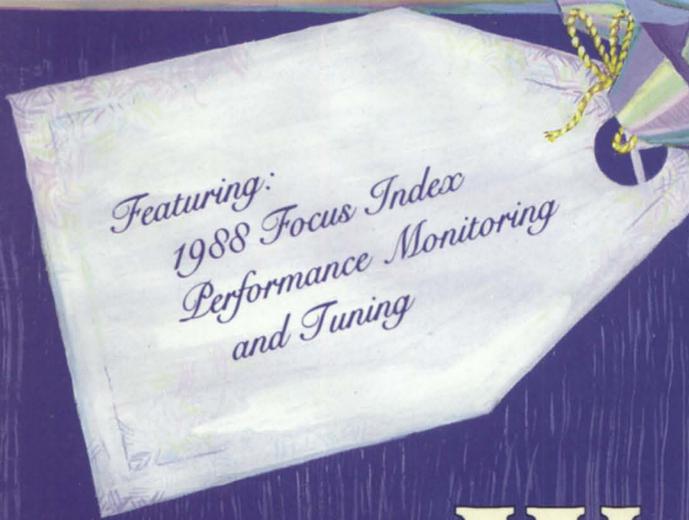


December 1988

FOCUS

The Magazine of the North America

General Users Group



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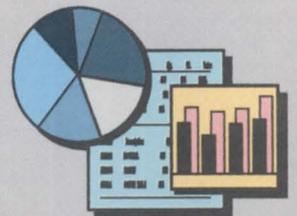


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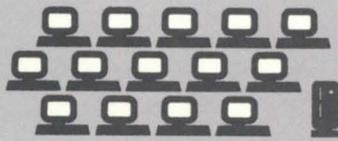
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Can we help you?

by Donald W. Clark
NADGUG president

I want to direct my words this month especially to people who are either new to NADGUG or who haven't yet become members. If you've been a part of NADGUG for a year or so, you might want to skip ahead a few paragraphs, because you'll already understand the point I'm trying to make.

Those of us who have been working to make NADGUG grow talk a lot about things like two-way communication between us and them, that is, between users and Data General. In fact, we hope that our efforts at communication will help blur that "us/them" distinction, because we all share the goal of making life easier, more prosperous, and more productive for the community of people who use DG equipment.

To be honest, though, that's a pretty rarefied goal. It sounds great, and you'd be hard-pressed to come up with a good reason for thinking it's a bad idea. On the other hand, it's probably not enough to get you involved in the group. We're asking people to make a small dollar commitment, but a big commitment of time and effort, in order to make NADGUG grow. Most people want a better answer to a basic question before they make that kind of commitment: "What's in it for me?"

That's a fair question, and I think NADGUG has a very good answer. The staff has been working on a list of good reasons to support NADGUG, and they're up to 31. Not all of them will speak to you directly, but there are bound to be a few that will hit you where you live. For example, if you have a number of people in need of training, how does a big discount on DG course work sound? How about the library of donated programs?

Those are just a few of the reasons. If you want the whole list, just call or write the NADGUG staff, and they'll make sure you get a copy.

As NADGUG has grown during the last few years, that list of benefits for members

has expanded. In time, we hope to have a much longer list that will appeal to the special needs of a lot more users. This is one of those beneficial cycles where the more members we have, the more we can do for them—and the more users will take that step of becoming a member.

For right now, we're trying to gauge how we can direct our efforts to do the most good. To this end, we're looking for input from members. Which of the services we provide now are most valuable to you? Which don't you care about? What new services should NADGUG add in order to attract new members?

If you have a pet interest that you think NADGUG should address, please tell us about it. You can call me directly or send a letter to the staff or leave a message on one of the bulletin boards. Believe it or not, messages like that really do have an impact, and many of the services we now provide got their start with a few members who had an idea.

Of course, there's always a risk in telling us what you want, because you might be invited to help implement a solution. But that's fun, too.



Another area we're looking for input on is the annual user concerns survey. This got started several years ago when NADGUG officers met with DG officers about the things that were bothering users. Ed de Castro put it in pretty blunt terms: if we could come up with some objective measures to back up our ideas, DG would pay attention to what we said. Otherwise, we were just complaining.

Since then, we've gone to a lot of effort to back up our concerns with some hard data. And DG has been quite responsive to the concerns we raised. In a month or two, we'll be sending out the questionnaires again, and once again, we'll ask you to return them promptly with your best judgments on what DG needs to do to make life better at your installation.

It's a simple questionnaire, but the results are very important. Watch for that questionnaire, and don't let this opportunity for making your concerns known get away from you.



Happy holidays!

△

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LETTERS



CEOWrite concerns cross the Atlantic

It is with ever-increasing surprise and anxiety we read Bobbie Pressman's *Focus* articles on DG's new CEOWrite pricing policy. Holland features an active DG user group, with [an] affiliated CEO SIG, representing more than 15 major companies using CEO. It was around May of this year that DG Holland made indications that CEOWrite/VS would not be a free add-on to CEO, nor a free replacement to CEO WP. Some users had already received the English version of rev 3 and to their surprise found CEOWrite/VS missing from the tape.

All this happened after extensive sales activity to promote rev 3 and advertise its blazing new features, including the long-awaited compound document support. Also, such features as multiple fonts, multiple language dictionary support, and hyphenation were advertised for rev 3, without any indication that this would require some extra guilders.

As a result of these experiences, I am sure you will not be surprised that we welcomed your criticism to DG's pricing policy. As far as we understood from Bobbie Pressman's article, we think DG's reaction to the user community uproar has been most inadequate. Of course, the management of DG Holland, as any other subsidiary, has very little flexibility to move independently from Westboro, which makes the users' position outside of the USA even less powerful than in the USA. Therefore, we welcome the opportunity to explain our arguments for the NADGUG forum.

In our opinion, the SPSA we pay every month includes not only bug fixes, but also most definitely the right to receive enhancements to the product in response to user requests. During the last year, several requests for enhancements to the word processor were indicated as available in rev 3. As far as I am aware, there was never an explicit statement made in Holland about a free CEOWrite/VS; however, indications about future enhancements most certainly never mentioned a new product, let alone a separate pricing, until May of this year. This amounts to a downright devaluation of the user's right-to-use of a supported product, initiated solely by DG.

Though we can see that the market is driving toward "versioning" of software (marketing jargon for separate pricing), we feel it is most unfair to the existing user base that an acceptable upgrade policy isn't included from the beginning. In our view, such an acceptable policy can only include a free exchange of CEOWrite/VS for CEO WP. If such an offer is not made, we feel that most users will move to Wordperfect/VS, which may not be a bad choice after all.

As much the same problem seems to have arisen with AOS/VS II, first presented to the user community as AOS/VS rev 8, we see the CEOWrite/VS case as a key issue to DG's feeling toward its current user base.

Wytze Oostenbrug, president
Data General Netherland Users Group

Off the top

In Jim Siegman's "Discoveries" column in the October [1988] issue of *Focus*, Jim responded to an inquiry from Dan Lapp regarding the use of a Novell network in conjunction with his MV. While it is true, as Jim mentioned, that revision 3.31 of PC/VS supports Novell's Netware, Jim further suggested that Data General's DG/PC*I may support Netware in the future, because (as Jim put it) "PC*I is built on top of PC/VS."

Jim is mistaken. PC/VS and DG/PC*I are entirely separate and incompatible products. It is true that Rational Data Systems was involved with the development of Data General's PC*I; in fact, our Netlink product even offers PC/VS-like functionality and works "on top of" DG/PC*I. However, DG/PC*I uses OSI's IP and TP4 protocols, which are not compatible with the XNS protocols used by PC/VS, Netware, and most other PC LAN products on the market today. For this reason, DG/PC*I cannot, in its present form, communicate with Novell's Netware.

Rational Data Systems views Netware compatibility as PC/VS's most important feature. We are proud of the current level of compatibility and are working hard to increase the ability of our customers to operate RDS and Novell products in a homogeneous environment.

Doug R. Kaye, partner
Rational Data Systems

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If you use CEO (revision 3.0), you can also have the powerful advantages of WordPerfect word processing software. WordPerfect can be accessed directly from within CEO, and will support the CEO filing system, calculator, and interrupt key. There is no need to leave WordPerfect to use these CEO features.

Documents can be saved and retrieved from the appropriate CEO drawer and folder. The CEO calculator is easily accessible as well, by using only a few quick keystrokes.

If a mail message is received while you are typing a document in WordPerfect, you will be notified at the WordPerfect status line. You can then use the CEO interrupt key to temporarily suspend

WordPerfect while you access your message through CEO. When you return to WordPerfect, the cursor will be right where you left it.

The WordPerfect/CEO combination will provide you with the same host of powerful features users have come to expect from WordPerfect 4.2. For example, you'll have the Thesaurus and 115,000-word Speller at your fingertips. Columns appear side-by-side on the screen as they will look when printed. Footnotes and Endnotes are automatically formatted and numbered for you. Macros let you record and automate keystroke combinations, and the Merge option allows you to combine data from two or more different sources into a single document.

With WordPerfect on your AOS/VS machine, you have the added benefit of opening as many as ten documents, and seeing two simultaneously on-screen.

If you've considered buying WordPerfect 5.0 for the IBM PC, rest assured that WordPerfect documents created on Data General machines can be retrieved into 5.0 format on the PC. Likewise, files created with 5.0 for the PC can be saved in 4.2 format and then re-retrieved on the Data General. (Features new to 5.0 will not transfer to 4.2.)

Because all WordPerfect file structures are identical, you can transfer them from one machine to another in a straight binary format—no conversion program is necessary. WordPerfect is available on many machines, including DG, VAX, UNIX, IBM 370, IBM PC, Apple, Macintosh, Atari, and Amiga. For those who work in an environment that combines several computer systems, the convenience of WordPerfect connectivity is invaluable.

For more information on programs or marketing, contact the Data General Products Division at WordPerfect Corporation.

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ROUNDUP

News from NADGUG and its affiliates



by Cathlene Gentry
RIG/SIG coordinator

The Austin, Texas, start-up group had its first organizational meeting on October 4. The meeting, held at the Collonade Office Park, was hosted by the people at Snowbird Systems, who provided refreshments for members to snack on while getting to know each other. Gregg Leidel of Hillhouse Associates acted as MC and asked the 20-plus others in attendance to introduce themselves and tell what type of systems they used, what their companies did, and what their interest in a local users group was. He then introduced me as the NADGUG RIG/SIG coordinator. I spoke about the benefits of local user groups, and what NADGUG could offer the group if it became a recognized RIG.

Don Bowen from the Austin Data General office gave a short talk on the new products that DG had introduced the day before: the Eclipse MV/40000 and the MV/40000 HA computer systems, the Message-based Reliable Channel subsystem, and AOS/VS II. He also offered his office's support for the group.

For more information, contact Gregg Leidel at Hillhouse Associates, 8834 Capital of Texas Highway N., Suite 300, P.O. Box 201359, Austin, Texas 78720; 512/343-5555.

The RIG/SIG Committee met in Phoenix October 26 to 28 in order to discuss plans and strategies for the upcoming year. They also met with the organizers of the Phoenix regional interest start-up group to give their support to help the group get off the ground as smoothly as possible. A more detailed account will be given in next month's issue of *Focus*.

The Metropolitan New York RIG has scheduled its next quarterly meeting to be held at Data General's Saddle Brook, New Jersey, offices (Park 80 West, Plaza One), on Tuesday, December 20, from 10:00 a.m. to 12:30 p.m. A presentation on Cybertek's CQCS 4GL programming language will be featured.

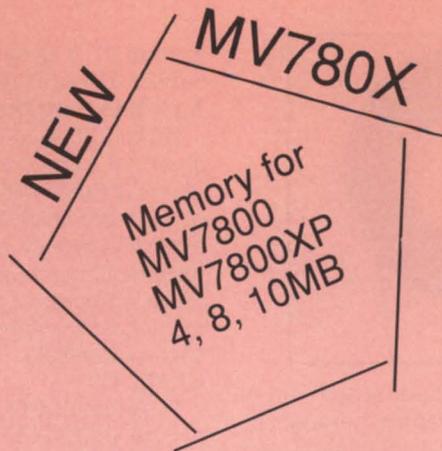
If you plan to attend, please contact Stephen Kern at 201/327-6300 ext. 368.

Germany now has its own Data General Users Group. As of May 6, the Data General Anwendervereinigung DGAV was founded. The group's president is Dr. Wolfgang A. Slaby, Akad. Direktor. Dr. Slaby says the aims of the group are to promote information exchange among the members on the use and application of DG hardware/software or third-party products running on DG equipment. The group will also represent the interests of its members with respect to hardware and software requirements. The group will support interest groups for special hardware, software, or applications.

The DGAV held its first annual meeting on November 24 and 25 at the Holiday Inn, Main-Taunus-Zentrum Sulzbach.

Data General users from western Washington and southwest British Columbia, are joining forces in starting a user group in their area. A preliminary planning meeting was held on October 25 at the Data General office in Bellevue, with a general meeting scheduled for November to elect officers and establish a regular meeting schedule. Any interested users in the area are welcome to join. Please contact Don Hardwick of Data General at 206/453-3200, or Leryl Cash at 503/631-2605.

The Northern Ohio Data General Business and Scientific (NODG BS) users group recently held an organizational meeting in which 45 people attended. The group is attempting to form a committee to handle its leadership functions. This committee will take the place of elected officers, and allow members to share the responsibilities of leadership. The group will meet again on January 18 at the new DG office in Cleveland. A tour of the facilities tops the agenda. Anyone interested is encouraged to attend. For more information, contact Tim Boyer at Denman Tire Corporation, P.O. Box 951, Warren, Ohio 44482; 216/898-2711. △



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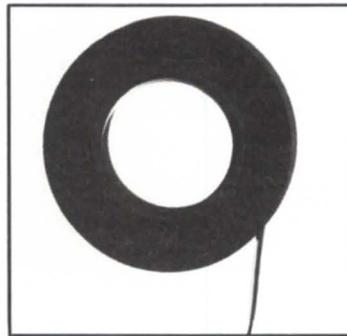
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A complete listing of the NADGUG software library

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.

Automatic logoff

This Pascal program automatically logs off users from the system after a determined period of time. Uses 246 blocks.

Big Brother

Automatic log-off program written in

Fortran 77. Donated by the U.S. Forest Service. Uses 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. Uses 5,749 blocks.

CRTEDIT

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

DBCHECK

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

DUMpload

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

FILEMNGR

You can move, copy, delete, view, and perform several other options. This is distributed as shareware. If you try it and

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continue to use it, you are requested to pay a registration fee. From Kim Geiger. Uses 459 blocks.

FTNCVT

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

Games

Games is a collection from various places. Enjoy. Uses 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. Uses 416 blocks.

IMSLUTIL

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

Uses 6,154 blocks.

JAG_UTIL

JAG_UTIL consists of several programs: Filecount, Userspace, Scan, and Laminate. John Grant has reserved some rights on his stuff, so check the documentation for specifics. Uses 1,501 blocks.

Kermit

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

Logout

Another auto-log system. Uses 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. Uses 438 blocks.

Macbook

This is a collection of macros from the Colorado users group. Uses 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. Uses 492 blocks.

Misc Kerm

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

QHelp

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

SKLSCRN

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

Softrans

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

SWITCHES

SWITCHES is the GET.SWITCHES routine from John Grant's column in *Focus*. Uses 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. Uses 495 blocks.

VT100KER

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

Xfer

Xfer is a tape-conversion utility. △

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Means of support

The marketing manager of DG's Software Business Unit explains controversial new policies

DG formed its Software Business Unit about a year ago, and charged it with increasing the company's focus on software as a business—especially software maintenance and support services. Recently announced changes in the way DG sells and supports its software products reflect that new focus.

The SBU is responsible for software quality assurance for the corporation, as well as the delivery of support services through the Atlanta telephone center. Recently it established a separate group to do maintenance of "versioned" products. According to Frank Kenney, marketing manager for the SBU, "This is really a big change for Data General. Historically, the maintenance for the various products was done by the original developing organization. We were always competing with new development for maintenance resources."

The common thread in this interview is the SBU's effort to develop a "business framework." In order to assure the quality of software support services as well as the quality of the initial releases, Kenney argues that a number of fundamental changes were necessary. How those changes will affect users is the subject of this interview.

Focus: Long before DG announced the details of its new software policies, users had heard enough to get confused, or in many cases, upset. From your point of view, what are the policy changes all about?

Kenney: With the responsibility for maintenance of software products now isolated into the SBU, we hope we'll be able to improve our maintenance ability and offer people a choice—and not force them

to go to newer versions of their software in a six-month time frame.

Software maintenance services are the most significant aspect of what we're trying to do now. A major aspect of that change is to remove the 32-bit operating systems from the Software Subscription Service. SSS for AOS/VS started in 1981 with version 1.1, and the price at that time was around \$1,000. In May of 1983, we had a price increase to \$1,440, and in July of 1986, our price increased to \$1,600. Over that time, we've had about 50 updates to the product. You paid the flat fee, you got the 50-plus updates during that time, and you could apply them to any number of systems at no additional charge. Frankly speaking, that method of operation is not realistic in today's business environment.

Focus: But moving customers from SSS to Support Plus is going to cost them a lot of money, isn't it?

Kenney: We've tried to give people time to make their choice. The substitute product for the SSS for the 32-bit operating systems is Support Plus. What we've said is that SSS customers can continue under the old guidelines, paying a flat \$1,600 fee, with renewals until April 1 of 1989. So if someone renews at the end of March 1989 for a year, they will still have a \$1,600 flat fee and still get updates to VS until April of 1990.

We also tried to reduce the financial impact of the transition. The existing SSS subscriber can convert to Support Plus at no charge for the remainder of the SSS agreement. Then at the end of that agreement, that person can get the Support Plus service at a discount that varies by the class of machine.

Focus: What users are really concerned about is the "versioning" of software products.

Kenney: In the case of versions, there are really just two products covered so far, AOS/VS II and XTS II. In order to provide

these new versions, practically speaking, we have to charge for them. They really are new products. This is very similar to the industry-standard practice with respect to software. We continue to support the old version, and licensees of the old version can upgrade to the new version for 30 percent of the new version price.

Historically, we forced people to convert all their systems to a new version within a six-month time frame if they wanted to continue getting support from Data General. That was not well received by many people, because they didn't necessarily want the features or functions of the new version. And the cost of going to the new version can be significant—it's more than whatever the license price is because hardware upgrades may be necessary, and the customer's conversion time has a cost, too.

The customer now has a more valid choice. Now we're saying here's a new version: you analyze it on its own merits and decide whether you want it or not. And you can do it on your own time frame. The most significant part is that we'll support the older version, going back to the fact that we now have the maintenance responsibility.

Focus: Once again, isn't this going to be expensive for customers?

Kenney: To provide some financial relief for existing users, if you're already licensed on the previous version, there's a 70 percent discount to go to the new one. In this case, we said we will provide additional discounts over and above the 70 percent based upon the customer's dollar volume agreement. For systems that are on the low end, we will give two times whatever the dollar volume discount is off of the remaining 30 percent. If it's an E-class machine, the additional discount is 1.5 times the dollar volume discount. The intent there is to provide additional discounts for the individuals who have larger numbers of smaller machines.

Focus: Will the SBU help to define the capabilities for new products, as well as do maintenance on the old ones?

Kenney: No, the SBU is not responsible for new product development. Our responsibility is the maintenance of older versions. New product development responsibility is as it was in the past.

Focus: Some aspects of the new software policies were announced one way, but have been changed a bit since then. I'd like to make sure that we get the correct information on these, so I'll take them one at a time. First, can you tell us about the unbundling of software licenses from hardware purchases?

Kenney: For several years we've been offering the operating system as a separate product with its own price, but system purchases have always included the OS. We will continue that for all system packages except the new MV/40000 and MV/40000 HA. We had some initial discussions about unbundling the entire product line, but we also had the objective of being able to do it without a price increase, so we decided against that.

This isn't really so much a support issue as it is a packaging issue. We started with the MV/40000 because we wanted to see what the benefits are for both our customers and ourselves. The overwhelming majority of our customers also purchase our operating systems.

Focus: Going back to the "versioning" policy, what software products are covered?

Kenney: Today, it affects AOS/VS II and XTS II. The decision of what constitutes a version of something in the future is really a technical question of whether the changed content is significant enough to call it a version, and whether it's compatible with the environment it's going into.

Focus: That's a question a lot of people I've talked to have been wondering about. Who decides whether changes to a software product are simple revisions, or significant enhancements that would constitute a new version for which DG will charge an upgrade fee?

Kenney: Well, to answer your question in general, it's Data General. Within that, it's really the Software Development and Product Marketing organizations working together to answer that question. It's not our intention to version everything that was previously distributed as an update. If something has been in development for a year—and that may translate to 20 man-years of effort—then Data General as a corporation has to ask

itself whether that's a new version or not.

Frankly, I was surprised when I went back to look at all the updates that had been delivered for VS. I can't believe that anybody really wanted to implement those 50 updates.

