Microsoft Windows FAQ

Frequently Asked Questions

Copyright

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Credits

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I would also like to express my gratitude to the countless people who have contributed information to the Windows FAQs, through Usenet news, email and personal conversations. You know who you are: I'm grateful for your help, as this FAQ would not be what it is without your help.

Latest versions of this FAQ are available by anonymous *ftp* on *ftp.metrics.com (198.133.164.1)* in the directory *~/faq.*

Microsoft Windows

Windows 1.0

Microsoft first began development of the Interface Manager (subsequently renamed Microsoft Windows) in September 1981. Although the first prototypes used Multiplan and Word-like menus at the bottom of the screen, the interface was changed in 1982 to use pull-down menus and dialogs, as used on the Xerox Star.

Microsoft finally announced Windows in November 1983, with pressure from just-released VisiOn and impending TopView. This was after the release of the Apple Lisa (but prior to the Macintosh), and before Digital Research announced GEM, another competing graphical environment. Windows promised an easy-to-use graphical interface, device-independent graphics and multitasking support. The development was delayed several times, however, and the first version hit the store shelves (after 55 programmer-years of development!) in November 1985. The selection of applications was sparse, however, and Windows sales were modest,

The following were the major features of Windows 1.0:

- Graphical user interface with drop-down menus, tiled windows and mouse support
- Device-independent screen and printer graphics
- Co-operative multitasking of Windows applications

Windows 2.0

Windows 2.0, introduced in the fall of 1987, provided significant useability improvements to Windows. With the addition of icons and overlapping windows, Windows became a viable environment for development of major applications (such as Excel, Word for Windows, Corel Draw!, Ami, PageMaker and Micrografx Designer), and the sales were spurred by the runtime (Single Application Environment) versions supplied by the independent software vendors. When Windows/386 (see next section) was released, Microsoft renamed Windows to Windows/286 for consistency.

The following are the major changes from earlier versions of Windows:

- Overlapping windows
- PIF files for DOS applications

Windows/386

In late 1987 Microsoft released Windows/386. While it was functionally equivalent to its sibling, Windows/286, in running Windows applications, it provided the capability to run multiple DOS applications simultaneously in the extended memory.

The following are the major changes from earlier versions of Windows:

- Multiple DOS virtual machines with pre-emptive multitasking

Windows 3.0

Microsoft Windows 3.0, released in May, 1990, was a complete overhaul of the Windows environment. With the capability to address memory beyond 640K and a much more powerful user interface, independent software vendors started developing Windows applications with vigor. The powerful new applications helped Microsoft sell more than 10 million copies of Windows, making it the best-selling graphical user interface in the history of computing.

The following are the major changes from earlier versions of Windows:

- Standard (286) mode, with large memory support
- 386 Enhanced mode, with large memory and multiple pre-emptive DOS session support
- No runtime versions available
- Program Manager and File Manager added
- Network support
- Support for more than 16 colors
- API support for combo boxes, hierarchical menus and private .ini files

Windows 3.1 **92-09-21**

Microsoft Windows 3.1, released in April, 1992 provides significant improvements to Windows 3.0. In its first two months on the market, it sold over 3 million copies, including upgrades from Windows 3.0. It is currently continuing to sell at a rate of over 1 million copies per month.

The following are the major changes from Windows 3.0:

- No Real (8086) mode support
- TrueType scalable font support
- Multimedia capability
- Object Linking and Embedding (OLE)
- Application reboot capability
- "Mouse Trails" for easier mouse use with LCD display devices
- Better inter-application protection and better error diagnostics
- API multimedia and networking support
- Source-level API compatability with Windows NT

Windows 3.11 **94-03-01**

Windows 3.11, available now, adds no new features but corrects some existing, mostly network-related problems. It is replacing Windows 3.1 at the retail and OEM levels, and the upgrade is available free from *ftp.microsoft.com*.

Windows for Workgroups 3.1 **93-04-22**

The Windows for Workgroups package, released in November, 1992, is the first integrated Windows and networking package offered by Microsoft. It provides peer-to-peer file and printer sharing capabilities (on a level comparable to LANtastic or Netware Lite) highly integrated into the Windows environment. The simple-to-use-and-install networking allows the user to specify which files on the user's machine should be made accessible to others. The files can then be accessed from other machines running either Windows or DOS.

Windows for Workgroups also includes two additional applications: Microsoft Mail, a network mail package, and Schedule+, a workgroup scheduler.

Windows for Workgroups 3.11 **94-03-01**

Windows for Workgroups 3.11, available now, adds 32-bit file access, fax capabilites and higher performance to Windows for Workgroups 3.1.

Windows NT 3.1 **94-03-01**

Microsoft Windows NT is Microsoft's platform of choice for high-end systems. It is intended for use in network servers, workstations and software development machines; it will *not* replace Windows for DOS. While Windows NT's user interface is very similar to that of Windows 3.1, it is based on an entirely new operating system kernel.

The following are the major changes from Windows 3.1:

- Based on a new microkernel design
- Portable architecture for Intel x86/Pentium, MIPS R4000/R4400 and DEC Alpha processors. Support for PowerPC and SPARC architectures is under development.
- 32-bit addressing for access to up to 4 GB of memory
- Fully protected applications with virtualized hardware access
- Installable APIs for Win32, Win16, MS-DOS, POSIX and OS/2
- Installable file systems, including FAT, HPFS and NTFS
- Built-in networking (LAN Manager and TCP/IP) with remote procedure calls (RPCs)
- Symmetric multiprocessor support
- Security designed in from start, to be initially C2 certified, with a B-level kernel design
- API support for asynchronous message queues, advanced interprocess communication, registration databases, Bezier curves and graphics transformations.

The following is the minimum platform for use with the client edition of Windows NT:

- 33 MHz 386 processor
- 12 MB memory
- 100 MB hard disk
- VGA graphics

The Advanced Server Edition requires 16 MB of memory.

Win32 in itself is not a version of Windows, but the name of application programming interface for Windows NT and Chicago.

Win32s for Windows 3.1 **94-03-15**

Win32s is a set of libraries for Windows 3.1, which enable users to run most Windows NT 32-bit applications on Windows 3.1, without the extensive hardware requirements of Windows NT. The Win32s interface has effectively replaced the older Windows-32 programming interface used by 32-bit Windows applications such as previous versions of Mathematica.

Windows 4.0 ("Chicago" and Win32c) 94-03-15

This unannounced product is rumored to be released in late 1994. It will be a 32-bit system providing full pre-emptive multitasking, advanced filesystems, threading, networking and more. It will include MS-DOS 7.0, but will take over from DOS completely after starting. It will not include Windows NT's security, multiprocessor support, server capabilities or multiple API modules. It will include a completely revised user interface, along the lines of "Cairo", but not taken as far as that product.

See the section entitled **Chicago Q&A** for more information about Chicago.

Windows NT 3.5 ("Daytona") **94-03-15**

"Daytona" is Microsoft's codename for an upcoming release of Windows NT, which will provide OLE 2.0, improved performance and reduced memory requirements. Availability is expected in mid-1994

Windows NT 4.0 ("Cairo") **94-03-15**

"Cairo" is Microsoft's project for object-oriented Windows, and a successor to the Daytona release of Windows NT. Firm details are not available, but most rumors place expected availability sometime in 1995. Developers are encouraged to work with OLE 2.0 in order to start moving in the correct direction towards future "Cairo" compatability.

Windows for Pen Computing 3.1

Microsoft developed Windows for Pen Computing for use on pen-based systems. In most aspects, it is basically equivalent to Windows 3.1 with extensions for pen support. These extensions include the use of a pen as a pointing device as well as handwriting recognition and conversion. Pen Windows first shipped in April, 1992.

Multimedia Windows

The term Multimedia Windows describes a package with Windows 3.0 and the Multimedia Extensions. These extensions are included in Windows 3.1, and thus Multimedia Windows is no longer sold as a separate product.

Modular Windows

Modular Windows is the operating system for Tandy Corp.'s Video Information System (VIS) multimedia player. It is essentially similar to Windows' core, but without any desktop accessories, TrueType fonts or a number of other features.

Win-OS/2

Win-OS/2 is the Windows component of IBM's OS/2 2.0. It is based partially on Windows 3.0 and partially on 3.1. While it runs a majority of the commercial Windows applications, it is not covered by this document.

Chicago Q&A

The following questions and answers are from a document distributed by Microsoft in December, 1993.

Microsoft is continually enhancing its Windows operating system product line to deliver easy to use yet powerful products that exploit the latest advances in microcomputer hardware technology. There is a great deal of interest in and speculation about the Chicago project, the technology development effort which will deliver the next major release of Windows for the mainstream desktop and portable PC. The purpose of this document is to answer the most common questions that customers have voiced about Chicago.

What is Chicago? **94-03-18**

What is Chicago and how does it compare to the Microsoft Windows* 3.1, Windows* for Workgroups and Windows NT* operating systems?*

Microsoft has a family of operating system products designed to fully utilize the range of PC hardware available in the market today, while providing a consistent user interface for end users and a programming environment for developers. Windows 3.x and Windows for Workgroups 3.x on MS-DOS* are designed for mainstream portable and desktop PC platforms. Windows NT is designed for the high-end business and technical workstation platforms and Windows NT Advanced Server is designed as a server platform.

Chicago is the code name for a development project that will produce the successor to Windows 3.x and Windows for Workgroups 3.x. The Chicago project encompasses a variety of important new technologies that will make personal computers running Windows easy to use, and that will provide a more powerful multitasking system and a great platform for communications. Decisions about how those technologies will be packaged will be made later in the development cycle and will be based on customer and business needs.

What is Cairo? **94-03-18**

What is Cairo? How does Chicago compare to Cairo?

Cairo is the code name for a development project that will produce the successor to Windows NT. Chicago and Cairo will produce complementary products that will continue to provide a consistent user interface and programming environment across the entire range of PC hardware platforms.

Why does Microsoft have multiple Windows products? 94-03-18

Why does Microsoft have multiple Windows operating system products? Wouldnt it be simpler to just have one product? Does that mean ISVs have to decide between different operating system products when writing applications?

There are two distinct design points for operating systems platforms. One is centered on the mainstream system, and the other is centered on the high-end system. It is not possible to have one operating system implementation that fully exploits the broad range of hardware available today. At the low end (currently represented by products such as the HP Omnibook and entry-level desktop machines), the primary design goal is to keep the operating system small and fast and to keep usage of machine resources to a minimum. At the high end (for example, a dual-processor technical workstation), the product would need to fully support multiprocessing and advanced 3-D graphics as well as be capable of running technical applications that use maximum machine and system resources.

Over time, low-end machines will become more powerful, and over time, some of todays high-end features will migrate to the low end. In addition, some technical innovations will appear on the mainstream Windows system first, largely because of the timing of product releases, and because some features are focused on end users and ease of use. The Win32 API assures developers that, whichever system they target today, their applications will be able to run in the future as the platform evolves.

Thus, while Chicago and Cairo may leapfrog one another with some features, depending on release cycles e.g., Chicago will sport the next major advance in the user interface, with Cairo inheriting it in its release a few months later the general principle over time is that the high-end product will be a superset of the functionality offered in the mainstream product. Any deviations from this principle are temporary, due to variations in the product release schedules. For ISVs and for development purposes, however, Microsoft has just one Windows platform, defined by the Windows-based 32-bit API, Win32. By following a few simple guidelines, ISVs can write a single application (executable) that runs on the Windows operating system product family. If they wish, ISVs can target specific operating system products because the functionality they provide is important to their particular application, but that is not a requirement. This situation is very much like the Intel microprocessor product line. At any point in time, the Intel product line offers multiple products targeted toward different PC products, ranging from the 80386SL for low-end portable products to the Pentium microprocessor for high-end workstations and application servers. What defines those products is the Intel instruction set, which enables applications to run on all Intel chips, even though the underlying implementation at the transistor level may be very different across the Intel product line. There are also some instructions offered on the Pentium chip that are not on the 80386SL, but ISVs would have to go out of their way to make their products run on only Pentium. And over time, Pentium will become more mainstream, just as the 80486 has become the mainstream microprocessor today, and technologies developed at the low end, such as System Management Mode, will be implemented on the high end as well.

When will Chicago and Cairo ship? **94-03-18**

When will Chicago ship? When will Cairo ship?

Chicago is scheduled to ship in the second half of 1994. Cairo is scheduled to be released in the first half of 1995.

What is Daytona? **94-03-18**

What is Daytona? When will it ship?

Daytona is an interim release of Windows NT that is scheduled to ship this spring.

How will Chicago make the projected ship date? **94-03-18**

Major new releases of operating system products have in the past been significantly delayed. How will you make your projected shipment date for Chicago?

Chicago will be released when customers tell us it is ready. The way to make shipment dates is to hit your intermediate milestones. To date, Chicago has been making its milestones with the release of the first Preliminary Developers Kit (PDK) in August and the second PDK in December. Feedback from beta releases beginning in March will tell us more precisely when in the second half of 1994 Chicago will ship.

What if Chicago ships before Cairo? **94-03-18**

If Chicago ships before Cairo, how will users of Windows NT obtain the new functionality in Chicago?

Any new functionality offered in Chicago will be made available to customers of Windows NT through the release of the Cairo product.

What are Chicagos key benefits? 94-03-18

What are the key benefits and features of Chicago? What features will Chicago not have?

For customers, Chicago will present a major step forward in functionality on mainstream desktop platforms by providing a system that is easy to use, offers responsive multitasking performance, and provides a great platform for communications. Ease of use will be delivered through the Plug and Play architecture and an improved, intuitive user interface. Chicago will be a complete, integrated protect-mode operating system that does not require or use a separate version of MS-DOS, implements the Win32* API, and provides pre-emptive multitasking and multiple threads of execution for 32-bit applications. The communications capabilities of Windows will be enhanced with integrated, high-performance networking, built-in messaging, and features such as Remote Network Access and File Synchronization designed for mobile and remote computer users. Chicago will also be a hassle-free upgrade for the current installed base of Windows-based users. Chicago will be compatible with most current applications and drivers for MS-DOS and Windows, and will provide an easy transition to the new user interface features. The applications performance of Chicago will meet or exceed the performance of Windows 3.1 on 80386 systems with 4MB of RAM running the same applications. For systems with more memory, performance will be significantly improved over Windows 3.1. The setup program will enable customers to uninstall Chicago, assuring customers a way to remove it if they are in any way unhappy with it, and will provide tools for system administrators to customize the configuration of Chicago. Chicago will not be processor independent, nor will it support symmetric multiprocessing systems, provide C2-level security, or provide full Unicode support. These features cannot be delivered on the mainstream platform in the near future while still meeting the performance and resource targets necessary to create a compelling upgrade for the huge installed base of users of the Windows operating system. If these features are important to a customer, Windows NT is the product to deploy.

What different Chicago packages will be available? **94-03-18**

What different packages will you have for Chicago?

Decisions about packaging the different technologies being developed as part of the Chicago project will be made later in the development cycle and will be based on customer and business needs. One option is to provide a base Chicago package with some add-on packages that deliver functionality required by specific market segments. This is much like the situation today in which the user of Windows 3.1 can upgrade to Windows for Workgroups by acquiring the add-on package that adds the 32-bit file system and 32-bit networking enhancements to Windows.

What will Chicago be called? **94-03-18**

Since the term Chicago is a code name, what will you call the product(s) that you will eventually release?

Decisions about names will be made after we decide on a packaging plan.

What will happen to MS-DOS? **94-03-18**

What will happen to the MS-DOS product line?

Microsoft will continue to enhance MS-DOS as long as customers require it. Future versions will be derived from the protected-mode technology developed in the Chicago project. Current MS-DOSbased applications and drivers will continue to be compatible with new versions of MS-DOS.

How will Chicago perform on 4 MB? **94-03-18**

Your performance goals on 4MB platforms sound very ambitious, considering all the functionality youre adding to Chicago. How will you achieve those goals?

Chicago will implement new working set management technologies that will optimize the use of memory on low-configuration systems. The networking, disk and paging caches will be fully integrated. Protect-mode device drivers will be dynamically loadable, to ensure that only the drivers that are immediately needed are consuming memory. More components of the base operating system will be pageable. Great attention will be paid to effective page tuning, including hand-tuning source code.

Will Chicago run current applications? **94-03-18**

Will Chicago run my current Windows-based applications? How about MS-DOSbased applications?

Chicago will run most of the current applications for Windows and MS-DOS, as well as new applications written to the Win32 API. Some classes of applications will need to be revised to be compatible with Chicago, such as shell-replacement utilities and file-management utilities. Chicagos new shell provides a complete set of services that is tightly integrated with the operating system components. Shell programs will need to do more than simply replace components such as Program Manager or File Manager. And file-management utility vendors will want to revise their applications to take advantage of the Long File Name feature that Chicago offers. Microsoft is working closely with shell-replacement and file- utility vendors to enable them to revise their products to add value to and be compatible with Chicago.

Will I need to get new device drivers? **94-03-18**

Will I have to get new device drivers to use my current devices with Chicago?

Chicago supports current real-mode device drivers as well as new 32-bit protected mode device drivers. As a result, customers will be able to use their current devices either with their current device drivers, or with new device drivers made available with Chicago. Performance and functionality can be improved if the user installs the new Chicago drivers. Microsoft is making it easier for device manufacturers to deliver new drivers for common devices by defining a more layered, modular device driver architecture. For displays, printers and modems, Microsoft will deliver universal drivers. These drivers will implement common device functionality and expose an interface for device manufacturers to create minidrivers that implement the features specific to their devices. This approach was very successful with printers for Windows 3.1, resulting in rapid availability of fast, high-quality drivers for a wide range of printers.

Will my current applications work well on Chicago? 94-03-18

Will my current applications perform as well on Chicago as they do on Windows 3.1 today?

For Chicago to be a compelling upgrade, Windows-based users must experience a level of performance after installing Chicago that meets or exceeds the performance they currently experience running an identical set of tasks on Windows 3.1. Because a large portion of the installed base of users of Windows today have 4MB systems, Chicago must meet its performance goals on 4MB systems. On systems with more than 4MB of RAM, Chicago will offer significantly improved performance. Understand, however, that there are user and application scenarios today that already use more than 4MB. Users who already require more than 4MB will continue to require more than 4MB with Chicago and if they are using more than 4MB, they should see improved performance. But they wont get away with using less memory in the future than they do today. Its an important distinction to maintain.

When will Chicagos new UI be ready? **94-03-18**

You say Chicago will have a different user interface than Windows and Windows NT. When will that user interface be reflected in the beta versions of Chicago?

The new user interface will be delivered with the first beta of Chicago, scheduled for March 1994.

Will the new user interface mean a lot of retraining? 94-03-18

Wont a new user interface mean a lot of retraining for current Windows-based users? Will the advantages of the new user interface be worth the retraining costs?

The user interface being developed for Chicago will offer dramatic gains in ease of learning and ease of use for the broad range of people using PCs today. Instead of mastering different kinds of tools to work with different resources on their computers, users of Chicago will be able to browse for and access all resources in a consistent fashion with a single tool. This will be much easier than learning separate applications such as Program Manager, File Manager, Print Manager, Control Panel, etc. as users of Windows must do today. A system toolbar that is always accessible will make it much easier to start and switch between full-screen tasks. The implementation of OLE 2.0, with its focus on the users document rather than on the tool used to create it, and the direct manipulation of data through drag and drop in the user interface, will make working with documents easier and more intuitive.

Current users of Windows will be immediately productive with Chicago and be able to learn the new features of the user interface as they work. Chicagos smart setup technology will use the current system settings to present an initial configuration that is familiar for the current Windows-based user. And for corporate customers and individuals who may not want to make any user interface changes initially, Chicago will enable them to continue running their current Program Manager and File Manager configurations.

What is Plug and Play? **94-03-18**

What is Plug and Play? What benefits does Plug and Play provide?

Plug and Play is a technology jointly developed by PC product vendors that will dramatically improve the integration of PC hardware and software. It allows a PC to adapt itself dynamically to its environment; devices can be plugged into or unplugged from a machine, without the user having to do anything special the machine just works. Plug and Play is a general framework that advances that state of the PC architecture by defining how the software communicates with any device connected to the PC. Plug and Play technology enables installation and configuration of add-on devices without user intervention. Plug and Play will make it possible for a consumer to turn a standard desktop system into a great multimedia machine by just plugging in a Plug and Play sound card and CD-ROM, turning on the system, and playing a video clip. Plug and Play can enable new system designs that can be dynamically reconfigured. For example, imagine a docking station that enables you to remove the portable system while it is still running so that you can take it to a meeting, and the system automatically reconfigures to work with a lower-resolution display and adjusts for the absence of the network card and large disk drive. Or imagine an IR-enabled subnotebook that automatically recognizes, installs and configures an IR-enabled printer when you walk into the room, so your applications are ready to print to that printer. Plug and Play can also save development and support costs for the product manufacturer. Today, as many as 50 percent of support calls received by operating system and device manufacturers are related to installation and configuration of devices. With Plug and Play, device driver development is simplified because device manufacturers can write one driver that works across multiple bus types using the Universal Driver Model specified by the Plug and Play architecture. Today, device manufacturers have to include bus-specific code in each of their drivers. With Plug and Play, specific bus configuration data is contained in bus drivers. Also, operating system preinstallation and configuration are simplified for OEMs because Plug and Play devices will automatically install and configure during setup.

What hardware changes does Plug and Play require? 94-03-18

What changes to current hardware and software are required to make Plug and Play a reality? How will vendors figure out how to develop new devices with Plug and Play capability?

First, Plug and Play is compatible with existing systems, so nothing breaks because of Plug and Play. Plug and Play devices can be brought out over time in fact, this is already occurring and will work with existing systems. To deliver all of the above benefits requires changes to devices and drivers, the BIOS, and the operating system. Three fundamental capabilities are required for a system to provide Plug and Play functionality:

- A unique identifier for every device on the system
- A procedure for the BIOS and operating system to install and configure that device
- A mechanism for the system and applications to recognize that a configuration change has occurred while the system is running

All the changes to devices and drivers, the BIOS and the operating system are defined by a series of specifications for Plug and Play architecture. The Plug and Play architecture is an open, flexible and cost-effective framework for designing Plug and Play products. The Plug and Play architecture was jointly developed by a working group of leading vendors, who reviewed design proposals with hundreds of companies in the industry at conferences and through online forums. Plug and Play can be implemented by any operating system vendor and any hardware manufacturer. In addition to Microsoft, IBM has announced support for Plug and Play in OS/2. The Plug and Play architecture is flexible, because it provides a framework that works on multiple types of bus architectures (ISA, SCSI, PCMCIA, VL, PCI, etc.), and it is extensible to future bus designs. The Plug and Play architecture is also cost-effective, because it requires little or no incremental cost for vendors to implement in their products.

Wont it take a long time for Plug and Play? 94-03-18

Wont it take a long time for these changes to be reflected in products? Acceptance of the Plug and Play architecture is widespread, as seen by the rapid progress the industry is making in delivering Plug and Play specifications and products. Specifications have already been released for ISA, SCSI and PCMCIA devices, and the Plug and Play BIOS. Additional specifications are in process, including PCI, ECP, VL, EISA, Micro Channel, and Access. The first Plug and Play devices were demonstrated at COMDEX/Fall 1993, representing a wide range of companies and products. Intel has released development kits that enable device and system vendors to deliver improved configuration capabilities for ISA and PCI systems running with Windows 3.1 in a manner that will provide compatibility with future Windows operating systems. Fully Plug and Play-capable systems (including all Plug and Play devices and a Plug and Play BIOS) will be available in the first half of 1994. These systems will be able to offer complete Plug and Play functionality when combined with Chicago.

Is the Chicago API different from the Windows NT API? 94-03-18

Ive heard that Chicago implements a 32-bit API. Is that API different from the 32-bit API implemented on Windows NT?

There is only one 32-bit Windows API, called Win32, with ISVs able to use the API set to provide different levels of functionality for Windows 3.1, Chicago and Windows NT. Chicago implements a large subset of the functionality of the Win32 API offered on Windows NT, and extends the Win32 API in some areas. These extensions will be delivered on Windows NT as soon as possible after the release of Chicago.

Will vendors need separate Chicago and NT versions? 94-03-18

If there are different implementations of the Win32 API available on different products in the Microsoft operating system product line, does that mean ISVs will have to have separate versions of their applications for Windows and Windows NT?

No. By following some simple guidelines, ISVs can develop a single executable file that runs on Windows 3.x, Chicago and Windows NT. At the recent Professional Developers Conference, we provided in-depth technical sessions on the proper way to design applications to do so, supplied tools in the SDK to help make such development easier, and showed several applications that ran across the entire Windows family.

When will Chicago applications be available? 94-03-18

When will applications be available that exploit Chicago? Wont that take a long time?

ISVs who are developing 32-bit applications for Windows 3.1 and Windows NT using the Win32 API and the guidelines we have provided will have applications that are able to run on Chicago immediately. There are already more than 250 Win32 applications available today, and more coming quickly. Other ISVs will wait until Chicago ships to provide their 32-bit applications; usually those applications start coming on-line about 90 days after the operating system ships. Chicago also will support todays 16-bit applications, so users can move to Chicago immediately and upgrade their applications as they become available. Chicago represents a major market opportunity for ISVs. Chicago will ship on almost all OEM systems soon after it is released, and it will be acquired as an upgrade by a substantial portion of the Windows installed base (the installed base will probably number more than 50 million by mid-1995). Customers who purchase new systems and upgrade their operating systems are the most active purchasers of new software applications. As a result, ISVs have a very significant business incentive to release versions of their applications that exploit Chicago.

Is Chicago completely 32-bit? **94-03-18**

Ive heard Chicago described as a 32-bit operating system, yet Ive also heard that portions of Chicago are implemented with 16-bit code. Are both these statements correct?

Chicago will provide a 32-bit platform for applications by implementing the Win32 API on a complete, protect-mode operating system. Chicago will also run well on mainstream Windows platforms (which for a large portion of the Windows installed base is a 4MB 80386 system), and Chicago will be compatible with applications and drivers for MS-DOS and Windows. These requirements must be met if Chicago is to meet customer needs and provide the volume to make ISVs successful.

These requirements have driven all the design decisions for Chicago. The resulting design deploys 32-bit code wherever it improves performance without sacrificing application compatibility. The design retains existing 16-bit code where it is required to maintain compatibility or where size is a critical issue but has minimal impact on performance. All of the I/O subsystems and device drivers in Chicago, such as networking and file systems, are fully 32-bit as are all the memory management and scheduling components (the kernel and virtual memory manager). Many functions provided by the Graphics Device Interface (GDI) have been moved to 32-bit code, including the spooler and printing subsystem, the rasterizer, and the drawing operations performed by the graphics DIBengine. Much of the window management code (user) remains 16-bit to retain application compatibility.

How do the 16-bit components fit in? 94-03-18

If portions of Chicago still remain 16-bit, what happens when a 32-bit application makes a function call that is implemented by the 16-bit Chicago component? Doesnt this slow down 32-bit applications on Chicago relative to 16-bit applications?

When Win32-based applications call a 32-bit API that is implemented by a 16-bit component of the system, the function call is translated to its 16-bit equivalent for processing by the system. This translation process is referred to as thunking. Although there is some overhead associated with a thunking operation, the Chicago thunk layer is very efficient. That overhead will be more than offset by the improved efficiency of the linear memory addressing scheme used by Win32-based applications. The overall impact of some thunking code is quite modest vs. all the other work the application and operating system have to do. For end users, perceptions of application performance are based on a combination of the efficiency of the application when executing its own code and the efficiency of the operating system code when the application has called an operating system service. On Chicago systems with adequate memory, end users will experience gains in system efficiency when running 16-bit applications, and they will experience gains in both system and application efficiency when running 32-bit applications.

Will existing networking software work with Chicago? 94-03-18

Will I need new networking software to connect Chicago to my network server?

Customers will require Chicago to connect to their network servers when Chicago is installed, and to offer high-performance, reliable networking functionality. To meet this requirement, Chicago will continue to run existing real-mode networking components. However, we expect customers to want to upgrade to the new 32-bit networking components provided by Chicago. Chicago will enhance the open, flexible, high-performance 32-bit networking architecture offered today with Windows for Workgroups 3.11 that enables customers to mix and match networking components. Chicago will support NDIS 2.0, NDIS 3.0 and ODI drivers, and will provide 32-bit NetBEUI, IPX/SPX and TCP/IP protocols. Redirectors for SMB and NCP-based networks will be included. In addition, Chicagos new multiple-provider interface will make it possible for the user to view, browse and connect to multiple networks in a consistent fashion.

What about Netware with Chicago? **94-03-18**

What about NetWare? Are you working with Novell on NetWare support?

Customers will require high-performance, reliable NetWare support the day Chicago is released. To meet that requirement, Microsoft is developing a 32-bit NCP Redirector that is seamlessly integrated with the Chicago user interface, and is encouraging Novell to do the same. Microsoft will offer Novell access to information and assistance to write a Chicago redirector. Novell engineers attended the Win32 Professional Developers Conference and have been provided access to the Preliminary Developers Kit for Chicago. With this approach, customers should be able to choose from multiple sources for reliable, high-performance NetWare connectivity software when Chicago is released.

Will there be Chicago server version? **94-03-18**

Will there be a Chicago server?

No, not in the sense of a server product such as Windows NT Advanced Server. Chicago will continue to improve upon the peer server capabilities offered in Windows for Workgroups by offering additional features for remote installation, control and administration. These features will make Chicago an even better product for an easy-to-use file and print-sharing LAN that is ideally suited as a small-business, small-department or remote office network. Similarly, Windows NT offers peer services as well for the high-end desktop. But for most server applications, and in the sense that most people ask about a server product, Windows NT Advanced Server is the Microsoft server product.

What about Chicagos portability? **94-03-18**

I keep hearing rumors that you are working on a portable version of Chicago. Is this true?

No, we are not working on a portable version of Chicago. Windows NT is our portable operating system, and its already available on high-end Intel, MIPS, Alpha and Clipper machines; it will be available on the PowerPC by mid-1994 and on other high-end platforms over time. There is no reason to make Chicago portable. Chicago is optimized for Intel processors, and much of its internal code is Intel assembler, which puts Chicago at the heart of todays low-end and mainstream line. Portability is important for the new generation of high-powered Intel and RISC machines, on which Windows NT runs and for which Windows NT has been optimized. As these new high-end machines become more mainstream, which will happen over time, Windows NT will already offer the power, security, and reliability that users will demand to exploit these new machines.

