Microcomputer Newsletter

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♥ Contents ♥

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Announcements

Hewlett-Packard Font Changes

Hewlett-Packard recently announced changes concerning LaserJet printer cartridges. For more information on these changes, see the *Book Center Notes* column. ◆

The One Constant Is Change

Here is a test to help you keep past and future microcomputer changes in perspective and to test your knowledge of happenings in the microcomputer world in the last decade. Match happenings from column A with their year in column B (answers on page 53).

Column A

1. Borland releases Turbo Pascal for DOS: 198___.
2. Microsoft ships Windows: 198___.
3. IBM introduces the PC; it uses the DOS operating system, 5.25-inch 160K (single-sided) floppy drives, and an 8088 CPU: 198___.
4. IBM announces the XT, an "extended" PC, with a built-in 10 megabyte hard disk: 198___.
5. IBM introduces the AT, an "advanced" PC, with an 80286 CPU: 198___.
6. IBM announces the PS/2 line that come standard with 3.5-inch floppy drives. Some PS/2s use the Micro Channel Architecture: 198___.
7. IBM discontinues the IBM XT and AT: 198___.
8. IBM ships OS/2 version 1.1: 198___.
9. Apple introduces the Macintosh; it has a 3.5-inch, 400K (single-sided) floppy drive and 128K of RAM: 198___.
10. Apple announces the Macintosh II, a 68020-based machine: 198___.
11. Apple introduces the LaserWriter with a built-in PostScript controller: 198___.
12. Compaq announces its first portable: 198___.
13. Compaq releases the Deskpro 386; it has an 80386 CPU: 198___.
14. Hewlett-Packard introduces the LaserJet: 198___.
15. First 80486 systems shown: 198___.
16. University of Minnesota initiates Microcomputer Discount Program: 198___.
17. MicroPro ships Wordstar for the Apple II: 198___.
18. Lotus announces 1-2-3 for the IBM PC: 198___.
19. WordPerfect for DOS released: 198___.
20. Aldus announces PageMaker for the Macintosh; documents have a 16-page limit: 198___.

Column B

1. 1981
2. 1981
3. 1982
4. 1982
5. 1982
6. 1983
7. 1983
8. 1984
9. 1984
10. 1984
11. 1984
12. 1985
13. 1985
14. 1985
15. 1986
16. 1987
17. 1987
18. 1987
19. 1988
20. 1989

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Virus Update

Since a new Macintosh virus has made its debut at the University of Minnesota in the past month, it's time to talk about viruses again. IBM-compatible users may want to read the *Overview* and *Protecting Yourself* sections below, and then turn to *Ma Micro Notes* on page 51 to learn about VIRSCAN.

The new Macintosh virus is called WDEF, and its method of operation is considerably different from that used by previous Macintosh viruses.

Overview

Generally, computer viruses, like flu viruses, impose annoying but not life threatening complications on your life. Computer viruses are small programs whose prime objective is to go forth and multiply. Left unchecked computer viruses can reproduce themselves at least once on every disk with which they come in contact. Although most computer viruses are not malicious, they cannot coexist with some applications; and as the viruses spread, their incompatibilities show up as weird behavior by previously well-behaved software. Potentially, viruses can crash your computer's hard disk, forcing you to rebuild the information on it. Because of this potential, you should practice safe computing and stamp out infections as soon as you notice them.

Dealing with an infection is relatively simple; just delete the infected files and replace them with clean copies. Of course, by the time you realize that the virus has infected your files, the damage is done, and you may have lost a lot of your hard work. An understanding of viruses' methods of operation, together with some simple tools and precautions, can protect you from the damage caused by viral infection.

Old vs. New: How They Work

Older Macintosh viruses, such as nVIR and Scores, travel from machine to machine by inserting copies of themselves into programs such as MacWrite or MacPaint (executable machine code) on a disk. They generally target the operating system software of a computer first. Once the virus has infected the operating system, it is in the perfect position to infect other programs. When you start up spreadsheet or word processing software, the operating system does the work of loading the program, allocating memory for it, etc. Thus, every time you open a program, a virus hiding in the operating system can find out about it. The virus can then insert a copy of itself into the program being opened. The next time that infected program is started, its copy of the virus can look around for other programs or operating systems to infect, and so on. One implication of this replication strategy is that non-executable data files (such as word-processing documents) are "immune" to infection by viruses.

In the past, one strategy for protecting machines from infection was to keep all executable programs (software applications) on locked disks, and to keep data files on separate, unlocked disks. If a disk is locked, nothing can be written to the disk, so a virus cannot write a copy of itself into a program on that disk. Thus you could save data files on the unlocked disks, while the programs used to create those files were safe from infection.

The new WDEF virus uses a different replication strategy. Instead of infecting programs, it writes a copy of itself into a specialized Macintosh file call the Desktop file (the Macintosh Finder uses the Desktop file to manage icons on the Desktop). The Desktop file is so specialized it is invisible; it has no icon. Virtually every Macintosh disk, whether or not the disk contains executable code, has this invisible Desktop file. This means that WDEF can travel on a "data-file-only" disk just as easily as on a program disk. Once WDEF infects a disk, inserting it into another machine spreads the infection to other disks attached to or inserted into that machine. The WDEF virus can spread even if you do not open anything.

Although the WDEF virus apparently is not intended to do any harm, some bugs in the virus cause it to do nasty things. WDEF causes both the Macintosh IIci and the Portable to crash; it can severely degrade performance of AppleShare file servers; it may crash a Macintosh when an attempt is made to save a file under MultiFinder; and it may damage disks, forcing you to reformat them to make them usable again.

Protecting Yourself

In order to protect yourself from viruses, you must follow some basic precautions.

Be a Backup Fanatic

First and foremost, back up all information that you cannot afford to lose onto floppy disks (or other media) on a regular basis. At a minimum, you should do a backup once every week. If you have backups of all of your work, replacing damaged files is relatively easy.

