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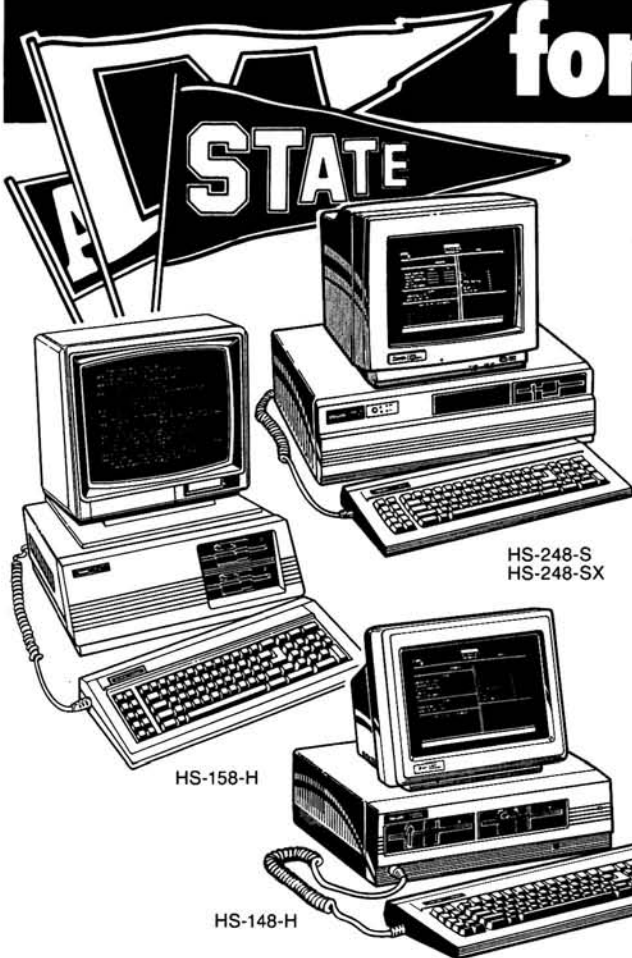
Volume 8, Issue 9 • September 1987

P/N 885-2092 Issue 92

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HUG's New Address And
Mini-Contest. See Page 7.



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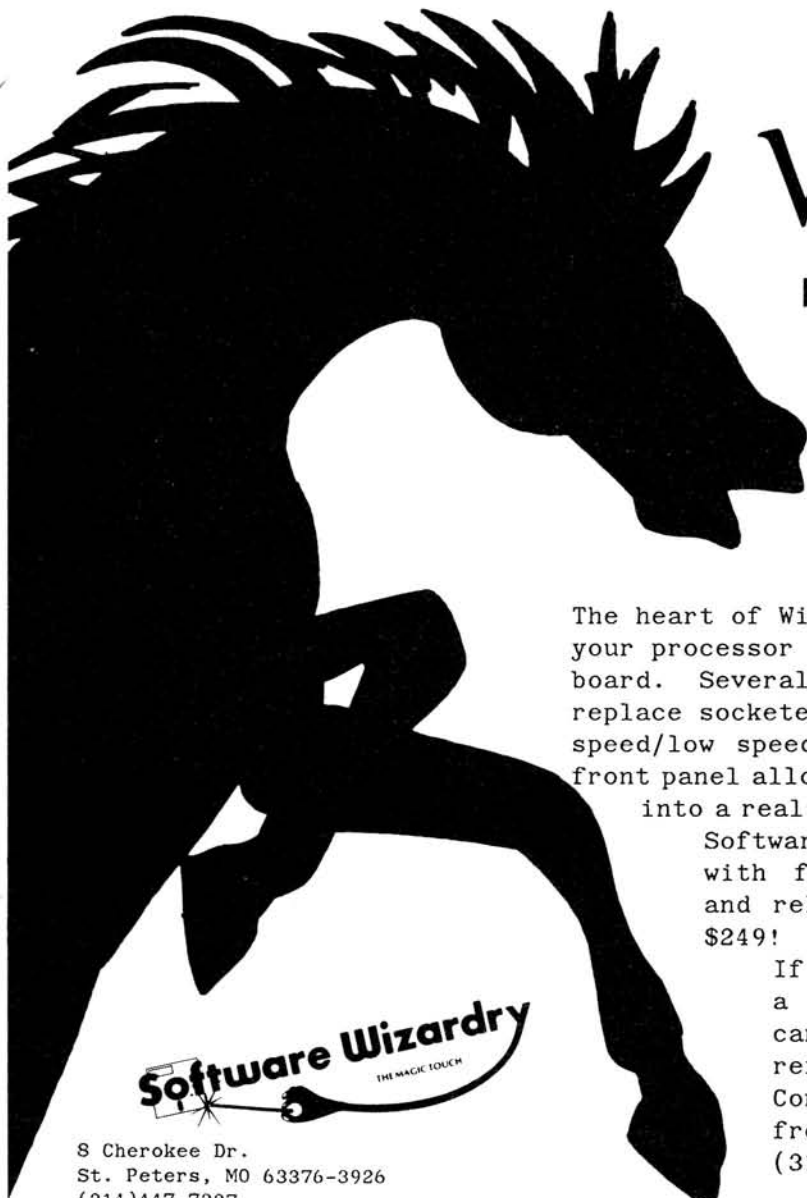
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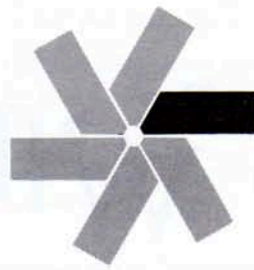
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On The Cover: Among the many disks that you can count for our Mini-Contest is a product called "Window-DOS" by WindowDOS Associates. Bill Adney talks about this in his series, "The Leading Edge", on Page 31. Photo by Jim Buszkiewicz.

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FINAL Z-100 SOFTWARE CLOSE OUT

Zenith packages with software, manuals and registration cards for the original Z-100 computer series (not for the IBM compatibles).

PART NUMBER	DESCRIPTION	LIST PRICE	SALE PRICE
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CD-463-2	Condor File Manager	\$299.00	\$10.00
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MS-253-1	Microsoft BASIC-80 (8-bit)	\$175.00	\$10.00
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HUG's Moving



(Not Really!)

It hardly seems like three months have gone by since the kids were just getting out of school for summer vacation. How time does fly!

As of September 1, 1987, ALL PHONE ORDERS FOR HUG SOFTWARE SHOULD BE CALLED IN DIRECTLY TO HUG AT (616) 982-3838. Mail orders and all written correspondence should be sent to our NEW address: Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217. The Heath Parts department will no longer be taking HUG part orders. These changes should enable us to process your orders more efficiently.

During the first week in July, I had the opportunity to hold a conference call with about 30 members of the Toledo Heath Users' Group during one of their meetings. The call lasted about one hour, and during that time I made a few beginning comments, but mostly answered questions from the floor about anything and everything. I enjoyed it because it gave me a chance to see what a typical local group was up to. The point is, if your club is having a hard time coming up with things to do during meetings, they might consider a similar conference call. All I ask, is that an appointment be made 4 to 5 weeks in advance of the actual meeting date. Give me a call at (616) 982-3837 if you have questions, or want more details.

During my conference call with THUG, one of the questions I was asked, was why we haven't held any more contests lately. I really didn't have a good answer other than our last contest (about 3 years ago) re-

ceived poor response. So I figure, ok, let's try again. This contest is open to current HUG members, and you don't even have to know how to program (although it might help) to enter it! All you have to do is count the BLACK DISKS on this month's front cover, and send me your answer on a postcard. See, nothin' to it! I can give you a small hint. Those disks are new DSDD disks from Dyan and, there's more than one, and less than 1000 pictured there. Postcard entries must be postmarked by midnight October 31st, 1987. Ties will be broken by a random drawing. Now, what are you going to win for guessing correctly? Why, all those new blank disks (jackets included), of course! Second and third place winners will be those entries whose guess comes the closest to the actual count, or drawn randomly in case of ties. The second place prize winner will receive a copy of Pat Swayne's new HEPCAT program (p/n 885-3045-37), and the third place prize winner, a copy of HADES (p/n 885-3040-37). Only one guess per postcard will be allowed. Employees and staff members of HUG/Heath/Zenith and their families are ineligible.

If you missed last month's archeological find, we still have a good, but dwindling supply of new 8-bit software for sale at unheard-of prices. This is what we have available:

OS-63-2 CP/M-86 For the H/Z-100 (runs standard CP/M programs)	\$25
HOS-8917-2 CP/M-80 (Hard Sector'd CP/M for H-8's, H/Z-89/90's)	\$30
HMS-837-4 MicroSoft Basic Compiler for CP/M	\$25
HMS-837-52 MicroSoft Macro 80 Assembler for CP/M	\$25
HOS-817-1 HDOS 2.0 (Documentation good for 3.0)	\$25

Although this software is still new in the box, the only guarantee we can supply, is that the disk itself is readable. The version of CP/M-86 we're selling, was the original version sold by Heath for the H/Z-100, and will also run standard CP/M programs, as well as CP/M-86 programs. All the MicroSoft software will run on any Heath/Zenith computer (H-8, H/Z-89/90, H/Z-100), which can run standard CP/M programs. These products CAN ONLY BE ORDERED FROM US HERE AT HUG by calling Margaret Bacon at (616) 982-3463, or from the HUGPBBS bulletin board (if you're registered) at (616) 982-3956.

-Jim Buszkiewicz
HUG Managing Editor



BUGGIN' HUG

OK, UCI! You Got It!

Dear HUG:

Just like Charles E. Wiley (REMark, November '86: An injustice has been done), I would like to commend UCI for the good work done with the EasyPC, which is finally a very good IBM emulator. I know what I am talking about, for I first had two versions of the Gemini board before, without any result. I finally got the only decent explanation from guess who? . . . Yes! The UCI technician, who told me that the way the Gemini Technology people were using the buss S-100 would explain why the UCI RAM board I had was incompatible with the Gemini board.

Thanks to Bill's understanding (formerly Heathkit Electronics Center in Towson, Baltimore), I got in exchange the EasyPC board. It worked the very first moment I managed to install it properly, although various programs like ENERGRAPHICS, LOTUS 123 and a few others would not boot properly.

Following very closely any comment relative to the EasyPC, I grabbed all the suggestions or explanations I could get in REMark. Finally, Charles E. Wiley's comments helped me bring the last modifications that made the EasyPC really functional. The only bug I found up to now is concerning version 2.5 of DATA EASE (version 2.12 works fine). I suspect an address problem. Since, I have installed two extra 96tpi drives (sold half price by JAMECO, CA) using two double stroke triple switches to connect them to the only two sets of power supply wires. I then can combine one 48tpi to a 96tpi drive, or use 2x48tpi, or 2x96tpi at request, thanks to the UCI utilities disks (\$50) which contains all kinds of very useful programs replacing previously problematical utilities. With two 96tpi, I can use large programs like AUTOCAD or SPSS, which are sold in hard disk versions only. For I have 728K of space on each diskette.

I wish good luck to other H/Z-100 owners.

Lucien Laforest
579, rue Boisjoli
Sherbrooke, Quebec J1J 3E8

Problems With The H-89-37 Controller

Dear HUG:

Has anyone experienced any problems with the H-89-37 soft sector disk controller? This is the weakest and the least reliable part of my H-89.

I cannot SYSGEN after INIT (in double density) on HDOS: I receive a comment that the disk should be INIT!!! The FORMAT on CP/M works only in single-density. I get the "unable to format this disk" if I try to format in double-density. Of course, the Extended formatting does not work!

I started to read the information on H-89-37 and thought that the J3 jumper (pre-compensation) should be out (or in position 0). What is the status of the pre-compensation using the Tandom 96 tpi and Siemens 48 tpi from the soft sector disk controller? I checked the 3 soft sector disks.

I also cannot use the MCS communication program from HUG on my company main frame: They use a lot of ESC codes. I disassembled the MCS and found nothing restricting to pass the code. It seems that the direct cursor sequence does not react properly. I run the terminal section of the

H-89 with the main frame and everything works fine.

Finally, what is the cheapest way to use electronic mail like HUGPBBS from Canada to access other users of Heath computers? Is there an equivalent in Canada?

Roger F. Dupuis, P.Eng
978 Francis
Longueuil, P. Quebec
Canada J4J 1E4

Cauzin Softstrips

Dear Mr. Damato:

Thank you for your letter of March 16, 1987, regarding my letter in REMark magazine about the Cauzin strip reading system. I am very glad to hear that there is no royalty payment required for the publishing of Softstrips(tm) in magazines. This is quite at odds with the implications of your statement in the documentation that came with my reader. There you seemed to say that any commercial use of strips required permission from you and payment of a fee. Since publication in a magazine is certainly a commercial use, I took that to mean you wanted royalties to publish strips. I thought at the time that that was a dreadful self-defeating policy that would certainly pre-

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judice publishers against you. *Please*, add a paragraph in your documentation explaining your actual policy more clearly. Your explanation in your letter sounds quite reasonable to me. Will you ever release the photographic technology itself so that magazines can do their own (it would certainly help with deadlines)?

I find your "advantage" of strips which are more secure than floppies around paper clips, staples, and coffee to be weak in light of my experience. We have made a simple rule around my office that no staples or paper clips are to be used around floppies at all. We use Scotch tape and Post-it notes. We have never experienced an inconvenience because of this. Paper clipping or stapling a Softstrip can ruin it too, if you crease the paper over the actual strip. As for spills, I can't say about coffee, as I don't drink the evil brew myself, however, I can say that Pepsi destroys a Softstrip as easily as it does a floppy, either by actually smearing the ink or wrinkling the paper. As we have never experienced an actual spill (the Pepsi was a test I made for an article I wrote for Sextant that was never published), I can't say that the spill-proofing is much of an advantage. As for airports, well, sigh! I don't get to travel much, so there is no advantage there for me. However, I do know that simply requesting that your briefcase be hand inspected is almost always complied with and you do not have to take Draconian measures to protect film and/or floppies. This is not true in Russia, I am told. However, the possession of either floppies or strips there presents other problems.

I applaud your introduction of the IBM-H.P. Laserjet stripper printing program. I

hope that it does a better job than the Epson based one. I plan to purchase one of the laser programs and will include a Softstrip if I ever send any program to a magazine again. Perhaps that will encourage publication of strips.

Finally, I wish to repeat an idea that I sent to you some time ago, that you expand your newsletter to an actual magazine and publish several public domain programs each month. That would do a great deal to highlight what I still think is the main advantage of your system, downloading free software from the printed page of a magazine.

Thank you for your time.

Yours truly,

William G. Nabor
27172 Huerta Street
Mission Viejo, CA 92692

Answers Regarding Super-Cheapcalc

Dear HUG:

I have received many letters regarding my article and program Super-Cheapcalc. Some have a question regarding whether the program will be included or not in the HUG Library. I really don't know, and so I did not answer the question. (*Ed: Probably not.*)

On the bugs department, I discovered a small one in Super-Cheapcalc. It is a poor handling of an input to the program. Line 2080 should be amended as follows:

```
2080 PRINT CON$;:LINE INPUT "FILE NAME  
TO SAVE = ";A$:IF A$=""  
THEN GOSUB 2220:GOTO 1390
```

The conditional statement is a trap to exit appropriately in case the input is a carriage

return without name. Otherwise, the program returns an irrecoverable error.

Regarding the third part of the article published in Issue 5, there are many additional symbols left over by the gremlins all around the article. Those are Spellbinder formatting characters due to my poor debugging of the manuscript.

At the third line of the article, delete the ".C" which to Spellbinder means "center the following string." Delete all the "^^" (two consecutive carets) included all around the article. Finally, at page 39, the geographical coordinates should read:

10°30'0" North,
65°30'0" West,
10°20'30" North,
10°20'30" West.

I'm really sorry for all the inconveniences this may have caused in understanding the article.

Regards,

Luis E. Suarez
Apartado 66994
Caracas 1061-A
VENEZUELA

Can't Use It Until They're Fixed

Dear HUG:

Several weeks ago I purchased a copy of WINDOWS (Microsoft vers. 1.03, Zenith Vers. 1.00) for my Z-100 system (p/n MS-3063-30, s/n 000-00060587-6-01). I am having several problems with it, and until they're fixed I won't be able to use it as planned.

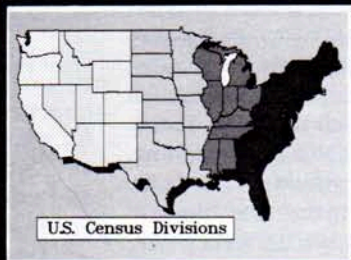
Mine is a Z-110 low profile color system upgraded to 8 MHz and 768K RAM with

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HOGWARE COMPANY
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the HA-108 kit. I'm running ZDS MS-DOS 3.1 (MSDOS.SYS vers.3.10 and IO.SYS 3.00), and the system monitor ROM is version 2.9. The 8088-2 has been replaced by a recent 8 MHz V20. My printer on J3 is an Epson MS-80 with Graftrax. My modem on J2 is a Courier 2400. The (non-WINDOWS) system printer is a Diablo 1620 on J1. I'm running without a mouse (guess why!) The system is equipped with the original Z-217/10.7 Mbyte winchester combination, plus an additional ST-225 half-height winchester installed in place of the original 5" floppy. Two each 5" (360K) and 8" (1.2M) floppy drives in external enclosures are driven from the Z-207.

With so much hard disk space, I use SUBST liberally to create many logical drives. Lately, I've been using physical drives A:-F:, logical drives G:-H: and J:-X:, and a 166K VDISK drive I: (with COMMAND.COM, my WordStar overlays, and a winchester shutdown batch file). The WINDOWS display doesn't like this many drives. If WINDOWS sees more than a certain total number of physical and logical drives (20, I think) on initialization, it suffers from what can only be described as "over-scan". The leftmost 2-3 columns in the MS-DOS directory display, for example, are cropped off at the edge of the screen. While this bug does not seem to affect any functions, it should be fixed since WINDOWS is such a visually oriented environment.

My first and most critical problem is that HyperACCESS (vers. 3.10) does not work at all under the Z-100 version despite the fact that it was written to run under multi-tasking environments, such as WINDOWS (Hilgraeve supplies the required PIF files), DoubleDOS and TopView. I wrote to Hilgraeve about this, and Matt Gray says he's confirmed the problem with a third party who has been doing some testing for them. The results, he says, are "puzzling". Matt believes the source is WINDOWS itself (see copy of letter below). This is a very serious problem since I do a great deal of telecommunications work, and I must be able to modem download in background while working spreadsheets and word processing in foreground mode.

Second, when I try to print a second copy of a document using the PRINT option of WRITE.EXE (acquired from another source — no thanks to ZDS marketing for not including it), my system blows up with a wild interrupt. After just one printout on the Epson (configured as LPT1: on J3), I have to cold boot to do another. The problem seems to be that the SPOOLER never seems to complete its job. I've tried elim-

inating the HBPS TSR routine with no effect. The printer symbol remains on in the icon area, and "~xxxxxxx.xxx" files collect in the WINDOWS directory. I have to delete them at the MS-DOS level before re-entering WINDOWS to print another copy. I noticed another minor problem with WRITE when trying to close it after initiating a print. WINDOWS went into an endless loop prompting me to place the WRITE disk in drive A:. It shouldn't ask if you're running on a hard disk, right? Cold boot time again.

Third, the WordStar 3.31 program information file (WS331.PIF) contains a minor bug which causes WordStar to lose its programmable keys whenever it is placed into background status. In fact, the bug is that WordStar can be placed in background status in the first place. WS331.PIF must be modified with PIFEDIT to turn the "modifies keyboard" entry on (true). WordStar can no longer be placed in background status when this is done, but all function keys will operate exactly as configured with WINSTALL.

I've also found that Barry Watzman's PERKS (vers. 2.07) causes the WINDOWS system to blow up, requiring a cold boot if the activation key is changed from the original SHIFT-BREAK combination. This is to be expected since both PERKS and WINDOWS remap the keyboard. I'd gotten sort of used to using a single keystroke to bring down PERKS' menu, but the original works just as well and doesn't bother WINDOWS.

Finally, I was quite disappointed with the documentation provided with the Z-100 version of WINDOWS. It certainly wasn't up to your usual standard of clarity and completeness. For a very experienced Z-100 user like me, I found it confusing; for an ordinary user it must be confounding.

As I said in a recent letter to HUG, I cannot recommend the present release of WINDOWS to anyone wanting to use it in any serious business applications. In fairness, it's less buggy than Barry Watzman's initial release of PERKS, which then cost almost exactly the same as WINDOWS does now. I had faith that Barry would fix any bugs, and in fact, he did in a matter of weeks. Will ZDS do the same for WINDOWS? If you can't get it to work with HyperACCESS (both are listed in Heath catalogs and are thus presumed to be compatible), I will be asking for a full refund of the purchase price.

Sincerely,

Robert G. Savage
112 Lakeland Hills Drive
Belleville, IL 62221-1321

Letter To Robert Savage

Dear Mr. Savage:

Indeed, problems arise when you attempt to run HyperACCESS on the Z-100 with Windows.

We don't have Windows for our Z-100 yet, but we've had an experienced HyperACCESS user who had also reported problems do some testing for us. The results are puzzling. Zenith's implementation of Windows doesn't seem to be working correctly, in some respects.

We plan to speak to Zenith about this and we hope to do some testing ourselves with Z-100 Windows, but I can't be sure when. As you might suspect, as Zenith has shifted its emphasis to PC-compatibles, Hilgraeve has had to do the same, but we will try to fit Z-100 maintenance in when time allows.

You might check back with us in a few months to see if there's a fix available. Since we suspect the problem lies with Z-100 Windows itself, it may be that a solution won't be available until Zenith's next revision to Windows.

Thank you for pointing out this problem. Some time in the future, it's possible that we'll mail out offers for updates to Z-100 HyperACCESS — if and when that happens, you may return a copy of this letter to us and we'll send you the update for free.

Sincerely,

Matthew Gray
Marketing Director
Hilgraeve Inc.
P.O. Box 941
Monroe, MI 48161

Program For 64 Colors On The Z-100

Dear HUG:

I have enjoyed the 8 colors on my Z-110 for a couple of years now, but there has always been a plan forming in my head to add more color capability. I decided recently that to keep the Z-100 series alive and healthy for a few more years that projects like this, if possible, should be pursued. So I recently took some time to devote to the project. I now have working on my Z-110, not just 8 colors, but 64 colors. These are not mixed colors, but actually 64 colors available for any given

pixel. I have every video mode the Z-100 is capable of and the modification does not slow normal video processing at all as it is transparent until used. The 64 colors per pixel can be accessed using any existing graphics routines in any language that supports Z-100 video graphics. The only drawback to the system is that every routine, when in the 64 color mode, must be done twice. This does slow graphics routines. Text in the 64 color mode is possible, but again at the sacrifice of speed. I am not sure how many colors would be available using mixing of the 64 colors. More colors than the eye could discern, I suspect.

The questions I have for my fellow Huggies are . . .

1. Does this modification appeal to enough of you that I should pursue a final version of it?
2. As I probably do not have the time to develop a commercial version myself, is there one of you commercial Z-100 supporters that would like to market the modifications?

If you would like to discuss this project or express support for its future availability, drop me a line. Let's keep the Z-100 series alive.

Bob McGowan
8096 Meridian Road NE
Silverton, OR 97381-9741

Interfacing A Digital LQP02 Printer To A Serial Port

Dear HUG:

I am asking for assistance from anyone concerning interfacing a DIGITAL LQP02 printer to my PC-Compatible through the Serial Port. I have tried many cable configurations, but obviously not the right one. No matter what I try, the printer will accept one buffer of data, print it normally and then the print head will bounce from side to side printing X and O. Digital refuses to give any interfacing information for other than their own computers.

I am also seeking a set of normal ROMs for my Okidata microline 93 dot matrix printer. My printer presently has the IBM Plug-N-Play ROMs which seriously limit the printer features.

Any help from anyone on the above problems would be very much appreciated.

Sincerely,

George Duke
8350 SW 184 Terrace
Miami, FL 33157

Problem With ANSI Patch

Dear HUG:

There is a problem with the patch to the ANSI.SYS device driver presented on the Patch Page in the March '86 issue of REMark. I have been using the keyboard mapping feature of ANSI.SYS for over a year and have not encountered the problem described by Pat Swayne. Since he didn't describe the exact nature of the bug, I applied the patch anyway. My remapped keyboard sequences no longer worked properly! The last character of the remapped key string was lost. The following are two examples of keys that I was remapping.

Alt F remapped to:

```
Escape [0;33;"C:FORMAT "p
```

Alt L remapped to:

```
Escape [0;38;"DIR /P";13p
```

In the first example, the space character after FORMAT was lost and in the second example, the Return character (13) was lost. If you are suffering from these same symptoms after applying Pat Swayne's patch, copy the original version of ANSI.SYS from your MS-DOS distribution diskette to your working MS-DOS diskettes or your hard disk (where your patched version on ANSI.SYS resides).

Sincerely,

Rick Brannock
HQ USAREUR
Box 2186
APO NY 09063

Joseph Katz' "Free RAM"

Dear HUG:

I was drawn very quickly to the "Free RAM In Your IBM Compatible" section of Joseph Katz' "Mainstream Computing" article in the April '87 REMark. While reading it, I noticed one serious error and a conclusion that was not supported by the actions taken. Let me tie my comments to Mr. Katz' recommendations.

First, this section is 100 percent correct, but the actual savings in RAM is really negligible. When DOS loads any program for execution, it builds a copy of the master environment, which for DOS 3.X only, includes the complete drive:\path\filename.ext where DOS found that program. Then DOS builds a Program Segment Prefix (PSP), and finally, loads the program above that PSP. If several Terminate but Stay Resident (TSR) programs are in the AUTOEXEC.BAT file, each individual program's copy of the environment will be longer by the

length of the path. Now, since the size of the program's copy of the environment has to be a multiple of 16, because DOS only allocates memory in paragraph (16 byte) chunks, the extra eight letters and two backslashes for the path may not cause the environment to grow. In my case, with two TSR programs, it did cause me to lose 32 bytes, but that loss is negligible. So, placing your TSR programs in the root directory will save you at most, 16 bytes of memory for each one. If DOS 2.X is used, this whole discussion is no longer applicable because the program's copy of the environment. I believe, keeping each TSR program along with its associated files in one subdirectory leads to far more manageable hard disk organization and is well worth the 16 bytes of memory per each that is lost.

Second, I agree that it is good practice to set the PATH very near the end of your AUTOEXEC.BAT. The reason is that it will save space in each TSR program's copy of the environment. The path string can be quite long, but still probably under 100 bytes. Doing this saved me 48 bytes as my PATH is not that long. There can be one problem, not giving the TSR programs the PATH. Check each TSR's documentation to ensure that it does not use the PATH information in locating files. There are only two that I know of that are sophisticated enough to use PATH information, and I wrote one of them! In the future, that may not be true.

Third, each program's copy of the environment does NOT include an entire copy of COMMAND.COM. (I went so far as to trace manually through the Memory Control Blocks starting with the resident portion of COMMAND.COM through two TSR programs to the final program to ensure that another copy of COMMAND.COM is not residing anywhere else in there.) Only the path to COMMAND.COM is in the master environment when the line "SET COMSPEC=;" has not been included in the AUTOEXEC.BAT. The only way that another copy of the resident portion of COMMAND.COM can be brought into memory is if COMMAND.COM is evoked as another command processor by one of the TSR programs. None, to my knowledge do this. Now, the real savings in memory when using "SET COMSPEC=" as the first line saves on order of 16 bytes per copy of the environment. This is about the same savings by not specifying the PATH until the end. For me, the savings was 32 bytes. Here again, there may be a hidden problem. Some programs may rely on the COMSPEC specification in its copy of the environment to evoke COMMAND.COM as a

secondary command processor. This feature is very common in programs today, especially DOS shell programs which may rely on this feature. The reason is that the DOS function call to load and execute another program does not use the PATH information! The path information must be supplied to DOS. This will be a problem only if COMMAND.COM is kept somewhere else than the root directory of the boot drive.

Lastly, earlier in the article, Mr. Katz used the term TSR command and used an example of the SET command to set the PATH in the environment. This can be a little misleading, because from the rest of the discussion, I got the idea that the SET command also gets its own environment in the same way TSR programs do, and therefore, some RAM is lost. This is not true. More correctly, the SET command is an internal command which means the code is part of the resident portion of COMMAND.COM. Whether it is used or not, there is no extra RAM lost as the master copy of the environment is used.

Using all of Mr. Katz' suggestions resulted in the gain of 96 bytes on my system (a 640 Kbyte Z-248 using MS-DOS 3.1 with two TSR programs). I cannot explain the facts of the article the gain of approximately 135K bytes, but I am very confident that it was not as a result of Mr. Katz' recommended actions.

While on the topic of the environment, there is a very handy, but undocumented feature of DOS 3.X that will allow the user to set the amount of memory allocated for the environment. DOS uses the default value of 160 bytes for the size of the environment. The DOS manual states that the environment will automatically expand to hold additional strings if any TSR programs have not been loaded. Most people use an AUTOEXEC.BAT which will probably contain at least one of these types of programs, so it is virtually impossible to expand the master environment. Even trying the trick of using the SET command with the long string as the first statement in the AUTOEXEC.BAT will fail because a block of memory right above the master environment is allocated to the AUTOEXEC.BAT file so that effectively blocks further expansion of the master environment. The solution to this problem was found on the CompuServe IBMPC SIG User Group. The trick is to use the SHELL command in the CONFIG.SYS file. The format for this is:

```
SHELL=C:\COMMAND.COM C:\ /P /E:XX
```

The first parameter indicates where the initial copy of COMMAND.COM is to be

found. The second parameter indicates from where COMMAND.COM is to be reloaded, which in the case above is the exact same location. The third parameter, '/P', indicates that this substitution is to be permanent. It is the last and undocumented option which indicates the size of the master environment in paragraphs (16 byte chunks). Valid values for XX are 10 to 62. Values outside this range are ignored, the default value of 10 is used. Now doing this will not waste bytes because the copy of the environment built for each program is only as large as required to contain all the information string in the environment. All the extra space created using the above option in the CONFIG.SYS is not duplicated in each copy of the environment. Therefore, if a large environmental space is needed, it can be allocated without fear of eating up a lot of RAM with unused space.

Raymond Moon
Annapolis Software Guild
P.O. Box 6434
Annapolis, MD 21401

Need Driver Software For The H8/H19

Dear HUG:

I recently became the very proud owner of a Houston Instruments DMP/4 six pen plotter. I'm currently building the interface cables to run it off of my H8/H19, but have just realized that I don't have any driver software for it.

Do you, or any of your readers, know of any commercial (or public domain) packages which run under CP/M 2.2.03 which will allow me to plot data using my system? My main interest and work is in data analysis, so the package should be capable of at least X-Y plotting. Any language is OK, from BASIC to PASCAL and anywhere in between.

Anyone with any information can write to me at the address below. Thanks, in advance, for any assistance you can give me.

Cordially,

Thomas G. Bohon
P.O. Box 5154
Albuquerque, NM 87185

Problem And Solution For The Epson FX-86e

Dear HUG:

Here is a tip for anyone with an H/Z-150 PC/MS-DOS 3.1 using an EPSON FX-86e

printer with Model 8148 8K serial interface:

When running CONFIGUR in MS-DOS 3.1, the COM1 serial port menu will display Option "B" — MS-80 (4800 baud, DTR pos. (pin 20)). This option will not work satisfactorily with the Epson 8148 serial interface. Apparently, the timing handshake signal on pin 20 is not fast enough to satisfy the serial output of the H/Z-150. At least, that is the case with my H-158. Of course, all will work well if less than 8K is sent to the printer, or if the printer is fast enough to stay ahead of the buffer — as it is in draft mode. The problem will show up in NLQ mode, where the slow print will allow the buffer to fill to the handshake signal. One or more characters will be lost at each DTR signal. This same thing will happen with any slow printer, such as the SCM TP-1 daisy-wheel.

Checking back issues of REMark for hints for any clue to a fix on this problem produced nothing. There must be a solution! After all, the FX-86e with serial input operates o.k. with the venerable old H-89!

When all else fails, read the instructions! Here's the solution:

Do NOT choose CONFIGUR Option B for the FX-86e (or the LX-86) if you intend to use NLQ mode! Instead, create your own serial printer option under "I" — Alternate Menu and call it "FX-86e NLQ and other daisy-wheel printers". At the prompts, type in:

```
Strip parity on input - <N>
Strip parity on output - <N>
Map lower case to upper on input - <N>
Map lower case to upper on output - <N>
G - 4800 baud
A - 1 stop bit
A - No parity
B - 8-bit words (if you will be using
graphics)
G - DTR positive (pin 20) - unless you
have software for XON/XOFF
NO PAD CHARACTERS
```

```
----> TIME OUT FOR COM1: 32
      (THE SOLUTION!)
```

Make changes to both memory and boot disk(s).

