PRinT SCreen

The Newsletter for the
Stanford/Palo Alto Users
Group for the IBM PC

August 1988

Volume 6, Number 8

Clip Art Gets Political

THIS MONTH

CLUB NEWS

July Meeting

Ever wonder how others use computers in their work? Well, last meeting, Fred Waters, a professional technical writer and enthusiastic hobbyist, entertained SPAUG members by describing his philosophy on how a computer can be made to be a servant, and then described his computer. Fred is an avid "one-finger operator," that is, if he wants to do something on the computer, he programs it so that (as much as possible) pressing one key will initiate the action he desires.

Fred's work as a technical writer makes it necessary to have almost instant accessibility to all the text that pertains to a given contract. He indicated how he kept track of as many as a dozen current writing projects along with a number that are being held for approval, revision, etc. The need for an effective system to retrieve working files, especially when they are numerous, led him to design a retrieval system that is simple to use.

Part of Fred's success with his "one-finger" concept of file- retrieval and program-startup is attributable to his special keyboard—it has forty "function" keys. Actually, these keys behave no differently than keys in the standard keyboard configuration where there are only ten function-keys and the operator must press two keys, e.g., Ctrl-F1, or Alt-F6. Anything for a one-finger operation!

Fred also described how he set up a batch-file menu system that interprets one-key presses and starts up whatever program he wishes by calling on other batch files. Many of the menus and programs that he uses to implement his system were displayed and described in detail. Throughout his informal, skillful presentation, Fred often gave good advice

August–September Calendar

Aug. 31	Group Meeting	8:00
Sept. 12	Microsoft Word SIG	7:30
Sept. 14	Planning Meeting	8:00
Sept. 28	Group Meeting	8:00

Next Meeting

Date: Wednesday, Aug. 31

Time: 8:00 p.m.

Place: Polya Hall, Turing Auditorium (Rm. 111) Stanford University

See DIR C:\August on page 3 for all the details regarding the next meeting.
All members are welcome to attend the monthly planning meeting, where we make decisions on the future of the group. Call Beverly Altman, 329- 8252, for the location of the next meeting.

and valuable tips on how to get the most out of a computer.

Fred is one of the few remaining individuals who believes in buying IBM products, rather than the inexpensive clones. He feels IBM has better quality, and he knows where to go if he has a problem. In line with this conservative attitude, Fred keeps three backups of everything and makes 6-8 backups of his data every day. He uses floppy disks, not his 44MB hard disk, for archival storage. Consequently, his hard disk only has 11MB on it.

Dirk Van Der Linden described the Shareware program AUTOMENU, and demonstrated some of its features on the computer system in the auditorium. The program was featured as the Club's "Disk of the Month," and hence was made available for $1.00 at the meeting.

Rick Altman described the DOS filter FIND and used the the computer in the meeting room to demonstrate the many ways in which the filter could be used.

Robert Caviglia, PRODIGY representative, returned to obtain member's inputs as to the effectiveness and usefulness of PRODIGY. Many members shared their experiences and their views with the representative. Any future com-

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The Cover

This month's cover art was produced by Macintosh Paint, converted to PC format and placed on the page by Ventura Publisher in GEM IMG format. The art is produced and sold by Goldmind Publish-

DIR C:\August

Very few of us have heard about Lotus Development's new AGENDA, and even fewer have any idea how a "personal information manager" can make our lives easier. Mike Rubenstein from Lotus Development Corp. will talk about Agenda and show how this new program processes information just like the human mind.

Information and ideas dumped into various categories can be arranged in a variety of ways to find answers, formulate new concepts, and, most importantly, provide new insights.

Mike will also introduce the newest version of Manuscript—a super word processor with a powerful equation language and a document publishing system that places the personal computer on a par with corporate mainframe word processors.