Focus: If I understand the history of those updates correctly, a lot of them were largely

for quality assurance. That is, they were fixing a problem that had just been uncovered in the previous rev. There were more revisions at a greater frequency in the early days when quality assurance was more of a problem.

Kenney: I suspect you're correct. I think the frequency now is two or maybe three times a year. Of course, the updates will still continue on the new versions. Our

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commitment to support version II by means of updates, bug fixes, and everything else is still there. We're not saying that everything that appeared before as an update is now going to appear as a revision. That's not the case at all.

Focus: You mentioned earlier that DG considers versioning to be an industry-standard practice. That may be, but it

certainly isn't a standard expectation for the current customer base. Could you give us some background about what other companies are doing about this?

Kenney: In the case of IBM, of course, they charge for separate versions. Everybody really charges for separate versions, but they do it under different methodologies. DEC would charge for a new version, but they'd do it under a service option. Hew-

lett-Packard would also charge for a new version.

Focus: The first hint we got of the versioning policy is something you haven't mentioned at all. It came last spring when we learned there would be a separate charge for the upgrade to CEOwrite from CEO Word Processing. That created a lot of heat among users who had been paying software support fees for CEO Word Processing, and thought they were entitled to the upgrade for no additional charge. During the summer, we began hearing that DG would treat the new DUMP_III/LOAD_III and AOS/VS II the same way. What was the background for DG's decision? Why did you decide to change a policy that seemed to be working well?

Kenney: I don't recall the earlier decisions—I wasn't here at the time—but to present Data General's side of the story, versions as they're now packaged were included under the update service provided under SSS. Over the years, that had resulted in changes in functionality, as well as bug fixes. For \$1,600 a year, there were more than 50 updates to AOS/VS. That business practice, by any reasonable measure, is not sufficient to maintain the product, let alone improve the functionality. By a purely financial measure, it probably doesn't even pay for the media that was sent out over that time frame. There has to be a sufficient revenue stream to provide new functionality, to provide support services, and to maintain older versions.

Focus: How would you respond to users who say that DG needs to be working on offering new functionality anyway, in order to remain competitive with products that are available from other companies? That's just a necessary part of product development, they say, and maintenance is something altogether different. This point of view says that maintenance charges should cover the expenses of support and distributing updates, but shouldn't provide revenues for development.

Kenney: What customers have been paying in SSS fees wasn't sufficient even to support the maintenance. In the case of new versions, the customer doesn't have to go to the new versions now. They don't have to pay for it if they don't want it. They may have gotten it as part of SSS before, but practically speaking, the cost of implementation may have been significant.

Focus: I get the feeling that there has been
(continued on page 80)

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Out of Sorts with Present?

Fooling DG's 4GL Sort command

by Dennis J. Berman
Special to Focus

It's late Thursday night in Philadelphia. My trusty radar detector and cruise control guide me effortlessly southward down I-95—back toward Baltimore. Another successful NADGUG conference has been penned to the history books and corporate expense ledgers. My thoughts now turn toward the many encounters I had with the others fortunate enough to attend. Some were fulfilling conversations, some were not.

I found myself defending the honor and merits of Present, Data General's ad hoc reporting facility, almost as much as I ended up defending Vanna White. (For those of you who have read my last few articles, I finally met Vanna in Los Angeles. I think we should make her an honorary member of NADGUG.)

Some users apparently think of Present as the "horse and buggy of today's 4GLs"—short on features and lacking in power. This is far from the truth. Others argue against the merits of 4GLs altogether. The latter viewpoint will be the topic of a future article. As to Present's flexibility and strength, I have shown you in the past how to do things like work with multiple files (*Focus*, November 1987) and use complex conditional logic (*Focus*, September 1988). This month, I will share yet another helpful feature—how to make Present sort the way you want it to.

The Sort function in Present is straightforward. Simply list one or more items (fields, parameters, tables, etc.) you want it to sort, and by default, it will do a major-to-minor ascending sort. You can change the sorting of any or all of the items by indicating DESCENDING. Just by itself, Sort is a mighty powerful function. Add the Present Table function and you can really go places. The Table command is used to translate a list of items into corresponding values. For example, you could send values 01 through 12 through Table, and it will spit out January through December for you. The following is an example of how you can keep from being "out of sorts."

I have this little INFOS data base called BASEBALL.DB that contains the current (September 1988, EOM) major-league baseball team standings. See Figure 1 for its record layouts. I wrote a simple Present macro (see Figure 2) that sorts the data by division to come up with the report you see in Figure 3. As much as I enjoy seeing the Baltimore Orioles on the top of any standings report, this is not exactly how I need it to look. I am used to seeing the National League first, then the American League. Also, I like West to always follow East. And I do not like the way the report is handling the bad data (for you Kevin Costner fans). A simple descending division sort wouldn't fix this mess. It would produce a division sort of NW-NE-AW-AE. What I need is NE-NW-AE-AW. Also, to be a true standings report, I would have to compute each team's winning percentage and do a descending minor sort on it. The macro to do all this is in Figure 4. It produces the report in Figure 5.

Figure 1: Record layouts for BASEBALL.DB data base

```

**
** COBOL COPYFILE "BASEBALL.RC"
**

01 BASEBALL-STANDINGS-RECORD.
   05 BB-KEY.
       10 BB-TEAM          PIC X(15).
       10 BB-DIVISION      PIC X(02).
   05 BB-WINS              PIC 9(03).
   05 BB-LOSSES           PIC 9(03).
   05 FILLER              PIC X(07).

**
** PRESENT DESCRIPTION FILE "BASEBALL.DF"
**

ISAM FILE.
BASEBALL_STANDINGS_RECORD KEY BB_KEY.

01 BASEBALL_STANDINGS_RECORD.
   05 BB_KEY,
       10 BB_TEAM  CHARACTER(15)
           HEADER CENTER "TEAM",
       10 BB_DIVISION CHARACTER(02)
           HEADER CENTER "DIVISION",
   05 BB_WINS      UNPACK DECIMAL UNSIGNED(03)
           HEADER CENTER "WINS",
   05 BB_LOSSES    UNPACK DECIMAL UNSIGNED(03)
           HEADER CENTER "LOSSES",
   05 FILLER       CHARACTER(07).

```

Figure 2: BASEBALL_NOSORT.PR.MAC Present macro

```

INPUT INDEX BASEBALL
PAGESIZE 065 COLUMNS
TITLE 1 "(RPT BASEBALL_NOSORT)" DATE CENTER PAGE RIGHT
TITLE 3 "MAJOR LEAGUE BASEBALL STANDINGS" CENTER
TITLE 4 "(AS OF 30 SEPTEMBER 1988)" CENTER
TITLE 5 "— SORTED BY DIVISION —" CENTER
TABLE @DIVISION "NE" "NATIONAL LEAGUE EAST"
           "NW" "NATIONAL LEAGUE WEST"
           "AE" "AMERICAN LEAGUE EAST"
           "AW" "AMERICAN LEAGUE WEST"
           OTHER "<UNDEFINED LEAGUE>"

SORT BB_DIVISION
REPORT
   BB_TEAM
   BB_DIVISION
   @DIVISION(BB_DIVISION)
   BB_WINS
   BB_LOSSES
BREAK AFTER BB_DIVISION REPEAT
HEADER @DIVISION(BB_DIVISION) CENTER "DESCRIPTION"

```

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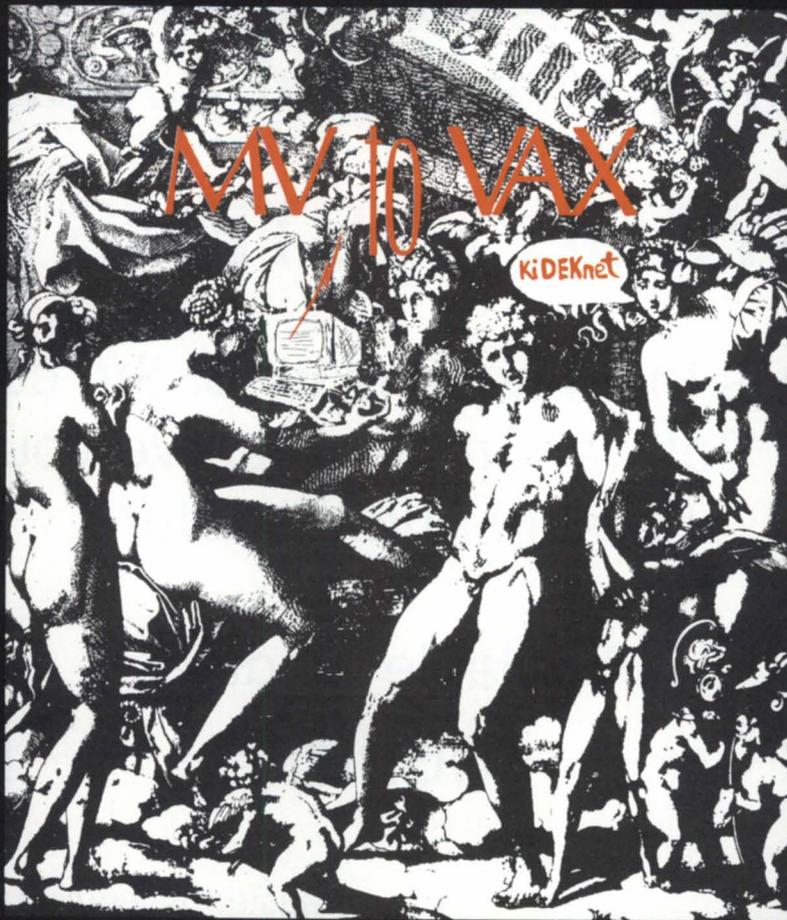
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The trick was to make a table (called @SORT_ORDER) that assigns an ascending value to the field keys in the order that I want them to sort. The Other key catches any invalid fields and sticks them at the end of the report. I then use this table in my major sort.

Another nice feature (although not fully developed) is Present's batch processing facility. There is nothing worse than walking around our shop looking for an available CRT only to find that they all are tied up doing a dozen different on-line report macro queries against data bases the size of the New York City telephone directory. Refer to your release notices on how to batch your Present jobs. If there is enough interest, I can show you how Present can do a double-pass, key-priming read of a single data base. This is nice to know if you have a file structure that requires you to use part of one record to find out the contents of another record.

If you are doing anything imaginative or ingenious with Present these days, please drop me a line. I will include it in a future article. Please send enough information so that I can re-create it on my end.



And now for my usual grab bag of comments to wrap up this article. For the Conference 88 attendees, if you need to associate my name with a face (for whatever reasons), I was the guy in suspenders who volunteered the \$100 bill for the magician to set on fire at the banquet. You may ask why I was such a good sport. Well, I had borrowed the money from a vendor! I was glad to have

Figure 3: Report output from BASEBALL_NOSORT.PR.MAC

(RPT BASEBALL_NOSORT)	9/30/88	1		
MAJOR LEAGUE BASEBALL STANDINGS (AS OF 30 SEPTEMBER 1988) SORTED BY DIVISION				
TEAM	DIVISION	DESCRIPTION	WINS	LOSSES
BALTIMORE	AE	AMERICAN LEAGUE EAST	54	104
BOSTON	AE	AMERICAN LEAGUE EAST	89	70
CLEVELAND	AE	AMERICAN LEAGUE EAST	75	84
DETROIT	AE	AMERICAN LEAGUE EAST	85	74
MILWAUKEE	AE	AMERICAN LEAGUE EAST	86	73
NEW YORK	AE	AMERICAN LEAGUE EAST	85	73
TORONTO	AE	AMERICAN LEAGUE EAST	84	75
CALIFORNIA	AW	AMERICAN LEAGUE WEST	75	84
CHICAGO	AW	AMERICAN LEAGUE WEST	69	89
KANSAS CITY	AW	AMERICAN LEAGUE WEST	83	75
MINNESOTA	AW	AMERICAN LEAGUE WEST	88	71
OAKLAND	AW	AMERICAN LEAGUE WEST	102	57
SEATTLE	AW	AMERICAN LEAGUE WEST	67	91
TEXAS	AW	AMERICAN LEAGUE WEST	68	90



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TEAM	DIVISION	DESCRIPTION	WINS	LOSSES
DURHAM BULLS	MN	<UNDEFINED LEAGUE>	158	1
CHICAGO	NE	NATIONAL LEAGUE EAST	75	84
MONTREAL	NE	NATIONAL LEAGUE EAST	80	79
NEW YORK	NE	NATIONAL LEAGUE EAST	97	60
PHILADELPHIA	NE	NATIONAL LEAGUE EAST	63	95
PITTSBURGH	NE	NATIONAL LEAGUE EAST	84	73
ST. LOUIS	NE	NATIONAL LEAGUE EAST	76	83
ATLANTA	NW	NATIONAL LEAGUE WEST	53	104
CINCINNATI	NW	NATIONAL LEAGUE WEST	85	73
HOUSTON	NW	NATIONAL LEAGUE WEST	82	77
LOS ANGELES	NW	NATIONAL LEAGUE WEST	92	66
SAN DIEGO	NW	NATIONAL LEAGUE WEST	80	78
SAN FRANCISCO	NW	NATIONAL LEAGUE WEST	82	77

finally met the guys from Le Software Man and Datalynx who distribute that great development tool, The Ultimate. In answer to the question "Does Dennis receive any compensation for all that majestic press he has given their product?" I must confess, I managed to walk away from the exhibit booth with one of their felt-tipped pens!

Here's wishing you and yours the happiest of holidays—and that all of your end-of-year date-change-handling problems be small ones!

Figure 4: BASEBALL_SORT.PR.MAC Present macro

```

INPUT INDEX BASEBALL
PAGESIZE 060 COLUMNS
TITLE 1 "(RPT BASEBALL_SORT)" DATE CENTER PAGE RIGHT
TITLE 3 "MAJOR LEAGUE BASEBALL STANDINGS" CENTER
TITLE 4 "(AS OF 30 SEPTEMBER 1988)" CENTER
TITLE 5 "— SPECIAL DIVISIONAL SORT —" CENTER
TABLE @DIVISION "NE" "NATIONAL LEAGUE EAST"
              "NW" "NATIONAL LEAGUE WEST"
              "AE" "AMERICAN LEAGUE EAST"
              "AW" "AMERICAN LEAGUE WEST"
              OTHER "<UNDEFINED LEAGUE>"
TABLE @SORT_ORDER "NE" "1" "NW" "2" "AE" "3" "AW" "4" OTHER "X"
COMPUTE PERCENT = BB_WINS / (BB_WINS + BB_LOSSES)
SORT @SORT_ORDER(BB_DIVISION) ASCENDING PERCENT DESCENDING
REPORT
  BB_TEAM
  BB_WINS
  BB_LOSSES
  PERCENT PIC Z.999
BREAK AFTER BB_DIVISION
1 "(" BB_DIVISION COLUMN+0 ")" COLUMN+0 @DIVISION(BB_DIVISION)
2
HEADER PERCENT CENTER "PCT"

```

Dennis J. Berman is the manager of applications for Crown Central Petroleum Corp., 1 N. Charles St., Baltimore, MD 21202; 301/539-7400.

Figure 5: Report output from BASEBALL_NOSORT.PR.MAC

(RPT BASEBALL_SORT) 9/30/88 1			
MAJOR LEAGUE BASEBALL STANDINGS (AS OF 30 SEPTEMBER 1988) SPECIAL DIVISIONAL SORT			
TEAM	WINS	LOSSES	PCT
NEW YORK	97	60	.618
PITTSBURGH	84	73	.535
MONTREAL	80	79	.503
ST. LOUIS	76	83	.478
CHICAGO	75	84	.472
PHILADELPHIA	63	95	.399
(NE) NATIONAL LEAGUE EAST			
LOS ANGELES	92	66	.582
CINCINNATI	85	73	.538
HOUSTON	82	77	.516
SAN FRANCISCO	82	77	.516
SAN DIEGO	80	78	.506
ATLANTA	53	104	.338
(NW) NATIONAL LEAGUE WEST			
BOSTON	89	70	.560
MILWAUKEE	86	73	.541
NEW YORK	85	73	.538
DETROIT	85	74	.535
TORONTO	84	75	.528
CLEVELAND	75	84	.472
BALTIMORE	54	104	.342
(AE) AMERICAN LEAGUE EAST			
OAKLAND	102	57	.642
MINNESOTA	88	71	.553
KANSAS CITY	83	75	.525
CALIFORNIA	75	84	.472
CHICAGO	69	89	.437
TEXAS	68	90	.430
SEATTLE	67	91	.424
(AW) AMERICAN LEAGUE WEST			
DURHAM BULLS	158	1	.994
(MN) <UNDEFINED LEAGUE>			

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Power Users and Office Cyberphobes

A field guide to the subspecies *homo sapiens technologicus*

by Michael E. Marotta
Special to Focus

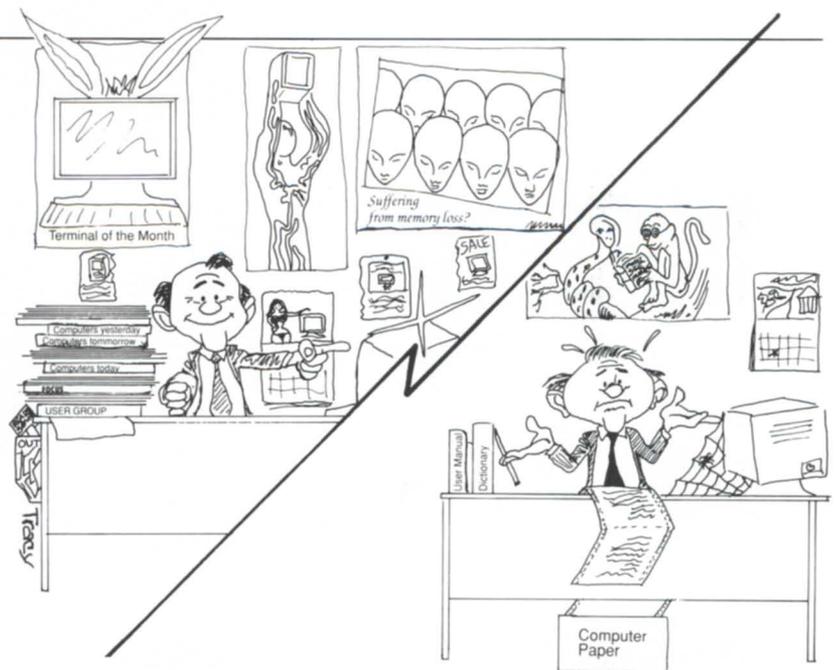
You know that you have a Power User in your office when all of the covers to the micros are held on by just one screw. Power Users are the only ones who actually use their deskminders to schedule appointments.

You can recognize Power Users from the library of magnetic media they gather. Reels and cartridges of tape are stacked near their desks. They have all kinds of diskettes: single- and double-density; single- and double-sided; 8-inch, 5/4-inch, and 3/2-inch. These diskettes are hauled around in plastic boxes and briefcases, or occupy one or more desk drawers. The labels may bear colorful cryptograms, although diskettes often have no labels. The Power Users know their media.

The Power User's library may be heavy on languages or operating system patches, but there will always be a random sampling of computerdom from which the Power User can get a utility to do almost anything.

Most of them started out on machines like the TRS-80, Apple II (no alphas), Commodore Pet, or Atari 800. These Power Users measure all computer software against BASIC. They always have homebrew ideas for improving the office computer system.

Power Users subscribe to at least three computer magazines, and they always fill out the reader response cards. This brings



the Power User a lot of fascinating junk mail. Anything that has even the slightest potential is filed away with several hundred brochures just like it. The stuff that can't be filed (or passed on to the boss) provides groovy computer art with which to decorate the walls.

A Power User's computer has a Dvorak keyboard.

Power Users can be humble or obnoxious. Usually, they are both at the same time. For instance, "Gee, I'm really sorry. I had no idea that would happen. I read about it in *Friendly Computing* magazine. The article said that you could enhance the BIOS bit-adder by sending a modified interrupt to the high byte of the instruction pointer. Have you ever tried that?"

The Power User calls Purchasing once a week to find out if they have ordered OS/2 yet.

Clearly, Power Users have their strengths and weaknesses. Overall, your office is probably better off for having Power Users. They can be the targets of moderate (or even immoderate) jeers. Even so, Power Users are good counterweights for their opposites, the Office Cyberphobes.

The Office Cyberphobe calls for a systems analyst when the printer jams.

The computer or terminal used by Cyberphobes is always off unless they are doing assigned work.

These people believe that a DG/One running accounting software is a "book-keeping machine." They see other users in the office as having "word processing machines," "graphics machines," and so on. They always confuse computers with terminals.

The Office Cyberphobe stays ignorant, because after all, "the computer revolution is still a few years away." On the other hand, the Cyberphobe has almost lucid

moments when you will hear, "Gee, someday these machines will be everywhere."

