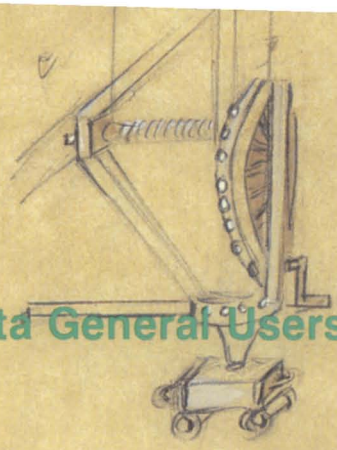
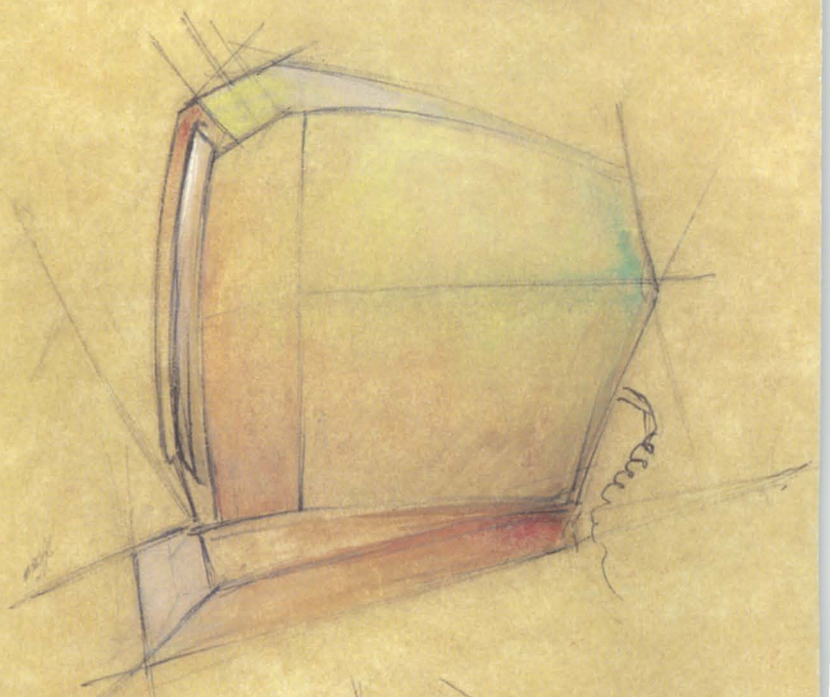
May 1989

FOCUS

The Magazine of the North American Data General Users Group





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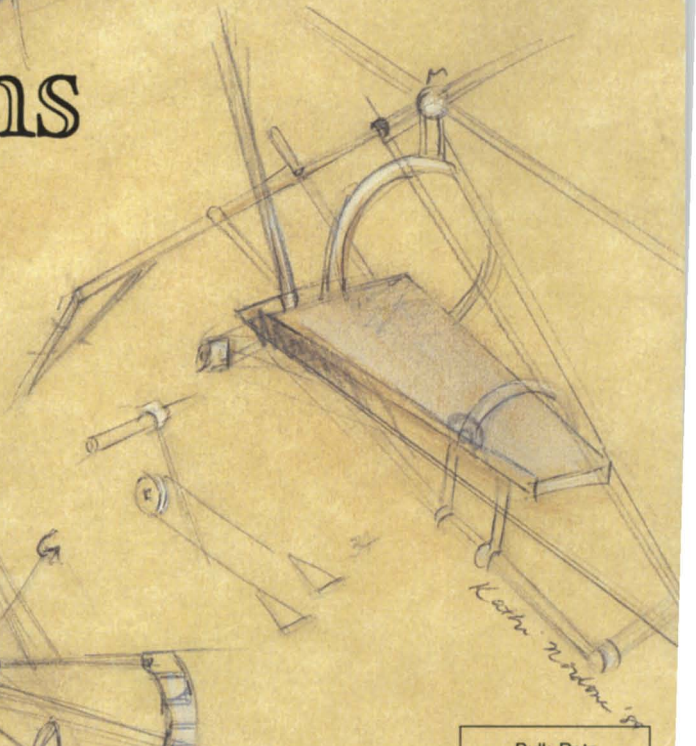

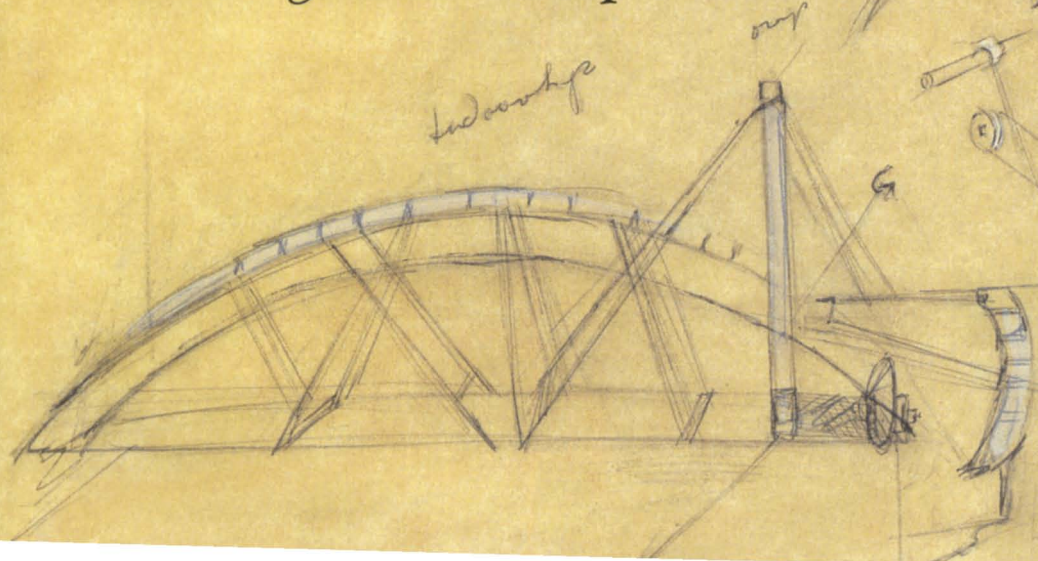

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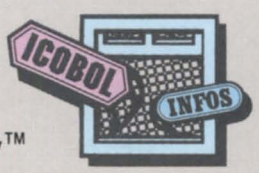

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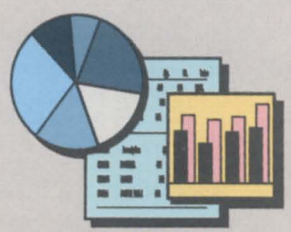

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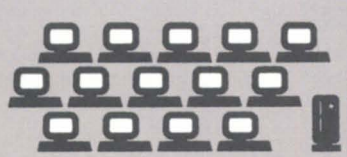

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Spring fancies

Spring . . . a time for April showers, May flowers, and youthful fancies lightly turning to thoughts of the 1989 NADGUG annual conference in New Orleans next September 18-21 . . . .

Actually, I don't recall my fancies ever turning to thoughts of NADGUG when I was a youth, but that's probably only because NADGUG hadn't been invented yet. I'm sure the current younger generation has rearranged its priorities. Or if not, they should.

The NADGUG annual conference is a subject I feel strongly about, especially in the spring. That's because each spring the NADGUG Executive Board meets to do half a year's worth of business. We always meet in the city that will host our conference the next fall, and planning for the conference is always one of the main topics.

This year's spring board meeting was no exception. We met March 9-10 at the New Orleans Hilton, right next to the Mississippi River. There was a lot of business to discuss—and I'll get back to that shortly—but right now I want to dwell for a few minutes on the conference.

The 1989 Conference will be a new undertaking in many ways. It's the first time we've had to arrange with a convention center to get all the room we need for sessions, exhibits, and other activities. In the past, we've always been able to fit everything we needed into a single hotel. However, each year our conference has gotten bigger, not just in the number of attendees, but also in the number and variety of sessions offered, the types of social events scheduled, and especially in the number of vendors exhibiting their products.

Phyllis Danieli leads NADGUG members on a tour of the convention center.

If you came to Philadelphia for Conference 88, you saw the limit of what we could do with a single hotel. There just wasn't enough space to go around. That will change this year in New Orleans—in a word, the convention center there is *huge*.

The Executive Board was an amusing sight as we toured the convention center. Phyllis Danieli, who is coordinating all of the activities that go into a successful conference, led about 40 of us out the door of the Hilton and across the trolley line to the Riverwalk. We almost lost some of us

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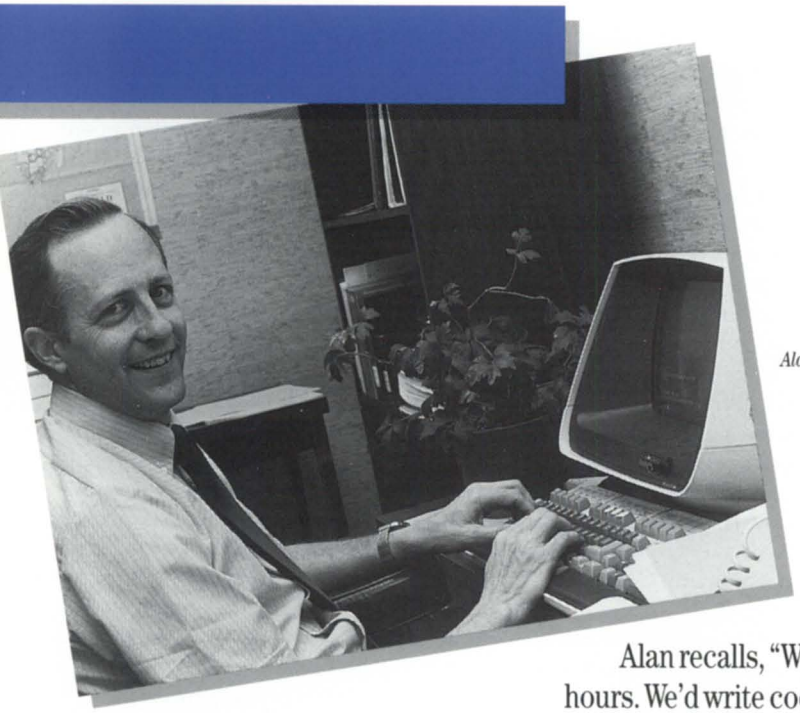

Alan Ashton, in the early days of WordPerfect, working at a Data General terminal.

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WordPerfect Corporation's relationship with Data General goes back to the very first keystroke.

Alan Ashton and Bruce Bastian had arranged with Orem, a small town in central Utah, to write a word processing program for the city's Data General minicomputer.

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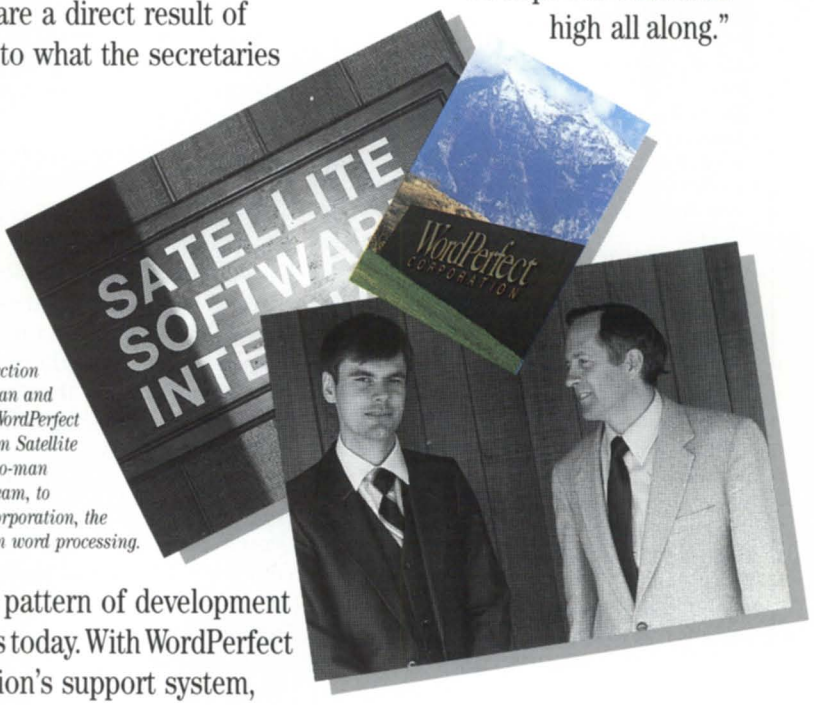
Alan recalls, "We worked long hours. We'd write code until two or three in the morning, or as long as one of us could stay awake."

And while they developed the program by night, they tested it by day on the city staff. The clean screen, speller interface, and other features are a direct result of listening to what the secretaries wanted.



Under the direction of Bruce Bastian and Alan Ashton, WordPerfect has grown from Satellite Software, a two-man development team, to WordPerfect Corporation, the world leader in word processing.

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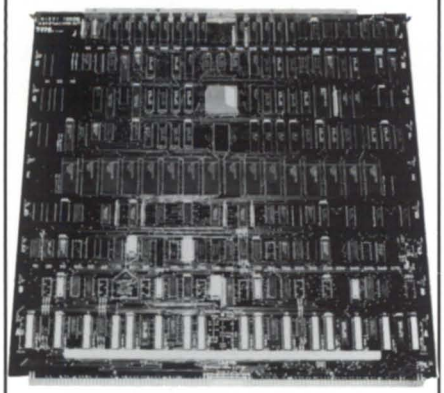

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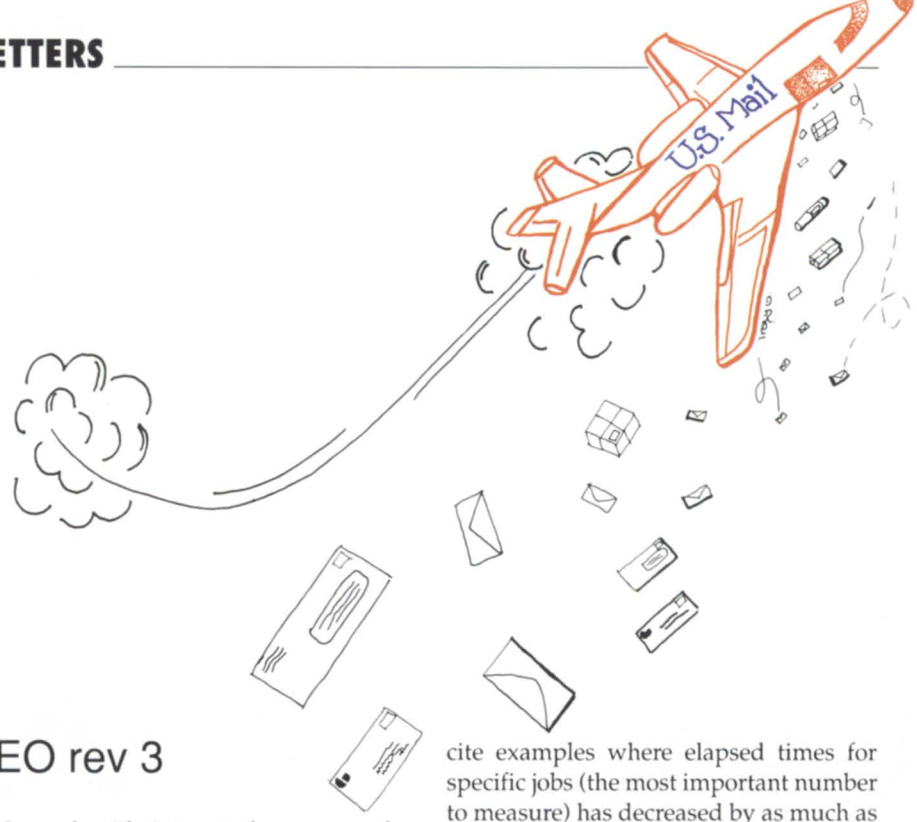

CEO rev 3

We read with interest the paragraph "CEO rev 3 and the host name problem" from ("Does DG value small business?") by Randall Berndt in the February *Focus*.

We are a single CPU site which beta tested CEO rev 3 and it was a disaster. A large number of errors we found were to do with the fact that we only had one CPU. The anguished cry, "Don't these guys think that there are sites with only one CPU?" interspersed with four-letter words was shouted on more than one ocassion.

We have a sign fixed to our branch office door, "Data General system software quality control department."

By the way, some errors are still with us 15 months later.

Yours Truly,
Colin Sparrow-Clarke
Director, Systems & Computing Services
Alberta Tourism
Administration Division

Disk optimization

In response to Brian Johnson's dismissal of disk optimization products as "anxiety ware" (Bulletin Board, *Focus*, March 1989) we maintain that the real answer to the question "Does disk optimization improve performance?" continues to be "It depends on the environment!"

To counter his claim of only a 5 percent reduction in disk service time, we could cite examples where elapsed times for specific jobs (the most important number to measure) has decreased by as much as 50 percent after optimization with the DMS Disk Optimization and Management Utility. The reason we don't publish specific numbers is that there are a large number of variables that impact system performance and the results of specific tests may not be fully applicable in all environments. However, it is very easy for someone to conduct their own test. A system manager can easily obtain a demonstration copy of DiskOpt, then time some of their more common tasks before optimization and after optimization. Is performance better or not?

Brian Johnson used to believe in disk optimization (see *Focus*, February 1987, p. 42). The reason he gave for not expending the effort to eliminate fragmentation is that "you create an artificial environment where disk response time is better than it should be for a few days or a week, and in the process you foster unrealistic expectations on the part of your users." Since DiskOpt is fast enough to run on a daily or weekly basis, this "artificial environment" will cease to be artificial.

We can argue about seek distance, service time, and number of requests per second, but ultimately the only way to see if disk optimization will help a specific system is to try it.

Sincerely,
Sue M. Dintelman
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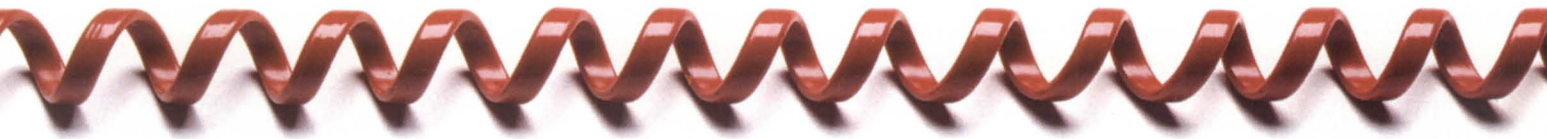

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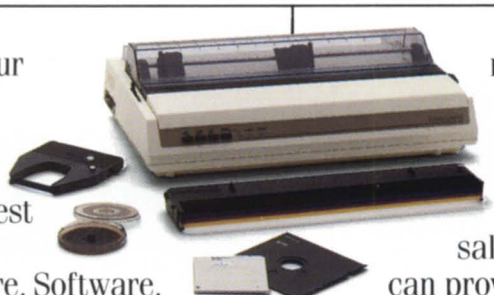

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New Orleans preview

Getting ready for Conference '89; RIG/SIG committee to offer workshop

A sneak peak at the **New Orleans Hilton** and **Convention Center** was one of the perks for attending the spring meeting of **NADGUG**'s Executive Board March 9-10. After the first day of the meeting, the attendees were given a tour of the convention facilities that will house NADGUG's 1989 Conference. The convention center is impressive and *large*. It was exciting to see how much growth has happened to the conference facilities, NADGUG's executive board, and NADGUG itself.

At NADGUG's spring board meetings each committee gives a report after which all the board members discuss the plans and goals for each committee. This was the first board meeting for the newly formed Membership Committee. **Bart Bates** of **Gibson Petroleum** (403/263-6300) is the chairperson. He presented several ideas for increasing NADGUG membership. Among those being considered are incentive plans aimed at current NADGUG members and Data General employees. Other plans include recruiting new members from RIGs and SIGs and issuing membership cards. All RIG/SIG leaders should soon receive NADGUG membership applications for distribution. Please help us pass on the benefits of NADGUG membership!

The **RIG/SIG Committee** met the morning of Saturday, March 11, to for-

Uniforum reveals DG's commitment to Unix and industry standards

by John Huddleston • Special to Focus

Data General wears two hats these days. It supports its proprietary AOS/VS operating system, and it also supports a Unix operating system. Taking it a step further, Data General's Unix supports both the AT&T Bourne shell and the Berkeley C shell. (This is something that AT&T did not implement until its System V version 4.0.) Actually, to describe Data General's involvement with the word "support" is an understatement.

While in San Francisco to attend the Uniforum conference from February 27 through March 2, I learned that Data General is chairing the committee for the development of the 88Open Binary Compatibility Standard (BCS). The BCS standard will allow executable programs to be transported from one hardware platform to another. That is, developers who write BCS software for the new Data General 88K-based system can be assured that it will run on other 88K-based machines as well. AT&T, with hardware based on the SPARC chip, has also joined the BCS committee. This benefits software developers by increasing the domain of their applications.

The BCS standard also benefits users in a variety of ways. Their investments in software need not be wasted if they decide to change hardware platforms. In general, software costs should be reduced. In addition, BCS identifies characteristics for Motorola-based Unix systems that are important for application portability. The IBM PC and its clones are marketed this way—if a program does not work on a particular IBM PC clone then that machine is deemed imperfect and rapidly disappears from the marketplace.

Wordperfect Corp. is scheduled to receive an 88K system in June, and should have its word processing software ready in September of this year. Although Wordperfect already runs under AOS/VS on Data General MV class machines, there are currently no plans to develop this software to run under DG/UX on MV machines. On the other hand, MV/UX runs concurrently with AOS/VS so you can have both Wordperfect and Unix on your MV.

Since Unix has traditionally been known as a development system, its reputation as an operational system is a well-kept secret. Our Water Supply Forecasting group in Portland operates under AOS/VS and develops all the software under MV/UX on an MV/8000 II. Our agency made a major purchase of AT&T 3B2 computers beginning in 1986. These are used in our 2,500 field offices throughout the United States. We anticipate reducing the costs of software development and training in the years ahead.

With the announcement of 88K systems that do not need special environments or power requirements and yet out-perform MV/8000s by a factor of 20 to 1, I am heartened with the news that Data General is taking a lead in the Unix industry.

Anyone interested in reading Data General's handout on BCS from the Uniforum conference may obtain a copy from RIG/SIG Coordinator Cathlene Gentry at *Focus* magazine. Or you may contact your local Data General systems engineer. Δ

John Huddleston is vice president of the NADGUG SIG/UX. He can be reached at P.O. Box 4611, Portland, OR 97208.

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malize plans that had been set in motion during the board meeting. The first order of business was appointing a vice chair to work specifically with special interest groups. The executive board and the RIG/SIG committee recognize that the needs of special interest groups differ dramatically from those of regional interest groups. Therefore it will benefit the special interest groups to have a person who knows about the workings of SIGs and who will be available to offer assistance and guidance. **Bobbie Pressman** was chosen to be the SIG vice chair.

The RIG/SIG Committee will hold its first workshop during Conference '89. The workshop will be held on Monday, September 18. It will be in conjunction with the RIG/SIG luncheon and is open to all RIG/SIG representatives or anyone interested in starting a RIG or SIG. The workshop (including lunch) will last approximately four hours and will offer sessions on utilizing RIG/SIG resources, increasing membership, RIG/SIG accounting, motivational tactics, Data General, monthly meetings and programs, workshops, and producing an effective newsletter. Speakers and program times will be announced in future issues of *Focus*. Please plan on attending and contributing your experiences while learning from others.

■

NADGUG is seeking volunteers for a speakers bureau for RIGs and SIGs. The talent and expertise among NADGUG members make them the most logical place to start looking for speakers. Speakers will be classified by subject, location, and willingness to speak for free or not.

Steve Kern, eastern vice chair, and **Leryl Cash**, western vice chair, will be in contact with the groups in their areas. If you haven't heard from Steve or Leryl and you need a speaker or wish to be listed in the speakers bureau, call me at 1-800/877-4784.

■

Four groups petitioned for recognition at the spring board meeting. The newly recognized groups are the **SMBasic SIG**, president, **Ken Smith** (216/621-6425); **Association of CQCS Users**, president, **Ray Walther** (713/626-1919); **Indiana Data General Users Group**, contact, **Nancy Miller** (317/253-1711); **Austin Area Data General Users Group**, chairperson, **Mike Leathers** (512/835-0143). If one of these groups interests you, please call the appropriate person listed above.

■

March was a busy month for most RIGs. Among those meeting were **CARORIG** (Carolinas Regional Interest Group), **Metropolitan New York Data General Users Group**, the **Indiana DG Users Group, Association of CQCS Users**, **Central New York DG Users Group**, **WISRIG** (Wisconsin Regional Interest Group), **BUDGE** (Boise Users of Data General Equipment), and **LA EDGE** (Los Angeles End Users of Data General Equipment).

■

LEDGUG (Law Enforcement Data General User's Group) will hold its Sixth Annual Training Conference in Bellevue, Nebraska on June 4 through June 7. For more information, contact **Al Devitt** at 402/593-2324. (Al says it's purely a coincidence that the meeting dates overlap with the College World Series baseball games to be played in Omaha.)

■

The Central New York DG Users Group will hold its June meeting in Oswego, New York, where members will be given a tour of the **New York Power Authority** computer operations. For more information, call **Bob Albanese** at 518/438-4571.

■

Have you had trouble reaching our RIG/SIG committee chairman lately? It may be because she has moved to a new location. **Charlene Kirian** may be reached at **Computer Training Associates**, 1005 BB&T Building, Asheville, NC 28801; 704/251-9551. Δ

Cathlene Gentry is the RIG/SIG coordinator for NADGUG. She may be reached at ***Focus*** *magazine, 4807 Spicewood Springs Rd., Suite 3150, Austin, TX. 78759; 1-800/877-4787, (1-800/USR-GRUP).*

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Circle 63 on reader service card.

The view from San Diego

USENIX conference helped show DG's place in the Unix picture

by Don Dewar
Special to Focus

DG/UX, Data General's Unix operating system, is a technical success by all industry accounts. Armed with that knowledge and Data General's commitment to a Unix strategy, I attended the Winter '89 USENIX conference held from January 30 to February 3 in San Diego, California.

What is USENIX?

USENIX, which stands for users of Unix, is an association that promotes knowledge and use of Unix. Its purpose is not to sell hardware or software, but to allow Unix users to communicate what they have learned so that the operating system will continue to be used and improved.

USENIX was founded about 12 years ago when a group of people decided to get together and talk about their mutual interest in Unix. That initial meeting has blossomed into an association that holds major conferences twice a year. At these conferences users meet each other to teach Unix-related techniques, especially to novitiates, and to let papers written on Unix-related topics be heard and discussed. Two thousand people attended the winter conference in California.

The format of the conference includes a series of full-day tutorials, paper presentations, and nightly "birds of a feather sessions" (BOFS). A variety of tutorials were held the first two days; for instance, I attended a tutorial on Kerberos, MIT's authentication service for its distributed Unix-based network. Over the next three days, papers that Unix users had submitted to the USENIX association were presented and discussed. BOFS were held from the second night on for smaller groups interested in discussing a specific topic in an open forum.

Where Data General fits in

In addition to those Data General employees, such as myself, who were sent to the USENIX conference to learn, Data General also did some of the teaching. Michael Kelley, principal software engineer at Research Triangle Park, presented a paper titled "Multiprocessor Aspects of the DG/UX Kernel." This paper discussed all the technical details of a fully symmetric Unix implementation that efficiently coordinates multiprocessor hardware. In his talk, Michael said that DG/UX "does better than most other implementations." He also mentioned that the 88000 port of DG/UX was going very well. His paper and talk were well received, as evidenced by the intriguing questions and interested audience.

At another paper presented by Daniel Klein from Carnegie Mellon University, the 88000 architecture was again mentioned. His paper, "A Comparison of Compiler Utilization of Instruction Set Architectures," compared complex instruction set architectures (CISC) with reduced instruction set architectures (RISC). He set out to prove that CISC architectures are better than RISC architectures, but in the process he proved just the opposite!

Klein's premise is that compilers generate almost all assembly code today, therefore, good architectures should cater to compilers. The 88000 was one of the architectures he used for his data, and it fared comparably to the SPARC and R2000 from this point of view. What he found was that 70 percent of all the instructions on CISC machines are never used by a compiler. In RISC machines, only 30 percent of the instructions went unused. Klein contends that these unused instructions are frills that the compilers cannot take advantage of and in fact slow the program down. He also found that the programs compiled on RISC machines are not substantially larger than those on CISC machines. He concluded that the future of Unix lies in the RISC arena.

By the way, all the papers presented at the USENIX conference were bound and distributed to conference attendees. If you have further interest in this organization or wish to obtain copies of the conference papers, you may contact the USENIX Association at 2560 9th Street, Suite 215, or P.O. Box 2299, Berkeley, CA 94710. The USENIX phone number is 415/528-8649.

