface

### TrayLaunch: Launching Desktop Applications

Windows 95 makes it possible to start applications in several different ways. The first method uses the Start menu on the Taskbar. The second method uses the Explorer. The third method uses shortcuts placed on the desktop. Most programs can be accessed through the Start menu, but certain system utilities are only available on the desktop, such as My Computer or the Recycle Bin. It is inconvenient if you want to start an application on the desktop if you have many windows open.

One solution is to put a folder with your desktop shortcuts in your Start menu. This approach has some limitations. You cannot start system utilities this way and you have to maintain both the desktop and the folder.

Traylaunch is an utility published in the February 1997 issue of PC Magazine. Traylaunch, which resides in tray on the far right end of the Taskbar, gives you menu access to all the programs on your desktop including system utilities.

It can be downloaded from the World Wide Web site [www.pcmag.com](http://www.pcmag.com) or download the file <ftp://znet.com/pcmag/1997/0218/v16n04.zip> directly through anonymous FTP.

### QuickRes: Changing Display Resolutions and Color Depths without Rebooting

QuickRes is a utility, included in the PowerToys utility pack available from the Microsoft web site with URL <http://www.microsoft.com>. As with all the utilities in the PowerToys pack, QuickRes is not an official Microsoft product and as such is not supported by Microsoft.

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## System Management

### COA32: Relocating Applications without Reinstalling

When you install a new Windows application a web of system references binds it to the drive and directory you or the application vendor chose at installation time. If

you move later on the application to a different drive or directory, changes are good that it will no longer work because the system is still looking for it in its old location.

Change of Address (COA32) is a utility published in the January 1997 issue of PC Magazine that updates all the systems references of particular application with the references to its new location. COA32 is an all-new 32 bit version of COA, compatible with Windows 95, and completely redesigned for ease of use. It updates references in the INI files, shortcuts and the Registry. You can control how thorough the search will be and you can review a list of found items and reject any incorrect references before COA32 makes its changes. Optionally, COA32 can generate a log file of the changes it has made.

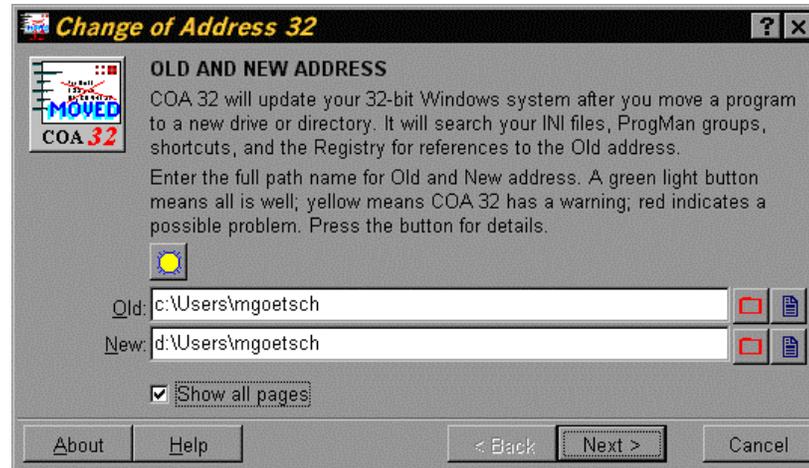


Figure 40. COA32 or Change Of Address Utility

It can be downloaded from the World Wide Web site [www.pcmag.com](http://www.pcmag.com) or download the file <ftp://zdnet.com/pcmag/1997/0107/v16n01.zip> directly through anonymous FTP.

## Synchronizing the Clock on Your Computer with 4dtime

The internal computer clocks is not very accurate. The deviation is especially noticeable over extended periods of time. You can synchronize your computer clock over the Internet with one of several atomic clocks in the country. The 4dtime utility from Thinking Man synchronizes your computer's clock on a regular basis. It can be downloaded from [www.thinkman.com](http://www.thinkman.com). The dialog to select the atomic clock server and to select the update frequency is shown in the next figure.