It's too bad that the otherwise excellent Z-100 PC series operations manual makes no highlight of this fact. It's buried in small print on page 3.52. In fact, the MS-DOS Option "I" (Alternate Menu) is overlooked!

The MX-80 option uses the 0 (zero) default choice for TIME OUT FOR COM1. Printers in NLQ mode are slow and permit buffers to load to the handshake signal which requires a bit of timing adjustment. O.K., so

how did I arrive at "32"?! Don't tell anyone, but it's the first number that I tried, and it worked, so I left it as is! One would suppose that perhaps 16 or 8 would work just as well. Use multiple factors of "2"; computers like that! You have to experiment if you prefer the smallest number.

Sincerely yours,

Paul B. Boivin, Jr.
242 Old River Road
Lincoln, RI 02865

P.S. There should be no problem with printers connected to a PARALLEL port. The reason for the serial input on my FX-86e is to permit use with an H-89 that just won't quit! Us HUGGIES find it hard to part with old faithful H-89s!

MIDI Support For The Z-100?

Dear HUG:

Recently, I have become intrigued with the potential created by connecting musical synthesizers and computers. I have investigated the possibilities of such a system, but have been disappointed in that no one is aware of any available MIDI support for my particular machine: a Zenith Z-100.

My computer currently has 768K RAM and I do own IBM-PC emulation software; I assume software support is available even in this emulation mode. The difficulty arises in attaining a MIDI interface using the S-100 bus of the Zenith; such hardware seems to be limited to more popular personal computers. If you or anyone else knows of information regarding MIDI using a Zenith Z-100, I would appreciate the advice and knowledge. Thank you very much!

Sincerely,

Brad D. Andersen
3100 Leonard Terrace NE
Cedar Rapids, IA 52402

Wants To Upgrade The Z-150

Dear HUG:

I read Mr. Robert Maskasky's article concerning replacing the Z-150's video board with some interest, because I have been seriously contemplating an upgrade to my graphics capabilities also. (I desparately want to go to a Hercules standard to use with Microsoft Word.)

However, I have one major concern. In view of the recent litigation concerning computer copyrights (namely Lotus Cor-

poration vs Mosaic Software, Inc. and Paperback Software), I am wondering if copying the ROM BIOS from the original two chips installed in the Z-150 computer onto a single chip is legal. Although I have indeed purchased the machine, have I also purchased the code within the ROM? And can I copy it or even modify it at the same time?

One solution would be for Zenith to help us all out by coming out with a reasonably priced modification kit to aid us in upgrading our video driver. This would include all of the components that Mr. Maskasky pointed out, in the form of a kit for all of us hobbyists. Another plus would be to modify the ROM code at the same time so that the annoying drive A: "grind" disappears when using a third party, non-Zenith hard disk.

Another solution would be for Zenith to license some other vendor to design and market the kit. For instance, RAM Technology sells a couple of different PAL chips for the Z-150 and this would not be far afield.

If anyone could answer the legal question, I would greatly appreciate it, but until then, I must be satisfied with my CGA standard, much to my chagrin. Other than that, the Z-150 is an outstanding computer, especially when speeded up to 8 MHz, and I am more than satisfied with mine.

Sincerely yours,

Michael T. Leblanc
OE Division
USS Nashville LPD-13
FPO New York, NY 09579-1715

Solutions To Interfacing

Dear HUG:

I experienced a problem interfacing my Z-248 with my printer, found the cause, and came up with two partial solutions. I would like to share this with the group in case others have had the same problem without being able to isolate the cause, and especially in case somebody out there has come up or can come up with a better solution.

The problem was when I connected the '248 to my printer buffer (an outboard device from Computer Friends in Portland, Oregon), any attempt to print caused the printer (a Daisywriter) to go berserk. Connecting the '248 directly to the printer helped, but I would still get odd characters popping up all over the place. Shades of life before word processors! Both devices

worked fine when connected to the old (pardon the expression) IBM XT the '248 replaced, so it couldn't be the printer, buffer, or cable. That left the computer. A quick trip to the Anaheim Heath/Zenith Electronics Center resulted in the troublesome news that the machine was fine. I even saw the excellent output. By the way, how many computer stores will take in an ailing machine and check it out for you while you wait? But the Z-248 was working as designed. Now what?

Well, the only difference between the Zenith and the IBM was supposed to be the speed. Ergo, I tried HUG's CS.COM program on the "Screen Saver" utilities disk to slow down the beast. Voila! Everything worked. It appears that the old printer (which has a small internal buffer) and the Computer Friends buffer are populated with slow RAM chips that cannot accept the blazing output from the Z-248's parallel port. Crud!

The only two solutions I have thought of are to either use a serial-to-parallel converter and send the printer output out the serial port at 300 baud, or else to use CS.COM every time I want to print. Neither of these solutions is very good. Converters are expensive and take up a serial port. Slowing down the '248 defeats the speed I bought it for. Some of the programs I run all the time sort files before they print. Slowing down the computer to allow for printing also slows down the sorting. Buying a Heathkit buffer won't help because there is no way around the printer's internal buffer. Short of buying a new printer (and you can forget that), does anybody have any suggestions? Mr. Swayne, what we need is a version of CS.COM that slows only the parallel output. Please?

Yours truly,

William G. Nabor
27172 Huerta Street
Mission Viejo, CA 92692

To Get An Umlaut . . .

Dear HUG:

This is in response to the November '85 REMark article by George Bullwinkle (I love the name). Subject: "It Loses Files . . ." and, "Now if there were only some way to do an umlaut . . ."

Here is a little routine I developed a few years ago to handle my German correspondence and show that "I Care". Both set up and result via PeachText are below. The "circle R" is my thimble's way of saying the Command Marker "Forward Slash". The

Continued on Page 82

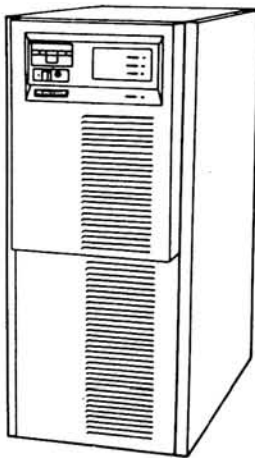
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BASIC To The Rescue

Or

Using dBASE III Files With PeachText

Gil Hoellerich
2617 Country Way
Fayetteville, AR 72703

For many years, I have been satisfied with the PeachText and Magic Wand word processors, and have refused to consider WordStar. These word processors did anything that WordStar could do without the use of control characters, and without the cluttered work space.

Recently, after converting from CONDOR to dBASE III, I found an exception; I could not use a dBASE III file for a data file for a variable letter in PeachText. However, I did not immediately rush to the nearest computer store to purchase WordStar, and I'm glad I didn't. After a few days of thinking, I realized that I could write a short BASIC program that would allow me to do this. Perhaps there are other readers who like PeachText, but would like to use dBASE III files.

dBASE III allows the conversion of a .dbf file to a .txt file by the use of the command COPY TO filename DELIMITED. This command takes the fields of the .dbf file and encloses the character type fields within quotation marks and separates all fields by a comma; records are separated by a carriage return. dBASE III also allows the use of blanks as delimiters between fields by adding WITH BLANKS to the command.

PeachText, however, requires a carriage return delimiter between fields and a blank field between records. So the question was how do I convert the .txt file of dBASE III to

```

10 'This program converts dBASE III .txt files for use as PeachText data files
20 LINE INPUT"WHICH FILE DO YOU WISH TO CONVERT";DBFILES
30 INPUT"HOW MANY FIELDS IN A RECORD";N
40 INPUT"Do you have A DATE field to be converted";ANS$
50 IF LEFT$(ANS$,1)="Y" OR LEFT$(ANS$,1)="y" THEN 60 ELSE F=0:GOTO 80
60 INPUT"Which field needs to be converted";F
70 IF F>N THEN 60
80 OPEN"I",1,DBFILE$
90 OPEN"O",2,"B:TEMP.TXT"
100 FOR I=1 TO N
110 INPUT#1,FLD$
120 IF I=F THEN GOSUB 500
130 PRINT FLD$
140 PRINT#2,FLD$
150 NEXT I
160 PRINT#2,CHR$(13):PRINT CHR$(13)
170 IF EOF(1) THEN 190
180 GOTO 100
190 CLOSE
200 KILL DBFILE$
210 NAME "B:TEMP.TXT" AS DBFILE$
220 END
500 MONTH=VAL(MID$(FLD$,5,2))
510 ON MONTH GOTO 520,530,540,550,560,570,580,590,600,610,620,630
520 MOFLD$="January ":GOTO 640
530 MOFLD$="February ":GOTO 640
540 MOFLD$="March ":GOTO 640
550 MOFLD$="April ":GOTO 640
560 MOFLD$="May ":GOTO 640
570 MOFLD$="June ":GOTO 640
580 MOFLD$="July ":GOTO 640
590 MOFLD$="August ":GOTO 640
600 MOFLD$="September ":GOTO 640
610 MOFLD$="October ":GOTO 640
620 MOFLD$="November ":GOTO 640
630 MOFLD$="December "
640 IF VAL(MID$(FLD$,7,2))<10 THEN DAYFLD$=MID$(FLD$,8,1)
    ELSE DAYFLD$=MID$(FLD$,7,2)
650 FLD2$=MOFLD$+DAYFLD$+" ", "+MID$(FLD$,1,4)
660 FLD$=FLD2$
670 RETURN

```

Figure 1
BASIC Program To Convert dBASE III .txt Files

```

"1016","ACKERMAN","DAVID R.",19860204,"ACCOUNTING",9.75,N
"1029","ANDERSON","MARIANE L.",19860418,"SHIPPING",9.00,Y
"1056","ANDREWS","ROBERT M.",19860603,"MARKETING",9.00,N
"1037","BAXTER","CHARLES W.",19860505,"ACCOUNTING",11.00,N
"1026","BENDER","HELEN O.",19860412,"PRODUCTION",8.60,Y
"1020","CASTLE","MARK C.",19860304,"SHIPPING",7.50,Y
"1066","CASTLEWORT","MARY T.",19860705,"PRODUCTION",8.75,Y
"1025","CHANEY","JOSEPH R.",19860323,"ACCOUNTING",8.00,N
"1017","DOI","CHANG J.",19860205,"PRODUCTION",6.00,Y
"1057","DUGAN","MARY L.",19860610,"PRODUCTION",8.75,Y
"1022","DUNNING","LISA A.",19860312,"MARKETING",9.10,N
"1030","EDWARDS","KENNETH J.",19860423,"PRODUCTION",8.60,Y
"1041","EVANS","JOHN T.",19860519,"MARKETING",6.00,N
"1013","MCCORMACK","NIGEL L.",19860115,"SHIPPING",8.25,Y
"1011","RAPOSA","ANTHONY P.",19860110,"SHIPPING",8.50,Y

```

Figure 2
.txt File Created By dBASE III

In addition to this conversion, I found that the program must convert the date field. The BASIC program shown in Figure 1 provides these conversions.

As a trial, I used a .dbf file created from a modified version of the EMPLOYEE.dbf example in Shelly Cashman's "Introduction to dBASE III". I then used the dBASE command COPY TO NU-EMPTY DELIMITED. This gives me the NU-EMPTY.TXT file shown in Figure 2.

I then ran the BASIC program of Figure 1 and entered, when prompted, NU-EMPTY.TXT as the db-file, and 4 as the field number which contains a date type. This produced a file that could be used with a variable letter in PeachText. The first three records of this file are shown in Figure 3.

this form. Then, I remembered the attributes of sequential files in BASIC.

When using BASIC sequential files, the data elements in the file may be delimited by either a comma or a carriage return. I could use the .txt file from dBASE III which has commas as delimiters for an input file, and then write them to an output file with carriage returns as delimiters. I could add the blank field between records.

```

1016
ACKERMAN
DAVID R.
February 4, 1986
ACCOUNTING
9.75
N

```

```

1029
ANDERSON
MARIANE L.
April 18, 1986
SHIPPING
9.00
Y

```

```

1056
ANDREWS
ROBERT M.
June 3, 1986
MARKETING
9.00
N

```

```

1037
BAXTER

```

Figure 3
**First Few Records Of File
Converted For PeachText Use**

MEMORANDUM:

TO: DAVID R. ACKERMAN

FROM: GILBERT HOELLERICH

DATE: NOVEMBER 18, 1986

In checking our records, we find that you have been employed in the ACCOUNTING department since February 4, 1986 and that your hourly salary is \$9.75. If any of this information is incorrect, please notify the personnel office on extension 1234.

MEMORANDUM:

TO: MARIANE L. ANDERSON

FROM: GILBERT HOELLERICH

DATE: NOVEMBER 18, 1986

In checking our records, we find that you have been employed in the SHIPPING department since April 18, 1986 and that your hourly salary is \$9.00. If any of this information is incorrect, please notify the personnel office on extension 1234.

MEMORANDUM:

TO: ROBERT M. ANDREWS

FROM: GILBERT HOELLERICH

DATE: NOVEMBER 18, 1986

In checking our records, we find that you have been employed in the MARKETING department since June 3, 1986 and that your hourly salary is \$9.00. If any of this information is incorrect, please notify the personnel office on extension 1234.

Figure 5
**The results of using variable letter (Figure 4) with converted
file (Figure 3).**


```

\SETUP
\LM12,RM60
\get db-filename
\FILE TO0,:db-filename
\DATA ,LNAME,FNAME,DATE,DEPT,RATE,,
\TEXT
MEMORANDUM:

```

TO: \:FNAME\ \:LNAME\
FROM: GILBERT HOELLERICH
DATE: NOVEMBER 18, 1986

In checking our records, we find that you have been employed in the \:DEPT\ department since \:DATE\ and that your hourly salary is \$\:RATE\. If any of this information is incorrect, please notify the personnel office on extension 1234.

Figure 4
A PeachText Variable Letter For Use With Data File

I then created a variable letter shown in Figure 4, and this produced the three memorandum shown in Figure 5.

*

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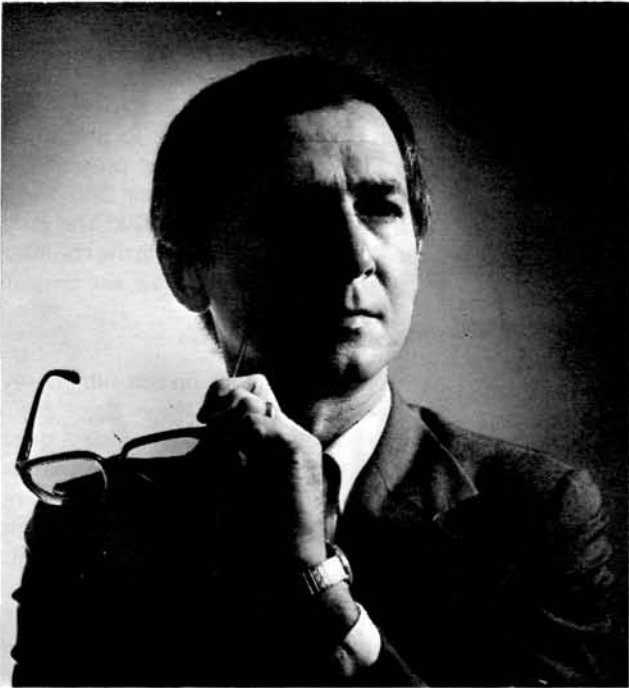
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Mainstream Computing

Joseph Katz

103 South Edisto Avenue
Columbia, SC 29205

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In April of 1987, IBM announced its "*SolutionPac for Desktop Publishing*." It's built around IBM's new Model 30 computer with a 20 MB hard disk, a monochrome or color display, and a mouse, which is bundled with the new IBM *PagePrinter* laser printer and *PostScript* board, and Microsoft *Windows* (with *Windows Paint* and *Windows Write*) as the environment for Aldus's *PageMaker* page layout software. The list price is \$8,553, and you should expect to pay the full list price now and for some time to come if you bite.

I wouldn't bite. The list price of a much better equivalent system is only about \$1,247 more. Don't gag at my use of the word "only" in connection with so much money. We're talking about list price, not street price. The street price of this system should be less than the check you'd wind up writing your IBM dealer. And yet it's a much better system, good enough to be worth much more money than IBM's desktop publishing system because my system will pump out more work, more easily, and in less time than IBM's, and because my system can be tailored to your needs for much less money than IBM's. Here's why.

IBM's Model 30 is essentially an XT-compatible computer with an 8086 microprocessor, which makes it run about two-and-one-half times faster than IBM's own XT. In other words, it should run about as fast as a

Zenith Z-158. I frankly think that's barely tolerable performance for intensive desktop publishing. You've heard me squawk and watched me squirm when I tried running Microsoft *Windows* on a '158. I didn't like it, and after a few attempts I didn't do it anymore. There's no reason why I'd like the experience any better on a similar machine from IBM. Oh, sure, you can do the job on it. But you probably won't like doing it, and it will take more time and energy than you need to spend.

In contrast, IBM's *PagePrinter* is half a step in the right direction: *PostScript*. Of all possible options for serious desktop publishing among laser printers available today, you really have to choose a *PostScript* printer. Oh, sure, you can put words and pictures on paper with other laser printers. But you won't have the flexibility you need to do the range of things you'll need to do in serious work. The trouble is that IBM's *PagePrinter* is a *PostScript* printer without *PostScript*. It's on a separate board that you must add to the computer. Of course, there's no need to worry about the price of one such board, because it's bundled into the IBM's *SolutionPac for Desktop Publishing*. There are, however, at least two things you must worry about. One is that the Model 30 has only three slots available for such boards. Use one for the *PostScript* board and, as best I can calculate, you'll have only two for everything else you

might need. You will need more. The second thing to worry about is that IBM's division of what should be one unit into two separate pieces — *PagePrinter* and *PostScript* board — results in a very expensive printer dedicated to one computer. That printer is tied to that board, and to whatever computer has that board. Question: What if you have more than one computer and want the ability to share the printer? Answer: Get a *PostScript* board for each computer. Somebody seems to be reaching for your wallet.

The *Dr. Katz Solution Pack for Desktop Publishing* comes to you from a man whose credentials include knowledge of how to spell the word "Pack" and taste that often prevents him from making up his own words. This system is built around a Zenith Z-248 microcomputer, which has the advanced 80286 microprocessor operating at 8 MHz with no wait states and runs rings around any 8086 machine. It gives you seven free slots for things like expansion memory boards, of which you will want as many as you can afford in order to give your system the juice required by desktop publishing. That computer with a 20 MB hard disk drive (same size as the one in IBM's system) lists for \$2,999. Add an Apple *LaserWriter*, which is a self-contained *PostScript* printer that, therefore, can be shuttled from computer to computer, will serve several printers on a net-

work, and even can be used with different kinds of computers. It now lists for \$4,999. You'll need a cable from the computer to the printer: \$15-\$75, depending on what you buy and where you buy it. *The Laser-Writer Connection*, with drivers to link the computer and *LaserWriter*, is \$40. A Logitech *Logimouse C7*, one of the best around, is a mouse you can adopt for \$99. Microsoft *Windows* (with *Write* and *Paint*) will set you back another \$99. Aldus's *PageMaker* lists for \$695. An NEC Multi-sync monitor gives you a splendid EGA display in addition to CGA and other modes for a list price of \$799. (I don't know if IBM's price includes a monitor.) The total list price is around \$9,800, compared with IBM's list price of \$8,553. Please don't hog-tie me with those prices. Vendor competition, your own desires, and your buying skill will determine what you buy and what you pay. None of those count right now if you buy the IBM bundle. But you shouldn't need much buying skill to get the Dr. Katz System for the price of IBM's, or less. And I think you'll be much better off right now with the Dr. Katz System.

So you can be assured I know more about desktop publishing than how to spell "Pack" correctly, you should know that the illustrations in this column and the last were prepared with just the system I describe. I'm especially pleased with the way Aldus's *PageMaker* and SymSoft's *HotShot* — both of which I have come to love as fine, friendly tools — perform on it.

Addison-Wesley's Desktop Publishing Books

Desktop Publishing is "in" this year, so you can expect a torrent of books on it. Most I've seen are at best harmless. They probably won't help you, but they probably won't kill you either. Few of them seem really good and useful. Many of those good and useful books come from Addison-Wesley.

The best book I've seen so far on the general subject of desktop publishing is James Felici's and Ted Nace's *Desktop Publishing Skills*. It's subtitled *A Primer for Typesetting with Computers and Laser Printers*, and that's just what it is. The book is serious, the orientation correct. "Desktop publishing," the term Paul Brainerd, President of Aldus Corporation, which makes *PageMaker*, is a misnomer for the process of typesetting on a personal computer. Felici and Nace handle the problem graciously by ignoring it and talking about the right things. They're covered in twelve well-balanced, well-written, well-illustrated, and meaty chapters. I particularly enjoyed the chapter on

page design, but close seconds are the chapters on typefaces and printer languages. I don't know another book that surveys the various laser printer languages, and I can't imagine anyplace else that would treat it so well. This book cries out to have an introductory course built around it. Good textbooks do that.

The only books on PostScript are Adobe Systems' own *PostScript Language Reference Manual* and *PostScript Language Tutorial and Cookbook*. The former is the bible for the page description language that quickly is becoming the standard in desktop publishing; the latter is its catechism, with examples of the right ways to apply precepts. Several of those examples do nice things, and most of the examples can be varied to do your own nice things. As is true when learning any programming language, you'll benefit from all the examples you can find. Adobe Systems seems to distribute a flow of demo programs to its dealers and others, but so far I haven't managed to pry any out of the company. But its books are good. You won't have any use for either book without the other, though, so if you order either make sure to order both. No, you don't need to know how to program in *PostScript* in order to do desktop publishing with a *PostScript* printer. You use the application programs — word processing, paint, draw, and so on — written by programmers who know how to program in *PostScript*. But if you enjoy tinkering — and, gad, do I love tinkering — you have to get these two books and a *PostScript* printer, like Apple's *LaserWriter*, to know what real fun is.

Nothing I've seen yet beats *TeX* for high quality text and technical typesetting on a personal computer with a good laser printer. Right now, though, you have to write programs in *TeX* for everything you want to typeset. That's well worth doing for books and other long runs of text in which you want a knockout result: *TeX* allows you to control everything. Once again, the place to look for the canonical works is Addison-Wesley's catalog. What to look for is Donald Knuth's five volumes of the *Computers and Typesetting Series*. I've seen only *The TeXbook* and *TeX: The Program*. They're volumes A and B in the series, a kind of identification that seems perfectly rational after you get used to Greco-English hashhouse puns. At any rate, the former is the bible. There are other *TeX* texts (feeble play on words, right?) that are good and deserve your patronage. In fact, I haven't seen a tackey *TeX* text (I suspect I'm not pursuing a fruitful direction at all), and I'm trying to garner everything I can find. No

matter what else you get, though, if you become interested in *TeX*, you need *The TeXbook*. Addison-Wesley publishes it in paper and hardcover. I recommend the hardcover version: I've consumed the paper version through constant reference. Incidentally, I think *The TeXbook* is great fun to read. If you want to see extremely tough technical material presented with wit, grace, and charm, dig into *The TeXbook*. You won't need *TeX: The Program* unless you're interested in the commented Web source code for *TeX*, the program.

Fast Memory For ATs

We touched lightly on this subject several months ago. Ever since I got my AT-compatible '248 I've been on a quest to find a "memory topper" that would work in it. For some reason, probably well-known and even boringly obvious in Armonk, New York, but a complete mystery at one office in Columbia, South Carolina, true AT-compatibles are delivered with less than the 640 KB of RAM that conventional MS-DOS programs can use as running space. No matter what Kodak says about snapshots, the really precious memories today are those in the "base" RAM of MS-DOS microcomputers. Its size is a key to the programs you can run. So the third thing the first-time owner of a new AT-compatible does is find a way to fill in the missing base RAM. Computer manufacturers call it "optional RAM." Ha. I call it "absolutely essential RAM" — part of the most important RAM in MS-DOS microcomputers. Heath's and Zenith's AT-compatibles come with 512 KB of base RAM, which is a diplomatic way to say that they are missing 128 KB of absolutely essential base RAM. My favorite way to add that missing 128 KB to the 6 MHz '241 model is still the inexpensive *TophAT* board. As the board's name implies, the *TophAT* tops off the base RAM to 640 KB. And it works like a charm, on '241s. On the 8 MHz '248 model, though, the standard *TophAT* doesn't work at all.

Neither does Boca Research's deluxe *TophAT* with 120 nanosecond ("ns") RAM chips — nor, for that matter, has any other memory topper I've tried from any other manufacturer. My '248 didn't recognize any of them. So my '248, like those owned by other people, has been a fast machine with insufficient base memory. Unlike other people, and only because it's my business to work with a broad range of software and other hardware, I've kept a '241 around for applications that absolutely require more than 512 KB of base RAM. In case you were wondering why I've

ATPERF -- PC Tech Journal AT Hardware Performance Test
 Versior 2.00, Copyright (c) 1986, 1987, Ziff Communications Co.
 Writer by Ted Forgeron and Paul Pierce
 IBM PC/AT Model 339 (8 MHz) = 1.00 for relative measurements.

	Byte	Word	Relative
Average instruction fetch:	0.25 uS	0.26 uS	1.55
Average RAM read time:	0.26 uS	0.26 uS	1.53
Average RAM write time:	0.26 uS	0.26 uS	1.55
Average EMM read time:	0.65 uS	0.65 uS	0.62
Average EMM write time:	0.65 uS	0.65 uS	0.62
Average ROM read time:	0.52 uS	0.52 uS	0.77
Average Video write time:	2.26 uS	4.53 uS	0.53
80286 CPU clock rate:	8.0 MHz	Relative: 1.00	
Refresh overhead:	3.9%		

Memory	Access width	Wait states
RAM read	Word	0
RAM write	Word	0
EMM read	Word	3
EMM write	Word	3
ROM read	Word	2
Video write	Byte	16

Figure 1. The combination of Cheetah Combo/70 board in a Zenith Z-248 as scored by the *PC Tech Journal Laboratory Benchmarks*.

(I did all illustrations this month with SymSoft's Hotshot and Aldus's PageMaker on an Apple LaserWriter.)

sometimes talked about my '248 and sometimes about my '241, and wrote it off to some inability of mine to keep numbers straight, you now know that I really have been running two similar machines. Oh, sure, it was a ludicrous situation. It was no less ludicrous, though, than rumors I'd heard that the '248 had obscure bugs preventing it from recognizing perfectly good memory boards. Ah, well. For me, at least, all that stuff now is history.

In the course of my long search for a memory board to fill in the base RAM of a '248, I heard about Cheetah International's products. Cheetah has specialized in making quality boards for original equipment manufacturers, and therefore, hasn't advertised much to end users. I called Gene Sumrall, Vice President of Cheetah International, and asked if one of the Cheetah cards would work. *Gene guaranteed* that either of his company's 70 ns products

would work: the *Cheetah Card/70* or the *Cheetah Combo/70*. The Cheetah Card is a straight memory board; the *Cheetah Combo* is the memory board with added input/output features, in this case a parallel port and a serial port. (The parallel port can be assigned as LPT1 or LPT2. The serial port can be COM1, COM2, COM3, or COM4. Either or both ports can be disabled.) When was the last time you heard the word "guaranteed" used by a manufacturer in connection with its own computer products? You know, "guaranteed" as meaning "You get your money back if it doesn't do what we say it will do"? "Guaranteed," therefore, is a word I really enjoy. So I got a *Cheetah Combo/70* and put it in the '248 and it in fact worked. I had a hunch Gene was sure of his ground when he used that friendly word "guaranteed."

Here's the bottom line. If you have a '248 limping along with a meager complement

of 512 KB base RAM, I've no hesitation at all in recommending the *Cheetah Card/70* (if all you want is the added memory) or the *Cheetah Combo/70* (if you want the added memory plus a parallel port and serial port). You have to specify the amount of RAM you want on the board when you order. If your only goal is to fill the base RAM on a '248, you can order the board with two banks of 64 KB RAM: 2 banks X 64 KB = 128 KB. You might want to order the board with more RAM, though, because any RAM in excess of what it takes to fill out the base RAM will become Extended Memory. You need it if you want to get the maximum from SCO Xenix or DESQview. Either is ample justification for Extended Memory. You should know that the Cheetah boards allow mixing banks of 64 KB and 256 KB RAM, so you can put together a custom board for your special needs.

An interesting bonus from the *Cheetah Combo/70* I'm using is that it significantly improves the computing performance of my '248. Cheetah also makes a *Cheetah Card/100* and *Cheetah Combo/100*, which have 100 ns RAM chips: you can use either in a '241 running at 6 MHz with no wait states and, Cheetah says, gain a 33% speed increase as a result. For a '248, though, you want the *Cheetah Combo/70*. I can't evaluate the claim that a '100 board will boost the '241's speed, but I can say that the *Cheetah Combo/70* has boosted the speed of my '248 from an 8.3 to a 9.4 Performance Index in Peter Norton's SI program from *The Norton Utilities*. Although Norton's SI tends to flatter a machine's performance, the number it produces is widely used and is convenient for comparisons. In fact, it's fun to lie that my '248 runs about nine and one-half times faster than a PC. I do it a lot. In case you're interested in how my '248 and *Cheetah Combo/70* test with the benchmarks used at the *Tech Journal* and *PC Magazine* labs, I ran those too: you can see the results in Figures 1 and 2. My '248 runs significantly faster with the *Cheetah Combo/70* than without it. Interesting, no?

The *Cheetah Combo/70* is a remarkably flexible board and flexibility, of course, brings complexity. Although there are many ways to set the board's switches to realize its many possibilities, you needn't get sucked into digital quicksand. To satisfy the most common needs of a Heath or Zenith owner — filling the base RAM and assigning the remainder to Extended Memory — all you do is run the Chsetup program in the software supplied with the board. You identify the board you want to install and answer a few easy questions

PC Magazine Laboratory Benchmark Series

BENCH28 Version 2.00: Processor Speed Instruction Mix Test

This test measures processor speed by executing a mix of assembly language instructions. A higher "Speed Index" means a faster execution. You may see variations in hundredths of seconds if you repeat the test.

	Time in Seconds	Speed Index Relative to 8.00 Mhz AT	Speed Index Relative to 4.77 Mhz PC
8086/8088 Instruction Set:	6.98	1.3	4.6
80286 Instruction Set:	6.86	1.3	

Press any key to return to menu ...

Figure 2. The combination of Cheetah Combo/70 board in a Zenith Z-248 as scored by the PC Magazine Laboratory Benchmarks.

about how you want it installed. Then, the program shows you a diagram of how to set the board's switches to get what you want. You needn't read the manual, unless you want to. You'll want to if you're interested in technical details, especially if you do any programming that involves communications: the manual is wonderfully specific about addresses and such.

Because it is, if you're one of those people who lament the good old days of Heath computers when real men didn't use pliers (I'm told they gripped the nut with their teeth and ran clockwise around the bolt to tighten it) and manuals really were manuals, go out of your way to look at the manual for the *Cheetah Combo*. You'll love it. In that case, you'll probably also like the idea that the Cheetah software includes two undocumented programs. One (CDISK.SYS) I figured out is a nice Extended Memory RAM disk program. The other (FORCE.COM) produces the message

"Cheetah Card execution forced in fast RAM — installed" and attaches to interrupt 30. Don't ask me why or for what reason. I can't figure out what it does.

Quarterdeck's *DESQview*

If you have an AT-compatible '241 or '248 with a hard disk, some Extended Memory, and some Expanded Memory, you really ought to put down this magazine right now and spend the time trying to locate a copy of Quarterdeck's *DESQview*, Version 2, before the stores close. No joke. Put down the magazine. Call your local software dealers. Find one who stocks *DESQview* and see if you can get a copy before the stores close. You can have the thing installed in a few minutes and spend the rest of the evening watching your computer do things you didn't know it could. If you're cautious, on a budget, or from St. Charles, Missouri, the very least you ought to do is get *DESQview* demonstrated to you right away. *DESQview* is almost incredible.

DESQview is a multitasking environment. You install it on your computer, then install your existing software within it. Run *DESQview* and from within *DESQview* run one or more of your other programs. Why? Well, even as we speak I'm writing this column in *XyWrite III*, according to a rough outline I put together in *PC Outline*, with product details I've taken to keeping in a *PC File+* database so I don't lose them. From time to time, I need a screen shot for illustration, so of course I loaded *HotShot* into RAM before I started. Since I need to print drafts on my Apple *LaserWriter* from time to time as I go, of course I also have *The LaserWriter Connection* driver installed. And since *DESQview* understands mice, of course, I also have the driver for Logitech's *C7* mouse installed.

