OPCUG The Ottawa PC Users' Group

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FROM THE PRESIDENT

David Terroux

Welcome to the autumn season of the Ottawa PC Users' Group. In the absence of suggestions from the membership at large for speakers and/or topics, we have assembled a list of speakers who will provide a good mix of computer topics from industry, government and talks of general interest.

We also regret the confusion regarding the distribution of the August 1990 Newsletter (Vol.7, No.7). Although it was edited and printed on schedule, the distribution side did not provide mailing labels to the Newsletter Editor.

Members who were at the August meeting may have picked up their copy. If not, it will be mailed to you shortly.

* * *

IS WINDOWS 3.0 A THREAT TO YOUR SYSTEM?

By Michael Goddard

Windows 3.0 gained acclaim when it was released by Microsoft. However, users are now asking what the REAL price of using Windows 3.0 is. In addition to the usual mundane problems affecting any major new software release, users are reporting serious difficulties with Windows 3.0. Some have had disk failures and file losses because of severe incompatibilities between Windows and certain large hard disk drives and disk-formatting programs.

As users buy more powerful systems and upgrade existing ones to tap the power of Windows 3.0, a wave of disk problems and data loss is starting to sweep the MS-DOS world. In July 1989, Microsoft released a limited-circulation memo which stated, in part: "Many non-standard (i.e. non-FDISK) disk-partitioning schemes will cause problems when used with Windows and/or the SMARTDRV.SYS disk-caching utility. This applies to Windows 286 & 386, and Excel. Specific partitioning methods that will always cause problems include:

- Disk Manager, by Ontrack & Seagate (DMDRVR.BIN)
- Priam disk partitioning (supplied with Priam hard disks)
- Golden Bow V-Feature Deluxe
- Partitioning used by CORE HDs (cannot be changed; contact Core)
- Any system with a XENIX or UNIX partition on the hard disk

Other brands of utilities may or may not cause problems... Because of the large number of partitioning-utility versions and methods of partitioning the hard drive with them, it is impossible to say whether a given utility will definitely cause a problem in a particular configuration.

The underlying reason for these problems is that some routines in Windows bypass DOS disk services (and associated disk utilities like Disk Manager and SWBIOS which change the way disk writes occur in normal operation) and write directly to disk through BIOS. Symptoms of the resulting discrepancy range from mild to severe, with file systems damaged and data lost.

Yet, in its general publicity and documentation for Windows, Microsoft has utterly failed to warn affected users that their programs and data are vulnerable to these problems. Nowhere in the Windows 3.0 manual or associated literature (such as the Hardware Compatibility List) are these limitations mentioned.

For example, the Windows 3.0 manual strongly encourages optimizing the hard disk interleave, which 'can drastically improve your system's speed.' But there is no warning about the dangers of using Disk Manager or other such programs which provide low-level formatting and interleave selection!

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NEXT MEETING

The next meeting of the Ottawa PC Users' Group will be held on September 26, 1990. Two guest speakers from Borland will talk about their products, concentrating on Paradox, Quattro Pro and Turbo C++. Don't forget your OPCUG ID card because there will be draws for prizes.

* * *

FROM THE EDITOR

Bonnie Carter

Hello everyone. I hope you all spend a pleasant and relaxing summer.

If for any reason you do not receive your Newsletter before a General Meeting, an announcement of the meeting and the Guest Speakers is published in the Notice Board of the Citizen the day before each meeting.

Thanks to Terry, Tim and Suzanne of Synersys for their presentation at the August meeting on Integrating Applications Software - The Electronic Carbon Copy, and congratulations to the five members who were winners of the draws for prizes.

Happy reading!

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The purpose of this message is to alert current and potential Windows users to these problems, and to provide an impetus for Microsoft to address this situation in a timely and effective manner.

INCOMPATIBILITY WITH DISK MANAGERS AND FORMATTERS

PROBLEM: The first type of difficulty occurs with 80386-based systems using a "permanent swap file" under Windows 3.0 in 386 enhanced mode and a non-Microsoft disk formatter such as Disk Manager (DM), SpeedStor or Vfeature. Many users have noted non-destructive system lockups and the inability to load and run certain programs. With the exception of very large hard disks, as noted below, no problems occur as long as Windows is not running in 386 Enhanced mode, or a permanent swap file is not in use.