What about systems management? **94-03-18**

What will Chicago do to make the client operating system more manageable?

A primary goal for the Chicago project is to make Windows less expensive to deploy in a corporation. Chicago will include some specific features and enabling technologies that will make it easier for system administrators to install, configure, monitor, maintain and troubleshoot their Windows-based desktops. Chicago can be set up from a network server and at the desktop can be configured at the desktop to run locally or across the network. In each case, the administrator can establish a specific configuration for the installation, selecting from a flexible array of setup configuration options. Chicago desktops require only a floppy drive to start up, and paging of components to a swapfile on the network can be disabled to minimize network traffic.

Once Chicago is installed, administrators will be able to centrally configure desktop settings such as file and printer sharing, network access, and passwords. They can remotely monitor Chicago desktops with peer services running to determine what resources are shared, what connections have been made, and what files are being used. Chicago enhances the security provided by Windows for Workgroups to include user-level security. To enable users to access their personal groups, applications, and data from any system on the network, Chicago will provide user profiles. Chicago will also provide the infrastructure for the delivery of enhanced desktop management services by third parties. A backup agent will be included with Chicago to enable administrators to back up desktop data to a network server. To integrate the desktop into SNMP-based enterprise management systems, Chicago will also include a Systems Network Management Protocol (SNMP) agent and a Management Information Base (MIB) for a number of system resources. The system registry and Plug and Play architecture provide a rich store of data about the software and hardware configuration on the desktop, and this information can be accessed by system management software using a DCE-compliant Remote Procedure Call (RPC) mechanism.

Will there be mobility features? **94-03-18**

What improvements will Chicago offer for people who use a mobile or remote computer?

Chicago will provide great support for mobile form-factor devices and will make it easy for end users to access the resources of their desktop systems when they are away from their offices. The implementation of Plug and Play in Chicago will support insertion and removal of devices such as PCMCIA cards while the operating system is running. It will also support automatic reconfiguration of dockable computers when they are inserted or removed from the docking station, without rebooting the system. An enhanced version of Advanced Power Management will further extend battery life. The services provided by Windows for Pen Computing will be enhanced and incorporated into Chicago, including basic inking and rendering support. A special focus will be on remote connectivity. Any Chicago-based machine will be able to serve as a Remote Access dial-up server or a remote client for Windows NT Advanced Server, Novell NetWare servers or Chicago peer servers. The same technology will be used for serial cable and infrared connections between PCs. The Remote Access architecture will be integrated with the Chicago networking architecture by using the same network protocols and advanced security features. Remote Access will support wireless devices and allow application developers to make their applications slow-link aware to improve the user experience when working on a remote system via modem rather than on a high-bandwidth network. Furthermore, Chicago will provide a simple form of file synchronization and APIs for applications to access the file synchronization services to merge changes when both the source document and copy have been modified. Remote e-mail and Microsoft at Work fax capability will be included, as in Windows for Workgroups 3.11 today.

How will file synchronization work? **94-03-18**

Will the file synchronization feature in Chicago provide document management capabilities?

Chicagos file synchronization services are optimized for the needs of the mobile computer user who wants to take copies of documents to a remote location and have them be automatically synchronized with the source documents. It is not intended as a replacement for sophisticated document management systems.

Chicagos file synchronization allows customers to identify files that they want to stay up to date, to change those files, and to have the files automatically updated when the source file is available to the system. The update is performed by replacing the source file with the modified copy at the discretion of the user. If an application writes a merge-handler, then specific data within the modified and source copies of a file can be merged, to create a new updated copy.

Will there be separate NT and Chicago SDKs? 94-03-18

You say you have one API with Win32. Does that mean there will also be just one Windows SDK?

Yes, there will be one Win32 SDK that developers can use to develop 32-bit applications for Windows 3.1, Chicago and Windows NT. In fact, we recently announced a new subscription service, the Microsoft Developer Network Level II that provides developers with not only the Win32 toolkit, but every system toolkit we offer, on a single CD, updated quarterly.

What benefits are there to developers? **94-03-18**

What benefits does Chicago offer to developers? What are you doing to make developing Windows-based applications easier?

The Microsoft Visual Basic programming system has dramatically streamlined and simplified the development of Windows-based applications, and it will be enhanced to support the development of 32-bit applications for Chicago. Microsoft also is enhancing its Visual C++ * development system and Microsoft Foundation Class tools.

Will Visual Basic for Applications be included? **94-03-18**

Will Chicago include Visual Basic for Applications?

Visual Basic for Applications will be offered as a separate product.

Will Chicago and NT use common device drivers? 94-03-18

Will Chicago and Windows NT share the same device drivers?

Generally not, since Chicago and Windows NT have different device driver models. However, since both products support a modular, layered device driver architecture, there are areas of substantial synergy. For example, SCSI miniport adapters for Windows NT will be binary- compatible with Chicago, as will printer drivers and NDIS drivers for Windows NT.

Will WOSA services be included? **94-03-18**

Will WOSA services be included with Chicago?

WOSA is a general, open framework for implementing multiple back-end services in Windows while providing a single front-end interface for end users. Services in Chicago such as messaging and remote network access are designed according to the WOSA framework. Whether or not support for additional WOSA services, such as ODBC support, will be shipped with Chicago is a packaging decision that will be made later in the development cycle and will be based on customer and business needs. All the WOSA- related toolkits are available today to developers through the Microsoft Developer Network Level II subscription service.

Internet and Usenet

Usenet **94-03-15**

If you received this FAQ from somewhere other than Usenet or Internet, you may not be familiar with Usenet. Basically, Usenet is a loose collection of over 1,000,000 computers which exchange mail and news. The network is unstructured and highly distributed; most communication is either by TCP/IP over high-speed connections (or over dual-up links using public telephone lines), or UUCP over public telephone lines.

Internet is the worldwide collection of computers linked using the TCP/IP protocol, consisting of somewhere between 5,000,000 and 10,000,000 computers, usually connected by high-speed TCP/IP network connections.

Usenet *news* is a software system where a person can post an article to a selected newsgroup, and have every other news reader be able to read it. There are over 3,000 newsgroups (including the *alt* groups), and daily volume of news now exceeds 50 MB.

While most Usenet systems are Unix-based, it is not a requirement, and there are a number of Usenet software packages available for Windows as well. If you have an Internet or UUCP connection, ask your system administrator whether you have Usenet news available. Some of the most common newsreading software packages are *readnews*, *rn*, *trn*, *nn* and *notes*.

Usenet Windows newsgroups **94-03-15**

There are a total of eight Usenet newsgroups dealing with Microsoft Windows:

- **comp.os.ms-windows.advocacy**
  This group is intended for adversarial discussions, arguments and comparisons to other computers and operating systems. Applicable to all Windows platforms.
- **comp.os.ms-windows.announce**
  This is a low-volume moderated group with only Windows-related announcements (and the text versions of the FAQs) and with no discussion. Moderated by Steve Graham (*sgraham@shiloh.nimh.nih.gov*).
- **comp.os.ms-windows.apps**
  This group contains discussions, questions, and comments about the selection and use of Windows and Windows NT applications.
- **comp.os.ms-windows.setup**
  This group is meant for questions and discussions about Windows and Windows for Workgroups setup process, driver availability and selection, and hardware compatability and selection.
- **comp.os.ms-windows.misc**
  All other discussions about Windows and Windows for Workgroups should be in this group.

- **comp.os.ms-windows.video** *(proposed)*
  Discussions about vide0 adapters, monitors and video drivers for usee with Microsoft Windows and Windows NT.
- **comp.os.ms-windows.networking.windows** *(proposed)*
  Discussions about Windows built-in networking capabilities: Windows for Workgroups, Windows NT, Windows NT Advanced Server and LAN Manager.
- **comp.os.ms-windows.networking.tcp-ip** *(proposed)*
  Discussions about TCP/IP networking with Windows, WinSock, WinSock-based applications, newsreaders, PPP and SLIP.
- **comp.os.ms-windows.networking.misc** *(proposed)*
  Discussions about Windows and other networks, including Netware, Banyan Vines, LANtastic and LAN Server.

- **comp.os.ms-windows.nt.setup**
  Questions and discussions about the Windows NT setup process, driver availability and selection, and hardware compatability and selection.
- **comp.os.ms-windows.nt.misc**
  All other discussions about Windows NT should be in this group.

- **comp.os.ms-windows.programmer.tools**
  Discussions about the selection and use of tools for Windows software development.
- **comp.os.ms-windows.programmer.win32**
  All discussions about the Win32 applications programming interface (used in Windows NT and Win32s) and the Windows NT SDK belong in this group..
- **comp.os.ms-windows.programmer.misc**
  This group is for all other discussions about Windows software development.

- **comp.os.ms-windows.programmer.bitmaps** *(proposed)*
  Discussions about programming with bitmaps, palettes and DIBs.
- **comp.os.ms-windows.programmer.controls** *(proposed)*
  Discussions about programming with controls, dialogs, custom controls and VBXs.
- **comp.os.ms-windows.programmer. drivers** *(proposed)*
  Discussions about programming Windows and Windows NT drivers and VxDs.

- **comp.os.ms-windows.programmer. graphics** *(proposed)*
  Discussions about programming with graphics, GDI, fonts and printing.
- **comp.os.ms-windows.programmer.memory** *(proposed)*
  Discussions about memory management, processes and DLLs.
- **comp.os.ms-windows.programmer.ole** *(proposed)*
  Discussions about programming with OLE, COM and DDE.
- **comp.os.ms-windows.programmer.winhelp** *(proposed)*
  Discussions about development of WinHelp and MultiMedia viewer applications.

- **comp.binaries.ms-windows**
  This group is for postings of free and shareware Windows applications, utilities, display and printer drivers and for the latest FAQs. Moderated by Tin Le *(tin@saigon.com).*

The following groups have been replaced by those shown above:
- **comp.windows.ms**
  This group was for discussions about Microsoft Windows.
- **comp.windows.ms.programmer**
  This group was for discussions about programming for Microsoft Windows.

The following groups may also be of interest:
- **alt.winsock**
  This group is for discussions about the use and programming of the Windows Sockets interface.
- **comp.databases.access *(proposed)***
  This group is for dicussions about Microsoft's Access database..
- **comp.lang.basic.visual**
  This groups is for Visual Basic (both Windows and MS-DOS versions) discussions.
- **comp.os.msdos.programmer**
  This groups contains general MS-DOS programming questions. Some, especially those concerning compiler selection, may be of interest to Windows programmers.
- **bit.listserv.win3-l**
  This group is a two-way gateway of the BITNET *WIN3-L* mailing list, dealing with all aspects of Windows 3.x.
- **bit.listserv.access-l**
  This group is a two-way gateway of the BITNET *ACCESS-L* mailing list, dealing with Microsoft's Access database.

The following groups are **not** for Microsoft Windows!
- **comp.windows.misc**
  This group is for miscellaneous discussions about windowing systems in general.
- **comp.windows.news**
  This group is for discussions about the Sun Microsystems NeWS windowing system.

In general, these newsgroups are only available to computers connected to Usenet or Internet; they are not gatewayed into BITNET, CompuServe, Prodigy or other services. Some FidoNet BBS systems, however, do carry selected Usenet newsgroups. If you cannot obtain access to these groups on your system, contact the author of this FAQ for possible alternatives.

Alternatives to Usenet 94-03-02

If you are unable to find a connection to the *Internet* (that procedure can not be easily defined, as the *Internet* does not have any sort of a formal structure), there are several alternatives available for finding more information about Windows, and for locating Windows software and drivers.

BITNET users (as well as any other with an electronic mail connection to Internet) can subscribe to lists such as **WIN3-L** *(win3-l@uicvm.bitnet),* a mailing list dedicated to Windows discussions. This mailing list is similar in content to the **comp.os.ms-windows.misc** newsgroup; no programmer mailing list exists on *BITNET*. See the following list for a list of mailing lists.

America OnLine also provides access to Usenet newsgroups.

If you live in North America (or in one of selected Western European countries), you can subscribe to *CompuServe*, a commercial service. *CompuServe* has extensive Windows-oriented discussions and a fairly good selection of free software. Although the level of discussion is often less technical, it is much more structured than the *Internet. CompuServe* also has numerous vendor-supported forums, including ones organized by Microsoft for Windows and Windows NT.

Many *FidoNet*-based BBS systems also carry the Usenet Windows newsgroups. Consult a local BBS listing to find your nearest *FidoNet* BBS.

Windows-related mailing lists 94-03-02

The following mailing lists are Windows-related. Please use the requests address for administrative mail (such as getting added to the list):

- **Dr. Help**
  List: *drhelp@eng.monash.edu.au*
  Requests: *listserv@eng.monash.edu.au*
- **LabView**
  List: *info-labview@pica.army.mil*
  Requests: *info-labview-requesr@pica.army.mil*
- **Lotus Improv**
  List: *improv@bmt.gun.com*
  Requests: *improv-request@bmt.gun.com*
- **MathCAD**
  List: *mathcad@eng.monash.edu.au*
  Requests: *listserv@eng.monash.edu.au*
- **OWL**
  List: *owl-list@cs.rpi.edu*
  Requests: *owl-list@cs.rpi.edu*
- **ProtoGen/ProtoView**
  List: *protoplus@netcom.com*
  Requests: *protoplus-request@netcom.com*
- **WIN3-L** (Windows 3.x)
  List: *win3-l@uicvm.bitnet*
  Requests: *listserv@uicvm.bitnet*

Freeware and shareware by ftp

While CompuServe (which has a lot of software) and your local BBS may have large selections, the Internet provides an immense resource for all PC users. The key program to access this software is called ftp (File Transfer Protocol), and it's usable from most Internet system, but is not usable through UUCP links.

If you do have ftp available to you, follow the example below to connect to ftp.cica.indiana.edu (do not type in the // comments):

```
$ ftp ftp.cica.indiana.edu          // make connection
Connected to ...                    // cica responds
Userid (user@cica): ftp             // enter "ftp" as userid
Password: real_userid@site          // enter your own userid
ftp> tenex                          // for binary transfers
ftp> cd /pub/pc/win3                // where the goodies are
ftp> ls -l                          // list the directory
ftp> get ls-ltR                     // get the current index
ftp> quit                           // we're done!
$ _
```

Of course, you can get multiple files at a time read the ftp manual page for more information.

Remember that **shareware is not free**: register the software you use to encourage the development of more low-cost software.

Popular Internet ftp sites **93-03-01**

The following ftp sites provide significant amounts of software of interest to Windows users:

- **ftp.cica.indiana.edu *(129.79.20.84)***
  Directory */pub/pc/win3* contains one of the largest selections of Windows software and device drivers anywhere. Mirrored by *wuarchive. Please do not access ftp.cica.indiana.edu between 8am and 6pm EST to prevent overloading the system.*
- **wsmr-simtel20.army.mil *(26.2.0.74)***
  Directory *pd1:<msdos>* contains a very large selection of MS-DOS (and some Windows) software. Mirrored by *wuarchive.*
- **wuarchive.wustl.edu *(128.242.135.4)***
  Directory */mirrors/win3* contains a copy of the *cica* Windows archives, and directory */mirrors/msdos* contains a copy of the *simtel10* MS-DOS archive.
- **ftp.uu.net *(137.39.1.9)***
  Directory */vendors/microsoft* contains a lot of the Microsoft developer support materials available on CompuServe, including tech notes, sample sources, the ODBC SDK and WinHelp documentation for Windows and Win32 SDKs.
- **garbo.uwasa.fi *(128.214.12.3)***
  Directories */win3* and */win31* contain a majority of the *cica* Windows archives, and a fair amount of non-*cica* material. *Note that garbo.uwasa.fi is located in Finland, and North American users should avoid congesting transatlantic Internet links by ftping from this site.* Mirrored by *wuarchive.*
- **cc.monash.edu.au**
  Directory */pub/win3* contains a copy of the *cica* Windows archives. *Note that monash is located in Australia, and North American users should avoid congesting transpacific Internet links by ftping from this site.*
- **ftp.und.ac.za**
  Directory */pub/pc/win3/vbasic* contains a a variety of things useful to Visual Basic programmers. *Note that und is located in SouthAfrica, and you should try to avoid congesting transpacific Internet links by excessive ftping from this site.*

If your ftp program complains about an unknown site, you can substitute the numeric Internet address (shown after each site name above) for the name in the ftp command.

Using archie **92-09-21**

If you know the program you're looking for, but don't know where to find it, you might try using a utility called *archie.* This program allows you to search for a filename in all the available ftp sites.

There are numerous *archie* servers available; to use one of them, *telnet* to the system, and sign on as *archie*. Follow instructions to search for a file. The following lists some of the know *archie* servers currently available for use; pick one in your geographical area:

- *archie.rutgers.edu* United States (Northeast)
- *archie.sura.net* United States (Southeast)
- *archie.unl.edu* United States (West)

- *archie.mcgill.ca* Canada
- *archie.au* Australia and New Zealand
- *archie.funet.fi* Europe
- *archie.doc.ic.ac.uk* United Kingdom

Ftp by email

There are several sites that will perform general FTP retrievals for you in response to a similar mail query, although it appears that the *info-server@cs.net* server is permanently out of order.

In general, please be considerate, and don't over-use these services. If people start using them to retrieve megabytes and megabytes of GIF or WAV files, they will probably disappear. Also, keep in mind that your system may be linked to the net using a long-distance UUCP connection, and your sysadmin may not be happy about large mail files using up modem time and filling overloaded spool directories.

- **bitftp@pucc.bitnet**
  For information on this one (available only to BITNET sites) send it the message:
  help

- **ftpmail@decwrl.dec.com**
  For information on this server, available to all Internet sites, send it a mail message with a body containing simply:
  help

- **mailserv@garbo.uwasa.fi**
  One final choice is to use the *garbo.uwasa.fi* server, which lets you access the *garbo.uwasa.fi* archive (which contains most of the *cica* files). For instructions, send it a mail message with "*Subject: garbo-request*" and a single line of text "send help" to
  send help
  Please do not use this service if you are located in North America!

FAQs (Frequently Asked Questions) **93-02-04**

Hundreds of Usenet newsgroups have their own FAQs, most of them in text format. You can retrieve almost all of these FAQs' latest versions by ftp from *rtfm.mit.edu* in the directory */pub/usenet/news-answers.*

More about Internet and Usenet 94-03-15

To learn more about Internet and Usenet, I strongly recommend you purchase or borrow a copy of Ed Krol's *The Whole Internet User's Guide and Catalog* (ISBN 1-56592-025-2, $24.95), which covers email, news, ftp, archie and much more. This 400-page handbook is a thorough guide to getting around on the Net, clear enough for neophytes but with new information even for true Internet veterans. A wide range of other books are also available; check your local bookstore for the selection.

To purchase *The Whole Internet User's Guide and Catalog*, check your local bookstore or contact the publisher, O'Reilly and Associates at 1-800-998-9938 (103 Morris St., Sebastopol, CA 95472).

FTP archives on CD-ROM **92-09-21**

Walnut Creek offers copies of the *cica, wuarchive* and *simtel* FTP archives on CD-ROM, at prices ranging from $25 to $50, with annual subscriptions available. Call (800) 786-9907 or (510) 947-5996 for more information.

Setting Up and Configuring Windows

System Configuration

Minimum Windows 3.1 configurations

The *minimum* system configurations to run Windows 3.1 are as follows:

- **Standard Mode**
  286 processor, 640KB base memory, 256KB extended memory, EGA graphics
- **386 Enhanced Mode**
  386 processor, 640KB base memory, 1MB extended memory, EGA graphics

The following are *recommended* minimum configurations (based on the experiences of many net Windows users) for good performance.

- **Standard Mode**
  286/12 processor, 2MB total memory, VGA graphics, mouse
- **386 Enhanced Mode**
  386SX/16 processor, 4MB total memory, VGA graphics, mouse

Minimum Windows 3.0 configurations

The *minimum* system configurations to run Windows 3.0 are as follows:

- **Real Mode**
  8088 processor, 640KB base memory, CGA/Hercules graphics
- **Standard Mode**
  286 processor, 640KB base memory, 256KB extended memory, CGA/Hercules graphics
- **386 Enhanced Mode**
  386 processor, 640KB base memory, 1MB extended memory, CGA/Hercules graphics

The following are *recommended* minimum configurations (based on the experiences of many net Windows users) for good performance. (Real Mode is not configurable for good performance, and many applications will not run in it due to a lack of memory.)

- **Standard Mode**
  286/12 processor, 2MB total memory, VGA graphics, mouse
- **386 Enhanced Mode**
  386SX/16 processor, 4MB total memory, VGA graphics, mouse

Minimum Windows NT pre-release configuration **92-12-22**

The *minimum recommended* system configuration to run the Windows NT pre-release Software Development Kit is as follows:

- 386DX/33 processor
- 12 MB memory
- 100 MB hard disk
- VGA graphics

The *recommended* system configuration to run the final retail release of Windows NT, including networking and several applications, is expected to be the following (according to Microsoft):

- 386DX processor
- 8 MB memory
- 100 MB hard disk
- VGA graphics

Standard mode vs. 386 Enhanced mode

If you own a 386- or 486-based system, you have the choice of running in either Standard or Enhanced mode. The following lists the advantages of each:

Standard mode

- Speed. Many aspects of Windows run substantially faster in Standard mode than in 386 Enhanced mode.

386 Enhanced mode

- Virtual memory capability.
- Multiple DOS sessions are pre-emptively multitasked.
- DOS sessions may be run in a window.
- Able to run 386-specific applications such as Mathematica, FrameMaker and wdeb386.

Selecting a hardware configuration for Windows

Selecting a CPU/FPU **92-12-22**

As always, faster is better. However, CPU alone won't determine your system's Windows performance.

You can get fairly good performance even with a 386SX/20 processor given sufficient memory, and if you have a video accelerator card, a 386DX/40 doesn't feel much slower than a 486DX/33. You most definitely won't be able to tell a 486DX/33 and a 486DX2/66 apart in "normal" Windows operation.

Windows itself will not take advantage of a floating point unit such as the 287 or 387.

Selecting the memory size **92-12-22**

Again, the more memory the better.

You can get tolerable performance with 2 MB, but 4 MB is a more realistic minimum for decent performance. If you have 8 MB, you can use a reasonably large disk cache (such as SmartDrive) and RAM disk; with 16 MB, you can disable swapping completely and get even better performance.

Make sure your memory is either on the motherboard, or on a high-speed bus (such as EISA or MCA). The standard ISA bus will slow your memory accesses down to a crawl.

Selecting a hard disk **92-12-22**

For best Windows performance, you want a WD-compatible disk controller. As most SCSI controllers (such as the excellent Adaptec 1542B and 1740) are not WD-compatible, they can not use Windows' FastDisk 32-bit disk access facility. Worse yet, you may need to double-buffer your SCSI drive with SmartDrive, further degrading performance.

The best bet for Windows 3.1 and future Windows NT performance is a high-speed IDE drive (all of which are WD-compatible). The controllers are inexpensive (and built into many motherboards), and the new drives are quite fast. IDE drives tend to be smaller, however, than their SCSI and ESDI counterparts, ranging from 40 MB up to about 500 MB (SCSI and ESDI drives currently on the market range from 300 MB to over 2 GB).

The final option is to use an ESDI drive; these drives are usually identical to their SCSI counterparts, but with different interface electronics. As long as you don't use a controller with a custom BIOS (such as the WD-1009), you can use Windows' 32-bit disk access for better performance. While ESDI is generally somewhat slower than SCSI, the 32-bit access capability far outweighs that difference.

Selecting a video adapter **94-01-20**

Given Windows GUI orientation, a fast video adapter is essential for good performance. In addition, a better video adapter can provide higher resolution, higher refresh rates (for a steadier picture) and more on-screen colors (for more realistic picture reproduction).

You should look for a card supporting a 70 Hz or 72 Hz refresh rate (provided your monitor can handle that), and likely at least

A local bus or EISA graphics card will provide better performance, but the difference is not as significant with accelerated cards as it is with dub frame-buffer designs such as the ET4000 chipset. In general, don't pay double just to get an EISA card!

The following will attempt to describe some of the high performance (i.e. better than VGA) video adapters currently on the market. The descriptions are frequently based on the chipsets rather than commercial product names, as numerous vendors will market adapters using basically identical hardware. *All comments below are subjective and reflect the author's opinion only. Do not base a purchase decision solely on this listing, but always test a video adapter using your own applications prior to purchase, if possible.*

4b: 4-bit color (16 colors) 8b: 8-bit color (256 colors)
15b: 15-bit color (32,768 colors) 24b: 24-bit color (16.7M colors)
*interlaced

- **ATI: Mach 8**
  1280x1024x4b*, 1024x768x8b, 800x600x8b, 640x480x8b
  This is the original ATI accelerator chipset, which powers the ATI 8514 Ultra, Graphics Ultra and Graphics Vantage. The Ultra cards use VRAM video memory, while Vantage uses slower DRAM. The 8514 Ultra does not include onboard VGA, but both other cards do. All three cards are 8514 compatible. These cards, while no longer the fastest around, provide excellent Windows performance at all resolutions. The driver support is very good (with Windows NT beta drivers available), and ATI provides anti-aliased Crystal Fonts for better readability.

- **ATI: Mach 32**
  1280x1024x8b, 1024x768x15b, 800x600x24b, 640x480x24b
  The second-generation ATI accelerator chipset powers the ATI Ultra+ and Ultra Pro. The Ultra Pro uses VRAM video memory, while Ultra+ uses slower DRAM. Both cards are 8514 compatible. Both cards are extremely fast and provide blinding Windows performance. The driver support is excellent, with even beta Windows NT drivers available. ATI provides anti-aliased Crystal Fonts for better readability. One problem is that the highest performance Ultra+/Pro setup requires a 4 MB memory aperture, which is not possible on an ISA-based system with 16 MB of memory; disabling the memory aperture reduces performance by at least 5-10%. Effectively an ISA-based Ultra+ is slower in a 16 MB system than the original Mach 8-based Graphics Ultra.

- **ATI: Mach 64**
  1280x1024x8b, 1024x768x15b, 800x600x24b, 640x480x24b
  These are ATI's upcoming third-generation accelerator cards.

- **Avance Logic: ALG2101**
  1280x1024x4b*, 1024x768x8b, 800x600x15b, 640x480x15b
  The '2101 is a medium-speed performer with some serious reliability problems and buggy Windows drivers.

- **Avance Logic: ALG2201**
  1280x1024x8b*, 1024x768x15b, 800x600x24b, 640x480x24b
  The '2201 is the upcoming replacement for the '2101, with 24-bit true-color support, and intended for local bus designs.

- **C&T: 82C481**
  1280x1024x8b*, 1024x768x15b, 800x600x24b, 640x480x24b
  C&T's '481 chipset (often combined with the C&T Wingine chipset for VGA compatability) is a blazingly fast performer, but is currently hobbled by limited driver support. Check that the modes you need are supported before buying, and be prepared to have Windows fly!

- **Compaq: 128084**
  1024x768x8b, 800x600x15b, 640x480x8b
  Compaq's excellent QVision accelerator design is now getting to be a bit long in the tooth, and its performance is below nearly all of its competitors.

- **IIT: AGX015**
  1280x1024x8b*, 1152x960x8b, 1024x768x15b, 800x600x24b, 640x480x24b
  The AGX015 is IIT's implementation of the XGA specification, although at least the first available cards (Hercules' Graphite series) are not XGA-compatible. Despite some benchmark cheats, this remains an extremely fast card in real use, and wit has refresh rates of up to 90 Hz available.

- **S3: 87C801**
  1280x1024x8b, 1024x768x15b, 800x600x24b, 640x480x24b
  The '801 is a higher-performance (32-bit), lower-cost version of the '924 chipset, using inexpensive DRAM instead of the faster VRAM video memory. The performance edge over the original '911 is in excess of 50% on WinMark benchmarks.

- **S3: 87C805**
  1280x1024x8b, 1024x768x15b, 800x600x24b, 640x480x24b
  The '805 is a further development of the '801 chipset, optimized for EISA and local buses, and with more memory to allow hi-color and true-color modes at higher resolutions. Like the '801, it's a 32-bit DRAM design.

- **S3: 87C911**
  1280x1024x4b*, 1024x768x8b, 800x600x15b, 640x480x24b
  This is the original S3 accelerator chipset. It provides very good all-around performance, and is widely used in accelerator boards such as the Diamond Stealth. For better performance, look for the newer '801 or '928 chipsets, though.

- **S3: 87C924**
  1280x1024x4b*, 1024x768x8b, 800x600x15b, 640x480x24b
  The '924 is an updated version of the original S3 '911 chipset. Its performance is only somewhat improved over the original chipset (and less so than the '801 and '928), but it has some hardware bugs fixed (these bugs were previously worked around by the Windows drivers).

- **S3: 87C928**
  1280x1024x15b*, 1024x768x24b, 800x600x24b, 640x480x24b
  The '928 is a high-end version of the '805 chipset, intended for ISA as well as EISA and local buses, and supporting up to 4 MB of VRAM for true color at high resolutions.

- **Texas Instruments: TMS 34010**

4096x4096x24b *[the TMS34010 chipset effectively does not limit resolution]*
The TMS34010 is a true coprocessed card instead of a fixed-function accelerator. As it's design is not optimized for Windows, it is at its best in CAD applications and similar, which can take advatage of its display list processing capabilities. It provides very good Windows performance, but at a very high price point. Check performance of the specific model before buying, though the drivers are developed by individual vendors, and can have a trememndous impact on TMS34010 perforomance.

- **Texas Instruments: TMS 34020**
  4096x4096x24b *[the TMS34020 chipset effectively does not limit resolution]*
  The TMS34020 is a 200 MHz 32-bit implementation of the original 100 MHz 16-bit TMS 34010. It can provide outstanding Windows performance (on par with the ATI Ultra Pro), but it does so at a very high price point. The chipset is worth considering mainly if you also use your system for CAD.

- **Tseng Laboratories: ET4000/W32i**
  1024x768x24b
  The latest 32-bit implementation of the venerable ET4000 is amazingly speedy considering its low cost. Cards such as the Hercules Dynamite are performing on par with ATI's Mach32 accelerators at less than half the price. Highly recommended.

- **Video 7: HT216**
  1280x1024x4b*, 1024x768x8b, 800x600x15b, 640x480x15b
  Video 7's first accelerator chipset is an inexpensive design which provides middling performance, on par with the Compaq 128084 and the Weitek 5186.