Lock Your Disks

Second, when you purchase new software, lock the disks as soon as you take them out of the package and make copies of the disks for use. *Always keep original disks locked.* This way, you will always have an uninfected copy of a program if you need to replace an infected one. To lock any 3.5-inch disk, slide the little black rectangle in the upper right corner of the disk up, so that the hole is open.

Beware of the Trojan Horse

Third, do not use pirated software or disks "borrowed" from someone else. Aside from the fact that using pirated software is illegal, using only legitimate copies of locked original disks greatly reduces the risk of viral infection.

Perform Periodic Examinations

Finally, use one of the many virus-checking programs available to check disks for infection frequently. Although no virus-checker can guarantee that it will find all viruses, using one or two of these programs can identify files that are infected by most viruses. The infected files can then be deleted and replaced from locked original disks or from your up-to-the-minute backup disks, before the virus has a chance to spread further.

Use Virus-Checking Software

The Microcomputer and Workstation Networks Center provides free virus-checking software. The Macintosh software is kept on the Mac Information server, in the volume called *information*, in the folder called *Computer "virus" info*. The folder contains about 1000K of software and information. If you copy this software in the Microcomputer HelpLine, you will need two 800K disks.

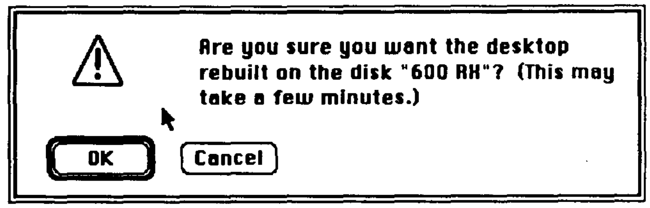
Strategies for WDEF Protection

Although these precautions are sufficient to protect you from the older Macintosh viruses, protecting yourself from the WDEF virus is a little trickier. Like any other virus, WDEF cannot write to a locked disk, so locking your application disks is still a good idea. But what about data disks and hard disks? In order to save files, a data disk must be unlocked, and there is no way to lock a hard disk.

One fairly simple way to protect yourself is to rebuild the Desktop file on your hard disk, and to do the same thing to every floppy disk that you insert into the disk drive. Rebuilding the Desktop file will erase any copies of the WDEF virus. To rebuild the Desktop file, hold down the ⌘ and Option keys when you start (or restart) your Mac. Hold the keys down until you are asked if you are sure you want to rebuild the Desktop (see Figure 1), and click the dialog box's OK button. Instead of "600 RX" you will see the name of your disk inserted between the quotation marks.

To rebuild the Desktop file on a floppy disk, you must be in the Finder. Hold down the ⌘ and Option keys as you insert the disk, and click the OK button when you see a message similar to the one in Figure 1.

Figure 1: Hold down the ⌘ and Option keys to get this message.



Lastly, the Mac Information server has new versions of two virus-checker programs that can find the WDEF virus. *Disinfectant 1.5* will find and remove the WDEF virus and *Virus Rx 1.6* reports infections by WDEF.

Conclusion

The best virus cure is prevention. Back up your files, keep original disks locked, and run a virus-checking program on disks you are not sure about. If you find infected files, don't panic. Simply remove the infected files and replace them with clean copies from your *locked originals*. If you have questions, call the Microcomputer HelpLine.

SoftPC

SoftPC, from Insignia Solutions, Inc., is Macintosh software that allows you to use applications written for an IBM-type personal computer on a Mac. While running SoftPC, the Macintosh emulates an IBM PC/XT and provides a simple way for owners of Macs to share data and software between otherwise incompatible operating systems. SoftPC includes the entire MS-DOS 3.30 operating system software and GW-BASIC as well as reference manuals for both.

Hardware Considerations

Macintoshes use a Motorola 680x0 central processing unit (CPU) and PC/MS-DOS computers use Intel 80x86 family CPUs. Because they have radically different hardware, programs written for the Mac will not run on PC/MS-DOS machines and vice versa. SoftPC makes it possible to run IBM software on the Macintosh by emulating the IBM PC's hardware. The drawback to this approach (emulating another machine's hardware by running a program) is that the overhead involved can make programs perform slowly. In spite of the overhead of running SoftPC, its performance is quite acceptable when compared to running the same software on a true IBM PC or XT.

SoftPC runs on a Mac SE/30, II, IIcx, IIx, or IIci, or a Mac SE that has an accelerator card. You also need at least 2MB of RAM and a hard disk. SoftPC ***will not run*** on the Mac Plus, the Mac SE, or earlier Macintoshes.

SoftPC emulates the operation of an IBM PC/XT with 640K RAM, a Color Graphics Adapter (CGA), a single floppy disk, one or two hard disks with selectable size from 1 to 30 megabytes, a Microsoft bus mouse, two serial ports (COM1 and COM2), and one parallel printer adapter (LPT1). SoftPC also mixes with the Mac file system via drive E. Files stored on drive E are accessible from both SoftPC and the Mac operating system, allowing you to transfer data between Mac and IBM applications. You have several options for the floppy disk drive, which are described later in this article.

With SoftPC you can run popular PC/MS-DOS applications, including those that address the IBM hardware directly. SoftPC recreates the IBM-compatible environment and allows you to run DOS and the Mac operating systems together, sharing all of the computer's resources.

Installing SoftPC

SoftPC comes in two sizes. The small version is for Macs with at least 2MB of RAM, and the standard version is for Macs with at least 4MB of RAM. Both options contain the same features, but the standard version runs 10 to 15 percent faster and requires 2.4MB of RAM; the small version requires 1.7MB of RAM. You must decide which version to use *before* beginning the installation.

Installing SoftPC is easy and straightforward. You insert *Program Disk 1* into the Mac's drive and double-click on the SoftPC Installer icon. (The icon name is *Install Small* or *Install Standard*, depending on the version you selected.) You will be prompted to create a folder on the Mac's hard disk, and SoftPC will be installed in this folder. When the installation has been completed successfully, you will have the SoftPC icon, a hard disk icon, and a fonts file icon in the new folder.