Disk of the Month

This month we break the monotony of level-headed utility programs with an ingeniously simple, addictive game that comes from the Soviet Union! Jared Nedzel will demonstrate *Tetris* and copies will be available for $1 each or a "goodie coupon." The disk also include other games from the library.

DOS of the Month

This month Rick Altman will offer a sneak preview of DOS 4.0. His talk will include such features as...nah, you better just show up.

The View From the Top

Computers: New and Old

by Ralph Muraca,
Club President

Although I was born in 1921 B.C. (before computers), my productive years were always associated with some form of computational device. In grade school it was a pencil, but in high school this was supplemented by logs and the *concept* of the slide rule. Finally, in college, it was slide rules—I remember well how they hung from our belts, much like cowboys wore pistols.

In the halcyon days of graduate school, slide rules gave way to Monroe hand-cranked calculators and acres of spreadsheets (they weren't discovered by Lotus). I remember a field of innumerable desks fading into the Los Angeles smog, each with a whirring calculator and a young lady carefully adding points to the design of a subsonic aircraft. And the latest news brought note of developments in electronic calculators (UNIVAC). Oh, if only we could get our hands on one!

Within another ten years, electronic calculators (those roomfuls of radio tubes hidden behind sleek cabinets) became more plentiful, but you had to queue up to use them, and you had to have generous funding. Then one day a bunch of guys said "transistor"—others whispered "solid state," and suddenly my experiences were pushed back into vague memory.

A generation later, on my 3x5-foot desk, there is a computer roughly equivalent to that roomful of radio tubes, and in many ways superior. But really exciting is that the next generation of computers will exceed my wildest dreams and be available within my lifetime!

Discussions of new computers usually include recitation of idle prattle in tabloid journals and "Who needs a PS/2 microchannel?" I must confess, in earlier years I hadn't thought through what computing tools really did for me. Why, I once voiced reservations about

Our president reminisces about the early days of computerdom. Now the little box sitting on his desktop has the power of a roomful of old radio tubes.

owning one! Now I realize each computational tool that came into my hands opened new vistas, made my work more productive, and made me more appreciative of the next tool, and no tool has ever been as versatile as the modern computer! Although a speedier tool is always welcome, it is the *capabilities* of a new tool that excite the imagination. As you can sense, it is the undeveloped potential of the '386—not its speed—that is of interest.

If you have any reservations about whether your old computer should be replaced with the latest advanced model, and if you find solace in tabloid babblings, then consider this episode: Many years ago, a farmer in his one-horse surrey looked out at the marvel of the day—a shiny, black Ford gasoline vehicle—and was heard to say, "Who needs a horseless carriage?" Obviously, a horse and carriage would do all the farmer could conceive at that time.

One day, he purchased an auto, and suddenly his viewpoint changed—even flying in airplanes seemed the "right way to go!" You see, his initial mental constipation disappeared once he owned the new tool; he began to think up new uses for it, and eagerly looked forward to the next generation of the tool. His thoughts had matured, his vision expanded, and all because he dared to use a powerful tool.

If you can't see how a new computer system can help you, it might be that your present computer system is ineffective and thus incapable of exciting imagination. I must admit the current crop of software doesn't titillate the brain, but then it has been hamstrung by the original limitations of the '88 CPU and an inane, widespread insistence on maintaining its ineptness on newer systems. If you insist on support for archaic systems and don't make an effort to use entirely new computers, and if you also subscribe to the dim vision of the episodal farmer, then you are doing yourself an injustice. In essence, you thoughtlessly are isolating yourself from the benefits of the mainstream of modern technology.

Now, why am I petitioning you to purchase new computers? Well, first of all, I wish the best for you. In the area of common interest, I want all of us to be at the forefront of advanced personal computing where we can enjoy the breathless excitement generated by one of civilization's coveted developments. More importantly, however, as our computers approach obsolescence, it becomes increasingly difficult to attract interesting speakers, for they wish to discuss advanced topics not applicable to our obsolete systems. Our club becomes obsolete!