WORKAROUND: Microsoft has published a workaround on CompuServe to address this problem. Briefly, two things must be done to avoid problems while using third-party disk formatters. Switch the permanent swap file to a temporary swap file and add the line **virtualhdirq=off** to the SYSTEM.INI file in the [386ENH] section.

NOTE: The temporary swap file is much slower than the permanent one, because the latter creates a block of contiguous disk space which is written to directly by Windows.

DESTRUCTION OF HDs WITH MORE THAN 1,024 CYLINDERS

PROBLEM: Windows (all versions), like DOS, only recognizes the first 1,024 cylinders of a hard disk. But, unlike most software, it can write directly to disk through BIOS. This is a major risk for larger hard drives, which may be using SWBIOS or similar software-based extenders to address cylinders beyond the 1,024th.

A mismatch between the DOS-level situation provided by SWBIOS and the BIOS-level situation encountered in a direct disk write can be fatal. One Windows 3.0 beta tester in Portland, Oregon recently had a Conner 150 MB drive trashed by Windows 3.0.

WORKAROUND: At present, there is no reliable workaround.

Some RLL and ESDI drive controllers support "sector translation" at the hardware level, making the drives they support appear to have no more than 1,024 cylinders. Use of or conversion to these controllers may avoid the problem. However, not all large MFM drives are RLL-compliant. In any event, reformatting hard disks is costly, tedious and error-prone.

> If you are unsure about the safety of your system, stop using Windows 3.0 immediately if you have a drive with more than 1,024 cylinders! Here is a partial list of these drives (number of cylinders in parentheses): Conner Hopi CP-30104 (1,522), CP-3204F (1,366); Stubby CP-4044 (1,104); Control Data 94186-383 (1,412), 94186-383H (1,224), 94186-442H (1,412); Fujitsu M2247E (1,243), M2248E (1,243), M2249E (1,243); Imprimis 94186-383 (1,412); 94186-383H (1,224), 94186-442H (1,412), 94196-766 (1,632), 94246-383 (1,747); Maxtor XT2085 (1,224), XT2190 (1,224), XT4380 (1,224), XT8760 (1,632); Micropolis 1551 (1,224), 1554 (1,224), 1555 (1,224), 1556 (1,224), 1557 (1,224), 1558 (1,224), 1653 (1,249), 1654 (1,249), 1663 (1,780), 1664 (1,780); Microscience HH-1090 (1,314), HH-1120 (1,314), HH-2160 (1,276); Miniscribe 3085 (1,170),3130 (1,250), 3180 (1,250), 9230E (1,224), 9380E (1,224), 9780E (1,661), 9000E (1,224); NEC D5655 (1,224), D5662 (1,224), D5682 (1,633); Priam 630 (1,224), V185 (1,166); Rodine RO5040 (1,224), RO5065 (1,224), RO5090 (1,224); Seagate Swift 94354-230 (1,272); Wren 94244-383 (1,747), 94246-180 (1,453), 94186 (1,412), 94186H (1,224), 94286-380 (1,747).

FURTHER INFORMATION

The two main sources of information for this message have been the Microsoft Windows forum on CompuServe and the Ontrack Systems BBS (612/937-0860). Ontrack is now intensively testing Disk Manager and Windows 3.0 and promises daily bulletins on their findings.

7 June 1990.

Fred Heutte, Sunlight Data Systems"

This may or may not be a valid claim. I thought that members of the Group interested in buying Windows 3.0 might want to be aware of it, should it be true. I have done nothing to validate this! This was taken from the Dr. Debug echo:

"I.S. Management Magazine this week is reporting that Windows 3.0 will corrupt data and fat tables on hard drives that are partitioned with anything other than MS-DOS 4.01's Fdisk. It seems that they used 4.01 as the standard during development and didn't bother to try it with any of the other disk partition software, like Disk Manager.

Ontrack, makers of Disk Manager, confirm that Windows 3.0 is incompatable with their product and finds it strange that MS did not bother to check to see if Windows 3.0 would work with the 8 million copies of Disk Manager that Ontrack has sold. Ontrack is working on a fix to allow Windows 3.0 to work with their product.

Drive manufacturers, who often bundle Disk Manager with their drives, have confirmed that they received a memo from Microsoft warning them of the incompatabilities, but Microsoft has evidently chosen not to tell the buying public about the problems.