Final views

Before attending the USENIX conference I was skeptical about Unix. I thought it was an ill-conceived operating system with no future. I still think Unix is lacking in many ways when compared to AOS/VS, but Unix has far more ability than I previously believed. Moreover, an operating system that functions in so many environments has to have some constraints. Judging by the number of USENIX attendees, the topics discussed, the number of architectures Unix runs on, and recent work already done on Unix, it is obvious that Unix has a future.

Furthermore, Data General has chosen a wise course for the second fork in its dual-pronged corporate strategy. Unix has a strong presence in the workstation market and an equally strong following of users. The mention of the 88000 architecture in the Klein paper and the mention of the architecture in casual conversation indicates that the 88000 architecture is gaining respectability very quickly.

Δ

Don Dewar is a software engineer at Data General headquarters. He can be reached at 4400 Computer Drive, Westboro, MA 01580; 508/366-8911.

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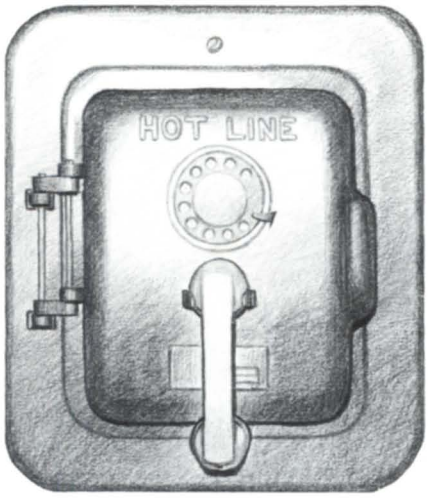

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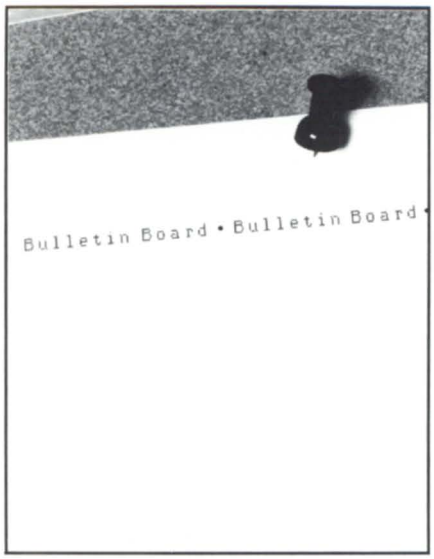

CEO 3.02

From: Rob Mougey

We have been running CEO 3.02 for about six weeks. The problems we have experienced all pertain to the Calendar. If your users rely heavily on their calendars, they will discover problems in rescheduling meetings. We run an MV/15 standalone. To date, I have applied 14 3.02 patches and reapplied two 3.01 patches (for 3.01 and 3.02). Overall 3.02 is a great improvement over 3.00 or 3.01. There are several undocumented changes that my users noticed before I did. Funny how they have a way of doing that.

From: Tom Moore

Have a seat! I just finished up-revving 2.26 to 3.02. If you plan on going directly to 3.00, don't. Load the 3.00 release, then follow the notice for loading 3.02+. If you use form files, be careful. CEO 3.00 overwrites some of the files in :util:forms. Follow the rev notice carefully.

From: Chris Langford

We are also about to upgrade to 3.02 from 2.26. I'm a bit concerned about the conversion of printer definitions. After a test conversion on one system, I found that printer margins on letter quality printers were set to zero. Did you have this problem ?

From: Tom Moore

Yes, but not just on letter quality printers. The new rev replaced my LPT.DEF.FORM and LDP.DEF.FORM. Also, on laser printers, CEO will try to print 8.5-by-10.5 inches on 8.5-by-11-inch paper. Not in this life! Use a magnifying glass or whatever and comb the pages of the release notice about 500 times (and take notes).

By the way, if anyone is using LPT.DEF.FORM for a 132 CPL printer, you will have to run FCU and change the CPL to 132, instead of 80 (in the new rev). If I am not making as much sense as I usually might, I am still all revved out!

MV/40000

From: Mike Shumway

Well, here we go again trying to stay a generation ahead. We are about to put in an order for an MV/40000 model 3 to upgrade our large CEO shop. Does anyone have a 40K yet that they are willing to talk about? Our concerns are obviously rev 8, oops, AOS/VS II, CEO on large systems (what happens to an index with over 300 users on it?), as well as hardware questions. DG is itching to get us to order one (even though the model 3 and 4 aren't available yet) and we would like to be as wide-eyed as possible going into it. Hopefully someone has had some hands-on experience. Thanks.

From: Doug Rady

World Computer in Auburn Hills, Michigan has had several in. They get them in, test them, load them with software, and ship them to customers. They had some hardware problems for a while but that seemed to be a lack of FE education and a lack of local parts. Other than that I think they are happy with them.

PED-iatrists

From: Andy Uzick

PED seems to dislike 6053 terminals. Whenever it attempts to write to a particular line (line 9, I believe), the display gets trashed. Is there some exotic CHARacteristics setting to overcome this or is it a permanent imPEDiment?

From: Kevin Danzig

We have had the same problem. If the con line has NAS on (it shouldn't for a 605X), turn it off and see if it works.

7.64

From: Rob Mougey

I would like to hear from anyone that has successfully loaded 7.64. We are running an MV/15 model 8 at 7.60 and CEO 3.02 (standalone). I would like to take advantage of the new /AUTOBAUD switch for IACs. Does this really work? I am also concerned about the change in XLPT. We have nine DG 6454 (HP Laserjet II) and two QMS Lasers. Any insight would be greatly appreciated.

From: Tim Boyer

I don't know about the /AUTOBAUD switch—I'll have to try it out. XLPT seems to be working well. Compared to 7.62, it's working *incredibly* well. BJ recommends that you change your printer priority to 4 when you go to 7.62. Other than that, it's running like a charm.

From: Brian Johnson

Put data channel printer XLPT priority at SWAPPABLE 1, put buffered printer XLPTs at SWAPPABLE 2 (e.g., lasers). If using 7.62 or 7.64 XLPT (one XLPT—many printers) try SWAPPABLE 1 first. If it causes response time problems, drop it to SWAPPABLE 2 and learn to live with jerky output on data channel printers.

Clean up files

From: Wendell Putney

I just discovered a new "feature" in XLPT. Effective with 7.64, XLPT won't output a cleanup file to a queue you've enabled for BINARY unless the QPRINT is done with the /BINARY switch. I use cleanup files to set character and line spacing and enable NLQ on my Okidatas. How am I to tell my package software that it's supposed to use the /BINARY switch when printing to a binary queue? Neat feature, huh?

AT&T network and Laserjet

From: David Czech

We have an AT&T network running with Data General, Digital, and Wang computers. We are trying to hook a Laserjet II printer to the Data General through the network and we can not make it work. Does any one know how to make an AT&T network and a Data General and Laserjet series II work together?

From: Rob Mougey

We are running AT&T's ISN and System 75. Our DG 6454 (Laserjet II) printers are run through fiber concentrators to the ISN and then to an IAC 16 on the DG. Define your DG port on the ISN as an

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EIAHOST and the printer port as a terminal on the ISN and then connect the two using a permanent circuit (CN PC address1 address2). We discovered that we needed IAC 8s (with ?mod and ?mri on) to have the DG disconnect if the user did not log off properly. Otherwise the next person to call the hunt group would end up with the other's active session!

AOS/VS II

From: Thomas Carey

An update on AOS/VS II. We had been running it for a week before we took it down this morning. At VSGEN time we took most of the defaults and have just one LDU/physical disk. But our master disk is stretching the limit at around 90 percent full. Given that, the system is considerably slower than 7.62. Also, found by chance that the output from the ?GUNM syscall contains an error. AC0, at least in our test, returned a -1 (should be a 0 or 1).

Most serious though is INFOS. We can read our data bases all day and if we try to write to them, the write is OK (i.e., no error return); but when that program finishes, the data base is locked out from further use. We get runtime error 3697. Tried everything I can think of but no success so far to avoid that error.

New CLI command

From: Michael Travis

Here's another bit of useless, obscure information. You can't define a macro with the same name as a CLI command, because the CLI checks its internal list of commands before it looks for a macro. The one exception to this rule is . . . XYZZY.

From: Doug Rady

Another of its glaring weak points! It should have the option to look in a system-wide macro directory first, then in the user's searchlist, and then in its internal table. Would add much flexibility!

From: Michael Meissner

If you are real handy with FED, you can always patch the CLI's command tables to rename commands. I've seen April Fools Days where people change the "BYE" command to "BUY", etc.

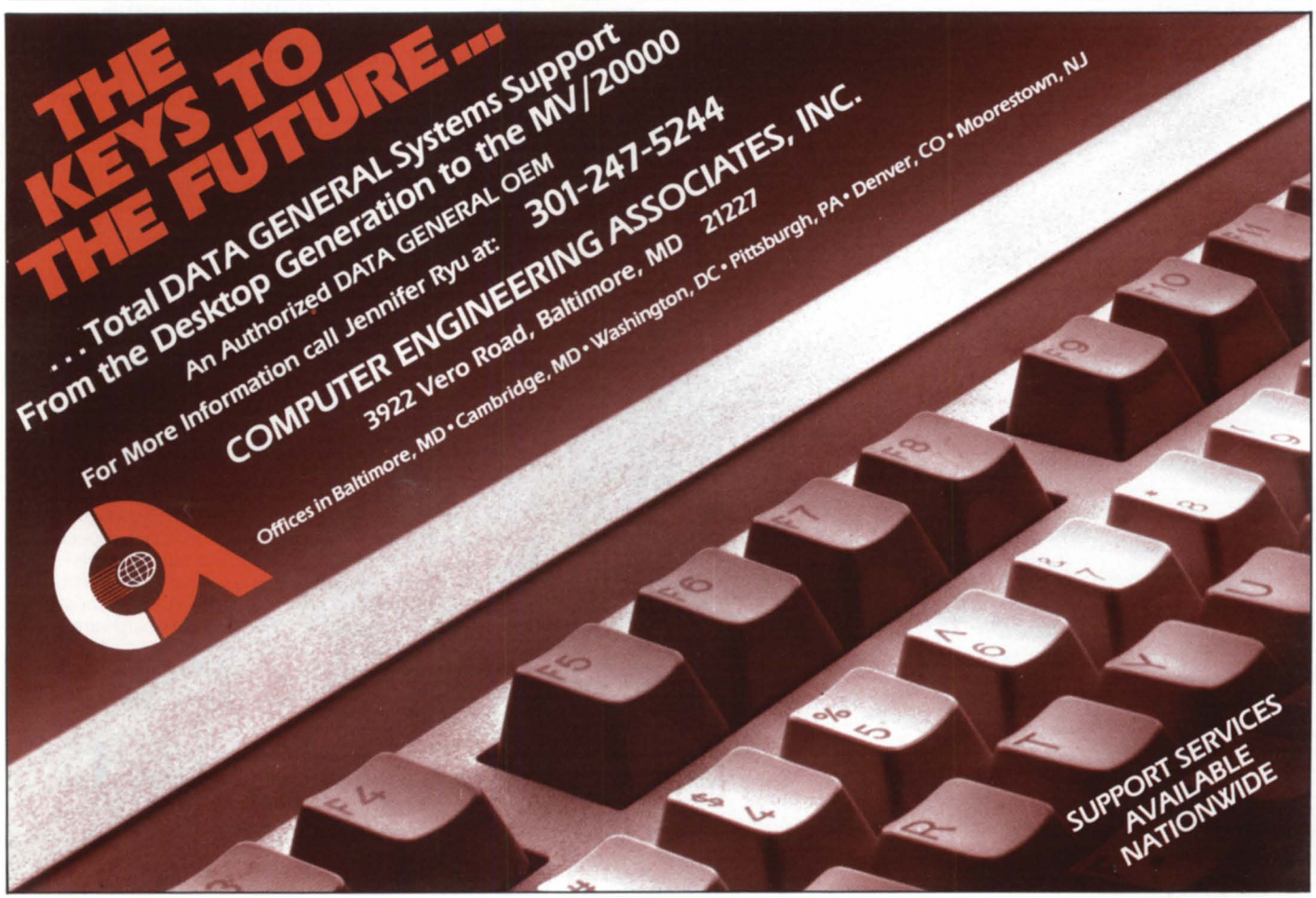
AOS/VS to Unix

From: Sharron King

As users of AOS/VS on an MV/10000, we are investigating converting to DG/UX rather than AOS/VS II. If anyone has gone from AOS/VS to DG/UX, it would be very interesting and helpful to hear about the experience. We are basically a Fortran scientific computing operation.

From: Glenn Diehl

We converted from VS on a MV/8000II to DG/UX 3.11 last January. At first, performance was a problem, but it has been improved somewhat with later releases (we are currently running 4.01). Rev 4.02 will be installed soon and it promises more performance improvements. I am pleased with the software for the most part, but the system is not a screamer. Δ



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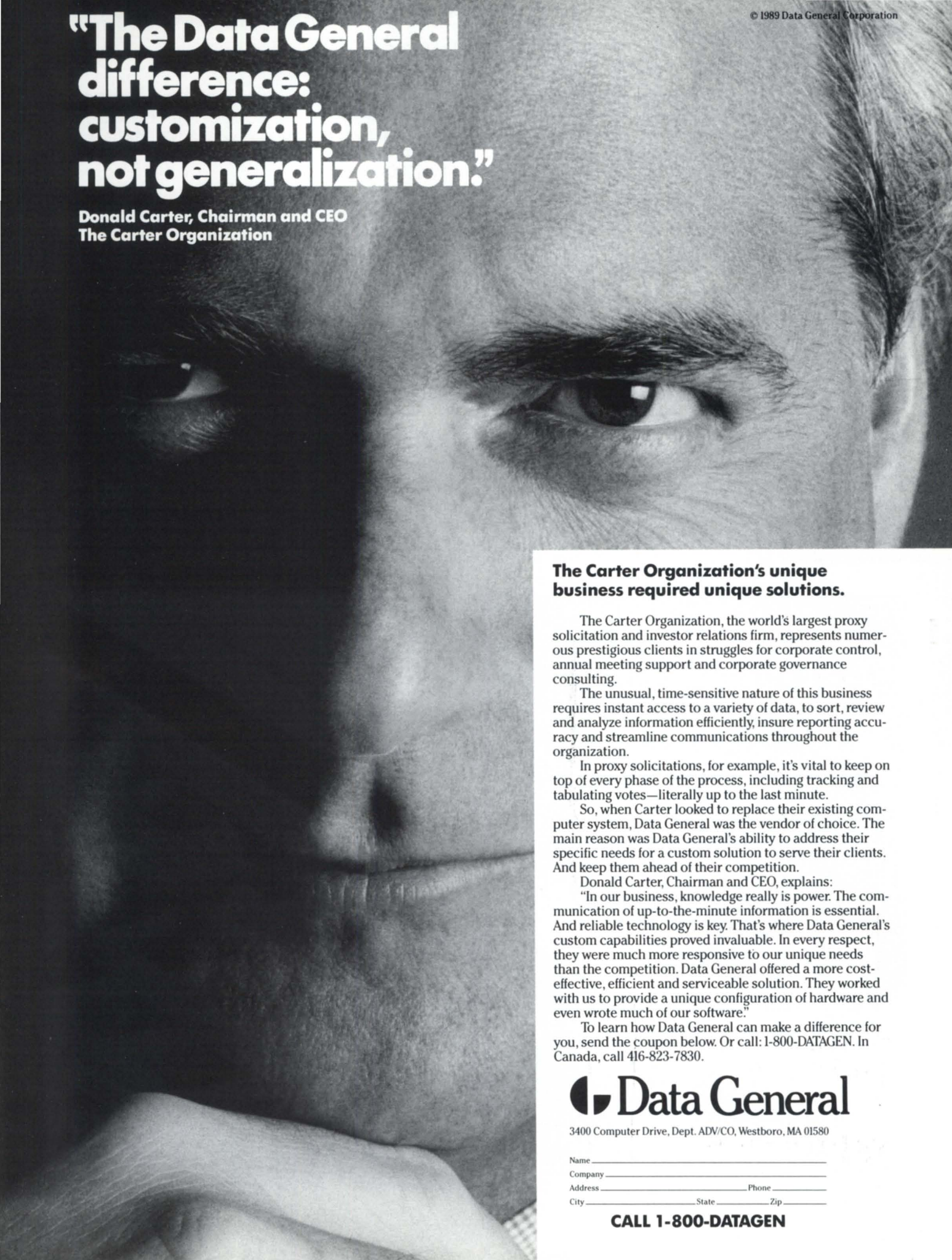

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The age of reason

In the world of artificial intelligence, there are many experts

by Robin Perry • Focus staff

The term artificial intelligence brings to mind images of humanoid computers, pulsing cerebrums with glowing eye sockets, and robots gone mad. But artificial intelligence, far from being part of some sinister future or the screenplay of a science fiction movie, is already here. And it's friendly, dear user.

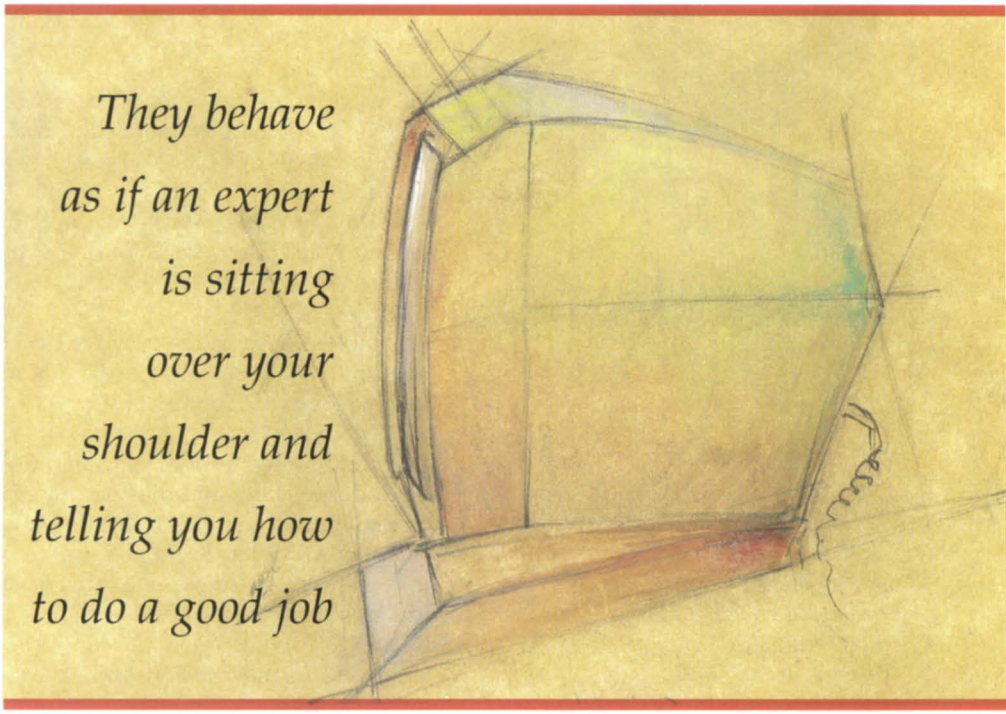
Here are just a few of the ways artificial intelligence is used today:

- to determine the hotness of chili peppers at a picante sauce factory;
- to schedule airline and hotel reservations;
- to recognize the locations of ships at sea;
- to scientifically evaluate the colors produced at a New England dye factory.

User interface is another area that has witnessed the effect of artificial intelligence. Object-oriented systems like the Macintosh where icons are used to represent various functions are an outgrowth of artificial intelligence. Even the familiar Lotus 1-2-3 is a product of artificial intelligence.

"Any company can take advantage of artificial intelligence. Artificial intelligence is pervasive today, only we don't call it as such," said Stevan Petrofsky, manager for Data General's Artificial Intelligence Marketing Group.

"Artificial intelligence brings together a lot of interesting technologies. The general benefits are in productivity. Decision-supported systems basically help novices get better at what they're doing. They behave as if an expert is sitting over your shoulder and telling you how to do a good job," Petrofsky said.



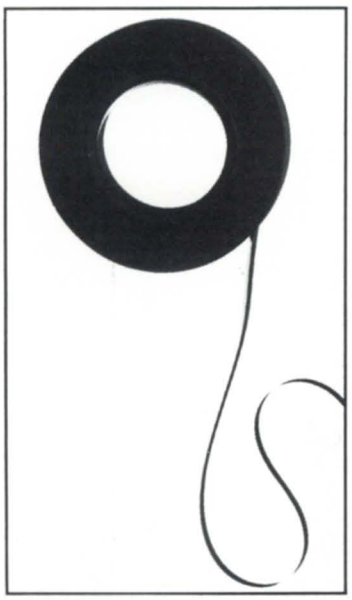
Expert, or knowledge-based, systems are terms used to describe forms of artificial intelligence that reproduce a person's reasoning logic. In a commercial setting, this often translates to the embodiment of the skill of an expert or master craftsman. These systems represent the fastest growing and most mature application area within artificial intelligence.

Of the expert systems sold in 1988, over half (54 percent) were bought by MIS corporate or department managers. The other expert systems buyers were in the fields of corporate research (14 percent), education (15 percent), and military and other government (17 percent), according to *Expert Systems Strategies Market Review*, published this spring by Cutter Information Group. The review predicts use of expert systems will increase dramatically in the 1990s, especially in the area of commercial applications.

Goldworks

Data General's entry into the expert systems market is in the form of a joint agreement with Gold Hill Computers, Inc., of Cambridge, Massachusetts. Under the five-year commitment signed in 1987, DG and Gold Hill will jointly develop and market a Common LISP-based expert tool, Goldworks, that will run on a range of Data General systems—first on PCs, then on minicomputers, a PC workstation, or all three in a networked envi-

A complete listing of the NADGUG software library



All NADGUG members interested in receiving the NADGUG software collection should send a 1,200-foot tape to:

Randy Berndt
American Urological Association
6750 West Loop South, #900
Bellaire, Texas 77401

or call 713/665-7500. (MV/2000 and MV/1400 users should send one tape cartridge.) Software contributions should be sent to the same address. Be sure to include your membership number.

People with AOS/VS rev 6 should send a 2,400-foot tape and specifically request a DUMP_II instead of the usual compressed version. The decompression program is rev 7-specific.

Please include a self-addressed envelope with sufficient return postage. In compliance with postal regulations, do not date the postage, because the tape will not be returned to you on that date. If you send it at the end of the month, please have the postage read for the following month.

Big Brother

Automatic log-off program written in Fortran 77. Donated by the U.S. Forest Service. 181 blocks.

B.J.'s BBS contributions

This addition to the library consists of about 20 items, including various programs, documentation, and macros. Some of the more interesting items include the :SYSMGR benchmark suite, a continuous incremental backup, a clean-up file maintenance program, a program to find strings in files, and a type-backward program. 5,749 blocks.

CRTEDIT

This is the old RDOS screen editor ported over to VS. 51 blocks.

DBCHECK

This program checks the open status of an INFOS file and examines the checkpointing status of a file. 230 blocks.

DUMPLOAD

DUMPLOAD is a Macintosh program to dump and load AOS/VS-compatible dumps on a Macintosh. 140 blocks.

ERP

A process-termination program developed by NASA and modified by Manville. In Fortran 77. 338 blocks.

FILEMNGR

With this new version, you can move, copy, delete, view, and perform several other options faster. This is distributed as shareware. If you try it and continue to use it, you are requested to pay a registration fee. From Kim Geiger. 459 blocks.

FTNCVT

This is a Fortran 5 to Fortran 77 translator. 287 blocks.

Games

Games is a collection from various places. Enjoy. 19,293 blocks.

Glossary

Glossary is a program from John Grant that builds a list of words used in a document and shows where they are used. 416 blocks.

IMSLUTIL

This is a collection of CLI macros, COBOL routines, and assembly routines callable from COBOL. By IMSL of Houston. 6,154 blocks.

JAG_UTIL

JAG_UTIL consists of several programs: Filecount, Userspace, Scan, and Laminate. 1,501 blocks.

Kermit

Kermit is a file-transfer protocol developed at Columbia University. Uses 9,328 blocks.

Logout

Another auto log-out system. 246 blocks.

Look

Look is used to view text files. It allows you to move forward and backward in a file. This program was donated by Data General. 438 blocks.

Macbook

This is a collection of macros from the Colorado users group. 342 blocks.

MENUDIR

This is an initial user menu that can chain to other applications. It features a password-control system. From the Fed SIG. 492 blocks.

Misc Kerm

An expanded version of AOS Kerm, this now includes other versions of Kermit including DG/One Kermit. 6,298 blocks.

QHelp

QHelp is a tree-structured help facility. 2,277 blocks.

SKLSCRN

This is the COBOL standard entry screen featured in George Burns' article that appeared in the April 1988 issue of *Focus*. 385 blocks.

Softrans

This is a file-transfer protocol written in Fortran 77. It's used to communicate with proprietary PC communications packages. 496 blocks.

SWITCHES

SWITCHES is the GET.SWITCHES routine from John Grant's column in *Focus*. 1,297 blocks.

TEX 2.25

TEX (Terminal Emulator with Xmodem) is a terminal-emulation program written by David Down. He has recently revised the TEX software to include a command language. TEX is being distributed as shareware. At the end of 30 days, either remove it from your system or send the author a $45 fee. 495 blocks.

VT100KER

VT100KER is the VT100 emulator from John Grant. 1,135 blocks.

Xfer

Xfer is a tape-conversion utility. 653 blocks. Δ

Stand and deliver

Expert systems in the U.S. Forest Service

Flathead National Forest, located in a remote area of northwestern Montana, is the unlikely site of an experiment with one of computer science's most exotic technologies.

Entering its third year in development is an expert system that will be used to identify and diagnose treatment alternatives for various plant communities. Currently these needs are identified by highly-trained silviculturists, who study a plant population (called a stand) and give treatment alternatives based on many factors including size, location, plant types, and the U.S. Forest Service's management goals, which could include recreation, preserving wildlife, maintaining fisheries, harvesting timber, or grazing.

"Our needs are ones one would classically associate with why you want to develop an expert system," said Jim Reid, director of management information services. "We have a limited number of silviculturist in the field, so there's always a shortage of experts to apply the knowledge. And there's always an increasing demand to work with a larger number of stands than is practical for a silviculturist to do in a given time frame." In addition to speeding up the diagnostic process, the system will help silviculturist make better informed decisions by sorting through volumes of information and seeking out the facts relevant to a specific site, he said.

There are plans to implement the system in all of Region 1, which includes 13 national forests in Northern Idaho, Montana, and North Dakota—in other words, 19 million acres of forested land where stands need to be diagnosed. A stand can be anywhere from 5 to 100 acres in size.

The system, now in prototype stage, is being developed for use on the network of Data General MVs installed throughout the Forest Service. It was developed mainly in-house, with some help from consultants at Data General's Research Triangle Park, said Jim Chew, timber management silviculturist.

"The first year-and-a-half was spent in just trying to develop an understanding of artificial intelligence, in particular expert systems, and getting to the point where we had the software to work on the MV. We didn't want to spend a lot of time working on software on PCs when they weren't going to be the delivery vehicle," he said. "Once we had access to Goldworks we spent a six month period learning the software and developing a prototype. From there it took us about a year to have what I consider a working expert system on our Data General."

Another challenge was preparing the large data base from which the computer will draw information to make recom-

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ronment. LISP (List processing) is a symbolic processing language.

The first announcement from the Gold Hill alliance was Golden Connection for the PC and enhancements to DG/Common LISP on the MV family of computers. These two products provided a Common LISP platform over which an expert system application running on the PC could directly access all AOS/VS operating system services and files. Also included was Goldworks' ability to access Lotus 1-2-3 and dBase files and interface with PC-based C language programs.

The second major announcement was in August of last year. The Goldworks inference engine and integrated GMACS editor were ported to the MV family under DG/Common LISP, an integration toolkit was added to facilitate reporting the results of MV interfacing, and a CEO interface was added to DG/Common LISP. Now expert systems can be developed on the PC and delivered on the MV. With CEO integration, expert systems can directly send messages or documents to/from the electronic mail and filing system. The Lotus 1-2-3 and dBase interfaces are also included for Goldworks on the MV so that with PC*I these files can be accessed from either the PC or MV-based Goldworks.

LISP is not the only artificial language available, although it is the one in which Data General has invested its expert systems. "I recognize that there are only so many LISP programmers out there," Petrofsky said, but he pointed out that the much-talked-about NeXT computer, from Steve Jobs, a founder of Apple Computers, is shipping a copy of LISP with every machine.