DESQview, all four application programs, and both drivers are running simultaneously. The drivers are just there, you understand, doing whatever it is that drivers do to earn their money while I'm earning mine. *DESQview* and the other programs, however, are installed in individual windows at my beck and call. Each window is identified by a number. Right now, for example, *XyWrite III* is in Window 1, *PC Outline* in Window 2, and *PC File+* is in Window 3. Most of my time is spent in Window 1, chattering away in *XyWrite III*. When I need *PC Outline* to remind me about where to go next, I press *DESQview's* main hotkey (which I redefined as the Sys Req key because I got tired of it sitting there with nothing to do) and the 2 key, and *PC Outline* immediately appears. When I need a fact that is recorded in my *PC File+* Products database, I hit the Sys Req and the 3 key to get my place there. Returning to *XyWrite III* at any time takes only the hotkey and the 1 key.

All of this sounds much more complicated than it really is. A useful metaphor, I think, is three computers on my desk, each running the drivers and one of the application programs. In that metaphor I turn from the *XyWrite III* machine to the *PC Outline* machine or the *PC File+* machine whenever I want. Naturally, I'm not restricted to looking at the displays of those three machines: I can enter new information, as well as look at the old. That's the same with *DESQview*, except everything is running on one physical machine.

Not only does *DESQview* on one computer cost much less than a separate machine for each application, but also it's much more useful. *DESQview* allows manipulation of the windows for most programs: they can be resized and moved, for ex-

ample, so the display of one program overlaps that of another. I usually have *DESQview* display only ten or twelve lines of *PC Outline* at the bottom of the screen so the text I'm working on in *XyWrite III* shows through, as in Figure 3. It helps me keep my place. On occasions when I need to see more of *PC Outline*, it's a simple matter to zoom out by hitting the hotkey and the Z key. Or, because I use an EGA monitor, sometimes I put *PC Outline* in the EGA forty-three-line mode. When I need even more information at one time, *DESQview* lets me do so by hitting the hotkey, then R (for "Rearrange"), then P (for "Position"), and then a number from 1 to 9 to display all or some of the windows in one of several predetermined grid patterns.

What's even more useful is that data can be copied from one of the running application programs to another. Hit the hotkey when in the source program, then M (for "Mark") and define the block to be copied. Then switch to the destination program, hit the hotkey again, then hit T (for "Transfer"), and then hit the Enter key. Without *DESQview* it's easy to transfer data from *PC Outline* to *XyWrite III*, but you can't go the other way. With *DESQview* you can, so I can take advantage of the ideas that come while I write and transfer them to my outline for integration into the grand scheme. *DESQview* also can copy data from one place in an application program to another place in that same program. It's a useful adjunct to the block-copying function in many programs, allowing two different sets of data to be stored in memory for copying. In fact, there actually are more data exchange options than these, and they make *DESQview* infinitely more capable at copying data than a mere desktop accessory like *SideKick*. And in fact, you might not need or want programs like that when you use *DESQview*: it includes a "learn" feature that really is a sophisticated macro handler, sophisticated enough so that I could teach *DESQview* to automatically set up my complex article-writing system for me at the press of one key. But if you have a program you don't want to give up (there are some things in *Keyworks Advanced Version* that I don't want to give up), you can use it in *DESQview*.

As I said at the beginning, *DESQview* is incredible. No matter how much space I use to describe its features, I really can't do this program justice. Nor has anyone else I know really done it justice in print. I'd been hearing about *DESQview* for a couple of years, but I'd written off the praise as ravings from wild-eyed fanatics. I've also

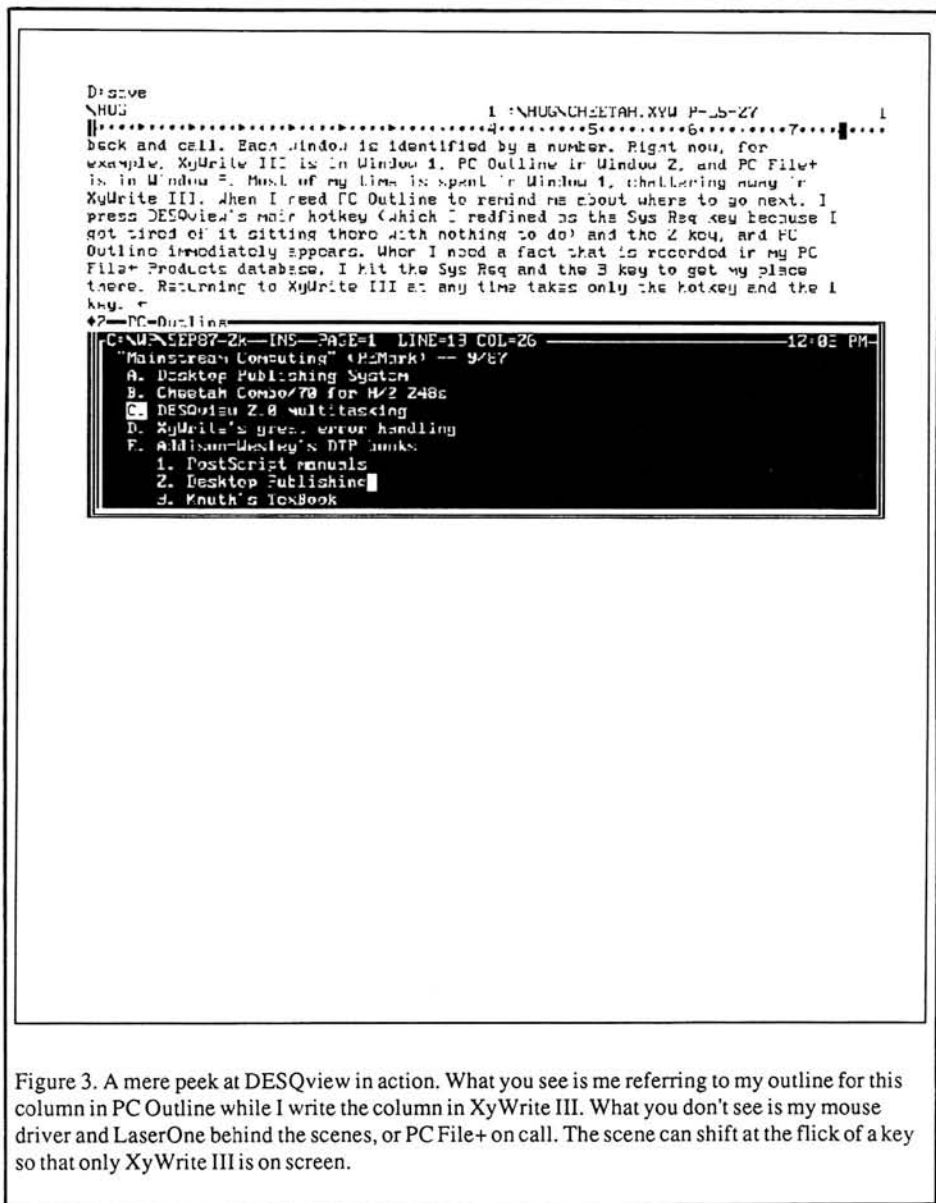


Figure 3. A mere peek at *DESQview* in action. What you see is me referring to my outline for this column in *PC Outline* while I write the column in *XyWrite III*. What you don't see is my mouse driver and *LaserOne* behind the scenes, or *PC File+* on call. The scene can shift at the flick of a key so that only *XyWrite III* is on screen.

seen *DESQview* used at COMDEX booths to show off various computer products, but I made the mistake of looking at those products instead of *DESQview* itself. And I've read reviews that soberly evaluated what *DESQview* would and wouldn't do, but I never let my own imagination fix on what it could do for me. That's why I began by saying you need to get your own hands on *DESQview* right away: it is, in a manner of speaking, a most personal kind of software package. In case you're interested, it took coincidence to set me off. Gene Sumrall is a *DESQview* fan who kept making references to things that could be done with it and his Cheetah boards, things of the kind I've just been telling you. Then came the Spring COMDEX, when I happened to pause at the Quarterdesk Office Systems booth while Therese Myers was there. So I identified myself and asked for a *DESQview*. Within five minutes after it ar-

rived I had it up and running, and so was I.

You probably can use *DESQview* on any of Zenith's XT- or AT-compatible computers as they come right out of the box, but you ought to know that in many ways *DESQview* is like *Oliver Twist*: it wants "more," deserves "more," and will repay you more the more you give it. You can use *DESQview* with a minimum of 512 KB of RAM, but then you're severely limited in the number of application programs you can run at once. The ideal setting is 640 KB of base RAM, 64 KB of Extended Memory (so *DESQview* can push part of itself up there and free the equivalent amount of base RAM for the application programs), and as much Expanded Memory as you want to plant in your computer. I have 3 MB in my '248. As I've said, the base RAM is filled out by a *Cheetah Combo/70*, which also gives

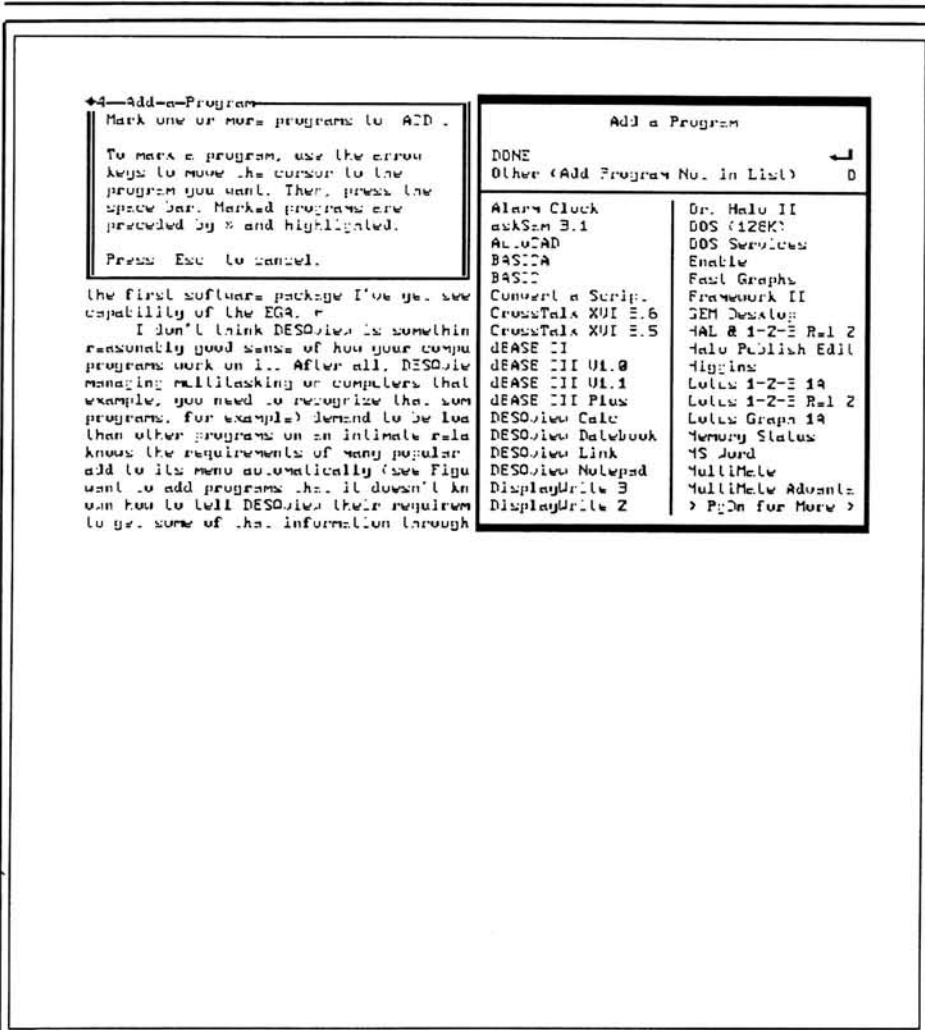


Figure 4. DESQview's background machinery can be called to the fore at any time, perhaps to add a new program.

me Extended Memory. The Expanded Memory is on a combination of Boca Research extraordinarily flexible memory boards: 1 MB on the new Lotus-Intel-Microsoft specification BocaRAM AT board, 1 MB on the standard BocaRAM that I've been using for some time, and 1 MB on a daughter board for that standard BocaRAM. You needn't go so far to benefit from *DESQview*, but — my oh my — you ought to see what life with it is like if you do. The manual says you can run *DESQview* with a floppy-only system, but that's a waste of its power: *DESQview* uses "virtual memory," swapping programs to a hard disk as necessary when you're running more than can fit into available RAM. You really do need a hard disk, not because *DESQview's* own modules require much, but because you want space for use as virtual memory. Much less important than the RAM and the hard disk, but nice nonetheless, is an EGA monitor: that forty-three line mode really is useful when layering *DESQview* windows.

The odd thing is that *DESQview* is the first software package I've yet seen that justifies, for me, this capability of the EGA. I don't think *DESQview* is something for an absolute novice. You need a reasonably good sense of how your computer does what it does and how your programs work on it. After all, *DESQview* really is doing the impossible: managing multitasking on computers that weren't designed to do it. So, for example, you need to recognize that some kinds of programs (communications programs, for example) demand to be loaded first because they depend more than other programs on an intimate relationship with the hardware. *DESQview* knows the requirements of many popular programs (see Figure 4 for some examples), which it therefore will add to its menu automatically, but if you want to add programs that it doesn't know, you'll need to figure out on your own how to tell *DESQview* their requirements and behaviors. You might have to get some of that information

through trial and error, and therefore, you'll also need a measure of serenity that comes only with the experience of coping with program crashes. You'll also need a little common sense derived from that experience: be careful with programs, such as disk caches, that depend on keeping an up-to-date record of where things are on a disk, because if the program is suspended with those things, you stand a chance of crashing the disk. Don't be discouraged by this paragraph, though. If you've read so far in this column without the need of strong drink lost, chances are you can handle *DESQview* nicely and benefit from it enormously.

Then you should be prepared to tinker, and be prepared to become an absolute boor when you feel the urge to convert your neighbors to *DESQview*. In that boorish vein I will add two observations. First, my productivity increased almost immediately as a result of what *DESQview* made possible. The reason is that I don't have to keep dropping in and out of one program after another to get the bits and pieces I need. Everything, therefore, goes faster and easier, and I can do more because I don't get abraded early by tedium. Second, I find myself running some programs in *DESQview* even when there's no real need to do so at the time. I don't know why yet, but I tend to run *Mirror*, the communications program, and my word processing programs that way. Maybe the smart guy who sometimes visits my brain has figured out that these are the kinds of programs from which I'm likely to need to access other programs sooner or later. I'll have to think about that idea. Right now, I'm only reporting my observations.

XyWrite III Catches My Fumble

I am a pack rat. I don't think I am as much of a pack rat as my father is. When he sold the house in which my sister and I were raised, he tried cajoling us to go through it and take what we wanted. There was his tool closet, for example, crammed with great stuff like a radio from his 1930 Packard and the tools one of my uncles used while helping to rebuild the *Normandie*, a noted ship, during World War II. The garage had good things like a malted milk machine and other equipment from a luncheonette my father and mother owned during the nineteen forties. About half the basement was stacked floor to ceiling with a twenty-year accumulation of magazines and comic books. "Junk!" I declared with a sneer, thereby turning my back on a large fortune in collectibles. But I couldn't resist the malted milk machine, and my brother-in-

law Stewart (who may have picked up the pack rat gene by marriage) took — for some reason I haven't figured out — the ship-builder's tools. His duties for the State of Connecticut include coordination of relief in disasters: maybe he has an ark in mind. Stewart is nothing like the pack rat I am, and I am not so much of a pack rat as my father is.

But if I'd have had a computer then, and if all that stuff could have gone on a floppy diskette or a hard disk, I'd have it all here. It hurts — it really and truly hurts me — to erase anything from my hard disk, even if I've archived it on a floppy diskette. So I don't. And from time to time, therefore, I run out of hard disk space. Usually, the program I'm using does something nasty, like crash and throw all my good words on some vagrant breeze blowing in the direction of Tijuana.

But the last time I ran out was a few minutes ago, while I was working on this column, and the experience was almost delightful. Nothing bad happened. When I tried saving the file (I have picked up a few good habits), *XyWrite III* mildly said I couldn't because there wasn't enough disk space. "Gee," I thought, "that can't be right. I had 30 MB on that drive only a few months ago." So I tried again, with no better result. I don't know why I'm always so surprised at these things that happen frequently enough to create great demand for me as a Bad Example. The correct recovery from this kind of situation in *XyWrite III* turns out to be to erase unneeded files and then to save again. *XyWrite III* allows two obvious good choices for doing it. Either shell to DOS and delete a few things to free space before you return to *XyWrite III*, or open a window from within *XyWrite III* and call for a directory listing on which you can make deletions with the program's own delete function.

What I did was tell *XyWrite III* to save my file to another drive. And I continued merrily on my way. Now I have two versions of this column, one on each drive. Twenty years from now I'll probably be trying to talk Matthew into taking all these old files with him. "It's Good Stuff, son, really Good Stuff. They don't make files like this anymore. Take a look at these two versions of my September 1987, *REMark* column. Feel the quality of those words. Beautiful, right?" I figure I can stick the kid with several gigabytes of hard disks and maybe a few thousand old, unlabelled floppies too. He loves me, and he has splendid manners. In addition, I know he wants the malted milk machine, so I think I

can make a package deal. Sort of bundle it in, the way IBM does.

The obvious point, though, is that *XyWrite III* took everything in stride and gave me a few different ways to recover my goof. It's not its fault that I chose what you will conclude is the silliest possible way. Only a few minutes later did I say to myself, "Hey. The thing didn't crash. Now I don't need to clear space before starting something new. I'll just get more hard disks!" I probably could have used a floppy.

See you next time.

Joseph Katz will try to answer letters accompanied by a stamped, self-addressed envelope, but his volume of mail makes him unable to promise to do so. Letters may be edited and published, unless you specifically request otherwise.

Products Discussed

Desktop Publishing Skills

By James Felici and Ted Nace.

Paper. ISBN 0-201-11537-9. \$19.95

PostScript Language Reference Manual

By Adobe Systems.

Paper. ISBN 0-201-10174-2. \$22.95

PostScript Language Tutorial and Cookbook

By Adobe Systems.

Paper. ISBN 0-201-10179-3. \$16.95

The TeXbook

By Donald E. Knuth.

Paper. ISBN 0-201-13448-9. \$24.95

Hard. ISBN 0-201-13447-0. \$29.95

TeX: The Program

By Donald E. Knuth.

Hard. ISBN 0-201-13437-3. \$34.95

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Cheetah Combo/70

Cheetah Card/70

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If you are tired of pop-ups that can only sing solo, give HEPCAT a try. HEPCAT is available from HUG as part no. 885-3045-37 for \$35.00. It works on any Z-100 PC, Z-200 PC, or Z-100 (not PC) system and any version of MS-DOS or Z-DOS.

SPREADSHEET/DATABASE

Corner I



H. W. Bauman
493 Calle Amigo
San Clemente, CA 92672

As I have said many times before, spreadsheets and database programs go together like bread and butter. Therefore, I am changing the name of the series! What this means is that we can express our data in the best way. The vendors of the software are generally better at one type of program than the others. This is the problem of many of the integrated software packages. Another reason is if the user learns one type of software well, the user will not have to learn another to use an integrated package. ADD-IN programs look like the way most vendors will be going. For now, I am not going to dwell on this. I will prepare some tutorial projects to cover database software and I will start at the novice level. Now everyone will be able to understand what we are discussing. This will take several articles and then I will do the same for spreadsheet software. Next, I will use some tutorials to demonstrate the intermediate level for each type of program. Then, we will start using tutorials to show why a spreadsheet is better than a database program or vice versa for a given application. At this point, we will tackle the "integrated packages" to test whether to use them or use the ADD-IN programs.

The readers answers to the questionnaire in an earlier "SPREADSHEET Corner" supplied a great deal of useful information to guide me in making this column the best

for the most readers. If you did not reply to the questionnaire and you feel strong about another approach, I want to hear from you! All readers should remember that this is your column and it is your function to let the author know what changes you would like to see made or any constructive criticism you may have. The author will attempt to answer all letters if the reader will enclose a self-addressed, stamped envelope (business size).

I will start the first few database projects using both DBII and DBIII (Ashton-Tate). The users will get to know their software. I will use DBIII through the beginners' level. I will slowly change over to the DBIII PLUS software during the intermediate level, and I will start to enter some other good database software so that the reader can decide which he prefers. There are a lot of good programs and I have nearly all of what I consider the best to show you a little about each. For the readers that do not have DBII or DBIII at the beginners level and need help, I would like to have you write to me, and if there is enough demand, I will cover this in the articles, otherwise, I will try to get you started by mail.

Let's start with some database definitions so we all use the same language:

1. DATA is information.
2. DATABASE is a collection of related information stored as a file.
3. FILE is a subgroup within the database. Example — The collection of Los Angeles metropolitan telephone books would be called a database. The Beverly Hill's telephone book would be considered a file within the database.
4. RECORD is a grouping of closely related data. In the above example, one line in the Beverly Hill's telephone book — containing Name, Address, and Phone Number — would be a record. Note! The Name is always associated with a particular address and/or phone number.
5. FIELD is a specific item of data within the record. In our example, the name, address, and telephone number would be three fields of the record.
6. A database program is software that stores data, retrieves data, changes data, and permits data to be added or deleted. Nearly all database software handles these items in similar ways. It is the many other features that might be included that make one software package superior to another, reports!
9. Database Tables, for example, in the database program generally display

the data in columns and rows. As an example, a personal phone book:

NAME	PHONE NUMBER
Smith, John	788-1234
Jones, Sue	678-4321
Fire Department	123-4567
JOE'S GARAGE	782-5678

Each row is a record and each column constitutes a field.

10. **RELATIONAL DATABASES** are files that are related to one another through a common field. The example of the phone book could be a relational database with the Name as the common field. This is the key factor between database programs. Are they relational or what I call a FLAT database? Most of the "integrated software packages" use the FLAT method. The better database programs are of the relational type. This does not mean to say that flat databases are not useful. It all depends on the users' application.

I have decided to design a Real Estate database for our project. It pays to work with something you know. My wife, Betty, is a Real Estate Broker of many years standing and she is a member of the local Real Estate Board. Typically, we keep the everyday client database in a definite order — by name alphabetically, by ZIP Code, and address. Another database may have

the same peoples' phone number, how long they have been living in their home, the size of the family, estimated income, etc. This is necessary so that we can structure the database to make it easy to work with and to develop other databases with more information. Most of us mortals do not like messy file cabinets and that applies to computer databases, as well. We mortals would keep index cards in a shoe box where each card would be inserted alphabetically by last name. You can see that if you wanted to find someone that might be ready for a larger house because they have a new member coming, it would get to be a pretty big and complicated shoe box. This is where the trusty computer with a relational database can really shine! I am sure that nearly every reader has wished for a filing system that would allow them to find some detail in an easy way and not be related to real estate at all. How about Income Tax info?

I am sure that nearly every reader has used a file system similar to file cards. The mortal system is quite different than the computer database system (DBMS). As mortals we can read what each line on the index card represents. The computer CANNOT understand anything about data, based on its context. Therefore, we must provide the data with a structured database rigidly followed so that the computer does not mistake a Name for a Phone Number. This

must be done explicitly! Computers are FAST, but they are not SMART!

How should we structure this project's database? First, we must decide what we want to store! To do so, we will break the data down into fields. Remember, each record in the database can only use these selected fields!

Project Requirements

1. Create your database with at least 25 clients.
2. Use the dBASE 'CREATE' command to establish the structure.
3. Name the database "CLIENTS" — or any other name you prefer. The name must conform to certain rules! Limit it to 8 characters with no spaces and no punctuation marks. There are some exceptions that will come up in future projects. Remember that your file must be stored on the data disk drive that you selected. If you are using two floppy drives or one floppy and one hard drive, use the command 'SET FAULT TO A or C', for example.
4. This Record Structure will contain six fields. The reader can select any field names that the reader likes. There are a few rules that must be used. The names must not have over ten characters, no spaces, and no punctuation marks. I prefer to keep them as short as

Record#	LNAME	FNAME	ADDRESS	CITY	STATE	ZIP
1	BAUMAN	HAROLD	493 CALLE AMIGO	SAN CLEMENTE	CA	92672
2	BUTLER	SARAH	45 MACEDONIA ROAD	RALEIGH	NC	27606
3	CAMPBELL	CHESTER	2716 ETOILE WAY	LAFAYETTE	KY	42254
4	COOKE	JONATHAN	568 EASTWESTBOURN	MISSION RIDGE	SD	57557
5	GREYSTOKE	ARTHUR	8897 PLAINES LANE	CHEYENNE	WY	82005
6	LAKELAND	LIONEL	4902 BLUFFSIDE ROAD	MUSKEGON	MI	49450
7	LOCK	JOSEPH	5788 CERTIFIED WAY	CARSON CITY	NV	89701
8	LYMAN	WILLIAM	78 RYE STREET	TOPEKA	KS	66699
9	NEUHOFF	LUANN	8653 RITA DRIVE	BLOOMINGTON	IN	47401
10	RANDOLPH	CHARLES	894 GRIGSBY ROAD	KNOXVILLE	TN	37922
11	ROARKE	JOHN	87899 GALLATIN SW	ROANOKE	VA	24018
12	SMITH	JOHN	321 MAPLE STREET	SAN DIEGO	CA	92123
13	APPLETON	JANET	6578 RIVER DRIVE	GREEN BAY	WI	56964
14	JOHNSON	DAVID	936 BALTIMORE STREET	HASTINGS	NE	85631
15	JAMESTON	MARY	455 PARK AVENUE	NEW YORK	NY	07892
16	RYAN	GERALD	1119 S. WEBSTER AVE.	GREEN BAY	WI	55677
17	PHILBROOK	RUTH	9970 WISCONSIN AVE.	MILWAUKEE	WI	58763
18	BACON	MARGARET	55 HILLTOP ROAD	ST. JOSEPH	MI	49844
19	ELLERTON	ROBERT	6654 WESTWOOD BLVD.	WESTWOOD	CA	95644
20	JONES	JAMES	999 LAS VEGAS BLVD.	LAS VEGAS	NE	91223
21	BARRET	PETER	499 CALLE AMIGO	SAN CLEMENTE	CA	92672
22	SORAN	EDWARD	393 CALLE GUERA	SAN JUAN	CA	92677
23	LIDSTER	RALPH	5989 CALLE FRONTERA	SAN DIEGO	CA	97742
24	STUMP	ARTHUR	488 CALLE CANADA	SAN CLEMENTE	CA	92672
25	GILLMORE	ANDREW	19988 LAKE DRIVE	EL TORO	CA	91645

possible and still define them so that I can come back days or weeks later and know what they stand for. The fields that I will be using are as follows:

- a. LNAME — for last name
 - b. FNAME — for first name
 - c. ADDRESS
 - d. CITY
 - e. STATE (two letters only)
 - f. Zip (5 numbers only)
5. All of the above fields will be character type data even though the zip code contains numbers, but we will not be using them for calculations. Therefore, we will type 'c' before the data fields. Also, no decimal points will be used, thus we will use a '0' for that part of the field. (We will go into this more in the next project.)
6. Use the 'APPEND' command to load the data into the database.
7. Lastly, print a listing of the database. (See my printout.) Use the following commands:

```
.SET PRINT ON.  
.LIST.  
.SET PRINT OFF.
```

For this project, I will start with a step-by-step procedure. This should not keep the user from referring to the software manual!

1. Set up dBASE on your system per the manual. There are too many combinations for me to go through the steps for each of them.
2. Turn on the computer and printer.
3. Format a blank disk. This will be your data disk! Put it in the drive you will use for your database files.
4. Boot DOS and enter Date and Time if you do not have a built-in clock.
5. At the system prompt, load the dBASE program by typing 'dBASE'. You will find a 'DOT' prompt when dBASE is ready.
6. Type 'SET DEFAULT TO 'x''; where 'x' is the drive prompt where you have your data disk.
7. Type 'CREATE' after the DOT prompt.
8. dBASE will ask for 'ENTER FILE-NAME:'.
9. Type x:CLIENTS — remember 'x' is the file disk drive.
10. dBASE will ask —

```
ENTER RECORD STRUCTURE AS FOLLOWS:  
FIELD NAME, TYPE, WIDTH, DECIMAL PLACES  
#1
```

11. The Field TYPE can be Character (C), Numeric (N), or Logical (L). A Numeric type can contain digits only, with an optional decimal point and Numeric is used only when the field will be used for calculations. The Logical field can contain only (y) yes or (n) no. The Character field can contain letters, numbers, or punctuation marks. The Width is where you define the maximum number of characters that you will ever want to enter! A Logical field would have a width of one. The Numeric field with a decimal point must contain the number of digits, plus one for the decimal point.

12. At the #1, type LNAME,C,10,0
13. Computer will now show #2.
14. Now type FNAME,C,10,0.
15. Now #3 will be seen.
16. Type ADDRESS,C,20,0.
17. #4 will show.
18. Type CITY,C,15,0.
19. #5.
20. Type STATE,C,2,0.
21. #6.
22. Type ZIP,C,5,0.
23. #7.

24. Press RETURN/ENTER. This tells dBASE that is the end of the entries!

25. dBASE will ask — INPUT DATA NOW?

26. Type N.
27. '. DOT' prompt will now show.
28. Type the command 'USE X:CLIENTS'.
29. . another DOT prompt.
30. Type command 'APPEND'.
31. dBASE will display the defined data form:

```
RECORD #1  
LNAME   :           :  
FNAME   :           :  
ADDRESS :           :  
CITY    :           :  
STATE   :           :  
ZIP     :           :
```

32. Type in the following:

```
Your last name  
Your first name  
Your address  
Your city  
Your state (2 letters only)  
Your ZIP Code (5 digits only)
```

Notes!

1. dBASE will "beep", and the cursor will move down to the next field when any field has been filled to the specified width.
2. dBASE will automatically display the next Record Number after each Record has been completed.

3. Repeat step 32 until you have put at least 25 clients into your database! Type in the data as shown by mine, or you might want to start a useful project like a Xmas list or some mailing list you use often. WARNING! If you are really a Novice, use mine so that it will be easier to follow the article and find errors! I will be using this database in a following article.

33. After the last Record has been completed, press return. The DOT prompt will return to the screen.

34. Type the command 'LIST'. The entire database will be displayed on the screen. Note! If your Record exceeds 80 columns, the "wrap" will cause the display to look complicated. Thus, for now please keep your database records within the 80 character limits.

35. If you check your work and you are satisfied with it, print out a copy with your printer. Do the following:

```
.SET PRINT ON  
.LIST  
.SET PRINT OFF.
```

Note! It is always good practice to use the 'SET PRINT OFF' unless you are sure that you KNOW that you will want to print another copy! Until you type this command, anything you do at the keyboard will cause the printer to respond.

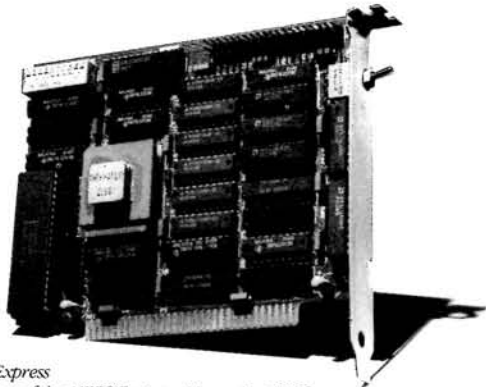
36. Type the command '.QUIT'.
37. dBASE will display **END RUN DBASE**.
38. The DOS prompt for the current drive will appear.

You have now completed a Structured Database. You can manage this database by giving the computer dBASE program precise instructions! We will be getting into more of this in the next project. Until next month, keep trying some similar projects of your own! ✱

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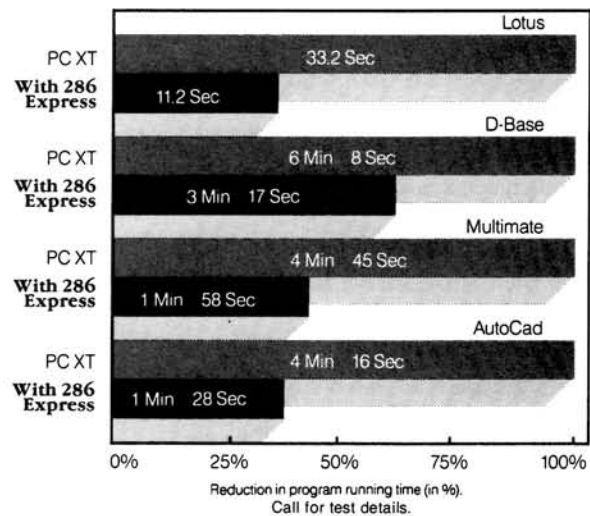
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Ecosoft C88 Compiler, Enable, FlipFast Books, FORMAT Command, HEPCAT, HyperACCESS, The LaserWriter Connection, WatchWord, WindowDOS

This has been one of those years. Many of my writing commitments have been delayed or late due to my spending an extended amount of time in Indiana due to my mother's illness with emphysema. It was a long battle for her, and she passed away on April 30. My thanks to everyone on the HUG staff and Heath Company for their support and understanding.