- **Western Digital: WD90C31**
  1280x1024x4b*, 1024x768x8b, 800x600x15b, 640x480x15b
  Western Digital's new chipset is used by a number of display adapters, including the Paradise Windows Accelerator and the Diamond Speedstar 24x. While the chipset benchmarks moderately well (slotting between ATI's and S3's first- and second-generation chipsets), it has worse-than-expected real life performance, especially in scrolling. The current drivers are also quite buggy and unreliable.

- **Western Digital: WD90C33**
  1280x1024x8b, 1024x768x15b, 800x600x24b, 640x480x24b
  WD's second generation design will be targeted at local bus designs, and will attempt to improve performance with more accelerated operations and a 32-bit design (instead of the 32-bit/16-bit hybrid design in the WD90C31).

- **Weitek: W5186**
  1024x768x8b, 800x600x8b, 640x480x8b
  Weitek's initial foray into accelerator chipsets does not provide stellar performance, largely since the accelerated operations are limited to BitBlits and line drawing. An 16-bit/8-bit internal design and a lack of support for more than 256 colors don't add to the attraction of the W5186 chipset.

- **Weitek: W5286**
  1280x1024x4b*, 1024x768x8b, 800x600x15b, 640x480x24b
  The upcoming second-generation Weitek chipset will attempt to correct some of the problems of the W5186, using a 32-bit/8-bit internal design, true-color support (albeit only at low resolutions) and accelerated color expansion and pattern fills. It looks doubtful, though, that the W5286 would significantly surpass the top first-generation accelerators (such as the ATI Ultra and S3 87C911), let alone match the latest performers.

System BIOS compatability 93-04-22

A number of different computers have BIOS incompatabilities with Windows 3.1. The following list contains BIOSes with such problems. Contact you manufacturer for an update if you have one of these systems.

Manufacturer	Version	Problem
ALR	MPS	Incompatible with Seagate IDE disks
AMI	1987	Floppy access causes reboot
AMI	1989	Intermittent crashes
AMI	1991	Serial port problems for versions prior to 1991-07-07
AST	Premium/286	Crashes, keyboard lockups and network errors
Award BIOS	<= 3.04	Floppy read errors before version 3.05
DTK BIOS	<= 34	No IDE drive support
DTK BIOS	36	Setup utilities must be disabled
Peak BIOS	1.10	1.30 or newer is required
Phoenix BIOS	<= 1987	1988 or newer is required
Quadtel BIOS	<= 3.04	3.05 or newer is required
Tandon	All	Old BIOSes cause keyboard failures
Toshiba	T3100/20	BIOS 4.2 is required
Toshiba	T3100e	BIOS 1.7 is required
Wyse	All	Setup detects 101 keyboard as 84
Zenith	286	Keyboard problems
Zenith	386/16	BIOS 2.6E or newer is required
Zenith	TurboSport	BIOS 2.4D or newer is required

The BIOS name and version number (or date) are usually displayed when the system boots. As an alternative, you can use **msd.exe**, a DOS-based diagnostic utility included with Windows 3.1, to determine the BIOS your system is using. Also, there are several diagnostic utilities available in *wuarchive*'s /mirrors/msdos/info directory: **sysch233**, **sysid602** and **ifp1p155**.

Video drivers

Identifying your video card **92-09-28**

The first step in finding the correct Windows drivers for your video card is to determine the type of card you have. First, you may have a "brand-name" card; if so, your box and/or documentation will ientify the type of card. Second, you can look at the BIOS message (if any) displayed when you boot your system. Third, you can open up your system, and look for identification on the card itself usually either printed on the card itself or on some of the integrated circuits.

As an alternative, you can use **msd.exe**, a DOS-based diagnostic utility included with Windows 3.1, to determine the manufacturer and type of video card in your system. Also, two utilities available from *wuarchive*, **atmem10** and **vgautils** (in directory /mirrors/msdos/vga) may help you identify your video card.

See the following section on locating a video card driver for a listing of possible names to look for.

Locating a driver

Once you have identified your card, you are ready to begin searching for the right driver. First, check whether Windows includes the driver you are searching for (Windows 3.1 includes generic VGA (640x480x16) and SuperVGA (800x600x16) drivers, as well as numerous specific drivers). Second, look at the diskettes you received in the video card package. These may contain the appropriate driver, saving you from a further search.

If neither Windows nor the diskettes have the drivers, or they are out of date, you may wish to check *ftp.cica.indiana.edu* for the latest one. If there are none at *cica*, you can try one of the following:

- Contact your dealer
- Call the video card manufacturer
- Download the latest driver from the manufacturer's BBS
- Download the latest driver from the Microsoft BBS (206-936-6735)

Note that Windows 3.1 drivers are normally dated after the release date of Windows 3.1 itself (April 6, 1992).

Video card manufacturers

The following is a partial list of video display hardware vendors who support using Windows with their products. *CAUTION:* The numbers listed may not, by the time you read this, be up to date!

Ahead Systems		510-623-0961
Appian Technology		206-649-5363
ATI Technologies		416-756-4591
Boca Research		407-241-1601
Diamond Computer		408-730-1100
Everex Systems		510-226-9694
Focus Information		510-657-9451
Headland Technology	Video Seven	510-656-0503
Matrox Electronic		514-685-6008
Micro-Labs		312-648-6008
Micron Technology		208-368-2130
National Design		512-343-5054
NEC	NEC	512-832-1962
Nth Graphics	Nth Graphics	512-832-1962
Number Nine Computer		Number Nine 617-862-7502
Orchid Technology	Orchid	510-683-0327
Panacea	WinSpeed	603-432-5193
Sigma Designs	Sigma	510-770-0111
STB Systems	STB	214-437-9615
Tecmar	Tecmar	216-349-0853
Trident Microsystems	Trident	415-691-1016
ViewSonic	ViewSonic	213-944-2195

The following vendors do not provide BBS access, but do make updates available on *CompuServe,* in the forum indicated.

Tseng Laboratories	ET3000, ET4000	WINADV

Using 256 (or more) colors in Windows

In order to use more than 16 colors in Windows, your display card and its driver must first support 256 colors. Second, your application must know about 256 colors in order to take advantage of this feature, as this requires palette switching and some additional programming. Many applications currently on the market only support 16 colors.

In order to get 256 colors, your video card will need at least 320K (for 640x480), 512K (for 800x600) or 768K (for 1024x768) of RAM. For most video cards, 256-color drivers are also much slower than 16-color drivers. Some video cards support 15-bit (32,768 colors) or 24-bit (16,777,216 colors) video; these can also be used in Windows given the appropriate display driver and sufficient video memory.

Panacea Winspeed

One alternative to the specific manufacturer-supplied drivers is to use Panacea's Winspeed drivers. These drivers often provide a substantial speed improvement over vendor-supplied drivers, although some vendors have highly optimized drivers which can meet or exceed Winspeed's performance.

CGA drivers **92-09-19**

Windows 3.1 does not include CGA drivers, as the recommended minimum for running Windows 3.1 is EGA. If you need to run Windows on a CGA system, you can download the CGA drivers from the Microsoft BBS (206-936-6735).

Printer drivers

The following is a partial list of printer manufacturers who support using Windows with their products. *CAUTION:* The numbers listed may not, by the time you read this, be up to date!

Canon	Canon	516-488-6528
Lexmark	IBM laser printers	606-232-5653
NEC	NEC	508-635-6328
Okidata	Okidata	800-654-3282
Panasonic	Panasonic, Roland	201-863-7487

The following vendors do not provide BBS access, but do make updates available on *CompuServe*, in the forum indicated.

DEC	DEC	DECPCI
Varityper	Varityper	Desktop Publishing

Eliminating the Ctrl-D in PostScript output **92-10-31**

To prevent Windows from placing a Ctrl-D (printer reset) at the beginning of your PostScript output files, specify

CtrlD=0

in the *[ModelName,Port]* section of your **win.ini** file.

Note that this method does not appear to work with the generic PostScript Printer driver.

EPS graphics print in portrait even on landscape pages 92-12-30

If EPS (Encapsulated PostScript) graphics won't print correctly in landscape mode, try adding the following line to the *[Model,Port]* section of your **win.ini** file:

LandscapeOrient=270

Hewlett-Packard DeskJet printing problems **92-12-16**

If you are getting incomplete pages printed on your DeskJet, make sure that there is the the entry

PrtResFac=0

in the *[ModelName,Port]* section for the DeskJet in your **win.ini** file.

Note that only the drivers supplied by Hewlett-Packard support HP scalable fonts and/or color printing, and these do not currently support TrueType fonts.

PostScript printer uses incorrect fonts **92-08-10**

If you have a PostScript printer installed, and your documents print with the incorrect font whenever you select something out of the ordinary (for example, WingDings or one of the Lucida fonts), your printer driver is likely configured incorrectly.

In Control Panel's printer setup, click *Setup...,* then *Options...,* and finally *Advanced....* Now make sure you have the *Use Printer Fonts for all True Type Fonts* checkbox cleared. If you have this box checked, Windows will attempt to match each of your TrueType fonts to the "nearest" PostScript font, not always very successfully.

Alternately you may choose to purchase Adobe Type Manager, and use Type 1 PostScript fonts instead of TrueType fonts to avoid the problem.

Selecting a PostScript printer driver **92-10-31**

If your PostScript printer model is not listed in the available printers listing, you should not choose the generic PostScript printer. Microsoft advises that "if you select PostScript Printer, you may encounter problems when printing". Instead, you may wish to try Apple LaserWriter as your first possibility.

Using an Apple Imagewriter or Imagewriter II with Windows 93-06-19

the Apple Imagewriter and Imagewriter II are compatible with the C-Itoh 8510 printer, whose driver is included with Windows 3.1. You will alse need to use a null modem with the serial cable connection from your PC to the printer, and set your serial port to 9600/8N1.

Math coprocessors and WIN87EM.DLL

Windows 3.x itself does not take advantage of a math coprocessor. Windows applications, on the other hand, may or may not, depending on the application: for example, Excel will, while Word for Windows won't. In general, an 80x87 chip gives the greates speedup for trigonometric/log type of calculations, and does not significantly improve graphics speed in most cases.

The WIN87EM.DLL is a dynamic link library which provides floating-point emulation for Windows applications. Any application which is capable of using an 80x87 will need this library on a machine without an 80x87.

Multimedia

AdLib cards and .wav files **92-09-14**

The standard AdLib driver supplied with Windows 3.1 is a MIDI-only driver and is not capable of playing .wav files. You can add this capability, however, by installing the driver contained in *adlibw.zip*, available at *ftp.cica.indiana.edu* and other sites.

Using MIDI cards with Windows 3.1 **92-12-20**

if your sound card plays MIDI files (such as **canyon.mid**), but none of the selections under Control Panel's Sound icon are available, your card/driver does not support wave files. You will need either to add a wave driver for your card (if available contact your sound card manufacturer) or to get a card which supports wave drivers.

SoundBlaster Pro and Windows 3.1 **93-02-25**

One of the most common symptoms of SoundBlaster Pro problems in Windows 3.1 is a complete hang of the system on exit from Windows. You need to use the SoundBlaster Pro drivers, *not* the SoundBlaster 1.5 drivers included with Windows 3.1. The drivers shipped with SB Pro may be out of date, like those on Microsoft's BBS and on CompuServe (this may, however, have changed by the time you read this). In any case, *ftp.cica.indiana.edu* has the set of updated drivers available as *sounds/sbpw31.zip.* You can also get them from Creative Labs' BBS at (408) 428-6660.

Note that if you tell the driver to expect an IRQ other than the one the SoundBlaster Pro actually uses, Windows will complete the driver installation. When you than try to play a .WAV file, Windows will not recognize any device capable of playing it.

Using the PC's built-in speaker **92-09-14**

Windows 3.1 does not contain a driver for playing sounds over the PC's built-in speaker, as the speaker is not quite standardized and not all machines would work as intended. If you would like to try, however, you should get a copy of the speaker driver, contained in the self-extracting archive *speaker.exe*, available at Microsoft's BBS, *ftp.cica.indiana.edu* and other sites.

System resources

Free system resources are things such as window handles and global memory block handles (*handle* is a Windows programming term, but it is basically an identifier for a window or any other global item. Each window (dialog, icon, memory block, or whatever) requires a handle.

Windows 3.0 has a limit of 64K of resources (32,768 handles), and Windows 3.1 has a limit of 128K of resources (65,536 handles). Windows NT does not have a global resource limit.

You can't increase system resources by just adding more memory; the only real solution is to close some applications if you are running low. Windows 3.0 Program Manager was a resource hog, but the 3.1 version is much better.

Some poorly-written applications will also not release all the resources they have grabbed when they exit. You can check for this by checking the Free System Resources figure, starting up the application, working in it for some time, and then exiting. If the Free System Resources figure is not the same as before you started, your application is not properly freeing its resources and it's time for you to call the vendor and complain!

Networking

Compatible Networks **93-01-20**

The following networks have either been tested by Microsoft, or reported by Usenet users to be functional with Windows 3.x:

Network	**earliest version**	
3Com 3 Plus	1.0	
3Com 3+Open	1.0	
Banyan Vines	4.0	
BW NFS	?.?	
DEC PathWorks	4.0	
Frontier Tech Super-TCP	1.0	*[Windows-based TCP/IP, SLIP and NFS]*
FTP NFS	?.?	*[Windows-based telnet application]*
IBM PC LAN	1.1	*[except server]*
LAN Manager	1.0	
LAN Server	1.0	
LANtastic	4.0	
Novell Netware	2.15	*[shell & utilities must be version 3.01]*
Sun PC-NFS	3.5	*[must use interrupt 3 instead of 5]*
Wollongong NFS	2.0	*[Windows-based telnet, FTP; include SLIP]*

Note that many NFS packages have difficulty with Windows for Workgroups due to a bug in WfW FindNext implementation; check with the vendor to determine whether their NFS implementation has a workaround available.

Windows for Workgroups

Accessing Windows for Workgroups drives prior to starting Windows 92-08-25

Unless you read the documentation *very* thoroughly, you will get the impression that you cannot access drives shared using Windows for Workgroups (or Windows NT) until you have started Windows for Workgroups on your own machine. However, there is a way of accessing the network (as a client only, not as a server) even from the DOS level.

To access the network resources, simply enter the command

```
net logon /yes
```

at the DOS prompt. Omitting the /yes option will still work, but will ask you whether you are really sure you want to do this. To disconnect the network, enter

```
net stop /yes
```

Note that this will use up 100K of your maximum 640K of DOS memory.

Usin NetBIOS from MS-DOS **94-01-20**

You can start NetBIOS (including the NETBEUI protocol) by entering the following commands *before* starting Windows:

```
NET START NETBIND
NET START NETBEUI
```

You will then have access to NetBIOS even for MS-DOS applications without using Windows for Workgroups.

Sharing a CD-ROM drive with Windows for Workgroups 92-08-20

To share a CD-ROM drive with Windows for Workgroups, you must first use MSCDEX (**M**icro**s**oft **CD**-ROM **Ex**tensions), v. 2.21 or later. If you do not have a more recent version, 2.21 is included on your WfWG distribution disks.

In addition, you will need to specify the **/s** (share) option on the MSCDEX commandline in roder to allow sharing of the drive.

Finally, depending on how a workstation uses the shared CD-ROM drive, it may or may not need the MSCDEX installed on that station (typically, using the CD-ROM strictly for file access will not require the use of MSCDEX). If you do install MSCDEX on workstations, do not specify the /s switch.

Windows for Workgroups with TCP/IP

Microsoft does not officially support using Windows for Workgroups with TCP/IP. However, it's possible to use your existing TCP/IP protocol with a shared NDIS protocol stack. This will allow you to access NFS and TCP/IP (telnet and ftp) as usual, but with full Windows for Workgroups functionality available as well. Unfortunately you will generally lose the Windows-specific capabilities of your NFS software (such as mounting NFS drives from File Manager).

See the following sections for examples of how to set up Windows for Workgroups with a TCP/IP and NFS-based network.

DEC Pathworks with NDIS **94-01-20**

The following example has been tested and is known to work with Pathworks. Note that this example does *not* include the usual **config.sys** options such as *device=himem.sys;* you can add these as usual.

- **config.sys**

```
DEVICE=c:\win\protman.dos /i:c:\win
DEVICE=c:\win\depca.dos
DEVICE=c:\decnet\dllndis.exe
DEVICE=c:\win\workgrp.sys
```

- **autoexec.bat**

```
C:\win\net start
c:\decnet\sch /H
c:\decnet\dnneth.exe /LANA:1 /rem:2
c:\decnet\lat
```

- **protocol.ini**

```
 [network.setup]
version=0x3100
netcard=ms$ewtrb,1,MS$EWTRB
transport=ms$netbeui,MS$NETBEUI
lana0=ms$ewtrb,1,ms$netbeui
lana1=ms$ewtrb,1,datalink

[protman]
DriverName=PROTMAN$
PRIORITY=MS$NETBEUI

[MS$EWTRB]
DriverName=DEPCA$
RamAddress=0xD000
MaxMulticast=8
MaxTransmits=16

[MS$NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=32
BINDINGS=MS$EWTRB
LANABASE=0

[DATALINK]
DriverName=dll$mac
Bindings=ms$ewtrb
LG_Buffers=16
SM_Buffers=6
Outstanding=32
Heuristics=0
```

FTP TCP/IP: general **93-01-20**

With FTP's TCP/IP, you will need to set up Windows for Workgroups to use the NDIS stack (see the Wollongong section for a sample **protocol.ini**); your TCP/IP can be set up as usual, using the NDIS protocol stack. In addition, you will need to get a copy of the file **wfwftp.386** from FTP; this file corrects the FindNext problem with Windows for Workgroups. Copy this file to your system directory, and add the following line to the *[386Enh]* section of your **system.ini** file:

```
device=wfwftp.386
```

Thanks to Sue Youshock Pruyn and Larry Backman at FTP Software.

FTP TCP/IP: NDIS setup **93-04-30**

The following example has been tested and is known to work with PC/TCP. Note that this example does *not* include the usual **config.sys** options such as *device=himem.sys;* you can add these as usual.

Thanks to Sue Youshock Pruyn at FTP Software.

- **config.sys**

```
device=c:\usr\windows\protman.dos /i:c:\usr\windows
device=c:\usr\windows\workgrp.sys
device=c:\usr\windows\enlkii.dos
device=c:\pctcp\dis_pkt.gup
```

- **autoexec.bat**

```
REM Note that the Microsoft net start command is used instead
REM of the PC/TCP netbind.exe command.

c:\usr\windows\net start
c:\usr\windows\netbeui
c:\pctcp\ethdrv
```

- **protocol.ini**

```
[network.setup]
version=0x3100
netcard=ms$elnkii,1,MS$ELNKII
transport=ms$netbeui,MS$NETBEUI
lana0=ms$elnkii,1,ms$netbeui

[protman]
DriverName=PROTMAN$
PRIORITY=MS$NETBEUI

[MS$ELNKII]
DriverName=ELNKII$
INTERRUPT=3
IOADDRESS=0x300
MAXTRANSMITS=12
TRANSCEIVER=onboard

[MS$NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=32
BINDINGS=MS$ELNKII
LANABASE=0

[PKTDRV]
DRIVERNAME=PKTDRV$
BINDINGS=MS$ELNKII
INTVEC=0X65
```

FTP TCP/IP: generic DOS kernel setup **93-04-30**

The following example has been tested and is known to work with PC/TCP. Note that this example does *not* include the usual **config.sys** options such as *device=himem.sys;* you can add these as usual.

Thanks to Sue Youshock Pruyn at FTP Software and Juha Petäjä <Juha.Petaja@ntc.nokia.com>.

- **config.sys**

```
device=c:\usr\windows\protman.dos /i:c:\usr\windows
device=c:\usr\windows\workgrp.sys
device=c:\usr\windows\elnk3.dos
device=c:\usr\windows\msipx.sys
device=c:\pctcp\dis_pkt.gup
```

- **autoexec.bat**

```
REM Note that the Microsoft net start command is used instead
REM of the PC/TCP netbind.exe command.
set pctcp=c:\pctcp\pctcp.ini
c:\usr\windows\net start
c:\usr\windows\msipx
c:\usr\windows\netx
c:\pctcp\ethdrv -t 8
```

- **protocol.ini**

```
[network.setup]
version=0x3100
netcard=ms$elnkii,1,MS$ELNKII
transport=ms$netbeui,MS$NETBEUI
lana0=ms$elnkii,1,ms$netbeui

[protman]
DriverName=PROTMAN$
PRIORITY=MS$NETBEUI

[MS$ELNKII]
DriverName=ELNKII$
INTERRUPT=3
IOADDRESS=0x300
MAXTRANSMITS=12
TRANSCEIVER=onboard

[MS$NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=32
BINDINGS=MS$ELNKII
LANABASE=0

[PKTDRV]
DRIVERNAME=PKTDRV$
BINDINGS=MS$ELNKII
INTVEC=0X65
```

SunSelect PC-NFS **94-03-19**

The following example has been tested and is known to work with SunSoft PC-NFS 5.0 and Windows for Workgroups 3.11. Note that this example does *not* include the usual **config.sys** options such as *device=himem.sys;* you can add these as usual.

Thanks to Farid Rahmi for this information.

- PC-NFS 5.0 or newer is required (5.0b is preferred)
- A patch for multiprotocol NDIS is required (NFS-NDIS.SYS). It is available from SunSelect (Compuserve) or by ftp from *ftp.york.ac.uk* (/pub/pc-nfs)
- 32-bit File Access should be disabled. Typically, an *Invalid COMMAND.COM* message will appear upon exiting Windows for Workgroups if it is enabled.
- Western Digital/SMC cards (especially WD/SMC8013 series) might not work with a multiprotocol setup, even with the patch mentioned above. SunSelect and SMC are known to be working on resolving this problem.

- **config.sys**

```
device=C:\usr\windows\ifshelp.sys
```

- **autoexec.bat**

```
C:\usr\windows\net start

SET TZ=WET0WDT
SET NFSDRIVE=C
SET NFSPATH=C:\usr\nfs
SET TN_DIR=C:\usr\nfs\TELNET

C:\usr\nfs\prt *
C:\usr\nfs\net init
C:\usr\nfs\rtm.exe
```

- **c:\usr\windows\protocol.ini** *(not c:\usr\nfs\protocol.ini!)*

```
[network.setup]
version=0x3110
netcard=ms$elnk3,1,MS$ELNK3,3
transport=ms$nwlinknb,NWLINK
transport=ms$ndishlp,MS$NDISHLP
transport=ms$netbeui,NETBEUI
transport=nfs-ndis,NFS-NDIS
lana0=ms$elnk3,1,nfs-ndis
lana1=ms$elnk3,1,ms$nwlinknb
lana2=ms$elnk3,1,ms$ndishlp
lana3=ms$elnk3,1,ms$netbeui

[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP

[NWLINK]
BINDINGS=MS$ELNK3
lanabase=1

[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=MS$ELNK3
```

lanabase=2

[NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=12
BINDINGS=MS$ELNK3
LANABASE=2

[NFS-NDIS]
DriverName=NFSLINK$
BINDINGS=MS$ELNK3
LANABASE=0

[MS$ELNK3]
DriverName=ELNK3$

[ELNK3]
Adapters=MS$ELNK3

The following is NOT supported by SunSelect or Microsoft, so you are on your own here. Peer to peer services are supposed to be used over some kind of NetBIOS implementation, so it is in theory possible to run them over something else that the (default) NetBEUI protocol provided with WFWG. The reason to choose another protocol is that you just might want to access resources that are not on your local subnet and therefore you need a routable protocol, typically TCP-IP (or IPX for Novell fans).

You can use NB.EXE, an RFC 1001-2 implementation shipping with PCNFS since 5.0 to get access to peer services over NetBIOS. The price to pay is performance : transferring files using this method between 2 PCs will typically get you between 2 and 20KB/sec,. This is a PCNFS issue only, but that's the way it is.

To do the trick, get rid of other protocols in the "Network Setup" utility of WFWG, leaving PCNFS as sole protocol. Note that now that only one protocol is required, the SMC problem disappears if you use the NFS-NDIS.SYS provided with the PCNFS 5.0 box. Do *not* apply the patch.

Second thing to do is modify AUTOEXEC.BAT like this :

- **autoexec.bat**

C:\usr\nfs\rtm /heap 64 /segsize 1024
C:\usr\nfs\nb -n 8 -f C:\USR\NFS\NBNAMES

This will start up NetBIOS with 8 sessions at boot time.

Next, create a file to map the NetBIOS names to IP addresses. This will allow you to use resources which are not on your local subnet. The file can be anywhere, such as C:\USR\NFS\NBNAMES in the above example.

141.253.2.35 ANNEX5
141.253.2.214 PPC
141.253.1.138 DELL

The ANNEX5 and PPC machines are on the same subnet and have the same workgroup name (ANNEX), while the DELL machine is both on another subnet and has another

workgroup name (CASTLE).

To connect resources from DELL, you need to type in the name manually as \\DELL\ before you can browse its directories and files.

Known Limitations

To start with, modifying the number of sockets (RTM /heap 64) will eat up memory and it might not be possible to load this TSR into high memory afterwards. Also, NB.EXE will take away another 69KB so you could end up with as little as 400KB of DOS memory to start with. Nothing you can do here to have substiantial gains, except lowering the number of sockets *and* the number of NetBIOS sessions, which is related. This will probably limit you number of peer connections.

As said before, the overhead of NB.EXE is enormous and transferring large files (1MB) between 2 PC's will easily take 10 minutes where this would be done in seconds using NetBEUI. But for small files, chatting, fax (?),etc... speed might be less important than connectivity.

Browsing on the local subnet to find other peer machines might not give very good results, so on some occasions it might be better to type in a known machine name than wait for it to appear in the list box.

Last but not least, do not call SunSelect for this. The installation manual only supports coexistence with NetBEUI, not running peer services over NB. Let's hope this changes in future releases.

The following example has been tested and is known to work with WinQVT/Net. Note that this example does *not* include the usual **config.sys** options such as *device=himem.sys;* you can add these as usual.

- **config.sys**

```
device=C:\usr\windows\protman.dos /i:C:\usr\windows
device=C:\usr\windows\workgrp.sys
device=C:\usr\windows\ne2000.dos
device=c:\usr\windows\dis_pkt.dos
device=C:\usr\windows\msipx.sys
```

- **autoexec.bat**

```
pktint
C:\usr\windows\net start
C:\usr\windows\msipx
C:\usr\windows\netx
REM The next line may or may not be necessary
winpkt 0x61 0x62
```

- **protocol.ini**

```
[network.setup]
version=0x3100
netcard=ms$ne2clone,1,MS$NE2CLONE
transport=ms$netbeui,MS$NETBEUI
transport=ms$ipx,MS$IPX
lana0=ms$ne2clone,1,ms$ipx
lana1=ms$ne2clone,1,ms$netbeui


[protman]
DriverName=PROTMAN$
PRIORITY=MS$NETBEUI

[MS$NE2CLONE]
DriverName=MS2000$
IOBASE=0x300
INTERRUPT=3

[PKTDRV]
drivername=pktdrv$
bindings=ms$ne2clone
intvec=0x62
chainvec=0x66

[MS$NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=32
BINDINGS=MS$NE2CLONE
LANABASE=1

[MS$IPX]
DriverName=IPX$
```

MediaType=Novell/Ethernet
BINDINGS=MS$NE2CLONE

Wollongong Pathway Access/NFS **92-12-30**

The following example has been tested and is known to work with Wollongong's Access TCP/IP and NFS product, and SMC' 8013EP network card. If you are using BW, Sun, FTP or some other vendor's software, you will likely need to modify some of the driver names and options, and you will definitely need to adapt the network card selection and configuration to match yours. Note that this example does *not* include the usual **config.sys** options such as *device=himem.sys;* you can add these as usual.

Thanks to Ron Olsthoorn at Wollongong Canada.

- **config.sys**

```
stacks = 9,256
device = c:\usr\windows\protman.dos /i:c:\usr\windows
device = c:\usr\windows\workgrp.sys
device = c:\usr\windows\smcmac.dos
```

- **autoexec.bat**

```
rem The following line configures Pathway Access to interrupt 65
pwconfig -n:65
c:\usr\pathway\ndis -d:3 -i:A
c:\usr\windows\net start
c:\usr\pathway\pwtcp
c:\usr\pathway\nfs
c:\usr\pathway\mount u:   \\servername\\/u/joeuser
```

- **protocol.ini**

```
[network.setup]
version=0x3100
netcard=ms$w13ep,1,MS$W13EP
transport=ms$netbeui,MS$NETBEUI
lana0=ms$w13ep,1,ms$netbeui

[protman]
DriverName=PROTMAN$
Priority=MS$NETBEUI

[MS$W13EP]
DriverName=SMCMAC$
IRQ=10
RAMAddress=0xC800
IOBase=0x240
ReceiveBufSize=1024

[MS$NETBEUI]
DriverName=netbeui$
Sessions=10
NCBS=32
Bindings=MS$W13EP
LANAbase=0
```

Novell's NWPOPUP utility won't initialize **92-12-30**

If you are running in 386 Enhanced mode, and the version of **nwpopup.exe** is dated earlier than 10 March, 1992, **nwpopup.exe** will not initialize properly under Windows 3.1.

You may also try placing the following line in the *[386Enh]* section of your **system.ini** file:

```
TimerCriticalSection=10000
```

This increases the amount of time (milliseconds) before the critical section is timed out.

WINSOCK.DLL-based TCP/IP networking 93-11-16

Winsock.dll is a vendor-specific library that provides a standardized interface for accessing that vendors proprietary TCP/IP network transport layer. Generally you should contact your TCP/IP software vendor to obtain the correct version of **winsock.dl.**

There are, however, two shareware versions of **winsock.dll** available, both of which work with the freely available packet driver.

Trumpet Winsock

This package was written by Peter Tattam, and works with ODI and NDIS drivers as well as the Clarkson packet drivers. It is available via ftp as:

ftp.utas.edu.au:/pc/trumpet/winsock

VxDTCP

This package was written by Jagane Sundar, and thanks to its VxD-based implementation, is very fst. It also supports ODI, NDIS and packet drivers. It is available via ftp as:

biochemistry.bioc.cwru.edu:/pub/wintcp

Integrating with Unix e-mail **94-01-24**

In general, Windows-nbase email packages will not talk to Unix hosts over the network (unless you're using Microsoft's LAN Manager). If you wish to use Windows-based email over a TCP/IP network, you need an SMTP-compatible email package such as Mail-It (from Unipalm Ltd., Cambridge, UK; +44 223 42002; *tom@unipalm.co.uk*), Cinetic Mail Manager (from Cinetic Software, available as shareware), or Wollongongs mail software (which is included with their TCP/IP software).