"There are really two different perspectives to artificial intelligence," Petrofsky said, "the user's perspective and the developer's perspective. Users see smart programming as a natural way, an intelligent way, of doing things that help one do a job. From the developer's standpoint, we talk about tools to build smart programs." Data General's offering to the market will offer tools to the developers, smart programming for the user, and a broad range of support for both, he said.

Spaghetti code

"There are two reasons one would want to develop an expert system. One reason is that the application is too complicated. It is too complex for flowcharts. The other reason is the notion of maintainability," said Petrofsky. When a conventional yet complex program has to be changed often, the programmer may end up with spaghetti code.

That was what happened in Data General's International Treasury Department, which determines pricing policies for worldwide sales and shipping. The department was using a COBOL program on a MV, and although the program was implemented only a few years ago, the structure of the COBOL program made it difficult, almost impossible, to keep up with the constant changes.

"Before we developed the knowledge base, much of the policy was written in

Continued on page 21

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who helped develop the program. "For example, if we make an international sale, typically an item, a model, or a part has to be transferred from the U.S. to a manufacturing or marketing subsidiary. Transfer policy pricing is the policy we use to determine at what price to make that transfer and that's based on things like international tax law, customs regulations, and foreign exchange control requirements. There's some leeway but there are all sorts of restrictions on how you set a pricing transfer. Typically it's based on stated cost or U.S. list price and it's related to how we deal with third party distributors."

The new system is a PC-based inquiry-only system developed using Goldworks. It uses PC*I to go across the network to an MV data base that contains parts information. Approximately six months were needed to go from a prototype system to an actually fielded one. The advantages of the new system over the old one are numerous, according to Anderson.

"It's more accurate, it's easier to use, easier to maintain, and it has more ways of looking at the information. Previously, the system would let you enter a part and a destination and it would say 'Here's the transfer price.' Now we can use the same knowledge base to say, 'In general, what's the policy for transferring MV/15s to a marketing subsidiary in Belgium?' and it will give you the generic rule for doing that. You wouldn't have to find an MV/15 part and say 'What's the transfer price?'" she said.

In addition to being easier to use and maintain, the new system has a facility that lets users review the computer's decision, Anderson said. "It comes out with additional information about the part: standard cost and list and other things that they previously couldn't get very easily. So it's more complete in that sense. If they want an explanation of how the system arrives at a transfer price they can say 'Please explain this' and it will pop up another screen and give an explanation of how it arrived at the price."

What the future will bring

In addition to hardware and software, new technologies need support services. Data General recently announced that it is offering custom knowledge engineering consulting services through its Artificial Intelligence Group. The consulting service offers a team approach using the skills of a Data General consultant, a client's sytems engineer, expert system developer, and end user. These services are available to support various phases of knowledge engineering: application selection, knowledge acquisition, prototyping, design, and system development. Educational services are also offered to train the client and staff about knowledge-based technology.

The re-implementation of the Treasury Department's program as an expert system could not have been done without the development of Goldworks and the Golden Connection. Other innovations are sure to come as Data General explores the many technologies that fall under the catch-all term artificial intelligence. Δ

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mendations. If a stand is diseased, for instance, the program may be called upon to determine what insect or organism is affecting the stand. Then it will have to recommend the proper treatment, based on the Forest Service's goal for that stand. Some treatments are meant to improve the health of forest stands; others to avoid a change in stands that would be detrimental to wildlife. Sometimes the recommended treatment is to remove and replace an aging stand because it is susceptible to disease. The recommendation might be to change the number or species of trees in order to benefit a particular wildlife habitat or management objective, or to have an impact on the watershed. "There's quite a variety of given treatment alternatives that one could come up with," Chew said.

This variety of alternatives makes the Forest Service's goal an especially challenging one, Reid agreed. "It's a little bit different from using an expert system to diagnose a car engine or something like that. There's just tremendous variability in this. In some ways I think we've picked a hard case to work on," he said.

The system is workable, Forest Service officials say, and it is now undergoing extensive testing. For one of the tests, the expert system and a silviculturist will be asked to diagnose the same stand of trees and the answers will be compared. The question is, how will they know which are the best answers? Δ

Continued from page 19

procedural code, or COBOL code," explained Maurine Hennings, AI program manager for Data General's Information Management Group. "One of the problems was that [in representing policy] you're trying to take data and put as much of it into tables as possible. Usually in a table you have a one-for-one relationship between items and tables. In the case of a policy ruling, you're many times looking at a three-way relationship of information. When you try to represent that in procedural code, that causes a lot of conflict and exceptions."

In the case of the Treasury Department, three factors are put into every pricing decision: the type of part, the destination of the part, and the policy. These ever-changing variables made the program difficult to maintain—so it wasn't maintained. Seeing these problems develop, Petrofsky's department decided that the re-implementation of Data General's International Treasury Department could be an example of what expert systems do best: take a complicated decision-making process and make it seem easy. In this case, it meant taking the factors that determine policy and dividing them into discreet units that could be changed without having to adjust the entire code.

In order to do this, programmers had to have training in LISP, the underlying language of Goldworks, as well as Goldworks. They had to understand the PC environment and systems integration.

The elusive policy type is determined by a number of factors, explained System Technology Consultant Betsy Anderson,

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Loading and using Data General's Office/Publisher rev 2.11 with CEO is easy. With it and a good quality laser printer, you can produce your own professional-looking newsletters, proposals, and legal contracts. Because using Office/Publisher requires some special procedures and skills, I will use the term "publish" to distinguish it from normal printing of CEO documents.

Inside specs

To use Office/Publisher, you must be running AOS/VS CEO Integrated 2.24 or later and have at least one output device supported by Office/Publisher. To merge Data General's GKM graphics you must have 3.00 and one of the following printers: a Model 4558 Desktop Laser Printer with full paint mode; a Model 6454 Desktop Laser with 6456 expansion memory and full paint mode; a Model 6474 running in Hewlett-Packard (HP) emulation mode; an HP LaserJet Plus, LaserJet 500+, or LaserJet Series II printer with 1.5 MB of memory; or a QMS Lasergrafix 800, 1200, 1500, or 2400.

You can create a WYSIWYG (what you see is what you get) environment by using Office/Publisher's PC preview option. This feature allows users to see exactly what the document is going to look like before it is published. To use the preview option, you need a Data General Dasher/286 or XT/AT compatible personal computer running MS-DOS and Microsoft Windows 1.04. You will also need DG/PC*I or Intercon's D410 terminal emulator and file transfer software, plus the hardware to establish a serial connection between the PC and your MV family system.

Inside Loading

Office/Publisher is loaded into a directory called PUBLISHER. You can install the software by following the instructions found at the back of the system manager's reference manual. In addition to this manual, Office/Publisher comes with a copymark reference card and user's manual. These guides are informative and easy to use and were, by the way, created using Office/Publisher.

Publishing is done in a batch stream process described in the installation procedures. Two utilities, PUBSTYLE and PUBUSER, must be run. PUBSTYLE creates a site default style sheet (or page layouts) for the users until they can create other style sheets for their own purposes. PUBUSER is the PREDITOR of Office/Publisher. Every potential user must have a profile under his or her AOS/VS username as well as a default style sheet.

It is essential that you check each user's PREDITOR profile to ensure that the following values have been established: 1) initial program set to :CLI.PR, 2) batch privilege, 3) change address space type set to YES, 4) a disk quota of at least 2,000 blocks. Since Office/Publisher runs as an integrated application under CEO, the system manager must create a public application so that users may access it easily. The PRINTDEF utility defines the printers.

Inside publishing

Publishing a document requires no more than invoking the application. That is the simple part. Creating the formatted output is where skill and creativity lie. Using Office/Publisher is a lot like using CEO Wordview. You take a regular word processing document, add commands, and get the end result.

You may be familiar with CEO Wordview, which uses control commands surrounded by carats. These control commands are not actually part of the document. Office/Publisher uses similar commands, called copymarks, to direct formatting; the difference is that these copymarks are the text overstrike attributes in the actual document. Usually, one skeleton copymark is set up with a function key. This will produce a code surrounded by angle brackets, called boots, as seen here: <Df p-n>.

Copymarks can be placed anywhere in the document. The command letters are changed depending upon the desired function. It is important to realize that once a document has been prepared for *publishing*, it cannot be *printed* like a regular document, because the copymarks will turn into overstrikes and yield jumbled output. Copymarks can only be seen on the screen, and their results can only be achieved after the document is *published*.

Inside text

Different typefaces can be utilized with the various text attributes in CEO. The text attribute for bold, (+), will generate a boldfaced output while the underscore attribute, (_), will generate italic output. Using the (*), or bold underscore attribute, will result in bold italic output. A text underscore option is not supported by Office/Publisher as it is considered improper in the typesetting world.

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Publishing Focus

Wordperfect is the keystone for Focus' typesetting and pagination system

The English-speaking world is stuck with yet another misnomer. When a term gains wide usage, even purists have to stop arguing about what's proper. Granted, academic types still insist that "data" is the plural of "datum" and therefore requires a plural verb: "The data are clear on this." They are correct, of course, but that's beside the point.

The same is true of "desktop publishing." In publishing circles, the purist's view is that you're not a publisher if you don't have subscribers—or at least a list of people to bombard with your messages. What passes for desktop publishing is really computer-aided graphic design. "Publishing" is what you do with those beautiful pages *after* they're printed.

Like it or not, the term "desktop publishing" is here to stay. It's important to remember, however, that it's only part of the picture. A complete publishing system has to include components for data communications, word processing, text control, and circulation management, as well as "desktop publishing."

The *Focus* staff has gradually assembled (some would say "kludged") a poor man's publishing system over the last three years. Now we're ready to go public with it. Naturally, desktop publishing plays an important part, but there's a lot more to the story.

It's minicomputer-based

Not surprisingly for a magazine devoted to DG users, the *Focus* staff uses a DG minicomputer for almost everything. We might have gotten much the same functionality from a network of PCs or Macintoshes, but we were concerned about issues like reliability and system management—factors that minicomputer users can take pretty much for granted.

Office automation is a background assumption for the *Focus* publishing system. Electronic mail is a tremendous advantage for staying in touch with other staff members on the progress of articles without having to devote a lot of time to meetings. The calendar is extremely useful for keeping track of tasks and scheduling activities. The spreadsheet program is absolutely essential: it manages the articles and estimates their length; it organizes all the information about advertisements to be placed; we even use it to produce costing information on individual projects and print invoices for *Focus* advertisers. And of course, there's word processing.

Desktop publishing tools

The OA software we use all comes from Wordperfect Corporation: Library for electronic mail, calendar, scheduling, and a customizable menu shell; Planperfect for spreadsheet; Wordperfect for word processing. The reasons are partly historical—our first system was a DG Desktop Generation Model 30, and *nobody* recommended running CEO on it. By the time we were able to afford an MV system, we had grown too attached to the Wordperfect products to seriously consider anything else. Fortunately, this choice worked out very well because of the way Wordperfect has implemented compatible file structures on its PC and Macintosh products. This turns out to be a very important advantage.

Getting the words

The mail carrier groans under a daily load of press releases and product announcements addressed to *Focus*. In addition, many companies have discovered that we have a Fax machine. After filtering and editing, the relevant items get entered directly into Wordperfect.

Most of the authors and columnists prefer to submit their work electronically. We either log on to their system, or they log on to ours. Sometimes an author sends a PC diskette, which we load and transfer to our MV/4000. Where feasible, we like to use XMODEM to ensure accurate file transfers. This is especially worthwhile if the author's work is a Wordperfect document. Otherwise, it takes a considerable amount of massaging to convert spaces into tabs, insert boldface commands, etc.

The goal at this point is to take care of as much formatting of the text as possible before handing the articles over to be desktop published. Desktop publishing offers wonderful tools for making things look good, but it's terrible for editing text.

Since several people will be handling each article, we file the articles in an easy-to-remember disk structure: a "cabinet" for each year, a "drawer" for each month, and separate "folders" for text and ads; individual documents are named for their author or subject. Such an open system doesn't keep track of who has edited the text or what changes they made, so we have instituted a manual system that logs each article and who has worked on it. Each article goes through the same sequence of reading, checking, editing, and double-checking.

Onto the page

When an article is finally ready, the editor schedules it for downloading to a Macintosh-based "pagination station." Again, the reasons for selecting the Macintosh were partly historical: we already had two of the old 512 KB Macs, and it was less expensive to upgrade them than it was to start over with PCs. We now have four stations, each equipped with a Mac Plus, 30 MB hard disk, and 16-inch monitor.

The other part of the decision came down to evaluating the differences between two major contenders in the desktop publishing arena: Ventura Publisher vs. Pagemaker. Both are good products, but Pagemaker had certain advantages for *Focus*. First, it is based on the metaphor of the graphic designer's layout table, which is comfortable for graphic designers and more amenable to designing individual pages. Ventura was developed more for producing documents that

The finished product can take on many faces, depending upon your output device. Models 4557, 4558, and 6454 printers will accept font cartridges, whereas the Model 6474 and HP printers will support downloaded fonts. Many fonts are available including Swiss 721, Times Roman, Helvetica, and Century Schoolbook. Intercon sells Interfont font cartridges that include the standard ASCII characters, super/subscript characters, fractions, international letters, and commercial symbols. Intercon will also customize fonts and put graphics and corporate logos on a cartridge. The Interfont cartridges use bit mapped fonts from Bitstream.

In addition to setting typefaces and point sizes, Office/Publisher allows CEO graphics to be merged from CEO Drawing Board, Wordview, CEO Charting, Present, and Trendview applications.

Automatic page numbering, headers, and footers are other Office/Publisher options. Pages can be numbered by page only, page and chapter number, or page and text label. Numbers can be located left, center, right, or verso-recto (alternate left to right depending upon whether it is a left or right page). Headers and footers can accommodate up to 10 lines and they can be left, center, right, or verso-recto.

Inside output

The Office/Publisher menu gives access to diagnostic and preview output, AOS/VS queue status, and request cancelling. When a document is published a diagnostic file is generated in the working directory of the user. This can be typed from CLI or accessed from the utilities menu. Viewing the file will disclose any errors or warnings that could interfere with the output.

The menu also gives access to Tag Image File Format (TIFF) graphics files. Using the HP ScanJet image scanner, a user can copy a TIFF file created by another computer and convert it to use with Office/Publisher.

Office/Publisher is different from CEO Desktop Composer or Ventura Publisher, which work with pre-created pieces. The publishing process with these packages is more akin to electronic paste-up with editing capability. While Ventura is capable of high quality output, it is an MS-DOS based package that must be run on a PC.

Office/Publisher allows you to turn a regular word-processing document into a book-quality published piece with graphics. It is not as elaborate as the other desktop publishing software, but the amount of time needed to learn how to use Office/Publisher is much shorter; for most CEO users who already know their word processors, the only training needed will be on the placement and use of copymarks. If you need further assistance, however, Data General Educational Services offers a two-day Office/Publisher training course. Δ

Joe Cannata, a training specialist with Data General Educational Services, conducts Office/Publisher training. He can be reached at 7927 Jones Branch Dr., Suite 200, McLean, VA 22102; 703/827-9690.

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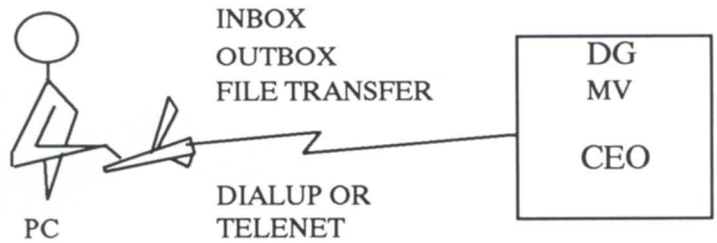

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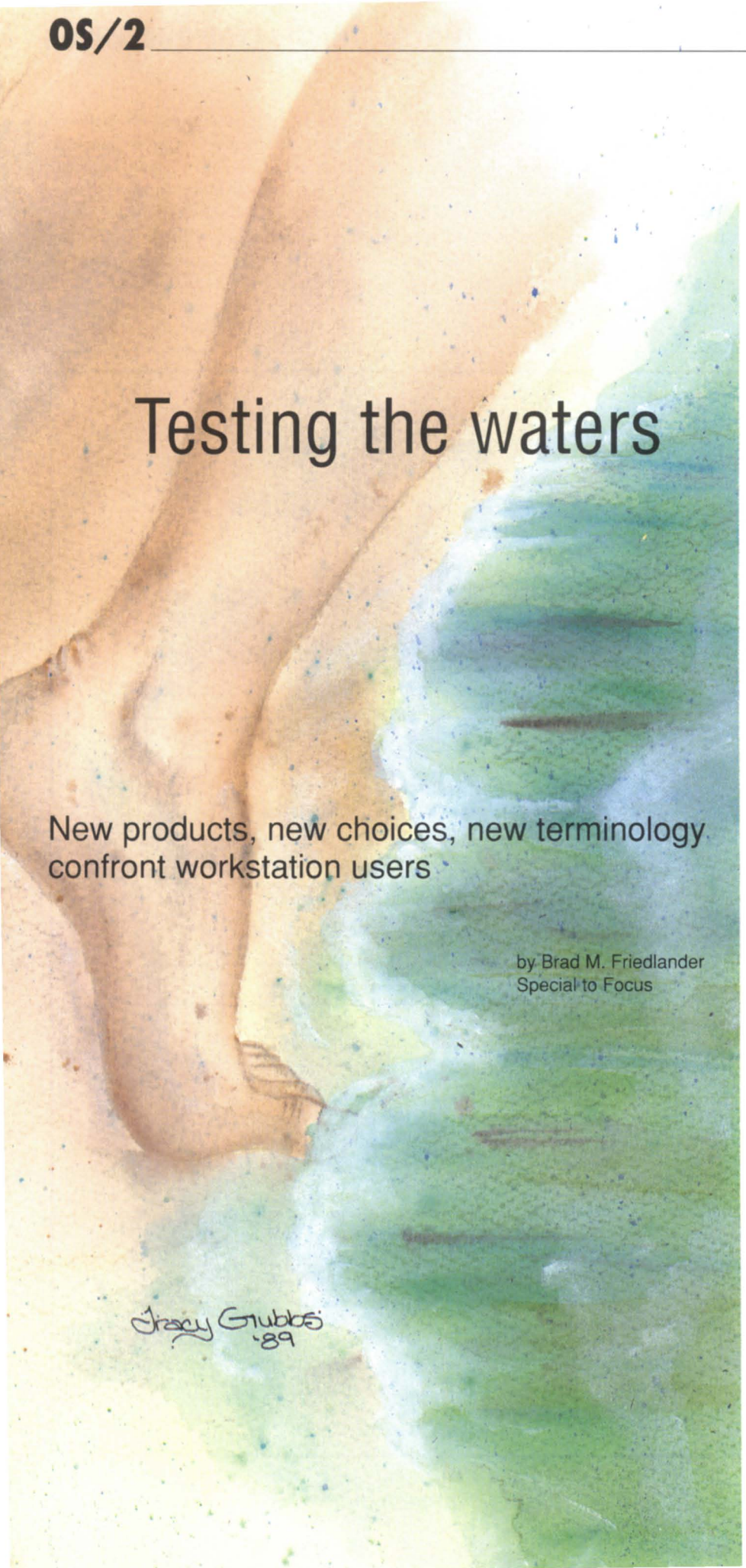
Testing the waters

New products, new choices, new terminology confront workstation users

by Brad M. Friedlander
Special to Focus



Just when workstation buyers thought it was safe to go back in the water, in washed a new wave of uncertainty. The PC and MS-DOS had seemed like a secure platform until IBM announced the PS/2 in April 1987. For IBM, the second-generation PS/2 workstations with the new OS/2 operating system represented new computing power, a leap in desktop processing speed, increased direct memory access, better graphics, and, most important, a major redirection in IBM's personal computer strategy. Two years later, however, the market is still making up its mind.

While PCs have become integral to many companies' operations, the introduction of OS/2 and the IBM PS/2 is forcing information systems managers to decide yet again what the proper software and hardware platform should be for the future.

Most potential PS/2 customers are aware that IBM markets PS/2 and OS/2 as indispensable to each other. They also hear that Microsoft licenses OS/2 to numerous other hardware vendors. As if that were not confusing enough, many users aren't sure what would make OS/2 a prudent purchase for them. Their uncertainty becomes harder to bear when they see that their choice of a hardware platform may restrict their options for the entire system, including operating systems and other application packages.

Complex choices

At its most general level, the decision-making process involves measuring present and projected applications against the new hardware and software. The user decision tree in Figure 1 (page 30) illustrates the complex choices. First, the user must define the relevant applications. Then, the application must be mapped onto the appropriate operating system: MS-DOS or MS-OS/2. If these are constrained by memory size, OS/2 can be a viable option. If the applications require multitasking, OS/2 again becomes the choice. In contrast, if they are not constrained by memory, do not require multitasking, and do not need the sophisticated, memory-intensive graphical interface of Presentation Manager, MS-DOS is adequate. If the demand is for only a modest graphical interface, users can run MS-DOS with Microsoft

are essentially similar from page to page. Pagemaker also offers simpler printing, because it prints directly to Postscript devices, rather than producing Postscript output files that have to be queued to the device.

Two of the *Focus* pagination stations are wired directly to the MV/4000. Using Versaterm for DG terminal emulation, they can log on and initiate a binary XMODEM file transfer of the Wordperfect documents. So far, so good. The next step is to prepare the file to be "paginated" with Pagemaker. A little sleight of hand is necessary here, because the current revision of Pagemaker hasn't learned to recognize Wordperfect files. However, it *does* recognize Microsoft Word documents, and since Macintosh Wordperfect can save a file in MS-Word format . . . . You get the picture.

The first pass through Pagemaker produces laser printed "galleys"—the document is produced in the proper font and column format, but with no other design work. The galleys allow the editors to gauge the length of the article while the author gives it a check for accuracy. Meanwhile, the graphic artists are at work planning placement of ads and cooking up illustration ideas.

All of this comes together during the eight-day production cycle, during which editors, ad sales staff, and artists go through as many rounds of corrections as it takes to make them all happy—usually from two to five versions of each page.

The staff keeps a "dummy book" of each issue, which documents the production cycle with laser-printed copies of each version of each page. By the time the magazine is ready for the printer, the dummy book fills two large three-ring binders.

When everybody is satisfied, the artists deliver Macintosh diskettes with the finished Pagemaker files to our typesetting vendor. It usually takes only a few hours to produce "slicks"—the full-page typeset film produced by the typesetter. The final step is to mount the slicks on art boards, produce detailed instructions for the engraver, and box up the whole thing for shipment to our magazine printer.

Summary

Publishing remains a labor-intensive process, even with the help of excellent tools. Desktop publishing is one of those excellent tools, but it will hardly put graphic designers out of business. In fact, as many people have already discovered, a graphic designer's touch may be more necessary than ever: it's hard to mess up a plain typewritten page, but when you put hundreds of type styles at the disposal of people who aren't trained to use them, the results can be anything but pleasing.

Desktop publishing doesn't make every user a publisher any more than electronic mail turned all of us into letter carriers. The real role for desktop publishing is to put better tools in the hands of people who can use them with skill and judgment. The same is just as true for the other excellent tools that are now available to help manage and improve the many tasks that are part of publishing. Δ

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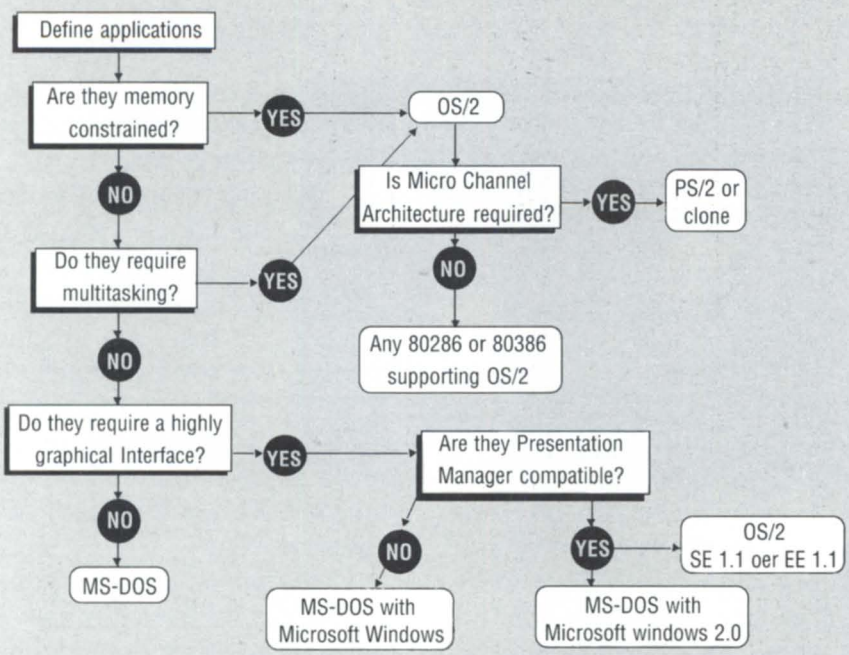
Figure 1: User decision tree



Windows 2.0, which can access Presentation Manager-compatible programs.

For those applications that consume large amounts of memory or require multitasking, the decision to go with OS/2 leads to related hardware choices. If the Micro Channel Architecture (MCA) is not required, any 80286 or 80386 computer that supports OS/2 is adequate. Only where MCA is needed should the user turn to an IBM PS/2 or clone system.

If the user decides on a PS/2 or clone, the next choice is between IBM's and another lic ısee's OS/2. Users also have the additional choice of Standard or Extended Editions of OS/2. Buying another licensee's OS/2 instead of IBM's precludes the use of IBM's Extended Edition (EE), which integrates data base and communications capabilities with the SE. However, other vendors should soon provide equivalent functions that will operate under any OS/2.

Not going with IBM's version of OS/2 also means not having to pay for the MCA and PS/2. (Pay is not just the relatively

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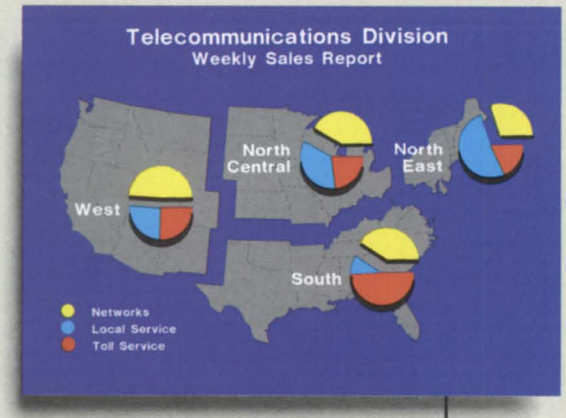

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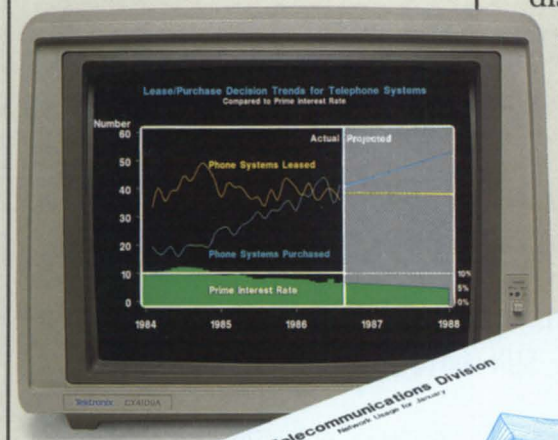

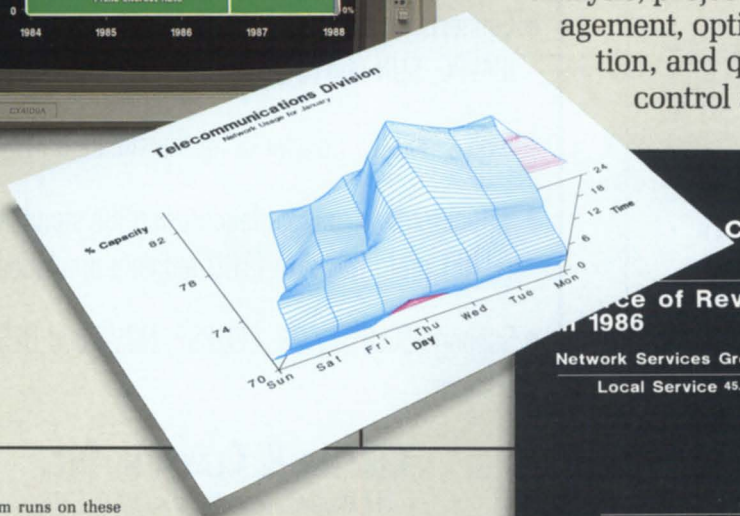

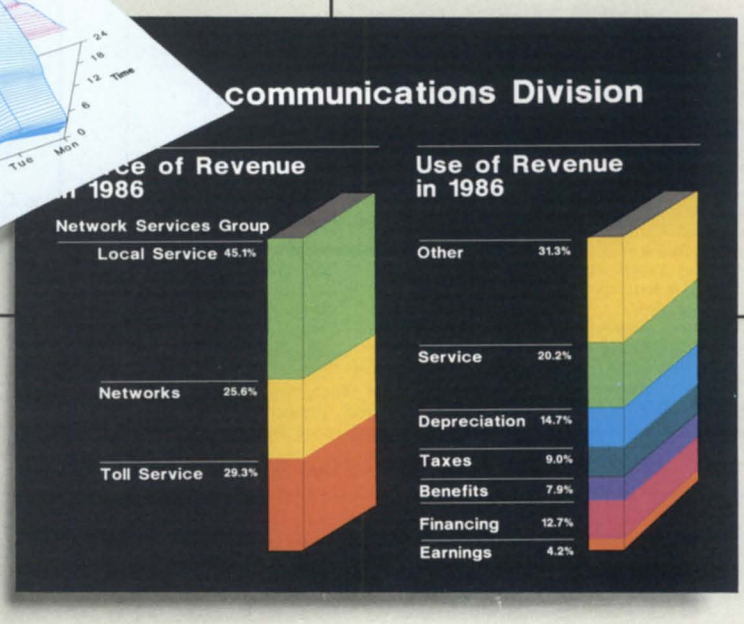

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basic questions must be answered:

- What applications does our business need?
- What operating system will best support these applications?
- What hardware platform will best support the operating system?