The Office Cyberphobe confuses uppercase letter O with zero and lowercase l with 1. This is a good shibboleth for detecting the Closet Cyberphobe. These are the apparently well-adjusted people who insist that they live at "Three-oh-eight Shadyside Lane." They claim to have phone numbers like "Three five one-oh two nine oh." They also have ASCII 79 (4Fh) in their zip codes and social security numbers.

The person who calls up data on the screen and copies it by hand to paper is an Office Cyberphobe.

The concept of an integrated telecommunication network is lost on these people. They place direct-dial, long-distance calls, then ask the operator for "time and charges." They will hold up a project for two weeks until someone convinces them that a Macintosh can share data with an MV/10000.

Having successfully created a hardcopy graph from spreadsheet data, the Office Cyberphobe hauls out scissors and tape to include the graph in a report.

Pull-down menus with icons are of no help to these people, since they confuse LOAD with SAVE, no matter what the pictures look like.

As amusing as the Office Cyberphobes are, they serve a real purpose. They are the only way to halt the unbridled enthusiasm of the Power Users. Both the Power User and the Office Cyberphobe miss the fact that computers are tools subject to and supportive of human judgment. Δ

Michael E. Marotta is a systems analyst with a decade of experience on Data General and other equipment. He specializes in creating user manuals.

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A LAN tutorial

A close look at local area networks sheds light on communications buzzwords.

Part III

I started this tutorial three months ago with a description of the seven-layer OSI model for communications, and then moved on to describe five of the best-known LAN wiring systems: StarLAN, Arcnet, Token Ring, Ethernet, and Lattisnet. All of these systems address the OSI model's physical and data link layers.

Between the LAN hardware (controllers and wiring) and the LAN applications (file service, etc.) resides the LAN communication software, which meets the requirements of the OSI network, transport, and session layers.

To most users, the details of these layers are unimportant, but the buzzwords abound, so you need to know enough not to be overwhelmed.

XNS

To support Ethernet, Xerox developed its Xerox Network Systems (XNS) family of protocols. Today, the XNS protocols are the simplest and most efficient of all LAN protocols. During the past few years, most LAN vendors have implemented XNS protocols on their hardware before implementing any others.

The XNS protocols are listed here:

- **Network layer:** Internet Datagram Protocol (IDP)—IDP implements basic routing and relaying of packets among multiple networks. The resulting topology is called an internet. IDP also supports a basic datagram facility. Novell calls this the IPX protocol, and it is the platform upon which all of Netware is based.

- **Transport layer:** Sequenced Packet Protocol (SPP)—SPP (or SPX, as Novell refers to it) is the full-function transport layer of XNS. It provides reliable, full-duplex communications between processes on separate computers. SPP is used by Term Servers, ITC controllers, 3Com Communications Servers, and Popterm

for terminal interconnection. PC/VS uses a simplified XNS transport mechanism, called the Packet Exchange Protocol (PEP).

TCP/IP

The Department of Defense has a wide area network called ARPAnet, which connects multiple defense, research, and academic sites under the Defense Advanced Research Projects Agency (DARPA).

The protocols used to implement this network are complex and numerous, but are often referred to by the Transport Control Protocol (TCP) and Internet Protocol (IP): TCP/IP.

The advantage of TCP/IP compared to XNS is its wider use in defense and academic environments. Many Unix-based systems include TCP/IP as part of the operating system kernel, although XNS is now starting to appear as well.

Furthermore, because of TCP/IP's academic (public-domain) nature, there are strong efforts under way to ensure that one vendor's TCP/IP can communicate with that of others.

The disadvantage of TCP/IP is that (being intended for wide area applications) it is less efficient in LAN applications than XNS (which is designed solely for LANs). Most vendors estimate that TCP/IP is inherently 30 percent slower than XNS when using the same hardware for identical applications.

- **Network layer:** Internet Protocol—IP is roughly equivalent to XNS's IDP, and is the foundation of all DOD/ARPAnet networks. Actual user datagram communications are based upon UDP (User Datagram Protocol), which is an extension of IP.

- **Transport layer:** Transmission Control Protocol—TCP is the equivalent of XNS's SPP: a full-duplex, reliable interprocess communications platform.

TCP/IP is not of primary importance to users of DG/PC*I, PC/VS, or Netware.

ISO

In addition to developing the Open System Interconnect (OSI) model, the International Standards Organization (ISO) is also hard at work designing its own protocols for each of the seven OSI layers. To put this in perspective, remember that XNS was designed by a small group within a single corporation, and TCP/IP evolved from a collection of universities. ISO, on the other hand, is an international organization with one voting member per country. Add to that ISO's goal of a single, large suite of protocols suitable for all data-communications environments, not just local area networks, and you can see why these are the most complex of all LAN protocols.

- **Network layer:** Internet Protocol (IP)—Unfortunately, ISO's network layer has the same name as ARPAnet's. Although functionally similar, ISO's IP is substantially more complex.

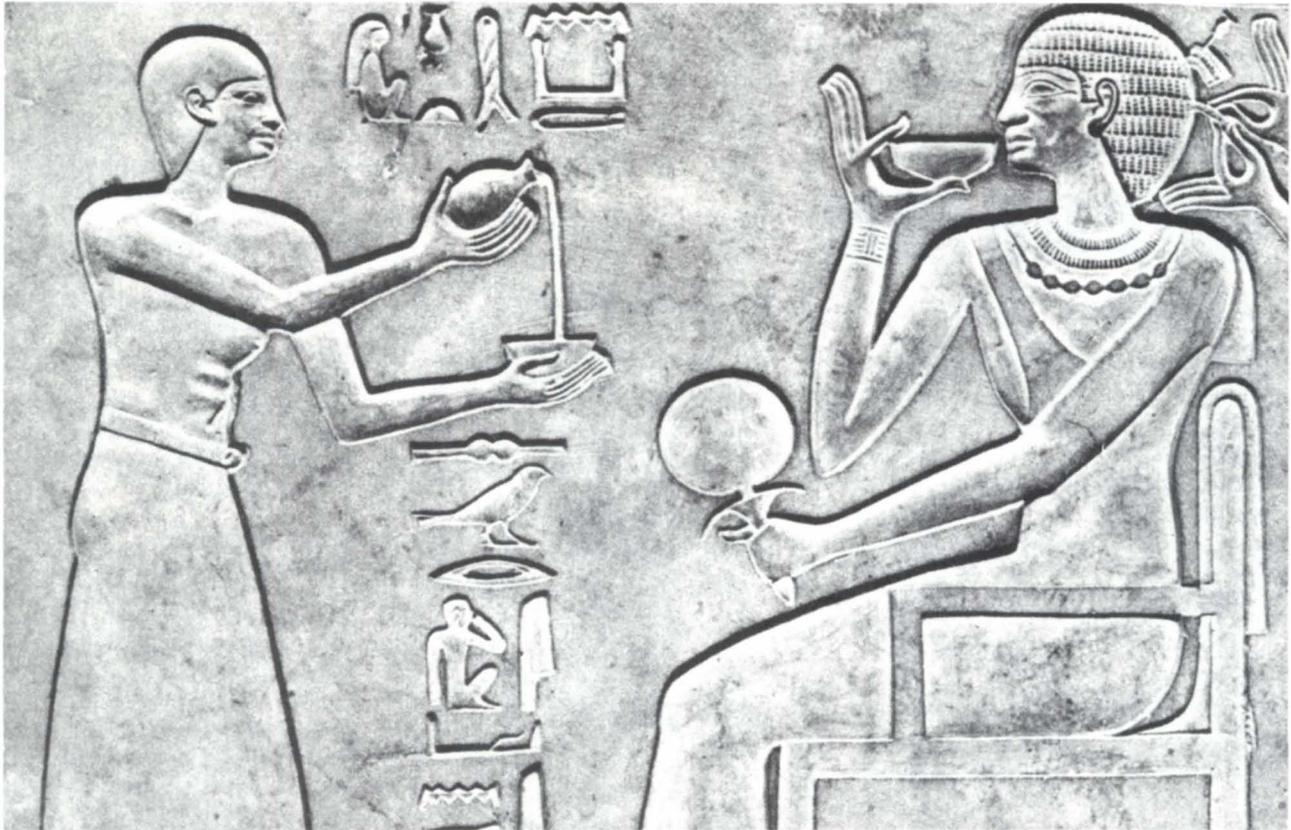
- **Transport layer:** TP4—In fact, there are five ISO transport-layer protocols, named TP0 through TP4. During connection establishment, the two entities negotiate the class of transport service to be used. However, the rules are complex; for example, a class 4 transport entity must be able to fall back to the simpler class 2 service if requested by the other end during these negotiations.

Clearly, when ISO protocols become common (say, around 1995), we will all be glad to have them. By that time, implementation will have been reduced to a few specialized integrated circuits. In the meantime, extensive memory and CPU resources are required to implement these protocols. The results are often buggy, and one vendor's ISO implementation may have difficulty communicating with another's.

If you are using DG/PC*I, you are using IP and TP4. At this time, no other PC-integration software for Data General systems (in fact, no other DG software of any kind) makes use of these protocols.

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The most obvious use for a local area network is to share data. When a mini-computer or dedicated PC is used to store files, it's called a file server. There are three

different ways to access files on a server: true file service, virtual disk service, and file-transfer service.

True file service

This is the file service most LAN users think of. A local PC's drive letter (say "N:" for example) is redirected to a specific subdirectory on the file server. Therefore, MS-DOS filenames prefaced with that

letter actually refer to files on the server. For example, if N: is redirected to :UDD:GLADYS, the following MS-DOS file specification:

```
N:\DOCS\LETTER.WP
```

actually refers to the following file on the server:

```
:UDD:GLADYS:DOCS:LETTER:WP
```

True file service is intuitive and provides the everyday services that most users need. Server-based files may be accessed as though they reside on the local PC. Using the extensions of MS-DOS 3.10 (and later), files may also be shared among multiple users, provided that the applications are truly multiuser and support the operating system's file- and record-locking mechanisms.

True file service allows files to be transferred to the host system using the standard MS-DOS COPY command and other standard programs.

Virtual disk service

Whereas true file service redirects requests at the file level, virtual disk service waits until a request has reached the physical device level. As with true file service, a drive designator letter is associated with a redirected virtual drive. When an MS-DOS file request for that drive is received, it's sent to the server. A virtual disk is an AOS/VS file with an internal structure that is a bit-for-bit image of an MS-DOS disk. Read and write requests for particular sectors are translated into requests to read and write the appropriate blocks of the virtual disk file.

The advantages of virtual disk service compared to true file service are performance and overhead; a virtual disk server is faster than a true file server, especially when processing random records and files as in data base applications.

The disadvantage of a disk server is the lack of one-to-one correspondence of PC files to server files. Files stored on virtual disks are not individual AOS/VS files.

File structure incompatibilities

While virtual disk service is a better performer, and true file service offers flexibility, it's not quite that simple. Consider, for example, how you would go about TYPEing a simple AOS/VS text file on your PC using a true file server. The following command ought to do it:

```
C>type n:list
```

Let's assume that when TYPed from an

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1-Password:		3-Password life:	90	24-Encrypt password:	Y
2-Profile expire:	12-Jul-89			25-Superuser:	N
4-Initial Program:	CLI.PR			26-Superprocess:	N
5-Initial IPC file:				27-Use IPC:	N
6-Initial directory:				28-Use console:	Y
7-Default user priority:	2	8-Max. queue priority:	0	29-Use batch:	Y
9-Unlimited son processes:	N	10-Max. son processes:	1	30-Use virtual cons.:	N
11-Disk quota (blocks):	500			31-Use modem:	N
	BATCH		NON-BATCH	32-Change password:	Y
12-Log. addr. space:	-1	18-Log. addr. space:	-1	33-Change priority:	N
13-Min. working set:	-1	19-Min. working set:	-1	34-Change type:	N
14-Max. working set:	-1	20-Max. working set:	-1	35-Change username:	N
15-Def. user local.:	0	21-Def. user local.:	0	36-Access devices:	N
16-Use other local.:	N	22-Use other local.:	N	37-Create w/o block:	N
17-Other locality:		23-Other locality:		38-System Mgr priv.:	N
Time of last logon:	18-Jul-88 08:39			39-Access local device remotely:	N
Last password change:	15-Jul-88 06:40			40-Change address space type:	Y
Last profile change:	15-Jul-88 13:01			41-Change working set limit:	N
42-Comments:					

Edit which field?
"Help line"...

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AOS/VS console the file looked like this:

```
True file service
Virtual disk service
File-transfer service
```

However, because AOS/VS and MS-DOS store text files differently, it will look like this when typed on a PC:

```
True file service
      Virtual disk service
                File-tr
ansfer service
```

Because the file server can't separate text files from other types, there is no way to solve this problem without the use of an extra step to convert one file format to the other.

To point out another problem with true file service, consider the following AOS/VS filename:

DOCUMENTATION

Because this filename has more characters than the maximum allowed for MS-DOS filenames, it cannot be accessed from a PC. Likewise, the following MS-DOS filename:

NEW-IDEA.TXT

is not a legal AOS/VS filename. Therefore, the file will not be accessible via this name on the server.

File-transfer service

To solve these limitations of true file service, you must turn to file-transfer service, which allows users to store and retrieve entire files. File-transfer servers do not allow read or write access to individual records or blocks within a file.

As primitive as this may seem, this is an important service for three reasons. First, the format of the file may be changed during file transfer. In the example above, the newline characters used to separate lines in AOS/VS text files can be replaced with pairs of carriage returns and newlines during the transfer operation. Like-

Doug Kaye is a partner in Rational Data Systems. He can be reached at 5725 Paradise Dr., Corte Madera, CA 94925; 415/924-0840. This article is an excerpt from the "Rational Data Systems Report on PC Integration." For a free copy, contact Rational Data Systems at 150 S. Los Robles, Pasadena, CA 91101; 818/568-9991. Copyright © 1988 Rational Data Systems.

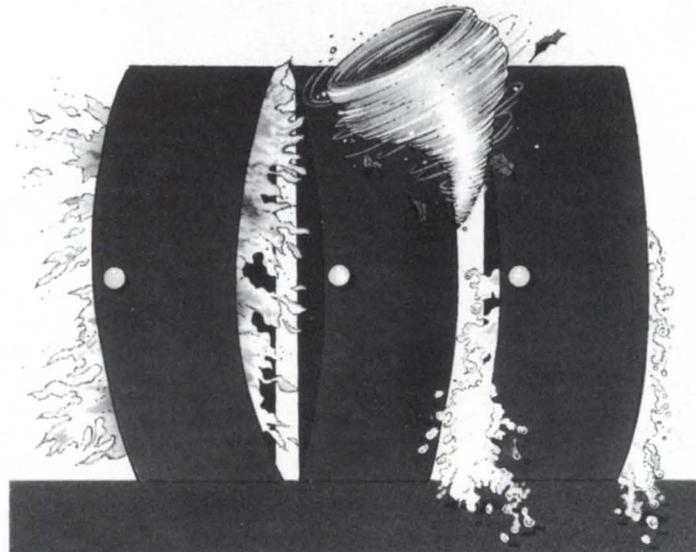
wise, a transferred file may be renamed from the source machine to the destination. Finally, because file transfers are inherently simpler, transfer speeds may be greater, as compared to true file service or virtual disk service.

PC/Remote provides file-transfer service in the asynchronous environment, while PC/VS and Netlink support file service for local area networks.

Remote print service

After file sharing, peripheral sharing is the next most common feature of PC integration. Remote print services allow PC users to use the printers attached to a minicomputer as though those printers were local devices. Print servers typically include sophisticated multiuser spoolers that improve shared access to these devices. Δ

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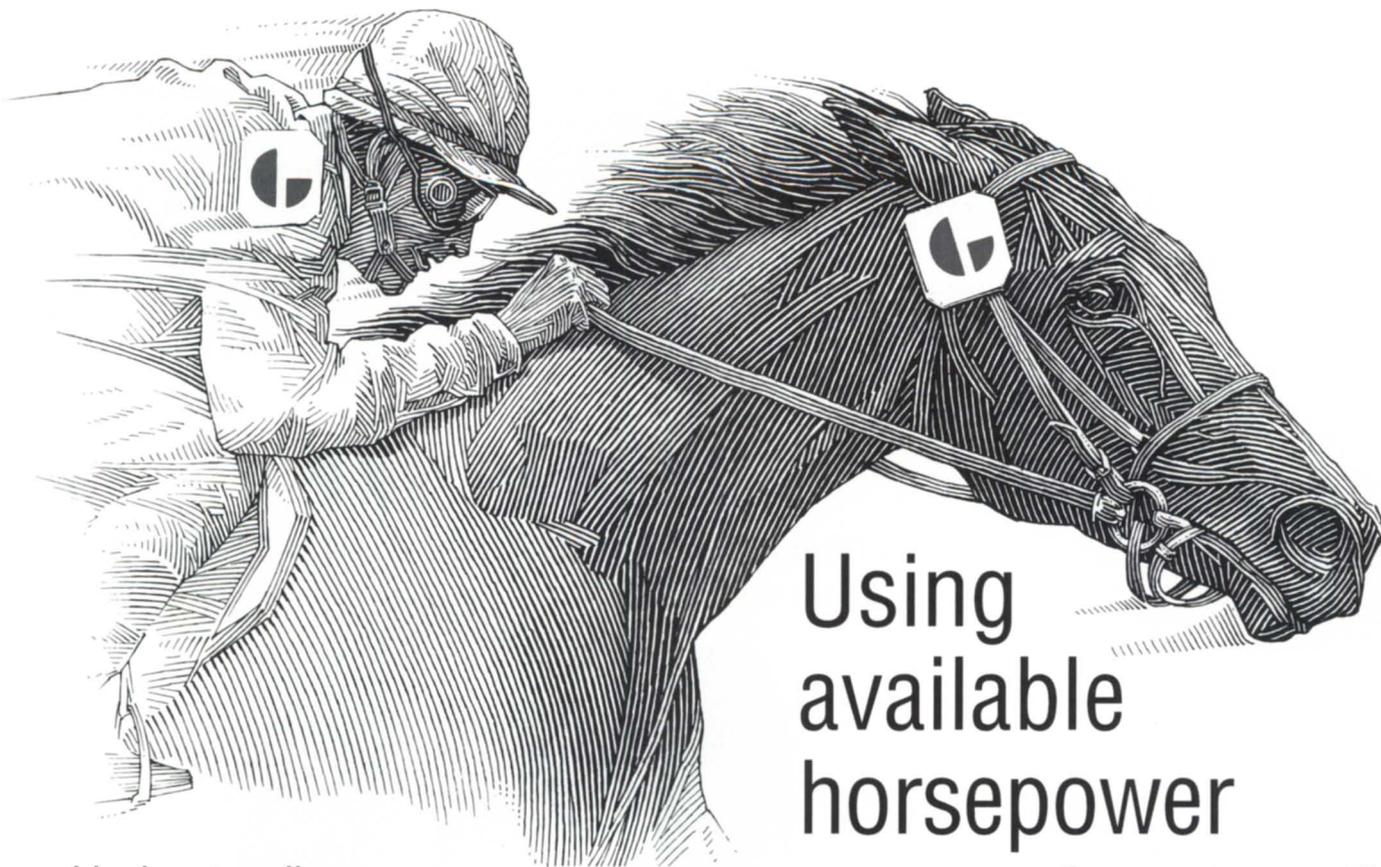


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Using available horsepower

Understanding, analyzing, and optimizing CPU utilization

by Andy Wilkes
Special to Focus

Your Data General system utilizes the CPU to handle the processing requirements of your application and operating environment. The MV/20000 model II actually integrates two processors to handle the processing load. An individual CPU has a limit as to the processing load that it can support, similar to the horsepower rating given to cars. Typically, CPU power is based on a variety of measures, including MIPS ratings and Whetstone numbers. If the demands placed on the CPU or an automobile exceed its physical power rating, performance may suffer and problems may result. For instance, with a car, the engine may overheat while still performing below optimum levels. Similarly, an oversubscribed CPU may still perform, but run poorly.

The purposes of this article are to define the areas where the CPU spends its processing time, to provide threshold values for comparison purposes, to describe anal-

ysis tools for evaluating your system's CPU performance, and to list some techniques to optimize the CPU requirements of your operating and application environment. The techniques discussed include changes to the operating environment and generation, application programs being run, and process hierarchy and priority. These techniques should be utilized to optimize the operating and application environment of your AOS/VS system(s), whether or not you feel that you have a CPU usage problem.

Where does CPU time go?

The Central Processing Unit for your system must handle requests from many different areas, primarily system, user, and idle time. Any analysis of CPU utilization requires a clear understanding of each of these areas. The sum of these three areas should represent 100 percent of your total CPU power.

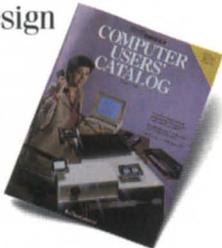
System CPU time is the percentage spent to manage the various components of the operating environment. In other words, the AOS/VS operating system itself must use a portion of CPU power to allow the multiuser and multiprocess components of AOS/VS to function. The operating system may also expend unnecessary CPU resources if some other subsystem (disk or memory, for instance) is poorly allocated or oversubscribed.