Serial communications

Using COM3 and COM4 **92-11-09**

This is a generally a problem only in 386 enhanced mode. To use these ports, you will need to tell Windows where they are located.

For Windows 3.1, you should run the MSD.EXE utility while outside Windows. This utility will allow you to determine your COM port configuration. After running MSD, use the Control Panel's Ports utility to tell Windows how your ports are configured.

For Windows 3.0, the instructions for doing this can be found in the Windows readme file **sysini2.txt**, which should be located in your Windows directory. In summary, what you need to do is tell Windows what memory addresses and interrupts (IRQs) your COM3 and COM4 ports use. This should work, but is not guaranteed to: COM3 and Com4 are not standardized, and this is one of the most difficult things to get working with Windows. If possible, move your devices to COM1 or COM2.

If the port still does not work after specifying the correct IRQ and memory address for the port, there is another possibile solution: Assuming the ports work OK from plain DOS, try setting up COM3.OS2 (or COM4.OS2) instead of the usual COM3 or COM4. The Windows 3.0 manual says this is just for OS/2 machines, but it seems to work for many clones.

Also note that due to interrupt conflicts, machines without an EISA or Microchannel bus are generally not able to use both COM1 and COM3, or COM2 and COM4 simultaneously.

Finally, some video accelerator cards, such as the ATI Vantage and Ultra series, and the S3 89C911-based cards, use the address normally assigned to COM4, preventing you from using this port number.

Using a high-performance 16550 serial port **92-09-15**

You can use a 16550-based serial card, or upgrade your serial card to use a 16550 chip instead of an 8250 or 16450 (get the 16550AFN if you're buying a chip only) to improve Windows serial communication performance. This is most noticeable at 9600+ baud rates using advanced protocols such as Zmodem.

If you use a Windows-base communications package, the 16550 is automatically enabled. You can disable it, however, by setting

COMxFIFO=off

in the *[386Enh]* section of your **system.ini** file, where *x* is your serial port number (1 to 4).

DOS boxes and 16550 serial ports **92-09-28**

For DOS-based applications, the use of the 16550 serial port chip (and its built-in FIFO buffers) is not enabled by default. What you need to do is set

COMxBuff=off

in the *[386Enh]* section of your **system.ini** file, where *x* is your serial port number (1 to 4). This will disable Windows' buffering of that serial port, and allow the DOS app to access it directly. This is **not** recommended for use with Windows-based communication packages!

Another alternative is to use chcomb.386 (replace the *device=*combuff* line in the **system.ini** file with *device=chcomb.386*), a shareware device driver which allows you to use a 16550 for both WIndows and DOS applications.

SmartDrive and 16550 high-speed transfers **92-09-27**

If you use **SmartDrive** with Windows 3.1, disk writes are cached by default. While this is generally a good idea, this causes a problem with high-speed downloads, since **SmartDrive** turns off all interrupts when it is performing the delayed disk write. Since the interrupts are turned off, you may lose a packet whenever the disk light goes on!

The easiest workaround is to disable write caching for your download drive.

Disk drives and virtual memory

Virtual memory and swapfiles **92-09-19**

The type of swapfile you select for running in 386 Enhanced mode can have a significant impact on your performance within Windows.

If you have 12 MB or more of memory, you should likely disable swapping completely; this provides substantially better performance than either permanent or temporary swapfiles. You may also be able to do this with 8 MB, depending on the size of your disk cache and the number of applications (especially DOS applications) you run simultaneously.

If you determine that you do need a swapfile, you should usually use a permanent one. Permanent swapfiles allow Windows to start up much faster than temporary ones, which must be recreated every time you start Windows. Permanent swapfiles, however, require contiguous (unfragmented) disk space; you may need to compress your disk, using a tool such as Norton SpeedDisk or PC Tools first.

Maximum swapfile size **92-09-28**

Windows 3.1 determines your virtual memory limit by rounding the amount of RAM on your system to the nearest 4 MB, multiplying by 4, and then subtracting the amount of the system RAM from the total. This is then the maximum amount of virtual memory (swapfile size) you can use, provided you have sufficient unfragmented hard disk space (see previous section).

The multiplier of 4 is a default that can be changed by using a

PageOverCommit=

setting in the *[386Enh]* section of the **system.ini** file. The multiplier can be from 1 to 20.

Windows 3.x and Stacker **92-11-09**

Stacker 2.0 works well with Windows 3.0 and 3.1. You should, however, follow the guidelines below for using Stacker with Windows:

- Never place a permanent swapfile on a stacked disk.
- Never place a temporary swapfile on a stacked disk.
- Never use SmartDrive to cache the stacked volume
- Do use SmartDrive to cache the unstacked volume containing the stacked volume
- Place SmartDrive before Stacker in your **autoexec.bat**

To enhance your memory usage, you may wish to stack your RAMdrive to provide additional room for temporary files (such as the Print Manager's spool files).

Note: Beware that although Stacker will assume that it can compress your data to provide 2x the physical storage capacity, it cannot guarantee that, and placing your temporary files on a stacked drive (whether a disk drive or a RAMdrive) may cause the stacked drive to run out of room unexpectedly if the compression ratio does not reach 2x (you may wish to read up on this in your Stacker documentation). If this happens, Windows will experience a catastrophic disk error and I think we can all agree that that's not a pleasant experience!

SCSI controllers

If you have a bus-mastering SCSI adapter such as the Adaptec 1542, you should be installing the **aspi4dos.sys** ASPI driver (provided with your controller, or available from Adaptec's BBS at (408) 945-7727) as the first device in your **config.sys**. Using the ASPI driver drops the requirement for SmartDrive descrivbed below.

Normally, in 386 enhanced mode, Windows 3.x supports only ST-506, ESDI and IDE disk controllers. If you have a SCSI controller, you need to load SmartDrive in order to allow Windows to recognize your hard disk and with Windows 3.1, you should use the */double_buffer* option (see the next section). Do not disable double buffering in a bus-mastering SCSI drive unless you're using the ASPI driver described above.

As a third alternative, you may insert the following line in your **system.ini** file, in the *[386enh]* section:

VirtualHDIRQ=off

Finally, some people report having problems with permanent swapfiles on SCSI drives using Windows 3.0.

SmartDrive double buffering on SCSI drives **92-12-30**

When you install WIndows 3.1 on a system with a SCSI drive, it automatically adds the line

```
device=c:\usr\windows\smartdrv.exe /double_buffer
```

to your **config.sys**. To determine whether you actually need double buffering, run SmartDrive again from the command line to check on its status. Typically, the initial display would be similar to the one below:

```
Microsoft SMARTDrive Disk Cache version 4.0
Copyright 1991,1992 Microsoft Corp.

Cache size: 1,048,576 bytes
Cache size while running Windows: 1,048,576 bytes

               Disk Caching Status
drive    read cache    write cache    buffering
-----------------------------------------------
  A:         yes            no            no
  B:         yes            no            no
  C:         yes            yes           -

For help, type "Smartdrv /?".
```

Here SmartDrive has not yet determined whether double buffering is necessary or not. To force SmartDrive to make up its mind, run two simultaneous DOS sessions from within Windows, and do some disk accessing from each. After this, SmartDrive should be able to determine the need for double buffering. If the double buffering is not required, the display will be similar to the one below:

```
Microsoft SMARTDrive Disk Cache version 4.0
Copyright 1991,1992 Microsoft Corp.

Cache size: 1,048,576 bytes
Cache size while running Windows: 1,048,576 bytes

               Disk Caching Status
drive    read cache    write cache    buffering
-----------------------------------------------
  A:         yes            no            no
  B:         yes            no            no
  C:         yes            yes           no

For help, type "Smartdrv /?".
```

If this is the case, you can remove the SmartDrive line from your **config.sys**.

Windows 3.x and large hard disks

In rare cases, there are problems with using Windows 3.0 on large hard disks. Your system may be at risk **if**:

- You are using third-party partitioning software, such as:
  - Disk Manager (dmdrv.bin)
  - InnerSpace (edvr.sys)
  - SpeedStor (sstor.sys or hardrive.sys)
  - Vfeatures Deluxe (fixt_drv.sys)
- **and** you are using SmartDrive (smartdrv.sys) as your disk cache
- **and** your hard disk has more than 1023 cylinders

If your hard disk has fewer than 1024 cylinders, you may still be at risk if the first two conditions hold true, you are using DOS 3.30 or later, **and** your hard disk is not supported by your BIOS. To avoid problems, you can either stop using SmartDrive, or reformat your disk using the DOS FDISK utility.

There are no problems with large partitions created by the FDISK program included with MS-DOS 4.0 and some versions of MS-DOS 3.3.

If you are still having problems, call Microsoft Technical Support at (206) 454-2030.

Troubleshooting

One essential tool for troubleshooting Windows 3.x problems is Microsoft's *Windows Resource Toolkit.* This combination of a comprehensive reference and some utility tools is priced at around $30, and can't be beat for value. If you are responsible for keeping a number of Windows systems running, run, don't walk, to the nearest phone and order it now!

The toolkit is also freely available in Word for Windows format from *ftp.cica.indiana.edu* (and its mirror sites); while this version is complete, it is large, and will take significant time to ftp and download (not to mention print!).

BMP wallpaper won't display correctly

Some of the possible reasons are:

- Your **.bmp** file is corrupted. Try reading it into Paintbrush to verify that it is readable.
- You are trying to display a bitmap with more colors than your video driver supports for example, 256 colors with a 16-color driver, or 16M colors with a 256-color driver).
- You have insufficient memory to display the bitmap. A 800x600x16 bitmap requires 256K of memory; 1024x768x256 would require 768K!

For 256-to-16 color dithering, you may try using a utility such as PaintShop Pro.

Frequent GPFs (General Protection Faults)

If you are experiencing frequent Windows 3.1 crashes, try starting Windows with the command

win /d:xsv

If the GPFs do not appear, add the line

VirtualHDIRQ=off

to the *[386Enh]* section of your **system.ini** file. If the GPFs contine, try

win /d:xs

If the GPFs do not appear, add the line

SystemROMBreakPoint=false

to the *[386Enh]* section of your **system.ini** file. If the GPFs contine, try

win /d:x

If the GPFs do not appear, add the line

EMMExclude=A000-EFFF

to the *[386Enh]* section of your **system.ini** file. While this will get Windows running more reliably, you should probably try to narrow down the range of memory that actually has to be excluded.

File Manager won't format floppies

If you are having trouble formatting floppies from File Manager, try adding one or more

```
DEVICE=DRIVER.SYS /D:# /F:#
```

lines to your **config.sys**; see your DOS manual for details.

Incorrect system version; reinstall the 386 enhanced version of Windows 93-01-29

If you get the above message when starting a DOS session, you are experiencing one of three potential problems:

- You are using a display driver written for Windows 3.0. Updating it to a 3.1 compatible version should make the problem disappear.

- Your display card selection is not consistent: the display.drv=, 386Grabber= and display= selections in your **system.ini** may not be consistent with each other. Use setup to install a fresh set of display drivers from the original distribution diskettes.

- Your **winoa386.mod** driver (in your system directory) may be out of date. If that file's date is earlier than **win386.exe**, use the expand command to get a new copy of **winoa386.mod** from your original Windows diskettes.

Mouse hangs when using communications software

This problem is usually caused by a mouse and a modem being on the same serial port pair (either COM1/COM3, or COM2/COM4). Each pair shares a common interrupt due to restrictions of the original IBM PC architecture, and so can not be used simultaneously.

If you are experiencing this problem, you should move either your modem or mouse a different serial port.

Object Linking and Embedding (OLE 2.0) does not work 93-12-05

The early versions of the OLE libraries shipped with applications such as CorelDraw! had some deficiencies; if you are experiencing difficulties with using OLE, contact your application vendor for an OLE update.

Also, you should make sure you are running SHARE if you intend to use OLE 2.0; this is required for correct operation.

Parity errors with Windows 3.1 **92-09-19**

Parity errors are real, and detected reliably by Windows 3.1 (Windows 3.0 ignored them for the most part). Unfortunately most memory test programs do not properly test 32-bit memory accesses, and thus do not detect all possible memory problems. Environments such as Windows 3.1, Windows NT, Unix, Xenix and OS/2 2.0, however, do exercise this aspect and, as a result, report memory problems where the memory testers don't catch them.

Below are some of the possible causes for parity errors, in approximate order of likelyhood:

- Defective memory module
- 80ns memory where 70ns is required
- Two different speeds of memory modules
- DMA or memory conflicts
- Outdated BIOS
- Defective DMA on the CPU chip

If you're willing to play with fire and gasoline (if, for example, you have 8-bit memory with no parity bit), you can disable parity checking by removing or commenting out the following line in the *[386Enh]* section of your **system.ini** file:

```
device=*parity
```

Note that this will disable your parity checking completely and may cause unexpected crashes or errors if your memory has parity errors!

Performance deterioration in a 386 Enhanced mode DOS session

The most likely cause of this type of a problem is slow memory. If your onboard memory is accessed with basically no wait states, but you have a slower memory expansion card, your machine will run slower whenever it is using those higher memory addresses. This will generally happen when you start a DOS session, and often result in 30-50% performance reductions using various benchmarks. The performance is actually also reduced within Windows, but it's difficult to notice this due to the lack of a suitable benchmark. The proper cure for this problem is to either upgrade your memory expansion card, or to correct whatever problem is causing your machine to access extended memory with such poor problem.

DOS application performace is also degraded by using a *.PIF* file (such as the default *.PIF*) with the **Monitor Ports** option enabled, but to a much smaller degree. With **Monitor Ports** disabled, DOS session performance should be within 5-10% of the performance under bare DOS.

Problems creating a permanent swapfile in Windows 3.0

First of all, you must be running in real mode to be able to create a permanent swapfile. Second, You must not have any SUBSTed drives or Windows won't create the swapfile. Once the swapfile has been created, you can re-SUBST your drives (although the use of SUBST is not recommended in general). You also can't create a permanent swapfile on a drive partitioned with third-party software such as SpeedStor.

If you are installing on a Novell client, you must first disable the *receive network messages* feature (using the network icon in the Control Panel) and reboot. Once you have installed the swapfile, turn messages back on again.

Program Manager claims only 8 KB of free memory 92-12-30

In Windows 3.1, it is possible that Program Manager (and other Windows 3.1 programs) will claim that you have only 8 KB memory when you really have 8 MB (that is, it chops off the kilobytes part and displays only megabytes but with "KB" after the figure).

This is caused by a null thousands separator in Control Panel's International settings. Set the
separator to either blank or some character to restore correct behaviour.

Using a slow expansion memory board with Windows 92-11-11

If some of your memory is on a slower memory expansion board (such as a standard ISA bus memory board, operating at 8 MHz in a 33 MHz system, you may experience serious performance deterioration as soon as Windows starts using the slower memory on the expansion board. (For example, see section *Performance deterioration in a 386 Enhanced mode DOS session*.)

Unfortunately Windows 3.1 does not allow you to specify memory ranges to be used for a RAMdisk or disk cache, and thus you can't control which memory gets used first. In this case, the best solution is to use QEMM-386, which allows you to do just that. Place your RAMdisk and disk cache in the slow memory (they will not suffer a significant performance drop), and leave the fast memory on the motherboard available for Windows' use.

Windows 3.0 refuses to run without a file called WINA20.386

Quoting from the MS-DOS 5.0 **readme.txt** file:

4.3 WINA20.386 File

Setup installs a read-only file named WINA20.386 in your root directory. If you move the WINA20.386 file to a different directory, do the following:

- Add a SWITCHES=/W command to your CONFIG.SYS file.
- Add a DEVICE=[drive:][path]]WINA20.386 command to the *[386Enh]* section of your Windows **system.ini** file.

Windows 3.1 does not require this file to be present.

Windows 3.1 hangs or crashes during startup

Try starting Windows with the command line

win /b

If it repeats the same crash or hang, take a look at the file **bootlog.txt** in your Windows directory. It will have two lines such as

LoadStart = SYSTEM.DRV

and

LoadSuccess = SYSTEM.DRV

for every driver succesfully loaded; the culprit driver will show a line such as

LoadFail = WIN3-64S.DRV Failure code is 05

If it's a standard Windows driver, try reloading it from diskettes; otherwise, for a third-party driver, try to locate an updated driver either from *cica*, your supplier or direct from the manufacturer.

Windows 3.1 hangs or waits a long time on exit

Windows 3.1 tries to reset the mouse driver on exit, and some IBM PS/2 models have great difficulty with this procedure, timing out only after an extended wait. In order to avoid the problem, add the line

```
InitPS2MouseAtExit=False
```

to the *[386Enh]* section of your **system.ini** file.

Windows 3.1 Resource Kit won't install

The most common WRK installation problem is an excessively long path. If you have problems, try reducing the length of your path for the installation, and you should be OK.

Windows 3.x waits a long time on startup

One possible reason is the use of a serial mouse on COM2 instead of COM1. If you have a serial mouse, Windows will first attempt to find it (with great persistence) on COM1, before it looks on COM2. If your mouse is on COM2, move it to COM1.

Using a temporary swapfile instead of a permanent one for 386 enhanced mode also slows down the startup process, but not to even nearly the same extent as the serial mouse problem.

With Windows 3.0, it has also been reported that adding too many fonts through the Control Panel will drastically slow down the startup, and with both Windows 3.0 and 3.1, a very large number of ATM fonts will also slow down the startup process.

Windows for Workgroups 3.11 claims ports are in use **94-02-25**

In some cases upgrading Windows for Workgroups 3.11 over Windows 3.1 does not update your **system.ini** file correctly. If you are getting this error when attempting to print or use a serial port, check to see that the following lines are in the *[386Enh]* section of your **system.ini**, and add them if necessary:

```
device=serial.386
device=vcomm.386
device=lpt.386
```

Windows and DOS

Configuring DOS sessions

DOS in a window

You can run a both the standard DOS command interpreter *(command.com)* and other DOS applications from within Windows. In Real mode, you are limited to a single session. In Standard mode, you can have multiple sessions, but they must still run full-screen. In 386 Enhanced mode, you can have multiple sessions, and they can run in a window.

You can control the starting up in a window vs. full-screen by setting up a **.pif** file for the program (command.com or any other DOS program). You canalso switch the state by pressing *Alt+Enter.*

Lotus 1-2-3 in Windows

Lotus 1-2-3, versions 1.x, 2.x and 3.1 run in all modes, but do not support any of the features of the Windows environment. For all intents and purposes, version 3.0 doesn't run under Windows.

If you want to use a spreadsheet in the Windows environment, however, you will be best off buying a real Windows spreadsheet such as Excel, WingZ, CACompete! or even 1-2-3 for Windows.

Reducing the amount of "jerkiness" in DOS window updating

Windows 3.1 updates the DOS windows by default every 50 ms. To increase the update frequency, specify another update interval (such as 20 ms) by adding a line to the *[386Enh]* section of **system.ini**:

```
WindowUpdateTime=20
```

A smaller interval will provide smoother updates but impose a higher load on the system.

Extended memory in DOS sessions

After you run Windows, a utility such as Norton SI will often report that you don't have any extended memory. This is not a bug, but rather a result of the Windows memory management system.. Windows requires applications to access extended memory using one of two mechanisms, known as "XMS" and "DPMI". These mechanism are implemented in himem.sys and emm386.exe. If you have *device=himem.sys* in your config.sys, the first XMS call (by Windows or SmartDrive, for example) will transfer control of the extended memory to himem.sys, and thus make it inaccessible to non-XMS/non-DPMI applications.

Changing the font size for a DOS window

All video drivers updated for Windows 3.1 allow on-the-fly font changes; to get the same functionality using older 3.0 drivers (in Windows 3.1), add the line

FontChangeEnable=1

to the *[NonWindowsApp]* section of the **system.ini** file. If you experience strange cursor behaviour or missing characters, remove the line from your **system.ini**. There are also alternate Windows 3.0 DOS fonts available at *ftp.cica.indiana.edu.*

Changing the number of lines inr a DOS window

To use more than 25 lines in a DOS window, add the line

ScreenLines=50

to the *[NonWindowsApp]* section of the **system.ini** file. If your screen doesn't quite fit 50 lines in a DOS window with a decent font, you may want to follow this procedure:

- Use a VGA font editor (such as VFONT) to create a DOS VGA screen font with more than 25 lines.
- Start up a DOS session (in a window)
- In that window, change the font (and thus screen size) to your new font/size. Voila!

Mouse in a DOS window

In Windows 3.0, if you are running a DOS application in a window, Windows will retain control of the mouse for cutting and pasting. You can use a mouse in a full-screen DOS session if you install a mouse driver by running mouse.com (either before starting Windows, or inside the DOS session), or by including

```
device=mouse.sys
```

in your config.sys file. If you're running WordPerfect 5.1 inside Windows, WordPerfect must be started full-screen in order to detect the mouse. Once it has started, you can use Alt+Enter to run in a window, if you wish.

In Windows 3.1, the mouse will automatically work in a DOS window if you have a video driver which has been updated for 3.1. Old 3.0 drivers do work, but they do not by default provide mouse functionality inside DOS windows, although you can force them to do so by adding the line

```
MouseinDosBox=1
```

to the *[NonWindowsApp]* section of the **system.ini** file.

If you have a Microsoft mouse, you should use the mouse driver version 8.20, included on the Windows 3.1 disks, named **mouse.co_** and **mouse.sy_**. Expand these files using expand.exe (also included on the disks) before using them.

TSRs in DOS sessions

Some TSR (Terminate and Stay Resident) programs will not work if you install them before running Windows. Some of them will not work if you install them inside a DOS session. Generally the best idea is to avoid TSRs completely unless you absolutely have to have them.

See also the description of **winstart.bat** in the Windows *.txt files.

VGA graphics in a windowed DOS session

Windows 3.1 will support VGA graphics in a windows DOS session if you have the correct display driver. True Windows 3.1 display drivers (such as the standard SuperVGA driver) will do this, but some partial implementations may not.

Troubleshooting DOS applications

Can't run VGA graphics in a window **93-07-15**

If you can't run DOS-based VGA graphics programs in a window you are probably seeing the message "You cannot run this application while another high-resolution application is running full screen". The "other" application is, in fact, Windows itself.

In this case, you need to reduce the resolution of your Windows desktop (possibly down to the basic VGA 640x480x16) in order to free enough video memory to allow the other application to run VGA graphics simultaneously with Windows. You may also have to add memory to your video card.

The plain VGA VDD (device=*vddvga) assumes that you have 256K on your display card. You can explicitly override this assumption by adding, for example, the line

SVGAMemory=512

to the *[386Enh]* section of your **system.ini**. This trick is known to work only if your display driver is using device=*vddvga; contact your video card supplier for a workaround for workarounds fpr custom VDD devices.

Corrupted diskettes when copying files in a DOS session

If you are getting corrupted diskettes with a 0xff as every other byte when copying files to a floppy within a DOS session, the most likely cause is an expansion board using the same memory area also used by Windows for EMM. You should check that you EMMExclude all areas used by your cards.

The Video-7 1024 SVGA board needs a more radical measure: you need to change a jumper to do all ROM decoding in *c000 - c7ff,* and change a DIP switch to force 8-bit ROM access.

High color and true color modes run out of resources 94-01-20

When using high color (16 bits, or 65,536 colors) or true color (24 bits, or 16.7M colors), Windows needs 2x-4x as much resources for each of the icons you display. This conflicts with Program Manager's liberal use of icons for programs and groups. Other Windows shells are often more frugal with their use of icons.

If you need to use high color or true color, and want to keep using Program Manager, reduce the number of groups, and keep no more than 15 icons in each group.

Out of Environment Space

When Windows starts up a DOS session, it by default gives it an environment of 224 bytes, or the space required to hold your current environment, whichever is larger. If you need more space, there are two methods of circumventing this. In order of desirability:

- *Use a .pif file for each DOS application you run*
  In this you can specify the environment size by using the /e:nnn option (see your DOS manual). You will need a separate .pif file for each program (although in Windows 3.1 you can create a **_default.pif**, which is used by all DOS applications which do not have their own .pif files). You can just create a **command.pif** with a suitable */e:nnn,* and then specify in the win.ini a line such as

  ```
  [Extensions]
  bat=command.pif ^.bat          // for DOS users
  ksh=sh.exe ^.ksh               // for MKS users
  ```

  With this, you can create batch file icons freely, and still get the options specified in command.pif or sh.pif.

- *Use a dummy variable*
  By specifying a dummy variable (such as DUMMY1=xxxxx...) before starting Windows, you can reserve some space in the environment. Then, as the first thing in each command.com session, do

  ```
  set DUMMY1=
  ```

  to reclaim the space used by DUMMY1 for use by other environment variables.

Protected-mode software

Some protected-mode applications currently on the market still use an older extended memory interface called VCPI (Virtual Control Program Interface), which is incompatible with Windows' DPMI (DOS Protected Mode Interface). Microsoft went against an established standard in choosing DPMI, but there are valid technical reasons why VCPI was not chosen for Windows.

At this point, you have three choices:

- *Run your protected-mode software under DOS*
  This means that you must NOT use Windows or SmartDrive before running your VCPI software, and may require you to have two different config.sys files.

- *Plead with your software developer*
  Call up the software vendor and ask them whether they are developing either a Windows-based version, or, at the minimum, one which uses DPMI instead of VCPI. They should already be working on it anyway, given the momentum and market share that Windows 3.x has.

- *Buy QEMM/386 or 386Max*
  Both of these packages provide VCPI. You'll be able to run your protected-mode software as well as Windows 3.0 and 3.1.

DOS shells and extenders

QEMM/386 and DesqView/386

You can use versions 5.0 of QEMM/386 and below with real-mode Windows 3.0 only. However, QEMM/386, versions 5.1 and higher, provides XMS services for Windows, thus allowing Windows to run in all modes under QEMM/386, plus providing compatability with VCPI applications.

Windows will run in Standard (Windows 3.0 and 3.1) and Real (3.0 only) modes as a DesqView/386 task.

MKS Toolkit: setting up

There are two possible problems with running Windows from the MKS Toolkit. First, with versions up to and including 3.1c of the Toolkit, the use of login.exe precludes the use of Windows 3.0 in any but the real mode. To avoid this, have your machine boot directly into the Korn shell or command.com (you may use **init.exe** if you wish).

Second, somebody at Microsoft had a brain fade, and Windows gets confused if it is started with a forward slash path. Thus, if you simply type "win" in Korn shell, the shell invokes Windows with something like

```
c:/usr/windows/win.com
```

and Windows doesn't know where to find itself! To cure this, specify a shell alias for Windows: I use

```
alias -x win='c:\\usr\\windows\\win.com'
```

Note that the double backslashes are necessary for the Korn shell, even inside the single quotes.

The newer versions of MKS Toolkit allow (standard and 386 enhanced mode) Windows to run directly from the login: prompt; but they still won't let you run standard/386 enhanced Windows from the shell (if you used login). An updated version of init.exe is available from MKS for users of older versions of the MKS Toolkit.

MKS Toolkit: maximizing DOS session memory

If you run MKS Toolkit by starting up init.exe from config.sys, and then starting the shell from **/etc/inittab**, you will likely find that there isn't much memory available in the DOS (shell) sessions you start from inside Windows.

One way to address this is to start up Windows immediately upon booting, avoiding loading the shell into the valuable DOS low memory. There are at least two ways of doing this cleanly:

- As the last line in your profile.ksh, add the command

  exec c:\\windows\\win.com

  (or whatever the path is to your Windows directory). Using the exec command retains the environment you have set up in your **profile.ksh** and **environ.ksh** files, but overlays the shell memory with Windows, avoiding memory loss.

  Since the startup script executes Windows at the end, make sure that you so not run *sh -L* from Windows, as this would attempt to restart Windows.

- Given that command.com uses much less memory than the shell, you can specify (as the last line in **/etc/inittab**, instead of starting up the shell) the following:

  ms;35;respawn;c:/dos/command.com /c c:\etc\init.bat

  Then, in **/etc/init.bat**, specify all your essential environment variables, and as the last line start up Windows. This method wastest a few kilobytes of low memory compared to hte first one, but allows you run *sh -L* without risk.

MS-SH

The basic problem is the MS-SH swap setting. In Real mode, you will need to use *swap disk.* In Standard mode, you can also use *swap extend,* but you will have to specify at least 200K of XMS memory in the MS-SH .pif file. Alternatively, if you are using Standard or 386 Enhanced mode, you can use *swap ems,* but again you will need to specify at least 200K of EMS memory in your .pif file.

A bug in the current (as of this writing) version of MS-SH prevents swap extend from working in 386 enhanced mode; MS-SH will always crash with a panic error. With Windows 3.1, *swap xms* works as intended, and is the appropriate setting.

Windows Tips, Tricks and Secrets

General

Automatically opening applications on startup, with predefined window positions
93-04-30

You can load applications automatically in two ways:

- By adding them to the Startup group in Windows 3.1 Program Manager. To run start them as icons, check the Run iconized checkbox in the File » Properties dialog for the program.

- By specifying them on the load= or run= line in win.ini. This will load the specified applications, respectively, either with their default window sizes, or as icons.

If you need specific window sizes or positions, you will need to use another utility, either shareware package (such as TopDesk, Layout, Command Post or Aporia) or a commercial one (such as Batchworks, Bridge or NewWave). TopDesk is included in the Windows Resource Kit.

Changing or bypassing the startup logo

To bypass the logo, you can start Windows with the command line such as

```
win :
```

Be warned, however, that some people have had problems with this. Also, skipping the startup logo does not significantly speed up the Windows startup process.

To change the logo to something else, you need to first create a .RLE file (using a graphics utility package), with no more than 16 colours, and not exceeding the VGA 640x480 screen resolution, and no more than 64K in size. Once you have this file, called, say, **mylogo.rle**, enter the following command in your system subdirectory:

```
copy win.cnf/B+vgalogo.lgo/B+mylogo.rle/B win.com
```

If you use CGA or EGA, limit the .RLE file to the appropriate resolution, and replace the **vgalogo** above with **cgalogo** or **egalogo**.