We must also bear in mind that association with Stanford prompts the need to be reasonably at par with the level of modern personal computing. IBM has a program that continuously upgrades personal computers in Stanford; within a year, the majority of computers will be the latest models. Since students look forward to SPAUG as a source of information and guidance, we owe it to ourselves to be at the cutting edge of technology and make our organization interesting to ourselves as well as to new student members. ¶

Your Very Own Function Keys

by Rick Altman

(This is the second in a multi-part series exploring hidden treasures of the ANSI.SYS screen and console driver. This series will culminate with instructions on building a professional, personalized menu.)

In our first episode of the Adventures of ANSI.SYS, we looked at how you can redefine any key on your keyboard, giving it an alternate definition. This is done by issuing a "PROMPT" command that tells ANSI.SYS what keystroke is to be redefined and what the redefinition is to be.

You identify the keystroke by using its "scan code"—in essence, a numeric fingerprint. To redefine <Alt-D> to be "DIR/p <Ret>" you would type the following command:

```
PROMPT $e[0;32;"DIR/p";13p
```

Because the <Ret> can be part of the redefinition (represented by the scan code 13), entire DOS commands can be entered by pressing one keystroke. In fact, you can program a keystroke to contain not only one command, but a sequence of commands—perhaps a sequence that you perform regularly.

For instance, let's say that you are a regular WordPerfect user, and before you start the program, you load a memory-resident thesaurus. The thesaurus can only be loaded from the current directory, requiring a CD command, so you use a simple batch file to automate this. You also have a batch file that starts WordPerfect, perhaps one that first takes you to the directory in which you store your documents.

This is the perfect place to use an ANSI.SYS command: A regular two-step process that can be turned into a

Our resident DOS guru offers a blueprint to create customized function keys, so now you can start your favorite programs with the touch of a key—just like they do in commercials...

Scan Codes for the Function Keys

F1	0;59
F2	0;60
F3	0;61
F4	0;62
F5	0;63
F6	0;64
F7	0;65
F8	0;66
F9	0;67
F10	0;68

single keystroke. And for the sake of the dramatic, let's make the <F1> key your personal Word Perfect key. Let's say that the two batch files that you regularly issue are "THES" and "WP." Here is the ANSI.SYS command that you would enter:

```
PROMPT $e[0;59;"THES";13;"WP";13p
```

After the PROMPT, the "$e[" tells ANSI.SYS that the command is to be an escape sequence. The "0;59" is the scan code for <F1> and the semi-colon after it is the separator between it and the redefinition. The "THES" is the literal redefinition and therefore must be in quotes. After the semi-colon, the "13" is the scan code for <Ret> and after the next semi- colon, the WP batch file is executed. The "p" at the end finishes the command. Remember that you will need to reissue your normal PROMPT command to reinstate your DOS prompt after redefining keys.

Granted, you could build one large batch file to perform this, but an ANSI.SYS macro is a much cleaner solution. Also, it gives you the exciting feeling of having a personally tailored system—to start Word Perfect, press <F1>. What could be easier than that?

You can build upon this theme, by reserving a function key for each of the major applications that you run. Those who rely upon the DOS editing keys will have to pass on using <F2-4>. Also, you can use the function keys in any of the shift states.

DOS Macros Help Memory Management

While you may find that you like executing even simple batch files with the touch of a function key, ANSI.SYS macros can help solve the more serious issue of automating memory management. In today's world of mega-programs that consume volumes of memory, there is a pressing need to be able to easily remove programs from memory before starting others. There are programs designed to purge memory, but the problem is that you can't use a batch file to do this, because when you purge memory, you also purge the batch file, stopping it in its tracks. Typically, you must perform two operations instead of one. The answer is an ANSI.SYS macro.