Some areas where system CPU time is spent include scheduling of processes when they become eligible and ready to run, processing interrupts from hardware devices, faulting in of pages to increase process working sets, processing system calls made by processes and preprocessed by the Agent, managing the disk I/O world, mapping memory pages to process working sets, handling memory contention and managing the Page and Swap files, logging of system information to requested log files (syslog), and creating internal system calls so that user calls can be completed. If you can improve any of these areas, overall CPU performance will also improve. Techniques to improve system CPU usage are mentioned later in this article.

User CPU time encompasses the time the CPU spends on behalf of the user community. This is the primary area where CPU efforts should be expended, since the main purpose of your AOS/VS system is to run user programs. Because user applications usually reside in ring 7 of the operating environment, any effort expended in this ring will be charged to user CPU time. Note that any CPU time requirements expended by code in any ring other than ring 0 (the kernel of the operating system) is charged as user CPU time. Some examples of user CPU requirements are code that performs data movement

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System idle time results from any time period when no eligible processes are ready to run, and the eligible queue (ELQUE) is empty. The operating system scans the eligible queue waiting for a process to become eligible and ready to run. Idle time results from processes

blocked in either of two ways: an explicitly blocked process is targeted by the Block CLI command or becomes blocked on process creation with the block son option. An implicitly or normally blocked process has no tasks that are ready to run and no outstanding system calls have been made. The AOS/VS utility PED (Process Environment Display) has a column labeled "BS" (Block Swap) with an entry in

the B column indicating a blocked process.

CPU analysis thresholds

The next question in evaluating CPU utilization is: "What are threshold values for monitoring Central Processing Unit performance?" After evaluating many AOS/VS systems, Data General's Systems Evaluation and Performance Center (SEPAC) established several values that its consultants use for evaluating CPU performance. These values are general in nature and may not be applicable to certain operating and application environments. However, in the majority of systems, these numbers can be used to evaluate performance.

One threshold value that SEPAC uses is average CPU idle percentage below 20 percent. If idle time averages consistently below 20 percent, the likelihood of CPU saturation increases. When full CPU saturation occurs (idle time of 0 percent), the possibility of degraded response time and throughput increases. A few systems are able to allocate exact CPU requirements, where idle time at 5 percent doesn't represent a problem. These systems typically run real-time or process-control applications with predictable resource demands.

For the majority of production and/or development systems in use, the 20 percent threshold is a valid parameter. For example, SEPAC recently evaluated an AOS/VS system that averaged 19 percent idle time during an eight-hour monitoring period. This average idle percentage was below the 20 percent threshold and indicated potential problems with CPU utilization. By using CPU idle-time graphs included in the SEPAC statistics package, it was evident that there were several time periods when CPU idle time remained at 0 percent. This investigation revealed areas where CPU utilization could be improved.

Another relationship that SEPAC likes to see is more CPU time spent on behalf of the user community versus the operating environment. This relationship should be approximately a 1.5:1 or 2:1 ratio, with user CPU time greater than system CPU time. As stated previously, the optimum CPU environment is one in which the CPU is mainly dedicated to user requirements and not to managing the operating environment.

SEPAC uses a system CPU threshold of 35 percent to indicate a system that may be forcing high CPU demands to manage the operating environment. The causes for the high system CPU demand may be any of the areas previously listed. For instance, memory contention, poor disk file organi-

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zation, spurious interrupts, and unnecessary page faulting could cause high system CPU time. The cause of the high system CPU time should be discovered and alleviated.

Once you determine the threshold values, you need some way to monitor CPU utilization and compare collected data against threshold values to determine your CPU's performance. Several utilities and services are available to measure system-wide CPU utilization and user and process CPU requirements.

CPU monitoring tools and services

Analyzing the CPU utilization of your system is fairly straightforward, provided you have the appropriate monitoring tools. Listed below are analysis tools and utilities available through Data General.

AOS/VS commands and utilities. CLI commands that can be used to analyze process parameters and have an impact on CPU utilization include RUNTIME, PRIORITY, and PRTYPE. There are also standard AOS/VS utilities that can assist you in evaluating CPU system-wide and process requirements. For instance, PED lists cumulative CPU time and CPU milliseconds used per second for processes running on an AOS/VS system, and the Priority Enque Factor (PNQF) column can provide you with the true process priority hierarchy used by AOS/VS to do scheduling. Program histogramming utilities allow you to locate areas within applications where CPU time is spent. Optimizing efforts should occur in the most active areas of key application programs. With system logging and reporting, user accounting information, including CPU utilization, can be recorded and evaluated. Using the generated report file, you can determine the most active users on the system.

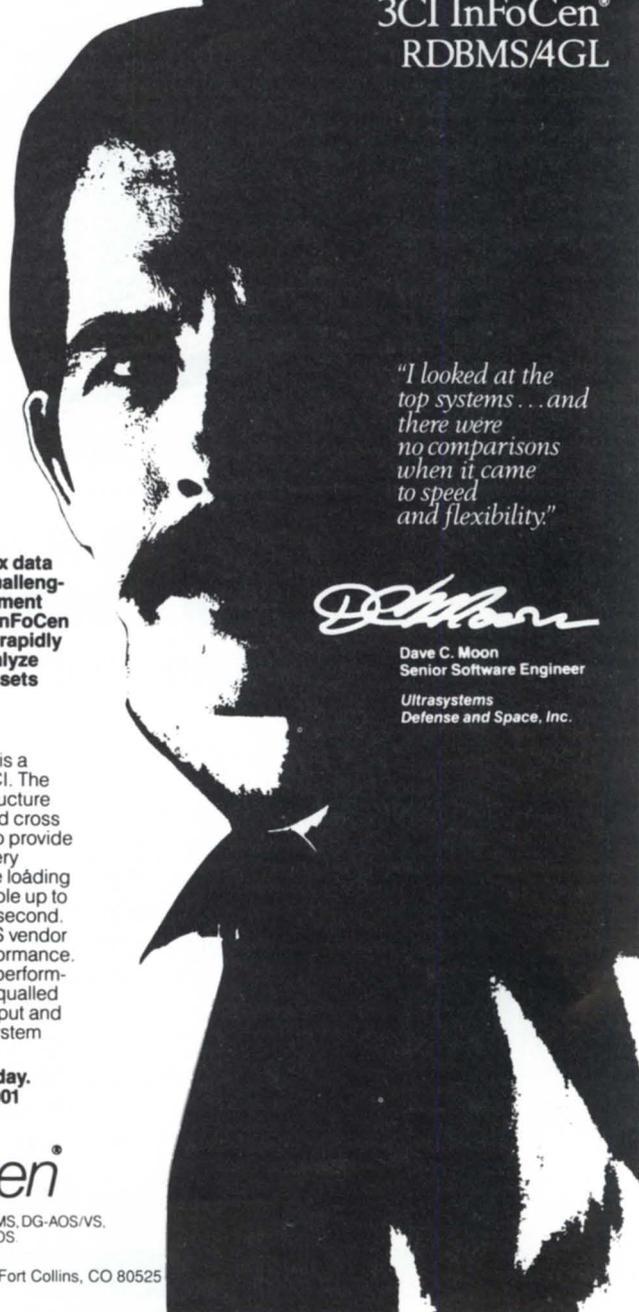
AOS/VS Performance Monitoring and Tuning Package. This Data General package (model 30718) offers several programs that allow you to evaluate AOS/VS system performance, including CPU utilization. The Performance Monitor program collects system, user, and idle CPU-time information and allows you to graph these values during a monitoring period. The CPUtime utility provides an interactive analysis of user, system, and idle CPU time and also displays the most active processes during a data-collection cycle, so you can focus on the most active processes and users. The Watch utility is an interactive histogramming utility that can zoom in on narrow address ranges of active programs. The MP_DISPLAY program

shows user, system, and idle CPU percentages for multiple logical processors, and also provides a breakdown of system CPU time.

SEPAC Performance Analysis Services. The SEPAC statistics package provides a comprehensive set of graphs and reports to show the performance of an AOS/VS system during a selected monitoring period. This package includes reports and

graphs that summarize and depict CPU utilization. The "CPU Monitoring" graphs show system, user, and idle time at each snapshot. Using these graphs, time periods where CPU performance suffered can be quickly highlighted. The "CPU by Pathname and Username" reports rank program and user activity during selected periods. With the help of a SEPAC consultant, the SEPAC software can zoom

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into specific time periods of CPU problems and focus on users, programs, user groups, or pathname groups using the highest percentage of CPU resource. The SEPAC statistics package includes two system-wide summary reports. The first summarizes the average, minimum, and maximum values for key performance areas including CPU utilization. The second report lists the number of system calls, system-call rates, and time required per system call.

CPU utilization analysis is important not only when you suspect CPU usage problems; analysis and optimization should also occur when there are no apparent problems. Why wait to run out of horsepower and put yourself in a possibly critical situation?

Tuning the engine

There are several techniques for improving CPU utilization of your operating and application environment. These are summarized in the following list.

- **Eliminate unnecessary processing.** Since you don't want AOS/VS to schedule unnecessary tasks during prime appli-

cation time, you should not run programs unless they are essential to your application environment. For instance, while word processing users are active, scheduling a month-end process that normally runs overnight may degrade the interactive response of the word processing users. An additional processing load may be the use of monitoring tools. I'm not telling you not to run monitoring tools during normal operations, because in some cases, these tools are required. But I will emphasize that running monitoring tools at low cycle times at a high priority throughout the day can block out the entire user community. Instead, a CRT near the system could be dedicated to monitoring system performance and running at high priority; the monitoring tools would only be used at this console when a problem is experienced, i.e., sudden poor response time.

- **Eliminate spurious or undefined interrupts.** Remember that the CPU runs interrupt processing at high priority, and frequent, unnecessary interrupts can cause system CPU time to be higher than necessary. Also, spurious interrupts from asynchronous lines can interrupt the Periph-

eral Manager (PMGR) if the line is enabled, and saturate an asynchronous controller. Make sure that lines are terminated correctly, lines are not extended beyond recommended distances (50 feet for RS-232C connections), and all asynchronous cables are shielded properly. Soft and hard errors from hardware devices are also handled at high priority and can interrupt normal processing. Monitor the ERROR_LOG file and eliminate the occurrence of hard errors and reduce soft errors by using error-free media.

- **Reduce faulting rates.** Encourage programmers to write structured code so that the program logic doesn't jump around the program address space. Also, ensure that program and data file pages are compressed and do not contain large gaps. For instance, reading an INFOS page through the local INFOS server window is charged as a page fault; therefore, if an INFOS data base and/or index volume has indirect and deleted records, gaps exist in the INFOS volume pages. To reduce program size and CPU requirements, production programs should not contain debugging code.

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•**Reduce system-call rates** and eliminate unnecessary system calls. Focus your attention on "expensive" calls, such as those to the I/O system. Using the SEPAC "System Call Analysis" report as a reference, the most expensive calls tend to be shared open (?SOPEN) and close (?SCLOSE), as well as creation and termination of processes. Monitor open and close rates to ensure that these calls are

made only when absolutely necessary. When evaluating system-call rates, also compare the relationships of related calls to ensure a logical ratio. For instance, looking up port numbers for interprocess communication (?ILKUP) shouldn't occur at a higher rate than actually sending a message (?ISEND or ?IS.R).

•**Tailor disk filing parameters.** Examine the disk filing system and tune the

filing parameters as much as possible. To improve the disk filing system, you should rebuild files requiring more than one level of index blocks; limit the use of large directories (greater than 64 KB in size); select tailored hash-frame sizes; choose a universal template Access Control List; and rebuild directories and disk drives periodically.

•**Reduce or eliminate memory contention.** The advent of memory contention causes the operating system to expand effort to allocate an oversubscribed memory environment. Contention has an impact not only on memory utilization, but also on system CPU utilization and disk I/O management.

•**Assign appropriate priority structures.** Implementing sound priority structures will ensure that the jobs you want to get processing time will receive it even though the CPU is saturated. For instance, problems could occur if a CPU-intensive program was run in group 1 scheduling and at a higher priority than user processes that normally run in group 2 scheduling. When the program becomes active and the CPU is saturated, the user community may be blocked from receiving any CPU time.

•**Generate a performance-oriented operating system.** Don't generate additional cache buffers if none are necessary. The longer the buffer chain, the more searching and system CPU time is required. If the cache hit percentage is greater than 95 percent and the miss rate is less than 5 percent, you have probably selected an adequate number of buffers.

•**Use optimization techniques** and the optimizing compiler. For instance, use buffered I/O and element-size assignment when creating reports (sequential files). Also, investigate the use of the optimizer if it is supported by your programming language and if you have access to source code. Various levels of optimization change the CPU requirements of individual programs.

•**Control processes or users** that have large resource requirements. You may be able to serialize the running of certain programs versus allowing concurrent executions. For example, running only two batch streams for compiling may be better than allowing all developers to run compilers interactively. Also, examine the memory demands of individual programs. Consider setting a working-set maximum on a program that must run during production: unless a memory limit is set, such a program may take as much memory as it wants, placing the system into memory contention. As mentioned earlier, mem-

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ory contention places unnecessary demands on your system's CPU.

- **Enlist the help of the user community.** Make sure that your users understand the ramifications of running CPU-intensive programs unnecessarily.

- **Offload a user or processing community** onto another CPU. Distributing processing can help in situations where a group of users or programs can be moved from one CPU and placed onto another. For example, development could be moved onto another processor and linked to the original processor through communications hardware and software.

- **Use intelligent controllers.** If possible, load CPU processing requirements for a particular program or application environment onto an intelligent controller. For example, the Xodiac Transport Service (XTS) link protocol code can be loaded into intelligent controllers under XTS rev 5 and later. Make sure to take advantage of any available buffering. Generate Intelligent Asynchronous Controller (IAC) buffers to match device characteristics. Avoid single-character I/Os, since the buffering capability of the asynchronous controller is not used effectively with this type of I/O.

- **Use an alternative scheduling package.** The AOS/VS scheduler does an excellent job of CPU resource distribution in the vast majority of application and system environments. When the CPU becomes saturated, the scheduler allows the highest priority eligible process to run and consume CPU resources, even if the process is CPU-intensive. In this scenario, lower priority processes may never be scheduled, although they are ready to run.

Data General's Class Allocation and Scheduling Package (CLASP), included in the Performing Monitoring and Tuning Package, allows distribution of CPU time to user and program classes or localities. CLASP enables lower priority processes to receive some CPU time (even if the CPU is saturated) and can also be used to control user- and program-class CPU allocation.

- **Upgrade your CPU to a more powerful processor.** A more powerful CPU may be necessary to handle the processing load of your application and operating environment. Fortunately, Data General has a

variety of processors that support AOS/VS and are upwardly compatible. If you currently have an MV/20000 model II, ensure that the second job processor is initialized during start-up procedures.

Cars get periodic analysis and tuning

To ensure that an automobile is making efficient use of available horsepower, a car owner generally takes the car in for peri-

odic performance analysis to find ways it can be optimized and tuned. Many system managers do performance analysis and tuning to ensure that their system CPU is fully optimized. All systems should be examined and tuned even though CPU problems are not evident. That way, you'll know for certain that your system is not wasting CPU cycles, but is taking advantage of available "horsepower." Δ

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Andy Wilkes is manager of Data General's Systems Evaluation and Performance Analysis Center (SEPAC) Consulting Services Group based in Norcross, GA; 404/448-6072.

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BACK IN BUSINESS

BBASIC SIG revived with new president and new products

The Business BASIC SIG is active again. After a couple years of inactivity, the group got together at the recent NADGUG conference, voted me in as president, and told me to get to work.

The beginning of every presidential term is always marked with lots of good intentions, and I've got no shortage of them for the coming year. Luckily, I have made no campaign promises (in fact, I wasn't even at the meeting when they elected me).

An active user group for Business BASIC is more important now than ever. For the past few years, BBASIC has been a fairly stable product. With the Data General MV series pretty stable, DG wasn't putting a lot of resources into BBASIC. Things were basically dull.

It's a much more exciting world now. At the low end, the Bluebird community is thriving, while B32 is taking the AOS/VS world by storm. Transoft is rushing to be the first company with a full Business BASIC under Unix, but they are being chased by B32 and Data General. Transoft also boasts an MS-DOS version, and Alloy is promising one.

From a hardware viewpoint, Data General's new MV/40000 series will use AOS/VS II, and the full effect of that remains to be seen. The development of the RISC-based 88000 system will certainly be significant.

The major reason why so much development is going on in the Business BASIC world these days (more than at any other point in its history) is that there is a large, fairly homogeneous group of users out there who like Business BASIC. These

users don't want to change from BBASIC, but they want to take advantage of new technology.

There are enough users out there that it makes good commercial sense for DG to develop new versions of Business BASIC for the new environments. This will be of tremendous benefit to all Business BASIC users in the future.

However, I'm concerned that all this new development will produce half a dozen incompatible versions of Business BASIC, resulting in a number of smaller niches that will not have the strength to survive in the current Business BASIC marketplace. Therefore, I want to make an appeal: if you are using any flavor of Business BASIC or have an interest in the product, join the user group now. The stronger we grow, the more diverse viewpoints we can include, and the more likely we'll be able to keep Business BASIC a healthy, growing entity.

To join, drop me a note with your name, address, and perhaps a note about what you do with Business BASIC. We still have a bit of money in the SIG bank account to use for mailings, so until we get rolling, we won't demand more. The address is at the end of this article.

A further note: I work for Maxon, which distributes B32 in North America. I only took on the job as president of the SIG because I felt it could be done without being a conflict of interest. Maxon currently has several hundred clients using variants of Business BASIC. It is in Maxon's best interest to provide the best possible products to its new customers and existing client base. Maxon's revenue comes mostly from sales of Data General hardware and applications software: only a small part is from B32. If anyone interested in working with the SIG feels there might be a conflict-of-interest problem, I

invite you to phone me, and we'll try to resolve it.

■

In other news, I went last week to the announcement of Data General's newest and largest machine, the MV/40000. It sounds pretty impressive. It comes in two variations—the MV/40000 and the MV/40000 HA. The HA, which stands for High Availability, has additional features such as repair-under-power and optional redundant hardware configurability.

The MV/40000 is a single processor that has about twice the performance of the MV/20000 model I. It can have up to 128 MB of main memory (up from 64) and has a 64 KB cache buffer (up from 16). For operating systems, it can use AOS/VS 7.64 or AOS/VS II (more on this later).

Overall, the MV/40000 seems to be a straightforward extension to DG's high-end products. No problems are anticipated in using it with Business BASIC or B32 under AOS/VS.

Data General has done more interesting stuff with the MV/40000 HA. It can be configured with up to four job processors. These are tightly coupled to be transparent to the user. Each job processor is an MV/40000 CPU board. Main memory can go to 256 MB, with typical configurations starting at 64 MB. Disk storage can be a mind-boggling 320 GB (320,000,000,000,000 bytes).

The speed of the system is truly impressive. Surpassing anything offered by DEC, it's in the IBM mainframe range. While DG doesn't say how many terminals can actually deliver decent response time, up to 3,456 could be physically connected. The MV/40000 HA is only usable with AOS/VS II.

In addition to the new processors, Data General announced a new piece of equip-

ment: the Message-based Reliable Channel (MRC). It provides a high-speed channel for connecting multiple MV systems. Disk drives and tape drives are plugged into one side, and CPUs are plugged into the other.

This approach makes it easy to do a lot of things. Equipment can be reconfigured without having to shut down the system. Diagnostics can be run at the same time as applications software. Power can be turned on or off a slot at a time, so boards can be added or removed without turning power off for the whole machine.

Of course, things like redundant data bases and shared disks become much easier to implement under this approach.

The MRC isn't required for the new machines. They can still be configured like older machines—all in one cabinet. The MRC, like the MV/40000 HA, requires AOS/VS II.

Data General finally announced AOS/VS II as well. Before we get to the ugly part, I want to talk about new features. AOS/VS II has a completely redesigned file system that is apparently much improved over the current one. It's described as "fail-safe," meaning it should be much better if anything goes wrong. Fixup will never have to be run again. If the system goes down unexpectedly, it can be rebooted immediately.

In addition, critical disk information is duplicated on the disk, so a failure in a single sector will not result in the loss of the entire disk. Fragments of files are tagged with information as to what file they belong to, making it easier to run consistency checks. File system panics are eliminated; problems are reported to the operator, who then decides on appropriate action.

Big news for many users is support of VT100 terminals. Any application that uses a Dasher D200 will work with a VT100. DG does note, though, that IAC performance may suffer because of the additional overhead of doing the translation. This feature will be available with release 2.

Who should be looking at AOS/VS II? Obviously, anybody buying an MV/40000 HA or an MRC. Also, if you need the new features in the operating system itself. DG expects that people ordering new machines will buy AOS/VS II instead of AOS/VS.