Changing the font used for the icon labels

To use 10-point Arial (substitute your own favorite below), add the following two lines to your *[Desktop]* section of your **win.ini** file:

```
IconTitleFacename=Arial
IconTitleSize=10
```

A shareware Control Panel utility, More Control also gives you control over the icon fonts.

Disabling the network warnings on startup **93-08-15**

Normally Windows will warn you on startup if it is unable to connect to the network you have set up. You can disable this warning by adding the following line to the *[Windows]* section of your **win.ini** file:

NetWarn=0

Limiting the size of the temporary swap file

In Windows 3.1, you can add a line such as

```
MinUserDiskSpace=4096
```

to the *[386Enh]* section of the **system.ini** file to limit the temporary swap file's size. The above line doesn't actually set the size of the swap file, but rather limits its growth to always retain at least 4096 KB (4 MB) of available disk space for your and your applications' own use.

Making Windows 3.x act like 2.x runtime

The Windows 2.x runtime version would start Windows from the DOS prompt, and exit back to DOS when you exit the application.

You can do this as follows (the example is for Excel; others are similar):

- Create a new directory called c:\excel (it doesn't have to be distinct; it could be your normal Excel directory, as long as it's not the main Windows 3.x directory).

- Copy the following to the new directory from the Windows directory:
  win.com
  win.ini
  system.ini

- In the new directory modify the [boot] section of system.ini by changing the shell= line to point to the one and only program you want to run. The original line should read:

  shell=progman.exe

  and the modified line should be something like:

  shell=c:\excel\excel.exe

  Remember to type the complete fileid of the program to be executed, including the .exe suffix.

- To execute the dedicated Windows session just put the new directory ahead of the normal Windows directory in your path and issue the 'win' command, or start Windows with the command 'c:\excel\win'. What we're doing here is making Windows think it's running on a network where the actual executable files etc. are on a network server, and only the basic control files (and win.com) are on the user's local disk.

Note that this technique isolates any changes in win.ini and system.ini made in the dedicated task from any changes made in normal Windows; this may or may not be desirable. If you need to keep the two flavors of Windows in sync you'll have to provide an outboard copy function to refresh the files.

Printing PostScript files without a PostScript printer

To print PostScript files on a printer without PostScript, you'll need to get a third-party PostScript interpreter. One such product is GhostScript, available free from the GNU project. The current version, 2.52, can be found by ftp as */mirrors/msdos/postscript/gs252win.zip* on *wuarchive.*

Search path in Windows

In addition to the standard MS-DOS search path, Windows will also search the Windows and *system* directories. In general, the search order is as follows:

- Current directory on current drive
- Windows directory
- System directory
- MS-DOS search path
- Current directory on network drives

Swapping the Ctrl and CapsLock keys

One method is to use the public domain program **CCSwap**, written by David Michmerhuizen. You can find this as swap10.zip at your favorite FTP site,

Alternately, you may be able to use a different keyboard driver. A good one comes with the distribution of Kermit for Windows, available either from cica or from the official Kermit archive at *watsun.cc.columbia.edu.*

Minimizing Windows disk space usage **93-10-15**

Although Windows 3.1 takes a fairly large amount of disk space when installed, it is possible to pare it down a couple of megabytes in order to run on a system (such as a notebook) with limited hard disk space. You will need to do a normal install first, and then delete all but the bare essentials from the Windows directory.

The following sample setup is for a 386-based notebook with a VGA display; thanks to Simon Tooke <*simon@sco.com*> for coming up with this. Note that the setup does not include File Manager or Print Manager; add them if you expect to need them.

Filename	**Size**
control.exe	15872
control.ini	4124
dosapp.ini	42
main.grp	1516
progman.exe	115312
progman.ini	101
reg.dat	352
system.ini	1759
system/citoh.drv	4720
system/comm.drv	9280
system/commdlg.dll	89248
system/control.inf	20993
system/ddeml.dll	36864
system/dosapp.fon	36656
system/gdi.exe	220800
system/keyboard.drv	7568
system/krnl386.exe	75490
system/lmouse.dll	45792
system/lmouse.drv	14352
system/lvmd.386	9705
system/lzexpand.dll	9936
system/main.cpl	148560
system/shell.dll	41600
system/sound.drv	3440
system/system.drv	2304
system/tty.drv	30496
system/unidrv.dll	119296
system/user.exe	264016
system/ver.dll	9008
system/vga.3gr	16384
system/vga.drv	73200
system/vgafix.fon	5360
system/vgaoem.fon	5168
system/vgasys.fon	7280
system/win386.exe	544789
system/winoa386.mod	49248
win.com	44170
win.ini	3445
Total	**2088246**

VT100 emulation for Windows **93-07-15**

There are two free options available for VT100 emulation: Windows Terminal and WinKermit. Each has its downfalls, and your other option is a commercial terminal emulator, a number of which are described in the *Available WIndows Applications* section of this document.

If you're looking at VT100 emulation over TCP/IP, you might also consider NCSA WinTelnet, which is also free.

Program Manager

Assigning a hotkey to Program Manager **93-06-15**

To assign a hotkey to Program Manager itself, add Program Manager to the Startup group (it will not actually start a second copy), and assign it a hotkey.

Changing the font used for the icon labels **92-09-19**

To use 10-point Arial (substitute your own favorite below), add the following two lines to your *[Desktop]* section of your **win.ini** file:

```
Icontitlefacename=Arial
Icontitlesize=10
```

A shareware Control Panel utility, *More Control* also gives you control over the icon fonts.

Changing the program icon

Choose the item in Program Manager, and then select File Properties. Click on **Icon...**, and then enter the name of the file containing the new icon.

If the icon file is a *.DLL* or *.EXE* containing multiple icons, you can either scroll though the available icons (in Windows 3.1) or cycle through them by clicking **Next Icon** (Windows 3.0). After selecting the correct icon, click **OK**, and then **OK** again. You can also use icons from other programs by the same method: just specify the name of the .exe file instead of an *.ICO* or *.DLL* file.

The icon that is displayed by the application when it is minimized is controlled by the application. It is not normally possible to change that; however, several workarounds exist for changing the icons of running DOS applications.

- Windows 3.1 will display the selected Program Manager icon for each running DOS application.
- In Windows 3.0 you can use the *iinject* or *puticon* utility to replace the standard DOS icon, which is contained in **winoa286.mod** and/or **winoa386.mod**.
- The *IconFixer* utility monitors your DOS applicationsin Windows 3.0, and updates their icons as you minimize them, allowing you to have different icons for different DOS applications.

All three utilities are available from *ftp.cica.indiana.edu.*

Changing the title of the Program Manager window **92-09-28**

In Windows 3.1, you can specify the title of the Program Manager window by adding a Program Manager icon to your Startup group. Windows will not start up a second copy of Program Manager, but will use the title you specify in **File » Properties** for the icon.

Converting documents to PostScript format **93-03-01**

There is a very simple way to convert documents of all types to PostScript format: simply select the PostScript printer driver from the Control Panel, and set the printer connection to FILE: . Then, usign your application, print the file to the PostScript printer, and enter the name of the PostScript output file.

Creating your own icons **92-09-28**

You can create your own custom icons with either *IconDraw* (shareware), *Icon12* (shareware), *Tamr11* (shareware), *SDKPaint* (a part of the Windows SDK) or *Resource Workshop* (a part of Borland C++). Simply draw your icon, and save it as an *.ICO* file.

Creating your own wallpaper

You can save a **.msp** file as a **.bmp** from Windows Paintbrush. You can convert a **.gif** file to a **.bmp** using the gif2bmp utility from *cica*. wingif will also do a good conversion, including dithering 256-color images to 16 colors (rescale before dithering!). A third, and the most flexible, conversion program is PaintShop Pro, which will do color conversions (16M, 32K, 256 and 16 colors), many format conversions, scaling and clipping. Both wingif and PaintShop Pro are shareware, and available at *ftp.cica.indiana.edu.*

A JPEG-format file can also be converted to a wallpaper bitmap by first uncompressing it with the cjpeg/djpeg utility (free, available at *wuarchive.wustl.edu* and other sites) to a **.gif**, and then using one of the utilities above to convert the **.gif** to a **.bmp**.

Previewing PostScript output **93-07-15**

To preview PostScript output on Windows, you can use Ghostview and/or Ghostscript, a free utility from the GNU project. The current version can be found on *ftp.cica.indiana.edu* and other archive sites as *GSxxxWIN.ZIP* where xxx is the version number (which changes frequently).

Restricting the Program Manager **93-01-02**

If you want to prevent a user from changing the Program Manager configuration, you can insert a combination of the following lines into the *[Restrictions]* section of **progman.ini**:

NoRun=1	*Disables the Run command*
NoClose=1	*Disables the Exit Windows command*
NoSaveSettings=1	*Disables the Save Settings command*
NoFileMenu=1	*Removes the File menu*
EditLevel=(see below)	*Sets the edit restriction level*

The following are the *EditLevel* restrictions:

1 *Disables creating,deleting and renaming groups*
2 *As 1, plus disables creation/deletion of program items*
3 *As 2, plus disables changing program item command lines*
4 *As 3, plus disables changing program information*

If you boot directly into Windows (and restart it immediately on exit), don't allow any unrestricted DOS sessions from Program Manager, and make **progman.ini** read-only, you can accomplish a reasonable level of protection from users changing their configuration.

Saving Program Manager settings without exiting Windows 93-03-01

In Windows 3.0, the trick is to try to select **File » Exit** with a DOS sessionactive; Windows will save the settings, and then refuse to exit.

In Windows 3.1, you can press **Alt+Shift+F4** at any time (while you are in Program Manager) to save the settings or hold down the **Shift** key while you double-click Program Manager's close box.

Starting Windows without activating the applications in the Startup group

You can do this by holding down the Shift key when the Windows startup screen appears, and then releasing it once Program Manager is active.

Starting an application in a different directory

To start up a Windows application in a default directory other than the Windows directory (or application executable directory), you have a number of choices:

- In Windows 3.1, set the *Working Directory* under File Properties for the application.

- Create a auto-execute macro for that application, which will change your directory upon startup.

- Specify your application's path in Program Manager as something such as *d:\u\personal\letters\winword.exe.* As long as the application is on your path, it will be started as usual, but with the default directory being the one you specified in Program Manager. Note that Program Manager will complain of this when you enter the path (and may require you to manually select an icon), but it will work.

- Create a dummy document for your application in the desired directory. As long as you have your application listed under *[Extensions]* in your **win.ini** file, starting that document from Program Manager (either with **File » Run** or by adding it as an icon to a group) will then start the application with that document loaded, and in the correct directory.

.

- For Word for Windows 2.0, add the line
  Doc-Path=pathname
  into the *[Microsoft Word 2.0]* section of your **win.ini** file. This will cause Word to start up in the specified directory every time.

Using environment variables **93-06-15**

Program Manager can use environment variables similar to MS-DOS batch files: for example, specifying the program name as %APPS%\my-app.exe will substitute in the value of the APPS environment variable. There is no way, however, of setting the environment variables from within Windows; you will need to set them either before starting Windows or in **winstart.bat** (which is described in the Windows documentation).

Windows accessories

Cardfile: converting to ASCII text **92-09-27**

To convert a cardfile to a text file, use the WinCrd utility, available from *ftp.cica.indiana.edu.*

Clock: Windows 3.1 Clock limitations

The Windows 3.1 clock is limited to one instance (simultaneously running copy) by design, as it retains the position and size you last specified for it. You can, however, run any number of Windows 3.0 clocks that you want in 3.1. As an alternative, you may want to take a look at the TimeFrame freeware program from *ftp.cica.indiana.edu,* which places the current time in the title bar of the active window.

Control Panel: accessing control panels directly **93-06-20**

You can access individual control panels directly by creating an icon in Program Manager (or equivalent) with, for example, the following commandline:

```
control main.cpl network
```

The last parameter should match the spelling of the name of the icon in the usual Control Panel window.

Help: changing the default window size **93-03-01**

To change default size of the WinHelp window, you can change the following lines in the *[Windows Help]* section of your **win.ini** file:

M_WindowPosition=[0,0,640,480,0]

Help: changing the keyword colors **93-07-15**

To change the keyword colors in your Windows help files, you can add some or all of the following lines to the *[Windows Help]* section of your **win.ini** file:

```
JumpColor=0 0 128
PopupColor=128 0 128
IFJumpColor=0 0 192
IFPopupColor=192 0 192
```

The colors are in RGB format; this particular example will set the jump color to dark blue, and the popup color to dark magenta. The IF colors are for interfile jumps and/or popups.

Notepad: F5 and current time

F5 in Windows 3.0 Notepad inserts only a date and not the time as well it's a known bug. And it's fixed in Windows 3.1.

Recorder: recording more than 60 seconds of sound

If you want to record, say, three minutes, follow this procedure:

- Record 60 seconds (Recorder will stop).
- Immediately record *again* for 60 seconds.
- Repeat one more time.
- Drag the scroll bar thumb all the way to the left

With this procedure, you will be able to record 180 seconds of sound. Repeat more times if you need more than 3 minutes of sound.

Terminal: keypad

Press ScrollLock to toggle the keypad between local and remote mode. The default is local mode.

General: Can't open TEMP.WRI (or similar message)

A message similar to this one is likely caused by an invalid definition of the TEMP environment variable in your **autoexec.bat**. Having a trailing space on the definition line can cause various Windows applications to generate invalid temporary filenames similar to the one noted. Correct the problem by making sure there are no trailing blanks.

Changing default directories

Bitmaps **93-04-30**

You cannot move the bitmaps from the Windows directory unless you use a utility program such as BitmapView or PaperBoy. BitmapView is included in the Windows Resource Kit.

Fonts

To move your TrueType fonts to a different directory, follow the procedure outlined below.

The trick is in knowing how Windows finds your truetype fonts. If you have ever done any digging around in your **system** directory, you may have noticed that there is a little (1300 byte) **.fot** file for each of your **.ttf** files that you have installed.

Now, unlike an ATM font which exists in two files, one containing the screen definition, and the other containing the printer definition, a TrueType font has all the information for both in one file (the **.ttf**), so why does the other exist? So far, the exact reason remains a mystery, but the **.fot** file *does* contain the full path to the corresponding **.ttf** file and the **win.ini**'s *[Fonts]* section points to the **.fot** file.

Here are step-by-step instructions for moving the TrueType (and other) fonts:

- First, move your **.ttf** files to where you want then to reside permanently preferably someplace outside the **windows** directory tree for ease of upgrading.
- If these TrueType fonts were previously installed, you will have to create new **.fot** files, so go into the ControlPanel and remove, but don't delete, those TrueType fonts that you had installed (make sure to remove *only* the TrueType fonts!).
- Next, add your TrueType fonts through the Control Panel. Now, before you select any, be sure to *uncheck* the *Copy Fonts to Windows Directory* box. If you leave this checked, the **.fot** files will point to the newly copied **.ttf** files that got relocated into your **system** directory. Highlight the fonts you want, and click **OK**.
- Now just move all the **.fot** files also to another location and then modify the *[Fonts]* section of your **win.ini** file to point to where your **.fot** files are located.

Thanks to Mike Bendtsen <msbendts @ mtu.edu>.

Icons

Yoy may place your fonts in any directory you wish, as long as you update your Program Manager's **File » Properties** dialogs to point to the correct location.

Fonts

Accessing foreign/accented characters **93-03-01**

There are two basic methods for accessing foreign and/or accented characters in Windows. The first is to use the CharMap utility (or equivalent in your word processor: **Insert » Symbol** in Word, **Font » WP Characters** in WordPerfect) to insert the appropriate characters into your text.

If you use a lot if accented characters, though, you may want to select the *English (International)* keyboard in the Control Panel. This makes the backquote, forward quote etc. into "dead" keys: pressing "~" followed by "n" would generate the ñ character. To get the original meaning of the dead keys, you need to press that key and then follow it with a space.

Converting font formats

There are at least two packages available to convert between Type 1 (ATM) and TrueType formats: AllType ($79) and FontMonger ($99). AllType, however, imposes its own copyright on any converted fonts, as well as doing a generally unsatisfactory job of coverting from ATM to TrueType.

Macintosh TrueType fonts are also directly compatable with Windows (you only need to strip off the resource fork from the Mac file).

Converting Macintosh Type 1 (ATM) fonts to Windows

Thanks for this procedure to Norman Walsh, the maintainer of the comp.fonts FAQ.

Converting Macintosh Type1 fonts into PC Type1 fonts can be done using purely free/shareware tools. I've outlined the procedure below. Make sure you read the "readme" files that accompany many fonts. Some font authors specifically deny permission to do cross-platform conversions.

The tools you need:

xbin	*xbin23.zip*	in /pub/msdos/mac on oak.oakland.edu (or other mirrors)
unsit	*unsit30.zip*	in /pub/msdos/mac on oak.oakland.edu
uncpt	*ext-pc.zip*	in /pub/pc/win3/util on ftp.cica.indiana.edu
refont	*refont11.zip*	in /pub/pc/win3/fonts on ftp.cica.indiana.edu
bmap2afm	*bm2af01.zip*	in /pub/norm/mac-font-tools on ibis.cs.umass.edu

xbin converts Mac *BinHex*ed files back into binary format. *BinHex* is the Mac equivalent of uuencoding: it translates files into hexidecimal digits so that mailers can send them around without difficulty. It also aids in cross-platform copying. *BinHex*ed files generally have filenames of the form "xxx.yyy.HQX".

unsit explodes *Stuffit* archives. *Stuffit* archives generally have filenames of the form "xxx.SIT".

uncpt exploces *Compactor* archives. The ext-pc implementation is called *extract* and does not require Windows (even thought it's in the Windows section on cica). *Compactor* archives generally have filenames of the form "xxx.CPT".

refont converts Mac type1 fonts into PC type1 fonts.

bmap2afm constructs AFM files from the metric information contained in Mac screen fonts (.bmap files). The screen font files do not have any standard name (although they frequently have the extension .bmap). The screen fonts have file type "FFIL" which, in combination with some common sense, is usually sufficient to identify them.

It's probably a good idea to check with *archie* for closer sites if you're not in North America. These tools run under MS-DOS. **xbin** and **unsit** can also be run under Unix.

How to do it:

Collect the Mac fonts from the archive or BBS of your choice. Most of these files will be in BinHexed format. As a running example, we'll use the imaginary font "Plugh.cpt.hqx". When you download this font to my PC, you would use the name "PLUGH.CPX". The actual name you use is immaterial.

Run **xbin** on PLUGH.CPX. This will produce PLUGH.DAT, PLUGH.INF, and PLUGH.RSR. The data fork of the Mac file (the .DAT file) is the only one of interest to us, you can delete the others.

If the original file had been "Plugh.sit.hqx", we would be using the **unsit** program. Since we chose a .cpt file for this example, I'm going to run **uncpt.**. Run **uncpt** on PLUGH.DAT. You'll want to extract the AFM file (if present), the documentation or readme file (if present), and the Type1 outline file. The AFM and README files will be in the data fork of the archive file. The Type1 outline will be in the resource fork. The AFM and README files have Mac "TEXT" type. The Type1 outline file has "LWFN" type. Use the docs for **uncpt** and **unsit** as a guide. If you got this far you probably

won't have much difficulty.

If the font does not contain an AFM file, extract the screen font. Screen fonts frequently have the extension .bmap and are "FFIL" type files. Use *Bmap2AFM* to construct an AFM from the screen font. If the archive *does* contain an AFM file, it's safe to bet that the author's AFM will be better than the one created by *Bmap2AFM*.

Finally, run **refont** on the Type1 outline that you extracted above. The result should be an appropriate PC type1 outline. **refont** will create a PFM file for you from the AFM file, if you desire.

Replacing your System font with a serif font **92-11-05**

Thanks to Peter Karrer <pkarrer@bernina.ethz.ch>.

Here's a way to produce your own system font from the MS Serif font (similar to Times Roman) in Windows 3.1. No warranties of course...

If you're using "small" fonts (*fonts.fon=vgasys.fon* in **system.ini**):

Make sure you have VGASYS.FON, 7280 bytes, and SERIFE.FON, 57936 bytes.
Use debug to do the following:

```
C:\WIN\SYSTEM> debug serife.fon
- nmyvgasys.fon
- m15b6 l14b3 100
- rcx
CX E250
:14b3
- w
Writing 014B3 bytes
C:\WIN\SYSTEM> debug vgasys.fon
- nmyvgasys.fon
- l6b6
- rcx
CX 14B3
:1C70
- w
Writing 01C70 bytes
- q
```

In your **system.ini** file, replace *fonts.fon=vgasys.fon* with *fonts.fon=myvgasys.fon*.

If you're using "large" fonts (*fonts.fon=8514sys.fon* in **system.ini**):

Make sure you have 8514SYS.FON, 9280 bytes, and SERIFF.FON, 81728 bytes.
Use debug to do the following:

```
C:\WIN\SYSTEM> debug seriff.fon
- nmy8514sy.fon
- m1b36 l1c20 100
- rcx
CX 3F40
:1c20
- rbx
BX 0001
:0
- w
Writing 01C20 bytes
C:\WIN\SYSTEM> debug 8514sys.fon
- nmy8514sy.fon
- l336
- rcx
CX 1C20
:2440
- w
Writing 02440 bytes
- q
```

In your **system.ini** file, replace *fonts.fon=8514sys.fon* with *fonts.fon=my8514sy.fon.*

ZIP code bar code fonts **92-11-11**

Word Office Productivity Pack (**wopr-20a.zip** and **wopr-20b.zip** on *ftp.cica.indiana.edu* and its mirror sites) will automatically print bar codes on envelopes. The package does require Word for Windows 2.0, though.

Applications

Access: printing a database diagram **93-04-30**

One sample approach to printing a complete database table/relation diagram is included as *Database Analyzer* in the **analyzer.mda** database, which is included in the Access package.

Ami Pro 3.0: getting a menu of special characters **93-07-15**

You can create a menu item which will pop up a dialog with the full Windows character set (similar to Word's *Insert Character)* for selecting special characters by using the **typechar.smm** macro, which is included with Ami Pro 3.0.

DayBook: running on Windows 3.1

The Windows 3.0 doesn't work well after upgrading to Windows 3.1. However, you can get it working and even keep your old datafiles using the following steps:

- Install ToolBook again (run tbksetup) after renaming your old daybook.tbk file.
- Start DayBook with the empty daybook.tbk.
- Open the old daybook file (from windows version 3.0)
- Save it as daybook.tal.
- Exit ToolBook.
- Rename daybook.tal to daybook.tbk.
- Now you can use the old information again under Windows 3.1

Excel: Calling DLL routines **92-12-16**

Excel can call C and/or Fortran routines located in an external DLL. In order to implement such DLLs, you will need the Excel SDK ($49 from Microsoft).

Excel: Doing log-log graphs **92-12-16**

To create a log-log graph, check the *log* checkbox under **Format » Scale** for each of the axis.

Excel: Multiple X-Y graphs on shared X-axis **93-04-30**

To draw multiple graphs on a single sheet, you will need to use the scatter graph, create the first series automatically, then create the second series (which will, by default, use the X values of the first series), and then manually change the X-values of the second series to point to the correct datablock on your worksheet.

Improv: converting hexadecimal numbers **93-10-17**

While Improv will nicely convert hexadecimal strings to numbers as long as there are alphabetic characters in the string, it will produce an ERR value if given a number without alphabetic characters. To correct this, use a formula such as the one below:

```
HexValue = decimal( if ( isstring(Input), Input , string ( Input , 0) ) )
```

Norton Desktop: Wider listbox for Scheduler **92-11-15**

You can change the Scheduler's listbox width by using a resource editor (such as Resource Workshop, included with Borland's latest Windows language products) to resize the list box, move the headings and move the buttons.

If you don't have any programming tools, you are basically out of luck.

Norton Desktop: Using smaller fonts for lists **92-11-15**

Most of the listboxes in NDW use the font size selected in the menus; make sure you select the correct size.

Procomm Plus: Adding fonts **93-11-12**

Procomm Plus for Windows will automatically make available any additional TrueType fonts you have installed in your system. However, you can only use fixed-width fonts, as proportional fonts do not work well in terminal applications. One of the possible commercial font packages to use is Microsofts Font Pack 1, which contains the excellent Lucida Sans Typewriter fixed-width font.

WinQVTNet: Hiding a gateway **92-12-16**

To hide a gateway, specify visible=no under that host in your **qvtnet.rc** file.

Word for Windows: changing bullet paragraph indent 92-12-30

You can do this by creating a macro that creates a bullet, and then linking the bullet button on the toolbar to that macro, rather than to the standard command. The macro should include a call to the ToolsBulletListDefault command, followed by your modified paragraphg formatting commands.

Word for Windows: centering equations **93-04-30**

To create equations that look like this:

$$y = 2 \qquad (1)$$

and

$$x = y + z + \log(w) \qquad (2)$$

you will need to set a Center Tab at the center of your page, and a Right Tab at the right margin. Now press *Tab,* insert your equation, press *Tab* again, and enter your equation number.

Word for Windows 2.0: converting batches of WP files to Word 93-11-13

To cnvert a large number of WordPerfect (for DOS or Windows) files to Word format, open the supplied **newmacro.doc** file, and use the *Batch Conversion* macro to do the job.

Word for Windows 2.0: custom toolbar icons **93-12-21**

To change the icons in the Word for Windows 2.0 toolbar, add the line

LoadToolbarBitmaps=1

in the *[WinWord2.0]* section of your **win.ini** file. When Word starts up, it will look for and load four bitmaps called **v1tbar.bmp**, **v2tbar.bmp**, **v2tbar.bmp** and **v4tbar.bmp**. Each bitmap holds 26 "icons" which of 18 pixels wide and 16 pixels high. If you are using 1024x768 resolution, the bitmaps are **81tbar.bmp**, **82tbar.bmp**, **83tbar.bmp** and **84tbar.bmp**.

You can more easily change these bitmaps using the WOPR utility package (available as shareware).

Word for Windows 6.0 allows you to fully customize any of the multiple toolbars.

Word for Windows: drop caps (large 1st characters of paragraphs) 93-04-30

Creating a drop cap is really quite easy in Word, once you know what you are looking for.

Create the paragraph, select the first character, change it to the font and size you want it to be, and then select **Insert » Frame** to create a frame. The frame will automatically size to the character and align with the top of the paragraph. That's all there is to it!

Word 2.0c includes a macro which performs the above process automatically.

Word for Windows: fonts larger than 127 points **92-11-11**

Since Word for Windows will not allow selection of a pointsize beyond 127, for very large pointsizes the best thing to do is enter the text in WordArt, and then scale the WordArt object to desired size in the Word document.

Word for Windows: foreign-language dictionaries and thesauri 92-12-30

To get a foreign-language spell checker dictionary or thesaurus for Word for Windows, you should contact Alki Software in Seattle, WA (800-669-9673). Available languages include British English, French, German, Italian, Spanish, Portuguese, Swedish, Finnish and more.

Word for Windows: getting rid of the list of last files edited

To empty the list of last files edited before someone else uses your machine, simply remove the file winword.ini from your Word for Windows directory. You may wish to put this in your autoexec.bat file.

Word for Windows: inserting today's date **93-04-30**

Using Word's built-in **Insert » Date and Time...** command will insert a date, but will update it every time you open the document. There are several ways to insert today's date and forcing it not to be updated:

After using **Insert » Date and Time...**, select the date and hit **Ctrl+F11** to lock the field. This will cause it not to be updated until you unlock it.

After using **Insert » Date and Time...**, select the date and hit **Ctrl+F9** to unlink the field. This replaces the field with its contents; you will not be able to update the field again.

Use **Insert » Field...** and inset a **CREATEDATE** (or, depending on your preference, **SAVDATE)** field. This will insert the date the document was created, however, and not necessarily today's date.

Word for Windows: linking in subdocuments **92-11-02**

Word for Windows' Link Document, Include document and Insert Document commands all include the entire text of the subdocument in the main document. If you want to "link" in a document for indexing or a table of contents but not bloat up the main document with all the actual text, use the *RD* (Refer Document) field. It won't print or edit the subdocument from the main document, but it does work for indexing and tables of contents.

Word for Windows: numbering equations **92-12-16**

To number equations in Word for Windows, insert a \seq field and use a sequence name like "Equation" to identify the sequence. For example:

x = 0 ({\seq Equation}

Word for Windows: overlining words **92-09-14**

To overline a phrase in Word for Windows, insert a \eq field and use the \x\to option to draw just the top of the box around the "equation". So, for example, to overline "Bar", you might enter

```
The Foo {\eq \x\to(Bar)} and Grille
```

Word for Windows: printing even and odd pages 93-03-20

The Word Office Productivity Pack (WOPR), a shareware collection, includes tools for printing odd and even pages.