When questioned about the problems, Microsoft confirmed that they had heard about problems, but that they could not comment until their team of software engineers could study the allegations.

Cordially,

Dave Mann."

Here is a verbatim reply that I received from MicroSoft Canada about the Windows 3.0/Fdisk situation. Their product support person encouraged me to disseminate this widely.

"In response to the articles in Information Week and other publications, regarding Ontrack's Disk Manager and other 3rd party disk-partitioning software, Microsoft has issued a positioning statement.

There are two separate issues with the Disk Manager and similar third party hard disk partitioning software; (1) the use of swapfile.exe on third-party partitioning schemes (to create a permanent swap file), and (2) the use of ROM BIOS extensions that support greater than 1023 cylinder disks.

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IS WINDOWS 3.0 A THREAT TO YOUR SYSTEM?

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The swapfile utility included with Windows 3.0 will refuse to create a permanent swapfile on disks with known incompatible partitioning schemes and non-512 byte sector sizes. This is automatic protection already built into the Windows environment. Swapfile does all the checking for you and won't let you mess up! Windows 3.0 works fine and you can use a temporary swapfile.

There is a problem with software ROM BIOS extensions that support > 1023 cylinders and using the 386 enhanced mode of Windows 3.0. The symptom? Windows 3.0 hangs while trying to boot into 386 enhanced mode.

There is no data loss or disk corruption associated with this problem... In addition, the various manufacturers of the software ROM BIOS extensions are working on updates to work more cleanly with Windows 3.0.

Despite the fact that the above situations are not associated with any data loss or disk corruption, the rumors continue to fly. We are actively tracking down each and every reported case. Should we identify any additional issues or problems, we will notify you. Cameron Stevens, Product Support, MicroSoft, Canada."

I have since read often that there are are configuration changes that can be incorporated into the Windows configuration files to get around the problems. Members are encouraged to call Microsoft if they are concerned. Use the OPCUG's special access code (2149) when using the toll-free service number 1-800-268-4781.

* * *

INPUT/OUTPUT USING ELECTRONIC FORMS

By John Whelan

Can we improve the man/machine interface, and thus the data coming into our systems, and conversely improve our output so that people will retain more of the information that we feed them?

Let's step away from computer systems for a moment and see where people have traditionally recorded their information. Successful magazines spend time and effort on design and layout of questionnaires. This requires the use of correct typefaces to create a given mood and give clues about what is being presented.

Can we can do this with a computer? Yes, but we still have a long way to go. WordPerfect has shown that PCs can produce high-quality outputs, such as this Newsletter, but it doesn't help with databases. Ventura allows you to zoom into an area and see the text more clearly.

FORMS PUBLISHING

I think the next major revolution in the PC is going to happen in forms publishing. The concept of paper forms is to take a screen image of the paper form and allow users to enter data into it for direct inclusion into a database. There are a few packages available already, such as Perform, Jetform and Formworx.

Decreases in the cost of lasers and operating system displays are combining with advances in software which used to only allow a forms expert to design a paper form with no attached data. Now, packages such as Windows 3.0 have given designers much more freedom in their use of typefaces on the screen. No longer are they stuck with 80-column MDA displays.

These packages are beginning to allow both screen inputs using a form image on the screen that looks identical to a paper image. Once you have filled in the form, you can print the complete form out on a laser printer. The data entered can be saved in a database file and nicely printed out.

Database files can be used to supply much of the data. By using the same form and obtaining the data from the database files, these packages also serve as powerful report writers on database files.

When used with Postscript, data can be printed with a carefully chosen font size of a particular typeface similar to those used in WordPerfect and Word. Laser printers revolutionized word processing by allowing the output to reach typeset standards.

PERFORM PRO

These new forms packages will revolutionize the database world. My favourite is Perform Pro. This package offers electronic signatures and very flexible capabilities in hooking into databases. Rumours are that other database hooks will follow, with Paradox mentioned as one of the targeted databases.

The package comes in two parts, the form designer and the forms filler. Once a form has been designed, there is a facility to "lock" the form so that no one can modify it. If you have a colour laser printer, the package offers graduated colour shading and colour control on the text.

Basic form design packages provide boxes that can be moved around. Using a mouse, you can draw or select a box and position it anywhere. Previously, the approach was to have hair lines that traced back to rulers on the top and side. Often a feature allowed you to snap to the nearest predefined small increment.