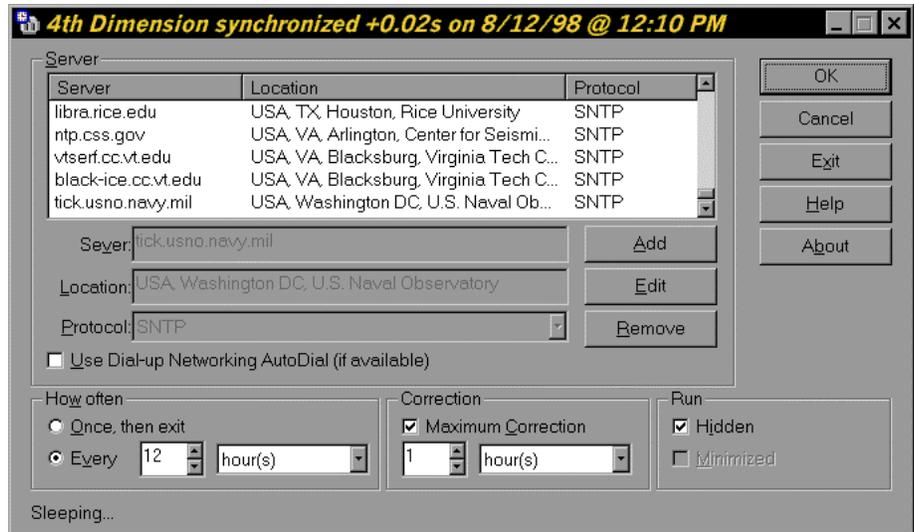


Figure 41. 4dTime Computer Clock Synchronization Utility

## Connecting Printers to Unix-Style LPR Ports

## Connecting Printers to JetDirect Ports

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# File Management

## Winzip

A ZIP file is a compressed archive of a set of files. Archives are files that contain other files. Typically the files in an archive are compressed. Archives usually have file names ending with CAB, ZIP, LZH, ARJ, or ARC, depending on how they were created. Archives make it easy to group files and make transporting and copying these files faster. Compressed archives also reduce the space required to store a set of files on a hard disk or floppy disk. ZIP is the default extension of zipped files. WinZIP by Nico Mak is a popular utility with GUI interface to manipulate ZIP files. A typical window for WinZIP is shown in the next figure.

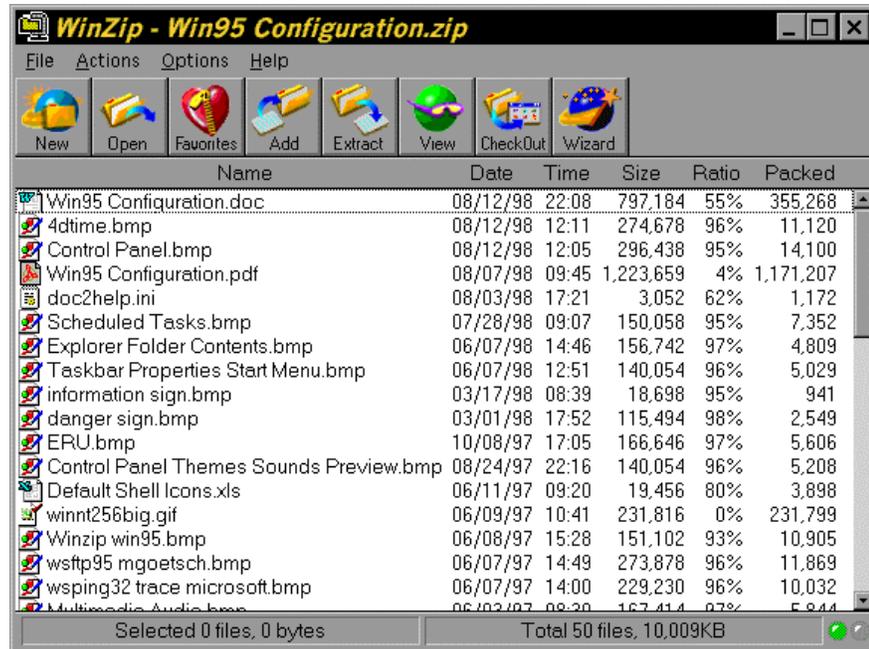


Figure 42. WinZIP Example

## FileGrab: Getting a List of File Names From Explorer

The Explorer does not provide the capability to create a list of files that then can be used in other applications. Examples are a list of all the files in a directory or folder, or the results of a file search with the Find command. When you drag a file or collection of files from Explorer and drop it into another application, you get the file contents, not its name.