On the brighter side, there have been lots of new developments in the world of Heath/Zenith computers. HUGCON was last month, and although I intended that this article be in last month's issue, there just wasn't enough time. For those of you unable to attend HUGCON, I will have a couple of surprises.

The Ecosoft C88 C Compiler

For those of you who have encountered programming limitations in BASIC and decided to learn another language, the Ecosoft C88 C compiler is probably the best thing since sliced bread. First and foremost, it is a rigidly standard C compiler as defined by the usually accepted book on C: "The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie. Many articles on the C language will refer to the "K & R standard" which is based on that book.

I have talked to Dr. Jack Purdum, President of Ecosoft, and a new version of the C88 Compiler was available at HUGCON. I have seen the new version of the compiler,

and like its predecessors, installation is straightforward and easy. In fact, it's much easier since there is a new installation procedure.

Compiling a C program is easy: all you have to do is type CC followed by the program name. But the CC program is not really part of the compiler itself. It is a utility program that controls compilation flow based on available compiler options (i.e., switches). The latest version has a remarkable number of features and options that are usually found only in much more expensive C compilers. In at least one case — the MAKE feature — I have not seen anything else like it in other compilers. It is a neat feature that takes care of compiling and linking of files that make up a program. It will only recompile those program modules that have been changed since the last compile. And just in case you like to tweak things to meet your specific programming requirements, the CC program is also provided in source form so you can do just that.

The CC program controls the various passes of the compiler consisting of the preprocessor (XP.EXE), parser (XC.EXE), optimizer (XOP.EXE), code generator (XM.EXE), and the assembler (XASM.EXE). The control program also invokes an error pass (with CE.EXE) in the event that one of the other passes detects an error. As you might expect, the final output of a successful compilation is an object module (filename

.OBJ) that is converted to an EXE file with the standard DOS LINK command. For those of you not familiar with C programming, all C compilers that I have seen make multiple passes like the C88. For example, my recollection is that the Computer Innovations C-86 compiler makes at least four passes. Even the Microsoft Macro Assembler (MASM) makes two passes for code generation.

This compiler has a complete library of various standard K & R functions in addition to a number of functions that are specific to MS-DOS and PC-type computers. The new compiler has the capability to generate four models. Without going into all of the gory details and explanations, that simply means that you can write programs that are larger than 64 kilobytes among other things.

In addition to all of that, the manual has been rewritten to include a complete program example for nearly all of the C functions. I say "nearly" all since it is difficult to come up with a reasonable (short) program example for some functions, but that is only a half dozen or so. Even those are illustrated with code fragments that show how the function is used.

I have seen a preliminary copy of the manual, and the manual by itself is probably worth the price of the compiler, particularly for beginners. The fact that it

includes complete programs is something that I have not seen before in a compiler manual. You can learn a significant amount just by looking at the examples, and if you are so inclined, you can type them in, compile them, and run the program. I do not claim (and neither does Ecosoft) that all of the programs are particularly useful, but they do work.

Before I forget it, I should mention that I recommend you get library source code when you get the C88 compiler. You can get the C Library Source that includes all library functions written in C, except for memfiles and math functions. Or you can get the Developer's Library that includes ALL source code for the Eco-C88 library including the transcendentals and assembler routines. Both are half price when purchased with the compiler. My experience is that you can learn a lot by looking at how these library functions are programmed. As a minimum, I recommend the C Library Source.

Aside from the fact that it is an excellent (and standard) C compiler, perhaps the best news is that it is quite reasonably priced at \$59.95. When you consider that the Ecosoft's C88 is a top-notch, standard compiler, the price versus quality is an incredible value. And the C88 will run just fine on the Z-100, as well as the PC series computers. This is one of the finest C compilers available at any price and it is highly recommended. But there is more — a LOT more.

Other Ecosoft Products

Ecosoft has a complete line of products to support the C88 compiler. The Flexi-Graph Graphics package has over 100 graphics and support functions that you can use. In addition to providing graphics support for the Z-100, it even supports the PC series for both CGA (Color Graphics Adapter) and EGA (Enhanced Graphics Adapter). If you like to create dramatic graphics effects on your computer, you can do it with this package. It makes the BASIC CIRCLE, DRAW, PAINT, and PLOT commands look positively archaic. My only problem with this package is that I spent a considerable amount of time creating some neat graphics for the Z-100. It is altogether too easy to get involved in the fun of doing that.

One product that I probably should have mentioned with the C88 is the CED (C Editor). This is a full screen editor that was specifically designed for use with the C88 compiler, although I have used it for other tasks too. It does all of the common editing

tasks that you would expect, plus it allows multiple windows, macros, and help on C functions. In my opinion, the best feature of this editor is that it provides you with a complete programming environment. In addition to everything else, you can also compile and link programs without leaving the editor. If you have an error that was flagged by the compiler, you can use CED to automatically go to the problem code. In the past, this editor has been included with the C88 compiler.

Do you do windows? Ecosoft does with the C88 Windowing Library. This is another one of those fun packages that you can spend a lot of time with. The bad news is that it does not run on the Z-100. Those of you interested in technical details would probably like to know that you are limited to 255 windows, but I think that five is quite sufficient, thank you.

I have seen Ecosoft's new source code debugger (which will be called something like C-MORE), and it is dynamite. It provides an easy way to run a program by watching the source code run in a "source window". You can execute a program one line at a time (called single-stepping) and watch the variables change value in another window. I wish I had had this when I was learning C. Unfortunately, the debugger does NOT run on the Z-100 — it only works on the PC Series computers. The debugger is highly recommended. By the way, I should also note that the debugger was written with the Ecosoft C Windowing Library.

Another new Ecosoft product is the new Computer Aided Instruction (CAI) on C. If you want to learn C, this is an excellent tool that uses your computer as a learning aid. I have been through this course from start to finish (several times), and I have learned something new each time I go through the course. If you are learning C, I highly recommend this course at a quite reasonable \$24.95. This program was also written with the Ecosoft C Windowing Library. Do you get the impression that Ecosoft REALLY supports their products? They do.

I haven't tried all of the Ecosoft products, but I should mention that they are available. The first is the Librarian (Prudence?) that allows you to create an object module library similar to Microsoft's LIB command. Another product is the ISAM Library. ISAM is an acronym that comes from the mainframe computer world and stands for Indexed Sequential Access Method. Suffice it to say that this product provides functions for accessing files on a sequential basis.

Although I have mentioned them before, Jack has published several books on C programming that I highly recommend. I learned C from Jack's first book the "C Programming Guide". I also have the "C Programmer's Library," as well as the "C Self-Study Guide". If you have a choice of reading material on C programming, I can highly recommend the "C Programming Guide" and the C Self-Study Guide" as an excellent starting point for learning C.

All in all, the Ecosoft software products are quite excellent. If you are a newcomer to the C language (and even if you aren't), Ecosoft has a complete line of products for the beginner, as well as the professional programmer.

Some Comments

Many of the ideas for articles come from other publications since I do not have the time for running benchmark tests on various products. C compilers are no exception to that. If you are interested in comparing the various details of a number of compilers, I recommend that you look at the article on "Benchmarking C Compilers" that appeared in the August 1986 issue of Dr. Dobb's Journal. Choosing a C compiler is somewhat like choosing a car: you have to find one that fits you the best. The Ecosoft C88 compiler was criticized in the Dr. Dobb's article for its documentation, but that has been corrected. Perhaps the most interesting part of the Dr. Dobb's article is that the C88 performed quite acceptably compared to the \$400+ compilers. In some benchmarks, the C88 did much better. I should also note that the new C88 now supports all four memory models instead of only the small model evaluated in the Dr. Dobb's article.

There is at least one example of how easy it is for writers to get tangled up in the technical details of a review and miss a point or two. Another review of the C88 compiler appeared in the February 1987 issue of Computer Language. I personally did not understand the author's comment about the C88 that: "In reality, it has some nice features and some big holes." What the big holes were was never made clear in the article. In response to a letter from Dr. Purdum in a later issue, the reviewer said that the big holes were the documentation and the lack of bit fields. Other than that, the review was generally complimentary on the C88.

Was the documentation a big hole? I never thought it was, but I did agree that it could have been improved — all documentation can be improved to some extent. But I did

not think that the documentation was as bad as the review could lead one to believe. I did not have any difficulty with it. In any case, that is now a moot point since the C88 documentation is quite excellent — better than either the C86 or Microsoft C compiler.

Even though the bit fields are a K & R standard, many other, more expensive compilers do not support them either. That also has become a moot point since the C88 now supports bit fields.

There are always times when writers get in a hurry, and occasionally the Gremlins get to everyone.

Enable (The Software Group)

You may have heard of Enable. It is an integrated software package that contains a word processor, spreadsheet (and graphics), database, and telecommunications software. And in case you had not heard, Enable has been a part of the government contracts that Zenith won last year. As I recall, that was part of the 250 million dollar '248 contract, since Enable was a PC-based software package.

But first, one of the surprises. Enable is now available for the Z-100! For those of you who were able to attend HUGCON, you saw Enable for both the Z-100 and the PC Series systems. Even better is the fact that the Z-100 Enable will be offered at a special introductory price of \$195. I suppose it is obvious to point out that Enable is almost certainly the last major software package that will be available for the Z-100.

Like most integrated software packages, Enable is a sophisticated set of programs. Based on my limited time for review before I wrote this article, I will mention some of the more obvious features.

Perhaps the most obvious thing that you can observe as you open the package is that Enable is NOT small. The Z-100 version contains six distribution disks: Install/Definitions, Utility, Enable/Check and Help, System, Operation, and Tutorial disks. The PC version contains nine distribution disks: Install, Definitions, Utility, Enable/Check and Help, Perspective A (EGA Graphics), Perspective B (EGA Graphics), System, Operation, and Tutorial disks.

Even though the documentation discusses the installation on a system with two floppy disk drives, I don't recommend any software that is as sophisticated as Enable on any floppy disk system. It seems to me that, if you need the capabilities of this kind of

software, it is silly to spend the time using a floppy disk. Disk swapping could be a real chore, and you lose a lot of the advantage of the integration simply because of the time.

As I have mentioned before, more memory is also necessary for this kind of operation. If you are using MS-DOS version 2, you will need a minimum of 384 KB of system RAM. If you are using MS-DOS version 3, you will need a minimum of 448 KB of system RAM. And if you expect to use the EGA graphics on the PC series, you will need the full 640 KB of system RAM, as well as an EGA-capable video card and monitor. In order to use the telecommunications software, you will obviously need a modem. Incidentally, the additional memory requirement depends on which version of the DOS you are using since the DOS version 3 itself requires more memory than version 2. If you really need Enable's capabilities, I strongly recommend that you have a hard disk with the maximum amount of memory available (either 640 K or 768 K) in your system.

The user interface to Enable is based on the Master Control Module (MCM for short). The MCM allows you to customize Enable based on your printer and other necessary items within each function. This customization is based on a Profile that allows you to change defaults for various features.

The documentation for Enable generally consists of five manuals: the system overview, word processing, spreadsheet, database, and telecommunications. A sixth "book" contains information on getting started, a quick reference guide, customer support, and the diskettes. For the PC Series computers, another small manual is included that documents the Perspective graphics software. While the documentation is formidable, it includes the software that performs a number of functions that would take considerably more room on your software shelf if you bought individual packages. Although I have not spent much time with Enable as yet, my general impression is that the documentation is good, although the Z-100 documentation appears to be a duplicate of the PC version with the exception of a small Z-100 supplemental manual.

The biggest single difference for the Z-100 is that the F0 key is used as the Alt key, and SHIFT-F0 is used for the CTRL key. There are also a few other differences in the keys that are unique to say the least. It is interesting that there is a warning NOT to use the Z-100 CTRL key. Subject to the obvious hardware differences between the

Z-100 and the PC series (e.g. EGA support), the software performs quite similarly on both systems. I will be telling you more about Enable in the future.

HyperACCESS

From what I can tell, a number of people have recognized how good HyperACCESS is. Heath Company has had it listed in the catalog for a long time, but I am pleased to note that I was one of the first (if not the first) to mention the Hilgraeve's original ACCESS and HyperACCESS. Since that time, I have seen good reviews of HyperACCESS in a number of publications including InfoWorld.

HyperACCESS is a very sophisticated telecommunications package. It can do just about anything you will ever need (and some things you may not have thought of). I have used CROSSTALK, and perhaps the nicest thing I can say about it is that I think it is clumsy.

If you are interested in telecommunications software, you owe it to yourself to take a look at HyperACCESS. In any case, HyperACCESS is probably the best telecommunications software on the market today. HyperACCESS continues to be highly recommended.

HUG Software

HUG software represents one of the finest values in programs today. They are available at a nominal price, and I have found that the software is uniformly excellent. Pat Swayne and a number of other people have contributed to the HUG software library to the extent that it contains something for nearly everyone.

Pat's legendary ZPC program is just one example. But I noticed that he has been busy again with another new program called the HUG Engineer's and Programmer's CALCulation Tool or HEPCAT, for short. If you were looking for a heavy-duty, pop-up calculator, then HEPCAT is for you. HEPCAT provides all of the standard floating point support and scientific notation that you would expect in an engineering calculator. Programming calculations can be done in a variety of radices, including binary and hexadecimal. One disk does it all since both the Z-100 and the PC series version are on the same disk.

I also noticed that my friend and colleague, Joe Katz, has been busy too. He has developed a neat program for the LaserWriter called The LaserWriter Connection that allows you to connect (and effectively

use) an Apple LaserWriter with a PC-type computer. It seems that Apple assumed that all users would connect the LaserWriter to a Macintosh. The only software furnished with the LaserWriter is for the Mac, so you were out of luck if you need software for a PC-type system. Alas, I do not have a LaserWriter, so I cannot tell you much about the software; however, knowing Joe, I am quite certain that it works quite well.

WatchWord

I just got a couple of notices in the mail from Steve Robbins (S&K Technology) that the original Z-100 WatchWord and the PC WatchWord have been updated to version 3. Unfortunately, Steve and Kay were not able to attend the HUGCON this year, but I still highly recommend WatchWord as the Corvette of all editors. It's fast, easy to use, and quite reasonably priced.

WindowDOS

You may recall that I mentioned WindowDOS in the December 1986 issue. I liked version 1 then, but version 2.0 has been released, and it is even better.

WindowDOS is basically a RAM-resident (it can also be non-resident) file manager with a LOT of extra functions. Although I suppose you could live without it on a floppy disk system, I think you must have WindowDOS if you use a hard disk. And I think a good argument could be made that it is a "must have" for a floppy disk system, too.

The WindowDOS main pop-up display is activated by CTRL-INS and shows file names sorted in alphabetical order. The cursor keys are used to move around in the file list, and as each file is highlighted, the top of the display shows the file creation date, time, and file attributes. WindowDOS commands appear at the bottom of the screen and include COPY, DIR, ERASE, FORMAT (floppies only), GLOBAL, LIST MKDIR, RENAME, SORT, TREE, and VIEW.

WindowDOS displays all files in the directory including the hidden/system files and the directories. If you want to change to another directory, all you do is move the cursor "pointer" to that directory and press RETURN. If you have a hard disk with a lot of subdirectories, this is a lifesaver.

WindowDOS includes a remarkable number of features that have been overlooked in MS-DOS. For example, you can rename subdirectories (and files), as well as MOVE files (no copying) between subdirectories.

Since WindowDOS displays every file in a directory, you can also change the HIDDEN or READ/WRITE file attributes. If you really want to get tricky, you can even hide a subdirectory name.

If you have a hard disk, one of the best features is that you can use WindowDOS to backup files, since it can copy files to multiple diskettes in a way similar to the MS-DOS BACKUP command. It is easy to "tag" multiple files for copying (and other functions) by highlighting the file and pressing the Keypad + key.

You can even create your own "help" screens with WindowDOS. A number of samples are included, but you could customize them or create specialized ones. Other features allow you to send setup codes to your printer, set the AT (or Z-200) real-time clock, and activate a screen saver to prevent CRT burnout.

I have not mentioned everything that WindowDOS can do, but it is a full-featured program that includes many needed commands. It is highly recommended, and I think you will like it as well as I do. WindowDOS runs on the PC Series computers only.

The FlipFast Books

The new FlipFast books are finally available. Books, did you say? Yes. The first is the update to the Heath/Zenith MS-DOS that includes up to version 3.2. But there is a lot more than that. This book also includes the "Programmer's Reference Manual" that I have mentioned in the past so that the book is now about 500 pages. Half of the book contains the same sections as the first one: Introduction, I/O Redirection & Directory Trees, Batch Commands, MS-DOS Commands, and Hard Disk Commands.

Section 6 contains the Programming Commands, such as CREF, MASM, etc. Section 7 contains DEBUG and EDLIN commands. Section 8 is about 60 pages of Programmer's Reference information that includes a brief listing and usage of all interrupts (hardware and software), as well as DOS error codes. Section 9 contains a Conversion Table with decimal, hex, octal, ASCII, and binary numbers up to 255 decimal. Section 10 contains hard-to-find information on the DOS memory map, disk formats (including the new 3.50"), device drivers, port addresses, and keyboard scan codes for the PC series. This section also contains the Escape sequences for the Z-100. Section 11 contains User Information related to the Configuration File (CONFIG.SYS), including examples, as well as usage, for all of the standard device

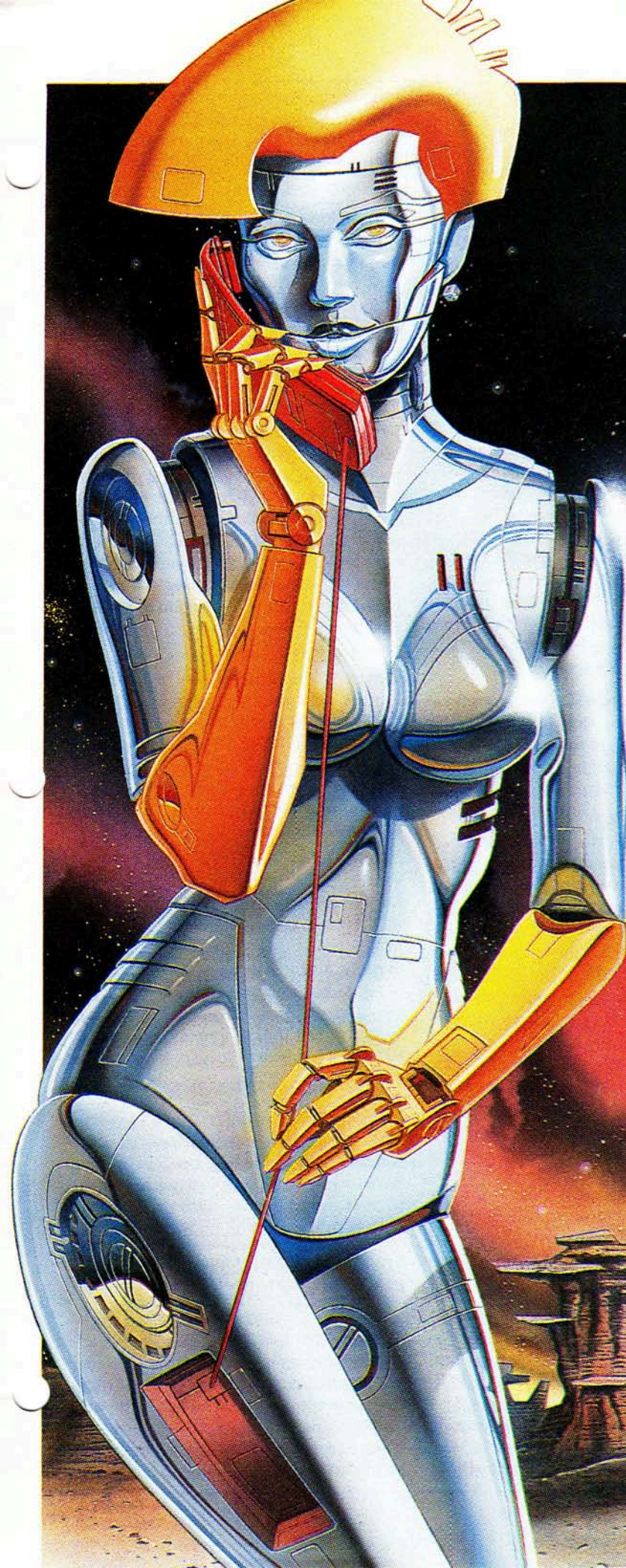
drivers ANSI.SYS, DRIVER.SYS (3.2 only), and VDISK.SYS. Last, but certainly not least, section 12 contains a cross reference to about 1,000 error messages that are documented in the book. That number increased from about 700 in the version 2 book because of the addition of the programming commands (MASM has a BUNCH of error messages!), as well as the new commands in version 3. But that is only the first book.

For you BASIC fans, we have a new book: The FlipFast Guide to Zenith/Heath GW-BASIC written by William Barden. This book contains all kinds of good information about GW-BASIC (not Z-BASIC) in a format similar to my original books. This book contains about 400 pages that are chock-full of information about GW-BASIC. Section 1 is "How to Use This Book & Introduction to BASIC". Section 2 describes "How to Write Better GW-BASIC Programs". Section 3 introduces variables and "Using Variables for Accuracy & Speed". Section 4 is the "FlipFast Reference to GW-BASIC" that includes the GW-BASIC command syntax, usage, examples, requirements, application notes, and error messages in the FlipFast format. Section 5 includes "Programmer's Appendices" with Reserved Words, Error Messages, Conversion Tables, Keyboard Scan Codes, and a few other goodies.

Although I have indicated that I have been working on several projects, I have been more than a little reluctant to mention them until I was sure they were complete. The MS-DOS book represents a compilation of just about everything I know about DOS including the programming information. That is why the book size doubled from the previous version 2 book.

Bill's BASIC book represents an incredible amount of expert information on BASIC programming, in general, and GW-BASIC, in particular. For example, did you know that you can improve the speed of your BASIC program by using integer variables whenever possible? I didn't, but that is just one example of the type of information available in the GW-BASIC book. I have to admit that it is difficult for me to be totally objective about the GW-BASIC book, since I also did some technical editing on it, but I still think it is an excellent book.

That covers all of the specific items for this month, so now it is time to get back to some "general information" about MS-DOS. I hope that the following will answer some of the questions that a number of you have had about the FORMAT command.



"Why Haven't You Called?"

"I've stayed up 24 hours a day waiting to hear from you. I know that for most of you, this may be your first time, but I promise, I'm very gentle! If you're still unsure, let me tell you what I have to offer. First, there's my message base. Here's where my users exchange ideas, receive assistance, and sell things. Next, is my database. Most of my users will tell you, it's second to none! With over 30 megabytes of hand-picked software it caters to all Heath/Zenith computers, but mostly PC compatibles. Finally, I have something new for you, my 'Bargain Centre'. Here you can buy surplus software and hardware, at unheard of prices. Interested? I hope so! Set your modem to either 300, 1200, or 2400 baud, and call me right now at (616) 982-3956, and register today. If you're still a bit shy, you can still call my human at (616) 982-3837 and register with him. Although he talks at 150 baud, he's gentle, too!"

MOC

The FORMAT Command

As a result of the article on the Z-200 hard disk last October, several people have asked me about the difference between the Zenith and IBM PC-DOS FORMAT command. Some have observed that the IBM FORMAT takes quite a bit longer to run on a hard disk than the ZDS version. Why?

The answer is that the IBM FORMAT command does a lot more than the Zenith FORMAT does (or needs to). That is particularly true when you FORMAT a hard disk. The most significant difference in this respect is that the IBM FORMAT command also tests a hard disk for bad sectors and updates the File Allocation Tables (FAT) during the FORMAT. That is the reason that the Zenith command will FORMAT a complete hard disk in a matter of a couple of minutes — the IBM FORMAT makes take hours depending on the size of the hard disk. Fine, but what does the Zenith FORMAT command do?

To answer that, we must recall some information about the Zenith hard disk utilities. Remember the DETECT utility? It performs a non-destructive read of every sector on the disk. If DETECT can not read a sector on the first try, it makes a note of the sector location in the Bad Sector Table. Then, the hard disk is formatted, and the Zenith FORMAT command checks the Bad Sector Table.

If a sector is marked as bad, FORMAT marks the cluster as bad in the File Allocation Table (FAT), normally with an FF7 hex. That is why it is not enough to run DETECT occasionally — you must also FORMAT the disk to prevent loss of data. Otherwise, the Bad Sector Table will get updated, but MS-DOS does not know about that. MS-DOS only looks at the FAT while trying to allocate disk space for files. If a cluster is used or “reserved” (with an FF7 hex), MS-DOS does not try to use that disk space.

I think that the Zenith approach to the FORMAT command (and hard disks, in general) is much better than IBM’s for several reasons. Perhaps the most important is that there is a permanent record of the bad sectors in the Bad Sector Table. As far as I am concerned, once a sector fails to be read ANYTIME on the first try, I do not want to use it to store my data ever again. You will know you hit a bad sector when you get the Bad Sector message from MS-DOS or a BDOS Error from the Z-100 CP/M. If you write down that bad sector address, you can enter that bad sector address when prompted by DETECT. And then FORMAT

the hard disk to ensure that sector will not be used again.

The IBM FORMAT only tests for bad sectors during the actual FORMAT run. Since there is no permanent record of the bad sector, it is not permanently “locked out”. The bad sector is only locked out until the next time you run the IBM FORMAT. Under some conditions, a sector may test “good”; under others it may test “bad”. Heat, in particular, is one factor that may influence whether a sector tests good or bad.

If you FORMAT a hard disk in the morning, just after the system is powered-on, you may have a given number of bad sectors. But if you do that again in the late afternoon after the system has been running all day, you may find that there are a larger number of bad sectors simply because of heat. The same kind of situation can occur if you move a computer from a “cool” room to a “warm” room. Since you can never be exactly sure of which “bad sectors” are being locked out with the IBM FORMAT, it may be hazardous to the health of your data, not to mention your sanity.

By the way, the Zenith FORMAT command does test a floppy disk for bad sectors during formatting just like the IBM version does. IBM has apparently decided to treat the formatting of hard disks just like floppies; Zenith MS-DOS treats them a little differently.

One other interesting difference occurs when you compare the version 3.2 Zenith and IBM releases of the FORMAT program. FORMAT displays the head and side number during the formatting process. For a standard 40 track floppy, the Zenith FORMAT program displays the numbers 0-39 to indicate which track is being formatted; the IBM FORMAT displays track numbers 0-27 during formatting. Why? IBM is using HEX numbers (not decimal) for the tracks. If you watch the IBM FORMAT command, you will see it format tracks 09, then 0A, then 0B, and so on. It is strange displays like that which cause users to dislike working with the operating system. Despite the fact that programmers must use the hexadecimal numbering system, and some even like it, I think it is just plain dumb to force that kind of thing on users.

FORMAT is one of those programs that are “customized” by each manufacturer depending on the hardware. As it turns out, programs that can format a disk (like DISK-COPY and BACKUP) are customized by each manufacturer to meet their specific requirements. That is one reason that you will see some differences in the way those

programs run depending on who wrote the code. That explains, for example, why the Zenith FORMAT displays decimal numbers for the tracks, and the IBM FORMAT uses hex numbers.

The FORMAT command is one of the things that I particularly like about the Zenith MS-DOS. When compared to the IBM version, I like Zenith’s much better both for technical and other reasons. Perhaps the biggest “other” reason is that I prefer the prompt for the drive letter instead of formatting the default drive.

PC-DOS Has A Zenith Mode

By the way, have you noticed that IBM is now providing the capability to use a hard disk in the “Zenith mode”? It is just part of the trend that IBM has been becoming more Zenith compatible. For those of you who haven’t seen this information, a number of PC-related publications have talked about PC-DOS 3.3 allowing the use of multiple partitions (the “Zenith mode”), as well as doing away with the 32 megabyte physical hard disk limit.

While all of that sounds great, IBM has had a number of problems with version 3.3. Perhaps the biggest is that it causes loss of data on a hard disk, since the interleave factor has reportedly been changed. According to some publications, IBM has issued several patch disks (not to users) to correct the problem.

Another interesting point about PC-DOS version 3.3 is that it is not an “official” Microsoft release of the DOS. Reports are that 3.3 was updated entirely by IBM, so take extreme care if you plan to use this version. And if you have a hard disk, be SURE to back up everything BEFORE you implement the new version. That is ALWAYS a good idea whenever you change to a new version of DOS no matter who the vendor is.

In The Future

Now that things are getting back to some semblance of normalcy, I will be getting back to a regular schedule (I hope). Thanks to all of you who have written, and I finally have gotten caught up on the mail.

By the way, I ask my friends to call me Bill, so don’t hesitate to use my first name when we talk (or write).

As usual, be sure to include a self-addressed, stamped envelope (business size preferred) if you would like a personal reply to your question, suggestion or comment. And don’t be too surprised if you see your name as we take a look at your suggestion or article idea.

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 Z-100 only (OS-63-30) 150.00
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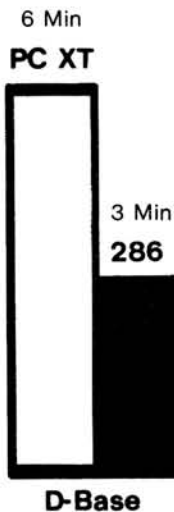
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Until recently, it has been difficult and/or expensive to prepare slides and overhead transparencies that could capture and hold the attention of an audience. While white print on a blue diazo background or black print on a white background do convey information, these types of slides just do not serve to highlight important points or spark an audience's interest to a higher level. Computer graphics changed all that. If you've got about \$2000.00 for Polaroid's Palette imaging system or about \$5000.00 for Nicolet's, you can prepare prime quality 2"-by-2" slides for presentations. The following is a report on what can be done with one of the available graphics packages (a mouse makes it easier), a 35mm camera (an autoexposure type is nice, but not necessary), and color 35mm slide film, at far lower cost.

I often must present information to classes I teach, at professional meetings, and to justify funding levels to granting agencies and contractors. Since visual aids greatly assist in information transfer to an audience, I try to use graphical material whenever possible. In the classroom, I commonly use overhead transparencies while

for seminars and other professional presentations, I usually use projection slides. In the past, I have relied upon the traditional method of making slides of hand-drawn black-on-white graphical material using a high contrast transparency film.

After I built my first Z-100 and bought Palette by Software Wizardry, I realized I was on to something. Since then, I have built two H-151 kits and one H-158 kit and use the graphics capability of each to the fullest. The procedures used are simple and can be available to anyone who owns a PC, with minimal additional investment. I believe that, as with most things computer-related, additional money thoughtfully spent can give better-than-average results. With the approach described below, however, even the basic set-up is a marked improvement over traditional techniques.

I use PC Paint, PC Paint Plus and either a Mouse Systems three-button mouse or a Visi-On Mouse when I am working with one of my H-100 PCs, simply because these were available when I began using this approach. The PC Paint Plus and three-

button mouse is installed in my H-158 which contains a Paradise Auto-Switch EGA card and the results are displayed on a Zenith ZVM-135 monitor. This high resolution system allows me 640 by 200 pixel resolution with 16 available colors and is the one I commonly use in my laboratory. I did (and still do) many applications on an H-151 using PC Paint and two-button mouse using the four colors of the CGA-equivalent output of the 151, again to a ZVM-135 monitor. [Note: I have installed the PAL modification and have 704 KRAM in my H-151. This modification interferes with the proper functioning of the Paradise card even after installation of the Video RAM Disabler Kit]. I also use this set-up with an NEC Multisync monitor, occasionally, for 640 X 350 resolution graphics. In addition, I often use my older Z-100 and Palette software (without a mouse) for similar work for the additional variety of colors this software provides.

Quite simply, I draw or type in the graphics I wish to use, add appropriate legends and photograph the monitor. Using PC Paint or PC Paint Plus, I use the "show screen" command to reveal the image; in Palette what

you see is what you can photograph. For slide presentations, I commonly use the Polaroid Instant Slide System (the same that is used in the Polaroid or Nicolet imaging systems), but I have successfully used Agfachrome 50, as well. The advantage of the Polaroid system is that I can immediately assess the quality of the slide and determine what changes will improve it. I can also wait until almost the last minute to prepare a series of slides. An autoexposure camera is especially nice, since there is no experimentation with screen brightness controls or exposure times required, but cameras with manually-controlled exposure settings can be used with only slightly lessened facility, although some experimentation to determine the best exposure settings for a particular type of screen display may be necessary.