The bad news is that Data General is not giving this operating system away. New licenses will cost from \$1,800 on an MV/1400 DC to more than \$43,000 on an MV/40000 HA model 4. Upgrade licenses for existing machines are discounted 70 percent.

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Regional and special interest groups serve a vital function in the DG community. They are a forum where DG users can talk about topics that are specific to their own needs, and a place where they can network with other DG users in the same geographic area. That's what NADGUG is all about.

RIGs and SIGs also provide NADGUG with ideas on how to best serve individual users. NADGUG listens to the suggestions of the RIGs and SIGs when deciding on member benefits, policy changes, and representation to Data General.

Recognizing how important the RIGs and SIGs are, NADGUG is making a special effort to support them through its RIG/SIG committee. Charlene Kirian, the new RIG/SIG committee chairperson, is working closely with the two vice-chairs to map out activities for the upcoming year. Vice-chair Steve Kern is coordinating activities in the eastern half of North America, and Leryl Cash, the other vice-chair, is giving support to the west. The NADGUG RIG/SIG coordinator, Cathlene Gentry, provides staff support to the committee and to all RIGs and SIGs.

We want to hear from you! If you have any questions or suggestions for how the RIG/SIG committee could better serve your interest group, or if you know of an area that needs a new group, give us a call.

*Yours Truly,
The RIG/SIG Committee*

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This is upsetting. We've been looking forward to AOS/VS rev 8 for more than a year now. DG has held sessions and courses (which some of us even paid to attend) so we would be ready for the new features. Imagine our surprise to find it wasn't going to be a new release after all, but a whole new product that we would have to buy. What were we paying Software Subscription for?

Data General, I think realizing how unpopular this move was going to be, will continue to support rev 7 of AOS/VS and even continue to sell it. But I doubt that a lot of resources will be put into enhancing it to support new equipment and features, and we'll all be forced to use AOS/VS II sooner or later.

What about the conversion? Is it as easy as earlier revs? No way. Data General has set up special programs to ease the way, though. Special courses are available for system managers, and Systems Engineering is offering a special AOS/VS II Migration Planning Service. Since disks have to be remapped, Data General is also renting disk and tape drives to aid in the conversion.

Resource requirements aren't completely spelled out yet. Early notices said that after the big memory increase for AOS/VS rev 7, no further increases were expected, but the early information on AOS/VS II warns that some machines running rev 7 may not be able to upgrade to the new operating system. Also, we have no indication yet whether additional disk storage will be needed.

The current status of AOS/VS II is that it is just beginning beta testing at selected user sites. The plan is to complete the testing and bring out the completed version around December or January. The quality of AOS/VS II may be more clear if they hit those target dates.

No problems are expected running Business BASIC on AOS/VS II, but I don't know of anybody who has done so yet. I'll keep you informed as I hear things.

The excitement about rev 5 of AOS/VS Business BASIC seems to have died down. Many users who have tried it have found nagging little problems, and have held off doing full conversions. The quick turnaround on fixes that was evident originally has slowed a bit. Δ

George Henne, a contributing editor to Focus, has worked with Business BASIC users for more than a decade. He is the vice president of Maxon Computer Systems, 575 Madison Ave., Suite 1006, New York, NY 10022; 416/445-4823.

A parallel world

Giving users some elbowroom in their workspace

Continuing with a series of short articles on sundry items, this month I will talk about how our system is configured to handle two very different types of processing.

Our system

We have an MV/4000 with FPU, 4 MB of memory, and two 6026 tape drives. The system disk is 147 MB, and the UP macro INITIALIZES a 592 MB DATA disk in ": ". For convenience, I will refer to these two disks as SYSTEM and DATA, respectively. Our principal output device is a 24-inch Versatec 8224 monochrome electrostatic plotter. For simple plots and previews of Versatec plots, we use Falco terminals (DG, DEC, and Tektronix 4012 emulation, plus more), which I highly recommend.

The only commercial software products we have are Fortran 77, Wordperfect (rarely used), and Versaplot plotting software (not recommended). The bulk of our software is written in-house for general R&D and map production. Our home-brew, 9-track data-acquisition systems for multichannel, gamma-ray spectrometry and borehole logging are built around Data General Nova 4C and Nova 1220 computers. One system is used for airborne surveys, one is in the back of a logging truck, and another is in a basement lab. All data is recorded on 9-track tape, and is processed on the MV/4000 system. The data for the airborne surveys is processed to the final map stage on our "private" system (using the monochrome Versatec plotter for verification). Then the 10 to 90 MB files of gridded data are transferred to the departmental computer center's VAX 8700 to be plotted on Versatec and Optronix color plotters using Uniras plotting software. We don't do the color work on our system, because we don't have the Uniras software or the color plotter, both of which are beyond our budget.

Types of processing

Some of our users are engaged in R&D that involves a lot of program development cycles (editing, compiling, and LINKing), while others are running large production programs that throw around massive chunks of data. Usually we are processing 10 to 15 airborne surveys at various stages at any one time. A single survey can have about 10 to 20 MB of data spread across about 150 to 200 files. While the borehole-logging group uses smaller files, there are several hundred more files for each area due to the multi-stage intermediate processing that is required to polish the data.

Configuration

We started off with just the 147 MB disk. When we ran out of disk space, I wanted not just another disk, but another controller as well so that the data could be thrown around on it with minimal impact on the rest of the system. The 592 MB disk is our DATA disk, and the directories used for processing these chunks of data reside entirely on it. This leaves the 147 MB SYSTEM disk for

system-related activities, such as paging and swapping and lighter user activities such as editing.

One other aspect related to the two-disk configuration is back-ups. We run an open shop, which means that users have access to the tape drives and do their own tape mounts (no operator). Each survey has its own archive tape that is used not only to archive and delete a finished or "stale" survey, but also to do backups of the newly created or modified files as the data is processed through the various stages. With such a system, I can leave back-ups of the data to the discretion of the users who are processing the survey. They all know that I don't back up the DATA disk, and they know what the consequences are if they don't back up a survey and we lose the DATA disk. The advantage of this is I don't have to spend much time doing backups of the DATA disk.

The SYSTEM disk is another story. Each user (including me) has a back-up tape for their directory (i.e., :UDD:GRANT). It's their responsibility to back up their directory on a schedule of their own choosing, based on their own personal paranoia quotient. In addition, I do backups of :UDD:# (excluding the usernames in :UDD that are LNK files to the DATA disk) from time to time and a regular PCOPY of the entire SYSTEM disk (I don't mind doing it if it's only 147 MB).

WSP: The workspace

So far, I have talked about the data slinging that's carried out in certain directories that reside on the DATA disk (these usernames exist as LNK files in :UDD to the DATA disk) and lighter user and system activities that occur on the SYSTEM disk. There is another hybrid type of activity that involves switching back and forth between the two disks. Most users have a re-

quirement to use small ASCII files that are created with an editor, and larger binary data files created by dumping a 9-track, raw data tape. We want to keep the ASCII files on the SYSTEM disk, so they are backed up, but the larger binary files should reside on the larger DATA disk, which has more free space but is not backed up (not a problem, because the data can be pulled off the tape again). To handle this requirement, the concept of the "workspace" was created.

Most users arrive on the SYSTEM disk when they log on, i.e., in :UDD:GRANT. For each of these users, there is a parallel workspace directory, i.e., :DATA:GRANT, which has an ACL of GRANT,OWARE. I create the initial workspace directory, because users can't create files in :DATA itself. From now on, a parallel workspace directory is created for each directory that requires one. There are two principal workspace macros: pseudo-

The movement is rather like the knight in chess. You can go "down" on the SYSTEM disk and "over" to the DATA disk, or you can go "over" to the DATA disk and then "down" to a subdirectory

macro \$WSP:CLI (Figure 1) and WSP:CLI (Figure 2). Pseudo-macro \$WSP:CLI is like [!DIRECTORY], except that it expands to the name of the workspace directory that is parallel to the current directory. It does that by stripping off :UDD from the name of the

Figure 1: Pseudo-macro \$WSP:CLI

```
[!EQUAL,%1%,][%0%,][EXPLODE,[!DIRECTORY]]][!ELSE]&
:DATA[$CONCATENATE,%5-%][!END]&
```

where \$CONCATENATE.CLI is:

```
%1%%2%%3%%4%%5%%6%%7%&
[!NEQUAL,(%8-%),( )][%0%% %8-%][!END]&
```

current directory (arguments 1 through 4 after exploding) and replacing it with :DATA. Then WSP:CLI creates the equivalent workspace directory (if necessary) and moves into it. The environment is PUSHed first so that a simple POP can be used to return to the SYSTEM disk. In addition, the starting directory is added to the SEARCHLIST so that the files on the SYSTEM disk are still available from the workspace directory. Note that the macro will fail if the directory immediately above the directory doesn't exist. For example (see Figure 3), if you are in :UDD :GRANT:XXX:AAA and you try to do WSP, it will fail if you have never done WSP while in :UDD:GRANT:XXX to create :DATA :GRANT:XXX. The remedy is simple: go to :UDD:GRANT:XXX

Figure 2: WSP.CLI

```
push

comment—prompt pop in case WSP fails
prompt pop

comment—create $WSP if it does not already exist
string [$WSP]
[!equal,[!filenames,[!string]],]
    write creating new workspace directory [!string]
    create/directory/max=100000/1=error/2=error [!string]
[!end]

comment—add current directory to searchlist before WSP
searchlist [!directory] [!searchlist]

comment — go there
directory/1=error/2=error [!string]

comment—now 'allow' user to find special programs
searchlist [!searchlist] :public.special

write You are in directory [!DIRECTORY]: 'POP' to return.

comment—disable prompt pop—user will POP when ready
prompt/k
string/k
```

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and do WSP to create :DATA:GRANT:XXX. Now POP and return to :UDD:GRANT:XXX:AAA and try WSP again. As you can see, the only subdirectories that are created on the DATA disk are those for which a workspace is required.

All of this moving around between directories is made even simpler by the FDIR.CLI ("Shortcuts," *Focus*, July 1988) macro that minimizes the work required to enter a directory and also allows you to exit the directory with POP. The WSP.CLI and FDIR.CLI macros combined with the POP command allow you to move around in these directory structures very quickly. The movement is rather like the knight in chess. You can go "down" on the SYSTEM disk and "over" to the DATA disk, or you can go "over" to the DATA disk and then "down" to a subdirectory. A series of POP commands will retrace your route.

Several other support macros enhance the workspace environment:

- MOVEW.CLI moves files to workspace from SYSTEM disk:

```
MOVEW/BUFFERSIZE=8192%0/% [$WSP] %1-%
```

- MOVEP.CLI moves files from workspace to SYSTEM disk:

```
MOVEP/BUFFERSIZE=8192%0/% [!DIR/I] %1-%
```

- WX.CLI runs a program in workspace without going there:

```
XEQ [$WSP]:%1-%
```

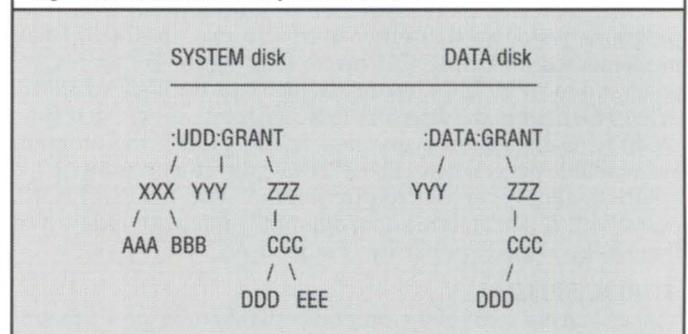
- WF.CLI runs FILESTATUS on workspace without going there:

```
FILESTATUS%0/% [$WSP]:[!EQUAL,%1%,]+[!ELSE]%1%[!END]
```

Using WSP

There are two kinds of .PR program files: those created for public use and those created for private use. Regardless of their use, .PR files can be quite large (our PUBLIC directory of our own programs contains about 400 .PR files, totaling about 60 MB!);

Figure 3: Normal and workspace directories



therefore, I don't want them created on the SYSTEM disk. To enforce this, I have modified the F77LINK macro so that it always creates the temporary files and final .PR file on the DATA disk in

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Jan 28, 1988	Main Menu	5:56:29 PM
0)...about menuOP (tutorial)		
1) CEO (Data General's CEO)		
2) Library (WordPerfect's Shell)		
3) File Crypt (data encryption)		
4) PIPELINE (async mail delivery)		
		Option Id: 0
(F11=Exit/Cancel) (SF1=Help)		

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the workspace directory. If the parallel directory doesn't exist, F77LINK creates it. The workload is thus shared between the two disks (I have one controller for each disk): LINK reads .OB files, etc., from the SYSTEM disk and writes the output files on the DATA disk.

Finally, the .PR files are located on the DATA disk, which is not backed up. That's OK, because I consider them to be expendable files: they can always be re-created from source files by recompiling and reLINKing. If they can't be re-created in such a manner, they don't deserve to exist at all!

:PUBLIC

Rather than change the ACLs of the directories in which .PR programs reside so that other users can execute them, I have implemented a PUBLIC.CLI macro (see Figure 4) that MOVES programs to a :PUBLIC directory (which is on the DATA disk) and deletes them from the directory in which they were created. Since :PUBLIC is always on everyone's SEARCHLIST, the programs are available everywhere. The :PUBLIC directory has an ACL of +,ARE to allow everyone to put files in it, and the PUBLIC.CLI macro will signal an error if an attempt is made to update a file that has been made public by another user.

:PUBLIC.SPECIAL

Since I create most of the programs that handle large amounts of data, I put them in the directory :PUBLIC.SPECIAL, which is only added to the SEARCHLIST when WSP.CLI is used. This ensures that these programs can't be found unless the user is sitting on the DATA disk. This is important, because some of them

are used to create 10 MB files, which I don't want on the SYSTEM disk.

Janitor

A recursive batch job (QBATCH/AFTER=+175 %0-%) runs every Friday at midnight to delete all +.OB and +.PR files that reside in :UDD:# on the SYSTEM disk. Many users who are doing program development forget to clean up the .OB files when they have completed a program. If the program is still under development, they will just have to recompile the files the next time they continue with the development (perhaps annoying, but not a hardship).

BACKUP_REMINDER.CLI

Since everyone is responsible for doing their own backups according to their own conscience, I nag them by having another recursive batch job run every Friday at 3 p.m. It broadcasts a message to all consoles, reminding them to back up their files if they haven't done so recently.

Everyone's system is different. We use these techniques that I have described because "it works for us." They may be useful in their entirety or perhaps only partially on your system. Although I create DATA:[!username] for each user on another physical disk, there is no reason you can't use exactly the same WSP technique with the DATA:[!username] directories placed anywhere you like. All you have to modify is \$WSP.CLI and change the prefix and the remaining arguments to be concatenated.

The workspace concept applied to separate physical disks allows system managers to create an environment where file

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January 28, 1988	Current Inbox	9:16:29
<u>Date</u>	<u>Sender</u>	<u>Summary</u>
1) 15-Jan-88	Sue	Meeting on Thursday
2) 20-Jan-88	John	PIPELINE information
Choose one: (1. Switch to outbox, 2. File Mail, 3) Examine, 4. Delete)		1

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Figure 4: PUBLIC.CLI

```

push; prompt pop

[!equal,%1%,]
  write Error: %0% requires argument 1 to be a program name
[!else]
  [!nequal,([!path,:public:%1%]),( )]
    [!nequal,([!acl,:public:%1%]),([!username],oware,+,re)]
      string not_yours
    [!else]
      string already_public
    [!end]
  [!else]
    string not_public
  [!end]

comment—mode 1—PUBLIC
[!equal,%0/delete%,]
  [!nequal,([!filenames,%1%]),(=%1%)]
    write Error: can't find program %1%!
  [!else]
    [!equal,[!string],not_yours]
      write Error: someone has beaten you to that name.
      write Program %1% is already public and it has an ACL
      write of [!acl,:public:%1%].
      write You will have to rename your program before
      write you can make it available to the public.
      var0/1=error/2=error/1=@null terminate macro
    [!else]
      [!equal,[!string],already_public]
        write Deleting old program '%1%' from :public
        permanence/2=ignore :public:%1% off
        permanence/2=ignore :public:[!ename,%1%].ol off
        delete/2=ignore :public:(%1%,[!ename,%1%].ol)

      [!end]
    [!end]

    write Moving,,new program '%1%' to,, :public
    move/buffersize=65535 :public =%1%
    permanence :public:%1% on
    acl :public:%1% [!username],oware +,re
    delete/1=ignore/2=ignore =%1%

    [!nequal,([!filename,=[!ename,%1%].ol]),( )]
      move/buffersize=65535 :public =[!ename,%1%].ol
      permanence :public:[!ename,%1%].ol on
      acl :public:[!ename,%1%].ol [!username],oware,+,re
      delete =[!ename,%1%].ol
    [!end]

    write ,,.....,Done[!asc,207]
  [!end]

[!else]

comment—mode 2—PUBLIC/DELETE
[!equal,[!string],not_yours]
  write Error: You do not own that program![!asc,207]
  write It has an ACL of [!acl,:public:%1%].
  var0/1=error/2=error/1=@null terminate macro
[!else]

```

```

[!equal,[!string],not_public]
  write Error: %1% is not currently public![!asc,207]
  var0/1=error/2=error/1=@null terminate macro
[!end]
permanence/2=ignore :public:(%1%,[!ename,%1%].ol) off
delete/v :public:%1%
delete/v/2=ignore :public:[!ename,%1%].ol
write Program %1% has been removed from public access
[!end]
[!end]
pop

```

placement is controlled to some extent, thus affecting the performance of the system. The same technique implemented by a single user (perhaps with the root workspace as :UDD :[!username]:DATA:) allows files to be partitioned into two (or more) groups, without having to resort to a filename template to distinguish between the groups. The DATA directory can be easily excluded at the top directory level with \DATA when doing backups, or any other file operation. Δ

John A. Grant is a geophysicist with the Geological Survey of Canada, where he manages the Exploration Geophysics Subdivision's MV/4000. He may be contacted at 601 Booth St., Room 591, Ottawa, Ontario, K1A 0E8; 613/992-1082.