One way to get a list of files is to open a DOS window and to run the DIR command with the output redirected to a file. For example to get list of all the help files in the current directory and to save this list in a file, you can execute the following command:

```
DIR *.HLP >HELFILELIST.TXT
```

FileGrab is a utility published in the March 1997 issue of PCMagazine that lets you use the Explorer to create file lists for use in other applications. Running FileGrab creates an empty window ready to accept filenames from Explorer. Just drop one or more files from Explorer onto the FileGrab window and you get a list of files instead of the contents of the files. You can then save the list to disk, print it, or copy it to the Clipboard for pasting into another application. The View options let you choose which file characteristics, such as date, size, or attributes, are to be included with the filenames.

It can be downloaded from the World Wide Web site [www.pcmag.com](http://www.pcmag.com) or download the file [ftp.zdnet.com/pcmag/1997/0304/v16n05.zip](http://ftp.zdnet.com/pcmag/1997/0304/v16n05.zip) directly through anonymous FTP.

## WinDiff: Comparing Two Directories or Files



Figure 43. WinDiff Directory Comparison Results Window

## Internet Services, Clients, and Browsers

### WS\_FTP95: a FTP Client

All Windows operating systems come with a command line FTP client called FTP.EXE.

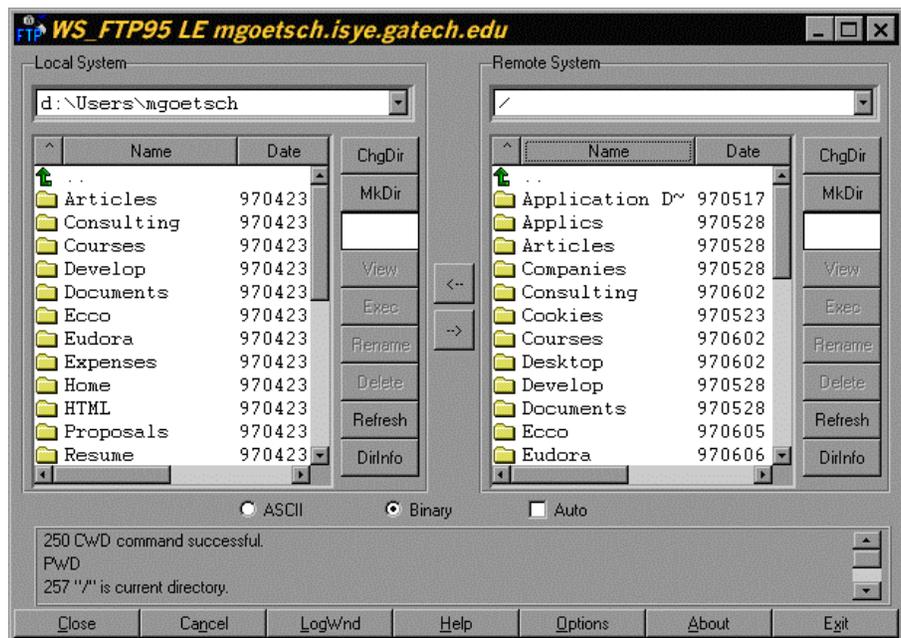


Figure 44. WS\_FTP95 FTP Client for Windows 95

Windows NT provides an FTP server as part of its **Internet Services Manager**. Windows 95 does not provide an FTP server, but several commercial FTP server programs do exist. If you purchase Microsoft FrontPage 98 an FTP server is also included on the CD-ROM.

## WSPING32: a PING and Trace Application

PING is a utility program that sends a small message to a remote computer to check if the remoter computer is on-line and it reports how long it took for the message to be echoed back. It is usually used as a test to determine if the computer has working TCP/IP network installed and can reach the Internet. It is also used to determine if the response time of a remote computer is small enough to support a multiplayer game.

All Windows operating systems come with a command line PING application called PING.EXE. A GUI PING utility WSPING32.EXE is shown in Figure 45.

All Windows operating systems come with a command line Trace application called TRACERT.EXE.

WSPING32 tracing the Microsoft web site is shown in the next figure.