As an alternative, the following macro to print odd and even pages is courtesy of Rob Ryan *(rryan@panix.com).* Use at your own risk and try it on a smallish document first!

```
Sub MAIN
    Dim dlg As DocumentStatistics
    ToolsRepaginateNow
    GetCurValues dlg
    n = Val(dlg.Pages)
    If n < 1 Then End
    For i = 1 To n Step 2
        FilePrint .Range = 3, .From = Str$(i), .To = Str$(i)
    Next
    If(n Mod 2 = 1) Then
        msg$ = "Put all the pages except the last one"
    Else
        msg$ = "Put all the pages"
    End If
    msg$ = msg$ + " back into the printer and press Ok when ready to print."
    If(MsgBox(msg$, "Printing Even Pages", 49) = - 1) Then
        For i = 2 To n Step 2
            FilePrint .Range = 3, .From = Str$(i), .To = Str$(i)
        Next
    End If
End Sub
```

And another alternative, from James Rudnicki and Richard Page *(page@vm.usc.edu):*

```
Sub MAIN
  Begin Dialog UserDialog 300, 154, "Odd/Even Printing"
    Text 48, 8, 234, 48, "Print odd or even numbered pages. The document may be
repaginated
                                    and saved before printing."
    GroupBox 11, 62, 143, 59, "Select Pages"
    OptionGroup   .OddEven
        OptionButton 21, 78, 112, 16, "Odd Pages"
        OptionButton 21, 95, 120, 16, "Even Pages"
    CheckBox 173, 79, 116, 16, "Repaginate", .RePage
    CheckBox 173, 96, 100, 16, "Save File", .SaveFile
    OKButton 10, 127, 88, 21
    CancelButton 110, 127, 88, 21
  End Dialog

  Dim dlg As DocumentStatistics
  GetCurValues dlg
  NUM = Val(dlg.Pages)              'Get number of pages

  Dim NewDlg As UserDialog          'Declare dialog array
  Choice = Dialog(NewDlg)

  Select Case Choice
```

```
    Case - 1                            'OK Button
      If NewDlg.RePage = 1 Then
        ToolsRepaginateNow              'Make sure pagination is correct
      End If
      If NewDlg.SaveFile = 1 Then
        FileSave                        'Save before printing
      End If
      If NewDlg.OddEven = 0 Then
        For cnt = 1 To NUM Step 2
          FilePrint .Range = 3, .From = Str$(cnt), .To = Str$(cnt)
        Next
      Else
        For cnt = 2 To NUM Step 2
          FilePrint .Range = 3, .From = Str$(cnt), .To = Str$(cnt)
        Next
      End If
    Case Else
  End Select

End Sub
```

Word for Windows: removing hard returns on downloaded text 93-01-20

You can easily do this by selecting the text, and running a macro similar to the one below. Note that this will mess up any tables in your input text!

```
Sub MAIN
    EditReplace .Find = "^p^p", .Replace = "#~@", .WholeWord = 0, .MatchCase =
0, .Format = 0, \
                          .ReplaceAll = 1
    EditReplace .Find = "^p", .Replace = " ", .WholeWord = 0, .MatchCase = 0, .Format =
0, \
                         .ReplaceAll = 1
    EditReplace .Find = "#~@", .Replace = "^p^p", .WholeWord = 0, .MatchCase =
0, .Format = 0, \
                         .ReplaceAll = 1
End Sub
```

Word for Windows: setting the find file default directory 92-09-19

Select **Tools » Macro** and edit *FileFind;* it will look something like this:

```
Sub MAIN
    ToolsMacro "FileFind", .Run
End Sub
```

Change it to look like this:

```
Sub MAIN
    On Error Goto STOPHERE      'Needed if user chooses Close

    Dim myfilefind As FileFind    'Define a dialog (same as FileFind dialog)
    GetCurValues myfilefind       'Get any values you may have already set

    myfilefind.SearchPath = "c:\windows"    'Use this type of line to set all the
    myfilefind.Name = "*.*"                   'defaults things your little heart
desires

    Dialog myfilefind               'Display the dialog box on the screen

    STOPHERE:                       'Just a label
End Sub
```

For information on the various things you can tag on to "myfilefind", such as .SearchPath, .Name, etc..., check the on-line help under Word Basic Commands -- FileFind.

Thanks to Paul Brown for the solution!

Word for Windows: turning echo off in a macro **93-01-20**

To turn off echo in a Word for Windows macro (making for a cleaner display and faster running), you need to implement two macros, EchoOn and EchoOff. These macros are fully described in Microsoft's tech note 13-5 (they were based on ones written by Steven Wexler of WexTech Systems), available on *ftp.uu.net* and Compuserve. Beware, though, that if your macro crashes before turning echo back on, you will thoroughly confuse the user!

If you just want to implement the macros, they are included below. Before you jump into it, though, here is Microsoft's warning from the Tech Note:

Use the Echo macro at your own risk. It has performed admirably for us so far with one exception: When you execute a macro defining a bookmark that isn't only an insertion point, the bookmark is not always defined correctly. To remedy the situation, turn echo on just before you issue the bookmark command, and turn it off immediately afterward. We leave it up to the user to explore and find all the ways Echo can be useful or harmful in your macro writing.

To turning echo off, use the following WordBasic line:

```
Echo.EchoOff IniKey$
```

where *IniKey$* is the name of the **win.ini** key used to store a value for turning echo on. This subroutine turns off redraw and saves the position of the scroll box in the vertical scroll bar of the
active window to the **win.ini** file. The information is stored in the *[Microsoft Word Echo]* section of **win.ini**, under the *IniKey$* key string. To turn echo back on, use:

```
Echo.EchoOff IniKey$
```

where *Inikey$* is the same key you used to turn echo off.

The Echo macro contains the following lines:

```
Declare Function SendMessage Lib "user"(hWnd As Integer, \
      wMsg As Integer,wParam As Integer, lParam As Long) As Long
Declare Function GetFocus Lib "user" As Integer
Declare Sub InvalidateRect Lib "user"(hWnd As Integer, \
      lpRect As Long, Bool As Integer)
Declare Sub UpdateWindow Lib "user"(hWnd As Integer)

Sub MAIN
   Echo 1, ""
End Sub

Sub Echo(fOn, IniKey$)
   WM_SETREDRAW = 11
   IniSection$ = "Microsoft Word Echo"
   FocusHandle = GetFocus
   If fOn = 0 Then

      SetProfileString(IniSection$, IniKey$, Str$(VScroll()))
   End If
   dummy = SendMessage(FocusHandle, WM_SETREDRAW, fOn, 0)
```

```
    If fOn Then
        InvalidateRect(FocusHandle, 0, 1)
        UpdateWindow(FocusHandle)
        VScroll Val(GetProfileString$(IniSection$, IniKey$))
    End If
End Sub

Sub EchoOff(IniKey$)
    Echo 0, IniKey$
End Sub

Sub EchoOn(IniKey$)
    Echo 1, IniKey$
End Sub
```

Word for Windows 2.0: using a watermark **93-12-20**

To place a watermark (usually a large a light gray text at an angle behind your normal text), you will need a PostScript printer. If you have such a printer, you can either use the Watermark macro from **newmacro.doc**. Alternately, insert a Print field into the header, containing the following PostScript code:

```
\p page "/Fn {findfont exch scalefont setfont} bind def
0.98 setgray
50 600 moveto
-45 rotate
180 /Helvetica Fn
(DRAFT) show"
```

This puts the word "DRAFT" at a 45 degree angle across the page in very light grey large letters.

Word for Windows supports watermarks for all types of printers autmatically.

Word for Windows: using date formats from [Intl] section in WIN.INI 93-12-11

If you want to make a generalized WordBasic macro which will use the users current date format settings, you should access the *[Intl]* section in the **win.ini** file. The following code fragment (by Sterling Bjorndahl <*bjorndahl@Augustana.ab.ca*> demonstrates this technique.

```
Declare Function GetProfileString Lib "Kernel"(Section$, Key$, Def$, Ret$,\
MaxSize As Integer) As Integer

Sub MAIN
'
Section$ = "Intl"
Def$ = ""
Ret$ = String$(255," ")
MaxSize = 256
'
Key$ = "sLongDate"
ResultLength = GetProfileString(Section$, Key$, Def$, Ret$, MaxSize)
MsgBox Ret$, "Long Date"
'
Key$ = "sShortDate"
ResultLength = GetProfileString(Section$, Key$, Def$, Ret$, MaxSize)
MsgBox Ret$, "Short Date"
'
End Sub
```

WordPerfect for Windows 1.0: changing the background color 92-12-16

WordPerfect does not allow you to set the colors directly (except in Draft mode); to change background color, you will need to change the systemwide default colors in the Control Panel.

WordPerfect for Windows 5.2: changing the button bar **92-07-15**

To get a list of available button bars, click on the current button bar with the right mouse button.

WordPerfect for Windows: decrypting a password-protected file 93-10-11

While WordPerfect Corp. claims that it is not possible to recover password-protected files for which you have forgotten the password, this is in fact quite simple. Obtain the program **wpcrack**, either by searching for it on the Internet (using *archie*) or from your local BBS.

WordPerfect for Windows 5.2: using smart quotes **92-07-15**

To enable ``smart quotes'', run the included macro **smquote.wcm**.

WordPerfect for Windows 5.2: using bullets **92-07-15**

To use bullets, run the included macro **bullet.wcm**; you can change the bullet character by running the macro **bulletdf.wcm**.

Gang screens ("Easter Eggs")

This section describes the ways to display the secret or gang screens, showing the authors of various packages, often with associated fireworks and/or other animation.

Windows 3.0

- Make Program Manager active
- While holding down **F3**, press **W I N 3**. Release **F3**.

Windows 3.1

- Make Program Manager or any desk accessory active
- Select **Help » About**, hold down Shift+Ctrl+Alt, double-click on icon, press **OK**
- Repeat
- Repeat to get the first "gang screen"
- Repeat to get the second "gang screen"
- Repeat to get the third "gang screen"

Ami Pro 2.0

- Select **Help » About**
- Hold down **Shift**, **Ctrl** and **Alt**
- Press **F7**. Type **S P A M**.
- Enter the last and third from last digits from the *Available memory* display.
- Release **Shift**, **Ctrl** and **Alt**

Thanks to Avinoam Shmueli.

Borland (all Windows products) **93-05-10**

- Select **Help » About**
- Hold down **Alt**
- Press **l**.

Thanks to Tim Tschirmer.

Corel Draw! 3.0

- Hold down **Shift** and **Ctrl**
- Select **Help** » **About**
- Continue to hold down **Shift** and **Ctrl**
- Double-click on the balloon at the left side of the dialog.
- Hold down the left (or maybe right?) mouse button to light the burner for the balloon, and make it rise, pulling a banner of developers' names.

Thanks to J.D. Mathew.

Excel 3.0

- Select **Formula » Goto**, enter **iv16384.**
- Use the scroll bars to make this the only cell visible.
- Reduce the row and column widths to zero.
- Double-click on the single remaining button at the top left corner.

Thanks to Aaron Wallace.

Norton Desktop for Windows 2.0

- Select **Help » About**
- Hold down **N**, **D** and **W**
- Double-click on the icon.

Thanks to Mark Scase.

- Hold down **Shift** and **Ctrl**
- Select **Help » About PageMaker**

Procomm Plus for Windows 1.0 **92-12-05**

- Select **Window » Monitor**
- Keep focus on the Monitor window
- Type **GO DATASTORM!**
- Select **Help » About » Credits**

Thanks to Joseph Malloy.

Word for Windows 1.x

- Turn **CapsLock** on
- Select **Format » Define » Styles » Options**
- Select *Normal* for **Based On**
- Press **OK**
- Press **Cancel**
- Select **Help » About**
- Move cursor to inside dialog box, then hold down **O, P, U** and **S** at the same time.

Thanks to Todd Lutz.

Word for Windows 2.0

- Select **Tools** » **Macro**
- Enter *spiff*, press **Edit**
- Delete all lines except for the middle blank line
- Select **File** » **Close**, press **Yes**
- Select **Help** » **About**, double-click on icon

Applications

Windows 2.x Applications

If you run in real mode of Windows 3.0, the old applications behave just like in 2.x, but have somewhat less memory available to them. If the applications are "well-behaved", they may also run in standard and 386 enhanced modes, but Windows will first warn you with a "nag" message that the application wasn't written for Windows 3.x. If you run a ill-behaved application in standard or 386 enhanced mode, the application will likely crash.

If you have a 2.x application that runs well in all modes, you can mark it Windows 3.0-compatible using either the *mark3.exe* or the *nonag.exe* utility. Both are available from *cica*.

Basically, Windows 3.1 will no longer run Windows 2.0 applications.

Troubleshooting

Access: version 1.1 upgrade **93-07-15**

The upgrade from Access 1.0 to 1.1 is free to all registered users (except for shipping costs). The upgrade packages (accp.zip) is also available on Windows FTP sites such as *cica* and on Compuserve.

AllType: converted TrueType fonts not in same family 92-09-15

When AllType converts a, say, PostScript Type 1 font into TrueType, it does not maintain the connection between the Regular, Bold, Italic and Bold Italic fonts in the same family. Thus, if you have a font called Franciano and select bold in your word processor, you will get a synthesized bold version, not Franciano Bold.

To correct this, you might try a shareware utility called **renamett**, which allows you to specify the family of the font.

Ami Pro 3.0: can't read Word 2.0 or WordPerfect 5.2 files **93-08-12**

Ami Pro 3.0 has some problems reading some Word for Windows 2.0 and WordPerfect for Windows 5.2 files. This is corrected in version 3.01, which is available free by ftp, or for the cost of shipping and handling from Lotus.

Ami Pro: mixed landscape/portrait document eats system resources 93-04-30

You may experience problems with a mixed landscape/portrait-mode document consuming all available system resources. This is caused by a bug in an early version of the **pscript.drv** PostScript driver. This problem is corrected by getting a new copy of the PostScript driver, with version 3.53 or later.

Ami Pro: table of contents

If your page numbers in the Table of Contents are all 1, you have likely generated the TOC twice without making any changes. To work around this bug, make a trivial change to your document, and regenerate the table of contents.

Ami Pro 2.0: divide by zero error

If Ami Pro crashes with a Divide by Zero error in Windows 3.1, check the version number in the About... box. If your version is earlier than 306, contact Lotus for a free upgrade to 306, which is fully compatible with Windows 3.1.

Ami Pro 3.0: equation handling problems **93-04-30**

The Ami Pro equation handling may occasionally cause your equation to disappear beyond the end of the line after aligning the equation with tabs. In addition, trying to delete an equation that has "disappeared" may caused a corrupted document and/or a throrough crash in Ami Pro. The only known workaround is to use only spaces, not tabs, to align equations if there is any chance that the equation might extend beyond the right margin..

Ami Pro 3.0: overlapped screen text

On some configurations, selecting a block of text and then starting to type over it will not erase the existing text first before placing the new characters on it, resulting in a corrupted screen display.

As a workaround, you may choose to either use draft mode or to turn off full justification.

A fix diskette for this problem is available by calling Lotus technical support.

Ami Pro 2.0: printing with incorrect fonts **93-04-30**

If you are getting incorrect fonts when printing from Ami Pro, the most likely cause is the font substitution table contained within the Ami Pro .ini file. You should inspect this table and remove entries that are not required.

Ami Pro 3.0: slow printing

If you are suffering from slow printing with Ami Pro 3.0, try the following steps to improve the printing speed:

- Disable Print manager in the Windows Control Panel
- Disable Background Printing in Ami Pro's Tools: User Setup: Options.

Ami Pro 3.0: unable to load Word or WordPerfect files **93-10-12**

If your version of Ami Pro is unable to load files produced by recent versions of Word for Windows (2.0c) or WordPerfect (5.2), you need to obtain an upgrade to 3.0.1, available fro Lotus at nominal cost.

Corel Draw! 3.0: can't rotate bitmaps **92-12-30**

If you attempt to rotate a bitmap (such as a **.bmp**, **.gif** ot **.tif** file), Corel Draw! will only display a gray rectangle. This affects only the display, however, and the rotated graphics should print correctly.

Corel Draw! 4.0: can't install from CD-ROM **93-07-15**

If you have a CD-ROM drive as your drive D:, Corel Draw! 4.0 may refuse to install because it needs 60K of free space on drive D:. If you get this problem, make sure you have your TMP and TEMP environment variables set and correctly pointing to your temporary directory. If you still can't install, create a small (<256K) RAMdisk in your config.sys as D: for the installation process; you can remove it once the installation is complete.

Excel 4.0: out of memory loading a workbook **93-12-05**

Excel has a problem loading in large workbooks; to avoid this problem, limit your workbooks to about 15 worksheets and/or graphs. This limitation is reputed to be corrected in Excel 5.0.

FrameMaker: scrambled dot-matrix output **92-09-14**

FrameMaker will produce correct output only if the output device has square pixels; that is, your printer must have the same horizontal and vertical resolution. A 144 horizontal by 192 vertical resolution will produce scrambled output. Unfortunately, the only choices are to use your printer in a "square-pixel" resolution, or to switch to a printer with such a resolution (most laser printers have square pixels).

KA9Q: dropped packets **92-09-14**

In order to run properly within Windows 3.x *and* not drop packets, you need to do two things:

- Start KA9Q with the -w option
- After starting KA9Q, start winpkt

Norton Desktop for Windows: can't format in the background

While Windows is limited by DOS in some of its multitasking capabilities (such as disk i/o), it can format floppies in the background (File Manager does it!). NDW arbitrarily refuses to let you do anything else while formatting it's a design feature!

Personally, I only buy preformatted diskettes!

Norton Desktop for Windows: crashes from selecting files 92-12-16

Norton Desktop, both versions 1.0 and 2.0, tends to crash if you select multiple files and try to drag them to several places on the screen. No fix is currently available.

Mathematica 2.0 for Windows: problems with Windows 3.1, other problems

Mathematica 2.0 does not work well with Windows 3.1. It also has a host of other problems which exhibit themselves even under Windows 3.0.

The cure is to upgrade to Mathematica 2.1; the upgrade cost is US$ 50.

Mathematica 2.1 for Windows: crashing problems **93-07-15**

Mathematica 2.1 still suffers from a variety of problems, most of them memory-related. Most problems become infrequent if you upgrade your system to 16 MB or 32 MB.

No fix is currently available.

NCSA Telnet [in DOS session]: crashes in a window 92-12-30

The standard Telnet does not work well in a DOS session inside Windows 3.1's 386 Enhanced mode. There are three possible workarounds:

- Load the packet driver inside the DOS session, not before entering Windows
- Use WinPkt (available free by ftp) instead of the standard packet driver
- Use PktMux 1.1 (available free by ftp) instead of the standard packet driver

PageMaker 4.0: font selection box won't scroll **92-09-21**

This is a known problem. The workaround to use, if you have more fonts than will fit in the selection box, is to press **Ctrl+T** to change the text attributes (and thus the font).

PageMaker 4.0: text color changes to almost invisible 92-09-26

this problems stems from an incompatability between PageMaker and Windows 3.1 video drivers. Although no fix is currently available, you can work around the problem by switching between PageMaker and the other "color intensive" application (which changes the colors) with **Alt+Tab** instead of minimizing one and then restoring PageMaker. If the colors have already been munged, start up **command.com** full-screen, exit it, and then maximize PageMaker again to restore the colors.

PageMaker 4.0: WordPerfect and Word for Windows import

As shipped, PageMaker 4.0's import filters do not support WordPerfect 5.1 for Windows (although WordPerfect 5.1 for DOS is OK), or Word for Windows 2.0. If you cannot locate the import filters at an ftp site or CompuServe, contact Aldus for free updates.

Paradox for Windows: dialog boxes can't be killed **93-04-30**

The initial release of Paradox for Windows does not provide any method for unconditionally dismissing a modal dialog box. If your dialog box code has a bug (not allowing you to close the dialog) you will need to reboot your system in order to close Paradox. No workaround (other than avoiding modal forms completely) is currently available.

Pathway Access 1.x: terminal font

If in your 10x16 terminal font the uppercase 'K' and lowercase 'k' appear identical, contact Wollongong for an update to a corrected terminal font.

PC Tools 7.1: restore problems

PC Tools 7.1 does not check backups for data integrity while restoring, thus possibly restoring corrupt data due to media errors on the disks. This is not a bug, but a deficiency in PC Tools, and is unlikely to be corrected prior to the release of the next version.

PC Tools also sometimes corrupts the last disk while doing a restore. Once the last disk has been read, you should immediately remove it from the drive.

Procomm Plus for Windows: Pasted text has extra CR/LFs 93-04-25

Prcomm assumes that it needs to add a return/linefeed to the end of every pasted line. If you are pasting from an unformatted text file, this is probably not the case. As a workaround, you can use the macro below:

```
; VIPASTE.WAS v 1.00   Paste function for Unix hosts
;*************************************************************************
;*                                                                       *
;* VIPASTE.WAS                                                           *
;* Copyright (C) 1992 Datastorm Technologies, Inc.                       *
;* All rights reserved.                                                  *
;*                                                                       *
;* Purpose:   Pastes the current contents of the Windows Clipboard       *
;*            to the terminal screen, stripping Line Feed characters.    *
;*            This is especially useful on Unix system.                  *
;*                                                                       *
;* This ASPECT SCRIPT is intended only as a sample of ASPECT             *
;* programming.   DATASTORM makes no warranty of any kind, express or    *
;* implied, including without limitation, any warranties of mer-         *
;* chantability and/or fitness for a particular purpose.   Use of        *
;* this program is at your own risk.                                     *
;*                                                                       *
;* Author:   Chuck Spohr                                                 *
;*                                                                       *
;*************************************************************************

proc main
   integer LFSetting

   cliptofile TEXT "\CLIPBRD.TMP"    ; Capture clipboard text to a file
   fetch ascii upld_lf LFSetting     ; Store current value before change
   set ascii upld_lf STRIP           ; Set Linefeed Strip option
   sendfile ascii "\CLIPBRD.TMP"     ; ASCII upload the file

   delfile "\CLIPBRD.TMP"            ; Clean up

   switch LFSetting                  ; Reset Line Feed traslation based
      case 0                         ; on previously stored value
         set ascii upld_lf STRIP
      endcase
      case 1
         set ascii upld_lf CR_LF
      endcase
      case 2
         set ascii upld_lf LF
      endcase
   endswitch
endproc
```

Procomm Plus for Windows: Zmodem transfer startup

If you initiate a Zmodem transfer from Procomm, the other end of the link may or may not automatically detect the start of a transfer, depending on the software at that end; it's not dependent on Procomm. Specifically, the sz/rz software on Unix does not start Zmodem transfers automatically.

Quattro Pro for Windows 1.0: Accessing drive D: **93-10-11**

The initial version of QPW insists on accessing all your drives (including CD-ROMs) when it starts up. This problem is corrected in the newer version 5.0.

Quattro Pro for Windows 1.0: Cut and paste to other applications 93-04-25

The intitial release of Quattro Pro only supports a few graphics formats for clipboard cut and paste, and does not include WPG (WordPerfect Graphics) or WMF (Windows MetaFile) support. Thus WordPerfect for Windows 1.0 will not be able to paste Quattro's graphics.

Quattro Pro for Windows: High resource requirements 92-12-16

Quattro Pro always uses a large amount of Windows' available system resources, and if you do heavy graphics, you can exhaust all available resources, making it necessary to restart Windows.

This is apparently due to Borland's use of the OWL libraries, and no fix is yet available.

Quattro Pro for Windows: Numeric format alignment 93-04-25

Quattro Pro does not correctly align non-decimal numbers formatted with the Comma or Decimal formats, leaving a space for the non-existent decimal point. No fix is yet available.

Quattro Pro for Windows: OLE and DDE problems **92-12-21**

Quattro Pro's OLE and DDE functionality is acknowledged to be buggy; however, no fix is yet available.

Quattro Pro for Windows: Saving over foreign formats **92-12-30**

If you open a foreign format (such as Excel or 1-2-3) spreadsheet, make some changes, and select **File » Save**, Quattro Pro' will delete the original document prior to telling you it can't save it.

No fix is yet available.

Quicken for Windows: conflicts with communications software

If Quicken produces a General Protection Fault on startup when you have a communications package already running, it is likely trying to get at the serial port (which is already in use).

To correct this problem, select **Edit » Preferences » Electronic Payment**, and disable all the bank accounts. Click OK, and exit Quicken. If this does not cure the problem, select **Edit » Preferences » Modem Settings**, and set Quicken to use a different serial port than your communications package.

If you actually want to use the electronic payment feature of Quicken, you will not be able to run it at the same time as a communications package.

Ventura Publisher 3.0: divide by zero errors **92-09-19**

Ventura Publisher 3.0 may get frequent divide by zero errors when used with Windows 3.1. These appear to be related to non-Microsoft TrueType fonts, which Ventura is unable to use reliably (the TrueType fonts from CorelDraw also cause problems). You may wish to remove either all or selected non-Microsoft TrueType fonts from your system to prevent the Ventura errors.

Ventura Publisher will also refuse to run with a display driver which uses more than 256 colors.

WinFax Pro 2.0 **92-09-19**

If you are having difficulty sending faxes with WinFax Pro, check the date of the file **mod.exe**; if it is 1-16-92 16:51, 62,976 bytes , you should get a replacement from Delrina (call cuatomer support at (800) 268-6082).

Word for Windows: accessing fonts

Word for Windows shows in its font menu the fonts currently available for the selected *output* device, not the *display* device. You can still use, say, vector fonts that you installed, by typing the name of the font in the edit box. Windows will draw vector fonts on the output device without problems you may or may not like the results. Screen fonts are also useable for printing on dot-matrix printers. These problems do not occur with TrueType fonts in Windows 3.1, as they are available both on the printer and on the display.

After you have installed new fonts (TrueType, ATM or any others), you need to force Word for Windows to refresh its output device font list. The easiest way to do this is to do **File » Printer » Setup**, click **Setup**, then click **OK**, and finally **OK** again.

Word for Windows 2.0: can't install additional components

If Word for Windows won't install additional components (such as the thesaurus or spellchecker) because it claims Word is not yet installed, check your **win.ini** file, and make sure that under *[Microsoft Word 2.0],* you have the line *ProgramDir=C:\WINWORD* (or whatever your Word for Windows directory name is).

Word for Windows 2.0: can't print envelopes **93-08-06**

Word for Windows has a bug which prevents you from printing envelopes if **Tools » Options » Print » Reverse Order Printing** is turned on. One workaround is to insert the envelope into your document (instead of printing directly) and then print just the single page from the document. You can also automate the turning off of reverse printing by using this macro written by John Steele, *jcs@ibmpcug.co.uk:*

```
Sub MAIN
Dim dlg As ToolsOptionsPrint
GetCurValues dlg
Rev = dlg.Reverse
ToolsOptionsPrint .Reverse = 0
Redim dlg As ToolsCreateEnvelope
GetCurValues dlg
Dialog dlg
Super ToolsCreateEnvelope dlg
ToolsOptionsPrint .Reverse = Rev
End Sub
```

Word for Windows 2.0: equation editor fonts

If Word for Windows complains about missing MT Extra or MT Fences fonts, but they are installed in the control panel, you will need to reinstall them (this most commonly happens if you upgrade to Windows 3.1 after installing Word for Windows). This is easiest done by using Word's Setup program to remove Equation Editor, removing the MT Extra and MT Fences fonts with *Control Panel,* and then reinstalling the Equation Editor.

This bug most frequently occurs if your printer port is set to FILE: when installing Word for Windows.

Word for Windows 2.0: equations have too much white space 92-09-27

If you're using superscipts or subscripts in your equation, there will likely be too much whitespace above the equation. If you check the character format, the equation will be subscripted by a *large* number, such as 40 points. You can manually reset the subscript amount; however, the subscript will be set again when you print, if you have *Update Fields* checked under **File » Print » Options**.

You can also use the following macro (written by Harvey Cohen, *hsc@honet6.attcom*) to correct the spacing of all the equations in your document:

```
Sub MAIN
StartOfDocument
ViewFieldCodes 1
EditFindClearFormatting
EditReplaceChar .Font = "", .Points = "", .Bold = - 1, .Italic = - 1,
        .Strikeout = - 1, .Hidden = - 1, .SmallCaps = - 1,
        .AllCaps = - 1, .Underline = - 1, .Color = - 1,
        .Position = "0pt", .Spacing = ""
EditReplace .Find = "^19EMBED EQUATION ", .Replace = "^m",
        .WholeWord = 1, .MatchCase = 1, .Format = 1, .ReplaceAll = 1
ViewFieldCodes 0
End Sub
```

This problem is corrected in Word for Windows 2.0b.

Word for Windows 2.0: file too big to save **92-11-09**

This appears to be an oocasional problem with versions 2.0 and 2.0a, although most users never experience it, even when working with large documents.

Some of the workarounds that have been reported to work for some users are:

Select the entire document and paste it into another document
Select a non-PostScript printer and save
Save the document as RTF
Turn off Fast Save

Word for Windows 2.0: headers and graphics

If you have problems with disappearing headers or footers, or with displayable graphics not printing, call Microsoft customer support for an upgrade to version 2.0a.

Word for Windows 2.0: mixed landscape/portrait document eats system resources
93-04-30

You may experience problems with a mixed landscape/portrait-mode document consuming all available system resources. This is caused by a bug in an early version of the **pscript.drv** PostScript driver. This problem is corrected by getting a new copy of the PostScript driver, with version 3.53 or later.

Word for Windows 2.0b: printing from Print Preview

If you install the macros in **pss.doc** (included with Word 2.0b), you will no longer be able to print from the Print Preview window. The following are two workarounds provided by Ron Apland <apland@mala.bc.ca>:

Select **Tools » Macro » Edit** *FilePrint,* erase the existing macro and insert the following:

```
Sub MAIN
    Dim dlg As FilePrint
    GetCurValues dlg
    Dialog dlg
    Super FilePrint dlg
EndSub
```

This will get you back to the original print macro.

Select **Tools » Macro » Edit** *FilePrint,* and insert the following immediately after Sub MAIN:

```
chkpv = FilePrintPreview()
If chkpv <> 0 Then
  Dim dlg As FilePrint
  GetCurValues dlg
  Dialog dlg
  Super FilePrint dlg
  Goto Bye
EndIf
```

This will run the original print macro if and only if you are using Print Preview.

WordPerfect for Windows: mixed landscape/portrait document eats resources
93-04-30

You may experience problems with a mixed landscape/portrait-mode document consuming all available system resources. This is caused by a bug in an early version of the **pscript.drv** PostScript driver. This problem is corrected by getting a new copy of the PostScript driver, with version 3.53 or later.

WordPerfect for Windows 1.0: floppy access

If WordPerfect for Windows refuses to access your A: drive, add the line

```
HighFloppyReads=0
```

in the *[386Enhanced]* section of your **system.ini** file.

WordPerfect for Windows 1.0: button bar won't display

If WordPerfect for Windows won't display your button bar despite selecting it from the menus, make sure it is looking in the right directory. Select **Macros » Keyboards » Button Bars**, and make sure the directory is set to your macros subdirectory.

WordPerfect for Windows 1.0: crashes with 256-color display driver 92-09-21

WordPerfect for Windows may crash (with a UAE or GPF) when used with a display driver capable of using more than 16 colors, or when used with ATI's Crystal Fonts driver. To correct this problem, contact WordPerfect technical support, and request a copy of the interim release. Once you have the interim release, start it with the /fl option to avoid crashes.

WordPerfect for Windows 5.2: incorrect table of contents 93-04-30

WordPerfect for Windows 5.2 (and possibly also 1.0) may produce an incorrect table of contents for your document. If this happens, try removing any conditional end-of-pages and block protects. This problem will apparently not be corrected until version 6.0.

WordPerfect for Windows 1.0: mixing landscape and portrait pages

WordPerfect for Windows will not allow you to mix landscape and portrait pages in a single document if you are using a Windows printer driver. This is a known limitation and not classified as a bug.

WordPerfect for Windows 1.0: printing with TrueType

WordPerfect for Windows will correctly print documents containing TrueType fonts only if one of the following is true:

- You are using a Windows-based printer driver, not a WordPerfect one.
- You are using a TrueImage printer, with a WordPerfect driver which supports TrueType.