Let's say that you are a regular Windows user. But because you also use a few memory-resident programs outside of Windows, you must be sure to clear out your memory before you start

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Personal Function Keys

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any Windows session, otherwise DOS grinds to a slow, deliberate death. Using a memory manager like PopDrop, which will automatically purge memory for you, the best that you have been able to come up with is a two-step process of issuing the PopDrop command that purges memory and then issuing the Windows command. Again, you would not be able to put these two commands into a single batch file because PopDrop would remove the batch file from memory before it finishes.

But ANSI.SYS stores its macros in an area of memory that is not affected by PopDrop's tricks. So you can create the following ANSI.SYS macro, using <F2>:

```
PROMPT $e[0;60;"POPDROP
  CLEAR";13;"WINDOWS";13p
```

(type this all on one line)

Again, how simple and elegant it would be to press <F2> and instantly have your memory cleared and have Windows kick into gear. What this is, in effect, is an invisible menu: Your applications are available at the touch of a key, yet you have a DOS prompt and full control over it. For those who want their menus visible, the upcoming columns in this mini-series will walk you through the steps to building a personal, customized menu. ¶

(Next Month: Your batch files learn how to ask you for input.)

Microsoft Word SIG

by Jane M. Corcoran

This group is extremely fortunate to have the active participation of Manny Melliza, Associate Sales Rep and PC Applications Specialist for Microsoft Corporation. Attendance at the meetings is usually eight to ten, and experience ranges from novice to advanced. Manny answers the hard questions as well as the easy ones with clarity and good humor.

All discussions are geared to version 4.0, but questions are also answered concerning earlier versions.

The topic of the July meeting was Style Sheets. At the August meeting Manny demonstrated Pageview, a page preview and graphics integration program for Word that also runs under Windows.

Although each meeting has an assigned topic, there is always time for questions regarding other aspects of WORD. Manny's presence gives assurance that all issues are resolved correctly.

If you are interested in attending these meetings, contact Jeanie Treichel at home (851-0100) or work (326-7438). Meetings are held on the second Monday of each month. The next meeting is scheduled for September 12 at 7:30 p.m.

Club News

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ments can be addressed to Robert on Prodigy's electronic mail service. His ID number is VHVR53A.

Public Domain Software

If you would like any software from our public domain library (and you don't have a modem, or don't want to download a long program), give Ralph Muraca a call (365-1659). He'll bring you the disk(s) at the next meeting or put it in the mail to you.

Bulletin Board

The club's bulletin board, nicknamed SPARC, is available 24 hours/day, 7 days a week. The number is 723-7995. Use the following communication settings: 300, 1200, or 2400 baud; no parity; 8 bits; and 1 stop bit.

For your own security, phone numbers will no longer be operative as passwords. If you have not changed your password from your phone number, please call a Sys Op to do so. The System Operators are Ralph Muraca, Turley Angle, Beverly Altman, and Mark Woodward. Their phone numbers are listed on the SPAUG Resource Center list.

Membership renewals

For the two months preceding the expiration of your membership you will find a renewal envelope enclosed in your newsletter. Use this envelope to promptly send in your $25 check ($10 for students) so that you won't miss an issue of the monthly newsletter. A current membership card will then be sent to you in the next PrtSc.

Goodie Coupons

Remember, the "Goodie Coupon" attached to your membership card is presently good for one free disk: the library catalog, Disk of the Month, or a blank disk. Trade in your coupon for a disk at a future meeting.

Floppy disks for sale

Xidex Precision disks are available for $6/box. High density floppies are 4 disks for $5. The catalog and the Disk of the Month will be offered for $1 a disk. If you wish to purchase disks at the meetings, you will need to present your membership card, so be sure to bring it with you.

Classified Ads

Easy Business Systems Accounts Payable by Computer Associates, Version 4.2. $350 or best offer. Call Joann Connors, 854-0627 (weekdays).

Diablo 630 letter quality printer, dual-bin sheet feeders, and sound cover. Best offer. Call Becky Bridges at 326-8605.