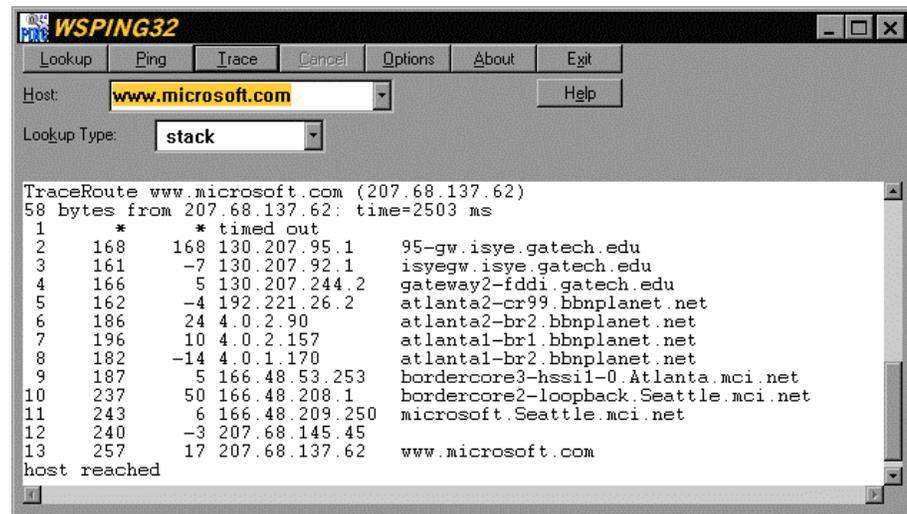


Figure 45. WSPING32 tracing the Microsoft Web site

# Chapter 8. Command Line Programs

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## Command Line Processor (DOS Prompt)

Until the advent of the Windows user interface, the command line processor, more commonly known as the DOS prompt, was the main user interface between computer users and their computer. The DOS prompt became the symbol for the difficulty of using computers for many users. With Windows 95 and the Windows NT the importance of the command line user interface has been greatly diminished. The command line processor is still very important for the execution of commands in batch files. Batch files remain the most common way to execute several commands in sequence. The control of most of these commands is based on command line parameters and text input and output. The majority of them are legacy, but at the same time very powerful, system level commands.

Further information on changing the appearance and the behavior of the command line processor can be found in the section devoted to the Registry. Further information on tasks that can most easily be accomplished with command line commands is found in the Chapter on programming.

There are significant differences between the command line processor of Windows 95 and Windows NT, where the latter in general is much more powerful.

### Using Command Separators for Sequential and Logical Execution of Commands (Windows NT Only)



The Windows NT command processor allows you to specify more than one command on the command prompt line by using the ampersand character as a command separator. For example, the following command will launch both Explorer and Write from the command line

**Explorer&Write**

You can even add a limited amount of conditional execution to your command stack using two other command separators. If you separate two commands using a double ampersand (&&), then the second command will be executed only if the first command runs successfully. Running successfully means it must be a valid command, it must run to normal termination, and it must not set a nonzero errorlevel

on exit. If you use a double bar (||) as command separator, then the second command will only be executed if the first command fails.

## Using File Handles for Redirection (Windows NT Only)



The Windows NT command processor interprets a single digit followed by a redirection symbol as a request to redirect to the handle represented by that single digit. Handles 0, 1, and 2 are the standard input, standard output, and standard error, respectively. The handles 3 through 9 do not have default definitions. To prevent Windows NT from interpreting the single digit as a handle number, you must precede it with a caret (^). For example, the command

```
echo ^0>result.txt
```

will create a file called result.txt containing the single character zero, while the command

```
dir *.txt 1>result.txt 2>error.txt
```

will create a file called result.txt containing the output of the DIR command, while the file error.txt will contain any error messages. This is a very powerful extension of the Windows NT command processor, which is not implemented in Windows 95.

---

## Command Line Programs Shipped with Windows

### XCOPY32: Copying Files and Directories

XCOPY or XCOPY32 are the programs that copy files and directories from a source to a destination location. XCOPY is just a stub program that launches XCOPY32 and is included to remain consistent with previous DOS versions. XCOPY32 actually executes the copying.

#### *Command Line Parameters*

You can request a list of all the execution parameters with the following command:

```
XCOPY32 /?
```

You can execute this command from a DOS box or from the Run command on the Start menu. You will see a list of execution parameters similar to the following list.