Control of exposure times and layout of the graphics are important parameters, whether an H/Z-100 PC or the classic Z-100 is being used. With either an autoexposure or manually controlled camera with center-weighted metering, the use of bright colors in the center of the graphic and darker colors at the periphery may result in a slide with a perfectly exposed center region and under-exposed edges, or the opposite may occur. If the graphics are

laid out to take up the entire screen, the finished slide may include a portion of the monitor bezel, since most 35mm cameras record on the negative a portion of the field of view which is not visible in the viewfinder. Worse, using the entire screen may result in a portion of the photographed image appearing to curve away from the viewer of the projected image due to the curve of the monitor screen.

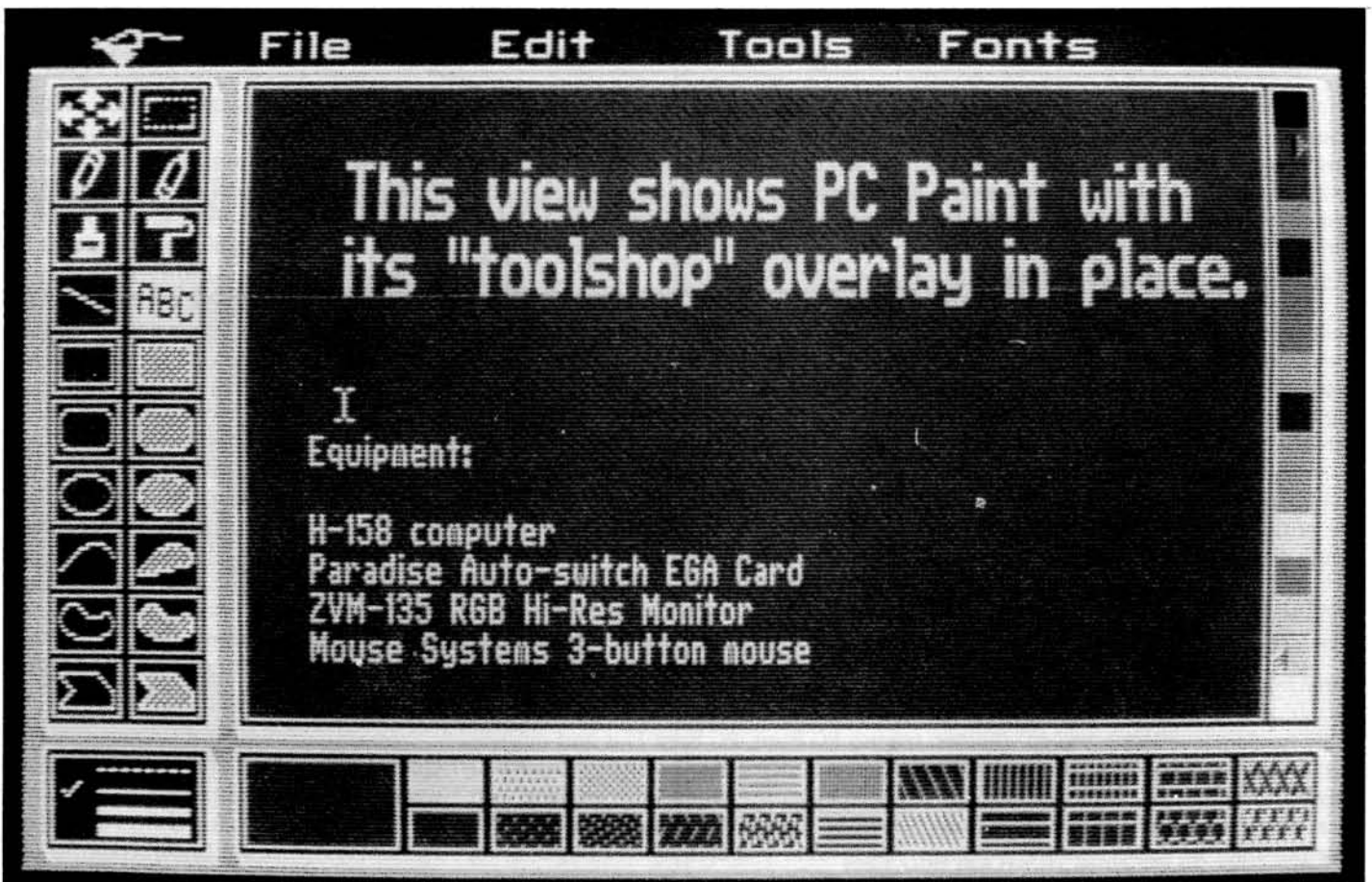
The basic procedure I follow when using the H-158 and PC Paint or PC Paint Plus is as follows. These drawing packages use an overlay on the screen which shows the graphics tools available and a "work area". This work area does not take up a full screen space when the control overlay is in place (see Figure 1). I try to limit my graphic or textual material to this working area. This ensures that when I use the show screen command, the resultant figure can be photographed without including any of the monitor bezel. In addition, this prevents the production of overly "busy" slides. Everyone has seen text slides that are essentially worthless for a presentation. Poor slides often have too much information crammed into too small an area and a viewer simply cannot pick out the important material. Slides may be difficult for a viewer to understand if the presenter does

not carefully lay out the graphics. Remaining in the working area available in PC Paint (and in GEM Draw, etc.) forces me to be concise and I believe this helps my presentations.

I use a black background both while I'm working on the slides and when photographing them. It has been suggested that white or yellow lettering on a blue background gives the best contrast for viewing, but I like the impact a variety of bright colors on a black background has on an audience. The different colors can serve to highlight or emphasize important points. Unless a program is installed to fill in the remainder of the screen with the background color you wish to use, backgrounds other than black may be especially difficult to frame properly for photographing.

For clarity and conciseness, I usually use the medium and large bold type fonts available in PC Paint and PC Paint Plus for text slides and use the small bold fonts for labelling drawn figures. I believe the bold fonts in these packages are the most legible at any distance from the projection screen, but other graphics packages may present different results.

To prevent glare and/or reflections from appearing on the slides, I photograph the



Here the Overlay has
been removed with the
"Show Screen" command.

Screen background is blue, text is yellow.

CRT screen only after turning out all room lights. With all lighting off, the display will appear quite bright. I find that I get the best photographic results if I dim the display to a level which is just visible in normal room light. Since photographing a CRT means a timed exposure (to prevent raster or scan line interference), I set my camera on a tripod, using the borders available in the overlay to align the camera's horizontal axis. In my laboratory, I use a Nikon FE-2 with a 55mm Micro (macro) lens, but I use an Olympus OM-2 with either a normal 50mm lens or an 80-210 Macro Zoom lens at home. The Polaroid Instant Slide film has an ASA of 40, so it is a relatively slow film, requiring either good lighting or long exposure times. Agfachrome 50 is only marginally faster, so with the CRT dimmed, using a black background and few bright colors (white or light pastels) near the center of the graphics, exposure times of five to eight seconds are typical when a median f-stop value (4-5.6) is used. If a blue background and yellow textual information are used, exposure times of only one-half second may be necessary. Shorter exposures than this results in problems with the refresh cycle of the display. If the display is left bright when a variety of colors are used, the black background may actually appear as somewhat gray when the slide is projected. I assume this is due to random electron impacts with the phosphors of the CRT brightening the screen indiscriminately. I have tried using daylight balanced Ektachrome, but find the resultant slides have a

greenish-yellow tint. I believe that this defect can be corrected using the proper filters, but have not attempted this since the other films are so readily available. I use a cable release to ensure that the camera will not be bumped during shutter release and exposure of the film. I believe the self-timer on most 35mm cameras should work equally well, assuming that triggering it does not alter the camera's alignment.

An important aspect of the procedure described is that any of the graphics can be saved on disk and, after saving, be used as the basis for other, slightly modified slides. Thus a progression series can be easily prepared with minimal extra time used and each modified graphic can be used as an original. Traditional pen-and-ink hand drafting techniques mean that the last slide in a series is the last modification of the original drawing. This can be a problem if errors are found later. In a computer-based system, modifications are easy no matter how often they are required.

An additional advantage is available to users who don't need projection slides, but who do use overhead transparencies. The PC Paint and PC Paint Plus programs include drivers for a variety of printers, including the Okimate 20 Color Printer. This is a thermal-transfer process printer which can reproduce color graphics directly onto transparencies. The quality of output depends upon the resolution of the computer system and the number of colors available, but really useful, readable trans-

parencies can be prepared using this set-up.

While I now do most of my graphics preparation on one of my H-100 PC systems, I still use my H-100 and Palette at home. The color spectrum available with palette is great for preparing pictures. The only two drawbacks I've noted using this system is the absence of prepared fonts and lack of a printer driver for the Okimate-20 color printer, but the feature of being able to type vertically (and even backwards) is an asset not found in some other packages. I used Pat Swayne's ZPC Emulator program with my H-100 and have found that PC Paint will install. However, since I have not yet installed a mouse on this system, the package will not run. Until then, I have found the Palette program quite useful for making quality slides with text and graphics on the H/Z-100.

For preparing presentation quality slides with colorful graphics and highlighted text at minimum expense, I believe the procedure described cannot be beaten. The system should be adaptable to almost any graphics package or program that generates graphics output. With some experimentation, almost any camera can be used to record the results.

Literature Cited

Day, Robert A. 1982. *How To Write And Publish A Scientific Paper*. ISI Press, Philadelphia. *

The following HUG Price List contains a list of all products in the HUG Software Catalog and Software Catalog Update #1. For a detailed abstract of these products, refer to the HUG Software Catalog, Software Catalog Update #1, or previous issues of REMark.

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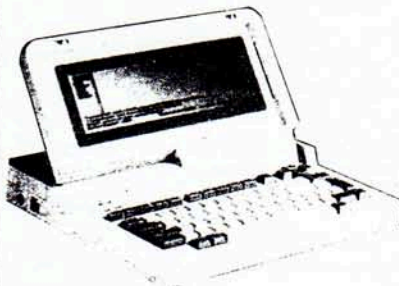
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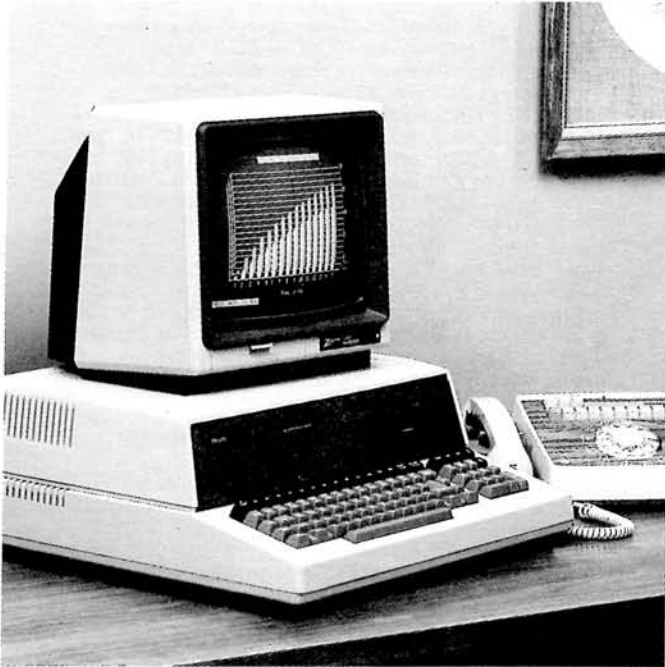
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ZPC Update #19



Pat Swayne
HUG Software Engineer

This is the nineteenth in a series of articles in support of ZPC, a program that allows you to run IBM PC software in H/Z-100 (dual processor) computers. ZPC is available from HUG as part no. 885-3037-37. An upgrade disk for ZPC is also available as part no. 885-3042-37.

In this installment of ZPC Update, I will give you some patches that will allow WordStar Professional release 4.0 to run under ZPC, including a patch for Word Finder, the thesaurus program included with WordStar 4.0. For those of you who use WordStar quite a lot, and would prefer to run in a native Z-100 environment, I have worked out extensive patches for WordStar 4.0 that allow it to run as a native Z-100 program. These patches are contained in an archived file called WS4Z100.ARC which, by the time this appears in print, should be on both the HUG bulletin board and the HUG SIG on CompuServe. They will also be discussed a bit in an article on WordStar release 4 in the next issue of REMark.

I will also present patches here for Newsroom Pro and Certificate Maker.

The WordStar 4.0 Patch

Those of you who have a Scottie board or other ZHS board have probably found that you can already run WordStar 4.0, and you may also have found that it will run without a board in PC mode 7 (monochrome). But if you do the simple patch I will present here,

you can run it in the normal color mode without any hardware support, and it will scroll faster. It will even run under the small memory version of ZPC, so you can run it on any Z-100 with enough memory for WordStar 4.0 itself and the 40k ZPC overhead.

There is one disadvantage to this patch. It removes one of the two function key prompt lines at the bottom of the screen — the one that indicates the shifted key functions. The keys still work, but you will have to memorize what they do. The reason for removing the line is that ZPC can use some facilities of the Z-100 to scroll the text if there is only one stationary line at the bottom of the screen, but if there are two or more, it can only scroll the text by rewriting everything. So scrolling is much faster if you have only one line of function key prompts at the bottom of the screen. By scrolling, I mean what happens if you move the cursor to the top or bottom of the screen and then press the up or down arrow key once more, or if you use Control-W or Control-Z.

To make the patch, add these lines to your PATCHER.DAT file:

```
WORDSTAR Release 4.0
Insert the disk containing WS.EXE.
WS.EXE
83B,19
90C,1,75
z
```

Make the patch using PATCHER as described in your ZPC manual.

The Word Finder Patch

When I first heard that the Word Finder distributed with WordStar 4.0 did not work under ZPC, I was wondering what they did to it, because I have an earlier version that works fine without any patches or anything else. I finally found the problem, which is that the new Word Finder tries to locate the cursor by reading a port, which does not work under ZPC and winds up messing things up quite a bit. But there is a single byte you can change in Word Finder that will cause it to get the cursor location from using ROM BIOS routines, which ZPC can emulate just fine. After you make this patch, Word Finder can also run under the small memory version of ZPC, but it will not display its sign-on screen when you start it up.

To make the patch, add these lines to your PATCHER.DAT file:

```
-WORD FINDER version 3.4m
Insert the disk containing WF.EXE
WF.EXE
200,1
z
```

Then make the patch using PATCHER.

Newsroom Pro And Certificate Maker

Newsroom Pro and Certificate Maker are two low budget desktop publishing programs that can be run under ZPC after they have been patched. The patches are nec-

essary whether you have a Scottie board or not. To patch Newsroom Pro, add these lines to your PATCHER.DAT file:

NEWSROOM PRO

Insert the disk containing NRPRO.EXE

NRPRO.EXE

26E,B0

6075,0,0

9033,0,0

9076,B0

96CA,CF

z

For the Certificate Maker patch, add these lines:

CERTIFICATE MAKER

Insert the disk containing CM.EXE

CM.EXE

2FE2,CF

383C,0,0

387F,B0

4936,0,0

4950,B0

z

Make the patches using PATCHER. One of the reasons why these programs require patches is that they access the graphic character table. But the programs also need patching because they capture the keyboard interrupt, but do not work properly with the key information provided by ZPC. For some reason, the programs work fine without the keyboard interrupt, so the interrupt processing routine is simply bypassed by placing an interrupt return (IRET) instruction at its beginning. *

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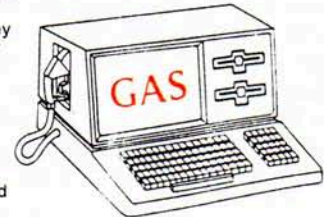
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User Input In Turbo Pascal



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One of the axioms of programming is that easier user input requires heavier programmer effort. Most microcomputer programs are interactive; the program waits for the user to supply critical data when the program runs. A program that does not interact with the user is limited in application. The choices the user makes determine the actions of the program. Without user input, the program is a show to watch, not a versatile applications program subject to the user guidance.

This article explores some methods for supervising user input. The programming language used is Turbo Pascal from Borland International.

Simple Input

Simple user input is through the system console designated as CON by Turbo Pascal. CON is a logical device name for the physical components of the computer made up of the keyboard and the video display. Physically, CON consists of the standard input and output devices of the computer.

The appropriate mode for input through CON is with the Pascal procedure READLN. Don't be tempted to try READ with CON. READ is not appropriate for input from CON. The operating system buffers input from the CON device. The buffer is a temporary memory location where the operating system collects information typed at

the keyboard until the user presses the return key. Buffering allows the user to change their minds about an entry before it is given to the program. A user may backspace, delete, overstrike and otherwise edit a line typed at the console (CON). Until the return key is pressed, the operating system does not release the buffered data to the program. Even if you use READ, the operating system will not release the data until the user presses the return key.

All data typed at the console enters the computer as a string of characters. Custom and Pascal designate a source of data in human readable form as a TEXT file. The major characteristic of text files is that the data contained are strings of characters organized into lines. A carriage return, such as generated by the return key, terminates each of these lines of text.

CON is a special kind of text file. The data from CON are a string of characters, not explicitly an integer or a real number or a sentence or any other type of data. A programmer using READLN must instruct READLN to convert the string into the desired data types and store these in memory. READLN knows how to convert appropriate textual data into a real number or an integer. READLN can also accept a single character or an entire string of characters for storage.

First, the programmer must declare memory locations to receive the data. A variable

is a named memory location. Declaration of a variable reserves both the name for the variable and a memory location for storage. Pascal is a highly typed language, so that declaring a variable also notifies the program what type of data may be stored under the variable name. For example, to reserve memory locations for a real number, an integer, a single character and a string of up to 20 characters, include the following in the declaration portion of a Turbo Pascal program:

```
var   OneRealNumber   :   real;
      OneInteger      :   integer;
      SingleCharacter :   char;
      String20        :   string[20];
```

To cause a program to stop its execution and wait for user entry, include the following segment in the executable portion of the program:

```
begin
  writeln(CON,'Enter a character,
    a real number, an integer');
  writeln(CON,'each separated by at
    least one space. Then, ');
  writeln(CON,'enter a list of up to
    20 characters...');
  writeln(CON,'Finally press
    <RETURN>');
  readln(CON, SingleCharacter,
    OneRealNumber, OneInteger, String20);
end.
```

WRITELN is a Pascal procedure that outputs data to a text file, in this case the console CON. Each of the enclosed quotes in WRITELN's parentheses is an output para-

meter. WRITELN displays the output on the system video display. Notice that it takes four lines of instruction displayed on the screen to prompt the user as to what data to enter. This is the easiest form for controlling user input; carefully tell the user what is expected, then read the input. If the input does not match the program's expectation, the fault is with the user or perhaps with the directions.

The preceding declarations and executable begin..end block will run under Turbo Pascal. The last executable line is the READLN. When the READLN executes several things happen. First, the program stops and waits for the operating system to get a line of data from the console. If the user has read the prompts, she might type (into the buffer):

```
W      234.56   23
      Now we shall see... <RETURN>
```

When the operating system passes the buffer string to the READLN procedure, READLN consults the list of parameters; CON indicates the source of the input. SingleCharacter is of type character and is easily filled by 'W.'

Next READLN expects OneRealNumber. Spaces follow the 'W' in the string. Spaces are legitimate separators, so READLN skips these until it encounters some other character. That character is a '2'. Note, '2' is the printable character not the number 2. READLN works its way through the next characters '3', '4', '.', '5', and '6' until the next separating space is found. Then READLN converts this string of characters into a real number and stores the number 234.56 in memory location OneRealNumber.

Similarly, READLN finds and converts '23' and stores 23 in OneInteger. Finally, READLN stores the remainder of the line of characters in String20. No conversion is necessary. It may surprise you that string20 is filled by this input. In fact, String20 will contain the string

```
Now we s'
```

The spaces are characters first and separators second. Thus, the leading 12 spaces are read into String20, causing it to fill before reaching the end of the line.

Experiment with input to this program. Try inputting

```
A      53      37.0   GoodBye
      <RETURN>
```

The program will exit with an I/O (input/output) error message. READLN detected that 37.0 was not an integer. Such an exit could be disastrous for the user. Imagine

that the error occurred in the middle of an Accounts Receivable program. The user has spent 5 hours entering data, has not saved the data and makes a typographical error. The program interrupts and all work for the session is lost.

Disabling I/O Error Detection

Try further variations of data entry to make the program abort. You should discover that I/O errors occur when integer or real variables cannot be successfully converted from the input string. Strings and characters alone cause no problems.

One way to avoid abrupt termination of a program by Turbo Pascal is to turn off the I/O error detection feature. Turbo Pascal makes use of a compiler directive to avoid aborting a program due to I/O error. Then, if incorrect data are entered, the programmer must assume the responsibility of checking the causes and seeking remedies. By placing {\$I-} immediately before the READLN, we instruct Turbo to ignore I/O errors. {\$I+} immediately after the READLN turns the checking back on. Our program segment becomes:

```
begin
  writeln(CON,'Enter a character,
    a real number, an integer,');
  writeln(CON,'each separated by at
    least one space. Then, ');
  writeln(CON,'enter a list of any
    characters. ');
  writeln(CON, 'Finally press
    <RETURN>.' );
  {$I-}
  readln(CON, SingleCharacter, OneReal-
    Number, OneInteger, String20);
  {$I+}
end.
```

However, this will not help the user. No second chance is offered to re-enter the data. Looping provides that second chance. The Turbo Pascal function IOResult returns a 0, if no error in input occurred. IOResult provides a method for controlling the loop. The program becomes:

```
var GoodEntry := Boolean;
begin
  {$I-}
  repeat
    writeln(CON,'Enter a character, a real number, an integer,');
    writeln(CON,'each separated by at least one space. Then, ');
    writeln(CON,'enter another space followed by a list of any');
    writeln(CON,'characters. Finally press <RETURN>.' );
    readln(CON, SingleCharacter, OneRealNumber, OneInteger, String20);
    GoodEntry := (IOResult = 0);
    if not GoodEntry then writeln('Input Error');
  until GoodEntry
  {$I+}
end.
```

String Input

The preceding program segment gives very few clues to the user as to the nature of

their error. After a few tries, some users will grow impatient because they have not discovered why their input is unacceptable. Four items may be too many things to enter at once. A safer method is to prompt for the data one at a time, check for appropriateness, then proceed. Error messages should be informative about the nature of the error. Consider Listing 1.

The FieldIntegerAt function in Listing 1 is relatively short. Brevity comes from making use of the built-in Turbo procedure Val. As previously observed, I/O error does not usually occur from string input. String input avoids the possibility of fatal I/O error abortion. FieldIntegerAt reads a string from the CON buffer and does the conversion internally with the Val procedure. Turbo's Val takes three parameters: the string of characters to be converted, the integer variable to receive the conversion, and an integer error code.

The error code is informative and useful. Val does the conversion a character at a time, stopping when the conversion is successfully completed (error code is zero) or when the first bad character is encountered (then error code is the position of the first bad character in the string). Val also supplies an error code when the conversion exceeds the size of the maximum allowable integer MaxInt = 32767. Val accepts no embedded blanks so that exclusive of a leading sign, 6 digits or more will produce an error. For that reason a length of 6 is sufficient for the string tempStringInt.

Standard Turbo Pascal does not have a formatted input feature. However, Turbo formats output quite nicely. For formatting integers or strings, follow the parameter in WRITE or WRITELN by a colon and an integer to specify the precise amount of spaces for the data. Turbo right justifies both text and integers within the specified amount of space. For example,

```
writeln('John is': 10, 25: 4);
```

will spread 'John is' across 10 spaces and 25 across 4 spaces. The output follows with '#' shown as the padding spaces:

Listing 1

```
{function FieldIntegerAt(x,y: integer) : integer; gets an integer
from the console at location (x,y);}
{ Usage: OneInteger := FieldIntegerAt(10,15);
obtains an integer from user input at column 10, row 15
of the console display and stores it in OneInteger.
If the user makes an error in input, a bell sounds,
the error is marked, then the field at (10,15) clears for
further user input.}

function FieldIntegerAt (x,y : integer): integer;
var
    tempInt,
    ErrorCode : integer;
    tempStringInt : string[6];

begin
    repeat
        tempstringInt:='';
        gotoxy(x,y);
        write(' ':6); {Clear input field}
        gotoxy(x,y);
        readln(tempStringInt);
        val(tempstringInt,tempInt,ErrorCode); {Convert to integer}
        if errorCode >0 then begin
            gotoxy(x,y+1);
            write('#7); {Sound Bell and }
            write('^': ErrorCode, ' Error'); {Mark error with ^}
            delay(5000);
            gotoxy(x,y+1);
            write(' ':ErrorCode+6); {Clear error message}
        end;
    until ErrorCode = 0;
    FieldIntegerAt := tempInt;
end;
```

###John is##25

In the event that the data exceeds the indicated space, Turbo overflows the data, taking as much space as needed; correct values are more important than a beautiful display.

Formatted output in conjunction with the error code provides an easy method for marking a data entry error. When the error code exceeds zero, move the cursor beneath the input and format the output '^' using the error code:

```
write('^': ErrorCode, ' error');
```

The procedure, write, will right justify the '^' exactly ErrorCode spaces, so that the '^' will be immediately below the first bad character in the input string.

For an analogous function for real input, use a function header of

```
function FieldRealAt(x,y : integer):
    real;
```

Change the name of TempInt to TempReal and declare its type as real. Since the range for real numbers considerably exceeds that of integers, change TempStringInt to TempStringReal and increase the length to 20: string[20]. Few other changes need be made. The built-in procedure, Val, is overloaded much as the operation '+' is over-

loaded. During compilation, the type of the data used in the second parameter of Val determines how the conversion will take place: an integer variable produces code for an integer conversion, a real variable produces code for a real conversion. Do not redeclare the variable ErrorCode. ErrorCode is an integer in both cases. The remainder of the function needs no change.

FieldIntegerAt preserves the advantages of buffered input. The user is free to edit data before pressing the return. However, the error message does not distinguish between an integer that is too large and a bad character. Also, the built-in procedure, Val, will handle a leading negative sign, but flags a '+' and leading spaces as errors. As a result, a user may spend more time than necessary correcting their entry. More sophisticated methods attempt to restrain the user from entering bad characters at all.

Controlled Character Input

To be sure that the user never enters bad characters, the program must monitor each character as it is typed. This requirement eliminates both the use of READLN and CON. Fortunately, immediate single character input is available through the pre-

declared Turbo file, KBD. READ becomes the appropriate procedure for input through KBD with the following syntax:

```
READ( KBD, ch);
```

where ch is of type char.

Now the program sees the character as typed without waiting for the press of the return key. Buffered input is lost. Editing through the operating system buffer is not available with the KBD device. If the user is allowed to edit input, then the programmer must provide the editing facilities.

Listing 2 provides an example of controlled character input for a real number. Once more, the Turbo procedure Val converts a string to a real value. The primary difference is that the monitor in the function filters out illegal characters.

You may wonder why a character is passed to the function. Suppose that the function is part of program that monitors for function keys, as well as data input in the form of numbers or strings. Such monitoring is common in spreadsheet programs. If the main program monitor detects a digit, then it should automatically call the function to obtain a real number. However, the first digit is lost if the character representing it is not passed to the conversion function. Passing the character results in a transition transparent to the user.

Notice that a large portion of the code screens for special characters used in editing. The function handles both standard decimal form and scientific notation. The return key indicates an acceptable entry. The escape key aborts entry and returns false in the success variable. The space and backspace keys reposition the cursor on the input line. The delete key operates as expected. Input of digits is in insert mode: enter a digit with the cursor in the middle of a string and the characters are shifted to make room.

If you're a C fan, you might revise the primary monitor loop from a repeat structure to a while structure. The conversion would operate more smoothly by implementing a C-like getchar function:

```
function getchar(ch :char) : char;
begin
    read(kbd, ch);
    getchar := ch;
end;
```

Programmer Created Types I/O

One of the advantages (and disadvantages) of a highly typed language, such as Pascal, is the availability of programmer created data types. Not only do created data types keep the programmer from accidental type mis-

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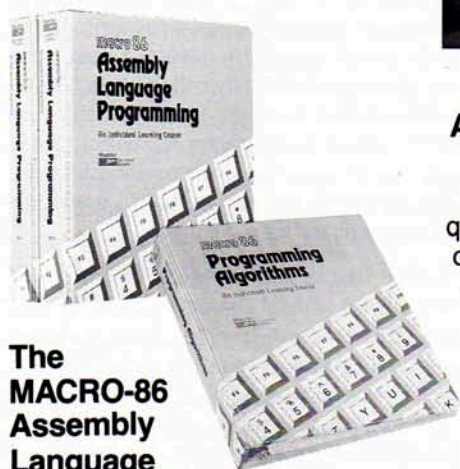
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Listing 2

```

{ function GetReal (var ch: char;
var success: boolean;
x, y: integer ): real →→
obtains a real number from the console at position (x,y). The function
is passed a first character obtained from some monitor program. If a
real is successfully obtained then a value of True is returned in the
Boolean success. }

{Version 1.1 December 12 - 23 - 86 }
{ $C- } {Turn off check for ^C. This is not revokable}

function GetReal ( var ch : char;
var success : Boolean;
x, y : integer ): real ;
const
  Digits : set of char = ['0'..'9'];
  Signs : set of char = ['+', '-','];
  Bell = #7;
  Space = #32;
  BackSpace = #8;
  Del = #127;
  Return : set of char = [#13, #27, #03];
  {Return, Escape or ^C
  You must set the compiler
  directive $C- to turn ^C
  interrupt off to use #03}

var
  tempReal : real;
  start,
  errorCode : integer;
  tempString : string[10];
  cancel,
  decimal,
  scientific : Boolean;

begin
  tempString := ''; {Initialize variables}
  errorCode:=1;
  start := x;
  x := x + 1;
  GetReal := 0;
  decimal := (ch = '.');
  scientific := false;
  success := (ch in (digits + signs+ ['.']));
  if success then begin {Proceed if first character is Ok}
    cancel := false;
    gotoxy(x,y);
    write(ch);
    tempString :=ch;
    repeat(Get digits)
      read (kbd, ch);
    case upcase(ch) of
      '0'..'9' : begin
        insert(ch,tempString,x-start+1);
        gotoxy(start+1,y);
        write(tempString, ' :10-length(tempString));
        x:=x+1;
      end;
    end;
  end;
end;

```

{Editing keys follow}

```

BackSpace : if x>start then begin
  x:= x-1;
end
else write(Bell);
Del : begin
  delete(tempstring,x-start+1,1);
  gotoxy(start+1,y);
  write(tempString, ' :10-length(tempString));
end;

space : if (x-start)<length(tempString)
then x:=x+1
else write (Bell);
#13
#27,#03 : {Do nothing for a carriage return}
begin
  cancel := true; {Cancel input attempt}
  tempstring:='';
  success := false;
  GetReal := 0;
end;

{Scientific notation follows}
'E' : if scientific then write(Bell)
else begin
  insert('E',tempString,x-start+1);
  gotoxy(start+1,y);
  write(tempString, ' :10-length(tempString));
  x:=x+1;
end;
'-','+' : begin
  if x = start then
    if (ch in signs) then
      tempString[1]:= ch
    else insert(ch,tempString,1)
  else if scientific then
    if (x-start)= pos('E',tempString) then begin
      if tempString[x-start+1] in signs then
        tempString[x-start+1]:=ch
      else insert(ch,tempString,x-start+1)
    end
  else write(Bell);
  if scientific or (x=start) then
    begin
      gotoxy(start+1,y);
      write(tempString);
      x:=x+1;
    end;
end;
',' : begin
  if decimal or
  (scientific and
  ((x-start+1)>pos('E',tempString))) then
    write(Bell)
  else
    begin
      insert(ch,tempString,x-start+1);
      gotoxy(start+1,y);
    end;
end;

```

```

        write(tempString, ' ':10-length(tempString));
        x:=x+1;
    end;
end;
else write(Bell) ;
end;
scientific := pos('E',tempString)>0;
decimal := pos('.',tempString)>0;
gotoxy(x+1,y);
until ch in return;
if (pos('+',tempString)>1) and
    (tempString[pos('+',tempString)-1]<>'E') then
    insert('E'.tempString,pos('+',tempString) );
if (pos('-',tempString)>1) and
    (tempString[pos('-',tempString)-1]<>'E') then
    insert('E'.tempString, pos('-',tempString) );

if tempString[1]='+' then delete(tempString,1,1);
if not cancel then val (tempString,tempreal,errorCode);
success := errorCode = 0;
if success then begin
    ch := tempString[1];
    GetReal := tempReal;
end
else GetReal := 0;

end;
end;

```

matches, but properly used data types can improve the readability of a program. For our purposes, programmer declared data types can also control user input.