Perform Pro allows you to open up a window that shows you the exact position and size of the box while you move it. You can type in exact numbers into the position box so as to expand, contract or move the box to the precise location.

If you use an HP LaserJet, one of its drawbacks is in the limited number of sizes and typefaces available. Perform Pro now offers a wide variety of typefaces and sizes. Printing takes longer if it has to download the typeface beforehand. Doing it all transparently makes the product easy to use.

When printing graphics on a laser, speed has always been a problem. Perform can download separately the form and the data to the laser printer. HP LaserJets, Canon CaPs III and Postscript printers have always had this ability, but few packages have made use of it.

Perform offers different printing speeds. Rounded corners take up a lot of time to print, so, when in the fast mode, Perform ignores any boxes with rounded corners. By using the three speeds available, a designer can see where design trade-offs occur when printing a well laid out product.

To make life easy for the form filler, the designer can attach a help screen to each field. A menu setting allows the help feature to be displayed on the screen as each field is being filled in. If you don't like fancy graphics, turn on Fast Fill. The field will then only display the prompt.

I haven't mentioned combs, security features, such as verification of electronic signatures, if then else, type features, etc.

If you use databases, design forms or are interested in the paperless office, combine this with E-Mail... I think the next revolution is here.

* * *

BACK TO BASICS

By Harry Gross

WHILE .. WEND LOOPS

Having gone through the FOR .. NEXT loop structure, we come to the next one, the WHILE .. WEND. The difference between the two is that the former will do a sequence of operations a fixed number of times, starting at a certain value for a counter, say J, and continuing to a limit set for that counter, say K, at some fixed interval, say L. These values may be single precision or integer and proceed up or down.

On the other hand, WHILE .. WEND will stay in the loop until some condition is satisfied.

Consider the following:

```
100 WHILE A<>3
110  INPUT "Gimme a number ",A
120  IF A<>3 THEN PRINT "Gobble,
     Gobble"
130 WEND
140 END
```

Unlike the DO loop, there are no preset number of times for the loop. It continues until some condition is met, and could continue for an indefinite period.

It is possible to make a WHILE .. WEND act the same as a DO loop by the following:

```
100 J=1
110 K=100
120 L=3
130 N=J
140 WHILE N<=K
150   PRINT N, 3*N
160   N=N+L
170 WEND
```

And, like the DO loop, the counter, N has a final value greater than the upper limit.

As the loop goes through the procedure the first time, it does so with the counter N set to the value J. With each pass through the loop, the counter is incremented by the value L and compared with K. If it is equal to or greater than K, control passes to the statement after WEND.

The structure is useful for searching simple unsorted lists as in the following:

Suppose we have a list, say 100 items long, contained in the array A$[100,5], with A$[n,1] being a person's name and the other four fields containing other information such as address, phone, city and so on.

```
100 INPUT "Name Please",NA$
110 HIT=0: N=1
120 WHILE HIT=0
130 IF NA$=A$[N,1] THEN HIT=1
140 WEND
150 IF HIT=0 THEN PRINT "Name not in
    list"
160 IF HIT=1 THEN PRINT "Address"
    A$[N,2]
170  IF HIT=1  THEN PRINT  "City"
    A$[N,3]
180 IF HIT=1 THEN PRINT " H.Phone "
    A$[N,4]
190 IF HIT=1 THEN PRINT "B. Phone "
    A$[N,5]
200 END
```

Some of you out there may think that this is a bit overdone and that a GOTO would be simpler. That is true only for simple programs, but experience will show that code using as few GOTO's as possible is easier to read and maintain.

I have found the main use of this structure is in reading serial files from disc where the file length is unknown. We have not gone into files yet, but it is necessary to include one function here, EOF(File). Once a file has been opened, this will return a value of -1 when the end is reached, and 0 elsewhere.

```
100 ' open some file or other as #1
110 WHILE NOT EOF(1)
120   INPUT #1,A$
130   PRINT A$
140 WEND
```

This is probably the most common use of this structure, reading in files, and avoiding errors caused by trying to read past the end.

This is then a good time to start on files. There are two main data types used, with a few variations on binary files. For now, we will confine our discussion to serial files.

As the name implies, these files must be read through from the start to the end. There is no simple convenient way to get something out of the middle, as may be done with a random access file. In order to get at it, it must be opened, and when we are done, it must be closed, or else all kinds of messy things will happen.