**Copies files and directory trees.**

```
XCOPY source [destination]      [/A | /M] [/D[:date]] [/P] [/S [/E]]  
[ /W ]  
                                [/C] [/I] [/Q] [/F] [/L] [/H] [/R] [/T] [/U]  
                                [/K] [/N]
```

**source**                      Specifies the file(s) to copy.

**destination**                Specifies the location and/or name of new files.

**/A** Copies files with the archive attribute set, doesn't change the attribute.

**/M** Copies files with the archive attribute set, turns off the archive attribute.

**/D:date**                    Copies files changed on or after the specified date.

If no date is given, copies only those files whose source time is newer than the destination time.

- /P** Prompts you before creating each destination file.
- /S** Copies directories and subdirectories except empty ones.
- /E** Copies directories and subdirectories, including empty ones. Same as **/S /E**. May be used to modify **/T**.
- /W** Prompts you to press a key before copying.
- /C** Continues copying even if errors occur.
- /I** If destination does not exist and copying more than one file, assumes that destination must be a directory.
- /Q** Does not display file names while copying.
- /F** Displays full source and destination file names while copying.
- /L** Displays files that would be copied.
- /H** Copies hidden and system files also.
- /R** Overwrites read-only files.
- /T** Creates directory structure, but does not copy files. Does not include empty directories or subdirectories. **/T /E** includes empty directories and subdirectories.
- /U** Updates the files that already exist in destination.
- /K** Copies attributes. Normal Xcopy will reset read-only attributes.
- /Y** Overwrites existing files without prompting.
- /-Y** Prompts you before overwriting existing files.
- /N** Copy using the generated short names.

XCOPY32 is particularly useful for copying large numbers of files such as in automated backup operations.

The files XCOPY.EXE and XCOPY32.EXE are by default located in the Windows directory and can thus be executed from any directory on your computer.

## EDIT: Editing ASCII Files

It is many times useful to have a small editor available for editing ASCII batch and configuration files. Notepad and Wordpad are examples of such small editors that can be used with Windows 95. It is also useful to have a command line ASCII editor. All versions of Windows come with the EDIT program, which is a DOS-based ASCII editor. I usually copy this editor to any startup disk or boot disk so that I can make small changes to configuration or batch files, even if Windows is not available. The files EDIT.COM and EDIT.HLP can be found in the *c:\windows\command* directory for Windows 95 and in the *c:\winnt\system* directory for Windows NT.

## CHKNTFS



Windows NT will run the CHKDSK /F program the next time it reboots depending on the status of the Dirty Bit for each NTFS partition. There is no way to clear permanently the Dirty Bit once it has been set, except by running CHKDSK /F. However, there is a way to prevent the running of CHKDSK /F on NTFS partitions when Windows NT reboots. You may want to do this to retrieve some file segments before CHKDSK permanently rearranges the files on your NTFS partition. Since the Dirty Bit is set when an abnormal system termination has occurred, preventing CHKDSK /F to run should only be done as a temporary stopgap measure until normal Windows NT operation can be restored.

The CHKNTFS utility allows you to override the normal behavior of CHKDSK /F at boot time. When you run CHKNTFS /?, it will display the following help.

**CHKNTFS drive: [...]**  
**CHKNTFS /D**  
**CHKNTFS /X drive: [...]**  
**CHKNTFS /C drive: [...]**

**drive:** Specifies a drive letter.  
**/D** Restores the machine to the default behavior; all drives are checked at boot time and `chkdsk` is run on those that are dirty. This undoes the effect of the `/X` option.  
**/X** Excludes a drive from the default boot-time check. Excluded drives are not accumulated between command invocations.  
**/C** Schedules `chkdsk` to be run at the next reboot.

If no switches are specified, **CHKNTFS** will display the status of the dirty bit for each drive.

CHKNTFS does not modify the Dirty Bit, but it sets or clears a flag in the Registry that overrides the behavior of `CHKDSK /F`. The Registry entry is

*HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\BootExecute*

Normally it is set to

*autocheck autochk \**

CHKNTFS adds or removes override lines for individual NTFS partitions, e.g. to prevent `CHKDSK /F` from running for NTFS partition D: the entry becomes:

*autocheck autochk \**  
*autocheck autochk /k:D*

When you schedule the `CHKDSK /F` for drive D: when the Dirty Bit was not set with the `/C` option, the entry becomes

*autocheck autochk \**  
*autocheck autochk /m:D*

In addition, you must have Administrator privileges to run the `CHKNTFS` command. The file `CHKNTFS.EXE` is installed as part of Service Pack 2 for Windows NT 4.0 and placed in the `\Winnt\System32` directory.