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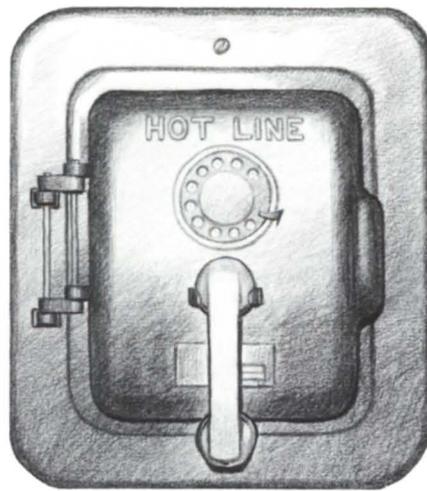
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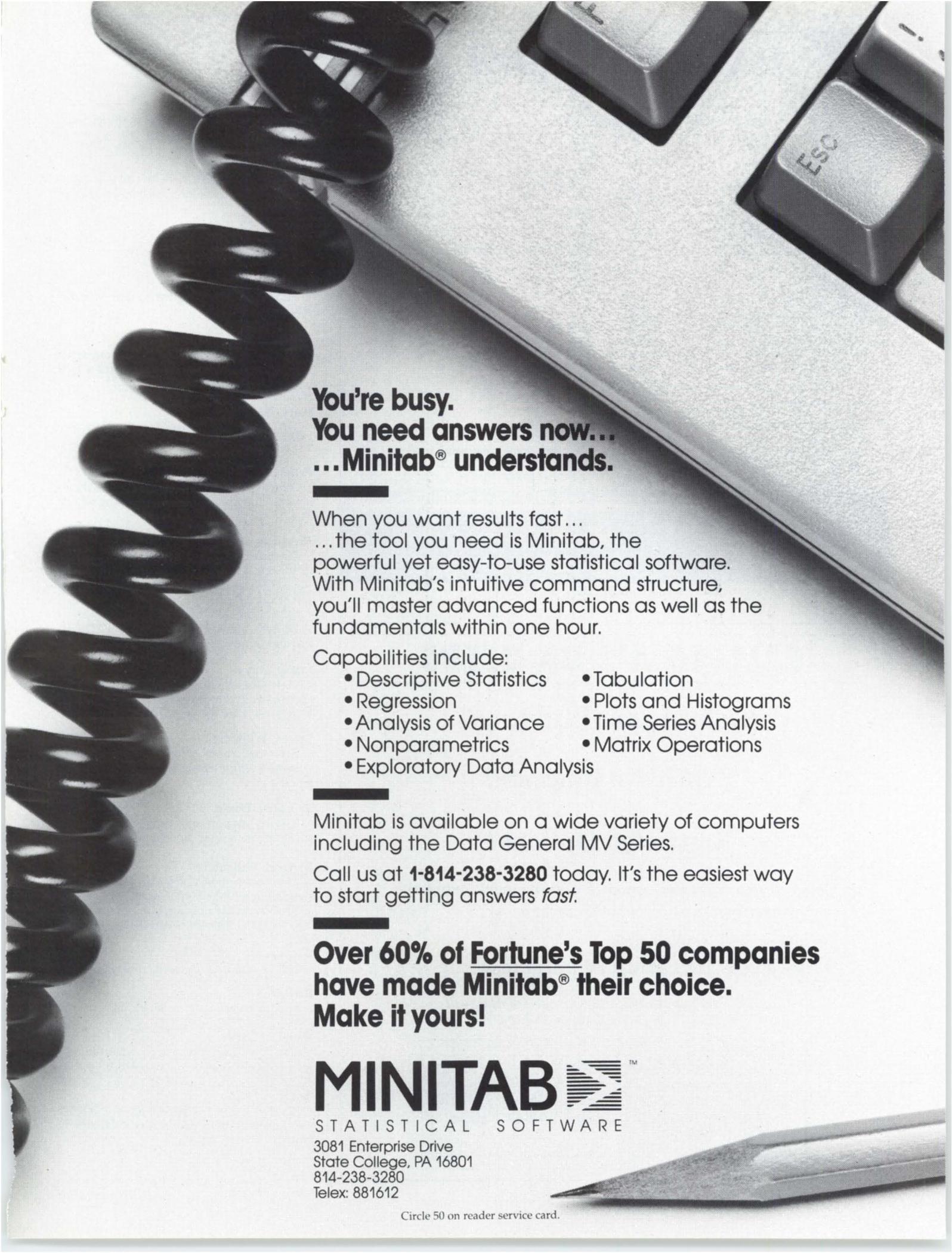
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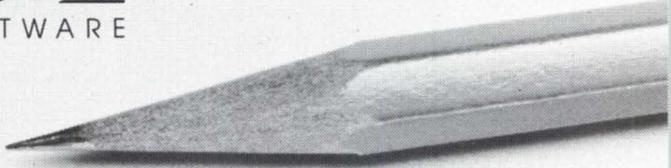
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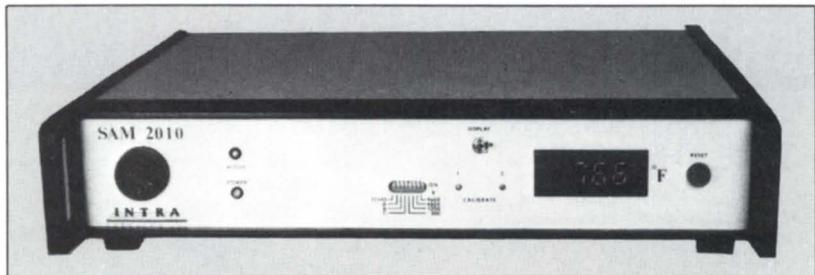
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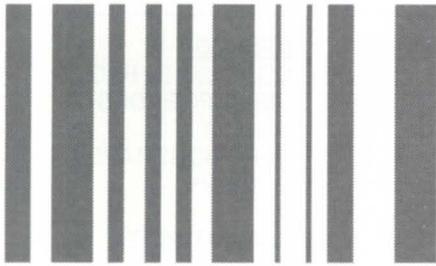
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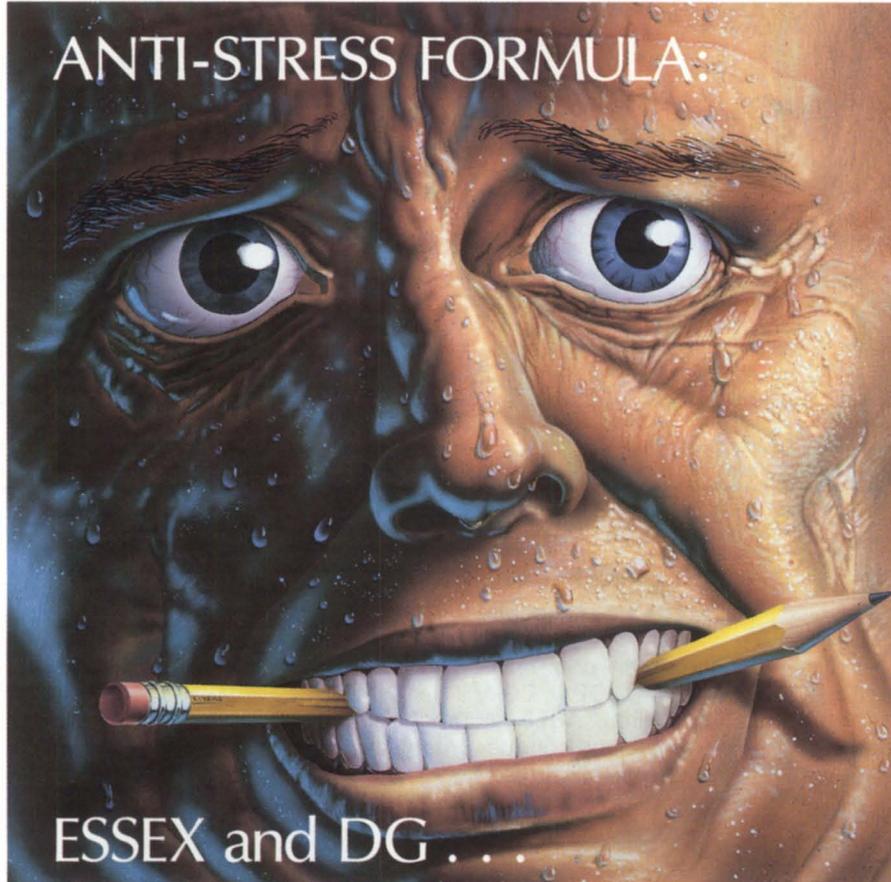
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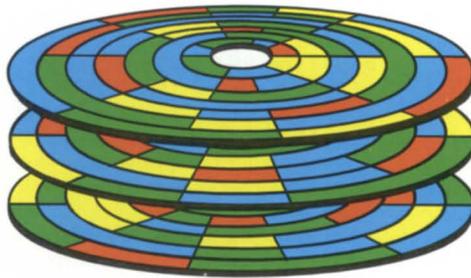
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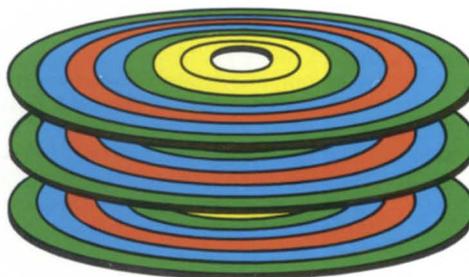
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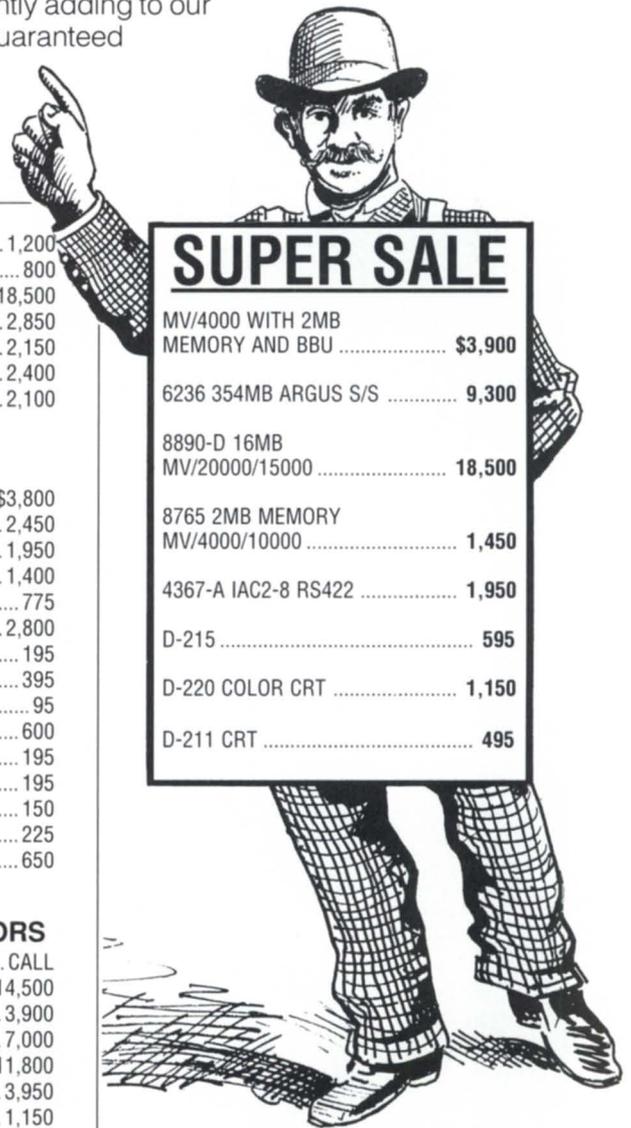
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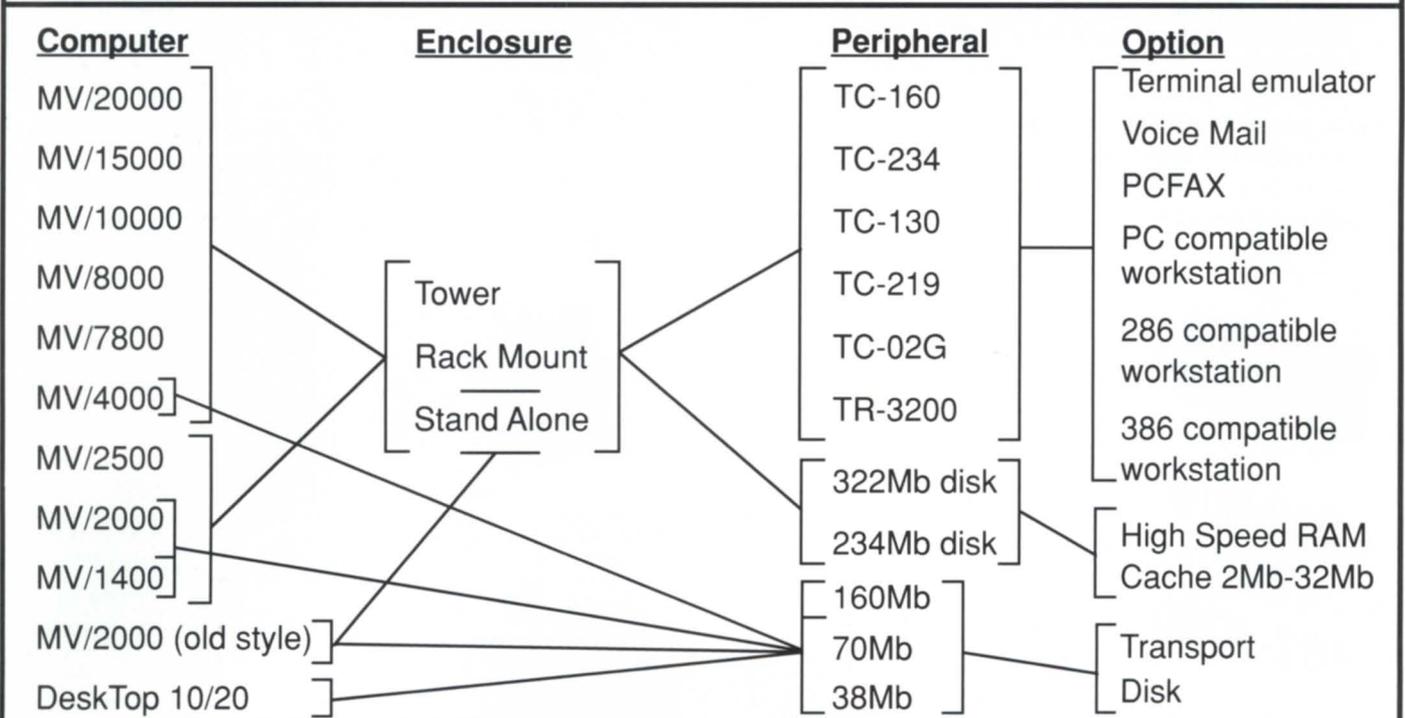
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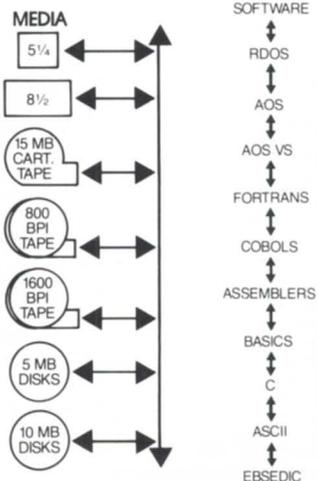
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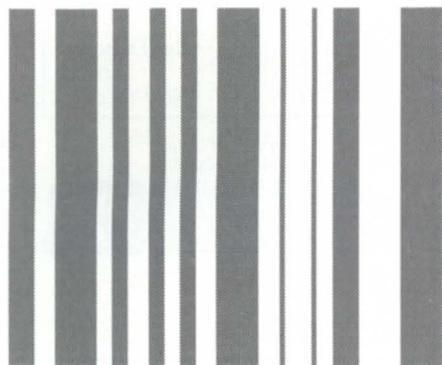
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On target

DG/Ingres hits the mark as DG/SQL enhancement

Bull's-eye! I got a lot of people's attention with my last article ("Turning the Tables," October 1988), which discussed the new standard in data base management systems, DG/SQL. Data General customers are still some of the most progressive people in the data processing industry. Interest in DG/SQL is high.

For those of you who aren't familiar with DG/SQL, it is DG's relational data base management system. Relational data bases were originally developed in the 1960s, but the early years were plagued with poor performance. However, with the introduction of DG's powerful MV architecture, performance became less of a concern, and DG introduced DG/SQL soon after it began shipping the MV series. With its advanced functionality, DG/SQL has consequently overtaken the other DG file management systems as the preferred DBMS.

DG/SQL is touted as a "high-performance" DBMS, a claim that matches reality. In formal benchmarks released by DG, DG/SQL rev 4.00 outperforms INFOS 4.30 in all cases except where INFOS has no active file options (differential file mode, data compression, etc.). We conducted two of our own INFOS versus DG/SQL bench-

marks with similar results. Rumor has it that DG/SQL 4.10 will provide a significant performance increase over 4.00. That should put DG/SQL performance questions to rest once and for all.

Now that the DG/SQL ball is rolling, let me introduce you to a new product I recently tested that has the potential to greatly enhance the functionality of DG/SQL applications. This product is the result of a joint development effort between Data General and Relational Technology Inc. (RTI). The new product, DG/Ingres, is a marriage between Ingres, RTI's fourth-generation language, and DG/SQL (DG will offer full customer support for the product).

Relational Technology is no Johnny-come-lately to the 4GL/DBMS game. Ingres was originally developed at the University of California at Berkeley in the 1970s. RTI was formed in 1981 to support Ingres customers. RTI is now one of the 4GL/DBMS industry leaders, with more than 7,000 installations.

The first phase of DG/Ingres was announced last August. Phase I is a subset of the total functionality found in RTI's standard Ingres. Phases II and III will complete the migration of Ingres to the DG world. Unfortunately, no schedules listing the release dates of the next phases have been published. DG/Ingres consists of a set of 4GL tools that work in conjunction with DG/SQL. Phase I contains two components: Query-by-Forms (QBF) and the Visual-Forms-Editor (VIFRED). (I'd

like to meet the guy who came up with that acronym.)

Query-by-Forms

QBF is a programmer's tool for performing ad hoc add/change/delete/inquire functions to DG/SQL table(s). You define to QBF what tables you want to access, and QBF defines a default screen layout. It's very simple to use. In general, DG/Ingres incorporates a user interface of menu and forms entry. There aren't a lot of cryptic commands to remember and type. If you're familiar with SQL_IQ, QBF output looks similar, but it has more features and is more user-friendly.

Visual-Forms-Editor

VIFRED takes interactive maintenance of tables one step further. You use VIFRED to customize the forms created in QBF. This customization includes an extensive "screen painter" that allows you to format the screen in the manner most logical for your application. VIFRED is also the mechanism used to define field attributes. Field attributes include reverse video, blink, bright, and even color selection (for color terminals, of course). Fairly complex field validations can also be accomplished with VIFRED. Another valuable technique VIFRED maintains in its repertoire is the ability to scroll table data both vertically and horizontally on the screen. With VIFRED, you can create visually appealing and useful end-user table-maintenance or data-entry functions.

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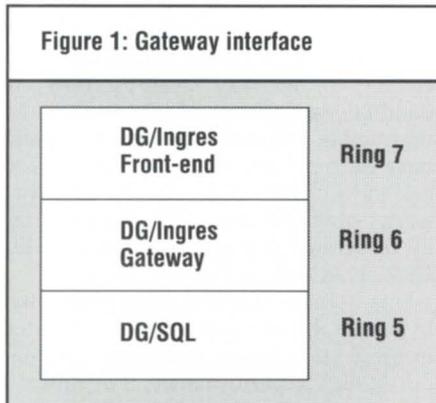
Reporting

As you know, commercial applications are mostly concerned with user-friendly data input and flexible reporting capabilities. VIFRED goes a long way in meeting the data-input requirement. Phase I doesn't include a report writer. Therefore, Present provides a short-term report writer solution until Phase II is available. The Ingres report writer is rumored to be extremely powerful, and should eventually replace Present in applications that use DG/SQL exclusively.

Architecture

So how is it that the DG/Ingres language (almost identical to standard Ingres) is able to access a DG/SQL data base? It is accomplished with inner-ring techniques. The "front-ends" of DG/Ingres (QBF and VIFRED) interface with DG/SQL using the so-called "gateway." The gateway ensures the Ingres calls are valid statements for DG/SQL. In addition to boosting performance, this allows the DG/Ingres statements to be portable to other environments. Figure 1 shows how this is implemented with MV inner rings.

Figure 1: Gateway interface



CEO integration

In keeping with Data General's office automation marketing strategy, DG/Ingres can be tightly integrated with CEO. This allows the following features:

- CEO function-key positioning (can be changed by user)
- status line on top screen line
- Interrupt key.

Target markets

Phase I of DG/Ingres is intended to be used for the simple tasks of application development. The ad hoc inquiry features of QBF and VIFRED allow quick generation of data base inquiries when compared with 3GL development (COBOL). Generally speaking, the current version of DG/Ingres is intended either for simple

applications or to meet the needs of simple requirements in more complex applications.

Phases II and III

Phase II will offer valuable functionality to enhance the current Phase I capabilities. Report-by-Forms (RBF) will be the report writer, and will replace Present in the DG/Ingres environment. Applications-by-Forms (ABF) will provide a full procedural 4GL environment for serious application development. Visual Graphics (Vigraph) will provide graphics output, and will replace Present/Trendview in the DG/Ingres environment. There will also be a component called Menu, which will allow menu hierarchies to be built. Some integration to PC/Ingres (the PC version of Ingres) and remote data base access will also be included in the next phase.

With the release of Phase II, DG/Ingres will graduate from its abilities to perform the simple table-maintenance functions of an application. Building complete applications with full menu structures, complex interactive programs, and comprehensive reporting and graphics will be possible. DG/Ingres will then be a tool that can be used by the "departmental" end-user and the professional programmer to create business applications. Phase III will complete the networking capabilities of DG/Ingres. Full distributed data base access will be available between DG, DEC/Unix, and IBM systems. The IBM communications will utilize SNA to access DB2, IMS, and VSAM data bases.

Do it now

DG/SQL has burst upon the scene as the predominant DBMS of choice. Many INFOS users have already converted their applications to use DG/SQL. There has never been a better time to start using DG/SQL in your applications. And DG/Ingres makes it even easier. If you're anxious to use Phase II features, you can use PC/Ingres for development and port the application to your MV when Phase II is released. One way or another, DG/Ingres can make a big difference in application development techniques and schedules. To paraphrase: Don't worry. Be relational. Δ

Kim L. Medlin is software project manager for the Commercial Software Development Group of Data General's Software Products and Services Division. He can be reached at Data General, 3617 Parkway Ln., Norcross, GA 30092; 404/448-6072 ext. 2007.

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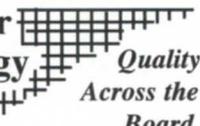
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AOS/VS II, XLPT, and DISCO all provide some solutions to old problems

:NEXT_MONTH

I had intended to surprise you this month with a *Gentleman's Guide to AOS/VS II*, but unfortunately, the documentation arrived a bit late—and was missing some critical pieces that were undergoing a last-minute reprinting.

The column will ignore the migration issues and instead focus on the operational differences between AOS/VS II versus AOS/VS. The migration effort has received far more press than it should have; what we really care about is what kinds of phone calls we are going to be getting from our users on the Monday after.

Some parts of the column are already put together, and I can give you a sneak preview: as near as I can figure it, the operational differences are no worse than the ones encountered when upgrading from AOS/VS 6.06 to AOS/VS 7.56. So far, all the surprises have been pleasant ones. My only major piece of advice for you early upgraders is to take it easy on the New File System features. Go for the defaults this time around (e.g., one LDU per physical disk). We'll work on what options are generally beneficial to exercise as we get more operational experience with AOS/VS II.