Using SoftPC

On the Mac you start SoftPC in the normal way by double-clicking on the SoftPC icon. You can use SoftPC under the Mac's Finder or under MultiFinder. Invoking SoftPC boots MS-DOS, just like switching on a real IBM-compatible; it even makes the same sounds of the system booting. You use the same DOS or application commands as "real" IBM PC users use. Once you have started SoftPC you will see its initial screen, shown in Figure 1.

You treat the SoftPC window as if it were an IBM PC screen and type MS-DOS commands at the C: prompt. MS-DOS and your application program run in the SoftPC window and behave as they would on a real IBM PC.

Most PC/MS-DOS programs require using the 10 or 12 function keys you find on IBM-type keyboards. If you

Figure 1: Initial SoftPC Screen

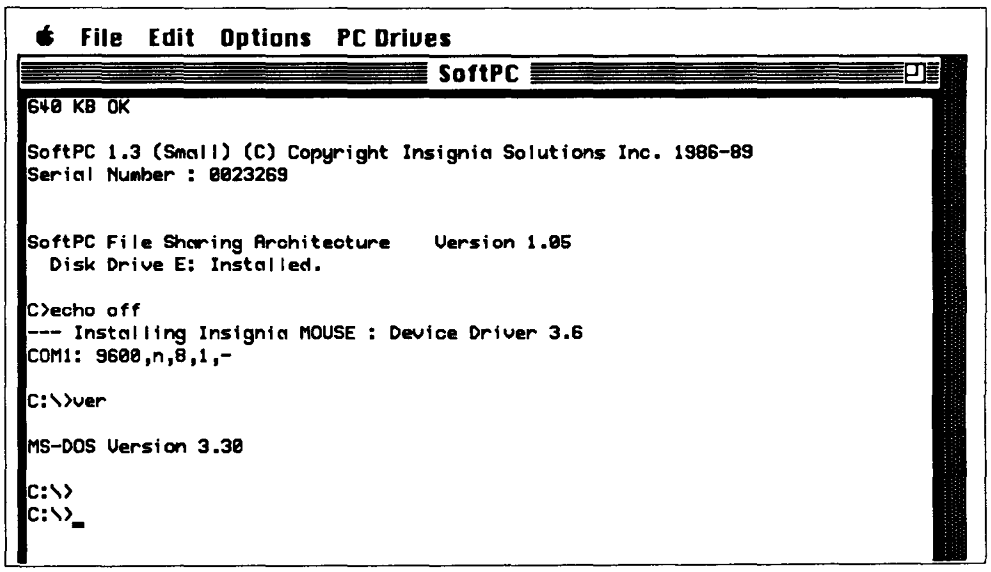
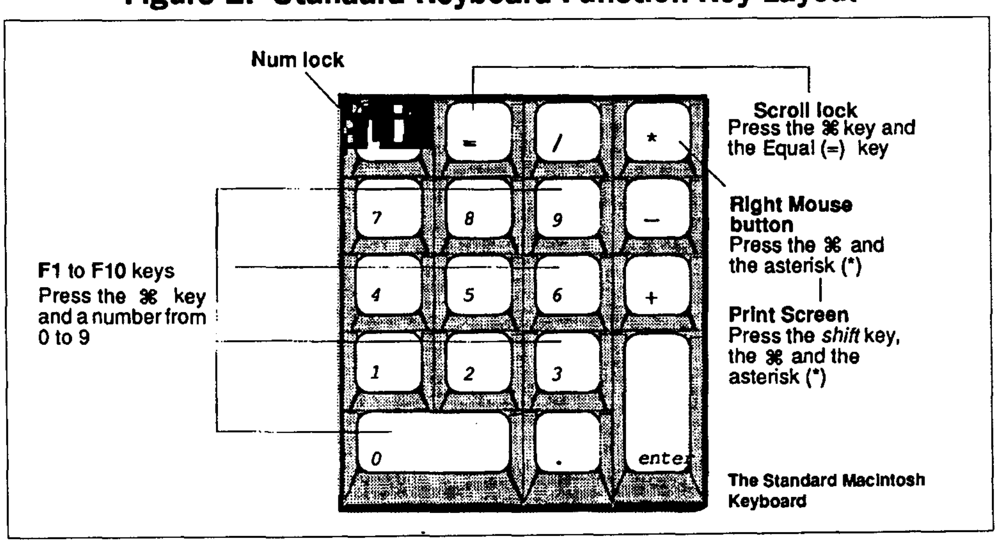


Figure 2: Standard Keyboard Function Key Layout

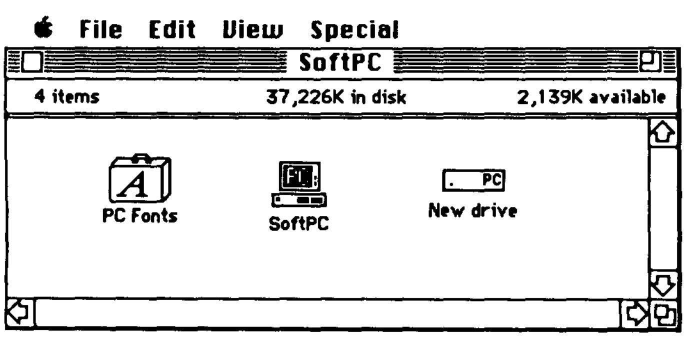


have an Apple Extended keyboard, the function keys will perform as they would on a standard IBM keyboard. If you do not have an Extended keyboard, you can use the standard Apple keyboard. The key combinations you use to simulate DOS function keys are shown in Figure 2, which was scanned directly from the SoftPC manual.