The file designation may have up to four parts:

```
      Drive - C:\
SubDirectory - GIFT\
       Name - LIST
  Extension - DEC
```

Put it all together and we have C:\GIFT\LIST.DEC.

This lets the program now exactly where to look. So to start things rolling:

```
100 OPEN "C:\GIFT\LIST.DEC" FOR
OUTPUT AS #1
110 WHILE N$<>"q"
110   INPUT "Name ",N$
120   INPUT "Gift " G$
130   WRITE #1,N$,Q$
140 WEND
150 CLOSE #1
```

Line 100 opens the file for us, and after that, all references to it are by the assigned number. As long as we do not type in <q>, the program will prompt us for a name and gift. Line 130 will write a sequence of lines to disc as follows:

```
"John", "Toy train"
"Kathy ", "GI Joe"
"q",""
```

If line 100 was:

```
PRINT #1,N$,Q$
```

the disc file would look like this:

```
John    Toy train
Kathy   GI Joe
        q
```

To read the file later on:

```
100 OPEN "C:\GIFT\LIST.DEC" FOR
INPUT AS #1
110 WHILE NOT EOF(1)
110   INPUT #1, N$, G$
130   PRINT "Name - " N$, "Gift - " Q$
140 WEND
150 CLOSE #1
```

That is about all there is to the WHILE .. WEND loop. Next time around, the discussion will be on data types, such integer, single and double precision, and strings.

* * *

WORDPERFECT NEWS

By Bonnie Carter

The latest interim release of WordPerfect 5.1 will be released on June 29, 1990.

Also, if you find sometimes that your machine hangs while using WordPerfect, the problem may be your Speller diskette. If this is the case, call the "features" section of the WordPerfect Corporation (1-800-541-5096), and they will send you a replacement for it.

* * *

COMPUTER TRANSLATIONS

By Jean Fortier

In a series of articles, we will deal with the French translation of computer terms and expressions which often create difficulties for members who use computer terminology in both official languages.

A member of the OPCUG gave me a list of English computer terms that he was having problems with and asked if I could provide him with the proper French equivalent for each word.

Here is an excerpt from this list:

Alias	- pseudonyme
Arrow keys	- touches flèche
Audit trail	- vérification à rebours
Buffer memory	- mémoire tampon
Carrier, data	- support d'information
Configuration	- configuration
Enable, to	- valider
Overwrite, to	- écraser
Pack, to	- condenser
Path, data	- chemin de données
Read-only file	- fichier à consultation seule
Root directory	- répertoire de base
Setup	- montage
Subdirectory	- sous-répertoire
Time-out	- délai (d'attente)

* * *

CODE BREAKING WITH YOUR PC

By Paul Cooper

Have you considered the challenge and fun of using your PC to break codes and ciphers? If the idea appeals to you, you can get the coded messages from the American Cryptogram Association (ACA).

I found out about ACA in an article in "Practical Communications". Its computer section offers a lively exchange of ideas, suggestions for programs to use and useful approaches to code breaking.

The ACA caters to a wide range of abilities. Their simplest codes are equivalent to brain teasers one finds in newspapers. Simple substitution ciphers are texts full of obscure words, preferably not using the letter "e", just to make things a little more difficult! At the other end of the scale are ciphers for serious security applications. The magazine carries ciphers hidden in mathematical puzzles, texts in foreign languages and messages hidden in graphical designs. Many of these can be deciphered with a number of computer programs published by the ACA.

The ACA has existed since the 1930s. It has nearly 800 members in 25 countries. Many of the older members were codebreakers in World War II. Its bi-monthly magazine, "The Cryptogram", contains articles, the computer column, book reviews and six puzzle departments. I regularly read the computer column and the book reviews.

An annual subscription costs $15 (US) and should be sent to "ACA Treasurer, 18789 West Hickory Street, Mundelein IL, 60060 USA". For further information about the ACA, give me a call at 821-2167.

* * *

THE DOS ENVIRONMENT

(Continued from the August Newsletter)

By Robert Parkinson

Well, if we can't automatically expand the Master Environment as we go, what can we do? There are a few courses open to us. Each has it's advantages and disadvantages.