It's a bit early for a detailed performance analysis of the New File System versus the Old File System, although that will certainly also come early in 1989.

:UPDATE:XLPT

Last summer, I ran a three-month series of columns on XLPT. Based on the feedback, my research solved a number of long-standing XLPT problems for quite a few users.

As luck would have it, AOS/VS 7.62 featured a brand-new, completely rewritten XLPT. Several users have called to inquire how the new XLPT affects the information that I provided in my series on XLPT, so here's a capsule summary.

The information I provided on binary clean-up file maintenance is still valid, except to the extent that clean-up files have to be modified to get around crocks and bugs in the new XLPT. The most common change involves adding a form feed to cover some mysterious circumstances where the new XLPT does not position to the top of a page when binary mode is enabled.

There were three major flaws in the old XLPT/PMGR implementation that I described. The first one had to do with the insertion by PMGR of inappropriate line-terminator characters on the last printable line of the page. The second one had to do with a disagreement between XLPT and PMGR on what constituted the columns per line and its effect on wrapping. The third one had to do with whether /WRP means "wrap at" or "wrap beyond" the

The migration effort has received far more press than it should have; what we really care about is what kinds of phone calls we are going to be getting from our users on the Monday after

last physical column.

The first problem appears to have been fixed, but the second one is still with us. It appears that the people responsible for XLPT still don't understand the difference between what they refer to as CPL and what PMGR calls CPL. They think the two values are the same, but they're not. Finally, the /WRP problem is also still with us, but it's kind of irrelevant, since turning off /WRP and specifying a CPL that doesn't exceed the exact printer width avoids the problem.

XLPT's CPL value is actually an LCPL (logical-columns-per-line) value, and PMGR's CPL (the one specified by the CHAR command) is actually a PCPL

(physical-columns-per-line). Unfortunately, the new XLPT still insists on changing the CPL and LPP associated with a serial printer whenever CX CPL and CX LPP commands are received. For printers with the /WRP characteristic turned on, this will cause problems at any CPL setting other than the actual physical line length of the printer. The redundant START/NL option that was added several revs ago in an attempt to get laser printers to work, but without recognizing and solving the real problem, is also in the new XLPT. This is another indication that the problem I described (and STRed) still hasn't sunk in back in development.

Compounding all these problems is the fact that the designers of the new XLPT violated Rule No. 1 when it comes to reimplementing a critical piece of systems software: *Except for bug fixes, it should work the same as the previous software, including crocks, quirks, and curios.* For example, the change in the way clean-up files are handled was reasonable, but not as an immutable standard feature. It should have been an option at START time. Too bad the author(s) of the new XLPT didn't learn from the excellent job that was done by the group that reimplemented EXEC back on AOS/VS 7.50.

Finally, there's the issue of performance. In this respect, the new XLPT is a disaster. In previous columns and in my seminar on AOS/VS performance, I've always recommended that XLPTs be run at a priority above group II, priority 2, for two reasons: XLPTs can be depended on never to consume vast quantities of CPU in a burst (thereby shutting out lower priority user processes), and few things are more annoying to the visiting firemen than seeing a 600- or 1200-lpm printer printing spasmodically.

The reasons that the old XLPT could be depended on never to consume vast quantities of CPU in a burst were because (1) it was written very efficiently in assembly, and (2) it used single-block I/O to read the file to be printed. This last item guaranteed that XLPT would take a breath every 512 characters, albeit at the cost of increased disk activity. In contrast, the new XLPT (1) is written in a high-level language, C, and (2) reads four blocks at a time.



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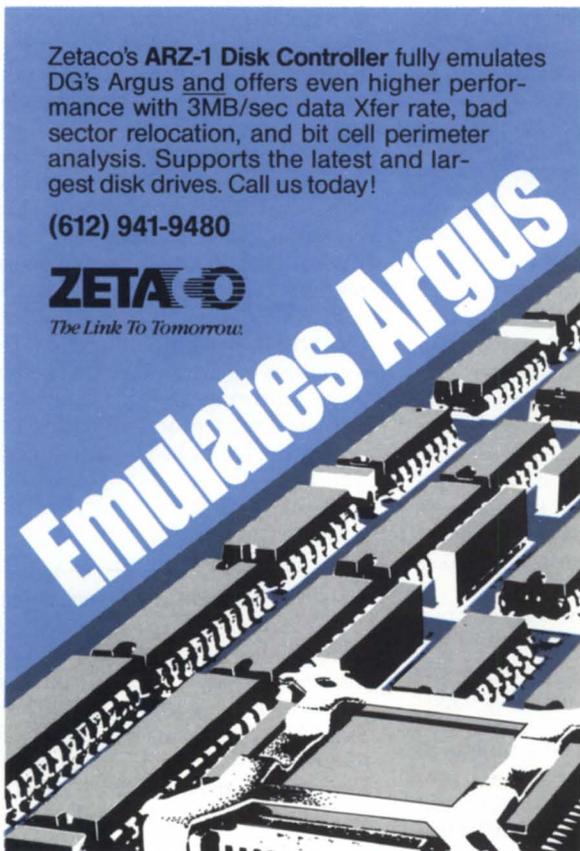
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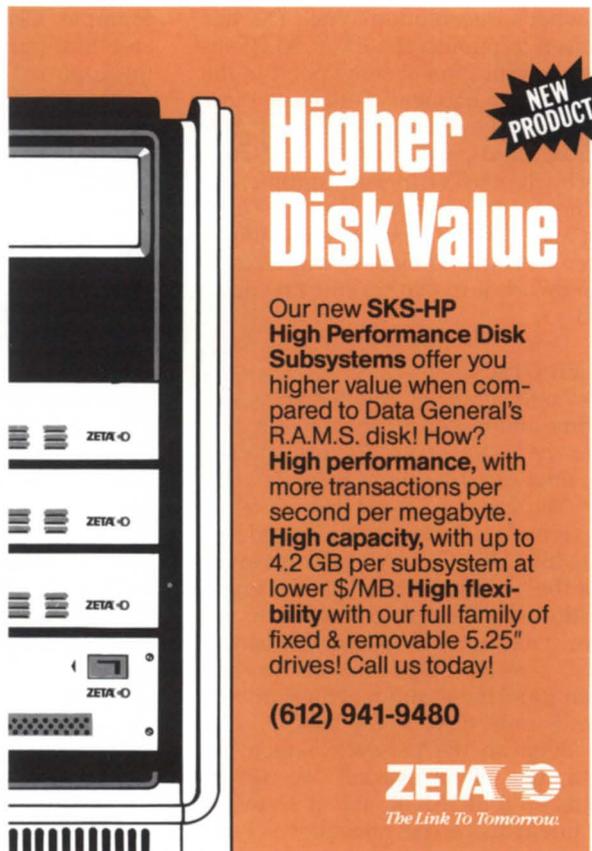
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The combination of these two things, along with the elimination of trailing-blank removal (yes, old XLPT removed trailing blanks, resulting in higher throughput to the printer and reduced PMGR CPU consumption) has caused the CPU consumption of the new XLPT to more than double. Printing a file consisting of 132-column lines with lots of trailing blanks (i.e., a typical COBOL-program-generated print file) on a 1200-lpm data-channel printer on my MV/4000 now consumes 52 percent of the CPU. It used to consume only around 16 to 18 percent. This means that more than one high-speed data-channel printer, or worse yet, a handful of 9600-baud serial printers, will potentially result in a high-priority XLPT completely taking over the machine. In fact, I QPRINTed PARU.32.SR to a queue STARTed against @NULL, and my terminal went dead for the duration of the print job. That didn't happen with the old XLPT.

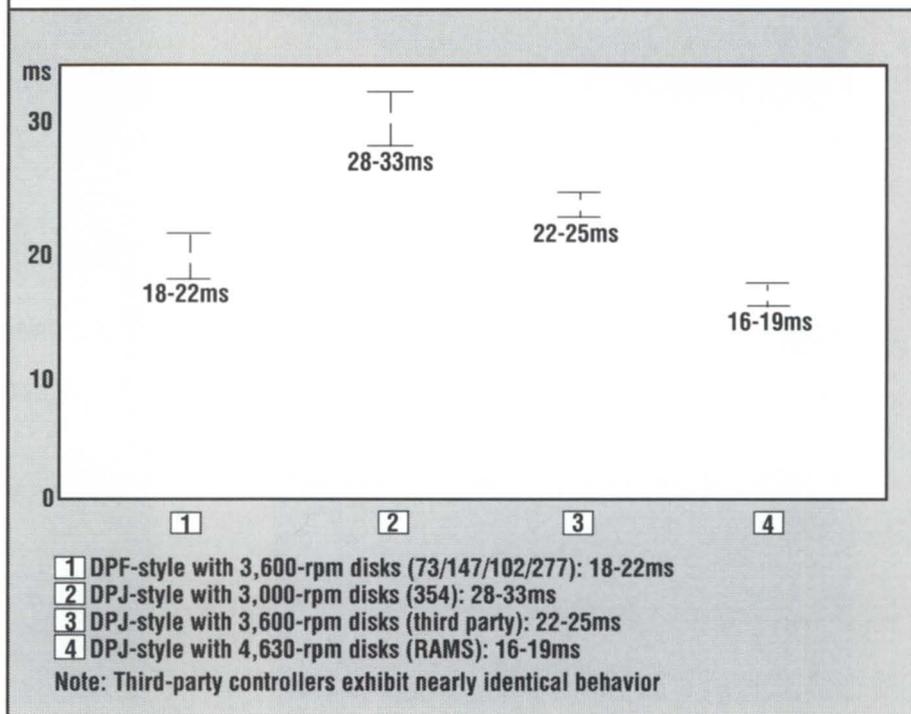
As a result, I hereby rescind my advice about running XLPT at a priority above the on-line users; it should be run at the same priority as on-line users (not lower, or you'll never see your printout). For shops with a heavy print load (we have a combined capability of 5,500 lpm on the MV/4000, and we do a lot of printing), this change can actually force a processor upgrade.

So what's the solution? Well, DG has promised to publish the EXEC-XLPT interface specification at some point in the future. If that happens, I imagine there will be no end to the highly efficient, full-featured, third-party spoolers that suddenly hit the market. In the meantime, I'm praying that they re-release the old XLPT, along with whatever patches are required to the 7.62 EXEC to make it work. No, it doesn't work as is; that was the first thing I tried.

:FILLER:DISCO

Rev 7 and later DISCO will display service time and response time for each disk unit on the "since-booted" screen only if a cycle time of 60 or more seconds is in effect. You can set a cycle time of 60 or more seconds either on the command line (XEQDISCO/CYCLE=60), or by repeated use of the ">" key while DISCO is running. But why the restriction? As far as I can see, it's a bug, so ISTRed it. The "since-booted" screen is based on totals for each disk unit, and the accuracy of the numbers shown is insensitive to the DISCO cycle time. Even on the per-cycle screen, 60 seconds is a bit of overkill. We use 15 seconds on :PERFMGR, and it seems to work fine at disk access rates above 1/sec.

Figure 1: Large disk performance



In any event, monitoring your disk unit service and response times has some significant benefits. Let me give you a little example. Certain sales types, both DG and third-party, are fond of making wild, unsupported claims for the relative speed of their disk and controller offerings, usually based on the transfer-rate figures. The truth of the matter is this: except for bizarre benchmarking situations and kinky data-acquisition applications, how fast one disk unit is with respect to another is determined by the ratio of their service times as reported by AOS/VS through DISCO or Monitor, or by the access time reported by :PERFMGR, or by whatever other monitoring software you use. Think about it. I'm saying that the speed of a disk is generally determined by the time it takes to do an isolated access to the drive (primarily determined by your average seek time and rotational latency), not the speed at which the data was transferred to memory (the transfer rate). Makes more sense, doesn't it?

Based on years of monitoring disk units on more than a thousand AOS and AOS/VS systems, the general range of performance for large disks (147 MB or bigger) on AOS/VS systems subject to normal loads (a mixture of on-line and some batch) is shown in Figure 1.

So, is it true that the new RAMS disks are substantially faster than Argus disks un-

der "normal load?" Yep, almost twice as fast. But are they faster than non-Argus disks? Yep, but just barely. Also, beware of anecdotal claims of performance gains by users replacing non-Argus disks with RAMS disks. Chances are pretty good that any performance improvements they might claim are simply due to the repacking effect caused by dumping their old disk to tape and loading it onto the new disk. Most of the improvement will probably vaporize during the following days or weeks as the disk refragments. Moral: You might want to trade in your Argus disks for RAMS disks, but in most other cases, you will notice little difference. The two situations where RAMS disks shine are when mirroring, and during heavy single-file sequential processing (due in large part to the look-ahead track buffering).

:HO_HO_HO

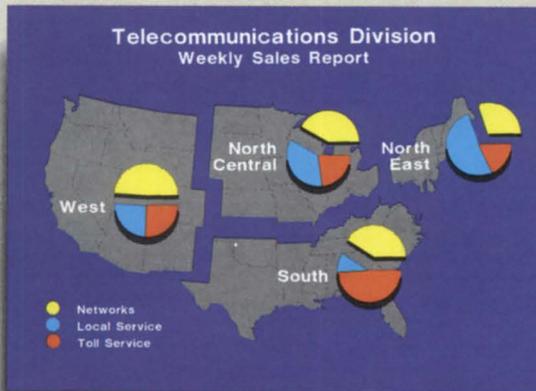
Merry Christmas. Δ

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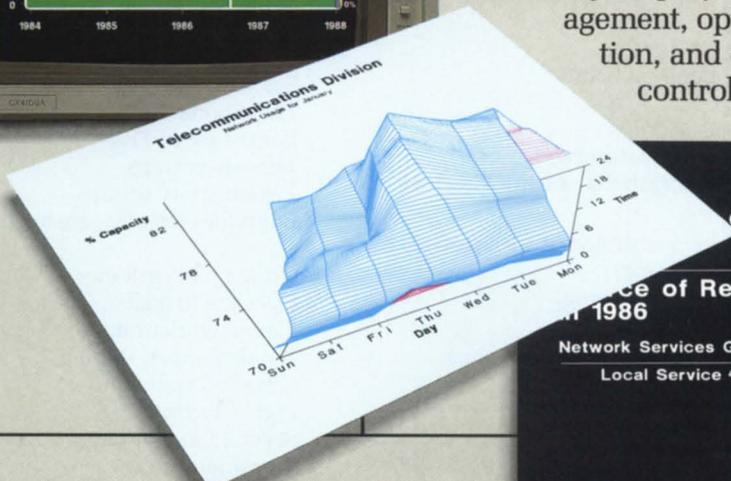
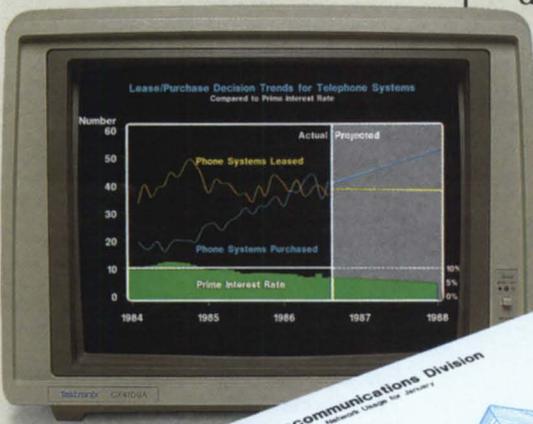
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Use of Revenue in 1986

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13 days of Christmas

A holiday tribute to Data General, NADGUG, Santa Claus, and David Letterman

Welcome to the end of another calendar year. Reviewing what has happened to me in the last year, I thought back to the time about 12 months ago when we were facing a number of minor problems. Some of them were due to trying new releases of software, some of them came from trying to install a new MV/2000, some of them involved unidentified problems we eventually blamed on transient power glitches—and a few of them had nothing to do with work. All of them teamed up to cause me a couple weeks of grief. With my usual poetic license, I have relived the incident, and wish to offer the following as a memorial. I hope it lifts your spirits as it has mine.



On the first day of Christmas,
My MV gave to me,
A crash that ate my directory tree.

On the second day of Christmas,
I gave to DG,
Two memory dumps,
From the crash that ate my directory tree.

On the third day of Christmas,
I gave to DG,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the fourth day of Christmas,
I gave to DG,
Four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the fifth day of Christmas,
DG gave to me,
Five phone callbacks
For the four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the sixth day of Christmas,
DG gave to me,
Six remote techs,
Five phone callbacks
For the four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the seventh day of Christmas,
DG gave to me,
Seven FEs swapping,
Six remote techs,
Five phone callbacks
For the four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the eighth day of Christmas,
DG gave to me,
Eight SEs trapping,
Seven FEs swapping,

Six remote techs,
Five phone callbacks
For the four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the ninth day of Christmas,
DG gave to me,
Nine SSRs patching,
Eight SEs trapping,
Seven FEs swapping,
Six remote techs,
Five phone callbacks
For the four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the tenth day of Christmas,
DG gave to me,
Ten developers coding,
Nine SSRs patching,
Eight SEs trapping,
Seven FEs swapping,
Six remote techs,
Five phone callbacks
For the four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the eleventh day of Christmas,
DG gave to me,
Eleven workarounds,
Ten developers coding,
Nine SSRs patching,
Eight SEs trapping,
Seven FEs swapping,
Six remote techs,
Five phone callbacks.
For the four STRs,
Three user traps,
Two memory dumps,
From the crash that ate my directory tree.

On the twelfth day of Christmas,

DG gave to me,
 Twelve wild guesses,
 Eleven workarounds,
 Ten developers coding,
 Nine SSRs patching,
 Eight SEs trapping,
 Seven FEs swapping,
 Six remote techs,
 Five phone callbacks
 For the four STRs,
 Three user traps,
 Two memory dumps,
 From the crash that ate my directory tree.

On the thirteenth day of Christmas,

NADGUG gave to me,
 Thirteen phone numbers of other users
 who had already solved this problem and
 had the published patch files from DG.



Continuing in the spirit of the holiday season, I'd like to go over my Christmas wish list, restricting it of course only to items that would be of interest to DG techno-junkies. In tribute to *Late Night with David Letterman*, this will be titled:

Jim's Top 10 List of Christmas Wishes That Will Never Happen

10. For all companies to believe in training the system operator. (At least so when I say "CLI," they don't say "huh?")
9. A user-friendly version of Unix. (I really do ask the impossible.)
8. System call ?DWIM (do what I meant). Requires initialization with ?IKWIS (I know what I said).
7. An auto-load tape drive that does. (My records are 55 minutes to load a tape on a DG drive, 38 minutes on a DEC.)
6. A data base system that leaves some of the system resources for the user. (Of course, it must be useful. Picky, aren't I?)
5. An auto-baud AOS/VS port. (IAC, LAC, UAC, DRT, whatever. I'm easy.)
4. Several new clients with purchase orders in hand. (Four projects of three to six months each would be about right.)
3. Next year's columns already done. (Complete with correct answers.)
2. A benchmark suite that really means something. (See B.J. if you don't understand this one.)
1. Marketing geared to make sense, not dollars. (Preferably from DG. I don't care what the other guys do.)

OK, party time is over. Let's get back to some serious business.

Three cheers for three helpful hints!
 A reader came through with some help for our October mail bag. The first solution concerned attaching a Centronics E-series printer to DG. It turns out that such an interface used to be manufactured by DG Special Systems, model number 5959AC.

The second answer provided also concerned a Special Systems product. There was once an 8-inch floppy disk drive that was designed for the sole purpose of exchanging data with an IBM System 34. The system consisted of a floppy disk unit and interface, and software drivers for the operating system. This unit is no longer actively sold, and he did not have a model number for it, but Special Systems always keeps their designs around, so you may be able to track one down.

The third item was a bit of information concerning the TCP/IP protocol. When using TCP/IP between two DG machines, you have full terminal control, as if you were physically wired to either machine. However, when talking to foreign machines (i.e., DG to anything else) only a hardcopy (teletype) protocol is supported. This of course applies to the current revision of the software, and will almost certainly be enhanced sometime in the future.

If you can't beat 'em . . .

Never trust what a company claims is its marketing strategy. For example, a trade journal recently announced that DEC has now added NFS support to VAX VMS systems and the ability for VMS to act as a TCP/IP node, allowing NFS users full access to VMS data. This is interesting in light of the fact that only a few months ago the same periodical (*Digital Review*) reported that DEC didn't particularly care for Unix and would not go out of their way to support it.

MIDI mail

Huey Squier of Bottom Line Advertising and Publishing asks: "What is your best system for music publishers?" If I assume you are referring to standard office functions, there are several systems on the market that do a decent job of handling payables, receivables, inventory, and order processing, although none that I know of are custom tailored for music publishers. If you are referring to per-

formance systems utilizing the MIDI interface, I know of none, but am very interested in obtaining or developing one. There are only two things that have stopped me from developing MIDI software for a DG system: time and money. Actually I figure the time investment won't be that bad; the money is the real kicker. Without a good MIDI keyboard with a class sequencer, it's not worth doing, and I don't have one.