The hard disk that is automatically created by the installer contains all the MS-DOS 3.30 system software, including GW-BASIC, and uses 1MB of hard disk space. If you wish to create a larger C disk, you may do so. However, since SoftPC uses the SoftPC folder as drive E and allows you to access files from both the IBM and Macintosh operating system environments, we recommend leaving the disk drives as configured by the installer program. You can put your application programs and files in drive E. If your software actually requires you to use drive C, you can reconfigure the drive to give it more room for storing programs and data.

You can access DOS files and directories from drives C and D via SoftPC but not directly from the Macintosh File System. Drives C and D are stored on your hard disk as Macintosh files that emulate IBM hard disks. In the SoftPC folder you will see only the hard disk icon itself. Figure 3 shows a single "hard drive" named *New drive* which is used as drive C when SoftPC boots.

Figure 3: The SoftPC Folder



To configure both of the SoftPC hard disks, use the *PC Drives* menu. As shown in Figure 4, you can choose various hard disk sizes. Files stored on drive E are available to both MS-DOS and the Macintosh operating system. Drive E's size is limited only by the size of the Macintosh hard drive itself. You can copy and delete files on any of these drives and create directories, which show up as folders on SoftPC's drive E.

The SoftPC window supports the full IBM character set and will use up to 16 colors or grey-scales if these are configured in the menu's *Control Panel.* SoftPC will also map the CGA-level colors onto black and white if you select only two "colors" (i.e., one bit-plane) in the Control Panel. We recommend that you try one bit-plane, since SoftPC performs optimally when this setting is used.

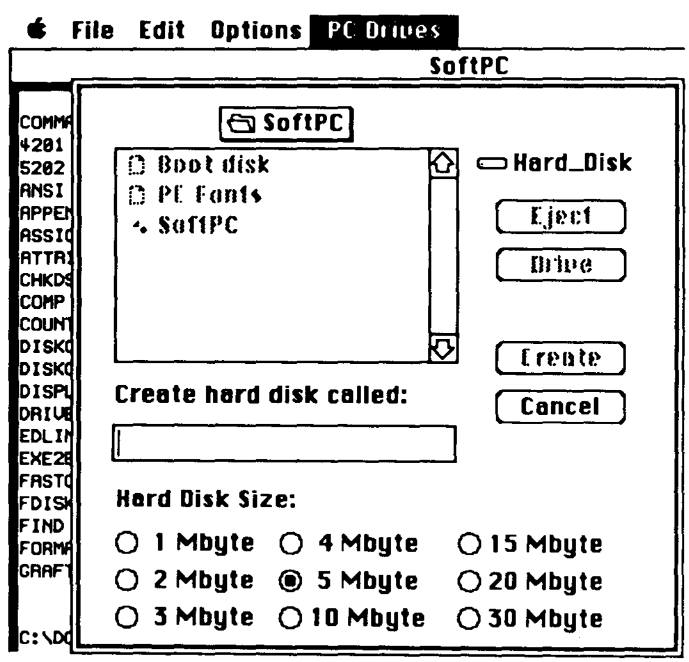
Several Macintosh applications, such as Word, PageMaker, and Excel, let you easily import DOS documents. This capability lets you save a DOS document, then switch from SoftPC to the corresponding Macintosh application and import the data from the DOS document into your Mac application. For example, you might use dBASE III+ to maintain a mailing list. Under SoftPC you could export the mailing list to Microsoft Word for printing labels. To do this, attach the database and use dBASE's *COPY TO* command to create a "delimited" text file that can be used with Word's Print Merge function. If you use Lotus for some applications and Excel for others, you can save a Lotus 1-2-3 spreadsheet and then, using the Mac's Multi-Finder, switch to Excel to load the spreadsheet data. (To open the dBASE and Lotus files in Word and Excel, you must hold down the Shift and Option keys when you select *Open* from their *File* menus.)

With the proper configuration, SoftPC can even install and run copy-protected programs. Some of these programs require a true emulation of an IBM PC hard disk; older versions of Lotus 1-2-3 and dBASE III are such programs. We expect most PC/MS-DOS applications to run successfully under SoftPC.

Copying DOS Software

You can copy DOS software for use by SoftPC in several ways. First, if you have a Mac with the FDHD SuperDrive, you can use a formatted PC/MS-DOS 3.5-inch diskette directly. That is, if the SoftPC window is active, you can put your disk in the disk drive and read and write files directly to it, using it as drive A.

Figure 4: PC Drive Menu



Second, you may use the *Apple File Exchange* software (which is included with all current versions of the Mac operating system) to convert files from the DOS format to Macintosh format. Diskettes in Mac format will not be readable while in SoftPC, but while in the Mac Finder you can drag files from the diskette into the SoftPC folder and use them from within SoftPC.

A third option is to use the Apple PC 5.25 Drive as drive A. This is a DOS 360K, 5.25-inch diskette drive that connects to a Macintosh equipped with an appropriate adadpter card. You can load and run copy-protected programs from this drive; you can also use it independently with the Apple File Exchange software.

Finally, you can connect a true IBM PC or compatible to the Macintosh with a specially made cable. This cable is not included with the package; however, the reference manual provides a schematic that you may use to construct your own cable. The exact cable you need depends on whether you are using an IBM PC or an IBM AT as the slave machine. When you do this you use the serial ports on both machines to transfer programs and data. SoftPC's *SlavePC* program runs on the IBM PC and communicates with SoftPC running on the Mac to provide the link between SoftPC and the diskette drive. Drive A on the slave computer will act as if it is attached directly to the Macintosh.

SoftPC can access any files or folders from the Macintosh desktop, even if they are on externally mounted volumes. This means that you can access these applications from network file servers such as *AppleShare* and *TOPS*, external PC compatible diskette drives such as *DaynaFile*, and other IBM-to-Macintosh serial-link transfer/translation software such as *MacLink Plus* and *Apple File Exchange*.

Using the Mouse

SoftPC has an option to emulate the Microsoft bus mouse. When you use this option, the Macintosh mouse is disabled, although you can gain access to the Macintosh mouse by pressing the ⌘ key. To return to full-time Macintosh mouse mode, press the ⌘ and the M keys. We used the Microsoft bus mouse emulation with Windows 2.03 and Word 4.0 and found the mouse action to be a bit jerky and slow, but with practice we were able to control its motion adequately.