Recall that the standard Turbo Pascal procedure READLN is capable of reading characters, character strings, integers and real numbers. Period. Similarly, WRITELN is able to output only characters, character strings, integers, real numbers and, as a Turbo bonus, Boolean values. Neither of these procedures operates with user enumerated types. This means that I/O through the CON must be interpreted by the program for programmer created types.

Top-Down design of a program usually begins with the broad activities that the program is to accomplish. The programmer creates new activities by declaring procedures and functions. Each activity is then repeatedly refined in detail until the instruction level can be understood by the Pascal compiler. The input of an enumerated type must ultimately make use in some manner of input of a simple data type. Consider Listing 3.

SexType is a programmer-created, enumerated data type. A variable declared as SexType may assume only two values: Male or Female. The limitation on values for a SexType variable helps to control user input. But further control can speed up input. Notice the function getSexAt in Listing 3. Compare this to our previous getIntegerAt function. Notice that getSexAt responds instantly to a key pressed to assign one of the two values for a SexType to the function designator. In addition, user

feedback comes through a printed equivalent of the value. To the user, it will appear that pressing a single key has caused the entire value to be typed to the console.

As with most computer activities there is the complimentary action. WriteSex is a procedure that allows formatted output of a SexType value. Remember, neither WRITE nor WRITELN is capable of directly outputting a SexType value to a text file. CON is a special text file.

Listing 3

```

type SexType = (Male, Female);

function getSexAt(x,y : integer) : SexType;
var ch: char;
begin
    gotoxy(x,y);
    write('Sex: ');
    read(kbd, ch);
    if upcase(ch) in ['M','B'] then begin
        write('Male');
        getSexAt := Male;
    end
    else begin
        write('Female');
        getSexAt := Female;
    end;
end;

procedure writeSex(sex : sexType; width : integer);
begin
    if sex = Male then write('Male': width)
    else write('Female':width);
end;

```

More extensive enumerated types require more complex I/O interpreters. A program may accomplish output of enumerated types by using a simple look-up table implemented with CASE statements. Listing 4 contains both a date input interpreter, getMonthAt, and an output procedure, Write-

Month. A few comments should clarify some of the design choices.

The value, Null, was included in the enumerated MonthType to allow for unselected month values and so that the ordinal position of each month would correspond to its year position. For example, ord(August) will return an 8. As an extra, Turbo Pascal generates a type conversion function for each definition of an enumerated data type. The function assumes the data type name as a designator. As a result, the statement

```
month := MonthType(11);
```

will assign November to month. User input for month is available by number: the MonthType function assigns any integer from 1 through 12 inclusive the appropriate month. Other integer values are assigned to Null.

JustifyType is an enhancement to allow writeMonth to left or right justify any monthType within the width field. A better way would be to use negative width for left justification and positive width for right justification. But this discussion is about enumerated types, so we ignore the more elegant solution.

Finally, notice the length of the interpreter for month input. As few as 20 or 30 enumerated values could result in long sections of code for interpreting user I/O. Whereas this is no problem for disk I/O

through files of type, a programmer should think carefully about enumerating too many values if direct user I/O is involved.

Menus

No matter how clever the programmer, a persistent user will find a way to corrupt the


```

        else ch := #03;
        end
        else ch := #03;
        end;
    else
        tempMonth := Null;
    end;
    gotoxy(x,y);
    writeMonth(tempMonth, 8, left);
    if ch <> #03 then read(kbd,ch);
    if ch = #27 then tempMonth := Null;
    until ch in [#13,#27];
    getMonthAt := tempMonth;
end;

```

input. Notice how my spelling checker passed the word "cleaver" in the previous sentence even though I meant "clever." Similarly, if the user means to type 100 and types 1000, the program cannot decipher those intentions. Good instructions and documentation can combat ignorance. There is no known cure for stupidity.

The best we can hope for is to shorten the data the user must enter whenever possible. One method for shortening user input is a menu. While not appropriate for input of integers or real numbers, menus do speed up input and accuracy for selecting actions.

Listing 5 provides a function for a generic menu. The menu selections are available by pressing a designated key. The menu also operates as a bar menu: press the space key to advance through the selections. Each selection is highlighted as it becomes current. Backspace moves back through the list of options.

Options take the form of a ten element array. By declaring different menus as constants (see ExamplePrompt), submenus and choices are readily available through the same Menu function. When a PromptType constant is passed to the menu function, the first character of each choice is automatically highlighted and designated as a legitimate choice. In addition, the programmer may mark other characters in the choice strings so that they are legitimate return characters. This is done by blocking the character with control-B (^B). With the Turbo editor you enter a ^B into a string by first pressing the control character prefix (usually ^P), then holding the control key down while pressing the "B" key. Insert a ^B before and after any other characters in a choice and Menu will automatically highlight these characters and add them to the set of legitimate choices.

Fewer than 10 choices are acceptable if the unused choices are empty strings. If the programmer wants an escape character to indicate an abort of the menu, embed the escape character surrounded by ^B in one

Listing 5

{ MENU returns a character from a selected list of choices given at x= offset and y = baseline }

```
type PromptType = array [0..9] of string[20];
```

```
const ExamplePrompt : PromptType = ('1. First Choice ',
                                     '2. Second Choice ',
                                     '3. Third Choice ',
                                     '4. Last Choice ',
                                     '0. Exit ',
                                     ' ',' ',' ',' ',' ');
```

```
function Menu (Prompts : PromptType; offset, baseline: integer): char;
type ResponseType = set of char;
type SinglePrompt = string[20];
var TempChoice : char;
    NumberOfChoices : integer;
    responses : ResponseType;
```

```
function Increase(var i: integer): integer;
begin
    Increase := i; {Increments the argument by 1}
    i:= succ(i); {while providing the previous}
end; {value for calculations}
```

```
function CountPrompts(var Prompts : PromptType): integer;
var HowMany, count : integer;
const tempPrompt : PromptType = (' ',' ',' ',' ',' ',' ',
                                  ' ',' ',' ',' ',' ');
begin
    HowMany:= 0;
    for count := 0 to 9 do
        if length(Prompts[count]) > 0 then
            tempPrompt[increase(HowMany)]:=Prompts[count];
        CountPrompts := HowMany;
        Prompts := tempPrompt; {Compress prompt list}
    end;
```

```
procedure GetResponses (var Prompts : PromptType;
                       var responses : ResponseType);
var count : integer;
begin {Determines legitimate responses including the}
    {first character of a prompt as well as characters}
    {Marked by a boldface #02 (^B)}
    responses := [];
    for count:= 0 to 9 do
        if length(prompts[count]) > 0 then
            responses := responses + [prompts[count][1],
                                     prompts[count][pos(#02,prompts[count])+1]];
    end;
```

```
procedure HiLite(prompt : SinglePrompt; BoldOn: Boolean);
var count , promptLength : integer;
begin
    promptLength := length(prompt);
    count := 2;
    if BoldOn then begin
        lowVideo;
        write(prompt[1]);
        normvideo;
    end
    else begin
        normvideo;
        write(prompt[1]);
        lowVideo;
    end;
    while count <= promptLength do begin
        if (prompt[ count ]<>#02) then
            write(prompt[increase( count ) ])
        else begin
            count:= succ(count);
        end;
```

```

BoldOn := not BoldOn;
if BoldOn then normVideo else lowVideo;
end;
normvideo;
end;

procedure Update(var originalPrompt, NewPrompt : integer);
begin
  gotoxy(offset, baseline+originalPrompt);
  HiLite(prompts[originalPrompt], false);
  gotoxy(offset, baseline+NewPrompt);
  HiLite(prompts[NewPrompt], true);
  originalPrompt:=NewPrompt;
end;

procedure DisplayPrompts( var Prompts : PromptType;
  count : integer);
begin
  while count > 0 do begin
    count := pred(count);
    gotoxy(offset, baseline+count);
    HiLite(Prompts[count], false);
  end;
  gotoxy(offset, baseline);
  HiLite(prompts[0], true);
end;

function GetChoice( responses : ResponseType): char;
const
  Space = #32;
  BackSpace = #08;
  Bell = #07;
var
  currentChoice, NewChoice : integer;
  choice : char;
begin
  currentChoice := 0;
  NewChoice := 0;
  repeat
    read(kbd, choice);
    choice := upcase(choice);
    case choice of
      '0'..'9' : NewChoice := ord(choice)-ord('0')+1;
      Space : NewChoice := (currentChoice + 1);
      BackSpace : NewChoice :=
        currentChoice+NumberOfChoices-1;
      else write(Bell);
    end;
    NewChoice := NewChoice mod NumberOfChoices;
    update(currentChoice, NewChoice);
  until choice in responses + [#13, #27];
  gotoxy(offset, baseline+currentChoice);
  hiLite(prompts[currentChoice], false);
  if choice in responses then
    GetChoice := choice
  else if choice = #13 then
    GetChoice :=
      prompts[currentChoice][pos(#02, prompts[currentChoice])+1]
  else GetChoice := #00;
end;

```

```

function PromptWithChoice(ch: char) : SinglePrompt;
var
  i, count : integer;
begin
  count := -1;
  for i := NumberOfChoices downto 0 do
    if (ch = ( prompts[i][ pos(#02, prompts[i])+1])) or
      ( ch = prompts[i][1]) then
      count := i;
    if count >= 0 then PromptWithChoice := Prompts[count]
    else PromptWithChoice := 'Choice not found';
  end;
begin {procedure MENU}
  clrscr;
  gotoxy(offset, baseline);
  baseline:= baseline+2;
  normvideo;
  write('Select:');
  NumberOfChoices := CountPrompts(Prompts);
  if NumberOfChoices > 1 then begin
    GetResponses(Prompts, responses);
    DisplayPrompts(Prompts, NumberOfChoices);
    tempChoice := GetChoice(responses);
    Menu := tempChoice;
    gotoxy(offset+10, baseline-2);
    write (promptWithChoice(tempChoice));
    delay(1000);
  end
  else if NumberOfChoices = 1 then
    Menu := prompts[0][pos(#02, prompts[0])+1]
  else Menu:=#00;
end;
{Sample MAIN Driver}
var ch: char;
begin
  clrscr;
  ch:=(Menu(ExamplePrompt, 10, 4));
  gotoxy(50, 20); write(ch);
end.}

```

of the unused strings or at the end of a used string. The ^B is necessary to mark escape as a legitimate choice. Escape itself is entered by prefixing with ^P.

Flexible Help

We started this discussion with a simple example of user input, documented with 4 lines of prompts to aid the user input. Note that no input method is foolproof. Someone is always clever enough to deliver input to a program in a manner unanticipated by the programmer. We guard against careless error and the user is appreciative. We cannot guard against meaningless data. If the user is determined to input bad data, there is no protection.

Suppose that the user's intentions are noble. Suppose that the user is reasonably careful. Remember our initial comment on simple input: "the fault is with the user or perhaps with the directions." Nothing is more frustrating to the user than not knowing the programmer's intention. Nothing will kill a good piece of software more quickly than bad documentation. Since directions embedded in the program not only waste space but are cumbersome to revise, another mode of online help is desirable.

Listing 6

```
{ HELP accesses an external text file to provide a user with online help}

type FileNameType = string[20];

procedure Help(fileName: FileNameType);
type MessageType = string[80];
const bold = #02;           { ^B }
var  afile      : text;
     line       : string[100];
     i,
     count      : integer;
     ch         : char;
     boldOn     : boolean;

procedure Message(Msg: MessageType);
begin
  gotoxy(1,24);
  clreol;
  lowvideo;
  write(Msg);
  normvideo;
end;

procedure clearArea;
var count: integer;
begin
  for count:= 1 to 20 do begin
    gotoxy(1,count);
    clreol;
  end;
  gotoxy(1,1);
end;

begin
  assign(afile, FileName);
  {$I-}                               {Turn off I/O checking}
  reset(afile);
  if ioreult = 0 then begin
    ch:= ' ';
    boldOn:=false;
    while (not eof(afile)) and (ch<>#27) do begin
      clrscr;
      count:=0;
      while (not eof( afile )) and (count <= 20) do begin
        readln( afile, line);
        for i:= 1 to length( line ) do begin
          if line[i] = bold then begin
            boldOn := not boldOn;
            if boldon then lowvideo
            else normvideo;
          end
          else
            write(line[i]);
          end;
          writeln;
          count:=count+1;
        end;
      end;
      if not eof(afile) then begin
        message(' More ...Press any key.  Press <ESC> to resume');
        read(kbd,ch); clearArea;
      end;
    end;
    if ch<>#27 then begin
      message(' Press any key to resume');
      read(kbd,ch);
    end;
  end
  else begin
    message('HELP file not found. ');
    delay(3000);
  end;
  close(afile);
  clrscr;
  {$I+}                               {Turn on I/O checking}
end;
{ Sample Driver
```

```
begin
  read(kbd, ch);
  case upcase(ch) of
    'M' : help('MainMenu.HLP');
    'G' : help('General.Hlp');
    'O' : help('OrderInf.Hlp');
  end;
end.
}
```

Listing 6 is an example Help procedure that can provide context sensitive help through the use of disk based text files. According to need, the file name of a text file is passed to the Help procedure. If the file is located, Help displays the contents of the file a page at a time. The user may abort the help at any time by pressing the escape key. The programmer can emphasize key portions of the help file text by embedding a ^B before and after phrases to be highlighted (See the previous discussion on entering a ^B).

Summary

In this article, we investigated several modes of improving user input in the Turbo Pascal environment. Among these were simple buffered input using READLN with and without I/O error checking. Also, input with appropriate error messages and control of the input line were discussed. Interpreters for enumerated data types were offered as a method for controlling user input. Finally, menu input and access to external help files were given as a method for improving user input.

I hope you may find some of these routines useful. If you have some improvements, please share them. User input demands a large portion of a programmer's time. Any library of debugged procedures to cut back on "re-inventing the wheel" each time a program is written saves time. But recalling the credo: "we must resist the temptation to enhance our programs," I intend to use these until improvements come along.

Happy computing.



MSDOS, Zeke, And A Computer Illiterate

The Continuing Saga Of A Threatened Marriage

Curt Messex

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In the beginning there was my second hand, 64K, Z-89, CP/M, Magic Wand, a dying electric typewriter, and my wife's school assignments.

"Yes, dear. I know the typewriter doesn't work very well. You really ought to try doing it on the computer. That's what I got it for."

"When I turn it on, the stupid thing just blinks at me and beeps whenever I type something."

"Well, you have to put the disks in and give it the right commands to get started . . ."

"I don't have time for silly games. The typewriter runs when I turn it on. When it works," she snarled, slamming the door.

Ah yes. Sweet memories of yesteryear. Then there was Zeke (a Z-100), MSDOS, and Peachtext 5000. Perhaps I'd better explain Zeke. About 18 months after I discovered computers, I began to run afoul of the limitations of 64K.

'Twas ever thus.

Enter Zeke and the sly, silver-tongued devil of a salesman who cheerfully fielded my early questions about a machine he hadn't sold me. Zeke is an early model (old motherboard) Z-100 that started life with two floppies, a fully loaded video board, a Zenith monochrome tube, and 128K.

Over the last few years he has accumulated a CDR hop up, an FBE memory expansion

to 768K RAM, a quiet fan, an FBE Smartwatch and a pair of Shugart 860 8" drives. There's a Sony RGB on top that arrived as a loaner (see sly, silver-tongued devil above) when the green thing died, an Okidata 92 on the left and an Anchor 12 on the right. MSDOS 2.1 and PERKS in residence. One Shugart (Drive C, 1.2 Meg) is fully loaded with programs. (After a 64K start I still find it mind boggling that I have 1.2 Megs of programs and could use more room.) The other is where I work on the current book-in-progress and other literary activities. The two 5-inch drives handle the other data and backups. One idiosyncrasy; Zeke flat out refuses to autoboot off anything but drive A. (Don't bother telling me about switches, if Command.Com isn't on A, Zeke says to hell with it no matter what the switches say. So I have some overhead on most of my 5" floppies. Shrug. I've got over 3 Meg on line. The Z-89 had a couple of Magnolia hard sectors with 180K. I'm in fat city.

"How do you get this darn thing started? It just beeps at me when I type ED and I have to get this resume done now."

"First type PT and the menu will come up. Then you can type ED."

"Oh yeah. I never remember how to get this darn thing started."

Later, about half way through Monday night football, "I've got it written. Can you

come up and put in the PRINT whatchamacallums and make the printer change type so I can print twenty of them in correspondence mode, please."

Still later. "There. Now we'll set the printer with SETOKI."

"Argh! You've lost it all!"

"No I haven't. Stop pounding on me. Now that we have the printer ready, we just go back into Peachtext, select PRINT and type in your filename. What was your filename?"

"Filename? You told me I could name it when I got done!"

"Argh! Okay. Which disk were you working on? It'll be there with the default name." "Disk?"

Well, as you can see there was progress of a sort. Then last summer I changed to Word Perfect. After a few days of wrinkled brows, I was in heaven. Footnotes without hassle! Page breaks without a sample hard copy. Text files over 100K and counting. Seven fonts from the keyboard and print-while-you-work! Whoopee!

My wife was unglued again. By then she was using the Peachtext List Manager and Spreadsheet (Peachcalc) in her own business in addition to the word processing. I had to pull the Peachtext word processor off the program disk to make room. When


```

TYPE YOUR NAME TO GET STARTED ON ANOTHER JOB
.
.
.
DISENGAGE 8" DRIVES BEFORE SHUTDOWN
.
.
LOG OUT, IT IS NOW
.
DSCLOCK
.
.
'BYE NOW

```

Listing 5

HELP.BAT

```

This is a help list for some of the useful commands you
can enter when (and only when) the system prompt is at the
bottom line on the screen and the cursor is flashing.
The system prompt looks like A> or B> or C> or D> or I>
and tells you which drive the machine is looking at.
Change drives by typing the drive letter you want and a
colon. As in "A:"

```

DIRECTORIES

```

DIR will give you a directory of the drive matching the
letter showing at the prompt. A better command:

```

```

ZDIR forms the directory into two columns and gives
you a chance to read it. Expand it to:

```

```

ZDIR A: to read the directory on drive A, for instance.

```

PAUSE

CLS

FILE HANDLING

```

COPY is the command to make a duplicate file or files
with the same or different name. For example: to
copy MYFILE.LTR from drive A to drive B. Enter A:
to change the prompt to A>, then type:

```

```

COPY MYFILE.LTR=B: Or,

```

```

COPY MYFILE.LTR=B:YOURFILE.LTR to copy and rename. Or,

```

```

COPY A:*.*=B: to copy everything on disk A to disk B.

```

```

ERASE This destroys files, so don't make mistakes!
First, change the prompt to the drive you are
working with, then type:

```

```

ERASE MYFILE.LTR Will do just what it sounds like, and
there isn't any way to undo it.

```

```

ERASE *.BAK would erase every file on the disk with a
BAK suffix. Handy sometimes for housekeeping.

```

As you can see, basics and simplicity are the keynotes. Trial and rejection has convinced me that it is impossible to get too basic and simple.

The PAUSE brings the screen to a stop until a key, any key, is depressed. The screen then clears and the next subject comes up ... FILE HANDLING, in this case. I debated with myself long and hard about including the ERASE command, and finally came down on the side of inclusion with verbal threats of bodily harm for accidental misuse. Sharpies will note unnecessary "=" signs. They don't change anything and I have found them more reliable with novices than a simple, easily overlooked, space. For some reason including the =

Listing 6

NEWDISK.BAT

CLS

This is "NEWDISK"

IT FORMATS, TITLES, AND INSTALLS

THE OPERATING SYSTEM ON ANY DISK

PLACED IN DRIVE B

NOTICE!!! WARNING!!! STOP HERE AND CHECK!!!

```

*****
* THIS PROGRAM WILL ERASE EVERYTHING THAT IS NOW ON *
* THE DISK IN DRIVE B--BE SURE WHAT *
* YOU ARE DOING! *
* (In case of panic, press 'ctrl C' to quit here) *
*****

```

PAUSE

C:

FORMAT B:/S

COPY MDISK.DVD=B:


COPY CONFIG.SYS=B:

COPY AUTOEXEC.BAT=B:

also seems to make a more readily acceptable statement. It seems to "make sense."

Finally, to take care of another problem that came up recently, the HELP file has a new section directing the reader to another batch file called NEWDISK which, well ... take a look at Listing 6.

She hardly ever needs my help now ... but I have this other problem: Getting my turn at Zeke. Anybody seen a good Z-100 with a hard disk? (Cheap!) *

Micronics Technology 

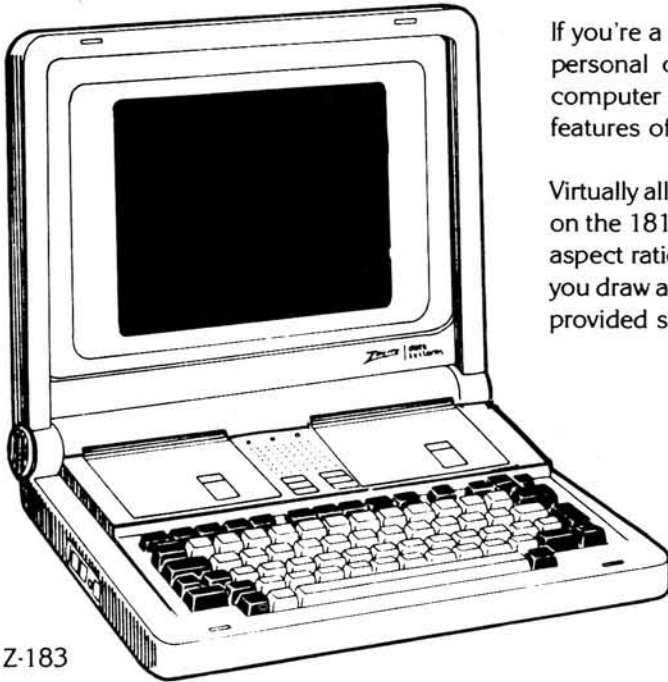
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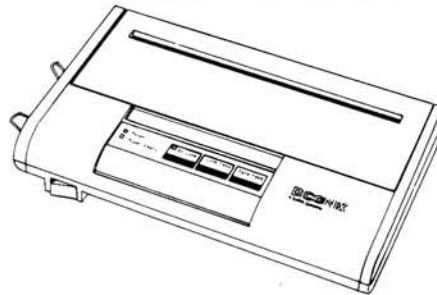
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Shoestring CAD Revisited



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Here it is, the end of January as I write this, and much has happened since I wrote the article that appeared in the September '86 issue of REMark. Heath and other vendors are now selling the older version of AutoCAD for \$300.00 for the basic program (it's not much good without the extensions, so I hear, and they are still sky-high) and version 2.5 of AutoCAD is going for \$2750.00. I've been discharged from the U.S. Navy and found less demanding employment, allowing me to delve deeper into the capabilities of my software collection and of my machine (an HF-151 with 640K RAM, 3 floppy drives, 2 serial ports, 1 parallel port, and the standard 320 x 200 video board).

ProDesign II took a back seat to my 1200 baud modem and the joys of acquiring public domain software for a negligible investment of time and blank diskettes. Then, I was given a project at work — draw up a schematic of a circuit we produce commercially. The existing schematic was drawn using drafting templates of the sort available from many office supply stores, and was useable, except for the freehand corrections that had been made in the course of circuit development. Aha! A chance to get paid to use ProDesign! I went to work, and in a week and a half had completed the new schematic. I learned a lot in that time, and discovered coincidentally that I had been guilty of reporting only my first impression and hadn't done as good a

job in my review as I had thought. Shortly before the end of the year, I received a notice from American Small Business Computers, Inc. to the effect that version 2.5 of ProDesign was available and registered owners of ProDesign II version 2.0 could obtain it for an upgrade fee of \$15.00 and the return of the original distribution diskettes. My check and diskettes were in the mail the next day. I would now like to share with you some of my discoveries about ProDesign and some of the enhancements incorporated in the new release.

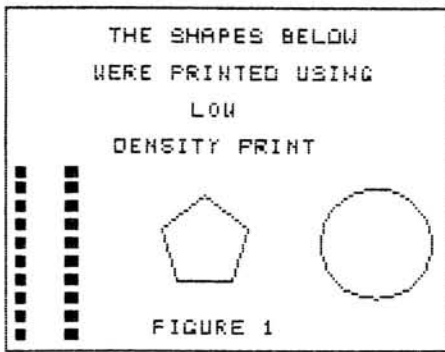
Correction And Apology

I had originally stated that my Epson RX-80 had insufficient resolution for printed circuit work — this was both true and false (if anyone caught it, I haven't seen any feedback in the "Buggin' HUG" column, and I can retract that statement with a minimum of embarrassment). The available resolutions (notice that I indicate more than one resolution) from a printer are dependant upon the capabilities of the printer (obviously). It seems that I had only tried the lowest resolution that an Epson was capable of producing under ProDesign. There are three different resolutions (referred to as "densities" in the ProDesign manual and print program) available from an RX-80. Some printers, such as the Okidata 93 we use at work, have only two resolutions. Please forgive me if I don't list the densities of every printer supported, but the time

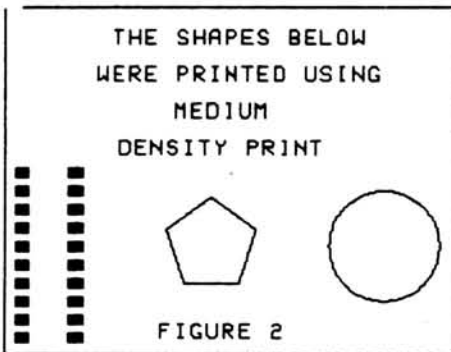
required to run PDSETUP for each printer would be prohibitive, and would only tell me how many different densities are available, not indicate the actual resolution available. I would like to go on record as saying that an Epson RX-80 is suitable for printed circuit foil layout work AT THE HIGHEST DENSITY AND A 2X MAGNIFICATION. 2X magnification is a standard for producing printed circuit foil negatives. Figures 1, 2, and 3 will show the differences in resolution better than I can describe them. As you can see, aliasing (stair-step effect) decreases with increasing density. Figure 4 shows a 2X rendering in the highest density. Figure 5 is a 1X plot (from my Radio Shack FP-215 plotter) of the same shapes. At this magnification, printer output is superior to that of a plotter. This difference in quality shifts at progressively larger magnifications, until plotter quality exceeds printer quality (about 4X or so). Figure 6 is a comparison of a ProDesign-generated foil pattern with a commercially produced layout transfer. Both are 2X magnification.

Bug Reports

Careful study of Figures 2 and 4 will reveal printing anomalies — they don't exist in the computer screen presentation. I don't know why they chose this occasion to appear, because I've never seen this happen before, and I've run at least fifty printer plots of drawings since I've been using ProDesign. Repeated attempts at reprinting



produced identical results. A note on the PAINT command used to fill the pads for the side-by-side comparison: if the pads are PAINTed at a 1X screen zoom, there will be unPAINTed streaks in the same area of the printer dump. I ZOOMed in (3X ZOOM) on the pads to PAINT them, and achieved a nearly complete elimination of unPAINTed area on the printer rendering. A 4X ZOOM would probably be complete. Plots of PAINTed areas exhibit the same problem. Apparently, the PAINT operation sends a scan of the screen to the disk file. When this is expanded for printing or plotting, the unfilled areas would represent non-existent scan lines between the ones

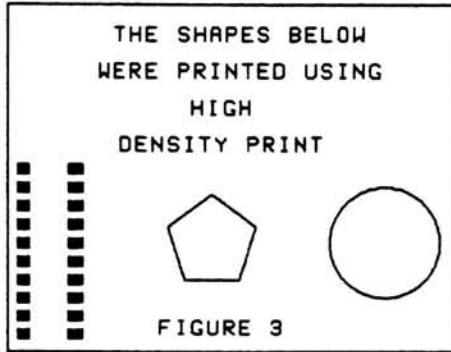


actually recorded. I suppose I've uncovered a couple of bugs. When I tried to call the programmers at American Small Business Computers, I was asked if they could call back. I haven't heard from them yet. I have heard different statements about "bugs" — maybe one of them applies here. One statement is "There are no de-bugged programs — only programs with undiscovered bugs". Another comment referred to bugs as "features", indicating that if you understand the nature of the bug, you can sometimes make it useful. I think that the first statement accurately describes the problems I had with Figures 2 and 4. The second approach could be used with the "faulty" PAINT command.

Version 2.5

ProDesign version 2.5 has much more capability than version 2.0. While the first

indication of this is the increase in the size of the manual, (up from 168 pages to 374), I



must admit that some of the manual is redundant. There are fifteen entries for "ZOOM" in the index, but two are essentially the same entries as two others — the only difference is in how the command was invoked. This is not the only instance of this sort of thing, but it was the easiest to find — "ZOOM" is the last entry in the index. The most noticeable change on-screen is a menu, accessed either with mouse or digitizer. The appearance is much like that of AutoCAD (which I haven't used but have seen demonstrated). The list of supported peripherals and display boards has increased. Speed is still the same, subject to the installation of a math coprocessor (still supported), with one minor exception, which will be covered later.

What can you do with version 2.5 that you couldn't do with version 2.0? There are, as the advertisements state, "more than 50 additional features" over version 2.0. A complete discussion is beyond the scope of this article, but I'll cover some of those I've used.

One of the most useful features I've found is the new "ZOOM WINDOW" command. You set two points at diagonal corners of the area to be enlarged on-screen and that portion fills the screen for more detailed examination and editing. Actually, a form of this command was available on version 2.0, but this uses a mouse or digitizer and "rubber-band box" to indicate on the zoomed screen the portion of the drawing which will be detailed after the zoom is executed. This cuts down tremendously on the chance for error with the attendant redrawing and rezooming (a time-consuming process on highly detailed drawings).

Another useful command is "PAN", allowing shifting of the drawing. Again, this was possible on version 2.0, but has been improved. On version 2.0, the area to be panned to had to be visible, usually requir-

ing zooming out to get the desired portion of the drawing on screen. Under version 2.5, the pan is specified in terms of direction and distance — you don't have to be able to see where you are going in order to get there, so to speak. This is a tremendous time saver. Version 2.5 allows the user to select one of two different conventions for direction. Mathematical angle measurement (0 degrees is at three o'clock, increasing counterclockwise) is the default when ProDesign is first run, and is the same as in version 2.0. With my experiences standing watch in the Combat Information Center of a naval vessel, I find geographical angle measurement (0 degrees is at twelve o'clock, increasing clockwise) feels more comfortable. Geographical angle measurement is new in version 2.5.

One new command is "POLYGON". Two points are set defining the length of one side of the desired figure. When POLYGON is called, you are asked how many sides are desired. After entering this number, a regular polygon is drawn with one side aligned on the two previously set points. This cuts down on the amount of keystrokes required if a hexagon, pentagon, or whatever, is required. The resulting figure may not appear to be a "regular polygon" on screen — I know it doesn't always come out that way on my 320 x 200 screen, but it will plot or print as closely as the resolution of the plotter or printer will allow. I used this to draw the pentagon for the example drawings.

Another new command is "STRETCH". This allows a section of the drawing to be manipulated like Silly Putty. For those of you who may not remember Silly Putty (is the stuff still made?), you could lift a picture from a printed page with Silly Putty and stretch it into fantastic and unlikely distortions due to the elasticity of the Silly Putty. Now you have this elasticity on the screen (and eventually printer or plotter) of your computer. I've played with this, but haven't found a need for it in my drawings (yet).

I mentioned previously that there was a minor speed change in ProDesign II. Version 2.5 is larger than version 2.0 (it now comes on 4 disks instead of 3), but the drawings produced are smaller. The accompanying samples had identical creation dates to those received with version 2.0, but after I had loaded the sample drawings and saved them (under different names for the sake of comparison, ProDesign doesn't retain older drawings, as while dramatically smaller, generally took

THE SHAPES BELOW
WERE PRINTED USING
HIGH DENSITY AND
2X MAGNIFICATION

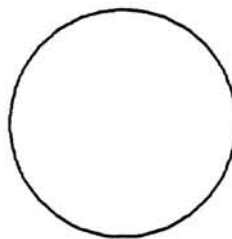
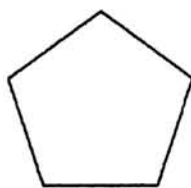
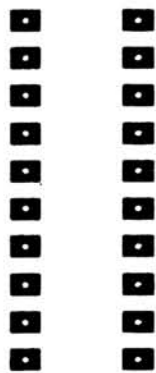


FIGURE 4

slightly longer to load. Of the five sample files provided, only one took less time to load in its new incarnation than it had previously. This is not intended as a negative comment, the differences amounted to less than 5% in all cases, and the largest difference (4.76%) was on the file which loaded faster after being re-saved. The next largest difference was 3.90% slower (percentages are based on the original time to load). In terms of actual time, the largest increase in loading time was 1.32 seconds. The largest difference in loading time was 5.21 seconds (that being the file that loaded faster after being re-saved). The big differences were in file sizes before-and-after:

saved under later versions — this was true of files created under version 2.0 relative to an earlier release, and holds true under version 2.5. As a side note to the difference in file size, we use an IBM PC-XT at work, and have installed an 8087 math co-processor specifically for use with ProDesign. My boss was so impressed with my progress that he decided to purchase a copy for the company, along with the DXF Translator (for interchanging drawings with AutoCAD), and the co-processor. I tried saving the files at work and came up with yet a different file size altogether — larger than that achieved on my “un-co-processed” machine, but still smaller than the original file size. These intermediate-sized files ARE

Original After Re-Saving File

Original After Re-Saving File	Size	Load Time	Size	Load Time
B1A	16256	58.91 SEC.	10865	59.73 SEC.
F15C	20992	89.61 SEC.	14554	90.05 SEC.
HOUSE	43392	109.37 SEC.	16518	104.16 SEC.
PART	7808	33.81 SEC.	3335	35.13 SEC.
SHUTTLE	45131	116.85 SEC.	39019	117.40 SEC.