## CACLS



Windows NT allows you to set the access privileges for directories and files from Windows Explorer. However, setting access privileges using Windows Explorer completely replaces the previous access privileges. To change the access privileges more selectively, you can use the `CACLS` (Change Access Control Lists) command. For example, you can deny access to a user without changing any access privileges assigned to or set by other users.

When you run `CACLS` without any parameters, it will display the following help:

**Displays or modifies access control lists (ACLs) of files**

**CACLS filename [/T] [/E] [/C] [/G user:perm] [/R user [...]]**  
**[/P user:perm [...]] [/D user [...]]**  
**filename**           **Displays ACLs.**  
**/T**                   **Changes ACLs of specified files in**

the current directory and all subdirectories.

**/E** Edit ACL instead of replacing it.

**/C** Continue on access denied errors.

**/G user:perm** Grant specified user access rights.  
 Perm can be: R Read  
 C Change (write)  
 F Full control

**/R user** Revoke specified user's access rights (only valid with /E).

**/P user:perm** Replace specified user's access rights.  
 Perm can be: N None  
 R Read  
 C Change (write)  
 F Full control

**/D user** Deny specified user access.

Wildcards can be used to specify more than one file in a command.

You can specify more than one user in a command.

Typical access privileges for individual user files and directories are:

**System: Full Control**  
**Administrators: Full Control**  
**Backup Operators: Read Only**  
**User: Full Control**  
**All other users: None**

The Security tab of the Properties shows the following access privileges:

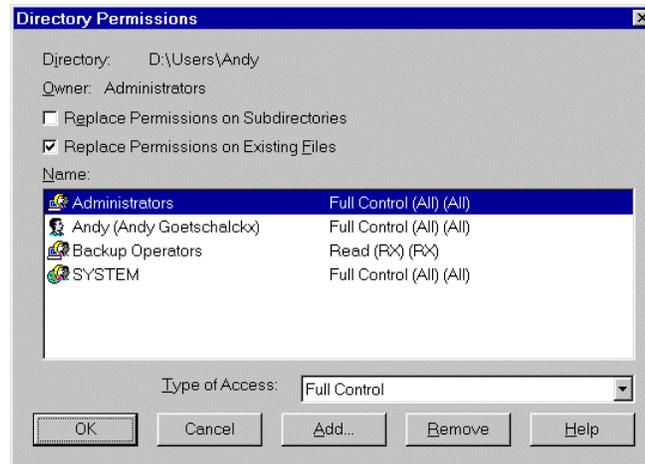


Figure 46. File and Directory Permissions

The corresponding access privileges as reported by CACLS are:

**D:\Users\Andy** FALCON\Andy:(OI)(IO)F  
 FALCON\Andy:(CI)F  
 BUILTIN\Administrators:(OI)(IO)F  
 BUILTIN\Administrators:(CI)F  
 NT AUTHORITY\SYSTEM:(OI)(IO)F  
 NT AUTHORITY\SYSTEM:(CI)F

**BUILTINBackup Operators:(OI)(IO)(special  
access:)  
GENERIC\_READ  
GENERIC\_EXECUTE  
BUILTINBackup Operators:(CI)R**

The file CACLS.EXE is placed in the \Winnt\System32 directory and so is accessible from any directory.

---

## Additional Command Line Programs

### LS

The LS command provides the ability to use the Unix LS command and its syntax for listing the files in a directory. This is particularly useful, when you are connected to a Unix host with Telnet, FTP, or similar utility. You can then display files on the remote host and on your local computer with the same command syntax.

Place the file LS.EXE in your Windows NT system directory *c:\winnt\system* so that the command is always available in every command processor window. For Windows 95 place the file in the *c:\windows\command* directory where it is available from any command prompt.

# References

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## Books and Articles

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[www.newriders.com](http://www.newriders.com).