Printing

SoftPC uses the standard Macintosh print facilities. Most PC printers use the parallel printer interface for printing, although serial printers are also available. PC/MS-DOS uses the parallel port by default, unless instructed otherwise with the DOS *MODE* command. SoftPC supports both options, although we recommend the parallel option because it is simpler to use and is supported by almost all DOS applications.

Normally, when you print from DOS or from a DOS application, text and graphics are sent to the parallel printer adapter. When you use SoftPC it captures the data, converts it as needed, and sends the document to the Macintosh Print Manager. The Print Manager then sends the data to the printer you selected from the menu's *Chooser*. Unfortunately, few DOS applications directly support any of the Apple printers, although some do support the LaserWriter using PostScript or Diablo 630 emulation.

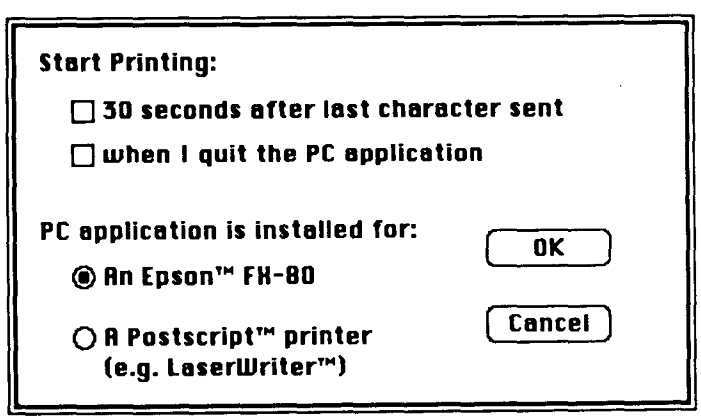
Select Printer Type

SoftPC allows you to specify one of two types of printers. If your DOS application supports a PostScript printer and you are using an Apple LaserWriter or other PostScript printer on your Mac, printing should be straightforward. When you go through the DOS application's installation process, you tell it you are using a PostScript printer, and include the step to select "A PostScript printer" from SoftPC's *Print Options* panel, shown in Figure 5. Unfortunately, printing to a PostScript printer is not straightforward. We have been unable to actually print PostScript on the LaserWriter, and our calls to SoftPC's support line for help remain unanswered.

If the application does not support PostScript, then you can install it to use an Epson FX-80 parallel printer, and select the Epson FX-80 option from the *Print Options* Panel. SoftPC will translate the FX-80 instructions into codes that the Macintosh Print Manager can use. To use the LaserWriter in Diablo 630 mode you must connect the LaserWriter to your Macintosh as a serial printer rather than over an AppleTalk network.

Printing from the parallel port of DOS machines is very rudimentary. For most applications, nothing is sent to the printer to indicate that the end of the transmission has occurred. As a result, SoftPC has no way of knowing when it has received everything that is to be printed and when it should dispatch the print job to the Print Manager. Therefore, SoftPC provides several methods to inform Print Manager when it has received the completed docu-

Figure 5: Print Options Panel



ment. The simplest involves selecting *Start Printing* from the *File* menu. Other options include flushing the printer buffer 30 seconds after the last character is received or flushing the buffer when you exit the current PC application. The latter two are selected from the *Print Options* Panel, shown in Figure 5.

Serial Printing

When serial printing is selected, for example to send print to a Diablo 630, the printer must be connected directly to one of the Mac's serial ports. When using this option, SoftPC does not perform any data conversion, and whatever the PC application sends to the emulated serial port will be sent directly to the printer. Both the application and the printer must have been installed properly for this option to work.

Other Features

You can copy text and graphics from the SoftPC screen to the Macintosh clipboard. What you copy can be pasted into Mac applications. However, you cannot paste to a DOS application from a Mac application, since PC/MS-DOS applications are not written to support such a feature. If the block you selected is text, each line you paste into the Mac application will have a carriage return appended to it. To transfer the text without carriage returns or line breaks, you can press the [Option] key when using the copy command.

You may also enable or disable sound, invert the SoftPC window to toggle between white-on-black and black-on-white, and select where COM1 and COM2 are routed. If you are connected to an AppleTalk network through the Mac's printer port, then PC printer and communication software cannot use the Mac's printer port.

Evaluation

SoftPC's emulation of an IBM PC/XT is excellent. The operating speed of the standard version of SoftPC is very close to that of a true IBM PC/XT. As noted above, the standard version of SoftPC requires a Macintosh with at least 4MB of RAM. The operating speed of the small version is only slightly slower. Disk operations in both versions are faster than on an IBM PC/XT because of the higher speed of the Macintosh hard disks.

We tested Lotus 1-2-3 versions 2.01 and 2.2, Microsoft Word 4.0, Turbo Pascal 5.0, Paradox 3.0, ProComm 2.4.2, COM 5.0, SIMTEK, and Microsoft Windows 2.03. We were unable to get Windows Write to print on the LaserWriter when Write was set up to use PostScript. However, we could print using the Epson FX-80 emulation from all applications. SoftPC's emulation of an FX-80 printer is very good, although generating 9-pin dot matrix output on a LaserWriter seems like stepping backwards.

Insignia Solutions does not have an 800 number for product support and our several calls to Insignia for help were not answered. The consultants were always busy and our messages asking for return calls were not answered. As a result, we have been unable to print PostScript on the LaserWriter. Therefore, we found SoftPC's technical support to be non-existent and printer support to be unsatisfactory.

If you already have a Macintosh with the necessary hardware to run SoftPC and need to run DOS applications, SoftPC provides an inexpensive alternative to purchasing a second computer. In addition, being able to copy information from the SoftPC window to the Mac's scrapbook makes it possible to easily integrate information from IBM programs into the Mac environment.