Because the hardware decision should come last, I will defer a fuller discussion of the hardware options to a later article. But in the meantime, what about the factors that affect the selection of an operating system?

Software availability

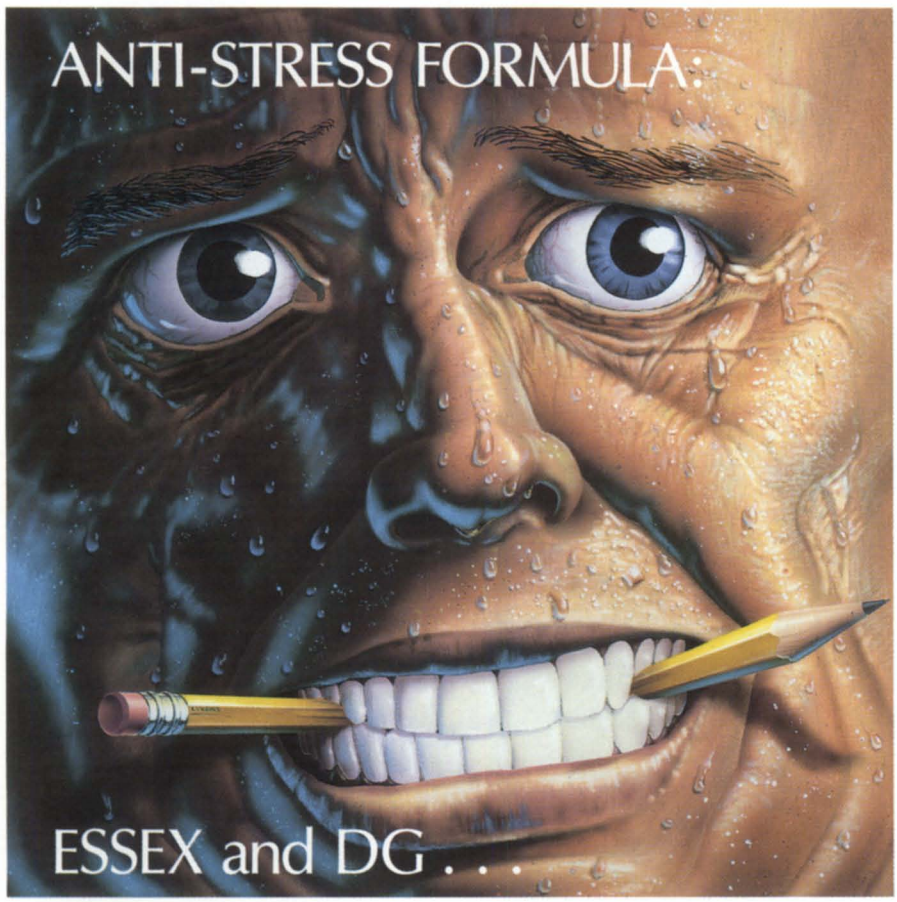
The primary issue is that programs designed to run under OS/2 will not run under MS-DOS, and vice versa. For that reason and a variety of other considerations peculiar to OS/2, the issue of MS-DOS versus OS/2 is not a question of simple cost/benefit analysis. Figure 2 summarizes some of the relevant factors, but potential buyers should also consider the following:

- Various versions of OS/2, from both IBM and other licensees of Microsoft, are already on the market—and more will come.
- The current versions of OS/2 are really for systems based on the Intel 80286 chip and do not take full advantage of the 80386.
- OS/2's potential for multitasking and large memory addressing are unnecessary for many people, but make the system a great boon for a few.

The lack of software stands out now as a primary deterrent to prospective OS/2 purchases. While numerous vendors will port their products to OS/2, the initial products will do little that they don't do under MS-DOS (although perhaps they will do it faster and without the memory constraints). Most products that are currently available are not Presentation Manager versions and are almost identical under MS-DOS and MS-OS/2. Some Presentation Manager applications (like Sidekick) are totally incompatible with the MS-DOS version. Users who look to OS/2 for software that will perform applications now impossible under MS-DOS must still turn to custom programming or do without. It will be many months or even years before these packages justify buying OS/2 products.

For all its quirks and esoteric command structures, MS-DOS runs on all Intel chips from the 8086 up. OS/2 requires at least an 80286. Based on current announced OS/2 plans, an Intel 80386 based system is probably the minimum platform to acquire for OS/2. More significantly at this stage, MS-DOS offers many thousands of commercial programs at costs acceptable to business customers.

Already, the anticipated release dates of many OS/2 products have been slipping. In addition, it will not be until Presentation Manager has been in software developers' hands for at least several more months that users will see a difference in the screen interface for their programs. Furthermore, the OS/2 capabilities of multitasking and addressing additional memory will remain underutilized until vendors create the needed device drivers to take advantage of these capabilities.



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small initial investment in new hardware and software. It also includes: scrapping peripheral boards (along with some devices); replacing or upgrading application software; and retraining users and support personnel.) Microsoft's OS/2 runs on 80286s without the MCA; however, this alternative eliminates the possible future advantages of incorporating peripherals and software specifically tailored for MCA. For users, this decision can be difficult, especially since specific advantages of the MCA (IBM claims increased throughput and speed) are still debated.

Considering that most routine business applications do not require OS/2's capabilities, there may be a substantial advantage in waiting a year or two until new products and the market's judgment make it clearer which combinations of OS/2-based products are significantly better than the MS-DOS environment.

Decisions regarding personal computers are no different from decisions about any other computer system. The same

Figure 2: Comparison of operating system choices

	MS-DOS	IBM's OS/2 SE and EE	MS-OS/2
Applications software	Much currently available	Very limited at present	Very limited at present
Graphical user interface	Presentation Manager-compatible user interface with Microsoft Windows 2.0	Presentation Manager	Presentation Manager
Other features	Runs on Intel 8086, 80286, and 80386 Addressable memory of 640 KB	Runs on 80286 and 80386 Multitasking Addressable memory to 16 MB, plus virtual memory of unlimited swapping of data with hard disk OS/2 EE has integrated data base and communications capabilites	Runs on 80286 and 80386 Multitasking Addressable memory to 16 MB, plus virtual memory of unlimited swapping of data with hard disk Licensees and third parties will add capabilities similar to IBM's EE

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grams, running in background. The same situation applies to MS-DOS.

Device and presentation drivers

Perhaps the stickiest question for operating system vendors will be that of the device and presentation drivers. The drivers for various peripherals and subsystems are totally different in OS/2 and MS-DOS. The presentation drivers are not required in MS-DOS except with Microsoft Windows. A conceptual representation of each system appears in Figure 3.

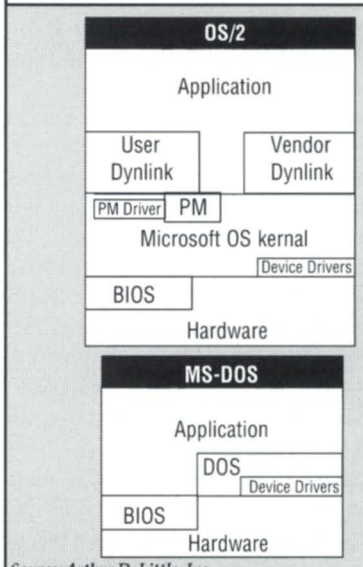
Device drivers manage the physical interaction of the device and OS/2. Presentation drivers manage the translation of generic display functions (e.g. bold and font size) into the device dependent commands.

Software running under OS/2 requires drivers for the users' devices, either from the software vendor or from the users. In addition, the Presentation Manager will require additional drivers to interface its functions with various display and printer hardware.

Standard or extended edition

The OS/2 Standard Edition is available now from Microsoft and numerous vendors who add their own device drivers while keeping the system compatible with the standard.

Figure 3: Exploded view of OS/2 and MS-DOS



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The Extended Edition is a proprietary product of IBM and is also available today. OS/2 EE is fundamentally the same as the OS/2 SE version, but it has additional dynamic link (dynlink) libraries (collections of subroutines shared among programs) that provide special functionality and some additional I/O drivers. Access to dynamic libraries is very similar to AOS/VS inner-ring calls. Dynlink does not bind the library to the program before it executes, so it allows users to switch libraries while the program is executing. IBM differentiates the OS/2 EE with SQL (Structured Query Language) data base and communications interfaces. This positions the product well for large corporate users in IBM networking environments where SQL is the norm.

Other vendors can and will provide similar functionality. Some will concentrate on other popular data bases, such as Oracle. Users should expect SE and EE

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Multitasking and expanded memory

Multitasking is when a single PC can execute two or more programs concurrently, allowing the user to make better use of time otherwise spent waiting for a massive computation, file I/O, or data communication to finish. OS/2 supports the same levels of multitasking as RDOS, AOS, and AOS/VS. This includes multiple concurrent processes and concurrent tasks within a single process. The latter is a key difference between OS/2 and Unix.

Multitasking ranks as the great potential of OS/2. Only since 1988 have a few operating environments layered over MS-DOS been able to perform true multitasking. However, setting up the software for such multitasking is often tedious and arduous for many users.

In general, however, multitasking is not only beyond the need of most users, but is also not the way they are accustomed to working, and is often inconsistent with the way they have been trained. Users doing even sophisticated word processing seldom if ever will need background computation or communication. Print spooling, which is widely available in the form of printer buffers under MS-DOS, is the most a typical user would require. Having the ability to switch quickly from one program to another is useful to many, but since this can be done under MS-DOS today it does not, by itself, justify buying the more expensive OS/2 environment.

On the memory side, OS/2 can directly address up to 16 MB of memory without requiring switching between banks of chips (one MS-DOS approach). Software that writes large blocks to memory should be easier to use under OS/2 than under MS-DOS, which has a maximum application-usable address of 640 KB. When an OS/2 program needs more RAM, the operating system hunts for chunks of unused memory and logically consolidates them, creating larger segments into which data can be moved. If memory is short—maybe because of heavy multitasking—OS/2's virtual memory kicks in and begins swapping segments to and from the hard disk.

Yet for the moment, only a few "power users" in a typical firm have spreadsheets or decision-support programs that require more than 640 KB. These users are good candidates to migrate to OS/2 now. A good strategy is to start by buying a small number of systems, which provides a cost-effective way for companies to sample the technology without committing to a large-scale conversion.

Multiuser ability

OS/2 will not inherently accommodate those people looking for multiuser systems. IBM's OS/2 RPG II program is a special application supporting dumb terminals and is intended to be the only application running on the machine. By design, all versions of OS/2 are made for a single user and give the current inputs from that user immediate precedence over any other task. For example, a command from the "active screen group" (the monitor, keyboard, and other input devices) could interrupt any other task under way. This would disrupt time-sensitive applications, such as telecommunications pro-

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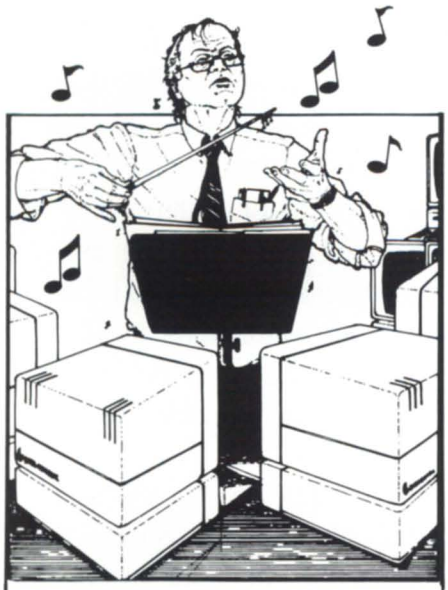

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PRESIDENT'S PAGE

to the shops—about a hundred specialty stores inside a beautiful mall stretching nearly three blocks along the Mississippi. Then we were there, and the Board members' jaws began to drop.

The lobby area of the convention center is bigger than a lot of airports. The meeting rooms upstairs are large and well-equipped. Each of the three exhibit areas would be big enough to house several Goodyear blimps—and each has a glassed-in catwalk above to give a panoramic view of what's going on below.

If you take into account only the facilities, this could easily be our best conference yet. But obviously it takes a lot more than facilities to make a conference. That's where Jan Grossman's Conference Committee comes in.

Jan has been working since last fall to get plans underway for the conference program and activities. The theme this year, "Emerging Technologies—Changing the Challenge," has a special appeal considering Data General's new strategies with RISC/Unix and communications. The call for presentations has already gone out, and early returns lead us to think there will be more and better sessions than ever before. Once again, the sessions will be arranged around separate "tracks" for end users, technical users, and management. There will also be room in the exhibit hall for as many as 100 booths—nearly every company that displayed its products last year will be back, along with quite a few new ones that have already expressed interest.

Jan's committee is also working on several little extras for attendees, including a packed social program, an expanded spouse program, and a special conference bonus—the 1989 T-shirt! (It'll be hard to top the shirts from Las Vegas and Philadelphia.)

If you've never been able to make it to one of NADGUG's conferences, I urge you to put Conference 89 on your calendar now. Travel and housing will be a bargain this year, and the conference remains one of the best ways I can think of to further your professional education, check out new products, talk about common problems with other DG users, and make your views known to Data General.

■

This year's spring board meeting was routine in many ways, but quite exciting in others. In years past we often spent hours reviewing the status of Regional and Special Interest Groups, but Charlene Kirian's RIG/SIG Committee has streamlined that process down to a few minutes. Likewise, the Publications Committee needed only a few minutes for its report. However, there were three areas that got a lot of extra attention.

First of these was the new Membership Committee chaired by Bart Bates. This committee was formed last Fall to focus extra attention on NADGUG's commitment to grow and extend new services to our members. Bart got off to a strong start when he presented a long list of suggestions that ranged from the obvious to the esoteric. The thrust of all of them was that NADGUG needs to strive for more visibility in the DG community by doing more for members. Part of this is marketing—getting people to see that NADGUG is working for their best interests. In addition, the committee is looking into additional services the group can offer to make NADGUG an even better deal for members.

For its part, Data General made a more substantive report to the Executive Board than ever before. In addition to the DG personnel that are directly responsible for working with the user group, we had presentations from two Franks: Frank Kenney, manager of DG's software business group, and Frank Keaney, DG vice president and a longtime friend of NADGUG. Both discussed the friction that developed between users and DG over the introduction of AOS/VS II last fall. The message from each Frank was that DG is committed to work harder to communicate with users and avoid conflicts like this in the future.

Finally, NADGUG budgets got a very thorough going over. This has been a problem area for the group in the past; we didn't have a formal process for reviewing expenditures against budgets, and committee chairs had a hard time getting a summary of their expenditures. That should change now, because we are putting all of our accounting on NADGUG's computer. It is my sincere hope that by this time next year, budgeting will become another one of those Executive Board responsibilities that will become quite routine. Δ

versions of OS/2 from various hardware and software firms.

User interfaces

Underlying the concepts of IBM's OS/2 SE and EE are the two Systems Applications Architecture (SAA) user interfaces. The OS/2 SE version 1.0 is text-oriented, designed to work with such programs as Lotus 1-2-3. The Presentation Manager provides a separate, graphics-oriented interface more typically associated with drawing programs.

Users who need a single graphics-oriented user interface have a choice between PM under OS/2 SE 1.1 (or EE 1.1) and Microsoft Windows 2.0 under MS-DOS. However, the program source code is not quite compatible. Both will provide the same functionality and appearance and limit the amount of support needed. Together, the operating system and interface choices place constraints on the hardware and software that will run on them.

Conclusions

If nothing else, the availability of OS/2 will force many users to analyze their PC use and expectations. Right now, most people rushing to purchase OS/2 will pay a lot and get little. The operating system and supporting hardware are more expensive than MS-DOS systems, and virtually no software exists that takes full advantage of them. Prices will drop within the next two to three years, while the functionality will increase over the same period.

Two sets of users who are immediate prospects for OS/2 are those who need a highly graphical, interactive user interface with mouse or similar input device accessing icons and windows, and those who need the ability to run several background activities that consume a fair amount of processing on their own concurrently. This universe is extremely limited, probably less than 1 percent of all users.

Another issue users face is whether to keep a single PC environment or convert to a multiple environment. At first glance, maintaining a single environment seems easier. However, it becomes more complex when a single user or a small set of users need OS/2. Then, in order to give each user what is needed, the business will have to be capable of migrating incrementally from MS-DOS to OS/2.

Until the products proliferate, many customers may make best use of their PC resources by purchasing a few OS/2 systems to get an idea of their performance on existing applications. Only when it becomes obvious that OS/2 offers something clearly superior is it likely to be a good decision to convert to that environment. Δ

Excerpted with permission from ***PS/2 and OS/2 in Practice: User Decisions and Vendor Dilemmas****, published by Arthur D. Little Decision Resources.* *The author, a member of Arthur D. Little's Information and Telecommunications Systems Section and a past president of NADGUG, specializes in mixed-vendor multiple-host networks, intelligent workstations, capacity planning, and performance analysis. He can be reached at Arthur D. Little, Acorn Park, Cambridge, MA 02140; 617/864-5770.*

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Office party

New features make Wordperfect's Office a strong OA contender

Any visitor to last year's NADGUG conference could have stopped by Wordperfect's booth to "kick the tires" of three different versions of the company's entry in the office automation road race. The official entry was "Library," a product that has been on the market for about two years. However, with a minimum of ingenuity, visitors could also peek under the hood of two prototypes for future revisions. One of these will soon be released as "Office," a successor product to Library.

Wordperfect recently sent *Focus* a beta-test copy of Office to put through its paces. With about two months to go before formal release of the product, neither the documentation nor the programs were in the final, polished form that users expect from "shrink-wrapped" sofware. However, with a very few exceptions (which I'll go into later), everything installed and ran smoothly.

Considering the controversy that erupted over DG's new versioning policy for AOS/VS, it's natural to ask how Wordperfect will handle the transition from Library to Office. According to Guy Pribyl, marketing manager for Wordperfect's DG products, Office will replace Library, and customers who have been paying for software subscription will receive the upgrade without additional cost. Otherwise, there will be an upgrade fee. Pribyl said that Wordperfect will provide limited support for customers who opt to stay with Library: it will attempt to fix outstanding bugs, but does not intend to enhance the old product.

Like its predecessor, Office is designed around a tailorable menu shell that integrates electronic mail, appointment calendar, and phone message capabilities. Office also offers two new features: a full-function calculator and a "notebook" (really a flat-file data base that can serve a variety of functions; one obvious use would be as a name and address file). One feature of Library that is missing from Office is the appointment scheduler.

Customers can buy Office either by itself or as a package that includes other Wordperfect products—especially the word processor and spreadsheet. Doing so will let them use "hot keys" to move quickly between applications; a "clipboard" and compatible data formats make it relatively easy to cut and paste data from one application into another. In addition, the Office main menu can be tailored to call other user applications and submenus.

That's what Office is supposed to do. The obvious next question is whether it performs as advertised. With one exception (probably temporary), the answer is, "yes." The exception was the notebook, which was not available at the time we ran our tests. According to Jeff Hall, Wordperfect's manager of DG testing, "This is the only part of Office that isn't completely ready. We're committed to begin shipping within 90 days, and this is the newest part of the product. Everything else has been out there a while and has been pretty well tested."

The installation instructions were simple and accurate, and the whole installation procedure, including reading the instructions, took only about two hours. I was surprised that there were two release tapes—one for Office and the other for Wordperfect's program editor, P-Edit. A review of the installation instructions explained that a P-Edit macro called ADD_DISK_FIELD would convert Library's user information files into the format used by Office.

In other words, P-Edit was there to handle the conversion from Library to Office. That's considerate, but it seemed odd to do it in a way that required them to ship a copy of P-Edit (for which they normally charge a license fee). This had the look of an interim solution—it seems likely that there will be a simple standalone conversion program by the time Office is formally released.

However, I soon discovered that P-Edit revenues wouldn't suffer even if ADD_DISK_FIELD turned out to be the permanent solution. *All* Wordperfect products now use an anti-piracy lock that requires the user to type in a password to unlock the program after installation. The lock gives Wordperfect the option of setting both an expiration date and a maximum number of users for any product they ship.

Regardless of how the conversion is handled, it *is* a conversion. New features in Office make it incompatible with Library. ADD_DISK_FIELD takes care of only one of the differences (it adds a field to each user record so electronic mail can be spread across many disk drives). Mail groups will have to be reentered, and old mail messages from Library can't be read into Office. The data from the Library calendar is usable in Office, but not vice versa. Menus and submenus that were created or modified in Library will have to be redone in Office.

For current Library sites, it would be wise to think through the differences in the two products before undertaking the upgrade. For example:

- If your users like to keep old mail messages as reminders of things to do, give them plenty of time to move their reminders onto the calendar's to-do list.
- If your site uses Library's scheduler, you may need to stay with Library, be-

cause Office doesn't have a scheduler at this time. (Wordperfect's Hall said he expects that a future revision of Office will bring back the scheduler.)

• If your site used the tailorable menus and submenus to give individual users only the menu choices they actually use, then give yourself plenty of time to recreate all those menus in Office.

If these changes annoy current Library users, it's worth remembering that the differences are there for a reason. Office has significant features that weren't in Library. Also, many of the features that *were* in Library have been streamlined or improved in Office.

For example, the calendar in Office is a significant improvement. One window shows about eight weeks of dates, while three other windows list memos, appointments, and a to-do list for the current day. All are visible at the same time. The calendar also offers almost as much control as a word processor over how the information looks. It's possible to use boldface or underlining to make some items stand out on the screen, and extensive printer controls are available—including a print preview option. The windows shrink and grow automatically to show as much information as possible, and Macintosh-like scroll bars show whether lines of information have scrolled off the window. Other Mac-like features include the ability to cut and paste memos, appointments, and chores into other days.

Two other calendar features deserve a mention. "Date difference" automatically calculates the number of days from one date to another. "Auto-date" will automatically write a memo, appointment, or chore into every date that matches the criteria you set. A superstitious person, for example, might remind himself to avoid black cats on every Friday the 13th for the rest of his life.

Electronic mail in Office uses "envelopes" that can contain a message and/or a file. This system takes some getting used to, but once you master it, it works well. There are also many options for controlling how the envelope is sent: urgent, encrypted, return receipt, auto-delete when read, etc. All of these options can be set either globally, or for individual messages. The mail outbox also provides a lot of new information, including the time and date a message was opened and deleted. In addition, E-mail provides full control for printing both messages and files.

When mailing to a defined group of mail users, it's possible to list the members of a group to your screen, then designate whether each individual is to receive a carbon copy, a blind copy, or be excluded altogether. If mailing to more than one group with overlapping memberships, E-mail sends only one message to each recipient.

The Office calculator features separate modes for programming, scientific, financial, or statistical calculations. It will also keep a "tape" of the calculations and entries that can be saved as a disk file or cut and pasted into other applications. By referring to the on-line help I was able in just a few minutes to figure out how to calculate the principal balance remaining on my home mortgage—and the answer agreed with my Canon financial calculator.

As noted above, the notebook data base wasn't available for review. However, if it works as described in the manual (or as it is currently implemented in Wordperfect Executive for the PC), this will be a welcome addition to most desktops. Imagine being able to set up a Rolodex file from which you can select individual names, and then directly produce a merge file for doing a mass mailing.

All of this persuaded me that Office is a significant improvement over its predecessor. But how does it stack up against competing products? Very well, with a few exceptions. One of these is screen I/O. Office draws lots of boxes and then fills them with data. This is fine at 19,200 or 9,600 baud, but excruciating if you're dialing in with a 1,200 baud modem. Data General's CEO is much better in this respect. I would also fault Office for its sometimes confusing array of equivalent commands—one screen listed three different keystrokes to accomplish the same result. One other comparison worth making is filing: CEO automatically enforces a strict drawer:folder:document structure, whereas Office allows users to store their documents in as sloppy a fashion as they want.

Taking these factors into account, it's still clear that Office is a very strong OA product that's bound to get much better in coming months.—G.F.

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Fine-tuning tradition

Inside Carnegie Hall (Photo by Steven J. Sherman)

MV system helps orchestrate fund-raising for Carnegie Hall centennial

by Betsy Zullo • Special to Focus

Carnegie Hall hails its 98th season this year—quite a feat for a building that was almost demolished when the New York Philharmonic announced in 1959 that it was moving to a new building. Isaac Stern, famous violinist and current president of the Carnegie Hall Association, was instrumental in saving the structure and preserving what has become a cultural constant for classical music aficionados throughout the world. So, in the midst of yet another busy concert season and with the 100th anniversary still two years away, board members are busily planning the centennial celebration.

"We are booking the biggest names in classical music to perform at Carnegie Hall during its 100th season—especially during the anniversary week," said MIS Manager Barbara Scheine.

"Those types of tickets are pretty hefty in price, usually $1,000 and up, and to sell them we have to do special solicitations. We send out invitations to a special mailing list which is on our computer system. The subscriber and donor data base are both on the Data General," she said.

To handle special solicitations, ticketing, accounting, and fund-raising, Carnegie Hall installed in September 1987 a mirrored Data General system on two MV/15000 Model 8s. "System A handles ticketing—box office and subscription sales—and some marketing. System B tackles fund-raising tasks," Scheine said.

The hall previously had a Wang 2200 that was used primarily for fund-raising; everything else was manual. "The amount of fund-raising we could do was limited because the system was not very sophisticated. We couldn't do any serious sorts and it was very difficult to extract information from the system. For example, we were unable to compile a list of donors who contributed more than $1,000 within a certain time period. That would be important information to have for sending invitations to those who might purchase tickets for those expensive centennial week performances," Scheine continued.

Growing pains

It soon became clear that Carnegie Hall had outgrown the Wang computer, and board members didn't waste time deciding on a new system. "When the board narrowed the choice down to two vendors (Data General and Hewlett-Packard), they called users and asked their opinion of Data General hardware and software support. Data General had a more impressive service and software support record compared to the other company," Scheine said.

Once the decision to purchase was made, the Labor Day weekend installation went off almost without a hitch. Scheine recalls, "We took a couple of storage rooms and a back stairway and converted that space into the computer room. There were a few problems in running the cables because the computer room is on the seventh floor and the box office is in the basement. But once installers figured out where the phone lines were, they ran the computer cables next to them," she said.

Calculating the savings

In addition to saving time and money, the Data General system allows the association to do many things that just weren't possible on the Wang.

"The system allows us to evaluate the number of tickets we sold at various discount prices. With a hard ticket it is difficult to tell at what price you sold the tickets unless the price was recorded when it was sold. Now we can just look up the exact number of tickets that were sold at each price. There is an enormous savings in time for our people in that they are not having to manually tally this information," Scheine said.

She continued, "We can save a lot of time when a concert is cancelled. We just pull a list of those who purchased tickets for an event, print labels, and send out cancellation notices."

A staff of five (Scheine, an assistant, and three computer operators) keeps Carnegie Hall's 80 terminals humming seven days a week, 16 hours per day. "We have no in-house programmers and use existing software as opposed to generating our own. The software vendor has done special programs that we have requested. If there is a report not being generated on the system, our software

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Indiana **RIG** *up and running!*

DGUI (Data General Users of Indiana) is a new group that is abundant with user enthusiasm and strong with Data General support! The group's members have determined that education and networking with other DG users are their main objectives and will plan meetings with these goals in mind. So, if you are in the Indiana area and want to learn how to get the most out of your DG system or you want to make valuable contacts close to home, join the group today!