Become a Writer

Be a part of the exciting evolution of PRinT SCreen by contributing your thoughts and ideas. The heart of any good newsletter is the opinions of its readers and we want to hear from you. What do you think of the new Word Perfect, did you like that outliner you tried, how about that little TSR you picked up...?

Please contact Becky Bridges at 326-8605. She's got a space in PRTSC reserved for you. ¶

Speed Kills, Time Heals

by Bob Blumenthal

Did I get a "virus" from a PC Magazine program? I don't know for sure, but I'm not going to rerun the program to find out!

I accepted PC Magazine's offer of their Laboratory Benchmark Hardware Performance Tests because, like most personal computer users, I'm a speed nut.

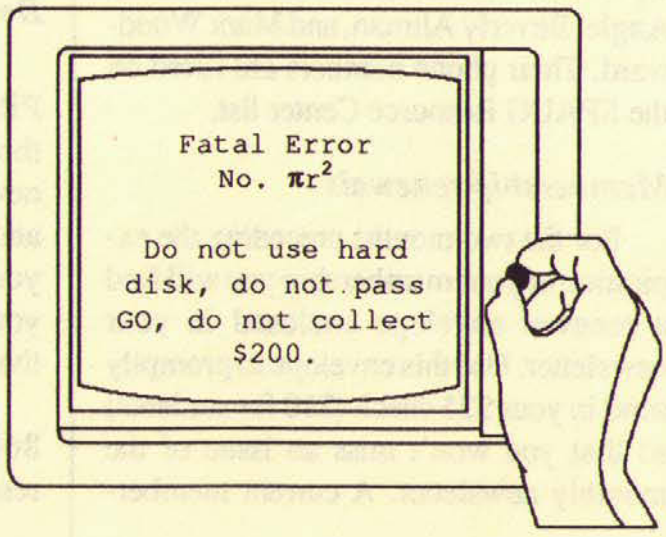
Although my longest database file sort (done once a month) only takes 22 seconds with my newly-installed cache, I would like to add 2MB to my 1.2 memory when the price comes down. That should save me, overall, about 15 minutes processing time a year that I could use to read the mail order ads for enhancement programs and boards.

When I ran the Benchmark test, I was delighted to learn that my AT clone was 1.4 times faster than the standard. At the completion of the test, the diskette asked whether I would like to copy the program to my hard disk. Thinking that I might run the test every time I got a new enhancer and could do so faster from the hard disk, I replied "y." Then I typed "C:" and saw the following message on the screen: "BAD FAT ON C."

It would be an exaggeration to say I sat there staring at the screen for an hour. As in all human endeavor, before facing up to reality, I clutched at straws.

First, I removed the PC Lab diskette and threw it across the room. Then promising God that if I got a clean boot I would never again run a speed test, I firmly pressed the computer's reset button. After about five minutes, it was clear that divine dispensation was in a hidden file. I conceded that the flashing cursor was about as close to a boot as I was going to get.

Obviously, a damage assessment was needed. I inserted a system diskette, booted and transferred to C. The root was a ladder of FILEXXXX.CHKs, but the subdirectories seemed to be intact, so could be set aside on floppies if I did an MS-DOS (DOS) format, and I had excel-



lent back-up in case there was some contamination.

Even more fortunately (although I didn't realize it at that point in time), I had bought Paul Mace's software some months before, mainly for its caching, dbfix, unfragment, undelete, etc. features. I had heard of its formatting pluses and had read the manual's description, which wasn't all that reassuring—lots of ifs and buts.

Now that an actual format was the only way out, I studied both the MACE and the DOS methods and concluded that MACE would always be the choice if it had been installed before the event occurred that required the format.

Both DOS and MACE apply the same DOS road map (the logical format) to the hard disk, but the MACE methodology provides a better chance that you will not lose your data in the process. Also, I found the DOS pre-format message somewhat daunting:

WARNING!