The Book Center's current price for SoftPC is $250. If you would like to try SoftPC, visit the Microcomputer HelpLine in room 125 Shepherd Labs for a demonstration. If you have some DOS software you would like to try, bring it with you.

Ma Micro Notes

Virus-Checker for IBM-compatibles

IBM-compatible users who are interested in virus-checking software can get a public domain program called VIRSCAN from the *IBM Information Server*. VIRSCAN searches for many of the most common DOS viruses. Although we have not tested VIRSCAN with all versions of DOS, its documentation states it will work with DOS 2.0, 2.1, 3.1, 3.2, 3.3, and 4.0 as well as OS/2 1.0 and 1.1.

The IBM Information Server is a file server that you can access in our Microcomputer HelpLine to copy public domain software, IBM and compatible software patches, and other useful software. VIRSCAN is in the Public directory; here is its full path name:

```
\PUBLIC\INFO\PUBDOM\VIRUS\VIRSCAN
```

The VIRSCAN directory contains these files

```
README          README.PUB
VIRSCAN.EXE     VIRSCAN.FIL
SIGBOOT.LST     SIGFILE.LST
```

All the Public files are stored on drive P. To select drive P: simply type

```
P:
```

then press the [Return] key. If you get an error message when you do this, then type

```
NETWORK
```

and press the Return key. Then type `P:` again.

Once you move to drive P, you can use the DIR command to see a DOS directory called *INFO*. All the IBM Information Server files are stored in the Info directory.

To easily copy all the VIRSCAN files, move from the Public directory to the VIRSCAN directory using the CD command:

```
CD INFO\PUBDOM\VIRUS\VIRSCAN
```

Once you move to the VIRSCAN directory you can copy its six files to your disk in drive A by using wildcards; that is, type

```
COPY *.* A:
```

Full instructions for using VIRSCAN are in its README file. You can view this file on the screen by using the TYPE command, that is, type

```
TYPE README
```

Whenever a README file is more than one screenful long, you probably want to stop and restart the screen display. There are several ways to freeze what is printing on the screen. To stop the display you can hold down the Ctrl key and type an S. To resume the display, type another Ctrl - S combination. If your keyboard has a Pause key, you can press it to freeze the screen. Then to resume the display, press the Enter key.

To use this virus-checking software, at the command prompt type VIRSCAN and a drive name, for example

```
VIRSCAN C:
```

For more information on the IBM Information Server, see our October, 1989 newsletter

Create a First Aid Disk

You can run VIRSCAN off a bootable, write-protected floppy disk. This disk can be your first-aid disk since a virus cannot attach itself to a write-protected disk. If you suspect your computer software has been infected, start up your machine with this disk.

To create a bootable disk use the DOS *FORMAT* command with the */S* option. The /S option copies the DOS start-up files to the appropriate spot on floppy disks. If you have a typical one floppy drive setup, this is what you need to type

```
FORMAT A: /S
```

If you have a 3.5-inch 1.44MB drive and want to create a bootable disk that you can use with all 3.5-inch floppy drives, here is what you need to type *if you use PC-DOS 4.0:*

```
FORMAT A: /S /F:720
```

However, *if you use PC/MS-DOS 3.3,* then to format a 720K disk in a 1.44MB floppy drive, you need to type

```
FORMAT A: /S /N:9 /T:80
```

To write-protect 3.5-inch disks, slide the little black rectangle in the upper right corner of the disk up so you can see through the hole. To write-protect 5.25-inch disks, cover the hole (notch) on the upper right-hand side corner with the small tape strips that come packaged with blank 5.25-inch disks.

Site License Forum

Sandra Welch, Forum Coordinator, 625-9091

In order to provide a forum for all University microcomputer users and make it easier to take advantage of licenses and discounts that the University offers, the *Microcomputer Newsletter* provides a forum for people who: 1) want access to licensed or discount packages that the University presently holds; 2) want to find participants for a license or discount package they already hold; 3) have a potential license or discount and want to survey the University community for interested participants.

The forum is coordinated by Sandra Welch, Information Systems. Once the forum is aware of your interest, it still needs about three months to conduct a survey, evaluate responses, and decide whether or not to obtain site licenses or other discounts.

UNIX Users: Upgrade Notice

AT&T will soon upgrade UNIX System 5, Release 3.2 to Release 4.0. If you have new equipment using any UNIX based software which requires you to be on the Master AT&T Equipment list, sign up for this new release now. Although I will send equipment update lists to the college computing coordinators, I know there are UNIX users who will not get this notice. Therefore, I am placing an additional notice in this newsletter.

> *This notice is important because if you act now, the upgrade is free. If you fail to place your equipment on the list now, it will cost you $800 per item to do so between upgrades.*

Please include all currently listed equipment as well as new equipment that you wish to have on the list. If you have equipment on the current list that is no longer in use, or if you are no longer using UNIX based software, let me know. I will remove that equipment from the list.

UNIX Equipment

Department: ______________________

Location of Equipment:

Rm ________ Bldg ______________________

Type of Hardware:

____

S/N ______________________

Contact Person:

____

Campus Address:

____

Campus Phone Number: ______________________

Send this information to:
Sandy Welch, Information Systems
University of Minnesota
103 Shepherd Labs, 100 Union Street SE
Minneapolis, MN 55419

ANNOUNCEMENTS FROM .... PAGE 45

Here are the answers to *The One Constant is Change* test.

1. Turbo Pascal released: ________ '83.
2. Windows shipped: ________ '85.
3. IBM PC introduced: ________ '81.
4. IBM XT introduced: ________ '83.
5. IBM AT introduced: ________ '84.
6. IBM announces PS/2: ________ '87.
7. IBM XT and AT discontinued: ________ '87.
8. IBM ships OS/2: ________ '88.
9. Apple announces 128K Mac: ________ '84.
10. Apple introduces Mac II: ________ '87.
11. Apple introduces LaserWriter: ________ '85.
12. Compaq announces portable: ________ '82.
13. Compaq announces Deskpro 386: ________ '86.
14. H-P introduces the LaserJet: ________ '84.
15. First 80486 systems shown: ________ '89.
16. University initiates Micro Discount Program: ________ '84.
17. Wordstar shipped for Apple II: ________ '81.
18. Lotus announces 1-2-3 for IBM: ________ '82.
19. WordPerfect released for DOS: ________ '82.
20. PageMaker for the Mac released: ________ '85.