(All files have the extension “.PD1” used by ProDesign)

It doesn't seem logical for a smaller file to take longer to load, but bear in mind that “loading” a drawing involves more than simply reading bytes from a disk, the drawing has to be plotted on the screen, as well. It's not as simple as transferring ASCII characters as is done by a word processor.

A note on compatibility: older versions of ProDesign cannot use files created or

readable and useable by my “plain-vanilla” installation. The DXF Translator was purchased because we will be farming out the plotting of the schematic to a local CAD service for processing under AutoCAD. Our 11 x 17 plotter can't render the finer detail of the schematic, so it will be translated to an AutoCAD-useable format before plotting and eventual photo-reduction for printing in the technical manual. I doubt if

the operation of the translator will justify an article by itself, but at the very least I will provide some comment via the “Buggin' HUG” column. The only thing we have been able to determine about the DXF Translator is that the resultant file is much larger than the original .PD1 file.

I don't have any benchmark times for the program running under a co-processor, because such activity is generally regarded as a waste of my time at work — as long as it's faster, why worry about how much faster? The difference is noticeable and worth the investment if you're going to spend much time using this program. Operations which take enough time for me to get and consume most of a cup of coffee (without the 8087) are finished by the time I get back with the cup (with the 8087). I'm talking about “little” things, like zooming. Printing and plotting are much faster too, but I can still count on at least one cup of coffee. This amount of time is due more to the speed of the peripherals than to the speed of the program, I believe.

THE SHAPES BELOW
WERE PLOTTED ON A
RADIO SHACK FP-215
AT 1X MAGNIFICATION

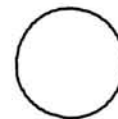


FIGURE 5

New Peripherals

Big news for version 2.5 is in the increased selection of peripherals supported. I won't list everything here as I did in the September article; the list has become too long. Instead, I'm going to list the “newcomers” not already mentioned in the previous review.

New Printers Supported

- DATAPRODUCTS 8012, 8022, 8052, 8072
- DATASOUTH 180
- EPSON EX-800, EX-1000, MX-80 FT
- FACIT 4528
- HP LASER JET PLUS
- IBM 5182 COLOR PRINTER (THIS MAY BE THE SAME PRINTER LISTED IN VERSION 2.0 AS “IBM COLOR PRINTER”)
- IBM 3852 COLOR JETPRINTER, QUIETWRITER II
- NEC P6, P7
- OKIDATA 292, 293, 294
- OLYMPIA NP
- OTC OT-700, OT-700E
- RADIO SHACK DMP-120

THE DIP PATTERN ON THE LEFT IS
A PRODESIGN-GENERATED PRINTING
THE ONE ON THE RIGHT IS
A COMMERCIAL LAYOUT DECAL

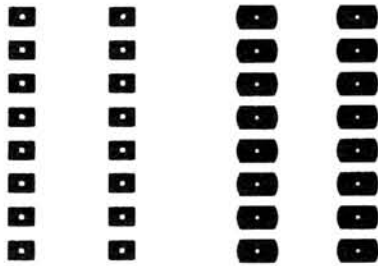


FIGURE 6

SMITH CORONA D-100
STAR NX-10, NX-10 PC MODE
TOSHIBA 321
TRANSTAR 315
XEROX 4045 LASER PRINTER
RASTER DATA ONLY

New Plotters Supported

APPLE 410 COLOR PLOTTER
AST TURBOLASER
CALCOMP 1043
HP 7570 C-SIZE, D-SIZE
HOUSTON INSTRUMENTS DMP-7,
DMP-56
IBM 6180
LASER MASTER
MANNESMAN TALLY PIXY 3
NUMONICS 2200
RADIO SHACK 6-PEN PLOTTER, 26-1190
PLOTTER
SERVOGOR 281
SHARP CE 515P
SILVER REED EB 50
(The option to define your own plotter to
the program still exists.)

New Digitizers/Mice Supported

ALTEK AC30, AC40
CALCOMP 2500 (ASCII), 2500 (BINARY),
9100 (FORMAT 1)
CHERRY DIGITIZER
HOUSTON INSTRUMENTS TRUE GRID
KURTA SERIES THREE
LOGITECH R7 LOGIMOUSE
MITSUBISHI GRAFNET 01
SUMMA 1103 (ASCII), 1103 (BINARY),
BIT PAD 2 (ASCII), BIT PAD 2 (BINARY),
SUMMAGRAPHICS MICROGRID
(ASCII), SUMMAGRAPHICS
MICROGRID (BINARY)

TEKTRONIX 4957 (ASCII), 4957 (BINARY)
TORRINGTON MANAGER MOUSE

New Graphic Displays Supported

AT&T 6300 DEB (640X400 COLOR)
IBM PROFESSIONAL GRAPHICS
ADAPTER
ORCHID TURBO PGA
TOSHIBA 3100
TSENG LABS EVA/480

The inclusion of a device in the "new" list means it is "newly supported by ProDesign". For instance, the Epson MX-80 FT, Radio Shack 6-pen plotter, and Logitech R7 mouse have all been in production for quite some time (and at least two of them I know to be no longer available), but this is their first appearance in the list of configurable options. There may be others that fit this description, but I'm not an authority on all computer peripherals ever manufactured. I suppose there was such a broad user base that the ProDesign programmers felt that providing support was justified. Also, some selections in version 2.0 have probably been expanded to specifically name a device that had been previously supported (but not named) by virtue of being compatible with some other peripheral.

Final Comments

I don't know if the change in cost of AutoCAD version 2.17 is a direct result of competition from ProDesign or of their release of a newer version, but it's nice to see prices in the reach of the less wealthy computer users: hobbyists such as myself, and small businesses. I never could see any reason why a CAD package should cost

more than a good word processor. While ProDesign still weighs in at \$299.00 as before, the upgrade policy is fair in my opinion, and the increase in capabilities is gratifying. For the difference in price between ProDesign and the higher-priced spreads, I can be satisfied using correction fluid to take care of the printer anomalies when they do show up.

Well, it's time for me to get down off the soapbox and move on to more serious things, such as drawing up the stepper-motor driver I've been working on. Maybe I'll do a plotter-construction article in the future. 'Bye for now.

Products Discussed

ProDesign II version 2.5	\$299.00
DXF Translator	\$ 99.95

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In the last issue, I covered the topic of Sequential Disk I/O. In this issue, the XENIX or Tree Directories Functions will be covered. One of the main differences between the XENIX and other disk functions is that they do not require the use of the FCB or the DTA. Instead, they make use of ASCIZ strings and file handles. An ASCIZ string is simply an ASCII string terminated by a zero or nul character byte. The file handle is a 16 bit number used to identify a file or a device. MS-DOS 2 always has 5 file handles open, they are:

0	STDIN	Standard input
1	STDOUT	Standard output
2	STDERR	Standard error
3	STDAUX	Printer or modem
4	STDP RN	Printer or modem

You are allowed 3 additional file handles. If you wish to have more file handles, use the CONFIG.SYS to do so.

The first function we will look at is the DOSF_CREATH or 3CH. To create a file, the DX register must have the offset of an ASCIZ file name path. Also, the CX register contains the file attribute; if you want a standard file, set CX to Zero. If you are successful in creating a file, the carry flag will not be set and the AX register will return the file handle number. If you're not successful, the carry flag will be set and the AX

Listing

```
TITLE--XENIX DISK OUTPUT PROGRAM
;
COM      SEGMENT
        ASSUME  CS:COM,DS:COM,SS:COM
        INCLUDE MSDOS.DEF
        ORG    100H
START:  JMP     DO
CLR_SC  DB     1BH,'E',1BH,'H','$'      ;clear screen home cursor Z100
MSG1    DB     'This program will input a line up to 80 characters.'
        DB     CC_CR,CC_LF,'The lines will be stored on a disk file.'
        DB     CC_CR,CC_LF,'Enter a CTRL-Z and CR to end program $'
MSG2    DB     CC_CR,CC_LF,'Proceed to enter text',CC_CR,CC_LF,'$'
F_MSG   DB     CC_CR,CC_LF,'Enter the file name path',CC_CR,CC_LF,'$'
F_PATH  DB     33                      ;path name buffer
        DB     ?
F_BUF   DB     33 DUP(0)
STR     DB     81                      ;string buffer
STR_CNT DB     ?
STR_BUF DB     81 DUP(' ')
F_HND   DW     ?                      ;file handle
ERR_OP  DB     'Unable to open file, program terminated $'
ERR_WR  DB     'Error on disk write, program terminated $'
NEXT_LN DB     CC_CR,CC_LF
NEW_LN  DB     CC_CR,CC_LF,'$'
F_CNT   DW     0
;
DO:     MOV     DX,OFFSET CLR_SC
        CALL   DISPLAY                ;clear screen
        MOV     DX,OFFSET MSG1
        CALL   DISPLAY
        MOV     DX,OFFSET F_PATH
        MOV     BX,OFFSET F_BUF
        CALL   PATH_NAME              ;get file name and path
        MOV     DX,OFFSET F_BUF
        MOV     CX,0                  ;no attributes
        MOV     AH,DOSF_CREATH
```

```

INT     DOSI_FUNC
JC      OPEN_ERR
MOV     F_HND,AX
MOV     DX,OFFSET MSG2
CALL    DISPLAY
MOV     DX,OFFSET STR
CALL    IN_STR
MOV     BX,OFFSET STR_BUF
MOV     AX,WORD PTR STR_CNT
XOR     AH,AH
MOV     F_CNT,AX
MOV     CX,F_CNT
MOV     AL,[BX]
CMP     AL,CC_SUB
JZ      FL_CL
INC     BX
LOOP    LOOPA
MOV     DX,OFFSET STR_BUF
MOV     CX,F_CNT
MOV     BX,F_HND
MOV     AH,DOSF_WRITEH
INT     DOSI_FUNC
JC      WR_ERR
MOV     DX,OFFSET NEXT_LN
MOV     CX,2
MOV     BX,F_HND
MOV     AH,DOSF_WRITEH
INT     DOSI_FUNC
MOV     DX,OFFSET NEW_LN
CALL    DISPLAY
JMP     MLOOP
FL_CL:  MOV     DX,OFFSET STR_BUF
MOV     CX,F_CNT-1
MOV     BX,F_HND
MOV     AH,DOSF_WRITEH
INT     DOSI_FUNC
MOV     BX,F_HND
MOV     AH,DOSF_CLOSEH
INT     DOSI_FUNC
INT     DOSI_TERM
OPEN_ERR: MOV     DX,OFFSET ERR_OP
CALL    DISPLAY
INT     DOSI_TERM
WR_ERR:  MOV     DX,OFFSET ERR_WR
CALL    DISPLAY
MOV     BX,F_HND
MOV     AH,DOSF_CLOSEH
INT     DOSI_FUNC
INT     DOSI_TERM
;
;
INCLUDE SUBS.ASM
ENDS
END      START
TITLE-- XENIX DISK INPUT PROGRAM
;

```

```

COM     SEGMENT
ASSUME CS:COM,DS:COM,SS:COM
INCLUDE MSDOS.DEF
ORG     100H
START:  DB
CLR_SC  DB
F_MSG   DB
ERR_OP  DB
ERR_RD  DB
IN_BUF  DB
F_PATH  DB
F_STR   DB
F_HND   DW
F_CNT   DW
;
DO:     MOV     DX,OFFSET CLR_SC
CALL    DISPLAY
MOV     DX,OFFSET F_PATH
MOV     BX,OFFSET F_STR
CALL    PATH_NAME
MOV     DX,OFFSET F_STR
MOV     AL,0
MOV     AH,DOSF_OPENH
INT     DOSI_FUNC
JC      OP_ERR
F_HND,AX
CX,82
MOV     DX,OFFSET IN_BUF
MOV     BX,F_HND
MOV     AH,DOSF_READH
INT     DOSI_FUNC
JC      RD_ERR
MOV     CX,AX
MOV     BX,OFFSET IN_BUF
MOV     AL,[BX]
CMP     AL,CC_SUB
JZ      EOF
INC     BX
LOOPA  LOOPA
MOV     DX,OFFSET IN_BUF
CALL    DISPLAY
JMP     MLOOP
EOF:    MOV     AL,'$'
MOV     [BX],AL
MOV     DX,OFFSET IN_BUF
CALL    DISPLAY
MOV     BX,F_HND
MOV     AH,DOSF_CLOSEH
INT     DOSI_FUNC
OP_ERR: MOV     DX,OFFSET ERR_OP
CALL    DISPLAY
INT     DOSI_TERM
RD_ERR: MOV     DX,OFFSET ERR_RD
CALL    DISPLAY
JMP     CLOSE
;create file
;unable to create file
;store file handle
;convert string count into word
;zero high byte
;check for CTRL-Z
;close file procedure
;next character
;write string
;error on disk write
;add cr & line feed to string
;do again
;remove CR
;write final string
;close file
;end program
;file open error msg
;file write error msg
;close file

```

```

;this subroutine will ask the user for disk drive,filename and extension
;requires DISPLAY and IN_STR subroutines
;INPUT DX contains offset of asciz string header, BX contains offset of buffer
;OUTPUT buffer
;FLAGS returned none
;Other registers affected none
;
PATH_NAME:
    PUSH    AX
    PUSH    DX
    MOV     DX,OFFSET F_MSG
    CALL   DISPLAY
    POP     DX
    CALL   IN_STR
    MOV     AL,[BX]
    MOV     AL,CC_CR
    CMP     JZ
    INC     BX
    JMP     CR_FND
    MOV     AL,0
    MOV     [BX],AL
    POP     AX
    RET
;put the following bytes in front of program to avoid phase errors
;FMSG DB 'ENTER THE FILE NAME PATH',CC_CR,CC_LF,'$'
;

```

register will return the type of error. When a file is created, it is open for both write and read operations. The DOSF_OPENH or 3DH function is similar to the create function. Register DX has the offset of an ASCIZ file path. If open is successful, the carry flag will not be set and register AX will return the file handle number. The value in the AL register tells what kind of operation the file is to be opened for. 0=open for read, 1=open for write, 2=open for both reading and writing. The DOSF_CLOSEH or 3EH functions only require that BX contains the file handle. The DOSF_READH (3FH) and the DOSF_WRITEH (40H) functions are both identical, except one reads a disk and the other writes to a disk. Register DX contains the offset of a buffer, CX contains the number of bytes to read or write, and BX has the file handle number. The two programs below do the same function as the programs in the previous article. The first program will take in data from the keyboard until a CTRL-Z is entered. The second program is similar to the TYPE command, only it doesn't like files with the (\$) symbol. Since the XENIX calls do not use the FCB, the program code is smaller. Chances are once you get used to the XENIX functions, you will probably not use the other disk I/O functions too often.

```

;
INCLUDE SUB2.ASM
ENDS
END START

THE INCLUDE FILES

File name MSDOS.DEF, definitions used by both programs
DOSI_TERM EQU 20H ; Program terminate
DOSI_FUNC EQU 21H ; Perform a function
;
DOSF_OUTSTR EQU 9 ; Output string
DOSF_INSTR EQU 10 ; Input string
;
; xenix function codes
DOSF_MKDIR EQU 39H ; Make dir
DOSF_CHDIR EQU 3BH ; Change dir
DOSF_CREAT EQU 3CH ; Create file
DOSF_OPENH EQU 3DH ; Open file
DOSF_CLOSEH EQU 3EH ; Close file
DOSF_READH EQU 3FH ; Read file
DOSF_WRITEH EQU 40H ; Write file
;
;character codes for ASCII control characters
CC_NUL EQU 0
CC_LF EQU 10
CC_CR EQU 13
CC_SUB EQU 26

```

```

File name SUB2.ASM, this file contains subroutines used by both programs
;Subroutine DISPLAY
;This subroutine will output a string of characters terminated by a $
;INPUT DX contains offset of string
;OUTPUT console
;FLAGS returned none
;Other registers affected none
DISPLAY:
    PUSH    AX
    MOV     AH,DOSF_OUTSTR
    INT     DOSI_FUNC
    POP     AX
    RET
;
;SUBROUTINE IN_STR
;This subroutine will input a string up to 80 characters
;INPUT DX contains offset of string buffer that has been set up
;OUTPUT string buffer
;FLAGS returned none
;Other registers affected none
IN_STR:
    PUSH    AX
    MOV     AH,DOSF_INSTR
    INT     DOSI_FUNC
    POP     AX
    RET
;
;Subroutine PATH_NAME

```

Just a couple of reminders to anybody who tries to assemble and run these programs. First of all, these programs were written for the Z-100, so the clear screen will not work on the PC computers. Also, the programs will not work on Z-DOS or MS-DOS earlier than version 2. Finally, these programs are not bullet proof, they were written to be used for a teaching guide, I make no claim of being an Assembly language wizard. On the closing note, I hope these articles have given you a better insight on how the MS-DOS disk I/O programs are generally constructed. Good luck and may the wild interrupt never show up on your screen. *

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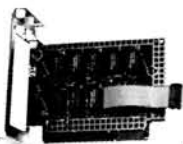
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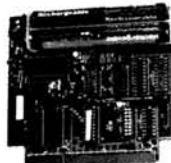
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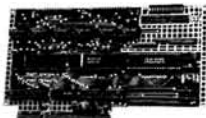
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I'm a sucker for software ads, the ones in the glossy computer magazines. The graphics are fantastic and the copy guarantees that THIS little beauty will solve all my problems, even the ones I didn't know I had. Twice this month the manager of my neighborhood convenience store has given me the eye: his sign reads "This is NOT a library." But I just can't help myself. My mouth waters when I read about all the new kinds of software — integrated systems (or whatever they're called: "systems" seems to cover everything these days), pop-up calculators and to-do lists, intelligent keys (what do they know that I don't?). I want them all, especially the programs touted as decision-making tools. Decisions of any kind are a big problem for me.

My software budget, however, says "No!" to just about anything fancy. I suppose I should confess that I never had a budget of any kind until I bought my "system" — a Z-151 with dual drives, an amber monitor and a nifty dot matrix printer. Naturally, I've been acquiring software ever since, more slowly than surely. The freeware library of my local users group has a few geajaws and jimcracks, but, as far as I can tell, none of the intrepid user-supported program writers have put together anything as trendy as a decision-making tool.

Now, I am the kind of guy who has been known to drive a nail with a pipe wrench or

remove a stubborn spark plug from my V-8 clunker with vice grips. Not a very efficient "system," I guess, but most of the time using a tool for something it wasn't designed for works OK. A little messy, maybe, but a lot cheaper than a trip to Joe's hardware. (My handtool budget is even lower than my software allowance.) So when I faced one of the toughest decisions I've had to make for the last ten years, I started to rummage through my disk file to see what I could find.

Let me say right now that I'm a movie freak. So's my wife Barbara. One of the major attractions of the town we moved to seven years ago was that it had a cable "system" that peddled a pay TV channel. Recently, our local cable proudly announced that subscribers could get three different networks, HBO, Showtime, and Cinemax. Well, we thought about getting all three, but there's quite a bit of overlap on the movies they offer, and that seemed wasteful. Even more important, the entertainment line on the household budget spreadsheet wouldn't sit still for all three unless I got a second job, and then I wouldn't have the time or energy to watch movies on TV anyway. No way out of it: I had to make a decision.

But which one? Cinemax, because of its name, seemed like the way to go, but looking at the program guide that covered all three networks was confusing. I couldn't

get a clear picture whether or not Cinemax really had more movies. Or better ones. Let me tell you, it was a sad couple of months at our house. Checking the program guide to see what was on the paynets we didn't get was driving us nuts. What I needed was to have the information presented in a way that would help me decide which "system" to sign up for.

Anyway, there I was leafing through my software to see what might serve. My word processing package seemed promising at first, but after fifteen minutes of making a list, I realized that I was just wasting my time. I don't know about your word processor, but mine won't even alphabetize. A lot of people talk about the decision-making capabilities of spreadsheets, their forecasting ability, so I fiddled with mine for a while, but I couldn't seem to find a way to lay out the information so that it would tell me what I wanted to learn. It was really Barbara who thought of putting it all into a sortable, manageable form, and that suggested a database.

Now, there are database managers and there are database managers. They range from simple little card shufflers to mammoth programs that will hold and manipulate all the names and addresses in the Metropolitan New York phone book. Mine is somewhere between these two extremes, and it's properly called a file manager, I guess. Whatever it's called, it's very easy to figure out.

Surprisingly, coaxing my filer into helping me make a decision was a lot of fun. I called the base "PayTV" and set up fields for "title" (of offering), "vendor" and "pgm-type." The last of these let me designate whether an offering was a movie or one of those other things the pays sell you, things Barbara and I would usually rather avoid. I called the items under "pgmtypes" simply "movie" or "other," though I probably could have been more elaborate if I'd thought of it then. It took a little more than an hour to type in the 228 offerings by all three vendors for the month, but it was time well spent. Only after I had finished entering all the data did I realize that what was really necessary to quantify everything was a rating system, one that could assign points to the various shows offered, the items in the "title" field.

I could have saved myself an additional half hour if I had thought to include a rating system when I first keyed in the info — instead of adding a field later and then going back and modifying each record. But that worked out well, because Barbara asked me what I was doing and "offered" to help me rate the shows the second time through. I had never realized how different our tastes in movies were, and well, she watches and pays, too. With the "rating" entry completed, we had a base with four fields that would give us separate listings of titles and ratings for each service. Our rating system was simple: we used a 5-for-high, 0-for-low system for both movies and "other" things, though we did occasionally indulge ourselves by giving stuff like "Not Necessarily Sniglets" a minus rating.

OK, the list facility generated a report composed of movie titles and rating numbers. Furthermore, because I had enough foresight to use the right symbol beside the rating field name, it also totaled the rating points. By doing a pass for just movies, we were able to compare totals for each service. This told us what we really wanted to know, which of the three networks scored the highest — according to the point values that we ourselves had given their movies. Since some services carry more movies than others, I considered coaxing my software into giving me an average rating for all the movies offered on each network, but I soon scrapped this idea. If Showtime could rack up a few points against HBO by giving me a greater number of movies that I had some interest in seeing, why not let it? My "average" would have defeated my real purpose. It's always hard to know when you're finished, especially when the fan in the CPU is still running.

Just for fun, I reran the separate lists including both "movies" and "other" and these results showed an even greater difference between the services than the movies-only totals. Barbara and I realized that a somewhat more accurate calculation could have been arrived at, especially for lists that include both movies and "other," if we'd seen the non-movie offerings on the other services. We tended to be more generous, probably, with the non-movie shows on the services we don't see. Similar to Samuel Johnson's observations on second marriages — the triumph of hope over experience.

With the numbers in front of you, the agony of decision-making vanishes like the contents of RAM memory when the plug is pulled. Just doing the database, especially naming the fields, will get you thinking about the criteria you need to establish in order to make a good decision.

Oh, by the way, we switched. Which service is best for die-hard movie fans? Use your database software and work it out for yourself. Your tastes are certainly different from ours. *

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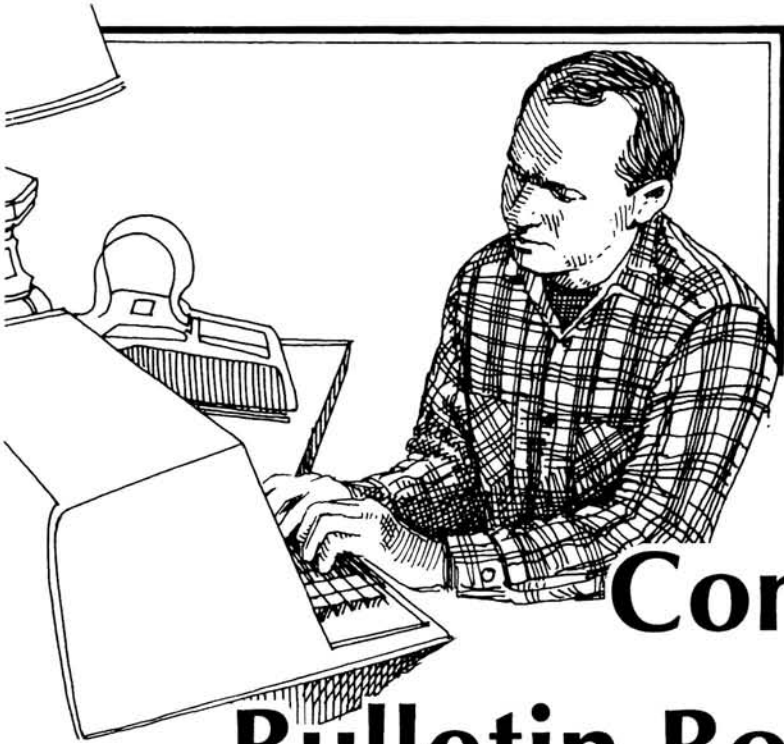


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Computers And Bulletin Board Systems

How would you like to receive hundreds of programs just for the cost of a phone call? If your answer is yes, then read on. I would like to introduce you to the world of remote electronic bulletin boards and public domain, shareware software.

Remote bulletin board systems (RBBS) are the computer version of the old cork bulletin boards where you would post notes with thumbtacks. With an RBBS system, you can "post" electronic notes. These can be read by other people with computers. If you want, you can leave private messages that can only be read by certain people. You can even use an RBBS system as an electronic mail service.

However, the biggest attraction of the bulletin board system is the file section. This is where programs are available for you to have. In order for you to get them, you need to "download" them. Download is the process of having the computer that runs the bulletin board (the host computer) send you the file. When you are receiving the file, you are storing it on your disk. After you have finished communicating with the bulletin board, you can then use the program. The computer operator who runs the bulletin board system is known as the SYSTEM OPERATOR (SYSOP).

Most of the bulletin boards that I am familiar with are for IBM or compatible computers (I own a Zenith Z-150). If you own

another type of Z/H computer, don't despair, there are boards out there for you. It just might take longer to find a local one. There is a large HUG special interest group located on CompuServe which you can call from just about anywhere. However, most of the software that I will be writing about will be for PC compatibles.

Who would ever allow you to take programs for free? Actually, there are quite a few people. Many of the programs are known as public domain, freeware, or shareware. There is nothing illegal about using these programs. Public domain or freeware programs are programs in which the authors are not trying to sell them to the public. They are available for use by the public. Usually, the source code is included. Some of the people who write the programs do it as a hobby or a sideline and are not able or willing to spend the time and effort to market the programs. It takes a lot of money and knowledge to successfully market commercial programs. It does not mean, however, that the programs are low quality. In many cases, they are just as good as many commercial programs.

The other category of programs are called shareware. Generally, these programs are available for you to test and try on your machine. If you like and use the program, the authors request that you send in a modest amount of money (registering) for the

use of the program. The authors usually are depending on your honesty in sending the money. The amounts that the authors want are usually small amounts, almost all are under \$100, most are under \$50. In many cases, if you register the program, you will get a printed bound copy of the instructions for the program, and/or a more expanded version of the program. Some of the shareware versions of different programs have limited features. However, this does not mean that the shareware versions of the program are not useful. The "registered" copy of the program will usually just have more features. Also, support of the program will only be available to those who have paid a fee. One of the reasons that the costs of the programs are low is because there are few expenses in marketing the program. Contrast this method of marketing to the copy-protected method!

Now that we have talked a little about bulletin board systems, what do you need in order to use a BBS. The main piece of hardware that you will need is a modem. You will need to decide whether to get an internal or external modem and the speed of the modem. Whether you get an internal or external modem will depend upon several factors. With some systems (H/Z-89), you can only use an external modem. With IBM compatible computers, you can pick either an internal or external modem. With an external modem, you will need an RS232

cable to connect it to your computer. Price, availability of expansion slots, and personal preference will play a role in your selection.

The other decision that you will have to make is the speed of the modem. There are 3 major speeds, known as baud, 300, 1200 or 2400. The faster the speed, the lower your phone bills will be, since the computer can receive files quicker. However, there is a trade-off, the faster the modem is, the more expensive it is. Unless you cannot afford a faster modem, I would suggest staying away from the 300 baud modems. My modem is 1200 baud; I couldn't justify the price of a 2400 baud modem. I don't really know that many people only have a 300 baud modem. Most of the people that I know have 1200 baud modems. Most of the bulletin boards use 1200 baud, some are using 2400 baud. You don't need to be too concerned about the speed of the modem that the SYSOP is using. The 1200 and 2400 baud modems can "slow down" and talk with a computer using a slower modem. My hunch is that for most of you, the 1200 baud modem will make the most sense when you take into account the prices of the modems.

After you have your modem hooked up, you will need some type of communication software. There are several ways to get modem software. With some modem products, a communication package is bundled with the product. Or there are some packages available through HUG. Once you have contacted a bulletin board, there are several programs available on the systems. So you have the opportunity to choose another package if you are not happy with the one that you have. My personal favorite is PROCOMM. This is the program that I use. Other well known programs are QMODEM, PC-TALK, plus many others.

Once your system is ready to go, who do you call? The most difficult number to find is the first. Once you are on a bulletin board system, you will find messages for other bulletin boards in the message section. One way to find bulletin board numbers is to ask other computer users that call bulletin boards. Where I live (in the San Francisco Bay Area) there are so many bulletin boards that I almost never make a long distance call. If you are still looking for a bulletin board to call, try HUGPBBS, a bulletin board run by HUG. The phone number for the HUGPBBS is (616) 982-3956. Another option is CompuServe or a similar board. CompuServe and other services like it do charge you.

Once you make a connection to a bulletin board through your modem, the software that you will probably be seeing will be the Remote Bulletin Board System (RBBS) or PCBOARD. In my experience, I have found these two RBBS software packages to be the most common. The first thing that you will probably notice on your screen is the name of the bulletin board and a prompt asking you for your name. If the computer cannot find your name in its list (it will not since this is the first time you called), you will be asked to register. Before you register, you will probably see a short message about the policy that the SYSOP has for his or her bulletin board (usually just called a "board"). Most policies that I've seen usually state that the SYSOP does not want you to do anything illegal or leave profanity in a message or something along those lines. If you do not have any problems complying with the SYSOP's policy, then the registration procedure will start.

When you register, you will be asked for your name, sometimes for your address and phone number. Some boards will verify this information, some will take your word. You will probably be asked to pick a password. When you call again, you will be asked for this password so don't forget it! You might have limited privileges your first few times on the board. Another option that you will be asked to pick is the file transfer protocol. Don't let the words scare you. The program is just talking about a method to transfer files between your computer and the "host" computer. You will be given a choice of options. These will be the file protocols that the bulletin board supports. Just pick one that your communications program supports. You can usually find out from the documentation on the program. Almost all communication and bulletin board programs will support "Xmodem". If you are not sure, pick Xmodem, your program will be able to support this protocol. If your communication program and bulletin board support it, I would suggest that you pick "Ymodem" or "Kermit". The advantages of these two file transfer protocols is that it takes less time to send a file, which can lower your phone bill!

After you register, then you will have a list of bulletins with a message asking if you want to read any of them. You will probably want to read any policy bulletins. When you are done with the bulletin section, the program will take you to the main menu. This is where you will see a list of areas that you can go to on the bulletin board. The main sections are: messages, this is the electronic mail section of the board; files, this is

where you can upload (send) or download (receive) files; conferences, a special interest message section; and usually a utility section, where you can change your password, change your information that the program has on you, etc.

One nice feature of the two main BBS programs is the level of help the programs give you. You do not have to memorize the commands needed to use the different functions. You are usually looking at a menu with a list of options and a brief explanation of the command. Once you become more familiar with the bulletin board, you can "turn off" the menus with the Xpert command.