THE SHELL STATEMENT

You can readily increase the allocated size of the Master Environment Block above 160 bytes by putting a SHELL statement in your CONFIG.SYS file. In essence, it's use requires you to put a line into your CONFIG.SYS file, such as:
SHELL=C:\DOS\COMMAND.COM /E:1024 /P
where /E:1024 will increase your environment size to 1024 bytes. This example assumes that you keep COMMAND.COM in a subdirectory DOS on your C hard drive. If not, change it accordingly.

The /P (for permanent) switch tells DOS to ignore any EXIT command and also to run your AUTOEXEC.BAT file, if found, after COMMAND.COM is loaded. However, if you do not choose to use the SHELL command, the AUTOEXEC.BAT file will still run automatically on system bootup.

For those who are interested, there is also an undocumented /D switch that, when used in conjunction with /P, will make COMMAND.COM permanent, but will not run the AUTOEXEC.BAT file. One point to remember here is that all of these various parameters (switches) are integral to COMMAND.COM. They are not part of the actual SHELL statement. They would not necessarily be valid for a substitute command processor.

The /E (for environment) parameter was only introduced in DOS 3.1, the maximum size in that version being limited to 62 paragraphs (992 bytes). The /E:nnnn required that you enter the actual number of 16-byte paragraphs desired, necessitating some calculation on your part. Also that version would not allow the /E switch to be used with secondary copies of COMMAND.COM.

DOS 3.2 and later versions allow you to expand your environment to 32,768 bytes, although even the greatest power user couldn't fill that space. You now specify the actual number of bytes that you wish and DOS will automatically round it off to the next highest 16-byte paragraph value.

Well, this seems simple enough, in that you now have an extra 864 bytes of environment space to play with. This is ample for normal usage, even though it does cost you a bit more of your precious RAM.

Unfortunately there is still one problem. This increased space applies only to the master copy of the environment. What about invoking a secondary command processor, via the COMMAND command from the DOS prompt or in a batch file, or else by "shelling to DOS" with WordPerfect's CTRL-F1, dBASE's Run, Telix's Alt-J, BASIC's Shell, etc.?

Sadly, in the case of the shell, DOS does not automatically give the new "active copy" of the environment the expanded space (i.e. 1024 bytes) that you specified in the SHELL statement, but rather gives it either the built-in default space of 160 bytes or the actual space occupied by the environment strings (rounded up to the next 16-byte paragraph boundary), whichever is the greater.

If you are deliberately calling up a secondary command processor from the DOS prompt or from a batch file, you are in full control. As long as you do not then load another program permanently into memory (say a TSR), you can expand the environment size by entering more variables, either from the DOS command line or from a batch file. There is no limit except that of total available memory.

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THE DOS ENVIRONMENT

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If you think that you might be constrained later, you can use the same syntax as in the SHELL statement referred to earlier to increase the allocated space.

For example, in your batch file just enter COMMAND /E:1024, and you will find that you now have 1024 bytes of space in the "active copy" of the environment.

For batch file use, if you are using DOS 3.3 or above, use the CALL command wherever possible in lieu of COMMAND to branch to another batch file and return. CALL does not invoke a secondary command processor and therefore doesn't need these expedients.

Since CALL is not a "child" process, it also has another very valuable benefit. Any action taken within that subordinate batch file can alter the DOS Master Environment Block. However, CALL is not suitable in every case, as it is designed simply to execute a single process, in this case invoking one batch file from another, and then returning automatically to the calling program. It does not have the full versatility of a secondary command processor.

We can increase our environment size when we are in control, but what happens when we shell to DOS from an application program? Here, there is good news and bad news. No program that I know of allows you to specify a size for the environment when you shell to DOS from within it. But no matter! The good news is that, as with invoking a shell from the DOS command line, when you shell to DOS from an application program you will, if you are using DOS 3.2 or later, normally find no limit on the increase in the "active copy" of the environment.

The bad news is that this is not always true. I have found that when using a fairly straightforward procedure (e.g. calling an application program and then, while in that program, shelling to DOS), all works well with no restrictions on the increase in size of the "active copy" of the environment.

This will normally be true if you add additional variables from the command line, but not if you try to add variables from a batch file, depending on whether or not DOS was able to load the batch file "program copy" of the environment into an unused memory block lower than the current "active copy." More serious problems occur if you initially use a DOS shell-type program, such as an executable menu program, Norton Commander, XTree Pro, etc., execute an application program from within that, and then shell to DOS from within that application.