Honeycutt, J., (1996). **Using the Windows 95 Registry**. ISBN: 0-7897-0785-3.  
[www.mcp.com/que](http://www.mcp.com/que).

Honeycutt, J., (1996). **Windows 95 Registry and Customization Handbook**. ISBN: 0-7897-0725-X. [www.mcp.com/que](http://www.mcp.com/que).

Petrusha, (1996). **Inside the Windows 95 Registry**. ISBN: 1-56592-170-4.  
[www.ora.com](http://www.ora.com).

Tridow, R., (1996). **Windows 95 Registry Troubleshooting**. ISBN: 1-56205-556-9. [www.mcp.com/newriders](http://www.mcp.com/newriders).

Woram, J., (1996). **The Windows 95 Registry: A Survival Guide for Users**. ISBN: 1-55828-494-X. [www.mispress.com](http://www.mispress.com).

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## World Wide Web Sites

Goetschalckx, M. [www.isye.gatech.edu/~mgoetsch](http://www.isye.gatech.edu/~mgoetsch)

Microsoft Corporation. [www.microsoft.com](http://www.microsoft.com)

PC Magazine. [www.pcmag.com](http://www.pcmag.com) or [ftp.znet.com/pcmag](ftp://znet.com/pcmag).



# Document Information

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## Version

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# Glossary of Terms

## **OSR2**

OSR2 is the acronym for OEM Service Release 2 version of Windows 95. It comes only preinstalled on some computer systems purchased after May 1997, it cannot be purchased separately as an upgrade or a software product. The most significant differences are FAT32 and the new Dial-Up Networking utility.

## **IPX/SPX**

The default networking protocol to connect computers in a local area network. NETBEUI and TCP/IP are other networking protocols.

## **NETBEUI**

A networking protocol used to communicate with computers running versions older than Microsoft Windows for Workgroups.

## **APM**

APM is the acronym for Advanced Power Management. APM is a set of system actions that conserve power consumption and is mostly implemented on laptop computers.

## **CAB**

CAB is the default extension for Microsoft Cabinet files. A Cabinet file is a compressed archive of a set of files. Archives are files that contain other files. Typically the files in an archive are compressed. Archives usually have file names ending with CAB, ZIP, LZH, ARJ, or ARC, depending on how they were created. Archives make it easy to group files and make transporting and copying these files

faster. Compressed archives also reduce the space required to store a set of files on a hard disk or floppy disk. Many Microsoft applications and even Windows 95 itself are distributed in CAB file archives.

## **DLL**

DLL stands for Dynamic Link Library. A DLL is an application extension, loaded and unloaded automatically by an application during its execution. The advantages of DLLs are that they can be unloaded during application execution and return at that time their memory to the operating system and that one instance of the DLL can be shared by one or more applications, again reducing memory requirements. Many of the key procedures and functions of Windows 95 and Windows NT are encapsulated in DLLs.

## **DOS**

DOS stands for Disk Operating System. The original DOS for IBM compatible machines had a command line user interface. The user interacted with the computer by typing commands at the DOS prompt. In Windows 95 this way of interacting with the computer is available through the DOS window.

## **FAT**

FAT is the acronym for File Allocation Table and it denotes the low-level organization of files on floppy and hard disks. The original FAT was a 16-bit file system that used 2 to the power 16 or 65536 clusters. The cluster size is equal to the hard disk capacity divided by the number of clusters, e.g. a hard disk with capacities larger than 0.5 or 1 GB have a cluster sizes of 16 KB and 32 KB, respectively. Every file stored on a hard disk uses a least one cluster and wastes on the average one half cluster of disk space. Therefore, FAT has a significant amount of wasted disk space. The original FAT is used by DOS, the original release of Windows 95 and optionally by Windows NT. It cannot handle hard disks larger than 2 GB.

## **FAT32**

FAT32 is the acronym for File Allocation Table and it denotes the 32-bit, low-level organization of files on floppy and hard disks. FAT32 is a 32-bit file system used by the OSR2 release of Windows 95 that avoids much of the wasted disk space inherent in the original 16-bit FAT, the file system used by DOS and the original Windows 95. FAT also cannot support hard disk larger than 2 GB, while FAT32 can handle

such large disks with ease. On the other hand, no other operating system can access a disk that uses FAT32, not DOS, not Windows NT, and not even the original release of Windows 95.