DGUI has had two meetings and is ready to start running with a full schedule for the summer! The next meeting is May 10 at 2:00 p.m. For details on location and program topics, contact either Nancy Miller at 317/253-1711, Don Haycox at 317/271-1542, Annette Kaub at 317/573-2980, or Arden Grubb at 812/934-4953.

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company will write a program so that we can do that report," Scheine said.

The software is written by two companies that work together. The ticketing system is provided by GIS Systems of Tampa, Florida, and the fund-raising software is written by Complete Computer Systems in North Philadelphia, Pennsylvania.

Performance

As far as problems with the system itself, lack of speed seems to be the major drawback. The hall has experienced significant performance problems that Scheine thinks are related to the fact that the vendor underestimated the hall's needs when configuring the system. "The original system cost $500,000. Last year we added $250,000 worth of equipment and this year we are tacking on another $350,000," Scheine said.

The Carnegie Hall Association is committed to doing whatever is necessary to keep its AOS/VS system efficient and operational and doesn't plan to join the Unix bandwagon. "We have too much invested in it to change to Unix," she said.

We have stressed to our vendor that we really didn't want to go to our board in a year and ask for more equipment

"We will soon install a facilities scheduling system. The accounting right now is PC-based, but we are going to be converting that over to the Data General. Our ticketing and fund-raising system is not integrated at this stage and we are planning to have an integrated system; we now have a separate subscriber and donor base," Scheine said.

Budgeting for growth

Much like a large company, Carnegie Hall works within strict budget constraints. And since the association is nonprofit, its board has to approve large ex-

penditures, such as the computer system. "We have stressed to our vendor that we really didn't want to go to our board in a year and ask for more equipment, and we asked them to give us a little more than we actually need. This latest upgrade is what they are recommending, although I'm hesitant to say that this is going to be it," Scheine said.

"Not everybody is on CEO right now because of the additional cost of the terminals. We can't just go ahead and order terminals. We have to get all of this approved. So a lot of the stations are PCs. The employees who do not have a Data General have a PC to do word processing," she said.

One expense that was (and is) considerable and wasn't figured into the total cost was training employees to work the system. "We couldn't afford the training for CEO that Data General offers so we had to go out and hire a consultant. I just felt that training in general was very expensive and it was a cost that was not budgeted as we were configuring the system," Scheine said.

Despite some training problems, Scheine notes that it is fairly simple to obtain specific information from the system. "If someone needs a report on how an event is doing, we can quickly show them how to go into the system and get the information they need," Scheine said. "And on the fund-raising side, it's very easy to train someone to look up a donor to see what their history is. We have 73,000 accounts on the subscription list. The system also keeps track of 51,000 donors and prospects."

Future plans

Scheine stressed how valuable the system has become to the hall's fund-raising efforts, and how those efforts will be enhanced once the integration is complete. And, although the system won't tie directly into the new 60-story office building Carnegie Hall Association is constructing, it is sure to play a key role in the hall's expansion.

For now, Scheine's job is to ensure the system is up and running every day so the employees can manage their jobs more effectively. "When I help people by showing them how to do things on the system, it gives me a lot of satisfaction. They can do their job a lot easier because of what I do," she said. Δ

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File transfer products

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(This article is the last half of a review of file transfer products. The first installment, "Transfer student: A close look at how BLAST, TEX, Softerm, and Smarterm handle file transfers" appeared in the April 1989 issue of ***Focus.****)*

VTERM

VTERM 1.04 is a virtual terminal emulator from American Airlines' SABRE travel information arm. The program uses the XMODEM protocol, and it can be invoked in one of two ways—by pressing Ctrl-Shift-F6 while you're using its DG terminal emulator program, or as a standalone program, XMDM.PR. The standalone programs sent LOAD_II in just about 20 minutes, or better than 827 bytes/second, making VTERM the fastest of the XMODEM protocols I've tested. It's also small and unobtrusive—the 24 KB file used about 4.4 percent of the CPU. If all you're interested in is doing is fast XMODEM transfers, this is the program to get.

MATE

MATE revision 1.20 from Concept Automation, is another virtual terminal emulator that supports XMODEM. MATE's protocol is not standalone, and I could find no method in the manual for starting a transfer through command line switches. Therefore, files can't be sent automatically, but instead must be invoked from within the program by using F12 to receive and F13 to send. For those of us with 6053 terminals or who are using a PC and an emulator, this is a minor annoyance. I never use function keys 11 through 15. If I'm using something that requires them, such as DISCO, I simply ^C^B out of it. This is because function key mapping is different in every emulator—Alt-F3 in Pereline, Alt-3 in Mirror, Shift-Tab-F3 in Smarterm 400, etc. For this demo, I had to find my manual and look up what to use, because MATE wouldn't let me use ^C^B to terminate it.

MATE transferred files at 802 bytes/second, but used almost 9 percent of the CPU time in doing so. In last month's column, I advised not to bother with ASCII file transfers while using a direct connection. I tried it with MATE, anyway—it sent a 52 KB file in just under 18 minutes, for a top speed of 49 bytes/second. In addition, if you type "escape" to try to get out of the transfer, MATE bombs out with a stack error. Here's a case where you really don't want to do ASCII transfers!

Breakthrough

Breakthrough , from Applied Computer Solutions, is designed exclusively for file transfers—no virtual emulation or other applications. I was a little disappointed, then, when the XMODEM transfer of my file took over 28 minutes. A product designed explicitly for transfers should be able to do better than 592 bytes/second, and should use less than 10 percent of the CPU.

The first time I tried Breakthrough, I left its console line number set at 5, the default, rather than 17, which I normally use. As soon as I started the transfer, the program dropped me into AOS/VS Debug. Art Giuliani, the company's president, told me that this was to facilitate problem solving. While this may have been desirable during the development stage, I feel that it's not very friendly—and potentially dangerous—to terminate a program by this method. I don't want anyone on my staff seeing DEBUG! I'd much rather the program terminate with a message such as "That line is already in use."

Turbotran

Turbotran rev 1.21, from Data Bank Associates, is also a file-transfer only program. It transferred my file efficiently and quickly—765 bytes per second, consuming about 5 percent of the CPU. Turbotran also offers YMODEM, which few of the other packages do.

Like TEX, Turbotran simply worked well. Turbotran, however, includes an interactive mode with a useful—if minimal—help screen. Some transfer statistics are shown before the transmission of the file. Unfortunately, these statistics are incorrect. The program gave an estimated transfer time for my file of 4 hours, 43 minutes, or more than 10 times what it actually took. I don't know if Turbotran is assuming that I'm transmitting at 1200 baud or what, but these numbers should either be corrected or removed. There's a good chance that an end-user wouldn't even try to transfer a file if he or she saw that it was going to take four hours.

The YMODEM transfer was, as expected, quicker than XMODEM. LOAD_II transferred at 860 bytes per second—better than 12 percent faster than the XMODEM transfer. In a clean line environment, I can't see any reason not to use YMODEM for all of your file transfers, and I wish other manufacturers would include the option. Chalk up a big plus for Turbotran.

If you happen to be using Smarterm 400 as your emulator, Turbotran has the

simplest method of transferring files that I've seen. Simply typing XSEND {DG file} {PC file} transfers my file to the PC—no setting up Turbotran or Smarterm, no additional commands necessary. Typing XRECEIVE will import files. This is definitely the way to go if you have users who have problems remembering their password! It's a simple and elegant procedure that should be included in any file transfer package. In fact, I'd like to see a Turbotran macro for other terminal emulators.

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Turbotran rev 1.21
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Data Bank Associates
20010 Century Blvd., #104
Germantown, MD 20874
301/540-5562
Contact: Edward Rosen

PC/Remote
$1,500–$24,000
Rational Data Systems
150 South Los Robles Ave., #410
Pasadena, CA 91101
818/568-9991
Contact: Doug Kaye

PC/Remote

Finally, I took a look at PC/Remote, from Rational Data Systems. Now, calling PC/Remote a file transfer program is a little like calling an MV/40000 a word processor, but Remote does include file transfers, so I thought I'd take a look. My file transferred at 540 bytes/second in the only mode PC/Remote has—error free—which places it at the top of the error-free transfers not using compression. Doug Kaye, the president of Rational Data, tells me that the program was designed for minimum system impact. He acknowledges that PC/Remote is not the fastest transfer utility available, but by doing such things as writing in 128-byte blocks, the IAC default, overall system performance will be optimized. My tests bear this out—CPU usage was 8 percent, the lowest impact of all of the error-free transfers. In addition, the nature of PC/Remote makes file transfers incredibly simple. To move a file from the PC to the MV, I typed PCR EXPORT AFILE:UTIL:AFILE.

Of course, PC/Remote will do much more than file transfers, but that's another story, and deserves a separate column. Suffice it to say that PC/Remote was the easiest, fastest, and least obtrusive of the error-free transfer programs that I tested.

There may be a dearth of software for Data General in some areas, but when it comes to file transfers, you just about have your choice of speed, ease of use, and price. What you should buy depends on what you need out of it, and in this case, there are plenty of alternatives.

Odds and ends department

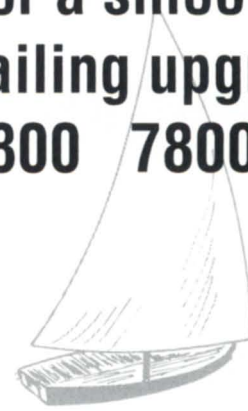
I'm giving a provisional blessing to VS 7.64. It's been up a month, and I have my printers back, and have run into no other problems.

For a pleasant change, I know what I'm going to write about for the next few months. My next column will be the ICOBOL 1.50 column. Rev 1.50 contains all of the file changes, and requires running MINISAM_CONVERT on my files. Actually, I'd much rather wait until someone out there does it and calls me with the results—but duty calls.

The column following that will be a review of the Megatape GT/88 tape drive. If you're planning on purchasing a tape drive, *do not* do it without calling Megatape. Just to whet your appetite—how does 2 gigabytes on an 8 millimeter VCR tape sound? Δ

Tim Boyer is EDP Manager at Denman Tire Corporation. He may be reached at P.O. Box 951, Warren, OH 44482; 216/898-2711 or on the NADGUG bulletin board at 415/924-3652.

For a smoother sailing upgrade 7800 7800XP



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Hot links

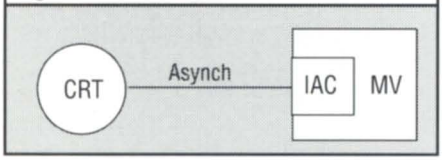
Termserver, ITC tame terminal connection nightmares

In a two-part article, this month and next, we'll look at something that affects terminal and PC users alike: terminal interconnection and emulation via ethernet. There's been a lot of activity in this area for the past year or so, but relatively little discussion of this new technology. New, at least, to Data General.

The Problem

Figure 1 shows the traditional way to link a terminal to an MV family computer: via an asynchronous connection to an IAC. Most terminals are connected in this manner today, but as DG central processors get larger and capable of supporting more users, the question arises, "How are we going to connect all these users to the MV?" Can you imagine an MV/40000 with over 1,000 RS-232c lines and 64 IAC-16s? Neither can I.

Figure 1: Traditional link

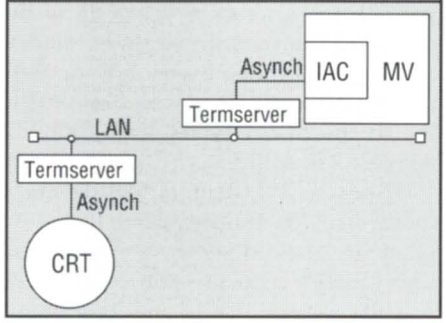


Along with this technical challenge to Data General comes a competitive one. DEC has been using ethernet as the standard method of terminal interconnection for a few years now. Whereas it is only a sophisticated DG shop that has ethernet cable installed today (typically for Xodiac), LANs such as these are common in the typical DEC shop.

Termserver: the teaser

Last year, Data General announced a gadget called the Termserver. A Termserver is sort of an ethernet-to-asynch multiplexor. It connects to the LAN, and provides 10 asynch ports for terminals, printer, etc. In the configuration shown in Figure 2 you still have lots of IACs and asynch cables, but the cables only go as far as the Termserver. From there, virtual circuits or connections are established to ports on remote Term-servers placed elsewhere on the LAN. This configuration provides port selection, and the ability to move terminals without running new wires all the way back to the MV, but it does little to eliminate the mess behind the computer. It is also fairly expensive since each connection requires two Termserver ports (one on each end) *and* an IAC port.

Figure 2: Termserver

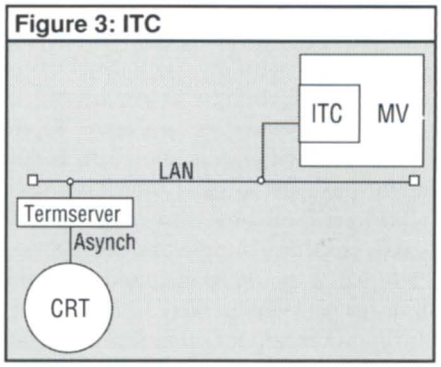


Enter the ITCs

Instead of using IAC-16s or IAC-8s in the MV family computer, there are two new controllers, the ITC-128 and the ITC-64. I hope you get a chance to see one of these things, for they are impressive pieces of hardware. Each ITC-128, for example, contains seven (yes, seven) Motorola MC68000 microprocessors. These are divided into two groups. The first group of four CPUs interfaces to the minicomputer, and with the proper download code, appears to AOS/VS as a 128-line IAC. That's the equivalent of eight IAC-16s. The other three 68Ks communicate with the Ethernet. That's a lot of horsepower for one 15- by 15-inch controller, and it's quite well stuffed with silicon.

Think of the ITC-128 as a 128-line IAC with remote ports. (See Figure 3.) These ports are delivered in the form of Termservers connected to the ITC via an ethernet. There is no hard-wired association between a port on a Termserver and a particular ITC-128 console number. When you turn on a terminal connected to a Termserver, you are first greeted with the Termserver's command line interface. If you want to connect to a port on your MV, you will type something like "CONNECT MV". If you want to connect to a particular port, you might type "CONNECT CON82". The system manager may also preconfigure the Termserver so that a particular port on a Termserver is always connected to CON82 on the ITC-128.

Figure 3: ITC



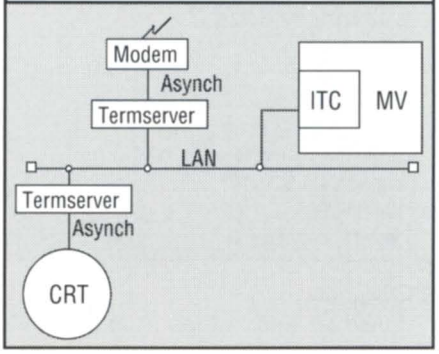
For the small format machines (MV/1500s, 2000s, and 2500s) there is a similar board called the LTC-64. This is the L-Bus Terminal Controller. It has half the capacity of its full-sized brother. We'll refer to the ITC in the rest of this article, but the comments refer to both boards.

Rotaries

The ability to name ports is made possible by an XNS protocol called Clearinghouse. Each port, either on a Termserver or on the ITC-128, can be assigned one or more names. From there, ports may be grouped into rotaries, and each rotary may have one or more names. When you attempt to connect to a rotary, you will get the next available port from that group.

Since a name may refer to either a port on an ITC or to a port on a Termserver, it is quite possible to connect from one Termserver port to another, and never use the ITC. DG sold Termservers in this configuration for many months before the ITC-128 was announced.

Figure 4: Accessing modems



Modems

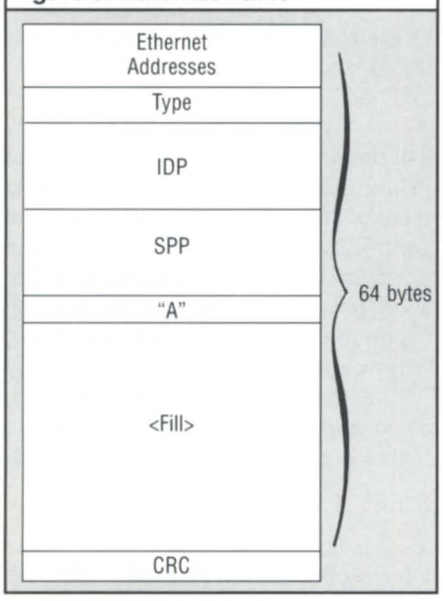
Suppose you have 100 users who would like to access modems. You have three possibilities: (1) you can buy a modem for each user, possibly connecting each of them to your PBX (ugh); (2) you can ac-

cess a pool of modems through DG/Gate (yuck); or (3) you can attach modems to Termserver ports, as shown in Figure 4. In this way you can use only five modems, say, to handle all 100 users, on the assumption that only five users will need to use a modem at any given moment.

Freedom

This is more than just port selection and a simplified cabling scheme. It also provides baud rate and parity independence. For example, your terminals may be connected at 9600 baud, but what is the baud rate of the ITC port? The answer is "it doesn't have any." Consider what happens when your terminal is connected to one of those modems on a rotary. The modem may be 2400 baud. How, then, can it communicate with your 9600 baud terminal?

Figure 5: Ethernet frame



When asynch data leaves your keyboard, the parity bits are removed and the character is treated as a raw 8-bit datum. The character is then encapsulated through various layers of protocol: at the session layer, the XNS sequenced packet protocol (SPP) is used. The SPP packet is further encapsulated into an internet datagram protocol (IDP) packet, which is finally placed into an IEEE 802.3 (ethernet) frame. (See Figure 5.)

At the other end of the connection, these layers are stripped away (de-encapsulated). If the destination is an ITC, the character is simply handed to the PMGR side of the board. It never needs to go through the asynch process again. If, on the other hand, the destination is another Termserver port, the character is re-generated as a serial stream of bits, with start, stop, and possibly parity bits attached.

Next month we'll continue the discussion of ITCs and their performance issues, and we'll take a look at how PCs can emulate Data General terminals directly over the LAN. Δ

Doug Kaye is a partner in Rational Data Systems. He can be reached at 5725 Paradise Drive, Corte Madera, CA 94925; 415/924-0840. This article is excerpted from the "1989 Rational Data Systems Report on PC Integration" to be published later this year. For a free copy, contact RDS at 150 S. Los Robles Ave., Pasadena, CA 91101; 818/568-9991.
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AOS/VS: WORRIED ABOUT SECURITY?

Try a Demo of: **GUARDIAN**

©DataLynx, Inc. GUARDIAN PROFILE EDITOR User name: DL.Husing

1-Password:
2-Profile expire: 12-Jul-89 3-Password life: 90
4-Initial program: :GUARD_USR.PR
5-Initial IPC file:
6-Initial directory:
7-Default user priority: 2 8-Max. queue priority: 1
24-Encrypt password: Y
25-Superuser: N
26-Superprocess: N
27-Use IPC: N
28-Use console: Y
29-Use batch: Y

Extended Options

101-Initial user program: :CLI.PR
102-Primary start time: 07:30 103-End time: 12:00 104-Days: 1-5
105-Secondary start time: 13:00 106-End time: 17:00 107-Days: 1-5
108-Use time windows in batch: N 109-Mins. after window to logoff: 0
110-User group number: 0 111-Force new password selection: N
112-Use GET_PASSWORD macro: N 113-User choose own password: Y
114-Maximum concurrent logins: 0 115-Number failed logins allowed: 0
116-Consoles not allowed:
117-Other host ID#'s:

42-Comments:

Edit which field?
"Help line"...

1. **AUTOMATIC PASSWORD CONTROL**
GUARDIAN allows management to set a time limit on every user's password life. At each log-in this limit is checked. If it has expired, the user is notified of the need to change passwords within 7 days. If they do not, the profile is disabled.

2. **EASY-TO-REMEMBER PASSWORD PHRASES**
As users often forget random character passwords, GUARDIAN can create 250,000 5-7 letter English password phrases. New password phrases can be automatically assigned to users, or they can be given the option of creating their own.

3. **SET 61 USER PRIVILEGES WITH JUST ONE SCREEN & WINDOW**
GUARDIAN replaces PREDITOR with one profile editor screen. 61 privileges can be set by changing single menu items or using any existing profile as a template. XODIAC support field specifies the processors to be updated if a profile is changed.

4. **CONTROLLING ACCESS BY TIME OR GROUPS**
GUARDIAN can limit a user's access to specific hours and consoles, and/or assign them to 1 of 100 groups whose access and number of concurrent users can each be controlled.

5. **MANAGEMENT REPORTS**
GUARDIAN uses a log file to track unauthorized access attempts. Management reports show who has expired passwords or profiles, "super" class privileges, "obvious" passwords, and who has not used the system for a user-defined period of time.

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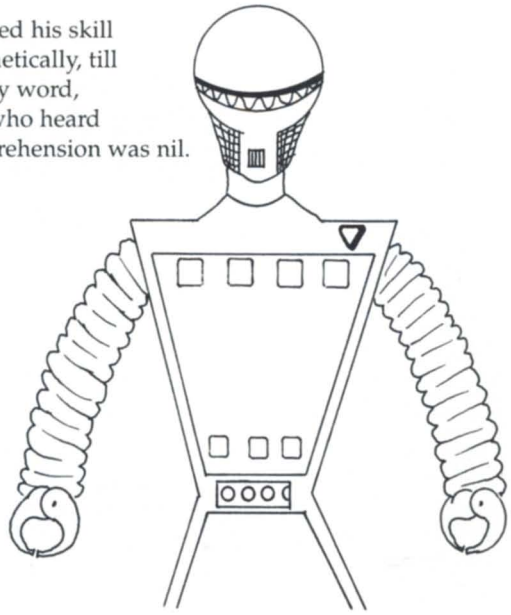
Circle 22 on reader service card.

Time out

Regaining control from the component between the keyboard and the chair

A robot developed his skill
At reading phonetically, till
He could say any word,
But the people who heard
Could tell comprehension was nil.



"Glorobots" by Gloria Maxson. Copyright 1975 by Technical Publishing Company, Greenwich, Connecticut. (Datamation)

by Michael Dupras • Special to Focus

If the first program you wrote was to print "Hello world," (or your name 100 times), then chances are that the second program read something from the keyboard. It is also likely that the program waited patiently for you to enter the characters while it was actually doing something else for someone else.

This article will discuss how you can get AOS/VS to do something other than wait patiently while reading your keyboard, and a little about reads in general.

?READ pending

By now, you are probably aware that a task that makes a system call will pend, or wait, for the completion of that call (after all, the computer really does only one thing at a time). On a block read or write request, your program waits until the data is returned or put somewhere safe, such as on a chain or queue. Since the time to actually move or get the data is relatively short (as we perceive it), we don't have to worry about it much.

READs from terminals, however, are another story, as it might take a person several minutes to actually press the keyboard in just the right spot, namely the NEW LINE key (or other terminator), thereby telling the IAC to send the data to the PMGR, which sends it to your data buffer, etc. The result is that your program is not doing very much for a while. This means that it is not the program that is in control, but the user located between the keyboard and the chair.

The usual methods of reading characters from the keyboard are fixed-length (record) reads, and data-sensitive reads. As their names imply, a fixed-length read will read any and all characters until the requested number of characters has been entered, and the data-sensitive read will read characters until a terminator is entered.

Screen-edit reads are similar to data-sensitive reads, but have the added convenience of allowing some of the basic editing functions to be performed in the IAC before sending the result to the CPU.

If you don't want your program to wait for a terminating character to be entered, you could always opt for single character (binary) reads. This allows the program to get control after every keystroke, but it does have a significant performance cost of a system call for every incoming character, and the program still must wait for a key to be struck.

In an upcoming article, I would like to discuss yet another type of read, called the greedy read, that uses the screen-management extensions to the ?READ system call, and allows the program to get all of the characters that the IAC input buffer has received since the last ?READ request.

Unpending Reads

One symptom that all of the above terminal reads suffer from is that your program waits until at least one key is struck, regardless of how long it takes. There is a way, however, to allow your programs to have control at all times, and that is by making timed-out read requests. The trick is to use multitasking and to get two tasks to do the work for you: one that does the reading, and another that does the timing. If, just before doing the read, we can tell the timer task how long we want it to wait, and then if we have a method of letting the timer task interrupt the read, we are well on our way to implementing timed-out read requests. There are a few other details to worry about, but I will get to them.

Timer task

Starting the timer task is easy, but we don't want to create and destroy a separate timer task for every read request, because this would impact the performance of your system. It is much more efficient to start the timer task just once, and have it start its stopwatch only when we want it to. This can easily be accomplished by using intertask messaging through a mailbox using the ?REC and ?XMT system calls. ?XMT allows us to send a "postcard" containing a single 32-bit non-zero value to a mailbox. Conversely, ?REC is the system call that allows a task to wait at the mailbox for mail to come in. When the ?REC call "comes home" the task that issued the call continues (postcard in hand, leaving the mailbox empty).

All is well. We (the task doing the read) have started the timer task (using the ?TASK system call), which is now waiting for mail (?REC), and sent it via an ?XMT value. AOS/VS has unpended the timer task upon receipt of the mail, and it is now waiting the required time (?WDELAY). In the meantime, we are waiting for someone at the keyboard to type in the answer to

"life, the universe, and everything," followed by a NEW LINE.

What happens next? If the user has finally struck the magic delimiter, nothing is different from the previous implementation of the program—the program continues normally. If the timer expired before the read, XYZZY (nothing happens). We, the programmers, must do something to let one task tell the other that the awaited event has finished. Unfortunately, ?XMT is not the answer this time, because the other task is not waiting with a ?REC. The other task is waiting for its event to complete. Now something must wake it up from what it was doing, and force it back to reality.

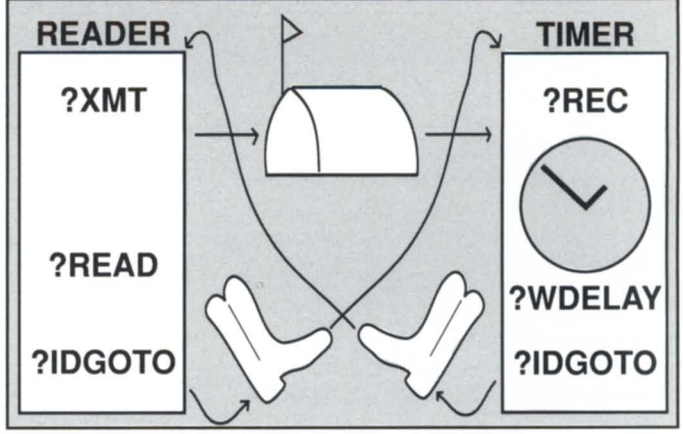
Kickbacks

As described above, eventually one of the two tasks will come to life because of completion of the system call. What we have to do now is stop the other task from finishing what it was doing. If the ?READ comes home first, we want to stop the timer, and restart it at the point where it is ready to receive another message. Then the task that issued the ?READ can continue on its way. If the case was that the ?WDELAY was the first to come home, we want the timer task to redirect the task that it was reading to a point where it knows that a time-out has occurred, and let it continue from there. Meanwhile the timer task resets itself to wait for another message, and the whole thing goes on from there.

AOS/VS does provide the mechanism for giving another task the kick—the system call ?IDGOTO. ?IDGOTO asks AOS/VS to force a task with a specific task ID to GOTO a particular address as soon as the specified task regains control of the CPU. If both the reader task and the timer task know where to send their alter egos, then we have a way of redirecting a) the timer task to await another timer request, and b) the reading task to give up on the current read and continue.

If you refer to Figure 1, you will see two parallel threads of execution, the reader task, and the timer task. Just before issuing

Figure 1: Flow control



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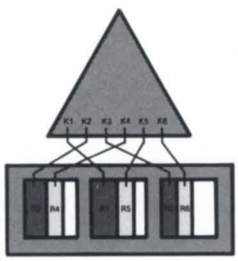
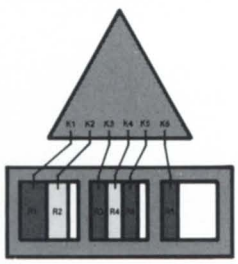
INFOS reorganization with the VS_TOOLBOX™



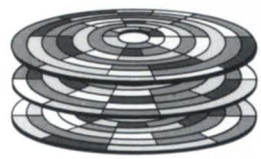
Before reorganization:
Modifications have made the INFOS file disorganized. As each record is accessed, a different page must be read from disk. A large amount of I/O is required, and INFOS performance is poor.



After the VS_TOOLBOX:
Data records have been re-written sequentially. During sequential processing, each page must be read from disk only once. The amount of I/O is reduced, and INFOS performance is improved.