Although each of these menu programs or managers are different, you may well be running under, not a secondary, but a tertiary command processor. While each will free up as much memory as possible as you shell" out of it, there will be a number of pieces of core code and data that must remain in active memory. Your memory map becomes a very cluttered scene indeed.

Under these circumstances, do not be too surprised if you see an "out of environment space" message. I use Marshall Magee's AUTOMENU. If I call a program, say WordPerfect, from within AUTOMENU and then shell to DOS from it, I encounter environmental limitations. I can usually increase the size of the "active copy" beyond it's default limit by entering new variables from the shell command line, but I can't do so from a batch file.

While you may never contemplate pushing the capabilities of the DOS environment to these extremes, it is helpful to be aware of the problems. There are some fixes that help. I'll discuss them next.

DUMMY ENVIRONMENTAL VARIABLES

The /E parameter will take care of most instances of a constrained environment. Remembering that the "active copy" of the environment of a secondary COMMAND.COM is now placed above the program code in memory, if we shell to DOS from an application program, there will normally be no limit placed on the environment size. Does this mean that we have no size problems left? Not quite true!

There are three times when you may see an "out of environment space" message:

- When you load a TSR into memory while in the shell, thus limiting the expansion of the "active" environment space. (This is definitely NOT a recommended practice, as it tends to freeze some or all of the memory allocated to the program, even after the program terminates and, in the worst case, may cause a system crash as the program exits.), or
- You are using a menu program to call up your application programs and encounter these problems when shelling to DOS from that application, or
- You use DOS 3.1 or an earlier version.

One awkward way of coping is to expand your "active copy" environment space with a couple of lengthy dummy variables before calling up the application and then deleting them when you shell to DOS, thus gaining some environment working space.

You can set these dummy variables from your AUTOEXEC.BAT or in the batch file that calls up the specific application. The latter has the advantage of not using Master Environment Block space until necessary, but it does require that you initially set your default size, using SHELL, large enough to later hold the dummy variables.

For example, in the batch file, just before you invoke the actual application program, you could enter:

```
SET DUMMY1=AAAAAAAAA
SET DUMMY2=BBBBBBBBBB
```

Then, if you need space in the "active copy" of the environment, delete them when you are actually in the shell with:

```
SET DUMMY1=
SET DUMMY2=
```

There is a slightly easier way to gain 100 extra bytes of environment space. Instead of the first entries above, enter:

```
FOR %%Z IN (A B C D E F G H I J) DO
SET %%Z=AAAAAAAAAAA
```

Then, when in the shell, and also before the batch file terminates, enter:

```
FOR %%Z IN (A B C D E F G H I J) DO
SET %%Z=
```

These fixes give you some working space, but are awkward at best.

In lieu of these convoluted batch file commands, a far better way of expanding the "active copy" of the environment before you shell to DOS is to use SUPERSET. The latest version (1.53) has a parameter (@FIL) which will fill your environment to it's default limit with arbitrary strings.

After shelling to DOS, enter SUPERSET !FILL*= to delete these filler strings and regain the full default space.

In these examples, you have only deleted the dummy variables in the "active copy", not in the Master Environment Block. To do this, you must repeat the last syntax for any one of the above, after exiting the application program, but before the batch file terminates. You need these particular remedies only in the three situations that I mentioned.

(To be continued in the October Newsletter)

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From the Editor: John Whelan provides some in-depth background on defragging, and Chris Taylor gives strategies for defragmentation and backing up hard disks. The interest shown in backing up spurred the development of "JOHNBACK".

HARD DISK UTILITIES INCLUDING DEFRAGGERS

By John Whelan

Hard Disk Utilities: a basic set of utilities which serve to unerase a file; avoid data loss due to hard disk failure, or to be able to recover from a hard disk failure; lay files out in an optimum way to reduce the time taken to load data; reduce hard disk wear, and back up data.

No one package covers of all these in the best possible manner. "Advanced Disk Technician" is useful for avoiding hard disk problems and recovering data from a problem disk. One of my 32Mb drives was losing clusters and formatting up at 19 Mb. 'Disk tech' brought it back to 32 Mb. It is also useful during arguments with suppliers about whether or not a hard disk is OK during its warranty period.