◆

Sticker Shock

In the past decade not only have many products been introduced, changed drastically, or discontinued, but prices have also changed dramatically. Here is a sampling that proves if you wait long enough, you will get more value for your dollar.

Then - In November 1984 for *$4100* you could buy an IBM AT with an 80286 CPU, 512K RAM, one 5.25-inch 1.2MB floppy disk drive, one 20MB hard disk drive, a 10-function key keyboard, a serial/parallel adapter, a monochrome display and monochrome display adapter, and PC-DOS 3.0. We recommended that you also buy a 360K floppy drive, bringing the machine's total cost up to $4414.

Now - For *$4047* you can buy an IBM PS/2 Model 70/061 with an 80386 CPU, 2MB RAM, one 3.5-inch 1.4MB floppy disk drive, one 60MB hard disk drive, a 12-function key keyboard, serial and parallel adapters, a 12-inch color display, a built-in VGA display adapter, and PC-DOS 4.0.

Then - In May 1985 for *$2254* you could buy the original Hewlett-Packard LaserJet. This machine prints on one side of the page, has one input tray, one slot for font cartridges, and came only with a serial interface.

Now - For *$2485* you can buy the Hewlett-Packard LaserJet Series IID. This machine prints on one or two sides of a sheet of paper, has two input paper trays, two slots for font cartridges, and comes with a serial and a parallel interface.

Then - In March 1986 for *$1920* you could buy a Macintosh Plus with a built-in 800K floppy drive and an 800K external floppy drive.

Now - For *$2040* you can buy a Mac SE with a built-in 1.4MB Superdrive and 20MB SCSI hard disk. ◆

Help Wanted

The Microcomputer and Workstation Networks Center is looking for an analyst/programmer to join us in developing state-of-the-art software for microcomputers and workstations. The large population of desktop computers and the University's campuswide network are a perfect environment to hone your skills while developing distributed applications using client/server architectures. If you have a strong background in Pascal, C, and graphic oriented user interfaces on desktop systems, we urge you to apply for this position.

If you are interested in this position, contact the Personnel Department's information number at 626-5550. Their offices are in the Administrative Services Center at 1919 University Ave., St. Paul, MN 55104. To apply for this position you must submit your application to University Personnel.

The University is committed to the policy that all persons should have equal access to employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

The specifics of the job are listed below:

Job Requisition Number: 056584
Job Class: Analyst Programmer
Pay Range: $2051–3376/month

Description of Position:
The person hired for this position will design, write, and document programs for the IBM PS/2, Apple Macintosh, SUN, A/UX, and NeXT computer systems. The projects will involve the use of Pascal and C programming languages and occasional assembly language. Although this is primarily a programming position, the person hired will work approximately 16 hours/week consulting on the Microcomputer HelpLine in room 125 Shepherd Labs.

Qualifications:
Bachelor's degree in Computer Science or related field (or equivalent experience) plus 2 or more years of programming experience with Pascal and C on the Macintosh, IBM, or UNIX workstations. Experience developing software for the Macintosh, Microsoft Windows, OS/2 Presentation Manager, SUN Windows, or NeXT Step environment is required. ◆

Book Center Notes

These offers are made to University departments, employees, and students; the regular Microcomputer Discount Program rules of eligibility apply. If you have questions about availability, phone the Electronics Desk at *625-3854*.

While Supplies Last

While supplies last you can purchase the following items at the Book Center.

Mac Memory Upgrades: 2MB for $199

Currently you can buy 2 megabyte (MB) memory-upgrade kits for the Macintosh for $199; this price *includes installation*. You can use this memory in all the current Macs *except the Mac IIci*, which requires faster memory, *and the Portable*, which requires special low power consumption memory. Once you have paid for the memory upgrade at the Electronics Desk, contact ACS Engineering Services to get the memory installed; free parking is available at Engineering Services.

Memory on the Mac is packed on SIMMS (Single Inline Memory Modules). You can buy two flavors of SIMMs: 256K and 1MB. The number of memory expansion kits you must buy depends on three things: which Macintosh and SIMMs you have and how much memory is already installed in your machine. The SIMMS in this upgrade are 100 ns (nanoseconds) memory; 100 ns is fast enough for use in the Mac Plus, SE, SE/30, and Mac II, IIx, and IIcx because these Macs require SIMMS that are 120 ns or faster.

The *Mac Plus and SE* have four sockets to hold SIMMs. If you have a Mac Plus or SE with 1MB of memory, these four sockets are filled with 256K SIMMs (4 x 256K = 1 megabyte). Since the sockets must be dealt with in *pairs*, if you buy one memory upgrade kit, you can replace one pair of 256K SIMMs with the two 1MB SIMMs in the upgrade kit. When you install one kit, you end up with 2.5MB of memory in your Mac. If you buy two kits, you can replace all four 256K SIMMs. When you install two kits you end up with 4MB of memory.

The *Mac SE/30 and Mac II family* have eight sockets to hold SIMMs. The Mac SE/30 and Mac II family come standard with either 1MB or 4MB of RAM. When you upgrade their memory, you must deal with the sockets in *groups of four*. Additionally, each group of four SIMMs must be the same size, that is, four 256K or four 1MB SIMMs. Whether you have a Mac with 1MB or 4MB of memory, these Macs have four empty sockets. Since you must deal with four sockets at a time, you must buy two kits (so you can fill all four empty sockets). When those who started with 1MB of memory add two kits, their Mac will have 5MB of RAM. Those machines that started with 4MB of RAM will have 8MB.