ALL DATA ON
NON-REMOVABLE DISK
DRIVE x: WILL BE LOST!

PROCEED WITH FORMAT
(Y/N)?

My decision made, I started the MACE format. It is a slow process (more on this later), but finally the announcement came that the format was complete. I quickly performed the three-finger salute and there was my root directory, complete and shiny bright, but there were no other directories. Not to worry, another session with the manual and I was off and running with the UNFORMAT program. Before recounting the program's built-in agony of suspense (like defusing a live bomb), I'll jump ahead and say right out: the program achieved a total recovery (well, 99.44%, with the remaining .56% an easy manual touch-up).

The essence of the MACE recovery method is the maintenance of a back-up file (call it B/U) that contains the data that would be "lost" on a DOS format. This is the file that UNFORMAT seeks; when found, its contents are restored to the several subdirectories. The search is sector by sector with lengthy delays as bad spots in the disk are confirmed. While the search is in progress, you have no indication whether it will succeed. If the search fails, you are back to DOS and patch-quilting your disk.

However, since the B/U file is in the root directory, at the front of the disk and, according to the manual, if it exists it will be easily identified by UNFORMAT, the search should be short

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PRTSC POTPOURRI

See Your Lotus, dBASE files in DOS

With the new version of the Norton Commander (2.0) you can look at your Lotus, Symphony, and dBASE files without having to load the software package. The new Norton Commander offers a utility for viewing the files *in DOS*.

For those of you who are not familiar with the old Norton Commander, this program is a DOS shell that displays a tree view of your directory structure and makes DOS file management a snap because you simply press function keys and point to the file name(s) on your directory tree.

The new version of the program also features pull-down menus. You can also build your own menus.

Lotus 1-2-3, Release 3.0

Latest rumors regarding Release 3.0: beta copies to be out in fourth quarter—the program requires expanded memory and a 286-based system—a separate program for 8088 users will be released after 3.0 but it won't support multiple spreadsheets and linking.

Trade-in Program for IBM PCs

Any of you IBM PC, XT, or AT owners interested in a PS/2? If so, you can get $100-1,000 off a PS/2 by trading in your used IBM PC at participating Big

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Speed Kills

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on suspense—or it would be if the search began at the front. But no, the program is designed to search from back to front, so you can't possibly know where you stand for at least a half hour.

So I stare at the screen for 20 to 30 minutes as the sector numbers click by in descending order, plus another 10 minutes while disk bad spots are confirmed, all the while trying to practice LaMaze control. Finally, after we're down to the last few hundred sector numbers, when I have just about given up hope, the screen flashes, "Old Recovery Info found at sector ###." I'm so happy that I don't think until later, why in the hell didn't it start with sector one?

Of course, Mr. Mace might well answer, "Look, Buster, you were in trouble when you came to me. Instead of spending a few days restoring your hard disk, and then probably not 100%, your disk has been completely restored in less than an hour.

If anyone wants a copy of the PC Magazine's Laboratory Benchmark Hardware Performance Tests, I'll have my copy at the August meeting. First come, first served. ¶

Blue dealers. The offer is good through August 31, 1988.

All Floppy Disks Are Not Alike

If you need to format a 360K (double density) disk in a 1.2MB (quad or high density) drive, use the command **FORMAT A:/4**. Without the **/4** parameter, the high density drive will assume you want to format an AT type disk, and will format it to 700-900K. Although you may think you're getting more space on a regular floppy, this space is highly unreliable.

You should reformat the disk with the **/4** parameter and you should then have no trouble reading or writing to the disk on a PC or an AT.

Ink-Jet Printer with Laser Quality

Hewlett-Packard's Deskjet ink-jet printer produces 300 by 300 dpi resolution—the same as current laser printers. Unlike other ink-jet printers, though, the Deskjet does not require special paper to keep the ink from bleeding. Cartridge and downloadable fonts are available. The paper feeder can hold 100 sheets, and envelopes can be manually inserted. While it uses ink instead of toner and therefore is not as sharp as lasers, its print quality is excellent...and Fry's is selling it for under $700.