Disk reorganization with the DISK_PAK™

Before reorganization:
Directory information, frequent files, and available space scattered throughout the disk. High average seek distance and poor performance.



After the DISK_PAK:
Directory information and frequent files clustered on a few cylinders, available space made contiguous. Low average seek distance and improved performance.

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Circle 27 on reader service card.

Figure 2: Sample program

```
#nolist
#include <paru.h>
#include <stdio.h>
#include <multitask.h>
#include <setjmp.h>
#include <packets:task.h>
#list

#define BROADCAST -1
#define FOR_YOUR_EYES_ONLY 0

#define TIMER_TASK_ID  10
#define TIMER_TASK_PRIORITY 1
#define TIMER_TASK_STACK_SIZE 3000

int ac0, ac1, ac2, *rac0, *rac1, *rac2, sys_error;

jmp_buf  reader_label, timer_label;
int      read_timeout_mailbox;
int      main_task_id, main_task_priority;
int      read_time_out_ms;

void read_timer()
{
    int sleep_time_ms, rtsys_error;

    /* setup where we want to be jumped to */
    setjmp ( timer_label );
    for (;;) /* forever */
        {
            if ( rtsys_error = sys_rec( &read_timeout_mailbox,
                                        &sleep_time_ms) )
            { /* your system call error processing goes here */ }
            /* now delay for so many milliseconds */
            sys_wdelay ( sleep_time_ms );
            /* wake up the read task & tear down the read request */
            mlongjmp ( main_task_id, reader_label, 1 );
        } /* end of forever */
} /* end of read_timer task.. surprise, surprise!!
    a task looks just like a normal function        */


main(argc,argv)
int argc;
char *argv[];
{
    /* get our task id,
        we need it so that the timer can kick back */
    if( sys_error = sys_mytid( & main_task_id,
                               & main_task_priority))
        { /* your system call error processing goes here   */   }
    /* start our timer task now so it gets a chance to
                                    init before we need it */
```


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- Your custom application protocols can easily be included by contacting Ki Research

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```
    if ( mtask ( read_timer,
                    TIMER_TASK_STACK_SIZE, TIMER_TASK_ID,
                    TIMER_TASK_PRIORITY ) )
          { /* your system call error processing goes here */ }

    /* prepare for us to be redirected upon demand */
    setjmp ( reader_label ); /* return here when redirected */
    for(;;) /* forever */
    {/* tell our timer task that we are about to do a read.
          should the timer task timeout, it will kick us
          back to the setjmp statement above, else we loop
          in this forever loop */

          if ( sys_error = sys_xmt( &read_timeout_mailbox,
                                    read_time_out_ms,
                                    FOR_YOUR_EYES_ONLY ) )
          /* check if mailbox already has something in it */)
          if (sys_error !=  ERXMT /* mailbox has something in it*/
                { /* your system call error handling goes here */ }
          /* issue the read — it MIGHT NOT come home!! */
          /* your code for doing any type of reads goes here. . .*/

          /* kick the timer so that it restarts */

          mlongjmp ( TIMER_TASK_ID, timer_label, 2 );
    } /* end of forever */
} /* end of main program */
```

the read request, the timer task will send a message via ?XMT to the mailbox. Upon receipt of the mail, the timer task uses the value on the postcard to delay for that many milliseconds. In both threads, execution will pend until their respective system calls "come home" (?READ or ?WDELAY). Upon completion of either system call, the task that completed first will force the other to a known point.

Time-out

At this point, you will have successfully implemented a timed-out read request (or any other type of operation that you want to put an alarm clock on).

For "C" programmers, I am enclosing an added bonus. Figure 2 contains a skeleton program that shows how to implement all of the details that were discussed. This is actually a fragment of a program that I have used. Please note that setting up the label and doing the ?IDGOTO were actually implemented using the setjmp() and mlongjmp() function calls available with "C," but they could be coded in any language that allows you to get and save the logical address of the current location, and perform a system call. Δ

Michael Dupras is senior consultant for the Software Products and Services Division of DG Canada. He may be reached at Data General, 1827 Woodward Dr., Ottawa, Ontario, Canada K2C 0P9.

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Don't duplicate. Instantiate!

Good code only needs to appear once

It never ceases to amaze me how disorganized and inefficient some people are with the management of their software projects. The most obvious example is duplicate code scattered all over the disk. Good code only needs to appear once in the universe. However, since all existing systems aren't interconnected (yet), this limits the definition of "universe" to a single system.

Figure 1: A simple algorithm

```
subroutine SWAP(var1,var2)
implicit none
integer var1,var2,temp
temp=var1
var1=var2
var2=temp
return
end
```

I have often seen groups of several subroutines containing almost identical code—only the subroutine name and one or two lines of code are actually different. Everybody knows rule number 1: create a subroutine or procedure rather than duplicate code. Having done that, don't stop there. If you have to change the algorithm slightly for a different case, don't copy the subroutine; modify the algorithm and add an option or two to the calling sequence. Finally, if another version of the procedure is required for a different variable type (using the same algorithm), use a technique called instantiation.

The Ada language has the capability of defining generic procedures and then declaring their types by instantiation at compile time. The algorithm is coded using generic variable types and an instance of the algorithm is created for each required variable type. As far as I know, no other language allows that, but the idea can be implemented reasonably well in Fortran and other languages using the "INCLUDE" statement.

Figure 2: Three versions of "SWAP"

```
subroutine SWAP_INT(var1,var2)
implicit none
INTEGER var1,var2,temp
include 'SWAP.GENERIC'
```

```
subroutine SWAP_REAL(var1,var2)
implicit none
REAL var1,var2,temp
include 'SWAP.GENERIC'
```

```
subroutine SWAP_CHAR(var1,var2)
implicit none
CHARACTER*(*) var1,var2
CHARACTER*256 temp
if(len(var1).gt.len(temp)) then
   stop 'Panic: SWAP_CHAR var1'
end if
if(len(var2).gt.len(temp)) then
   stop 'Panic: SWAP_CHAR var2'
```

Figure 1 shows a subroutine to switch the values of two integers. Despite its simplicity, the procedure can not be used with real or character entities. Rather than make three copies of the entire subroutine and change the declarations, Figure 2 shows how to create a subroutine for each different data type, keeping the algorithm separate in a "generic" file (Figure 3). The algorithm is coded for an unspecified variable type.

For the SWAP_CHAR subroutine, some assumption must be made about the maximum length of the character arguments: although 32,767 is the maximum length of a character entity, 256 is sufficient for all filenames and pathnames. To avoid surprises, SWAP_CHAR has two extra lines of code to check the lengths of the arguments.

Figure 3: File "SWAP.GENERIC"

```
temp=var1
var1=var2
var2=temp
return
end
```

Although the algorithm used here is trivial, the concept can be extended to complex algorithms. One of the best uses for instantiation is for sorting algorithms or other complex computation functions. Remember, the algorithm should only appear once! Δ

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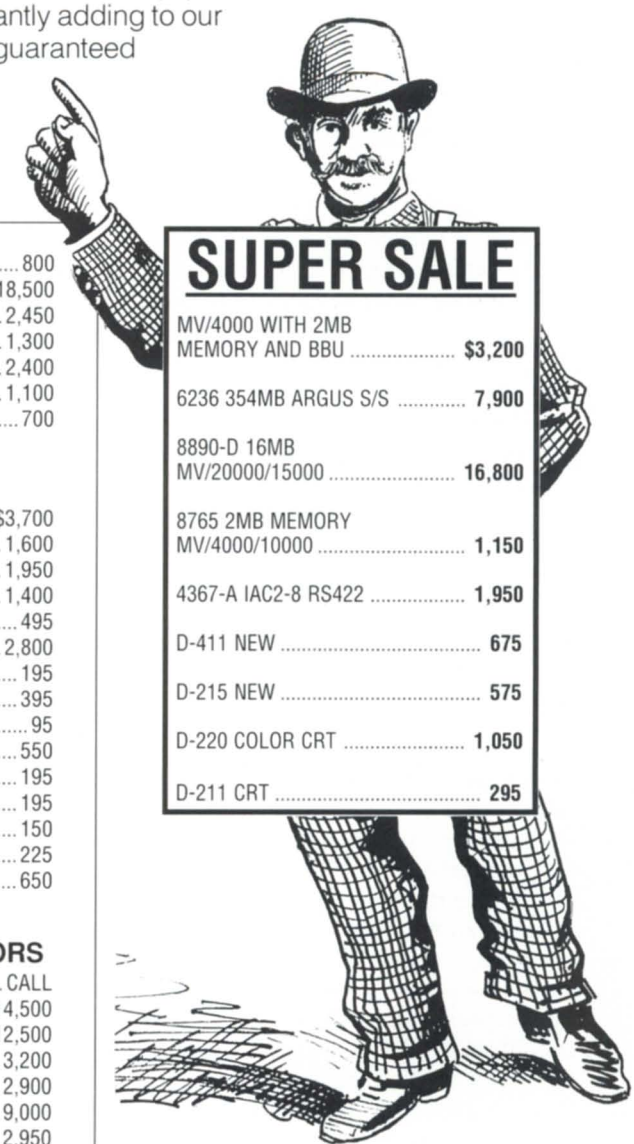

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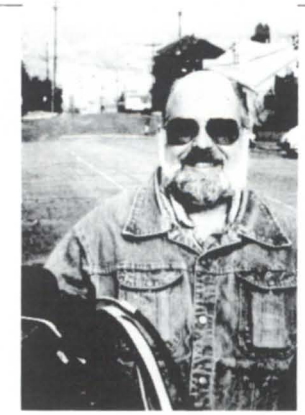

If it ain't broke, don't fix it

Diagnosing SEPAC's priority scheme

:PRIORITIES:REVISITED

Just after I wrote last month's column about setting process priorities under AOS/VS, one of the clients involved in a recent tune-up located the document that had been used to set his priorities and sent me a copy. It turns out that the source was Data General's Systems Evaluation and Performance Analysis Center (SEPAC).

Figure 1 is a summary of what the SEPAC document recommended for process priorities, compared with both the default settings and my scheme from last month. There is no indication in the documents I received of what SEPAC's goals were. Presumably, the goal is best average response time, although I can't see how anyone except CEO and network users would enjoy the fruits of this setup. Also bear in mind that this list is in descending order of priority as recommended by SEPAC. Let's take a look at this complicated 15-level priority scheme and see if we can make any sense out of it.

Under all three schemes PMGR is the highest priority process. Applying the rule of "If it ain't broke, don't fix it" makes me wonder what they have in mind when they recommend raising PMGR's priority to 1. My scheme leaves it alone.

SEPAC recommends setting the master console to the second highest priority. It's not clear what this accomplishes, other than allowing the master console to terminate a runaway lower priority process. Unfortunately, this recommendation has a nasty side effect: you would have to declare the master console off limits, because if you used it for anything that would consume a burst of CPU (like an F/AS/S or DUMP_II/LOAD_II), you would shut out everything except PMGR for the duration. Note that under my scheme it is still possible for PID 2, by virtue of its "interactiveness" relative to the runaway process, to terminate any runaway process except for PMGR, XTS, and XLPT. When's the last time you had to terminate a runaway PMGR, XTS, or XLPT? Me neither.

SEPAC level 3 includes only XTS. The default and B.J.Inc. schemes afford the same priority to XTS and PMGR. Does SEPAC know of some problem caused by this situation that the XTS development group isn't aware of and that SEPAC hasn't taken the time to STR? I think not.

SEPAC level 4 includes only EXEC. Apparently users attempting to log on (boo) and off (hooray) or users doing Q commands are judged more worthy than data base servers, network servers, CEO servers, and currently logged on users. How does that compute? When my system is pegged, the last thing I want to encourage is more logons.

SEPAC levels 5 through 13 seem to favor global data base servers over CEO global servers. Does this mean that data base servers and their customers are more "worthy" than CEO and the network global servers? As I stated last month, one class of users should not be able to leapfrog their assigned priority simply because they make use of a global server that other users don't.

SEPAC level 14 finally accords some CPU time to users who aren't currently using one of the privileged global servers.

Figure 1: Comparison of recommended priorities

Process	Default	B.J.Inc.	SEPAC
PMGR	RES 2	RES 2	RES 1
CLI	SWAP 1	SWAP 2	SWAP 4
XTS	RES 2	RES 2	RES 10
EXEC	SWAP 2	SWAP 2	SWAP 20
INFOS	SWAP 2	SWAP 2	SWAP 25
DBMS	SWAP 2	SWAP 2	SWAP 25
SQL	SWAP 2	SWAP 2	SWAP 25
CEO_OP	SWAP 2	SWAP 2	SWAP 28
NSA	SWAP 2	SWAP 2	SWAP 30
NETOP	SWAP 2	SWAP 2	SWAP 35
MTA	SWAP 2	SWAP 2	SWAP 40
FSA	SWAP 2	SWAP 2	SWAP 50
POA	SWAP 2	SWAP 2	SWAP 50
CEO_LOG	SWAP 2	SWAP 2	SWAP 50
CSA	SWAP 2	SWAP 2	SWAP 60
RMA	SWAP 2	SWAP 2	SWAP 80
SVTA	SWAP 2	SWAP 2	SWAP 90
FTA	SWAP 2	SWAP 2	SWAP 100
Users	SWAP 2	SWAP 2	SWAP 2
FORMATTERS	SWAP 2	SWAP 2	SWAP 3
XLPT	SWAP 2	SWAP 1	SWAP 3
Batch	SWAP 2	SWAP 259-511	?
Total Levels:	3	4	15

The original SEPAC document shows PID 2's default priority as SWAPPABLE 2. That's not correct; it's actually SWAPPABLE 1 as I've shown.

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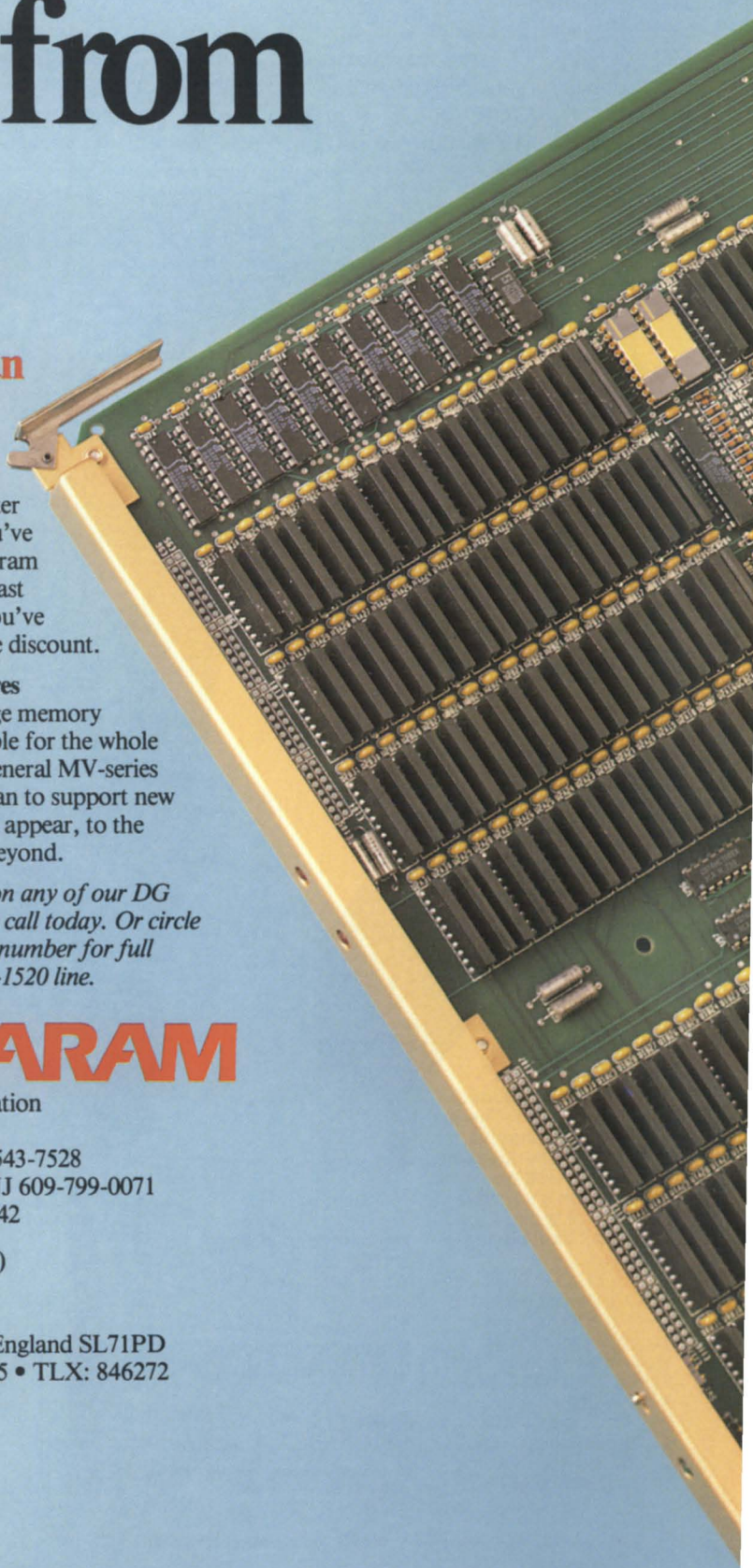

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Luckily, none of the processes at levels 1-13 are capable of sustained bursts of heavy CPU consumption individually or as a group. Or are they? My scheme doesn't take that chance.

SEPAC level 15 includes XLPT and the CEO_FORMATTER sons spawned by the CEO global servers. SEPAC makes no mention of BATCH, but presumably CEO_FORMATTER qualifies as BATCH. I think that whether CEO_FORMATTER is run higher or lower than BATCH is a decision best left up to the discretion of the system manager. Unless the CPU is massively oversubscribed most of the day, in which case the real solution is an upgrade, I'd leave the formatters sharing SWAPPABLE 2 with the users. AOS/VS will lower their priority based on their behavior (CPU intensive), and they will have minimal impact on well-behaving interactive users.

My strategy for BATCH is to use some combination of Group III priority levels—and perhaps class scheduling—that will be appropriate for the turnaround time goals on that particular job. The idea behind using Group III is to minimize the effect of batch job system calls on Group II processes, bearing in mind that system call processing for Group II processes is performed at a priority above that used for Group III system call processing.

Putting XLPT—a relatively well-behaved process CPU-wise—below all other processes except for formatters and batch ensures that all printing will cease during periods when you have no idle CPU. Not only that, but printing to unbuffered printers (like that big, expensive 1200 lpm LPB in the computer room) will grow increasingly erratic as idle CPU drops below 25 percent, even momentarily.

Almost all of these complications in the SEPAC scheme could be forgiven if you invoke the argument that global servers are typically economical CPU consumers. However, the XLPT recommendation indicates a fundamental misunderstanding of the trade-off between economical, but time-critical, CPU consumers and normal users and their global servers.

Here's an example to illustrate how this non-intuitive trade-off works. Suppose your interactive users and global servers are demanding 100 percent of the CPU and XLPT is demanding 10 percent.

Using SEPAC's recommendations, XLPT would get 0 percent, printing would cease, and interactive users would feel no impact.

Using the default priorities, XLPT would get somewhere between 0 percent and 10 percent depending on its behavior. Printing would be erratic, and interactive users and global servers would slow down by somewhere between 0 percent and 10 percent (barely noticeable, and only interactive processes behaving more poorly than XLPT would be impacted).

Using the B.J., Inc. scheme, XLPT would get the full 10 percent continuously, printing would go full blast, and all interactive users would theoretically slow down by a full 10 percent. I say "theoretically" because XLPT's CPU consumption is so bursty that there would still be plenty of time to schedule the

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well-behaving interactive processes between XLPT CPU bursts. Most of the slowdown, albeit only 10 percent, would be felt by the interactive processes that were in the process of a CPU burst themselves. Big deal.

The SEPAC priority scheme has one last pernicious side effect; it can cause unnecessary memory contention on systems that are not memory rich. When AOS/VS runs short of memory, it attempts to steal some from another process of *equal* or *lower* priority than the one that needs the memory. The SEPAC scheme effectively protects the global servers from giving up any pages, no matter how infrequently they are used, in order to benefit user processes during a memory crunch. A frequent beneficial side effect of using my scheme is that enough memory is stolen from inactive global servers (e.g., FTA) during the first bout of memory contention to keep the memory situation under control for the rest of the day.

:AVIION

I attended the press conference announcing the new Aviion series of systems based on the Motorola 88000 chip set (according to one flack at the conference, the name Aviion is really just a rearrangement of the letters in Nova II).

An 8 MB, 17 MIPS system running DG/UX for about $7,500 is pretty scary. The scary part is not that the system is from DG—it's simply the new face it puts on the world of computing. A "real" computer system running an "almost real" operating system for slightly more than the price of a 386 running MS-DOS is enough to make a guy get religion. Well, almost enough.

According to DG, it only took nine months to develop Aviion. That means that within the next 12 months, everybody and his brother are going to be shipping 20 MIPS or better systems for the price of a PC-AT.

Given that DG announced that it is making its "commercial grade" multiprocessor version of Unix available for licensing to other members of the 88Open consortium, you've got to wonder what DG's market differentiation is going to be once the Radio Shack Christmas catalog starts featuring an 88000-based system that adheres to the Binary Compatibility Standard adopted by 88Open. Is it going to be service? Possibly. Is it going to be price? Possibly . . . but what happens when the Far East vendors flood the market with cheap clones, as seems inevitable? Is it going to be ports of proprietary software packages such as CEO? Maybe, but that flies in the face of the whole issue of portability, interchangeability, and shrink-wrap software.

Well, I guess the only thing we can do is wait and watch.

:UNIFORUM:IMPRESSIONS

The DG announcement of Aviion was made the night before the opening of the Uniforum Conference, a confab of several thousand Unix freaks from all over the solar system. I should have set up a pocket protector concession outside of Moscone

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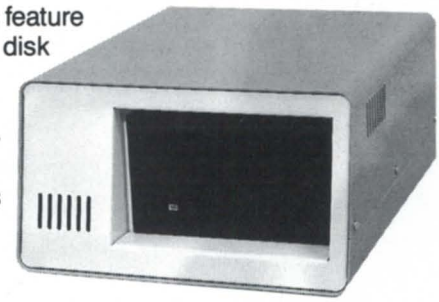

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Center. I would have made a bundle.

A scan of the conference brochure a few months ago showed two sessions of interest, so for the first time I signed up for a Unix conference.

Walking around the massive exhibit area, I was struck by two things. First, the quality of the displays was on a par with major conferences such as Comdex and NCC. Second, the products being offered were more reminiscent of a PC swap meet.

In retrospect, I think that the main value of the conference for me was a chance to swap lies and get drunk with the largest collection of ex-DG employees gathered in one spot since the infamous DG Birthday Party in Boston last year. However, for those of you who think there might be some Unix in your future, I'll report on the two sessions I attended.

:UNIFORUM:LICENSING

This was probably the most interesting conference session I've attended in quite a while, but that's probably because I also run a software sales operation. It also helped that for the last couple of years I've been sitting on a much-restarted column about software licensing and pricing strategies, but never had the guts to publish it.

The advent of networks of workstations sharing files and programs has complicated the licensing problem tremendously. Luckily, the Uniforum Networking Working Group has attacked the problem head-on and issued a challenge in the form of a portable standard for handling licensing on networked systems. Because a system with only one CPU is simply a network where n=1, the standard is equally applicable to standalone AOS/VS systems.

For our part ("our" being my software operation, :SYSMGR), we plan to switch to a standard-conforming licensing scheme as soon as possible. The standard allows for both license brokering (control of the number of concurrently executing copies of the licensed program) and usage metering (pay-per-play). The standard frowns on tying a license to a particular piece of hardware (like a processor or node ID number).

This means that there's finally a chance that software vendors can get rid of the ridiculous scheme of pricing software according to the processor speed (or worse yet, claimed speed) as a means of inferring value, usage, and support costs. In the case of DG, this would mean the end of classifying the switch from an MV/4000 DC to an MV/4000 as an "upgrade" for software licensing purposes.

Hallelujah!

:UNIFORUM:PERFORMANCE

I attended the only presentation on Unix system performance at the conference, a lame panel discussion (n=3, counting the chair) by a couple of college professors who are members of Performance Measurement Group, Inc. (PMG).

For those of you who aren't familiar with PMG, it's a group of rabid mathematical types who have struggled for nearly 25 years to collect one digit, or less, significant data and then use various

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exotic algorithms in an attempt to produce results that are accurate to four decimal places, and that are universally applicable. I'd invest in a perpetual motion machine before I'd bank on these guys producing numbers of anything more than academic interest. I've attended a couple of PMG national conferences before and gained some interesting insights into the nature of performance analysis and modeling, but accurate numerical results? Not yet.

At least the most distinguished panelist, Dr. Domenico Ferrari of UC Berkeley, was quite candid in admitting that after 25 years in the business, the biggest problems are still accuracy and extendibility.

Compounding the problem is the fact that AT&T Unix contains precious little performance data collection compared to operating systems like AOS/VS. According to DG insiders, this will definitely change in the case of DG/UX. I look forward to seeing the results.

:REALITY:AUTOBAUD

Yes, hitting NEW LINE or CARRIAGE RETURN a seemingly random number of times in order to get the logon banner is truly a pain. Who did the beta testing, and why did they sign off on this new functionality? And how is it that nobody complained that there is no timeout on AUTOBAUD lines until the logon banner is displayed?

We're still going through gymnastics around here trying to build a BLAST script that will log on reliably in a finite amount of time. I'm going to plagiarize Memorex's ads and get some bumper stickers made up that say "Is it dead, or is it /AUTOBAUD?".

:ERRATA?

Phil Horvitz called to say that I was wrong in accusing Wordperfect of doing binary screen I/O unnecessarily, and that the spelling checker uses shared page I/O, not direct block I/O.

This column was prepared using Wordperfect 4.2, and I used the AOS/VS debugger on it a few minutes ago to check the ?WRITE packet used when doing a down-cursor command. The packet specified binary dynamic I/O, not binary data-sensitive.

I also just ran the spelling checker on this column using the standalone version (SPELL.CLI/SPMAIN.PR). It took over five minutes of CPU (!) and used direct block I/O, not shared page I/O. However, checking the spelling while in the word processor does appear to use shared page I/O and seems to consume somewhat less CPU. Δ

Brian Johnson (BJ) is the President of B.J. Inc., a San Francisco based consultancy specializing in system auditing, system management, and performance analysis. :SYSMGR is a division of B.J. Inc. BJ can be reached at 109 Minna St., Suite 215, San Francisco, CA 94105, 415/550-1444. The :SYSMGR bulletin board number is 415/391-6531 (1200/2400 with optional MNP level 4, CHAR/605X/AUTOBAUD) or 415/550-1454 (voice).

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Short accounts

Small discoveries on a variety of topics

This month I want to highlight numerous little discoveries, most of which involve trivial items that I've happened onto in the last few months.

Secrets

Let's start with one of my favorite topics: best-kept secrets. There are two products in the 5000 series of DG's product list that appear to have a lot of merit but have had very little exposure. I think I'll present the problem first and then the solution.

A client has some large data bases requiring daily backups. Since he's running BBASIC (or B32 or ICOBOL) he can't use INFOS incremental file dumps. He thought of buying a 6250 tape drive but the price tag of nearly $30,000 was a sobering thought indeed. He looked at third party solutions and found a similar tape unit for $17,500. However, he doesn't want to lose DG maintenance. For the same reason, he also ruled out the Megatape cartridge units.

The solution? How about a DG 5080 and a refurbished 6026 (total price about $20,000)? The Model 5080 is a 600 MB cartridge tape unit that uses a serpentine recording method and can back up a full 354 MB Argus in 10-12 minutes. This should sound a lot like the Megatape 600 MB unit. If you put the two units side by side, you will see variations in the color of paint and brand name logo. Open them up and only an engineer could spot any differences. The used 6026 provided the client the compatibility to talk to the rest of the world with standard magnetic tape, and it serves as an alternate backup medium if the 5080 is down.

Here's another little-known beauty. Suppose you have a client who decides to upgrade to a used MV/4000. He is planning on having a couple of modems on his system but also has about 10 in-house users. An IAC-8 won't provide enough ports, two IAC-8s give him more modem control than he could ever want but take two slots, and an IAC-16 has the ports but no modem signals.

Enter the Model 5916. It's an IAC-16 with a twist. Twelve lines are like the IAC-16 and require only pins 2, 3, and 7 in your cable and four lines have full modem control like the IAC-8. It gives you the best of both boards with the maintenance cost of one board.

Horrors

A site I know of recently learned a bitter lesson about backups. To save money, this accounting firm decided not to purchase a maintenance contract. They had minor problems with their 6026 tape unit, but since it was the busy season for accounting firms they ignored the unit and did not make any backups. A little over a month later they lost their disk unit (I believe it was a head crash). Their situation could be summarized as this: they were at the peak of their busy season with dozens of tax forms due in the immediate future, they had a system with no tape and no disk, and they lost almost six weeks' worth of data entry due to lack of backups. It turned out to be cheaper and faster to buy a new disk and new tape unit instead of fixing the old ones.

The client's savings from cutting out maintenance coverage for about six months was $5,000 or so. He lost disk and tape units worth about $10,000—and he lost the month and a half of work by 14 full-time terminal operators. Even at minimum wage that amounts to nearly $20,000 with taxes and benefits. Thus, his supposed savings of $5,000 turned into a net loss of $25,000. The morals of this story are: if you go to time and materials, you're gambling; if you don't make backups, you're asking for trouble; if you have a hardware problem, don't ignore it.

Bugs

An ICOBOL bug? Naw, it couldn't be. Not good old reliable ICOBOL; but I recently had a number of programs that were aborting the cross-reference listing in the literal pool after printing the following: "UNKNOWN MESSAGE CODE 00012317, ILLEGAL CHARACTER IN ARGUMENT." I suppose if I had been keeping up to date on my ERMES file the message might have read a little differently, but that wouldn't have stopped the error from occurring. What I really wanted to do was get rid of the error. Well, I can't.

It can be reproduced with the following: MOVE LOW-VALUES TO X-FIELD. MOVE HIGH-VALUES TO X-FIELD. STOP RUN. One byte of nulls and one byte of high-values end up back-to-back in the literal table. When the literal pool listing was generated it was treated as a single 2-byte literal. Then when XLPT sees

it the null is ignored (I think) and the high-values (377 octal, FF hexadecimal) make it think that a VFU sequence is going to follow. It then blows up when it gets a bunch of spaces. Thus there are two things that need to be done.

First, make sure that low-values and high-values are properly stored as two separate fields in the literal pool. Second, add some smarts to ICOBOL to display octal or hex values of nonprintable literals in the literal pool as opposed to printing the literal exactly the way it's stored internally.

XLPT

Something good in XLPT 7.62? Sure. And it may have been there for some time. I don't know when it was added but we discovered something intelligent in XLPT yesterday. I will, on occasion, print a small report for which I am only interested in the totals. The other day I ran a report on a live data base that produced a huge file. I didn't know how many pages were to be printed and it turned out that I overstated the QPRINT/FIRST= command. I guess I haven't done that in years because XLPT printed a page telling me that I overshot the end of the report. The exact message was "BEGINNING PAGE GREATER THAN ENDING PAGE", "BEGINNING PAGE IS 100, ACTUAL ENDING PAGE IS 84". The first line seems to be an impossible statement until you add the implied word "DESIRED" in front of it.

By the way, I have another good thing to say about XLPT and report spooling in general. Thanks for the QMODIFY command. I knew it was probably coming in 1983 when DG answered my STR with "TO BE CONSIDERED IN A FUTURE REV." Then we were told it was coming two years ago. Anyway, now that it is here, it sure is convenient.

Speaking of spooling, it really should be SPOOLing. Trivia time. What does "SPOOL" stand for? Correct answers win a free drink at the DG reception in New Orleans.

Support

The new policy to bundle SPSA with software support for the first machine on every site has obviously done more harm than good for smaller users, especially since they found out about another policy that has been around. This policy allows any legally licensed site to purchase a one-shot upgrade for the going rate (approximately $1,200 for AOS/VS). I spoke to Frank Keaney from Data General about this and pointed out there are a lot of people who don't want SPSA. For many it's not a question of money or service, it's just that they feel perfectly comfortable letting their own in-house staff support the system and troubleshoot all software problems. All they want are new releases as they come out. You can get them by ordering the -20 suffix for your software. If you have an AOS/VS model 3900, you order 3900-20m where "m" is the media type to obtain the current version of software.

The one-shot purchase policy will allow you to get software without support, but it has three major drawbacks, all of

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which Keaney is very much aware of. First, most system managers have an easier time getting funds on a subscription basis with a flat fee as opposed to paying every three to nine months as new releases come out. The major complicating issue is that most management has no objections to spending a monthly or quarterly maintenance fee but they don't like the hassles of a complete purchase requisition/purchase order/billing and payables cycle for each upgrade. It also makes it harder to budget for.

The second is that there is no mechanism to let non-subscription customers know about new releases.

The third is that a site may encounter a problem with a specific revision, such as the AOS/VS 7.62 printer problems, that preclude using it. They should not have to pay again to get 7.63 or 7.64 or whatever revision finally fixes it. After all, they paid good money in the first place to get the new features. Why pay twice for something because the original product didn't work? Keaney and I talked about a reasonable solution for this: each major rev, 7.5x, 7.6x, 7.7x, etc. would be subject to the upgrade fee from previous revs; but if you purchased a specific rev, say 7.62, all other rev 7.6x updates (7.63, 7.64, etc.) would be included under the one-shot purchase.

Magic

Recently someone wrote in that you couldn't write a CLI macro with the same name as a CLI command with the exception of XYZZY (pronounced "magic" for you non-Adventure buffs). That is an interesting exception. I have been trying for years to figure out whether or not that command will do something if given the proper arguments or working directory. However, you can write CLI macros with the same name as CLI commands. You just can't use them unless you put the command in square brackets. Examples: "QPRINT" will execute the CLI QPRINT command but "[QPRINT]" will read the file named QPRINT in your working directory or on your searchlist and execute the CLI commands it hopes to find there. If the first occurrence of disk file "QPRINT" is a sub-directory, then you will get an error stating that QPRINT is the wrong file type and can not be used.

All's quiet on the western front

And the eastern one too. No cards or letters have graced my desk. Come on, folks, you can't have grown that reticent about DG systems. Let's get some cards and letters coming in. I can't promise to answer all questions, but those I can't will be forwarded to the correct people. So, until next time, keep in touch and maybe I'll see you in New Orleans at the fall NADGUG convention. Δ

Jim Siegman is a contributing editor to ***Focus****, chair of the NADGUG Audit Committee, and treasurer of the Chicago Area Data General Users Group. Send comments or questions to him c/o Datamark Corp., 3700 W. Devon, Suite E, Lincolnwood, IL 60659; 312/673-1700.*

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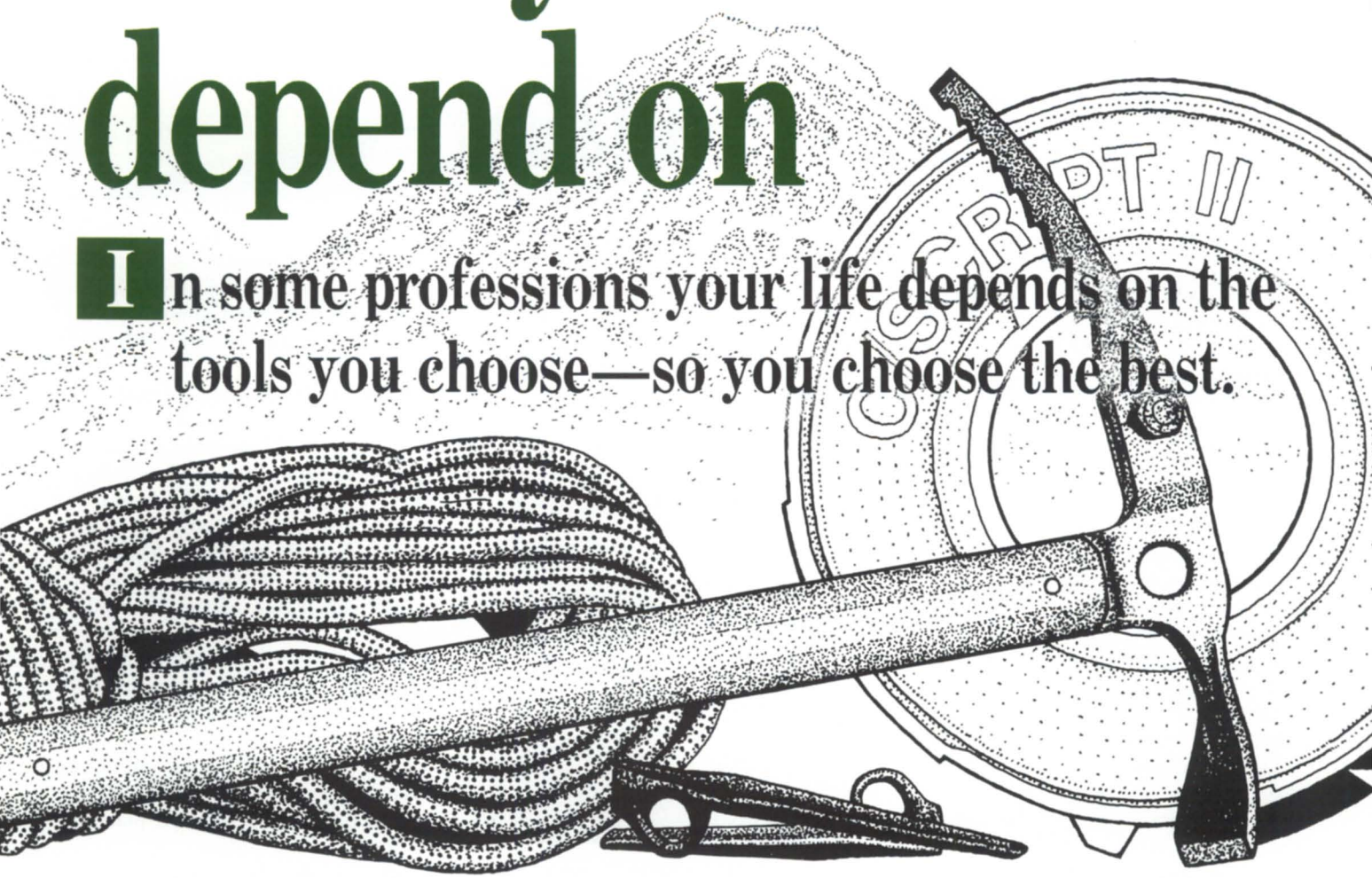

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STREAMLINED

Improved menus eliminate guesswork for DG's On-line Information Service

by George Tuthill and Linda Strenck
Special to Focus

OIS, Data General's On-line Information Service, was created to simplify information flow concerning products, services, and support between Data General and our customers. Since its introduction in 1986, OIS has matured and expanded into a valuable on-line data base.

Available seven days a week, 24 hours a day, OIS offers the latest information on Data General products and services. It also provides a user-to-Data General communications channel for submitting questions and Software Trouble Reports (STRs), and user-to-user communications through the bulletin boards. Over the last year, the OIS menu structure has been simplified so that both expert and novice users can find information much faster. If it has been a while since you have logged on to OIS, take a few minutes to read this article. The service has become streamlined to save you time and money when you are logged on.

A banner page welcomes you to the service and notifies you of any new messages. Next you will see the OIS main menu as shown in Figure 1.

Structured into three main segments, the main menu spells out clearly where you should go to find the information you want. Interested in a Software Trouble Report? You know right away that there are two areas pertaining to STRs, menu choice number 1 and menu choice number 6. Looking to access a bulletin board? You clearly know that menu item number 7 is an appropriate choice. This improved menu eliminates the guesswork. You will not waste time accessing choices that are not what you are looking for.

The first segment of the main menu contains Data General technical and independent vendor information.

Figure 1: The OIS main menu