My favourite unerase utility is "Norton Advanced", but PC Tools and Mace are also good. Norton has served me well, and I like the Norton Integrator interface. By the time PC Tools has been loaded as a TSR, you're lucky if there is room left to run WordPerfect, and I don't like having it modifing my autoexec.bat file.

FRAGMENTATION

DOS disk files are laid out in cluster sizes ranging from 512 bytes on a 1.2 meg floppy to 8K, 16K or more on large disk partition chunks. If the first chunk is on track one, the second on track 402, the third on track 92, etc., the head has to move back and forth when reading the file, subjecting it to wear and tear.

To read two adjacent chunks on the same track takes about a millisecond (ms). To move from one track to the next takes about 10 ms and from track 1 to track 604 about 87 ms (plus 8 ms average rotational to find the right bit of track for the next chunk). You begin to see why defragging or defragmentation might be worth having.

Let's assume you have a brand new disk drive just formatted, and you have installed WordPerfect. When you first enter WordPerfect, you read in 150 2k blocks (for 300k of the program). The program file is contiguous. All the blocks are laid out on the disk one after the other.

Next you use the spelling checker. You read in 100 2k blocks for the speller and 180 2k blocks for the dictionary. All these reads have been on contiguous files, so no fragmentation is apparent. Now bring in the thesaurus -- again, 100 2k blocks for the program and 180 2k blocks for the data.

Next you edit a few pages and save the file, taking 4k or two 2k blocks. Because the drive is new, all the empty space is together, so the blocks are saved together.

DOS 3.3 keeps track of the disk drive and writes new files to areas where no files have been for the longest period where possible. This improvement to DOS was added in order to help undelete files.

Three months later, you are on the same drive with the same programs. The program files haven't moved, so when you use the system now, fragmentation doesn't affect them. When you read a document in, however, it might be split into two seperate areas on the disk as it grows larger. This slows things down a bit, but you only read in a few 2K blocks for the document, even if it is fragmented.

But, remember all the program blocks, 100 here, 180 there? They are still not fragmented. That is why I say it is not necessary to defragment your hard disk more often than every few months.

Let's assume you load a new version of WordPerfect a few months later. Things can get really messy. If the program files get fragmented because the available space is already scattered across the disk, things can slow down. Then you do need a defragger.

DEFRAGMENTATION

All defragmentation programs work the same. They pick up bits of files scattered across the disk and put them together. Fasttrax comes with Maketrax which allows you to select the files you use most often. It places these close to the FAT (File Allocation Table). When you access a file, you must read the FAT in order to know where to find the file.

Put files that you use often near the FAT. The disk heads won't have to move as far, there will be less wear and tear on the disk, and you will have faster access times. Also, if you can arrange the file to fit into a a single track, then no track-to-track access is involved and the disk-access time becomes even faster.

Some public domain defraggers work, but seem to move the contents of the hard disk randomly around until the required order is turned up. These can really hammer your hard drive for an hour or two.

If you have large amounts of changing data but stable program files, load your program files onto your hard drive after reformatting the drive and then load the data files. This way, the programs are not fragmented. The data file scatter doesn't matter as much anyway.

Defraggers could be improved. Look at FastTrax. I tested it by pulling the power cord out on four seperate occasions while defragging and lived to tell the tale. It is also good at laying files out on the drive.

Have you tried pulling the power cord out while Compress or Mace is running? Don't try it! It will usually scramble your hard disk. Only with Fasttrax is it "safe", and even Fasttrax doesn't recommend the practice. It's a gamble. Will there be a power outage while you are running a defragger? PC Tools doesn't warn you that Compress is a defragger, let alone what can happen if you get a power outage.

DEFRAGGING STRATEGIES

By Chris Taylor

I recommend doing backups right before defragging, because it prevents the possible loss of everything if the defragging fails. Some defraggers keep the entire FAT in memory during defragging but if you lose power during the process, you lose EVERYTHING.

Backing up first allows you to restore all your files. Your backup set does not use more disks by backing up files prior to defragging. Fragmented files have their parts over various areas of the hard disk.

When you add or delete files, directories don't shrink. Defraggers usually re-write the directory to remove references to deleted files. You may notice a few extra K of hard disk space, but your backup set will be exactly the same size. And we all do regular backups, right?

A backup set needs a bootable floppy containing programs to recover from disaster, such as an editor, a backup program, any utilities you may need (perhaps to reformat your hard disk), a copy of autoexec.bat and config.sys, etc.

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