So what's the downside? Speed—or the lack of it. In letter- quality mode, it slugs along at 120 cps, or not quite two pages per minute. In draft mode, it does 240 cps. Of course, these speeds are only slow when compared to a laser. If you're not working with a high volume, this printer could be an acceptable alternative to a laser printer.

S.F. Chronicle On-Line

Articles from the San Francisco Chronicle are now available on- line through the DataTimes information service. Articles are available since January 1985, and 150-200 stories are added daily. Most articles are available with the exception of stock and financial tables and Sunday stories not produced by the Chronicle.

With a subscription to DataTimes (one time start-up fee of $75) you also gain access to Dow Jones News/Retrieval Databases and various national newspaper/newswire databases (e.g., The Washington Post, USA Today, The Wall Street Journal, and Associated Press Newswire).

The accessing rate is $1.25/minute with a $75/month minimum or $1.75/minute with a $12/month minimum. For additional information, call (800) 642-2525.

WordPerfect Support Group

The WordPerfect Support Group offers a monthly newsletter (called "The WordPerfectionist") and an electronic mail and software distribution service. The bulletin board's number is (301) 889-7895. I haven't been able to get an answer when I call but maybe someone else will have better luck.

To join this group, send a check for $36 to:

Utah Blue Chips
P.O. Box 510811
Salt Lake City, UT 84151

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Potpourri

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On Complexity

by Jim Hoisington, North Texas PCUG

It's getting harder and harder to rely on those software product review that are published in the trade journals. The problem is not that the reviewers are less skilled, it is that the software on personal computers is more complex.

My UPS delivery person, Bob, complains that I get the heaviest packages on the block. And he's probably right. Most vendors don't feel that they are really supporting their software if they don't come out with a new update every six months or at least once a year, and in boxes that could house the computers in which they are to be run.

Visicalc makes a good example of what has happened. The manual for Visicalc for version 1.20 had 270 pages and the entire product, including the hidden file, took up 70,965 bytes on one single-sided, eight-sectored diskette. There were 26 / commands and 31 @ functions.

Compare that to Borland's Quattro which comes with three manuals that weigh 5 pounds. The software is contained on four double- sided, double-density, nine-sectored diskettes for a total of 1,306,688 bytes of code. And it is one the smallest packages that I have seen.

A piece of trivia being tossed about this last month is that the documentation for Microsoft's Presentation Manager for OS/2 takes eight feet of shelf space! That's just one part of OS/2. I have seen entire computer systems documented with less space.

The problem that the software reviewers have is that software packages have grown so big and have so many features, that if they take the time to really learn the package, their review will be published after the next release has started shipping.

What is happening is that most reviews today are more like a "first look." And, that can be harmful to the really powerful packages which take effort to learn. These packages often get poor reviews because the reviewer is under pressure to get something in writing.

I wish I could offer hope for the future, but I only see things getting worse. As the hardware expands its processing power and memory addressing capabilities, the software developers will add even more features and power to their packages. No matter how much "context sensitive" help is provided and no matter how much use is made of icons, it still take a human longer to learn 1024 commands than 26.

So the next time you read a review of a software package, keep in mind that the reviewer had less than a month to learn the package and write the review. When the review says a package does something, it is probably true. But when it says that the package doesn't do something or lacks some feature, be careful! The reviewer may have overlooked the writeup on that feature in volume VIII, page 514 of the reference manuals.

In the movie, *Back to the Future*, the professor asks the question, "Why are things so heavy in the future?" Now we know the answer. It's because of all the documentation. ¶

The SPAUG Resource Center

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The Stanford / Palo Alto
User's Group for the IBM PC

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Club Information

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