```
On-Line Information Service
1.  STRs, Patches, Bulletins
2.  Software Shipment Schedule
3.  ISV Forums
4.  New Articles
    ***
5.  Electronic Mail
6.  STR Submission and Status
7.  NADGUG Bulletin Boards
    ***
8.  DG Services
9.  Usage Tracking
10. User Assistance
Enter choice!
```

Choice number 1 (STRs, patches, and bulletins), and **choice number 2** (software shipment schedule), contain technical information provided and maintained by Data General. Upon accessing one of these menu choices, you will see that it is further divided by product name, such as AOS/VS, RDOS, CEO, for example, so you can choose the product you are interested in.

Choice number 3 (independent vendor information) gives you access to information provided by major independent software and hardware vendors primarily for the MS-DOS/PC world. Vendors such as Ashton-Tate, Microsoft, Apple, DEC PC, IBM, and Hewlett-Packard are included.

Choice number 4 (new articles) provides the latest software bulletins and Data General announcements.

The second segment of the main menu is user communications. There are two distinct capabilities provided, user-to-Data General and user-to-user communications. This segment offers you, as an OIS user, the ability to communicate directly with Data General and with your fellow users.

Choice number 5 (electronic mail) provides you with your specific mailbox, where your messages reside. Pre-determined forms for mailing requests to Data General are also found and categorized into product related questions, service related questions, Software Assistance Requests (SARs), OIS feedback, and on-line STR submission. When you send a message to Data General, you'll receive a certification in your OIS mailbox and you will generally receive a response to your message within two working days of receipt of the message.

Choice number 6 (STR submission and status), enables you to submit a new STR, or check the status of an STR that has been previously submitted.

Choice number 7 (NADGUG bulletin boards) facilitates access to bulletin boards sponsored by Data General and maintained by North American Data General Users Group (NADGUG), for its members and non-members. The major capabilities of the bulletin board are user-to-user communications with messaging and conferencing capabilities, a public domain software data library with the ability to upload and download files (with the proper software), user options that allow the flexibility of customizing the bulletin board to suit your needs, and extensive on-line help to aid you in using the bulletin board. Remember, bulletin boards, both NADGUG and ISV forums, are provided for the benefit of all Data General users. They enable you to ask questions and provide input to others users' questions without leaving your office or home.

The third segment of the OIS main menu is on general information and Data

General services.

Choice number 8 (DG services) contains information on support services, consulting services, educational services and technical information, and publication services. If you are looking to purchase a service contract for your Data General hardware and/or software, or need a training course or a technical manual, you will find all your options in this section. Toll-free numbers are also available to call for additional information or sign-up.

Choice number 9 (usage tracking) enables you to determine the time used on the service for the current month and the time and charges incurred for prior months. You have the ability to always know how much time you are spending on OIS in any given month.

Choice number 10 (user assistance) contains general information on how to change your password, general systems help, synonyms, navigation commands, direct access to the phone book, legal notices, and the on-line OIS users guide.

When you log on to OIS, you may choose the area you want by menu choice number. Or, you may navigate through the database via menu, article, screen, and control commands or the "Go" command. You'll find that the new menus clearly indicate what is contained within, and with considerably fewer menus to navigate through, the effort required to access your information is reduced.

More protocols have been added to allow patches to be downline loaded. OIS now supports Blast, OIS Connection, X-Modem, and B-Protocol; in addition, the newest revision of AOS/VS (rev 7.62 and above) includes an OIS interface that allows faster and easier connection.

The improved service was demonstrated at the last NADGUG conference, and users who stopped by and tried OIS were very pleased with the user-friendliness of the OIS data base restructure. Many of the changes made to OIS were implemented in response to comments, ideas, and suggestions submitted by OIS users. And, more improvements are planned. Data General is developing an electronic ordering system to allow OIS users to electronically order Data General accessories and supplies. More detailed information will be available in the near future.

The hourly rate for accessing the chargeable areas of OIS is $45. NADGUG members and subscribers to Data General's Support Plus or Software Support Line packages receive one free hour of use per month.

We urge you to give the improved OIS a try, whether you are an existing user or a potential user. Then, let us know what you think. Working together, we will enhance existing options and add new options to provide you with the most comprehensive on-line data base available. Δ

George Tuthill is a program manager for on-line services at Data General. Linda Strenck is a Data General marketing communications specialist. For more information on OIS, call 1-800/325-3065 or 1-800/952-4300 (in Massachusetts).

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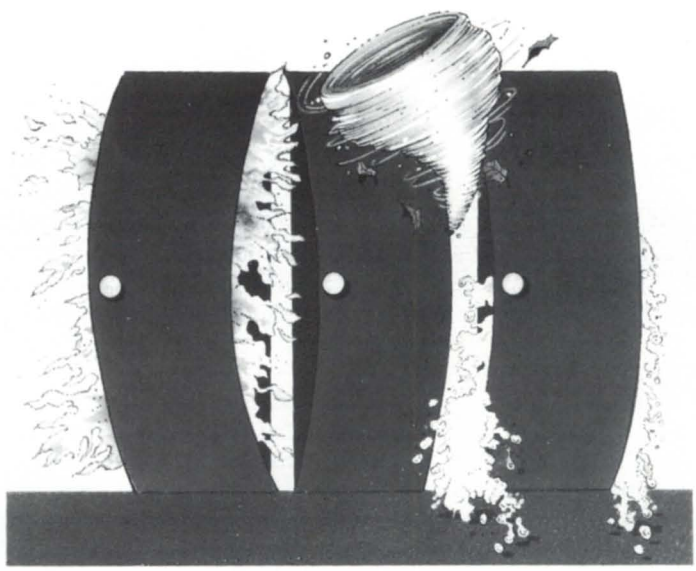

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Under Wordperfect's Spell

Spell-check ensures accuracy of documents—and makes crossword puzzles a breeze

by Guy Pribyl
Special to Focus

Wordperfect's Speller does far more than merely correct your spelling. As Wordperfect users who use the speller soon discover, it contains many powerful features. In fact, using the speller is like having a highly efficient secretary at your beck and call.

Wordperfect's Speller contains 115,000 words, including 10,000 legal and 15,000 medical terms.

To start the speller, press Spell (Ctrl-F2). The following menu appears: **Check:** 1 Word; 2 Page; 3 Document; 4 Change Dictionary; 5 Look up; 6 Count

Let's examine the speller menu options one by one. Options 1-3 let you have the speller check a word, page, or complete file. You can also check only a block of text, by highlighting the block you want checked and then pressing Spell.

Change Dictionary

The Change Dictionary (Option 4) lets you use specialized dictionaries you create, or other dictionaries available from Wordperfect. Wordperfect Corp. has developed several foreign language versions complete with foreign spellers. These spellers can be purchased separately for use with Wordperfect in English. Current languages available include Catalonian, Danish, Dutch, UK English, French, Canadian French, German National, German Switzerland, Icelandic, Italian, Norwegian, Portuguese, Spanish, and Swedish.

Look Up

The Look Up (Option 5) is my favorite feature. It is available both from this menu and while you spell-check a document. It lets you type in a word pattern and have the speller search through the 115,000 words it contains, bringing up every word that matches the pattern. For instance, if you enter "add-t-ly," the speller displays every word that starts with "add," has a "t," and ends with "ly".

Look Up is handy to have around when you're doing crossword puzzles. If you type ??T??Y the speller will search through the dictionary for all words that are six characters long, with a "t" as the third character and a "y" as the last character.

Once I was demonstrating this feature to a surgeon. Since I happen to know that surgeons take an avid interest in words that end with "ectomy," I typed in "-ectomy" and brought up a long list of the words. I was amazed at the surgeon's reaction. He became quite excited and exclaimed, "Wooooowie! Look at this!" Then he pointed at one of the words and observed, "Imagine that! I haven't performed one of those in a long time." Since most of the words displayed on-screen contained the various parts that can be cut out of a human body, the surgeon's enthusiasm almost alarmed me. I hoped that he wasn't looking me over too closely as he examined the words.

Having an option like the Look Up feature can be very useful. For example, the other day I simply couldn't remember a word that was almost right on the tip of my tongue. I only knew that the word started with an "e" and ended with "ious". Fortunately, Wordperfect's Speller was there to jog my memory. I typed in "e-ious" and instantly recognized efficacious when it appeared on the screen.

Count

The Count (Option 6) quickly counts the number of words that are in a file. Anyone who has ever been required to do a 5,000 word essay knows how useful this feature can be.

Using the speller

As we mentioned above, when you select Word (1), Page (2), or Document (3), the speller begins checking words. The speller searches for transposition errors, characters that have been left out of a word, and characters that have been incorrectly added to words. The speller also checks for numbers accidentally added to a word. If it finds a word in your document that it can't find in its dictionary, the speller assumes that the word is misspelled and highlights it on-screen. It then begins displaying a list of words that look or sound like the misspelled word.

The speller also checks a word phonetically, and displays any words that sound like the word. I've really enjoyed this feature. If I'm not sure of the spelling of a word, I just type it in the best I can. The speller does the rest. Ninety percent of the time, the speller finds the correct word for me.

Whenever a misspelled word is highlighted, the following menu is displayed at the bottom of the screen: Not Found! Select Word or Menu Option (Continue=0); 1 Skip Once; 2 Skip; 3 Add Word; 4 Edit; 5 Look Up; 6 Phonetic

If you want to leave the word just as it is, select Skip Once (1) or Skip (2). Skip Once skips the word that one time and displays the word whenever it is found again. Skip (2) temporarily adds the word

to the speller's dictionary and ignores that spelling for the rest of the spell check.

If you want to add the word to your speller's dictionary, select Add Word (3). The word is then added to your speller's supplementary word list. This feature lets you develop a personalized dictionary as you work. You can edit your supplementary word list by retrieving the LEX.SUP file into Wordperfect. Supplementary dictionaries can also be added to the main speller by executing the speller utility (see speller utility below).

Select Edit (4) when you just want to fix up a word slightly. You can then edit the word and press NEW LINE to continue using the speller. Note that you can use the Look (Option 5) from this menu.

Selecting Phonetic (6) has the speller list all the words that may sound like the word. For example, if I select this option for my name (Pribyl) the speller pulls up "prebill" and "preboil". (My sincere attempts to get my name added to the speller have as yet, unfortunately, been unsuccessful.)

Often I select Phonetic to find words that rhyme with a particular word, or sound like it.

As the speller displays possible word alternatives, each one has a letter beside it. Selecting a letter causes Wordperfect to replace the misspelled word with the new word, retaining the same capitalization and bold and underlining features. The speller then quickly moves to the next misspelled word.

The speller has another useful feature. Often I find myself typing the same word twice (for example, "gone gone" or "one one"). This is sometimes referred to as "stutter typing." To avert it, the speller stops at each occurrence of a double word to make sure that it is intentional.

Speller utility

The speller also comes with a convenient utility, Wordperfect Speller, that you can run outside of Wordperfect by entering SPELL at the CLI prompt. You can use it to display the common word list, check the location of a word in the word list (whether it's in the main dictionary or a supplementary one), change dictionaries, create a dictionary, add words to a dictionary, delete words, and organize the words in your dictionary so they are easier to find. It also lets you do background spell checks without having to go into Wordperfect, giving you a list of all the particular words that are misspelled in a certain file.

Write for you

In short, if you don't like having to hunt through dictionaries but you do want correctly spelled text, take the time to learn how to use the speller. In the words of an old song (with lots of pun intended), it will soon have you under its spell. (You can even put your name in its dictionary.) Δ

Guy Pribyl is director of marketing, Data General products, at Wordperfect Corp. He may be reached at 1555 North Technology Way, Orem, Utah 84058; 801/222-4100.

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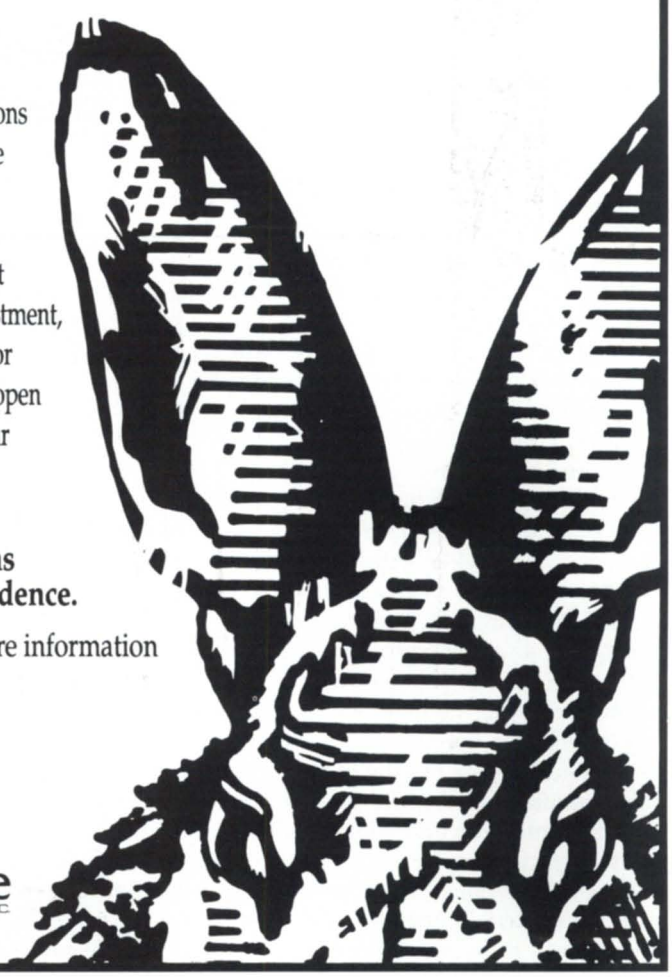

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Adventures await

The three 'I's of writing computer games

by Larry Morse • Special to Focus

Computer games have been a part of the lore of computers since the days of the UNIVAC, punch cards, and hardcopy terminals. Building upon these early beginnings, the industry has made mind boggling advances in hardware, software, and system capabilities, yet we still have a tendency to informally show off the power of a system by the quality of the games it can play.

Early system programmers produced "can't lose" tic-tac-toe; today we have machines that can compete in world-class chess tournaments. As more advanced systems became available, we progressed from Pong to Pacman to Nintendo, and at each step games became concrete examples of the application of new technologies; they also showed us that computers can be fun.

In this article I will present some general ideas about the key elements of a good game. We'll look at various types of games and how to choose those most suited for implementation on Data General systems. You'll find out where to get ideas for games, and finally, I'll give you some strategies you might use for designing and writing your own games in the DG environment.

In the broadest sense computer games can easily be grouped according to purpose, since they generally serve one of two basic ends. Most games either attempt to teach us something or provide us with entertainment. Therefore we describe them as either educational or recreational. Educational games tend to focus on providing the user with a novel way to learn a specific skill or build knowledge; they are usually designed to fulfill specific educational objectives, and often concentrate on providing repetition and practice.

Recreational games have no agenda other than entertainment. In order to attract players, recreational games usually focus on action and activity, and rely on the appeal of color, graphics, and motion or animation.

Most Data General systems are not set up for color and fast graphics, and running the terminal I/O intensive code needed to simulate motion can create problems on a multiuser environment. When I play a "green screen" version of Pacman on our marginally loaded MV/8000 system it quickly garners a rash of phone calls from people with loud voices and little patience. How, then, can we implement high-power recreational games on a Data General system? The answer is in most situations we cannot (or at least shouldn't); however, this doesn't mean that we can't produce good games that will run efficiently in a Data General environment. All we have to do is choose game models that make optimal use of the system's strengths and minimize demands on system resources such as asynchronous I/O paths.

There are three major factors that influence the quality (and playability) of a computer game. Good games are always highly interactive. They are interesting, and they possess some degree of intelligence. Let's look at how to optimize these "three I's" for a Data General environment.

Interactivity—One basic goal in game design is to always keep the player busy. If we can't keep him physically busy (as Nintendo does) we can still keep the player focused by making him "feel" busy performing mental activities associated with the game. Chess games require minimal terminal I/O, yet the player is still highly involved in the game. Games that involve thinking rather than doing can be very interactive; the nature of the interactivity may be different, but the game intensity is still maintained.

Interest—If a game doesn't keep the player interested, the player will quit (and probably never return). Here are some suggestions for revving up the interest level of a game:

• The single most important factor influencing a player's interest in a game is the challenge level. Since we know that physical challenges are not advisable in a DG environment the challenge should be addressed toward mental activities. There are two dimensions that influence the picking of a challenge; both the intensity and duration must be appropriate for the player. If a challenge is either too hard (intensity) or takes too long (duration) a player will find it difficult to achieve closure and interest will slip away. On the other hand, if the challenge is trivial the player will get bored. A carefully thought

out and well-managed challenge will ensure player interest.

• Theme-based games by their nature generate interest. The only problem you face is that the theme must be appropriate and carefully selected for a target audience. Young children might love a game based on *Winnie the Pooh*, but an adult audience would probably lose interest fast.

•Good games are usually designed around a subtle pattern, but rote repetition is an invitation to boredom. I was once asked to comment on a game a friend created to teach his third grade son the state capitals. It went like this:

Name the capital of Alabama _____ ,,,,
Good work!
Name the capital of Alaska _____ ,,,,
Good work!
Name the capital of Arkansas _____ ,,,,
No, try again!

I quit with Colorado, and my comments should be obvious.

Intelligence—Here is where good programs, optimized to take advantage of the DG environment, can shine. If you can't wow players with glitz, show them some smarts. If a game is language-based, implementing a good natural language parsing algorithm is worth the effort. I've seen some implementations of Adventure and Zork that are amazing.

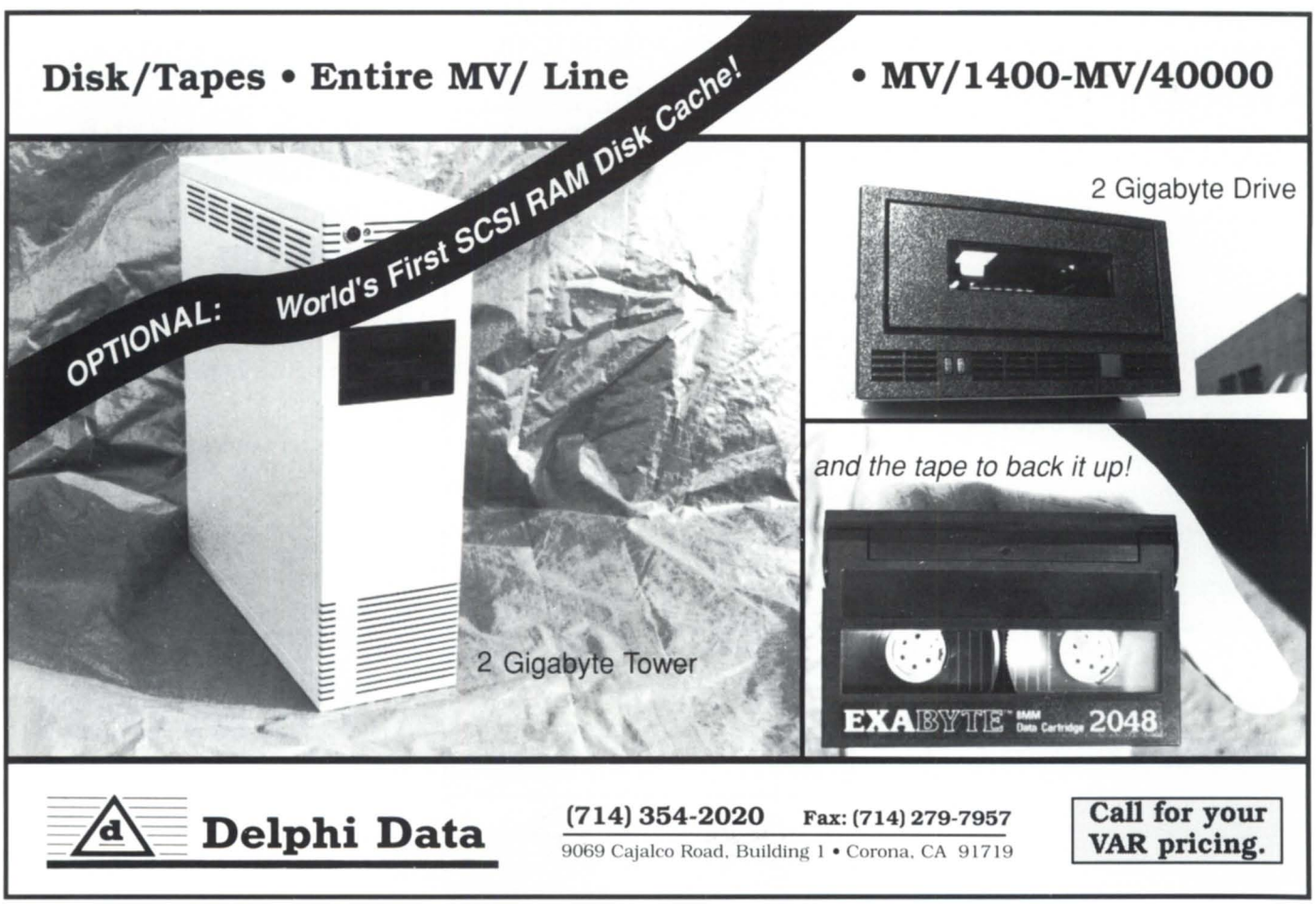
Good games are usually designed around a subtle pattern, but rote repetition is an invitation to boredom

So far we've talked about designing either an educational or recreational game, optimized for a DG system, that is interactive, interesting, and intelligent. Now comes the hard part. How do you come up with the basic idea for a game? Let me offer a few suggestions:

• An easy way to get started is to simply rebuild an existing game to host on your system. If you don't get too vain about originality you should be able to make a lot of good games run in DG land without too much effort.

• Create an educational game as a direct solution to a training problem. Usually these problems are easy to find, and a game might present a novel solution.

• Model a classic game. The ideas are already there; all you need to do is move



Circle 26 on reader service card.

them onto a system.

• The puzzle pages of science and math magazines are a good source of basic ideas. Try browsing through some old issues of *Scientific American* and you will see that with a little creative thinking puzzles can easily be made into games.

Once you have an idea in mind and it's translated into the basic concept for a game, the nuts and bolts of building the program need to be worked out and implemented. It is at this level that attention to detail becomes paramount; a good concept filtered through inappropriate or poorly written code usually results in a not-so-good game. Here are some general strategies that may help:

Human engineering—Good human engineering is simply the result of applying basic common sense, but there are some details that do need careful attention. The user interface must be crisp and uncluttered; long and wordy instructions or responses should be avoided and nothing should appear on the screen unless it directly relates to the player playing the game. The player should always know what to do next (move or play options, restart?, exit?, pause?) and it should be easy for him to perform the necessary functions (I prefer single key entries using simple keys such as ESC, HOME, arrow keys, and NEW LINE. For complicated games or when there might be confusion, a help facility might be warranted.

Playing mode—In games involving competition there are three basic ways a player can compete: against himself, another player, or the computer. Make sure the player understands who the competitor is, and the way that the competition is measured. If scores are maintained, there should be a mechanism that allows players to save at least high scores for later sessions or bragging rights.

Graphics—Jazzy graphics and color are not implementable in most DG environments, but that is not to say that you should give up completely. With a little practice and some ingenuity you can create some pretty nice looking displays; remember that this is what DG users are used to and all they expect! Combinations of "stars and bars," reverse video, underline, and blink can produce some good results. For example, I have a set of suit identifiers I use in card games that looks like this:

```
  ()    /\  ( \ / )   /\
()  ()<  >  \   /   /   \
  /\    \/    \/   ( /|\ )
```

Try punching them up on a Dasher and you'll see that they look pretty good.

In summary, there is hope for games in the Data General environment. You can find, design, and code games that you and your colleagues will enjoy playing. You will have the satisfaction of knowing that you created a diversion that makes our systems a little more fun. Δ

Larry Morse is a senior systems training specialist with Data General Educational Services, and has developed several games that run on Data General systems.

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The latest products for DG systems

Two new terminal server products expand options

Westboro—Two new terminal server products from Data General expand DG terminal connectivity options in local and wide area networks.

Termcontroller is a single-board ethernet communications controller that connects an Eclipse MV family computer to an ethernet local area network (LAN).

For customers desiring direct asynchronous connection to MV processors, the company also introduced new Intelligent Asynchronous Controllers (IACs). The IACs come in 8-line and 24-line versions supporting RS-232 and RS-422 electrical interfaces. IACs are designed to increase CPU performance by off-loading asynchronous I/O processing from the host.

DG offers Termcontroller in two versions. The ITC-128 Termcontroller supports 128 sessions; up to 64 sessions are available for active users. The LTC-64 supports 64 sessions; up to 32 are available for active users. The extra sessions allow users to log on to as many as eight different applications or hosts, and then switch easily between them.

Termcontroller utilizes a high-performance architecture to off-load asynchronous and network functions from the host. The ITC-128 consists of seven 12 MHz Motorola 68000 processors, a VLSI IEEE 802.3 controller, and 4 MB of memory. The LTC-64 consists of three 12 MHz Motorola 68000 processors, a VSLI IEEE 802.3 controller, and 2 MB of memory.

ITC-128 Termcontroller is priced at $9,500 for high-end MV processors. The LTC-64 Termcontroller is priced at $5,300 for low-end L-Bus MV processors. The IAC 8-line and 24-line versions consist of a single 15-inch Data Channel board, with the option of one or two Motorola 68000 processors. The IACs house up to 1 MB of memory, and offload many screen and interactive editing functions from the host. Pricing for an 8-line IAC ranges from $3,400 to $3,600. Pricing for a 24-line IAC ranges from $7,400 to $7,900. Δ

Data General Corporation, 3400 Computer Dr., Westboro, MA 01580; 508/898-4083.

Circle 73 on the reader service card.

DG Dasher/386 gets full ICOBOL abilities

Boulder, CO—Two products from Wild Hare Computer Systems, Inc., allow ICOBOL programs to be compiled and run on the DG Dasher/386 system running Unix.

Wild Hare's Choice! run-time system directly executes ICOBOL programs on any Unix-based Dasher system, including the new Aviion systems announced in February. Program and data files may be taken directly from DG operating systems and used under Unix.

Wild Hare's Axis Cobol is a DG-compatible ICOBOL source compiler that runs under Unix and other operating systems. It translates ICOBOL source programs into DG-compatible object code at over 7,000 lines/minute on most PCs. Δ

Wild Hare Computer Systems, Inc., P.O. Box 3581, Boulder, CO 80307; 303/442-0324.

Circle 82 on reader service card.

RDS adds to its PC integration products

Pasadena, CA—Rational Data Systems has added true file service and remote MS-DOS command execution to its line of PC integration software products. These features are included with PC/VS release 3.32 and PC/Remote release 1.30.

True file service allows direct access to AOS/VS files as though they are MS-DOS files. This feature is useful for word processing applications where documents must be shared between users on PCs and users at terminals.

Remote MS-DOS commands allow users or batch jobs under AOS/VS to execute MS-DOS programs on PC workstations.

PC/VS is Rational Data System's LAN-based PC integration software package, which has been on the market since 1985. PC/Remote is a comparable asynch-based product that allows PCs to access an MV family server via direct or modem serial connections. Δ

Rational Data Systems, 150 South Los Robles Dr., Pasadena, California 91101; 818/568-9991.

Circle 79 on the reader service card.

Computer Engineering Associates enters hotsite business

Baltimore—Computer Engineering Associates, Inc. (CEA), has opened a dedicated disaster recovery center in the Philadelphia area for Data General based computer users.

In addition to restoring a company's Data General equipment in the event of an emergency, CEA will provide technical assistance to connect nonstandard equipment to the hotsite system, according to CEA president Paul R. Keys. This could include bar code scanners, OCR gear, check sorters, or specialized printers.

CEA has purchased an MV/20000 to add to its large computer base and has over 5,000 square feet of office space ready for users in the event of a disaster. Backup of the disaster recovery center is at four separate locations. Δ

Computer Engineering Associates, Inc., 3922 Vero Rd., Baltimore, MD 21227; 301/247-5244.

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Continued from page 71.

Data Bank Associates to develop ARC for DG

Germantown, MD—Data Bank Associates has signed an exclusive contract with System Enhancement Associates of Wayne, New Jersey, to develop, market, sell, and license the ARC program for Data General computers.

System Enhancement Associates will continue to upgrade and provide the ARC program in the personal computer environment. With PCs, the ARC program is used to create and maintain libraries of files that are automatically compressed and uncompressed, resulting in space savings in the files. Data Bank Associates will develop new implementations of ARC that will save disk space in the Data General environment. Δ

Data Bank Associates, Inc., 20010 Century Blvd., Suite 104, Germantown, MD 20874; 301/540-5562.

Circle 72 on the reader service card.

IS-4210 storage subsystem increases disk capacity

Drayton Plains, MI—The new IS-4210 storage subsystem from Indocomp Systems, Inc., provides Data General users with a method to increase the disk capacity of their MV/2500, MV/2000, MV/1400, and DS/7500 computers. It consists of a desktop enclosure containing a 612 MB, 5-1/4-inch Winchester disk drive, the IS-4200 controller, an interconnect cable, and an AOS/VS compatible driver.

The 612 MB disk, a Control Data Wren V, has an 18 ms average seek time and a maximum transfer rate of 1.8 MB per second. The IS-4200 is a 15-inch by 7-inch option board that plugs into any L-bus based DG computer. It contains a 68010 I/O processor and a 128 KB buffer RAM and can accomodate up to seven SCSI peripherals.

The price of the storage system is $8,900. The price of additional 612 MB disk drives is $5,400. Δ

Indocomp Systems, Inc., P.O. Box 157, Drayton Plains, MI 48020; 313/666-9715.

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NEW

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Memory module increases capacity

Princeton, NJ—The new DR-6080 memory module from Dataram Corporation allows users of Data General MV/6000, MV/8000, and MV/8000 Model II computers to reach their maximum capacity of 16 MB.

The DR-6080's design accommodates up to 12 MB of memory on one board. When added to the CPU, the extra memory increases overall system performance to allow faster response, added applications, more users, or all three.

Dataram's DR-6080 boards are ready to use without the need to modify DG processors. The new modules carry a lifetime warranty from Dataram and are supported by the company's Express Spares Program within the United States.

There is a trade-in program for the new DR-6080 boards, with a trade-in allowance for certain DG modules. Δ

Dataram Corporation, P.O. Box 7528, Princeton, NJ 08543-7528; 1-800/822-0071 or 609/799-0071 (in New Jersey).

Circle 75 on reader service card.

EMU/470 provides color graphics emulation

Columbia, MD—Rhintek, Inc., has announced version 2 of its EMU/470 color graphics terminal emulator. EMU/470 emulates all of the top-of-the-line Data General terminals including the D411, D460, D461, and the D470C terminal. The CEO Connection, W460, provides workstation services for DG's CEO product.

EMU/470 version 2 provides graphics emulation on VGA, EGA, MCGA, CGA, and Hercules graphics adapters. A simulated compression mode, which displays 128 characters per line, is available with any of the above graphic adapters.

EMU/470 permits file transfers between a DG host and a PC. File capture and protocol transfers are included. The protocol capability includes a mechanism for calling various external protocols such as XMODEM and Kermit.

The emulator runs on IBM personal computers, IBM PS/2s, and 100 percent compatibles. It can simultaneously drive

CADGUG is alive and well and voicing it's concerns!

The Chicago Area DG User Group has been through a re-vitalizing period and is ready for an active summer! During May, in addition to a monthly meeting, CADGUG is sending out surveys to all members asking their concerns about local DG management. The June meeting will be hosted by Data General, who will address the concerns most mentioned on the surveys.

All Chicago area DG users are encouraged to fill out the surveys and turn them in so that DG can answer your questions. If you haven't received a survey to turn in, contact Don Mungovan (312/930-9400), or Jim Siegman (312/673-1700). This meeting should prove to be very interesting, don't miss it!

Circle 5 on reader service card.

SCREEN DEMON

Pop-up Windows For COBOL!

- *Electronic Mail*
- *Pop-up Calculator*
- *Print Screen*
- *Pop-up Notepad*
- *Redraw Screen*
- *Swap to CLI*
- *Faster Screen Display*

Rev. 2.0 just released!
New features include:

- *View screens of programs running on other terminals*
- *Record and playback terminal sessions*
- *Automatic termination of inactive program*
- *Remote termination with orderly shutdown*
- *WP Library and CEO interfaces*
- *ACCEPT time-out for ICOBOL*

Versions for AOS/VS COBOL and ICOBOL work with existing programs without recompilation. Screen Demon routines may be called from programs written in "C".

$950

Demo available $25

Threshold, Inc.
165 E. Magnolia Ave.
Auburn, AL 36831

(205) 821-0075

Circle 61 on reader service card.

any PC compatible printer or Microsoft mouse. EMU/470 is available for less than $200 in the United States. Δ

Rhintek, Inc., P.O. Box 220, Columbia, Maryland, 21045-0220; 301/730-2575.

Circle 80 on reader service card.

Concept Automation offers CEO encryption

Sterling, VA—Concept Automation, Inc., is currently shipping version 1.2 of its CEO encrypting device, Integrated File Crypt. Encryption software is used to prevent unauthorized access to files.

The new release features two enhancements for speed and simplicity. Users now have the option of using the CEO Interrupt key during the encryption request. Also, the software can now read the status of a document.

The cost is $7 a day for the first year on an MV/15000 model 8. Subsequent years are $400. The AOS/VS version costs half as much. Δ

Concept Automation, Inc., 1319 Moran Rd., Sterling, Virginia, 22170; 703/450-6000.

Circle 71 on reader service card.

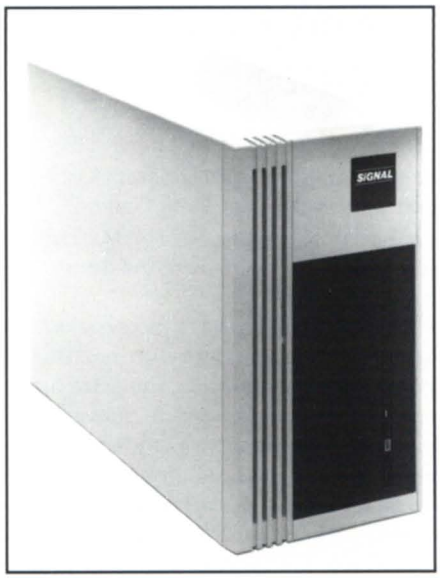
Signal offers DG/500 tape subsystems

Acton, MA—Signal Computer Products, Inc., has released new tape and disk drive subsystems for DG/500 and other DG computers.

The Pacer tape subsystem uses a standard 1/4-inch cartridge and has 150 MB storage capacity. It allows backup at a rate of 90 KB per second. In other words, an unattended backup of the standard 160 MB disk is completed in about five MB per minute. Pacer is available either as an internal mount or in a small desktop enclosure.

Sprinter is a high speed tape subsystem that can back up data at a rate of 1.5 MB per second using VHS technology. The 8 mm cartridge can store 2.3 gigabytes.

Both units come with controller, cables, and mounting instructions.



The Vault

For disk drives, Signal has released the Vault/380 and the Vault/780, which offer 380 MB and 780 MB of storage respectively, and access time of 16 ms. Data transfer rate can reach as high as 4 MB

CALLING ALL UK USERS

There are many third party products that can improve the efficiency of your Data General computer environment. Some of the most popular ones are indicated below:

B32 now has both CEO and Library shell interfaces.
Dimension is a 4GL which creates robust, commercial environment BB code.
EMU/470 is the most cost-effective way to color your applications.
File Finder is a utility for information retrieval with AOS/VS files.
GENISYS I is a fully featured DBMS for non-technical end users.
InfoLynx takes the strain from INFOS users.
PC/Remote gives PC integration using async RS232 instead of LANs.
THE ULTIMATE could save a lot of coding for INFOS users.
WPFile provides drawers, folders and documents for WordPerfect users.
WordPerfect is simply the best word-processing software for DG.
20/20 is the definitive spreadsheet product, now with CEO integration.

If you think that there may be other third party packages that would be of benefit to you, please phone, we would be delighted to help you to prove the case.

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Schedule:	
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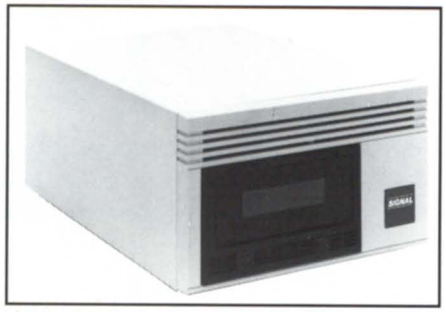

The Sprinter

The Vault series subsystems are available in a small desktop enclosure or standard rackmount enclosure. They come with drives, controllers, cables, and installation instructions. Δ

Signal Computer Products, Inc., 411 Massachusetts Ave., Acton, MA 01720; 508/263-6125.

Circle 81 on reader service card.

Fast Track acquires Sysgen contracts

New York—Fast Track Systems, Inc., signed an agreement with Sysgen Recovery Services, Inc., to acquire Sysgen's contracts for DG hot site services. Sysgen will no longer maintain a disaster recovery business, but will act as an agent for Fast Track, focusing on new business development. Both organizations are leading providers of hot site services to users of Data General equipment.

Fast Track Systems, Inc., operates hot site locations in Chicago, Brooklyn, and Wall Street. Services include alternate computing facilities, on-site equipment inventory, private communications networks (available in most cities), and consulting.

Data General has qualified Fast Track Systems, Inc., as a provider of DG hot site services, based on Fast Track having met criteria established by Data General. In addition to DG hot site services, Fast Track provides off-site data storage, facilities management, and contingency consulting. Communications hubs are located in San Francisco, Los Angeles, Dallas, Philadelphia, Miami, Chicago, and Toronto. Δ

Fast Track Systems, Inc., 61 Broadway, New York, NY 10006; 212/422-9880.

Circle 77 on reader service card.

High availability uninterruptible power supplies new from DG

Westboro—Data General Corporation announced a line of high availability uninterruptible power supplies (UPS). The UPS systems are field upgradeable, online peripherals designed to clean the electrical power to the computer system, and to provide power when normal utility power is lost during a brownout or blackout. The UPS systems further enhance the systems availability of the high-end Eclipse MV/40000 and MV/40000 HA computer systems.

The high availability uninterruptible power supplies are available in power ratings from 50 KVA to 125 KVA. This now expands Data General's online UPS product line from 3 KVA to 125 KVA. United States list prices for the power supplies start at $55,000 for the 50 KVA unit and $74,000 for the 125 KVA unit. Δ

Data General, 4400 Computer Dr., Westboro, MA 01580; 1-800/343-8842.

Circle 74 on reader service card.

Delphi Data announces generic SCSI disk cache controller

Riverside, CA—Data General's MV series of computers can use the newest high performance SCSI disk drives with Delphi Data's Cache Box family of RAM cache controllers. The Cache Box connects a host CPU and one or more SCSI disk drives.

The MV/1400, MV/2000 (new style), and MV/2500 have built-in SCSI controllers that can control many SCSI drives, any of which may be connected to a Cache Box. The MV/4000 through MV/40000 use SCSI disks by the addition of the single slot CSS controller made by DG.

The Cache Box functions with DG-RDOS, AOS/VS, AOS/VS II, and DG/UX, binary compatible MV machines, and the new 88000 machines. Δ

Delphi Data, 12155 Magnolia, Suite 6C, Riverside, CA 92503; 714/354-2020.

Circle 76 on reader service card.

The Value Added Resellers whose products are advertised on these pages are all Data General VARs and have been recognized in the marketplace as leaders. This section of Focus provides a sampling of the products that are available through DG VARs. If your company is a DG VAR that would like to be included, or if you know of other DG VARs that may be interested, please contact the Focus Associate Publisher at 512/345-5316.

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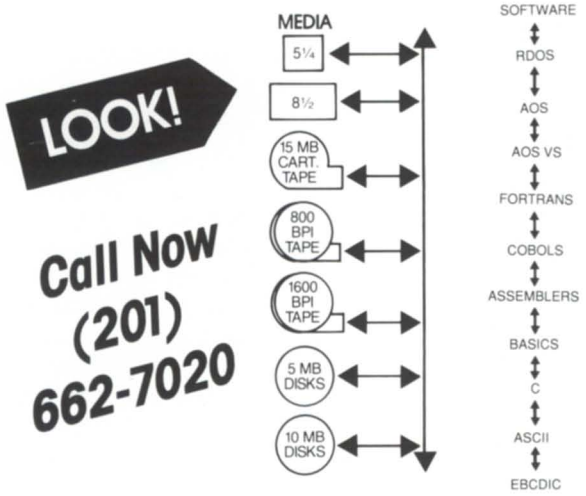

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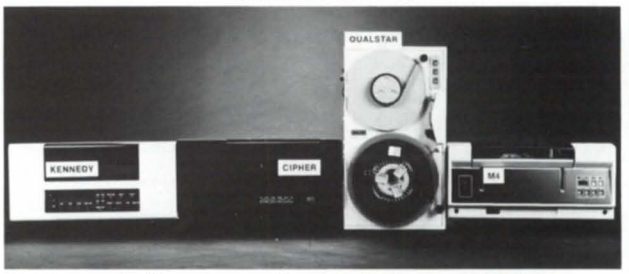

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Circle 44 on reader service card.

Data General will port **Novell**'s new Open Netware LAN services to the Eclipse MV/family of computers and to the company's new Aviion family of Motorola 88000 Unix-based systems unveiled at the end of February in San Francisco.

The DG marketing and development agreement with Novell is in conjunction with Novell's introduction of a portable version of its Netware product, which currently holds the largest market share in the international PC LAN market.

"This agreement is part of our new Distributed Applications Architecture and represents the second phase of Data General's open LAN strategy—aimed at giving existing and future customers the freedom to choose a network architecture based upon individual computing needs," said **John Kavazanjian**, Data General vice president of network services, Communications Systems Group.

■

Data General is the first major minicomputer vendor to embrace **IBM's** strategic communications programming interface, known as the **Common Programming Interface—Communications (CPI-C)**. CPI-C enables applications running on Data General and IBM systems in a systems application architecture (SAA) environment to communicate while making the network transparent to those applications.

"This commitment to CPI-C illustrates our grasp on what it takes to be the leader in adhering to IBM communications standards," said **Joe Clabby, Communications Sector** marketing manager at Data General. "We are committed to providing our own customers with products that can capitalize on IBM's series of SAA standards. Our adherence to CPI-C will help ensure a common communication environment for application interaction where program-to-program communication based on CPI-C is appropriate."

Data General also announced in March two new communications software products and enhancements to seven others that expand the interoperability of Data General and IBM systems.

■

Teledyne Control Applications, a division of **Teledyne, Inc.**, of Los Angeles, and Data General are combining forces to market and sell the first minicomputer-based Unix supervisory control and data acquisition (SCADA) system.

Vector, Teledyne Control Application's market-leading SCADA system, will be ported to DG/UX software. The system will run on MV/family computers and Aviion RISC workstations and servers.

Ed Holmes, marketing director for Teledyne Control Applications, said his company had been searching for a Unix operating system for SCADA. "We looked at different minicomputer vendors; when we compared the design, implementation, and performance of DG/UX, we decided that its features and flexibility are the most advanced in the industry. We feel that Data General will establish itself as a leading Unix systems vendor," he said.

Both Teledyne and DG have been successful in the SCADA industry, having co-developed systems with **Exxon** and for the Alaskan pipeline, among others.

Teledyne also became a DG cooperative marketing value-added reseller (CMV).

■

The following from **:SYSMGR** speaks for itself:

":SYSMGR is sponsoring a contest to award the **First Annual UPDATE.CLI Trophy**. The trophy will be awarded to the individual or group that submits the program that most outrageously exhibits how CPU time can be senselessly squandered doing even the most trivial task. Entries that most closely reflect the contest theme, **'MIPS, the Breakfast of Champions**,' will be given special consideration.

"The award was created in order to memorialize the AOS/VS UPDATE tool. The UPDATE tool was developed by Data General in order to make the installation of AOS/VS updates more user-friendly and bullet-proof. Clearly, CPU consumption was not a consideration; the program takes an hour and 20 minutes of CPU time on an MV/4000 to install AOS/VS 7.60 Update 04.

"All entries should be submitted in source listing form and must indicate CPU type and estimated CPU time, if possible. Estimated CPU time must be finite. All entries will become property of :SYSMGR, so please don't send listings of production software from your own systems, as suitable as they might be. Entries may be submitted in person at the :SYSMGR booth at **NADGUG**'s Conference '89, or by mail to the address below.

"The deadline for submitting entries is noon, Wednesday, September 20. Presentation of the award will be made at NADGUG's Conference '89 during a special press conference to be held in the bar area of the conference hotel on Wednesday night."

For details, contact **Carla Perumean**, marketing director, :SYSMGR, 109 Minna St., Suite 215, San Francisco, CA 94105; 415/550-1454.

■

Richard Finmore reports that the annual general meeting of the **Data General User Group of the United Kingdom and Northern Ireland**, held March 9-10 in London, was an even bigger success than last year's event. His gauge for success was the fact that many of the attendees were still in the hotel bar talking things over three hours after the conference concluded. Presentations by **Tim Reiter** of Data General and **Brian Johnson** of **B.J. Inc.** were especially well-received, according to Finmore.

In other DGUG business, **Hugh Ross** was elected to another term as chairman, and **Mike Hunt** became deputy chairman. Finmore will serve as a salaried managing director (the DGUG is organized as a limited corporation). **Graham Woodage** was appointed to serve as a liaison to Data General.

The DGUG is planning its next annual general meeting for late March next year; it continues to extend an invitation for NADGUG members to attend.

■

Don Mungovan, president of the **Chicago Area Data General Users Group (CADGUG)**, was unable to attend NADGUG's Spring Board Meeting because he was in London attending the UK DGUG conference. Coincidentally, the UK conference was held at the same time as the NADGUG board meeting in New Orleans (March 9-10). Mungovan won the free trip to London at the 1988 NADGUG conference.

■

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