## **FTP**

FTP is the acronym for File Transfer Protocol. It is a protocol for transmitting ASCII or binary files between different computers over the Internet.

## **GUI**

GUI stand for Graphical User Interface. It denotes a graphical interface through which the user interacts with the computer, mostly by pointing and clicking the mouse.

## **INF**

INF is the default extension for information files. The information files hold switches and settings for the automatic installation of a program. They can also be used to hold information on programs that are to be started automatically when a drive is accessed or to hold information on drive icons. INF files are ASCII text files that can be edited with any ASCII text editor such as Notepad.

## **INI**

INI is the default extension of Windows and applications configuration files. The INI files hold configuration settings and switches and permanent application settings. INI files are ASCII text files that can be edited with any ASCII text editor such as Notepad. The INI files are a holdover from Windows 3.1 since starting with Windows 95 most configuration switches are stored in the Registry. However many Windows applications still use the general Windows WIN.INI file or the application specific INI file.

## **ISDN**

ISDN stands for Integrated Services Digital Network, the international standard for a digital communications network that is intended to replace the world's analog telephone system. ISDN allows dial-up connections for transferring information between computers and connections to the Internet at data transfer rates of 128 kilobits per second (Kps). It also permits voice and data signals to share the same digital phone line.

## **LNK**

LNK is the default extension for shortcuts files. A shortcut is a small object that points to a target program, file, or directory. Every item below Programs on the Start menu and every object you have placed on the desktop is a shortcut. Windows relies heavily on shortcuts to make its operation appear more intuitive and requiring fewer mouse clicks.

## **MDI**

MDI stands for Multiple Document Interface and it defines a window arrangement so that a single program can display one or more windows on section of one or on different documents.

## **MMX**

MMX stands for Multimedia Extensions and indicates a group of instructions added in 1997 to the Intel 80386 processor instruction set to speed up video and sound functions.

## **MRU**

MRU is the abbreviation for Most Recently Used. A MRU list contains the files most recently used by an application or the command most recently used with the Run command.

## **OEM**

OEM stands for Original Equipment Manufacturer and it indicates the organization that actually manufactured, instead of just integrating and reselling, a particular piece of equipment.

## **PING**

Packet Internet Groper. An utility program that sends a small message to a remote computer to verify that the remote computer is reachable. The remote computer echoes back the message and the PING program reports how long it took.

## **SCP**

SCP is the default extension for Dial-Up Networking scripts. The Dial-Up Scripting tool allows the automated connection to external computers and networks. Windows

95 provides several standard Dial-Up Networking scripts. For example, to connect to CompuServe, the script CIS.SCP has been provided. To connect to other Internet service providers, you might have to modify one of the provided PPP or SLIP scripts.

## **TCP/IP**

TCP/IP stands for Transport Control Protocol/Internet Protocol and it indicates a set of rules on how computers communicate with each other. TCP/IP is the standard networking protocol for the Internet.

## **URL**

URL stands for Uniform Resource Locator and denotes the address of the resource on the Internet. An Internet site address typically starts with a protocol name followed by the organization that maintains the site; the suffix identifies the kind of organization. For example, <http://www.isye.gatech.edu/> identifies the Web server at the School of Industrial and Systems Engineering at the Georgia Institute of Technology. "*http://www*" indicates that it is a Web server that uses the http protocol, and ".*edu*" identifies Georgia Institute of Technology as an educational institution. Generally, commercial site addresses end with ".*com*" and government site addresses end with ".*gov*".

If the address points to a specific page, additional information such as a port name, the directory in which the page is located, and the name of the page file, is included. Web pages authored by using HTML (Hypertext Markup Language) often end with an .htm or .html extension. For instance my home page has an address or URL of <http://www.isye.gatech.edu/~mgoetsch/index.html>.

## **ZIP**

ZIP is the default extension of zipped files. A zip file is a compressed archive of a set of files. Archives are files that contain other files. Typically the files in an archive are compressed. Archives usually have file names ending with CAB, ZIP, LZH, ARJ, or ARC, depending on how they were created. Archives make it easy to group files and make transporting and copying these files faster. Compressed archives also reduce the space required to store a set of files on a hard disk or floppy disk. WinZIP by Nico Mak is a popular utility with GUI interface to manipulate zip files.



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