Available Windows 3.x applications

The following sections list some of the applications available for Windows 3.x While it does not attempt to be a comprehensive list, it does attempt to list the most popular commercial software packages and some selected shareware. This is *not* intended to be a review, but, rather, an overview of available titles. You should perform your own evaluation to determine the software best suited to your needs.

All prices listed are U.S. list prices at time of compilation, and cannot guaranteed to be correct.

If the application is available on another platform at better or at least substantially the same level of development, a code indicating that is shown in the header.

[Mac]	Macintosh
[Sun]	Sun OpenLook
[Motif]	Motif
[NeXT]	NeXTSTEP
[PM]	OS/2 Presentation Manager

See the Windows Programming Tools FAQ for a description of available development tools.

Mainstream productivity applications

Desktop publishing **93-07-15**

- **ArcheType Designer**
  Archetype. A full-featured package for relatively short commercial material such as ads and brochures. List $ 795.

- **Express Page**
  Carberry Technology. An front end for PageMaker for doing quick layout designs and draft versions. List $ 195.

- **FrameMaker for Windows [Sun] [Motif] [Mac] [NeXT]**
  Frame. A high-end integrated word processing and desktop publishing package. List $ 795.

- **FrameView**
  Myoung-Jun Kim. An alpha version of a frame-base DTP package with drawing capabilities. Free.

- **Microsoft Publisher**
  Microsoft. An easy-to-use package with an extensive feature set but missing high-end capabilties. List $ 199.

- **PageMaker for Windows [Mac]**
  Aldus. A full-featured high-end package; with the recent update, the user interface once again seems fairly modern. List $ 795.

- **PagePlus for Windows**
  Serif. A low-price packaged with a wide variety of high-end features, such as OLE and irregular word wrap. No color separation capability. List $ 59 (PagePlus), $ 99 (PagePlus and 100+ TrueType fonts).

- **Publish It!**
  Timeworks. A feature-rich basic package. List $ 199.

- **QuarkXPress for Windows [Mac]**
  Quark. A high-end package with precise layout and positioning and powerful color handling. List $ 895.

- **Ventura Publisher, Windows Edition**
  Xerox. A full-featured high-end package, ported from the original GEM-based version. List $ 795.

Integrated sofware **92-10-03**

- **CA-Simply Business**
  Computer Associates. Accounting, word processing, 3-D spreadsheet, project scheduling and graphics. List $ 567.

- **Eight-In-One for Windows**
  Spinnaker. Word processor, spreadsheet, database, communications and graphics. List $ 59.

- **PFS: WindowWorks**
  Spinnaker. Word processor, spreadsheet, database, communications and graphics. List $ 149.

- **Microsoft Works for Windows [Mac]**
  Microsoft. Word processor, spreadsheet, database, communications and graphics. List $ 199.

- **Microsoft Works for Windows, Multimedia Edition**
  Microsoft. Word processor, spreadsheet, database, communications and graphics. Multimedia tutorial; available on CD-ROM only. List $ 199.

Three other available packages, Microsoft Office, Lotus SmartSuite and Borland/WordPerfect Office, consist of bundled individual applications from the respective vendors, and are not integrated systems in the traditional sense.

Spreadsheets **93-09-30**

- **CA-Compete!**
  Computer Associates. A multidimensional spreadsheet, aimed at financial analysis, with an Excel 4.0-based user interface. More conventional than Improv, but still an excellent data analysis tool. List $ 495.

- **Excel for Windows 5.0 [Mac] [Sun]**
  Microsoft. A full-featured high-end spreadsheet with OLE2 support, strong analysis and macro language features. List $ 495.

- **I Hate Algebra**
  T/Maker. A basic spreadsheet intended for rudimentary financial activities such as tracking accounts, cash flow and expenses. List $ 39.

- **Improv for Windows [NeXT]**
  Lotus. An unconventional (maybe even revolutionary) spreadsheet designed for multidimensional models using English-like formulas. List $ 495.

- **Lotus 1-2-3 for Windows [Mac] [PM]**
  Lotus. A high-end spreadsheet with extensive 3D and full 1-2-3 Classic compatability. Suffers from poor performance compared to Excel and Quattro Pro. List $ 495.

- **Quattro Pro for Windows**
  Borland. A high-end spreadsheet with a low-end price. Has a notebook 3D idiom, and features and performance rival Excel. List $ 99.

- **Quattro Pro for Windows, Workgroup Edition**
  Borland. A version of Quattro Pro with advanced workgrouping features. List $ 495.

- **Thinx**
  Bell Atlantic. Not really a spreadsheet, but an application allowing you to build data and links between objects. List $ 495.

- **WingZ [Mac] [PM]**
  Informix. Originally an innovative and highly graphical midrange spreadsheet, now somewhat out of date. List $ 499.

Word processing **94-02-22**

- **Amí Pro 3.0**
  Lotus. A full-featured high-end package with desktop publishing features. Ami Pro 3.0 matches Word for Windows 2.0 in power and features, but the current version is a bit outdated compared to Word 6. List $ 495.

- **CA-Textor**
  Computer Associates. A low-end word processor with OLE, tables and English/French spell checker. List $ 99.

- **DeScribe [PM]**
  DeScribe. A midrange word processor strong on page layout, but overall not in the class of Ami Pro and Word for Windows. List $ 495.

- **Easy Working**
  Spinnaker. An easy-to-use package intended for light use such as memos, letters, faxes and to-do lists. Includes mail-merge. List $ 50.

- **FrameMaker for Windows [Mac] [Motif] [Sun] [NeXT]**
  Frame. A high-end integrated word processing and desktop publishing package. List $ 795.

- **JPW**
  ?. A Japanese-language word processor. Free.

- **JustWrite [Mac]**
  Symantec. An easy-to-use midrange package. No OLE support. List $ 249.

- **Legacy**
  WordStar. A frame-oriented high-end package. Catching up (including a BASIC-like macro language), but not yet a match for Ami Pro or Word. List $ 495.

- **Lotus Write**
  Lotus. A low-end easy-to-use package, previously sold as Samna Ami and then Lotus Ami. Has SmartIcons and OLE, and includes ATM. List $ 199.

- **Professional Write Plus**
  SPC. A mid-range package with an E-mail interface. List $ 249.

- **Scientific Word**
  TCI. A Windows front end to TeX/LaTeX. While this is an admirable attempt to combine the user-friendliness of Windows with the capabilities of TeX, the GUI front end falls far short of making it easy to take advantage of the power of TeX. List $ 395.

- **Signature**
  XYQuest. The Windows-based successor to XYWrite (which was commonly used by numerous magazine professionals). Fully featured with a customizable toolbar. List $ 495.

- **WinText**
  Palsoft. A lightweight executive word processor. List $ 195.

- **WiziWord**
  Microsystems Engineering. A heavy-duty word processor aimed at technical

documentation. Includes a technical drawing editor and supports HPGL and Tektronix graphics. List $ 595.

- **Word for Windows [Mac] [Sun]**
  Microsoft. A full-featured high-end package aimed more at writing than at desktop publishing. Includes OLE2 support and WordPerfect command emulation. List $ 495.

- **WordPerfect for Windows [Mac] [Sun] [Motif] [PM]**
  WordPerfect. A full-featured high-end package. Includes all WordPerfect printer drivers and a choice of CUA or WordPerfect user interface. Latest version is feature-laden but has some performance problems. List $ 495.

- **WordStar for Windows**
  WordStar. A midrange package originally based on Ami (unlike the NBI Legend-based Wordstar Legacy), with strong graphics and frame manipulation. Has OLE and DDE support but no macros. List $ 119.

Word processing utilities **93-10-17**

- **Correct Grammar**
  Writing Tools Group. Corrects grammar and analyzes writing styles from any Windows application. List $ 119.

- **Dorland's Medical Dictionary**
  Dorland. A specialized medical dictionary for most Windows-based word processors. List $ 99.

- **DVIWindo**
  Y&Y. A TeX previewer for Windows. List $ 175.

- **Funk and Wagnalls Standard Desk Dictionary**
  Inductel. A dictionary with secretarial handbook, gazette and abbreviation directory. List $ 79.

- **Ghostview for Windows**
  Russell Lang. A full-featured document viewer using Ghostscript. Free.

- **Grammatik Windows**
  Reference Software. Grammar and style checker and analyzer for Word, WordPerfect and Ami Pro. List $ 99.

- **MathType**
  Design Science. An excellent equation editor for Windows. List $ 249.

- **OmniSpell**
  Caere. An extended spell checker with a 100,000 word main dictionary and specialized medical and legal dictionaries. List $ 100.

- **QuoteMaster Plus**
  Que. A quote database oriented towards speeches and business documents. List $ 99.

- **Refs**
  Tim Cutts. An academic reference database manager with a friendly face. Registration £ 30 (approx. $ 45).

- **RightWriter**
  Que. A grammar and style checker for Windows. List $ 99.

- **Spell checker & thesaurus**
  Alki. Foreign language spell checkers and thesauri for Word for Windows: Danish, Dutch, Finnish, German, Italian, Portuguese, Swedish and Spanish. List $? each.

- **WinRefer**
  Simon Dobson. A reference management and searching utility, including refer, Medline and ISI format compatability. Free.

- **WOPR**
  Pinecliffe International. An extensive set of utilities for Word for Windows, including a toolbar bitmap editor. Registration $ 49.

- **WParse**
  Willem Bison. A WordPerfect file parser/decoder/disassembler. Free.

- **Word for Windows Cross-Reference Assistance**
  John Steele. Automates and eases cross-referencing in Word for Windows. Registration $ 10.

- **Word for Windows UK spelling dictionary and thesaurus**
  Microsoft. A British spelling dictionary and thesaurus is available from Microsoft for Canadian Word for Windows users. Free.

Information management

Databases, non-programmable **93-09-20**

- **AceFile for Windows**
  Ace. An easy-to-use database with a very good user interface and excellent reporting capabilities but mediocre database functionality. List $ 199.

- **Approach for Windows**
  Lotus. A simple database with strong database functions but serious limitations for programming. List $ 399.

- **DataEase for Windows**
  DataEase. A capable low-end database with a flashy user interface, suffering from bugs and a lack of comprehensive import facilities. List $ 395.

- **FileMaker Pro [Mac]**
  Claris. A well-designed port of the Macintosh FileMaker, offering good scripting and layout capabilities, but weak multifile features. List $ 399.

- **Instant Database**
  Asymetrix. A clever but fairly limited database based on the Toolbook. List $ 95.

- **Key Database Plus**
  SoftKey. A template-based database manager with extensive graphics support. List $ 59.

- **PrimaBase**
  SPCS. A low-end database with sophisticated multifile handling an reporting, but character-oriented user interface. List $ 349.

- **Q+E Database Editor**
  Q+E. An innovative interface for accessing xBASE, DB2, Btrieve, Microsoft SQL and other databases. List $ 299.

- **Windows Filer**
  Palsoft. A fairly basic package; includes xBASE file compatability. List $ 195.

- **Wyndfields for Windows**
  Wyndware. A basic database with menu-based quick record access. List $ 99.

Databases, programmable **94-02-22**

- **Access**
  Microsoft. A highly visually oriented full-featured database with strong GUI features, including OLE fields, Visual Basic-like programming and visual database construction. SQL and ODBC support. List $ 695.

- **CA-dBFast for Windows**
  Computer Associates. A fast and powerful xBase compatible database; allows for either quick-and-dirty xBase ports or full-blown Windows applications. List $ 550.

- **DB Vista III**
  Raima. A network (not relational) database.

- **dBase for Windows**
  Borland. Announced, but not expected to be shipping until 1Q94. Feature set not well known.

- **FoxPro for Windows [Mac] [Unix]**
  Microsoft. A Windows rewrite of FoxPro, with many Windows-specific features. Fast and powerful, using the xBase programming language. List $ 495.

- **Paradox for Windows**
  Borland. Announced, but not shipping. A new Windows version of the venerable Paradox for DOS. Many GUI features and an object-based programming language, but programs are not compatible with the DOS version. List $ 795.

- **Personal Access**
  Spinnaker. An easy-to-use programmable database using a HyperCard-like metaphor. Includes access to dBase, Paradox, Btrieve and Oracle databases, List $ 695.

- **Progress [Sun] [Motif] [PM]**
  Progress Software. A Windows version of the powerful Progress 4GL, which runs on DOS, OS/2, VMS, AS/400, and dozens of different Unix versions. Version 6.3 provides limited access to Windows interface; version 7.0, due in early 1994, will access a fuller feature set. List $ 1175. Runtime licence $ 225.

- **Quadbase-SQL/Win**
  Quadbase. A multiuser ANSI SQL Level 2-based database. Includes a DLL for Visual Basic integration. List $ 795.

- **Superbase**
  SPC. A graphical database package with some user interface oddities and problems, but with solid programming and graphics support. List $ 795.

- **WindowBase**
  SPI. A fairly easy-to-use package with midrange features and application development tools. List $ 299.

Form processing and management **93-09-20**

- **BeyondMail Forms Designer**
  Beyond. A BeyondMail-based forms package for designing and routing forms data through email. List $ 395.

- **Business Forms**
  Wizardworks. A standalone printed form designer. List $ 39.

- **EZ-Form Master**
  EZX. An extensible midrange forms processing system. List $ 189.

- **FormFlow**
  Delrina. An email-based forms package designed to route form data through workgroups. List $ 399 (Manager), $ 150 (User).

- **FormMaster**
  Information Integration. A printed form design and production package. List $ 119.

- **Forms**
  Prisma. A forms processing package with 150 templates included. List $ 89.

- **FormsWorx for Windows**
  Spinnaker. Forms design, entry and processing with xBASE compatability. List $ 150.

- **InForms**
  WordPerfect. A forms management package with links to a variety of databases, such as dBase, FoxPro and Paradox. List $ 495.

- **JetForm-Design**
  JetForm. Online forms design and processing with customizable toolbar, OLE, xBASE and Paradox support. Optional email capability. List $ 495. Runtime (JetForm-Filler) $ 129.

- **Key FormDesigner Plus**
  SoftKey Software Products. Forms design and processing with graphics and barcode support. List $ 39.

- **PerForm Pro Plus**
  Delrina. A leading forms management package with multiple database and OO programming capability. List $ 399.

- **WindForm**
  Ibis. Form design and processing application with scanner support. List $ 99.

- **Windows Form Maker**
  Cosmi. A basic forms processing package with the essentials included. List $ 39.

Project management **93-09-20**

- **Artemis Prestige for Windows**
  Lucas Management Systems. A high-end project management package with minicomputer database connectivity. List $ 4,995.

- **CA-SuperProject for Windows**
  Computer Associates. A midrange rewrite of the venerable DOS-based package. Includes access capability for C and Visual Basic. List $ 895.

- **CADENCE ProjectMaster**
  CADENCE. A low-end package with task/responsibility linking. List $ 295.

- **ManagePro for WIndows**
  Avantos Performance Systems. A crossover between a PIM and a project manager, with strength in group goal tracking. List $ 395.

- **Micro Planner for Windows**
  Micro Planning International. A middle-of-the-pack system with good multiple project handling. List $ 595.

- **Microsoft Project for Windows [Mac]**
  Microsoft. A midrange package with excellent user interfce but less emphasis on advanced scheduling. List $ 695.

- **Milestones, Etc.**
  KIDASA. A low-end package oriented toward graphical scheduling. List $ 189.

- **OnTarget**
  Symantec. A low-end package aimed at non-technical project managers. List $ 129.

- **PARISS Enterprise**
  Computer Aided Management. A midrange package with excellent user interfce but less emphasis on advanced scheduling. $ 695.

- **Project Director**
  AdRem. List $?.

- **Scitor Project Scheduler**
  Scitor. List $?.

- **Texim Project for Windows**
  Welcom Software Technology. A high-end project management package with high ease-of-use and risk, cost and resource management capabilities. List $ 1,295 (single user), $ 4,775 (5 user).

Graphics and illustration

Databases, image

- **MultimediaBase**
  Harley. List $?.

- **MediaOrganizer**
  Lenel. List $?.

- **ProFile for Windows**
  IEV. List $ 295.

- **ShoeBox for Windows**
  Kodak. Announced, due to ship 4Q92. List $ 295.

Charting (flow and organizational) **93-01-02**

- **ABC Flowcharter**
  Roykore. A dedicated flowcharting package. List $ 295.

- **Chartist**
  Novagraph. A diagramming and flowcharting package. Registration $?.

- **Instant ORGcharting!**
  Roykore. A dedicated organizational charting package. List $ 295.

- **Org Plus for Windows**
  Banner Blue Software. A specialized package for creating organizational charts. List $?.

- **RFFlow**
  RFF Electronics. A drawing package for flowcharts, organizational charts, and data flow diagrams. List $ 129.

- **Visio**
  ShapeWare. A drawing package specialized in diagrams and flowcharts, with OLE2 support and user-modifiable master patterns. List $ 299.

Drawing and illustration **93-01-02**

- **Arts & Letters Graphics Editor**
  Computer Support. A fairly easy-to-use high-end package. List $ 695.

- **Arts & Letters Apprentice**
  Computer Support. A stripped-down version of A&L. List $ 125.

- **Autodesk 3D Concepts**
  Autodesk. A 3D surface modeling package. Reads Generic CADD and DXF files. List $ 249.

- **CorelDRAW!**
  Corel. The market leader in high-end drawing and illustration software, with extensive set of graphics and image manipulation tools. Available on CD-ROM. List $ 595.

- **Freehand**
  Aldus. A high-end drawing and illustration package. List $ 595.

- **Graphics Works**
  Micrografx. A semi-integrated package containing Windows Draw, PhotoMagic, OrgChart and clip art and photo collections. List $ 199.

- **Harvard Draw for Windows**
  SPC. A high-end drawing package. List $ 595.

- **Micrografx Designer**
  Micrografx. A high-end package oriented towards technical illustration. List $ 695.

- **Microsoft Draw**
  Microsoft. A very basic package with OLE. Included with Word for Windows.

- **Professional Draw**
  Gold Disk. A powerful high-end drawing package. List $ 595.

- **Smart Draw for Windows**
  The Other Operation. A 2-D CAD package for Windows. List $ 99.

- **VentanaDraw**
  Micrografx. A low-end drawing package. List $ 149.

- **Visio**
  ShapeWare. A drawing package specialized in diagrams and flowcharts, with OLE2 support and user-modifiable master patterns. List $ 299.

- **Windows Draw**
  Micrografx. A low-end package with many high-end features, OLE and TrueType fonts. List $ 149.

- **XVT Draw [Mac] [Sun] [Motif] [PM]**
  XVT. A shareware package with very basic features. Registration $?.

Graphics conversion **93-04-12**

- **DoDOT**
  Halcyon. Extensive file conversions and full-color editing. List $ 189..

- **Graphics Workshop for Windows**
  Alchemy Mindworks. An image conversion and manipulation utility with an extensive feature set. Registration $ 40.

- **HiJaak for Windows**
  Inset. A screen capture (for Windows and DOS) and conversion utility. List $ 199.

- **Image-In Paint and Scan**
  Image-In. A grayscale painting and image processing package. List $ 99.

- **PaintShop Pro**
  JASC. A shareware package with extensive capture, file conversion and color manipulation features. Registration $ 49.
- **pixFolio**
  ?. A shareware image converter and cataloger. Registration $?.

Image viewers **94-02-12**

- **ColorView, ColorView/386**
  Millenium Technologies. A shareware package with both GIF and JPEG support. Version 0.97 is quite fast but somewhat buggy. Registration $ 30.

- **Ghostscript for Windows**
  L. Peter Deutsch. EPS (Encapsulated PostScript) viewer with a minimal user interface. Free.

- **Ghostview for Windows**
  Russell Lang. A full-featured document viewer using Ghostscript. Free.

- **JView, JView/386**
  David Holliday. A fairly fast JPEG-only viewer. Free.

- **PaintShop Pro**
  JASC. A shareware package with 24-bit color and good dithering; now including JPEG support and considerable image manipulation capabilities. Registration $ 49.

- **pixFolio**
  ?. A shareware image converter and cataloger. Registration $?.

- **ThumbsUp**
  Cerious. Graphic image viewer and manager with wide format support. Registration $ 50.

- **WinGIF**
  A GIF viewer, but with no JPEG support. Registration $?.

- **WinJPEG**
  A Windows JPEG viewer. Registration $?.

Painting and image editing **94-02-12**

- **CA-Cricket Image**
  Computer Associates. A 24-bit image processing and conversion package. List $ 92 until 93-01-31, regularly $ 295.

- **CA-Cricket Paint**
  Computer Associates. A 24-bit painting and image editing package. List $ 92 until 93-01-31, regularly $ 595.

- **CorelDRAW!**
  Corel. The market leader in high-end drawing and illustration software, with extensive set of graphics and image manipulation tools. Available on CD-ROM. List $ 595.

- **DoDOT**
  Halcyon. Extensive file conversions and full-color editing. List $ 189..

- **Fractal Design Painter**
  Fractal Design. Fully-featured package oriented towards original image creation. List $ 399.

- **Graphics Works**
  Micrografx. A semi-integrated package containing Windows Draw, PhotoMagic, OrgChart and clip art and photo collections. List $ 199.

- **Image-In Color**
  Image-In. A 24-bit image processing and retouching package. List $ 495.

- **Image-In Paint and Scan**
  Image-In. A grayscale painting and image processing package. List $ 99.

- **Image Pals**
  Image-In. A 24-bit image processing and management package, with JPEG support. List $ 249.

- **PhotoFinish**
  ZSoft. A low-end image manipulation package, with good MDI interface, 24-bit color and JPEG support. List $ 199.

- **PhotoMagic**
  Micrografx. A low-end 24-bit color image manipulation package, with JPEG support. List $ 149.

- **PaintShop Pro**
  JASC. A shareware package with 24-bit color and good dithering; now including JPEG support and considerable image manipulation capabilities. Registration $ 49.

- **Picture Publisher**
  Micrografx. A powerful image manipulation package. List $ 795.

- **Publishers' Paintbrush**
  Zsoft. Extensive 24-bit painting and image manipulation capabilities. List $ 495.

Presentation and business graphics **93-04-12**

- **3-D Charts To Go!**
  BLOC. An easy-to-use (but fairly basic) charting package. List $ 99.

- **Action!**
  Macromedia. A top quality presentation package with excellent tools and output quality, but no 24-bit color support. List $ 495.

- **Arts & Letters Graphic Composer**
  Computer Support Corp. A full-featured presentation package with 24-bit support. List $ 395.

- **Charisma**
  Micrografx. A high-end charting and business graphics package. List $ 495.

- **DeltaGraph Professional**
  Deltapoint. A scientific/business graphics package List $?.

- **Freelance for Windows**
  Lotus. A fully featured charting and business graphics package. List $ 495.

- **Harvard Graphics for Windows**
  SPC. A full-featured Windows-based rewrite of the venerable Harvard Graphics for DOS. List $?.

- **Hollywood**
  Claris. A high-end presentation package, previously marketed by IBM. List $ 499.

- **Origin**
  MicroCal. A technically oriented presentation package with graph layers. Suitable for scientific graphics. List $ 495.

- **Persuasion**
  Aldus. A high-end package capable of output to 35mm slides and other transparencies. List $ 495.

- **Pixie**
  Zenographics. A midrange business graphics package. List $ 295.

- **Powerpoint [Mac]**
  Microsoft. A full-featured presentation software package. List $ 495.

- **Stanford Graphics for Windows**
  3-D Visions. A presentation software package with many technical features, but not enough for serious scientic graphs. With extensive 3D graphics and other powerful features, but will make a 486/33 seem slow. List $ 495.

Technical and Scientific Plotting **94-02-12**

- **DeltaGraph Professional**
  Deltapoint. A scientific/business graphics package List $?.

- **FGraph**
  Marc Felisky. A fairly basic (but high performance) scientific plotting package. Registration $?.

- **GNUplot for Windows**
  The GNU Project. A command-line driven plotting package, also available on a wide variety of other platforms. Free.

- **Graphicon**
  Cygron. A function visualizer with numerical calculus and optimization capabilities. Limited version available free via ftp. List $ 300.

- **Origin**
  MicroCal. A technically oriented presentation package with graph layers. Suitable for scientific graphics. List $ 495.

- **SigmaPlot**
  ?. A scientific plotting package. List $?.

- **Spyglass Slicer and Spyglass Transform**
  Spyglass. Two high-end data analysis tools for Windows NT, with extensive graphics and transformation capabilities. List $ 595 (Transform) and $ 695 (Slicer).

Personal information and finance management

Financial Management

- **Balance Point**
  Moon Valley. A personal finance manager with portfolio management, but a poor user interface design. List $ 59.

- **Microsoft Money**
  Microsoft. An easy-to-use personal financial management package, fairly comparable to Quicken but missing portfolio management. List $ 69.

- **Quicken for Windows [Mac]**
  Intuit. The benchmark for personal finance manager software. Compatible with the ubiquitous Quicken for DOS. List $ 69.

- **WinCheck**
  Wilson WindowWare. A nicely designed shareware package, but without portfolio management. Registration $ 69.

Personal Information Managers **94-02-12**

- **Active Life**
  1Soft. A PIM aimed at scheduling and to-do lists. Evaluation copies are available from *cica* and other sites. List $ 149.

- **Address**
  GIR Software. An easy-to-use WYSIWYG PIM with address management, dialing, rolodex and more. Registration $ 25.

- **Ascend**
  NewQuest Technologies. A high-end PIM with to-do lists, dialer, scheduling and information management. List $ 299.

- **BusinessCards for Windows**
  Michael Dvorkin. A simple Cardfile-like information manager. Registration $?.

- **Commence**
  Jensen-Jones. A high-end forms-based personal information manager, from the developers of IBM Current. Has a very flexible network-type database, but requires substantial initial effort to set up. Includes DDE and agents (macro trigger events). List $ 295 (single user), $ 695 (3 user workgroup).

- **Desktop Set**
  Okna. Calendar, rolodex, dialer, to-do list, etc. List $ 89.

- **Desktop Set Jr.**
  Okna. A freely distributable older version of the Desktop Set. Free.

- **Epoch**
  Raindrop Software. Scheduler and to-do list. List $ 129.

- **KeepTrack**
  Prisma Software. Easy-to use lightweight cardfile. List $ 29.

- **ManagePro for WIndows**
  Avantos Performance Systems. A crossover between a PIM and a project manager, with strength in group goal tracking. List $ 395.

- **Lotus Organizer**
  Lotus. A low-priced PIM with extensive features. Uses Day-Timer paradigm for organizing information. List $ 149.

- **PackRat**
  Polaris. A high-end PIM with agenda, phonebook, to-do list, financial management, project tracking, etc. Network version available. List $ 395.

- **Pinboard**
  Raindrop Software. Post-It notes for Windows. List $ 129.

- **Pin-Up**
  Post-It notes for Windows. Registration $ 20..

- **ShoeBox for Windows**
  R+R Associates. A high-end PIM with group scheduling, project and expense tracking,

calendar and to-do lists. List $ 395.

- **WinPost**
  Eastern Mountain Software. An excellent shareware package for managing Post-It notes on the Windows desktop. Registration $ 30.

- **Xtimelog**
  George Fredericks. Activity and time tracking for billing and project management. Registration $ 49.

- **YourWay**
  Prisma Software. Time and contact management. List $ 199.

Communications and networking

Networking and groupware

Groupware **92-09-20**

- **1Team**
  1Soft. A networked PIM aimed at scheduling and to-do lists, with a very similar user interface to Active Life. Evaluation copies are available from *cica* and other sites. List $ 295 (2-user), $ 99 (additional users).

- **Network Scheduler 3.0**
  PowerCore. Network-based group scheduler. List $ 395 (5-user), $ 1,195 (25-user).

- **Lotus Notes**
  Lotus. Integrated information sharing using networks. List $ 62,500 (200-user).

- **NOTE-IT**
  Chord. A network-based system of using Post-It notes. List $ 249 (unlimited).

- **PackRat for Networks**
  Polaris. A version of PackRat for networks, with group scheduling, and document and information sharing. List $ 695 (3 users).

- **Pinboard**
  Raindrop Software. Post-It notes for Windows. List $ 399 (unlimited).

Internet news and mail readers/utilities **94-02-15**

- **Cinetic Mail Manager**
  ?. A Windows-based mail reader for reading your Unix mailbox through NFS. Registration $?.

- **CyberDesk**
  CyberCorp. A Windows-based interface to mail, news and ftp. Uses a modem and a standard Unix shell account to access Internet services without requiring you to have TCP/IP software on the Windows PC. List $ 179.

- **Helldiver**
  ?. A Windows newsreader based on Waffle. Registration $?.

- **Mail-It**
  UniPalm. A Windows mail program. List $?.

- **NetMinder**
  IMI Research. An Internet mail address manager and database. Registration $ 45.

- **Umail**
  Marcus Ranum. A Windows-based Unix mail manager; manages your mail files through NFS, FTP or serial line. Available by *ftp* at *decuac.dec.com* in directory pub/dos. Free.

- **UniQWK**
  A mail reader capable of including .WAV and .BMP files, and with an extensive set of useability features. Registration $ 30.

- **WinBiff**
  Paul Steckler. A mail notification utility for use with UUPC, Waffle, FSUUCP, Pegasus and PC-NFS. Suggested registration $ 10.

- **WinQVTnet**
  QPC Software. NNTP and SLIP support. Uses non-standard .newsrc files. Registration $?.

- **WinNews**
  ?. A WinSock-based newsreader for Windows NT. Registration ?.

- **WinVN**
  Mark Riordan. Available at *ftp.cica.indiana.edu.* NNTP, SLIP and serial support. Free.

- **WRN**
  Frank van der Hulst. NNTP-based newsreader, inspired by *xrn*. Free.

Internet access utilities **94-02-12**

- **HGopher**
  Martyn Hampson. A WinSock-based gopher client. Free.

- **HTTPS**
  EMWAC. Multithreaded World Wide Web (WWW) server for Windows NT. Free.

- **NCSA Mosaic**
  Chris Wilson and Neil Mittelhauser. A WinSock-based Mosaic implementation (WWW client). Free.

TCP/IP Networking **92-12-01**

- **Chameleon TCP/IP**
  NetManage. Telnet, FTP, printing and email. List $ 400.

- **Distinct TCP/IP**
  Distinct. VT100-based Telnet, a TCP/IP file manager and a TCP/IP backup utility. List $ 395.