Let's take a look at each of the sections of the bulletin board in a little more detail. We will start with the message section. This is where you can leave "electronic mail". If you want to read the messages, you can use the "R" command. Within the message menu, you can use the "*" command to read all of the messages that you have not previously read. You can leave a message by using the "E" (for enter) command. This is a good way of getting help on any type of computer related problem or concern that you have. I have not found any problem that someone hasn't had the answer to.

The next main section of the bulletin board is the file section. This is where you can see the files (programs) available for downloading. You can view a listing and a short description of all of the files available on the bulletin board. Some of the bulletin boards will have over 100 different programs! The procedures are fairly simple to receive or send a program.

If a program looks interesting, then you can download it. You will need to know what transfer method to use. You really don't need to know anything about the transfer methods, just make sure that the bulletin board and your program are using the same one. You will need to tell the bulletin board that you want to download a program and the name of the program.

Next, the bulletin board will prepare to send you the program using the file transfer protocol that you picked when you register. Don't worry, the program will usually tell you which protocol it will use. You do not have to remember which one you picked when you registered.

Then, you need to tell your modem program that you want to receive a file. Your modem program will ask for the communication protocol (pick the same one that the bulletin board is going to use) and the name of the file. This will be the name

that the file will be called on your disk. It doesn't have to be the same as the name of the file on the bulletin board, but usually you will keep the same name. Once you have done that, the bulletin board will start sending the program. Your modem program will save it on your disk. Once the transfer is complete, your computer will beep a few times to let you know that it has received the file. That's all there is to it!

To send a file to the bulletin board, you will need to "upload" it. The procedure is similar to the download procedure mentioned above. You will need to tell the bulletin board that you want to send it (upload) a file and the file transfer protocol you will use (Xmodem, Ymodem, etc.). Then, you tell your modem program that you want to upload; it will ask for the name and the protocol to use. Once you've given your modem program this information, it will start the upload. Again, your computer will beep a few times once the upload is complete.

The next main area of a bulletin board is the conference area. This is nothing more than a specialized message base. To get to the conference area, you use the "J" (for Join) command. You will usually get a list of the available conferences and their topics. Some are private (only for authorized users) and others are public (everyone is welcomed). The other commands that are used in the message area will work in the conference area.

The last major area of a bulletin board is the utilities area. This is where you can change some of the options available to you. These options include: color or monochrome monitor, ability to change your password, and several others. You usually do not use the options area that much.

While I have features of bulletin boards that run PCBOARD or RBBS, you should be aware that many of the other bulletin board programs will offer the same features as these two programs.

I hope that this article has helped those who are new to bulletin boards and those who are considering getting a modem. I have to admit that since I got my modem, it has opened a whole new area to use my computer in. In the future, I would like to write some articles describing some of the programs available on bulletin boards. ✱

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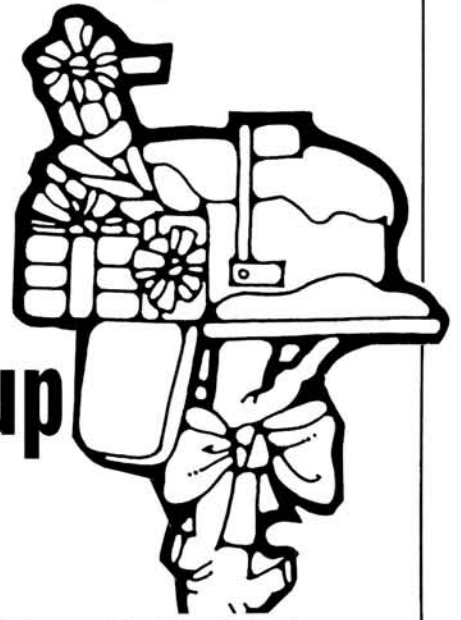
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Did you read *Popular Mechanics* during the Fifties? Then you may have seen an ad, way in the back, for a 'real printing press'. I was about a dozen years old then when my parents gave me one of these presses for a Christmas present.

It used actual printers ink (loved the smell) and metal type slugs. The type slugs were about an inch long with a rectangular cross section. The box that contained the type only measured 3 by 5 inches. But what a job to set the type in that box. Each letter had to be set by hand, reading backwards of course, including the proper size spacing between words and sentences. The text could even be justified if one had the patience to insert the different sized spaces furnished.

I had dozens of old bulk 35mm film cans my father had discarded into which I had sorted the quantities of each letter, number, punctuation marks and spaces that came with the press. Hunting for the correct container was part of the game.

After the type was set in proper order in the type box, it had to be locked in place in the box and leveled. If it wasn't leveled then only the characters sticking up above the rest would print, as I discovered on several occasions. More than once a careless move caused type and box to splatter all over the floor. Fasten the type box in place, apply a little ink to the rotating plate (I did

remember to clean the rollers, didn't I?), push the handle and Presto! a message for posterity.

The fun of setting the type and printing the material was heavily weighed down by the need to clean and re-sort all the type used. L's and 1's, m's and w's, b's and d's all tended to test one's powers of visual discrimination. The number of individual pieces to handle was staggering. Consider something as simple as: The quick brown fox jumped over the lazy dogs back. Over 50 pieces of type are required for this one sentence.

Although the press captured my imagination for some time, the drudgery of dealing with the large quantities of type kept the the operations subdued. The press was eventually put away and life went on.

At the time I decided to purchase a computer for my own use, I realized that some sort of word processor program would need to be selected. There seemed to be a lot of them, too. One I read about was Microsoft Word. It was described in one review as a "typesetting program disguised as a word processor." Now that statement really whetted my interest. It also brought back to mind memories of the old press. When I found the Zenith PC for sale, including Word (version 1.1), that tipped the scale.

My experiences with word processors at that point had been a line editor on a main-

frame accessed via a 300 baud modem and a popular word processor on an 8-bit machine. One problem I had with these programs was winding up with a whole page of bold face or underlined text because I either forgot to insert the command to terminate the feature or deleted it by accident. Right away I liked Word's feature of showing these selections as they would actually appear in print.

I could see that Word included the ability to select different type faces without having to remember a lot of printer control codes.

For informal documents the amount of control I had with Word was working out great. Bold face or underlining, for example, were easily selected. The text that the attribute applied to was readily visible on screen. But, my printer, a Star, included a near-letter-quality font which the printer driver for Word did not support.

At first, I took the "easy" way out and looked up the control codes in the printer manual and inserted them with the ALT key. Not classy, but it worked.

After a while, I screwed up my courage and tackled the task of reworking the printer driver to support the NLQ mode of the Star. The documentation in Word 2.0 (I was on my first update) for this task is sparse to say the least. Not being a programmer it took trial and error plus some guessing to get

things working right. But at last it was possible to press the Format Character keys and see NLQ as an option for the font.

As you might have surmised, this arrangement was satisfactory only for a while. The printers NLQ mode contained only one size of type so selecting a larger type made a drastic change in the appearance of the characters. The quality of the NLQ mode was an improvement over the draft mode, but still not near enough to near-letter-quality. Now an obvious solution to this problem would be to purchase one of the new laser printers. Microsoft was kind enough to include good support for these printers in version 3.0 of Word1 I was now using. The obvious problem to the solution was the cost was way beyond reason.

Then I began to read about a program by SoftCraft called Fancy Word. It claimed to allow the normal formatting of text using Word, then it used bit-mapped graphic printing to produce high quality printing on a variety of dot-matrix printers.

Instead of a multi-kilo buck laser printer, could I do what I wanted with a program costing under \$200?

There is no free lunch. The trade-off, of course, was speed. A laser printer could put out 8 pages a minute, while I'd be pushing to get one page in 8 minutes. Since it takes me a lot longer than 8 minutes to write a page of text, how would I react to a laser printer that could spit out hours of work in a minute? It could be very intimidating. And expensive.

Through this process of rationalization I decided to give Fancy Word a try.

The acid test was to reformat a document I had produced on a mini-computer and printed on a daisy wheel printer. The document was over 50 pages long and all done in elite type by a daisy-wheel printer. The information was there, but it lacked presence. A major revision was going to be made to the contents and this seemed like a good time to also improve its appearance.

First, I needed to gain some operating experience with the two programs, Word and Fancy Word, working together on some shorter documents. So personal letters started taking on a whole new appearance.

It was this experience that convinced me style sheets would be a must. I had used style sheets a little but only in a rudimentary way. I was using one for letters that defined the return address, inside address,

salutation, etc. When I thought of all the formatting to be done on the 50+ page document and what would be required for the inevitable changes, the power of the style sheet was really appreciated.

My initial step to the process of reformatting my 50 pages was to create a style sheet. As suggested in the Word manual, I took an existing style sheet, the one closest to my desired format, created a copy under another name and then modified the copy to my specifications.

The style sheet wound up with 11 styles. Two were divisions, 8 were paragraphs, and one was a character only format. The paragraph styles also contained character formatting. A total of twelve fonts were used.

Before applying the styles to the document, I first had some unformatting to do. The text had been downloaded from the mini as an ASCII file and it contained a Word paragraph mark at the end of each line and for each blank line. Removal was a multi-step process. Each double occurrence of a paragraph mark was replaced with a tilde to mark where most of the paragraph endings would be restored. Then all single occurrences of the paragraph mark were replaced with a space. Next, all multiple occurrences of the tilde were reduced to single occurrences, and then the tilde was replaced with a paragraph mark. This left a paragraph mark only at the end of each paragraph.

There was still a little manual cleanup to do, but this was taken care of during the remainder of the editing.

At this point, I attached the style sheet to the document. The standard paragraph gave the majority of the paragraphs in the document the desired style, but adding the remaining styles is what really dressed it up. For example, in the table of contents minor headings were given a slightly smaller font from the main headings. Since readers would be looking for specific pages, the page number was emphasized in 16 point type with a bullet (*) on each side. A sans serif font was used to indicate action desired by the reader. To keep the lawyers happy, references to a product had the "registered" symbol (R) appended.

The limitations of Word's WYSIWYG (what-you-see-is-what-you-get) display were very apparent during the formatting of the document. The majority of the text was 12 point and the standard display did not show the line breaks accurately. In most cases, this could be corrected by switching to printer display when needed.

There were still a few places where the display could not match the printed page. Proportional spacing and different font sizes are difficult to portray on a screen with a fixed-width character set.

Thus, several test prints were necessary to test the product. To print test copies in final form would have been excruciatingly slow. Fortunately, Fancy Word includes the ability to print in a rough draft form. For the Epson-like printer, such as the Star, there are actually six levels of rough draft printing. The roughest is also the fastest and almost as fast as normal printing. It can be a bit difficult to read, so I normally used the second level for test prints.

Printing with Fancy Word follows this procedure: After making sure the proper printer driver is loaded (supplied with Fancy Word), the file is printed to disk. But be sure you save it as a normal file, too, unless you never make mistakes. Then, the Fancy Word program is run using the Library Run feature of Word. The level of rough draft, if desired, can be specified along with the number of copies and which pages to print.

Fancy Word then formats the printer file into its own files for printing, loads the necessary fonts into memory (or disk, if insufficient memory) and then prints the file.

Each line of text requires several passes of the print head. The exact number depending on the size of the font and the rough draft mode selected. Twelve passes seems about normal for most text for finished work. I found that a new or re-inked ribbon was over-kill. If too much ink was laid down, then it would bleed through the paper and the print head would smear it across the page. At last, I had a use for all those faded ribbons.

Along the line of curiosity killed the cat, I discovered it was a good idea to not touch the paper during final printing. On the first test runs I just had to lift the sheet up to check on printing progress. Each time I did the paper would buckle just enough to mess up the current line being printed. So for my final seven hour printing run I made sure the paper and printer were protected from movement.

Was it worth the effort? Yes. Most people don't believe it was done on a dot-matrix printer. It really looks good. The 'return on investment' is substantial. For a mere pittance I can put out text that would make a laser printer blush. My only criticism is the type face for 12 point seems heavy. This is undoubtedly due to the multiple passes

needed to form the character making the minimum line width slightly out of proportion in the smaller fonts. I believe this minor fault can be corrected by setting wider margins, using the next larger font and slightly reducing the document during the photocopying process.

Unless you have lots of patience and nimble hands, a hard disk is almost a necessity to run these programs together. And if you do any kind of writing at all and spell with my kind of internal dictionary, run to the goodie store and get a copy of Borland's Turbo Lightning.

Are you still using DOS 2.1 with your hard disk? There is a feature in DOS that is not too well known that could give you the same surprise it gave me. My 20 MB disk filled up one day, yet I could account for only 15 MB of files. I was aware that files used more space than the DIR command indicated, but this was ridiculous! Upon investigation I discovered that DOS 2.1 changes the size of the clusters depending upon the size of the partition in use (not the disk size).

The cluster size sets the minimum space that a file can use on the disk. On a floppy, the cluster size is 1KB or two sectors. So a

25 byte autoexec batch file actually takes up 1KB of space on the disk. For a partition size (not disk size) under 16 MB, DOS uses a cluster size of 4 KB or 8 sectors. However, if you exceed the 16 MB partition size, DOS increases the cluster size to 8 KB (16 sectors). The smaller the cluster size, the greater the efficiency of file storage on the disk, but the speed of file lookup is reduced.

At the time my disk filled, there were over 1100 files on it. I felt if I could reduce the cluster size to 4KB from 8KB, it might save one of those clusters per file which would free up over 4 MB of space (4KB times 1100 files).

After backing up the files, I reformatted the disk and partitioned it with 13 MB and 7 MB partitions. After restoring the files, I had recovered almost 4 MB of disk space. Later, I found that DOS 3.1 uses a 2 KB cluster size for a partition larger than 16MB. Changing to 3.1 then might let me recover another MB or so of space and eliminate the minor hassle of dealing with multiple partitions.

According to the July 1985 article in REMark by William Adney (page 34), a partition size of less than 8 MB will result in a cluster size of 2 KB. However, my 7 MB partition does

not conform to this; it also uses a 4 KB cluster size. I suspect it might require that ALL partitions be under 8 MB. Since reformatting and restoring files is such a boring task, I plan to switch to 3.1 rather than give it a test with 2.1.

It has been a good many years since I last saw that printing press. It bears no resemblance to the computer and printer I'm using now. The smell of the printers ink is gone, but so is the mess and frustration (well most of it). The final product is better looking and much easier and faster to produce.

I think Microsoft should get a word of praise here for dropping copy protection on version 3. *

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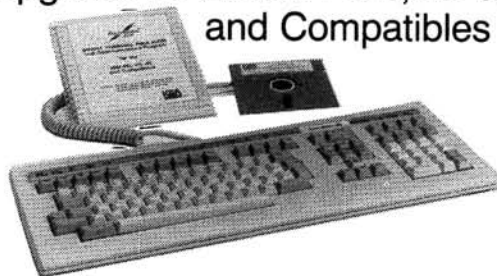
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Wide Printer Plots For AutoCAD 2.18

David S. Price
P.O. Box 9016
Springfield, IL 62791

HUG members who read the Heath/Zenith catalogs in detail probably noted that the company recently offered AutoCAD for \$300.00, as opposed to the \$2000.00 price previously listed. Practicality suggested that this price was not for the latest release, but rather for the penultimate version. (Look up that adjective; you can increase your vocabulary reading REMark!) If, like me, you have had the desire since you first got your Z-100 to have and use a CAD program, you probably bought a copy soon after receiving the catalog. AutoCAD version 2.18 is not embarrassingly less capable than the current version 2.5 release, and has been a delightfully productive tool during the first three months I've had it. It is well worth the investment, even though it did start me salivating over ads for digitizer pads.

My first real disappointment with AutoCAD was that I was limited to printer plots with a MAX size of 8 inches width by 11 inches height, even though I have a wide-carriage dot matrix printer. Conceptually, with such a printer you should be able to "printer-plot" drawings 13.5 inches wide by any height. The AutoCAD configuration options allow you to select one of four makes of printers to serve as a "printer plotter." While long, wide plots are supported for the TI Omni 800-series printers, the Epson and Okidata printers are limited to plots the size of a sheet of typing paper.

By comparing the AutoCAD configuration files for the TI and the Epson printers, I was able to locate and modify the size-specifier bytes to allow the Epson and Okidata printers to produce the large format plots I was after. Patches described in this article are not to the AutoCAD program itself, but to the configuration file, ACAD.CFG, which is a run-time look-up file for the program. ACAD.CFG contains the names and capabilities (should read "limitations") of each device you have installed with the AutoCAD configuration utility. The fourth printer option, for the HP laser printer, is obviously limited by the printer's physical size. Since it cannot accept large format paper, it will not be included in the patch discussion.

These patches may possibly work with the PC-compatible AutoCAD that is offered for the Heath/Zenith PC Series computers. I don't have access to a PC-compatible running AutoCAD, so I can not verify these patches for you. I expect the patch values are correct, but the patch locations may be different. Experiment with the patches, load AutoCAD and try the printer plot of a simple drawing, such as RECTANG. See what MAX size AutoCAD reports as being available. It was by just such trial-and-error that I developed the patching values reported here.

As always, never experiment with your distribution disks; use copies. I usually experi-

ment on a file in RAMdrive, for faster trial runs and no chance of ruining a disk file. When satisfied, I copy the end result file to my working disk (NOT the distribution disk.)

The patches detailed in the sample DEBUG session below will extend the MAX size to 13.5 inches wide by 20.0 inches high (chosen for the blotter-size paper on my desk pad.) Characters in parentheses (DO NOT type the parentheses) in the listing are the instructions you should type at the system or DEBUG prompt:

```
A>(DEBUG ACAD.CFG)

DEBUG version 1.08
>(D490 4AF)
xxxx:0490 00 00 00 00 00 00 20 40-00 00
      00 00 00 00 26 40 .....e&S.#.Z*e
xxxx:04A0 00 00 00 00 00 00 20 40-00 00
      00 00 00 00 26 40 .....e&S.#.Z*e
>(E496)
xxxx:0496 20.(2B)
>(E49E)
xxxx:049E 26.(34)
>(E4A6)
xxxx:04A6 20.(2B)
>(E4AE)
xxxx:04AE 26.(34)
>(D490 4AF)
xxxx:0490 00 00 00 00 00 00 2B 40-00 00
      00 00 00 00 34 40 .....+e&S.#.Z4e
xxxx:04A0 00 00 00 00 00 00 2B 40-00 00
      00 00 00 00 34 40 .....+e&S.#.Z4e
>(W)
Writing 04F7 bytes
>(Q)
```

The byte values at addresses 496 and 4A6 control the width of the plot, while the values at 49E and 4AE set the height. Don't be concerned if your dump doesn't look exactly the same as the example. You will find that your dump of these two lines probably contains byte values other than zero between the two patch locations on each line. Stored between and near these addresses is information regarding your last plot, to be used as defaults for the next time you request a printer-plot. Also, if you have "calibrated" your printer by plotting a one-by-one square and comparing drawing lengths to the actual output lengths, AutoCAD will have stored compensation values in these lines. Once so calibrated, AutoCAD will not report at plot-time the exact width or length as shown in the table below, but will correct the reported size to match your calibration. The only bytes of real import for this patch are those four bytes at the specific addresses given above.

Using the "let's-try-it-and-see-what-happens" method, (sometimes referred to as the scientific method,) I established the following byte values, which can be used on the Epson FX and the Okidata Microline 84 and 93 series printers:

496 & 4A6 WIDTH		49E & 4AE HEIGHT		(cont'd.)
byte value	20 : 8.0 inches	byte value	26 : 11.0 inches	3C : 28.0
	21 : 8.5		27 : 11.5	3D : 29.0
	22 : 9.0		28 : 12.0	3E : 30.0
	23 : 9.5		29 : 12.5	3F : 31.0
	24 : 10.0		2A : 13.0	40 : 32.0
	25 : 10.5		2B : 13.5	41 : 34.0
	26 : 11.0		2C : 14.0	42 : 36.0
	27 : 11.5		2D : 14.5	43 : 38.0
	28 : 12.0		2E : 15.0	44 : 40.0
	29 : 12.5		2F : 15.5	45 : 42.0
	2A : 13.0		30 : 16.0	46 : 44.0
	2B : 13.5		31 : 17.0	47 : 46.0
			32 : 18.0	48 : 48.0
			33 : 19.0	49 : 50.0
			34 : 20.0	4A : 52.0
			35 : 21.0	4B : 54.0
			36 : 22.0	4C : 56.0
			37 : 23.0	4D : 58.0
			38 : 24.0	4E : 60.0
			39 : 25.0	4F : 62.0
			3A : 26.0	50 : 64.0
			3B : 27.0	51 : 68.0

You are limited to a 13.5-inch width by the physical size of the printer, but the length can apparently be set as long as you want. The TI Omni printers are already set up for plots 65 inches high (long); the values above can bring your printer up to that capability. While 80-column printers cannot accept a larger width-byte, the length bytes may be changed. Long narrow printer plots can, therefore, be made for things such as patterns for lathe woodworking or

machining. For the money, this capability far surpasses what you can do with an expensive plotter. (There may, in fact, be an upper limit on the length; I just haven't played with that . . . YET!)

Warning!

AutoCAD stores graphics data for printer plots on disk as it is plotting. When completed, these reference files are deleted by AutoCAD, so you may never have seen them. Larger printouts will require much more disk space for these "scratch" files than standard-size printouts of the same drawing. If you do not have enough room on your drawing file disk, a "FATAL ERROR" will occur and AutoCAD will abort to the system prompt. The remains of the scratch files may or may not still be on your disk; you may delete them without concern. I have found on several occasions that when AutoCAD deleted them during an abort, the disk space they had used was not made available for future use. The directory command showed that hardly any bytes remained free, even though there were only a few small files on the disk. I have not run floppy disks for my drawing files and shudder to think what it may do to a hard disk, particularly if the lost space was not imme-

work disk or RAMdrive (which has the additional benefit of being really fast for AutoCAD's intensive read/write activity during a printer plot.)

This wide-carriage printer patch should make your AutoCAD a much more practical tool for drawing and design. Plotters capable of producing drawings of this size are in the price range of several thousand dollars; a cost no computer hobbyist is likely to be able to justify. The small plotters available for under \$500.00 and the wide-carriage printer now nicely complement each other. *



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diately noticed. BE CAREFUL! Make frequent use of backups.

I have started using a drawing "work" disk that contains only the text support files and the one particular drawing file I am working on. Since then, AutoCAD has not run out of scratch space. Once all editing is completed, I copy the drawing file onto a "library" disk that contains other completed drawings. Whenever I want to printer-plot one of the library drawings, I copy it to the

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Continued from Page 13

"1/4" equals Superscript sign "less than", the "1/2" equals Subscript sign "greater than", the period in the middle becomes your "UMLAUT".

Good Luck,

Bill Hougen
580 NW Norman Avenue
Gresham, OR 97030

```
SETUP
TM7,BM3
LM10,RM65
FORMS COPY1 HYI
RIGHT IF DATE="",GET DATE
TEXT
RIGHT:DATE
LEFT
```

Friedrich-Wilhelm Ullmann
Ullmann GmbH & Co. KG
K CPI8 K-12 1/4 1/2 CPI12 o
LINE-12 CPI13 TAB3 K-12 1/4 1/2
LINE-12 CPI8 TAB3 1n CPI10 er
Strasse 9
4018 Langenfeld
Postfach 1322
WEST GERMANY

Dear Ulli,

Friedrich-Wilhelm Ullmann
Ullmann GmbH & Co. KG
4018 Langenfeld
Postfach 1322
WEST GERMANY

Dear Ulli,

BetterBASIC's Julian Date

Dear HUG:

Re: The article in your May 1987 issue by Fred Kent entitled, "BetterBASIC: A New Approach to BASIC Programming".

Fred's article was quite interesting, especially since I have been looking for a better BASIC myself. However, there is an error in Listing 1 which is supposed to calculate the Julian date. It caught my eye because I use the Julian date frequently myself in data files to provide a compact "date of last update" which can be compressed to a two-byte field.

His program gives the correct answer for 1984 and 1988, but will give a wrong answer for years in the decades beginning with an odd-numbered digit, such as 1990. The problem is line 70 of his listing, which uses only the last digit of the year to identify and correct for leap years. Contrariwise, the last two digits of the year must be used. His program can be easily corrected by changing line 70 to read:

```
70 if m>2 and val(right$(date$,2))
   mod 4=0 then z=z+1
```

I get the Julian date (including year) from the system date differently:

```
100 restore 110:dim d(12):
   for i=1 to 12:read d(i):next i
110 data 0,31,28,31,30,31,30,31,31,
   30,31,30

300 REM ***** Calc Julian Date *****
310 jd=0:if val(right$(date$,2))
   mod 4=0 then d(3)=29 else d(3)=28
320 for i=1 to val(left$(date$,2)):
   jd=jd+d(i):next i
330 jd=jd+val(mid$(date$,4,2))+1000*val
   (right$(date$,1)):return
```

Lines 100 and 110 are executed only once in the housekeeping section of the program. Lines 300-330 constitute a subroutine to be called when necessary.

Sincerely,

Elmer A. Goetsch
Lt Col US Army - Retired
7524 Island View Road
Three Lakes, WI 54562-9216

Can't Print A Multiplan Spreadsheet

Dear HUG:

I wonder if anyone else has run across this peculiar quirk. When using my Z-241 with ZSPOOL installed, I can't seem to print a Multiplan worksheet. The computer just hangs up and must be reset to be used again. Everything works fine on Lotus spreadsheets, Lotus PrintGraph and Microsoft Word. I only recently discovered this because I seldom use Multiplan since getting 1-2-3, but it is a pain. If I remove the ZSPOOL, I can print Multiplan sheets. But then I lose the benefits of the spooler with the other programs.

On the other hand, I CAN print Multiplan spreadsheets on my Z-150 using the print buffer that comes as part of the Tecmar Captain board system. Anybody have any ideas? (Incidentally, I'm using Panasonic KX-P1592 and Tandy DWP-220 printers with the '241, along with a Radio Shack FP-215 plotter. A Radio Shack DMP-130 does the printing for the '150.)

Sincerely,

Jud Koehler
2586 Taylor Avenue
Wooster, OH 44691

Would Like Help With A Project

Dear HUG:

I have an idea for an interesting project for my Heath '151, but lack some expertise to

complete it. I am looking for someone who would like to work with me on the project or any input that might be helpful.

I presently am using the *FBE MegaRam* - 150 modification to expand my system memory to 704K and give me an additional 512K RAM disk. Looking at the operation principle, it appears that by adjusting a single I/O bit, two separate 512K banks of memory are swapped in and out of the address space from 3000:0000 through A000:FFFF. I would like to develop a multi-tasking environment (similar to *Double-DOS* or *Multilink*) that would use this feature as part of its memory management. The common memory 0000:0000 through 2000:FFFF could be used to provide support and housekeeping information. As an extension to this project, I would also like to make the interface compatible with *NETBIOS* or another accepted multi-user environment to allow one to develop and test multi-user applications on a single machine.

I have a pretty good understanding of the operation of MS-DOS and can program in C, Assembly and other languages. I don't know anything about the inner workings of *NETBIOS*. If anyone is interested, please get in touch.

Sincerely,

Mark E. Erbaugh
Microcomputer Enhancement
P.O. Box 282053
Columbus, OH 43228-2053

Correction To TIMARQ

Dear HUG:

The following is a correction to 4 of the lines in the TIMARQ program which appeared on page 10 in the June 1987 issue of REMark.

Line 200 should read:

```
' LINE 220 IS THE TIM....
```

Line 270 should be numbered 370

Line 280 should be numbered 380

Line 410 should read:

```
ES=INKEY$:IF ES="E" THEN 470
```

*

If You Don't Have WindowDOS 2.0, You're Wasting Time!!

"When Baba Ram Dass said "Be here now, remember," designers of hard disk utilities should have paid heed. A powerful manager like XTREE can track files and subdirectories and execute DOS commands, but it isn't memory resident. Handy pop-up DOS commanders like PopDOS may be here now, but they lack the power of a full-fledged disk manager. After much meditation, the developers of WindowDOS 2.0 have come up with the best answer yet to the guru's paradox.

Until now, the closest thing to a real RAM-resident disk manager was version 1.0 of WindowDOS. It offered a full-screen pop-up menu and could rename, copy, and delete files. But it couldn't move files, format disks, or rename subdirectories—which XTREE can. Now version 2.0 is here, and it's a winner. Its RAM resident (using less than 50K) but offers all the power of a nonresident disk manager."

—Patrick Marshall, WindowDOS 2.0 Product Review, PC World, May, 1987

Once you've experienced the convenience of instant access to DOS commands, you'll never be satisfied with returning to DOS to list files, format disks, or copy, rename, or erase files. Nor will you be happy with a DOS shell, because shell programs are just as inaccessible as DOS when you are using an application program. **Only one program combines memory-residency with the power of a full-featured disk manager: WindowDOS Version 2.0.**

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- ◆ Global copy & erase commands
- ◆ Copy function prompts you to insert another disk when necessary
- ◆ Display hidden files and subdirectories
- ◆ Display file contents in various formats and page forward/backward
- ◆ Display Wordstar files in readable format
- ◆ Unique RAM Environment function shows name, size, location, and interrupts of every program in memory
- ◆ Rename subdirectories for instant reorganization
- ◆ Hide and unhide subdirectories
- ◆ See and change file attributes
- ◆ Send control codes to printer
- ◆ Switch default printer
- ◆ Password "lock" your system
- ◆ Set AT Real-Time Clock
- ◆ 5-minute screen-blanking function
- ◆ Input response macros

Enhances These Functions

- ◆ Format disks (faster than DOS)
- ◆ Make and erase subdirectories
- ◆ Copy, rename, and erase files
- ◆ Copy files to printer or COM ports
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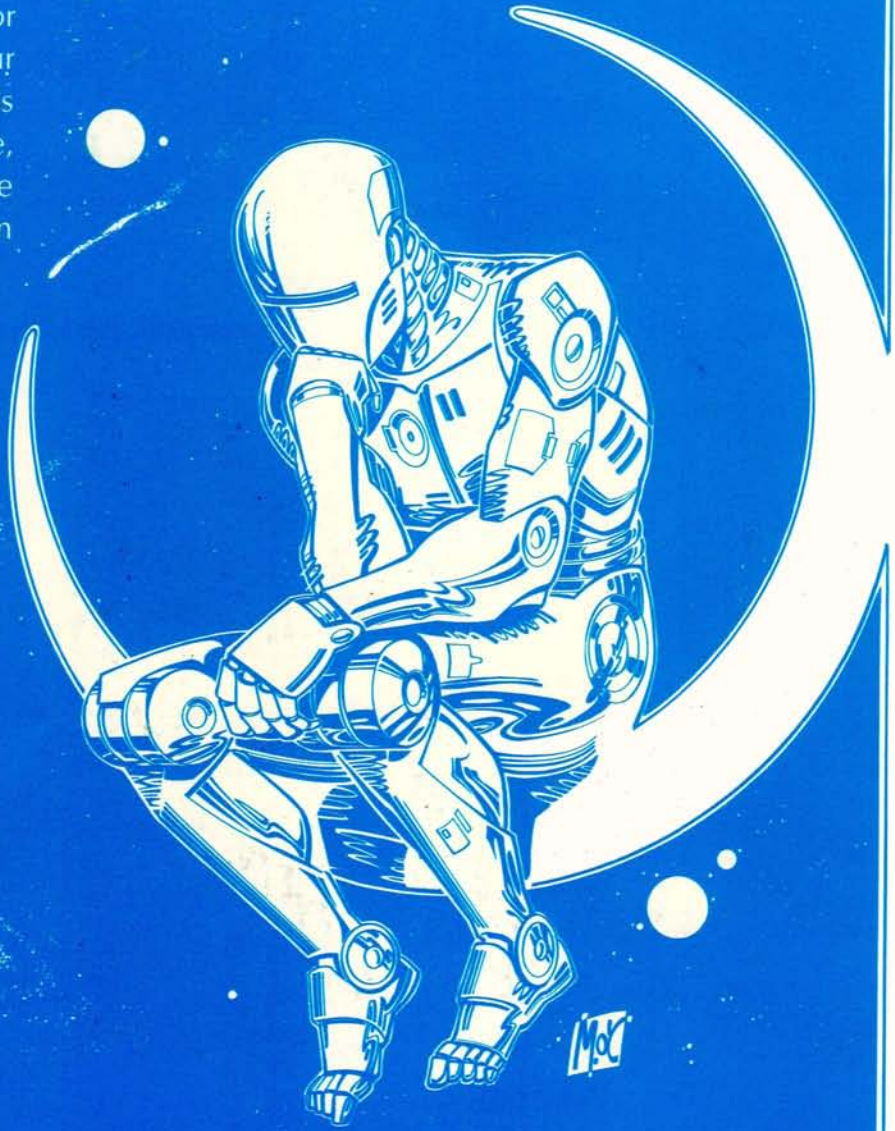
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