Mathematica

Currently you can buy Mathematica for the SE for $90 (its retail price is $495). You can also use the Mac SE version on the Mac II family; however, the SE version cannot take advantage of the Mac II's math coprocessor and it does not support color. Mathematica is an integrated software package for doing mathematical computations and exploration on a computer. You need at least 2MB of RAM to run Mathematica. Depending on what you want to do, you may need more RAM.

Mathematica's documentation is sold separately. You can buy Stephen Wolfram's book, *Mathematica - A System for Doing Mathematica by Computer*, in the Book Center's Reference section. If you buy Wolfram's book when you buy Mathematica, the book's price is $22. For more information on Mathematica, read its review in our January 1989 newsletter.

Thunderscan

Currently you can buy Thunderscan, a graphics scanning setup that works with the Apple ImageWriter printer, for $125. The Book Center's usual price was $181. ◆

Hewlett-Packard Font Changes

Hewlett-Packard recently announced a new *MasterType Library* of font cartridges and scalable typefaces for the LaserJet Series II, IID, and IIP. HP also announced it was discontinuing some font products. Due to this change, the Book Center cannot order all the HP LaserJet font cartridges listed in the *Printers and other peripherals* handout.

Microsoft Z and #C02 Cartridges

The popular Microsoft Z cartridge (92286Z for $204) has been replaced by another Microsoft cartridge called #C02 (from HP's C2053A series). Although the Book Center can no longer get the Z cartridge, they are already selling the #C02 cartridge for $135; it works with Microsoft Works, Windows, Word, Excel and other software. The #C02 cartridge supports the ASCII, Roman-8, ECMA-94, and Latin-1 7-bit symbol sets and includes the specifications shown in the table below. The new cartridge is a good value. HP's catalogs show that the only difference between the cartridges is that on #C02 the Line Printer font is also available in portrait orientation. The Microcomputer HelpLine has the #C02 cartridge available for your inspection.

HP Microsoft Font Cartridge #C02

Typeface	Point Size	Orientation†
Helvetica*	8,10,12	P
Helvetica Bold*	10,12,14	P
Helvetica Italic*	10,12	P
Line Printer	8.5	P and L
Times Roman*	8,10,12	P
Times Roman Bold*	10,12,14	P
Times Roman Italic*	10,12	P

* proportional
† portrait (P) available for all 7 typefaces; landscape (L) available in HP printers that can automatically rotate fonts

Other Old Cartridges

While supplies last, you can buy the HP font cartridges marked with a * in the table below. If you do not see a * next to an old 92286 series cartridge, it is unlikely that the Book Center will be able to get that cartridge. This table's Book Center Price is for the old fonts. The table also includes the part number of the HP replacement fonts.

Other Old Cartridges

Old Fonts		(Replacement Fonts)	Discount Price
92286			$ 92
*	A (Courier)	(92286PC or 92286IC)	
*	C (International)	(92286PC or 92286IC)	
*	D (Prestige Elite)	(92286IC or C2053A #C03)	
*	E (Letter Gothic)	(92286IC or C2053A #C03)	
*	G (Legal Elite)	(92286PC)	
*	H (Legal Courier)	(92286PC)	
92286			$ 204
*	R (Presentations 1)	(C2053A #C04)	
92286			$ 125
*	B (TMS proporat. 1)	(92286IC or C2053A #C08)	
*	F (TMS proporat.)	(92286IC or C2053A #C03)	
	J (Math Elite)	(C2053A #C07)	
	K (Math TMS)	(C2053A #C07)	
*	L (Courier P&L)	(92286PC or 92286IC)	
	M (Prestige P&L)	(C2053A #C03)	
*	N (LetterGothic P&L)	(C2053A #C03)	
*	P (TMS RMN P&L)	(92286IC)	
*	Q (Memo 1)	(92286IC or C2053A #C03)	
*	T (Tax 1)	(C2053A #C05)	
	V (Forms Landscape)	(C2053A #C05)	
	Y (PC Courier 1)	(92286IC)	

Replacement Cartridges

At press time the Book Center did not have prices or descriptions for all the replacement fonts.

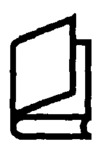
Replacement Cartridges

New Fonts		Discount Price
92286PC	Pro collection	$ 210
92286IC	–	$ —
C2053A Series		$ 135
#C01	WordPerfect *	
#C02	Microsoft *	
#C03	Polished worksheets	
#C04	Persuasive presentations	
#C05	Forms, etc.	
#C06	Bar codes + more	
#C07	Text equations *	
#C08	Global text	
C2055A Series		$ 68
#C01	Great Start *	

* available for your inspection in the Microcomputer HelpLine

To learn more about Hewlett-Packard's cartridges, examine the Microcomputer HelpLine's collection of font samples and H-P catalogs. ◆

And Books, Too



If you cannot find the computer books you want in the Book Center's Reference section, tell us what books you want to buy. Send specific titles or areas of interest to: Maureen O'Brien, 160 Williamson Hall, Minnesota Book Center, 231 Pillsbury Drive SE, Minneapolis, MN 55455. Here's what is new in the Reference section.

- ✔ *The Handbook of Artificial Intelligence, Vol IV* by Barr, an Addison-Wesley publication for $24.95.
- ✔ *Harvard Graphics Made Easy* by Campbell, an Osborne-McGraw publication for $24.95.
- ✔ *dBASE IV Programming Book* by Liskin, an Osborne-McGraw publication for $28.95.

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University of Minnesota
Room 125, Shepherd Labs
100 Union Street SE
Minneapolis, MN 55455-0421

Newsletter Reprints

(1) If you want back issues of volumes 3 to the present issue, Kinkos will make them for you for a nominal fee. The master copies are downstairs at the Kinkos shop at 306 15th Avenue SE. This shop is open Sunday–Saturday. (2) The Information server, accessable to Macintoshes directly connect to the University's internet, has the twelve most recent issues of the newsletter.

February 1990