- **Pathway Access**
  Wollongong. Telnet, FTP, printing and optional NFS. List $ 495 (?).

- **Super-TCP**
  Frontier Technologies. Telnet, FTP, printing and email. List $ 495.

X Window servers **93-08-06**

- **eXcursion**
  DEC. List $?.

- **FrameworX**
  IDE. Includes TCP/IP. List $ 545.

- **eXodus for Windows**

- **HCL-eXceed/W**
  Hummingbird Communications. X11R4 support; does not include TCP/IP. List $ 595.

- **PC-Xvision for Windows**
  Spectragraphics. X11R4 support; does not include TCP/IP. List $ 449.

- **Unipal X Server**
  UniPalm. X11R3 support; does not include TCP/IP. List $ 495.

- **XVision**
  UniPress Software. X11R4 support. List $ 449.

Communications and terminal emulation

Communications (ASCII)

- **Crosstalk for Windows**
  DCA. A totally revised high-end package with VT320, Zmodem and LAN support. List $ 195.

- **Dynacomm**
  FutureSoft. VT340 and Zmodem support. List $ 249.

- **EM320 Windows**
  Diversified Computer Systems. VT320 emulation, Kermit. List $ 229.

- **KEAterm 420**
  KEA Systems. VT420 and SuperKermit over TCP/IP, Pathworks, LAT and Int14. List $ 245.

- **MasterComm**
  MicroPlot Systems. VT220, Tek4010, Tek4014, Kermit, XModem support. Connect through modem, DECNET, Novell, 3Com or TCP/IP. List $ 95.

- **MicroCourier**
  Microcom. List $ 99.

- **MicroPhone II for Windows [Mac]**
  Software Ventures. VT102, Zmodem and Novell support. List $ 195.

- **Mirror**
  SoftKlone. VT320 and Tektronix emulation with Zmodem, CIS-B and Kermit protocols. List $ 195.

- **Procomm Plus for Windows**
  Datastorm. Numerous emulations (including VT320) and protocols (including Zmodem) and an advanced (if somewhat non-standard) user interface. List $ 139.

- **Reflection 1 for Windows**
  Walker Richer & Quinn. HP2392A and HP700/92 emulation. List $ 399.

- **Reflection 2 for Windows**
  Walker Richer & Quinn. VT320, Kermit, Xmodem. List $ 299.

- **Teemtalk 320W**
  Pericom Software. VT320, HP2392A, DG200 emulation. Kermit, XModem, YModem protocols. List $ 195.

- **Terminal Plus**
  FutureSoft. An advanced version of Windows Terminal, usign a similar user interface, with VT220 and Zmodem. List $ 99.

- **Unicom**
  Registration $?.

- **WinQVT**
  Registration $?.

- **WinTerm**

Marketfield Software Development. VT220 over TCP/IP, NetBIOS, LAT, Int14 and others. List $ 279.

Communications (IBM mainframe) **92-12-01**

- **Dynacomm Elite**
  FutureSoft. 3270 emulation through a variety of connections. List $ 495.

- **Extra!**
  Attachmate. 3270 emulation through coax, TIC or LAN. List $ 425.

- **IRMA WorkStation**
  DCA. 3270 emulation through a variety of connections, and also including asynchronous terminal emulation. List $ 495.

- **LinkUp 3270 UniSession**
  Computer Logics. 3270 emulation and more. List $ 295.

- **Rumba**
  Wonderware. 3270 emulation with extensive GUI customization. List $ 495.

Facsimile **94-03-15**

- **Bitfax for Windows**
  Bit Software. List $ 79.

- **Bitfax/OCR for Windows**
  Bit Software. With OCR support for converting faxes into text. List $ 199.

- **Eclipse FAX**
  Eclipse. A fax printer driver with thumbnails, OCR support and good speed. List $ 129 (with OCR), $ 99 (without OCR).

- **EZ-FAX for Windows**
  Calculus. A fax printer driver. List $ 499.

- **FAXability**
  Intel. A fax printer driver. List $ 119.

- **FAXability/OCR**
  Intel. A fax printer driver with character recognition. List $ 249.

- **FaxFiler/FaxCapture**
  Extended Systems. A network fax management system. List $ 695 / $ 495.

- **FAXit for Windows**
  SofNet. A fax printer driver. List $ 119.

- **FaxMaster**
  Caere. A fax printer driver with scanning and scheduling capabilities. List $ 149.

- **FaxMaster Server**
  Caere. A network fax server for FaxMaster. List $ 695.

- **FaxView for Windows**
  Black Ice Software. With color fax support. List $ 179.

- **FaxPress 3.0**
  Castelle. Network fax service with a Windows client interface. List $ 3,495.

- **Imara Lite**
  Imara Research. A hierarchical document manager and fax processor. List $ 295.

- **LanFax Redirector**
  Alcom. Client/server based network fax. List $ 995.

- **ShareFax for Windows**
  SofNet. Network fax for any Windows-compatible network. List $149 (2-user).

- **SuperFax for Windows**
  Pacific Image Communications. List $ 99.

- **WinFax Pro**
  Delrina. An advanced version of WinFax Lite (supplied with many fax cards); the fax device appears to Windows as a printer. Version 4.0 includes OCR and advanced fax management features. List $ 119.

- **Carbon Copy**
  Microcom. Control the applications, files and peripherals of a Windows system remotely from another one. List $ 199.

Fonts

Font packages **93-01-02**

- **Agfa Desktop Styles**
  Agfa. 39 TrueType text and display faces. List $ 79.

- **Agfa Type Jamboree**
  Agfa. 46 TrueType text and symbol faces. List $ 99.

- **Bitstream TrueType Font Pack 1**
  Bitstream. 40 TrueType text and display faces. List $ 79.

- **Bitstream TrueType Font Pack 2**
  Bitstream. 20 TrueType text and display faces. List $ 39.

- **Blue Sky Research Outline Fonts**
  Y&Y. The full set of Computer Modern fonts in Type 1 format. List $ 345.

- **Fluent Laser Fonts Library**
  Casady & Greene. 120 text and display faces. List $ 179.

- **Font Value Pack**
  QualiType. 150 faces plus 1500 icons. List $ 99.

- **infiniType Plus**
  SoftMaker. 124 typefaces from URW and Graphitech font foundries, included in both TrueType and Type 1 formats. List $ 99.

- **Microsoft TrueType Font Pack**
  Microsoft. Lucida Bright, Lucida Sans (? fonts total). List $ 49.

- **Monotype PostScript Value Pack**
  Monotype. 57 Type 1 text and display faces, including Baskerville, Book Antiqua, Bookman, Calisto, Century Gothic and Century Schoolbook. List $ 89.

- **Monotype Presentation FontPack**
  Monotype. TrueType versions of Albertus, Gill Sans Bold Extra Condensed and Swing Bold. List $ 19.

- **Monotype TrueType Value Pack**
  Monotype. 57 TrueType text and display faces, including Baskerville, Book Antiqua, Bookman, Calisto, Century Gothic and Century Schoolbook. List $ 89.

- **QualiType Fonts**
  QualiType. 135 TrueType fonts plus 1500 icons. List $ 99.

- **Optifonts**
  Castcraft Software. 400 TrueType text and display faces on CD-ROM. List $ 996.

- **SuperType Master Library**
  QualiType. 150 TrueType faces plus 1500 icons. List $ 99.

- **Top Fonts**
  EIQ Engineering. 93 TrueType text and display faces. List $ 199.

- **TrueType Font Pack for Windows**

Upgrade Systems. 600 TrueType text and display faces. List $ 129.

- **TypeCase**
  SWFTE International. 131 TrueType text and display faces. List $ 69.

Individual font packages are also available for varying prices from companies such as Adobe, Bitstream, Monotype and Image Club. Some software, such as CorelDRAW! and Windows Draw also include bundled TrueType fonts.

Font managers **92-12-01**

- **Adobe Type Manager [Mac]**
  Adobe. A scalable font manager; supports Adobe Type 1. List $ 99.

- **Bitstream FaceLift**
  Bitstream. A scalable font manager; supports Speedo, TrueType and Adobe Type 1. List $ 99.

- **Incubator for Windows**
  Type Solutions. A scalable font manager with special effects. List $ 149.

- **Publisher's Powerpak for Windows**
  Atech. A scalable font manager. List $ 79.

- **WorldFont**
  Data-Cal. A scalable font manager with international language support. List $ 149.

Font utilities **93-01-02**

- **AllType**
  Atech. Typeface conversion utility; supports Type 1, Type 3, TrueType and Speedo. Has some problems in conversions, and no hinting List $ 79.

- **FontMinder**
  Ares. Manages fonts by allowing you to activate and deactivate sets of fonts. List $ 79.

- **EZ Effects**
  Filmotype. Slants, condenses and rotates TrueType fonts. List $ 129.

- **FontMonger for Windows [Mac]**
  Ares. Typeface editing and conversion utility; supports Type 1, Type 3 and TrueType. Has automatic hinting only. List $ 129.

- **Fontographer for Windows [Mac]**
  Typeface editing utility; supports Type 1 and TrueType. Has automatic hinting only. List $?.

- **MoreFonts**
  MicroLogic. A font manipulation and modification package. List $ 129.

- **SoftType**
  ZSoft. A scalable and printer font generation and manipulation package. List $ 199.

- **TrueType Font Installer**
  Kai Kaltenbach. Preview, print samples and install TrueType fonts. Registration: a science fiction book.

Utilities and fonts

Disk and file utilities

Archiving utilies **93-04-12**

- **CCI Zip**
  A Windows-based shell for PKZIP. Registration $?.

- **SHEZ**
  A Windows-based shell for PKZIP. Registration $?.

- **WinZip**
  Nico Mak. An integrated Zip/Unzip utility; does not require PKUNZIP. Also handles ARC and LZH archives. Registration $ 29.

- **WizUnzip**
  An integrated Unzip utility; does not require PKUNZIP. Registration $?.

- **WUNA**
  An integrated archiving utility, which handles .zip, .arj, .lzh and .arc formats. Registration $?.

Backup software **93-04-12**

- **Back-It**
  Gazelle. Automatic and unattended backups to tape and floppies. Supports a wide variety of tape drives, including QIC-02 and SCSI units. List $ 149.

- **Central Point Back-Up**
  Central Point Software. A popular backup utility, albeit with limited tape drive support. List $ 99.

- **Distinct Back-Up**
  Distinct. Background backups using tool bars. List $ 129.

- **Norton Desktop for Windows**
  Symantec. Program manager, file manager, file recovery, backup. List $ 179.
- **PC Tools**
  Central Point Software. Some Windows tools and a Windows-based backup. Supports some SCSI tape drives. List $ 179.
- **SitBack**
  AitBack Technologies. Automated backups (with LAN support) to any DOS storage device. List $ 139.

Program launchers and desktops

Program Manager type **92-11-30**

- **Folders**
  Sloop Software. Program Manager add-on providing nested folders. Registration $ 20.

- **hDC Windows Express**
  hDC. An enhancement to the Program Manager. List $ 99.

- **Plug-In**
  Plannet Crafters. A Program Manager extension providing group management, custom group icons, QuickRun menu and other enhancements. Registration $ 20.

- **Program Manager Groups**
  Andreas Furrer. A Program Manager add-on utility providing hierarchical groups. Free.

- **SloopMan**
  ?. A program manager replacement with groups-within-groups. Registration $?.

File Manager type **94-02-15**

- **File Clip**
  Software Creations. A streamlined but effective File Manager replacement. Registration $ 20.

- **File Shuttle XPress**
  GetC Software. File Manager features, networking and LapLink-like file transfer. List $ 140.

- **Metz File F/X**
  Metz Software. File manager, file find, undelete, text search and task manager. List $ 129.

- **Salvation**
  Vitesse. Complete file management and viewing, with program launching and tool bars. List $ 125.

- **X-Tree for Windows**
  X-Tree. A Windows version of the venerable DOS-based XTree, with a good feature set but a rather slow implementation. List $ 99.

Integrated desktops **94-02-22**

- **NewWave**
  Hewlett-Packard. An excellent object-oriented environment that goes far beyond OLE and Norton Desktop. List $ 195.

- **Norton Desktop for Windows**
  Symantec. Program manager, file manager, file recovery and backup in an integrated object-oriented environment. List $ 179.

- **PubTech File Organizer**
  Publishing Technologies. An integrated environment with file and program management. List $ 199.

- **Sparta**
  Karl Thoroddsen. A Macintosh-style file manager/shell with hierarchical folders, drag-and-drop, file links, network support and a dustbin. Shareware.

- **WinTools**
  Tools Technology. An object-oriented shell with file and program management. List $ 149.

- **Workspace**
  ARK Interface. Program manager, file manager, file recovery, backup. List $ 179.

Icon docks/tool bars **93-10-17**

- **AppBar**
  Geert van Kempen. NeXT-style button bar: with trash can. Free.

- **Application Pad**
  Cjin Lee. A button bar with a clendar, clock, "eyes", screen saver. Registration $ 15.

- **hDC Power Launcher**
  hDC. Floating icon bars and an enhanced command line. List $ 99.

- **Next**
  NeXT-style button bar. Registration $?.

- **QUICK**
  Mohammed Kabir. A floating icon dock with task scheduling and macros. Registration $?.

- **Route 1**
  D.A. Karp. NeXT-style button bar: Visual Basic-based. Registration $ 14.

- **WinDock**
  Brian Capson. The class of the NeXT-style button bars: clean and easy to use. Registration $ 15.

Commandline utilities **94-02-22**

- **4win**
  A 4DOS-like shell for Windows; can start both DOS and Windows applications. Registration $?.

- **PShell**
  A somewhat Unix-like shell for Windows. Registration $?.

- **TSH**
  Troy Rollo. A command shell for Windows with a blend of Unix and DOS characteristics. Free.

- **WCL**
  Abimbola Olowofoyeku. A command shell for Windows with support for DOS internal commands, many extras and the ability to run both DOS and Windows applications. Can act as the Windows shell. Registration $?.

- **WCommand**
  A command shell for Windows. Registration $?.

Other program launchers **93-08-13**

- **BackMenu**
  A minimalist approach to desktops: right-click on desktop to get a hierarchical pop-up menu. Registration $?.

- **Command Post**
  Wilson WindowWare. A command-line oriented shell. List $ 49.

- **Dashboard**
  Hewlett-Packard. Multiple views of application configurations. List $ 99.

- **DropDesk**
  Scott Bender. Drag files from the File Manager to the desktop to run them. Free.

- **Dropper**
  Freely arrangeable buttons on the desktop. Registration $?.

- **Finder**
  A Macintosh Finder-type desktop. Registration $?.

- **GDesk**
  Right-click or left-clickon desktop to get configurable pop-up menus of available applications. Minimalist along the lines of Usher. Free.

- **Rooms**
  Xerox. Organize your applications into multiple desktops ("rooms"), and switch between them while running. List $?.

- **Usher**
  Right-click on desktop to get a pop-up menu of available applications. Definitely minimalist! Registration $?.

Other utilities

Benchmarking utilities **92-04-10**

- **WinBench**
  PC Magazine. Benchmarks performance with typical application usage. Free.

- **WinTach**
  Texas Instruments. Benchmarks performance with typical application usage. Free.

Clock utilities **93-04-12**

- **BarClock**
  Patrick Breen. A flexible utility which places a digital clock, free memory or free resources on active window's title bar. Free.

- **TimeFrame**
  Places a digital clock on active window's title bar. Free.

- **WTime**
  Dials up an atomic clock to set the correct time on your system. Free.

Desktop enhancers **92-11-30**

- **BigDesk**
  ?. A scrollable virtual Windows desktop. Registration $?.

- **More Windows**
  Aristosoft. A virtual Windows desktop. List $ 99.

- **TopDesk**
  ?. A scrollable virtual Windows desktop. Registration $?.

- **WorkShift**
  ?. A virtual Windows workspace with separate desktops. Registration $?.

- **WorkSpaces**
  ?. A virtual Windows workspace with separate desktops. Registration $?.

Miscellaneous **94-02-15**

- **ClipStac**
  PC Magazine. A utility for managing a clipboard "stack" instead of justa a single item on the clipboard. Free.

- **CEnvi**
  Nombas. An advanced macro language for Windows, MS-DOS and OS/2, based on C syntax. Registration $ 38.

- **Cloak**
  Lorry Back Software. Hides undesired icons. Charityware.

- **FileClip**
  Ben Sprachman. A file viewer for text, binary and (registered version only) graphics files. Registration $ 20.

- **GetSet**
  Set Inc. A startup manager allowing the selection of a configuration from a list on Windows startup. Free.

- **GNU Toolbuster [NT only**
  Congruent. The full set of GNU utilities for Windows NT. List $ 199.

- **Immunity**
  Unitrol. Disk Mirroring for protection against hardware failure. List $ 249.

- **Print Manager**
  Saber. Network printer management tool. List $ 79 (single-user).

- **PrintIt!**
  Text file viewing and printing utility. Free.

- **RightOn**
  Steve McCarthy. Programs the behavior of the right mouse button. Registration $15.

- **Search City**
  A high-speed search tool for a variety of file formats. List $ 200.

- **TimeFrame**
  Places a digital clock on active window's title bar. Free.

- **WinMatch**
  Tom Crosley. A side-by-side diff (comparison) of two files. Registration $ 20 (source $ 40).

- **WinSleuth Gold**
  A windows analysis and diagnostic tool. List $ 169.

Task schedulers **93-04-12**

Norton Desktop and Central Point' PC Tools also include task schedulers.

- **Clocker**
  Winnovation. Schedules processes for unattended execution. Includes a central network database facility. Registration $ 25 (single copy).

- **ClockMan**
  ?. Registration $?.

- **E'vent Manager**
  Merasoft. Builds complex macros that can be scheduled in advance. List $ 179.

- **RTimer**
  Robin Scher. Runs applications at predetermined times. Registration $ 10.

Task managers **93-07-15**

- **Metz File F/X**
  Metz Software. File manager, file find, undelete, text search and task manager. List $ 129.
- **Task Manager**
  Guenter Schwaninger. Registration $ 10.

Technical and engineering

CAD software **93-03-31**

- **AutoCAD R12 for Windows**
  Autodesk. A mid-to-high-end CAD system oriented toward civil and architectural applications, with 3D capabilties. A true Windows version of AutoCAD Rel. 12, not a front end as the earlier version; also to be available for Windows NT. List $ 3,995.

- **CADvance 5 for Windows 3.1**
  ISICAD. A mid-to-high-end package with full AutoCAD file compatability and excellent Windows integration. List $ 1,995 (competitive upgrade $ 395).

- **Drafix Windows CAD**
  Foresight Resources. A midrange 2-D CAD package. List $ 595.

- **MicroStation 4.03 Nexus**
  Intergraph. A mid-to-high end CAD system with a Motif interface and minimal Windows features, but including DDE and OLE. List $?.

- **Smart Draw for Windows**
  The Other Operation. A low-cost low-end 2-D CAD package. List $ 99.

- **TurboCAD Professional**
  Insi. A low-cost 2D CAD package with parametric capabilities and bill of materials. List $ 395.

- **Ultimate CAD Windows**
  Automated Methods. A midrange 2-D CAD package, with DDE. List $ 695.

- **SODA**
  Acronym. A structural steel design and analysis package. List $ 495.

- **Spice32 [NT]**
  Robert Zeff. A Win32s version of Berkeley's Spice 3e2 circuit emulator. Free.

- **WoodWorks in Canada [Mac]**
  Canadian Wood Council. A structural wood design package, using the Canadian building code only. List $ 495.

Mathematical **93-04-30**

- **MathCAD**
  A mathematical workbench/typesetting package. Version 4.0 uses the Win32s DLLs for 32-bit performance. List $?

- **Mathematica**
  Wolfram. A symbolic math package. List $?

- **Maple for Windows [Mac] [Sun] [Motif]**
  Waterloo Maple. A symbolic math package. List $?.

Simulation and modeling **94-01-12**

- **WinSim**
  WinSim. A simulation package with causal loops, parallel simulation and a full Windows interface. List $ 595.

Statistics **94-02-12**

- **Astute**
  DDU Software. A strong statistical add-on for Microsoft Excel 4.0 and 5.0. A demonstration version is available by ftp. List £ 80 (approximately $ 120).

- **SAS for Windows [PM] [Sun]**
  SAS Institute. The classic (and powerful) mainframe statistics package with a fresh face. Announced but not yet shipping. List $ 695 (base package), $395/year after 1st year.

- **SPSS for Windows [PM]**
  SPSS. A powerful statistics package with mainframe origins but with a well thought-out Windows interface. List $ 2995 (full package).

- **Systat for Windows**
  Systat. Powerfful statistics and excellent graphics, but has some user interface quirks. List $ 895 (full package).

- **WinFit**
  Yaron Danon. A non-linear least-squares fitting package. Registration $?.

Home, entertainment and multimedia

Multimedia

CD audio players **94-02-12**

- **CD**
  John Junod. A fairly basic Windows audio CD player, with source. Free.

- **CD Audio**
  Noel Dillabough. A CD player with a song database and do-it-once-and-forget CD programming. Registration $ 20.

- **CD Player**
  ?. A basic Windows audio CD player. Registration $ 10.

- **Media Player**
  Microsoft. A very basic audio CD player. Included with Windows 3.1.

- **WinCD**
  BFM Software. An audio CD player with shuffle play and programming (the little brother of WinCD Pro). Registration $ 10.

- **WinCD Pro**
  Apriori Software. An audio CD player with all the features one could think of, and then some more. List $ 49.

- **WinCDP**
  Tony Wu. Yet another fully-featured audio CD player. Registration $?.

Multimedia authoring **93-01-02**

- **AuthorWare Professional**
  ?. A high-end multimedia authoring tool. List $ 7,995.

- **IconAuthor**
  ?. A high-end multimedia authoring tool. List $ 4,995.

- **HSC Interactive**
  HSC. A fairly basic, easy-to-use, multimedia authoring package based on a subset of IconAuthor. No OLE, DDE or TrueType support. List $ 495.

- **Video for Windows**
  Microsoft. A video editor supporting OLE for embedding video clips into other applications. List $ 195.

Multimedia playback **93-05-10**

- **AmandaStories**
  Voyager. Animated stories for children age 3 and up. List $?.

- **Composer Quest**
  Dr. T's Music Software. Various classical composers, with sound, text and pictures. List $ 99.

- **Multimedia Beethoven**
  Microsoft. Experience Beethoven with sound, text and pictures. List $ 69.

- **MPEGPlay [NT]**
  Michael Simmons. A MPEG player with hicolor capability. Registration $?.

- **The Wave Utilities**
  TASSoft. Plays wave and MIDI files with features beyond those of standard WIndows applets. Registration $ 10.

- **WinTV**
  Hauppage. View NTSC TV in a window. Includes adapter card. List $ 495.

- **XING**
  XING. A MPEG player for Windows. Registration $?.

Sound editors **93-09-15**

- **Aleatoric Composer**
  Carl Christensen. This package attempts to create music using random and conditional probabilities according to parameters you set. Registration $ 1 (!).

- **Encore**
  Passport Designs. Music publishing package for composing and editing music. List $ 595.

- **Music Sculptor**
  Alpha Omega. A Windows-based MIDI sequencesr for recording, editing and playing music. Registration $?.

- **Sound Brush**
  MP Technologies. Sound editor and player. List $ 250.

- **Transcribe for Windows**
  Raffi Krikorian. Transcribes a .WAV file into alphabetic musical notes. Free.

- **Trax**
  Passport Designs. MIDI editor and player. List $ 595.

- **Wave for Windows**
  Turtle Beach. Sound editing package. List $ 149.

- **X-oR**
  Dr. T's Music Software. MIDI editor and librarian. List $ 129.

Video Editors **93-01-02**

- **CameraMan**
  Vision Software. Capture Windows screens into .AVI format movies. List $ 149.

- **Video for Windows**
  Microsoft. Capture video into .AVI files through a video capture board, and play them back or embed video clips into other applications. List $ 199.

Entertainment

Games and entertainment **94-02-12**

- **4 Play**
  Andrew Smith. An electronic version of Connect. Registration £ 5 (approximately $7.50).

- **AMAZEing**
  Stuart Swain. A 3-D maze game. Postcardware.

- **Blackjack Trainer**
  ConJelCo. A professional blackjack training program. List $ 75.

- **Block-Logic**
  Michael Ahlers. A pattern deduction game with alternate rulesets. Free.

- **ChessNet**
  Masque. Chess against computer or via modem or network. List $ 49.

- **Euchre for Windows**
  J.J. Lehett. A euchre card game. Free.

- **Kaleidokubes**
  Artworx. Color domino cubes (1 or 2 player). List $ 49.

- **Microsoft Golf**
  Microsoft. A Windows-based version of Links 386, with excellent control and high-quality scenery. List $ 65.

- **MicroMan 1**
  Brian Goble. An arcade-style adventure game. Registration $ 25 (includes MicroMan 2).

- **Microsoft Arcade**
  Microsoft. Old arcade favorites for Windows, including BattleZone, Centipede, Tempest, Asteroids and Missile Command. List $ 39.

- **Modem Chess for Windows**
  Noel Dillabough. A twoplayer chess game over a modem connection. Registration $ 10.

- **New York Times Crossword Puzzle**
  SWFTE. 200 daily and 50 Sunday crossword puzzles. List $ 49.

- **SimCity for Windows**
  Maxis. A sophisticated simulation of a city. List $?.

- **Squirmer**
  Christopher Cifra. A centipede-like arcade game. Registration $ 2 (!).

- **Symantec Game Pack for Windows**
  Symantec. Six Windows games. List $ 39.

- **Windows Entertainment Pack Vol. 1**
  Microsoft. Tetris, Minesweeper, Golf solitaire, Cruel solitaire, and more. List $ 39.

- **Windows Entertainment Pack Vol. 2**

Microsoft. Tut's Tomb solitaire, FreeCell solitaire, Pipe Dream, and more. List $ 39.

- **Windows Entertainment Pack Vol. 3**
  Microsoft. Fuji Golf, TriPeaks solitaire, WordZap, SkiFree and more. List $ 39.

- **Windows Entertainment Pack Vol. 4**
  Microsoft. List $ 39.

- **WinGames**
  WinSoft. WinCommand, Chopper Attack, Yacht and more. List $ 39.

- **WinGames II**
  WinSoft. MrMind, Lander, Adventure and more. List $ 49.

Sorry, the shareware and freeware games are just too numerous to mention them all! Check your favorite FTP site or BBS for availability.

Home

- **Cookbook Manager for Windows**
  Andy Brown. A cookbook manager with multiple cookbook capability and metric/imperial units. Includes the Usenet Cookbook. Free.

- **RunTrak**
  Joel Kulesa. A Windows-based runner's logbook. Registration $ 15.

Technical Support Contacts

This section attempts to list various avenues for technical support for Windows and Windows applications. Further information is always welcome!

Microsoft

Telephone **93-03-01**

- **Installation Support**

Visual Basic	(206) 646-5105
Visual Basic Pro Toolkit	(206) 646-5105
Windows Entertainment Pack	(206) 637-9308

- **Toll Telephone Support**

Access	(206) 635-7050
Excel	(206) 635-7070
FoxPro	(419) 872-0043
Mail	(206) 637-9307
Money	(206) 635-7131
PowerPoint	(206) 635-7145
Project	(206) 635-7155
Publisher	(206) 635-7140
Windows	(206) 637-7098
Windows for Workgroups	(206) 637-7098
Word	(206) 462-9673
Works	(206) 635-7130
Other products	(206) 454-2030

Internet **93-08-05**

FTP archive	*ftp.microsoft.com*
Directories:	
LAN Manager	*/lanman*
Microsoft Mail	*/mail*
SQL Server	*/sqlsrvr*
Windows NT	*/winnt*
Microsoft Developer Network	*/msdn*
Bug reports	
Windows NT	*y-winntb@microsoft.com*
Suggestions	
Windows NT	*ntidea@microsoft.com*
Requests	
VxD IDs	*vxdid@microsoft.com*
Beta programs	
Chicago	*winbeta@microsoft.com*
Win32s	*w32sbeta@microsoft.com*
Developer addresses	
3D DDK issues	*3d-ihv@microsoft.com*
DCI issues	*dci-ihv@microsoft.com*
IHV issues	*ihv@microsoft.com*
Internationalization issues	*global@microsoft.com*
MAPI issues	*mapi@microsoft.com*
Microsoft Developer Network	*devnetwk@microsoft.com*
Multimedia issues	*mmdinfo@microsoft.com*
Porting Lab communications	*portlab@microsoft.com*
TAPI issues	*telephon@microsoft.com*
Windows for Workgroups 3.11 DDK	*ndis@microsoft.com*
WOSA/XRT issues	*wosaxrt@microsoft.com*

Microsoft does not currently offer official email support.

Compuserve **94-03-15**

Windows	*GO MSWIN*
Windows for Workgroups	*GO WRKGRP*
Windows NT	*GO WINNT*
Access	*GO MSACCESS*
Excel	*GO MSEXCEL*
FoxPro	*GO FOXFORUM*
Visual Basic	*GO MSBASIC*
Word	*GO MSWORD*
Applications, general	*GO MSAPP*
Software Library	*GO MSL*

Microsoft Download Service		**93-07-15**
Download-only BBS	(206) 936-6735	

Wolfram Research

Internet **93-07-15**

Sales	*info@wri.com*
Technical support	*support@wri.com*

WordPerfect

Telephone **93-07-15**

- **Installation Support**

Visual Basic	(206) 646-5105
Visual Basic Pro Toolkit	(206) 646-5105
Windows Entertainment Pack	(206) 637-9308

- **Toll-free Telephone Support**

WordPerfect for Windows: features	(800) 228-1029
WordPerfect for Windows: installation	(800) 228-6076
WordPerfect for Windows: graphics/tables/eqns	(800) 228-6013
WordPerfect for Windows: macros/merge/labels	(800) 228-1032
WordPerfect for Windows: networks	(800) 228-6066
WordPerfect for Windows: laser printers	(800) 228-1017
WordPerfect for Windows: other printers	(800) 228-1023

- **Toll Telephone Support**

WordPerfect for Windows	(801) 228-9907
WordPerfect for Windows, after hours	(801) 228-9908
Grammatik	(801) 228-9919
InForms	(801) 228-9916

Bulletin Board Service **93-07-15**

BBS, 1200/2400 bps	(801) 225-4414
BBS, 9600 bps	(801) 225-4444