How about it? Does anyone out there have any ideas for music publishers' software? We're looking for some of everything: point of sale, MIDI packages, back-office accounting with a slant on the nuances of the music industry, and the ever-popular R&R (royalties and residuals). Send any and all information to me c/o *Focus* or to my office (see end of article). I'll do a column on whatever comes in.

Three if by C

Charles W. Buxton of Robert Reese and Associates asked three questions about C. Not being an expert, I consulted with other user group members who are. I offer their answers and my comments.

Q. Is there any way to create a smaller .PR file? Even the smallest of programs, performing a single printf, creates a .PR of 106,496 bytes (in rev 3.22).

A. Let me comment that the "smallest" of programs was probably the most complex program you could have come up with in a single functional statement. The reason there are big .PR files is because of the libraries that get linked in. The printf routines call almost every other routine in the library, either directly or indirectly. Consider an even smaller program:

```
MAIN ()
{
}
```

This program has 11 source bytes, compiled into a 324-byte .OB file, and linked into a 90,112-byte .PR file. The symbol table was 22,538 bytes with 531 symbols in it, even though the original source had only a single symbol. This is basically the overhead you have with any high-level language on almost any system (although some compilers are better than others about it). Our results used rev 3.21 of C.

There are really only two things you can do to be frugal on disk. The first is to link many programs in a subsystem together with the menu all using CALLs instead of RUNs or CHAINs. The system I am work-

ing on now has 11 COBOL programs that can all be linked and executed either standalone or as a single .PR file. When linked separately, they use about 4 MB of disk. When linked together, they take about 800 KB of disk, and the performance when switching from one screen to the next is drastically improved. One caution though: if your .PR files get too big (I think the limit is 4 MB), the process page table turns into a multilevel table. This can have as drastic a performance penalty on CPU time as a two- or three-level index can have on a large file with a small element size.

The second technique is to use the runtime shared libraries. Brian Johnson ran an article on the subject in the June 1987 issue of *Focus* (page 46). This allows your .PR files to be built with only a few standard library routines in them, the rest to be loaded at runtime. Although there is a small price to pay in runtime overhead, the amount of disk freed up can be very significant. Contact me if you can't get that issue.

Q. Using Business BASIC, I can set the

maximum amount of input that a user can enter at the keyboard by using an "STMA 4,10,<field length>" statement or an "@(-10,<field length>)" option within the Input statement. How would one best accomplish this effect through the use of Data General's C?

A. Use the assembler interface to ?READ, according to my associate. He does not know of any way to do it within the language, and that's the way they do it. He'll dig through his manuals and let me know if there is a way in time for next month's column. Anybody out there care to give this a shot? Demonstrating this technique would make an ideal column in *Focus*.

Q. Every so often, we receive a tape from Data General marked "AOS/V5 Common Language Library." What is this, and could it prove useful when producing compiled code for Data General systems? Where would I find documentation for it?

A. Not only is it useful, but you can't link C, COBOL, F77, PL/I, or any of the other compiled languages except DG/L without it. It is all of the runtime libraries for all of the compilers. Screen I/O, multitasking

routines, and many others are in there. If you have not been keeping :LANG_RT (or equivalent) up-to-date, you are using old library routines with your current compiler.

As far as the documentation, I am sure it's somewhere. However, I cannot recall seeing anything dedicated to those routines. The various language manuals mention the LANG_RT library routines in the LINK command-line section, since they all rely on certain object modules and libraries contained therein.



So have a good holiday season and celebrate a bunch. If in doubt, say no so that you may live long and prosper. Δ

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

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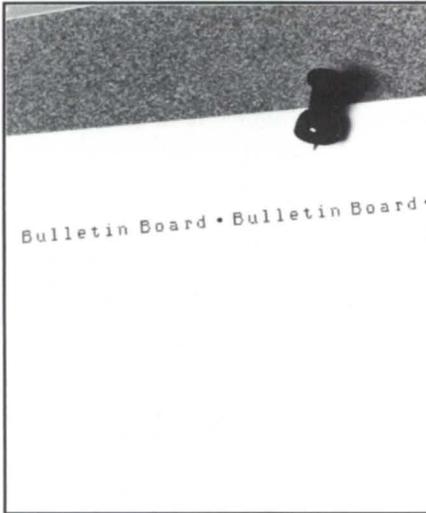
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Bits and bytes from the bulletin board



AOS/VS rev 7.62

From: Mike Shumway

I am glad that you guys have tested 7.62 for me. I'm putting my tape next to the biggest magnet I can find. Actually, we heard from our SE, who told us not to load it without waiting for "several patches for printer problems." Chalk another one up to QA.

From: Kevin Danzig

We found a new one with 7.62 XLPT in binary. We have several jobs that print on special-size documents, and if we put a form feed in the clean-up file, we are assured that, because it puts the file out before and after that, nothing ever lines up. What did we do? (We need binary for the job.) We put a CR (carriage return in the file), and you know what? The last line doesn't print at all? (Try that on a 200-page report with final totals on the last page!) 7.57, here we come (7.60 was a pig, too). Can I borrow your magnet?

STARTER.SYS

From: Kevin Danzig

There is STARTER.SYS to worry about. We once went down dirty, and it proc'd Fixup when we came back up. Unfortunately, there was a messed up block in Fixup (maybe in the bitmap), and it first deleted itself, then our installed system, and then it panicked. Had we come up like any normal system, we would first answer "no" to "can I fix it from Fixup?" We would have seen the problem and run Fixup from tape, etc.

From: Doug Rady

STARTER.SYS? What is it? An MV/2000 burden? We don't have it on our MV/15000. Anyway, as I said before, we just gen SMI into the system and then do not use any DG SMI software except the PID 2 CLI eating the pipe.

From: Kevin Danzig

When a 2000 comes up, normally it comes to a point where sysboot ends. On a big system, you get the option of program load or technical maintenance menu. Technical maintenance is in a gray area that is maybe sysboot, maybe not. Normal technical maintenance has 10 to 12 options. On a 2000, a program called STARTER.SYS follows sysboot. It decides to run Fixup with its own built-in script. Its technical maintenance menu has five options. Anyway, it's a bust!

From: Bart Etter

That is why I removed STARTER! Oh, I had lots of other beefs about SMI, but that was the last straw! And I do love having everything but uCode on one tape, anyway.

STARTER.SYS can also make an executive decision that a full format is in order. With 7.60 and the addition of a question as to whether you approve, the release notice points out that the format run may be totally unnecessary.

Without STARTER.SYS in the picture and running non-SMI, Fixup runs like it does on the big MVs.

AOS/VS performance

From: Doug Rady

Rev 8.xx or AOS/VS II as it is now known is estimated to consume .5 MB to 1 MB more memory than AOS/VS 7.63.

From: Kevin Danzig

Has anyone out there gone back from rev 7.60 or 7.62 to a lower rev, (7.57 maybe)? When we put up 7.60, we thought we were seeing poor response times but weren't sure. With 7.62, we're sure! We'd rather switch than fight. Anyone else feel the same? Also, anyone giving up on rev 4.00 F77?

From: Tim Boyer

According to B.J.'s benchmarks presented at the conference, there is no mea-

surable speed difference between 7.57 and 7.60. I dunno about 7.62.

From: Michael Meissner

I agree that under real usage 7.60 is much worse than 7.57. My 7.60 system (MV/4000, 8 MB, heavy software development, rev 3.00 CNA domain server) experiences blackouts every so often (everything will seem to hang, and in a minute or two, everything will go back to normal). I don't know what the underlying problem is, but I was running PED one day and noticed some batch jobs real priority (PNQ) changed from 433 (swappable 3) to 424 (swappable 2). Doing a PRIORITY and PRTYPE command showed the commands were running at priority 2. Given that the new optimizer compilers (C 4.00, F77 4+, PL/I 2.50, etc.) are much more CPU-bound, particularly when optimizing, I suspect something is getting mixed up with priority and CPU-bound processes (which AOS/VS and AOS have always had problems with).

From: Michael Meissner

One more thing, I noticed the exact same problems when I went from 7.57 to 7.58, and then went back to 7.57, since 7.58 was supposed to be for the MV/2000-class machines. Sigh.

COMPRESS

From: Chuck Cooperman

Several months ago, I downloaded COMPRESS.DMP and several other goodies from the :SYSMGR BBS for use on my MV7800/XP running AOS/VS 7.57. At first, COMPRESS worked fitfully, usually taking an error exit when there were more than a few processes running, but at least working well enough to un-COMPRESS those .DMZ files. Now, it fails immediately with an Error: Illogical process address space definition. I know some things have changed, such as rev 2 microcode, a new sysgen to install an additional IAC-8 in a new expansion chassis, and probably other things I'm not immediately aware of. I hadn't used COMPRESS for a few months up until the other day when I tried to un-COMPRESS GLOSSARY.DMZ. Any ideas?

From: Kevin Danzig

I hate to say this but get a new copy of COMPRESS and hope it can uncompress

what you have. I picked up something from :SYSMGR BBS that was compressed, and it was corrupt. It was a text file, and I spent a good day and a half cleaning it up. If it had been binary, it would have been total trash.

From: Michael Meissner

It sounds like bit rot to me. I've seen this in the past when I was using Zebra disk drives (the 190 MB removable). Every so often, a Zebra will get a new bad block (actually, a marginal block that used to be good will degrade to unusability). If you run the partial formatter, it will flag these new bad blocks. If the block was in the free list, everything is cool, but if the block was in use, the system will use a block of nulls instead. Unfortunately, there is no way that I know about to find just which file got roached. Maybe B.J., Eagle, or DBR have something like this. I've been bitten by normal files suddenly getting bad blocks (not fun), and by directories getting bad blocks (definitely painful—you lose everything in the directory and below it). The time I lost the directories, it was just a pair of minor directories that nobody ever used—just :UTIL and my main source directory (I recovered the sources by speeding the listing files).

From: Brian Johnson

We do indeed have a utility for recovering the data in a newly found bad block. Plans are to introduce this as part of a future product package. Until then, I don't know what to tell ya.

From: Chuck Cooperman

Getting a new copy of COMPRESS did the trick. It's not clear from the text of your letter. Are you saying that a damaged .DMZ file can destroy the COMPRESS.PR file?

I don't think it was bit rot; the disk is a Fujitsu Eagle that has been ultrareliable, but then again. . . . We just ordered DBR, so if it can test for bad blocks, I'll give it a try. Oh yes, a copy of the program in a different directory was also bad, but I'm not sure if the copy was made before or after the damage occurred. Thanks for the advice.

From: Michael Meissner

The Zebra stuff was years ago, but I learned from the experience (once bitten, twice shy). My sources are all in TCS (or SCCS). The TCS files are in a different directory. Every night, I copy both the sources and the TCS files via DUMP_II to a different disk on a different controller, and of course, the daily/weekly/monthly

archives. In case you all think this is overkill, I have been bitten by other failures, such as the tape drive being out of phase, and not being able to read the tapes when the drive was fixed (or on other systems). I also have been bitten by operations having some problem with the dumps, and not letting the system manager know. I just recently had to recover from the root disk going belly-up, and having to deal with the fact that the local operations use a local dump program, and my sys tape had long since vanished. Sigh.

From: Kevin Danzig

A bad .DMZ or .Z file can't touch COMPRESS; however, not all downloads or freebies that I have seen and used are clean. In the docs for COMPRESS (which we do use here and there), the author states that "Yes, a bug in a compression utility is pretty bad." Use caution!

From: Brian Johnson

Sounds like either (a) Fixup trashed the file contents (not unheard of), or (b) you've got a copy of COMPRESS that was downloaded in some non-binary fashion (like changing NLs to CR/LFs). Other than that, I don't have a clue. I've never had a problem with COMPRESS on my MV/4000.

Download problems

From: Brian Johnson

By far, the most common problem reported to us is that people inadvertently download files from our BBS using MS-DOS conversion (NL to CR/LF). Please make sure you are downloaded in a mode that leaves the data absolutely untouched *and* that you don't have /OFC/IFC turned on the port that you use if you're using an MV to do the transfer.

From: Kevin Danzig

When I downloaded from [the] :SYSMGR BBS, I took two things (Kermit docs and more Kermit docs). I downloaded using TEX in X- and Ymodem and then in a different package using Xmodem (all of the above with CRC). The files were identical. I didn't spend much time, but those docs have a regular hit pattern in them that looks like \^h something! Anyway, they weren't for me (I'm all heart).

CEO

From: Sam Pitts

Would there be any interest in a CEO-write sub-board on this system? I am running into some "techie" problems on the PC version, and a forum would be useful.

Thanks for any comments.

From: Paul Patterson

Has anyone configured a single MV/20000 model I with 270 or more CEO users? How about 200 or more CEO users? Any tips? I'm considering doing this, possibly pushing word processing down to the PC level with CEO Connection and CEOwrite. What may be the technical or management problems? Maybe I've just lost my last marble and it can't be done. Talk to me.

PC integration

From: Chuck Cooperman

I have been evaluating DG terminal emulators for PCs that include file transfer, and so far have found two that I like: Pereline by Peregrine Data Systems, and Softerm PC by Softronics. My personal favorite is Pereline, because it offers everything I ever needed as a Procomm user (I didn't use everything, of course) and is very friendly in use. It has scripts, it has Dasher 211 emulation (also ANSI, TTY, VT52, IBM3101, and VIDTEX), and a really nice phone dialer that saves a complete setup for each dial entry. Softerm is more high-tech; it is actually a set of programs, all of which can be made resident. The File Agent program will automatically log on to your DG and perform automatic file transfers using Softrans, like a clunky PC/Remote; I'm not too impressed, but my secretary likes it. The terminal emulator has full 410 emulation, as well as about 20 others. As a final note, I tried PC/Remote and I like it! The problem is getting the justification to the boss for buying it. Next year, maybe.

From: David Down

I've found two terminal emulators that I like. My favorite is Pereline for all around use, but Emu/470 is very nice when you need graphics. Both companies are responsive to changing the product when problems are encountered.

From: Tim Boyer

The other advantage to Pereline is that it costs about \$60.

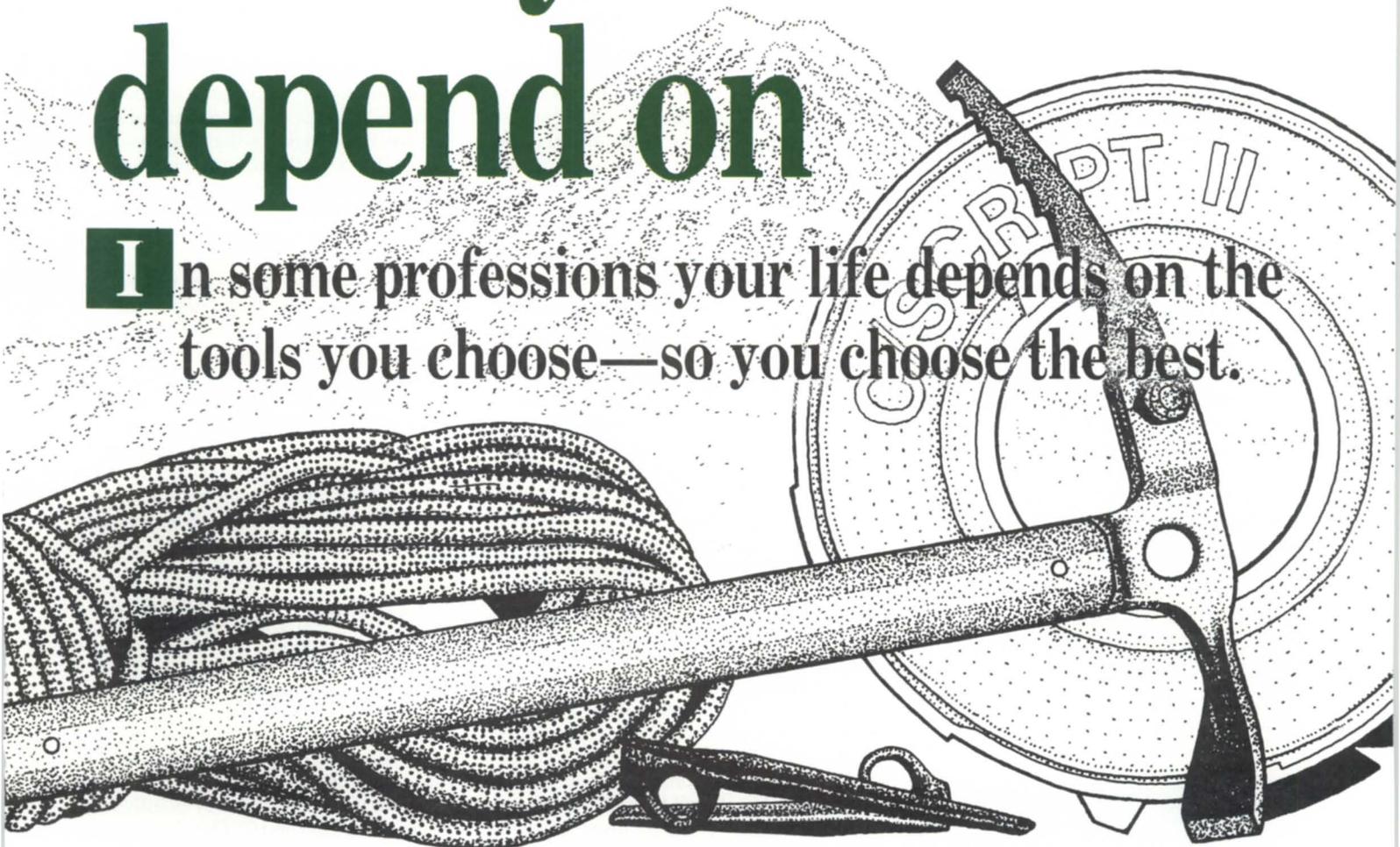
From: Chuck Cooperman

I tried Emu/470 too, but it doesn't meet my requirement of having a built-in file-transfer protocol such as Xmodem. Since none of the programs I have use color or graphics, the D470 capability is pretty much wasted. I bought the original Emu a few years back when I first needed a PC terminal emulator, and still use it when that's all I need, because it's small and fast.

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Data General announces array of high-end products

Westboro—Data General has announced several new hardware and software products, including its largest superminicomputer to date.

• **The Eclipse MV/40000 and MV/40000 HA (High Availability) computer systems** have a performance range of 14 to 50 MIPS. The MV/40000 is software-compatible with the entire line of MV series computers, and provides an incremental upgrade path for current MV users. The MV/40000 uses the same internal I/O architecture as other MV computers. The MV/40000 HA has the first external channel subsystem for superminicomputers and supports up to four symmetric multi-processors. The MV/40000 HA features instruction retry, which minimizes system failures attributed to transient error, and redundant components, such as backup power supplies, cooling units, and battery back-up capability that allows a system to continue functioning if a component fails. It also features an Independent Diagnostic Processor (IDP), which runs on-line diagnostics on components without interrupting system operations.



Prices range from \$500,000 for a single-processor MV/40000, to \$2 million or more for the four-processor MV/40000 HA model 4.

• **The Message-based Reliable Channel (MRC) subsystem** offers a 400-mbps channel. The MRC subsystem supports optional redundancy of all its components, including controllers, cooling systems, power systems, and battery backup.

The MRC subsystem is offered in two packages: a free-standing, 21-slot chassis and a 10-slot, rack-mounted version. Prices for the MRC channel range from \$30,000 to \$80,000, depending on the configuration.

• **The AOS/VS II operating system** is an

enhanced version of the AOS/VS operating system. It supports additional features and enhanced communications performance capability.

• **The Data-Sharing Architecture** is a system software framework that provides users with a high-performance approach to distributed computing for supermini-computer applications. It's designed to support transaction-oriented applications and provide a blueprint for incremental system resource growth in a distributed computing environment.

The Data-Sharing Architecture is based on the client-server model. One MV system is designated as the data base "server" and processes all requests for access to a common data base. Other MV "client" systems support the user interface to applications processing. The approach centralizes concurrency control. By designating a data base server system, the most highly used portions of a data base can be cached in the server's main memory, reducing the frequency of disk accesses. Also, users don't have to modify applications if they change methods of communication, for example, shifting from a local area network to a wide area network or to the MRC system, because the physical location of the data base is transparent at the application level.

The Data-Sharing Architecture encompasses recent enhancements to INFOS II and DG/SQL data base management software tuned for data sharing across multiple systems, new connection server software for INFOS II and DG/SQL data base management systems that run on the client systems, and integrated AOS/VS II kernel-resident communications software to optimize performance in a distributed computing environment.

• **DG/Open Network Management System** is a software package that manages and supports network monitoring and control functions in distributed computing environments. The network monitoring and management functions have been developed for Ethernet LAN and wide area networks (Xodiac/XTS), and MRC-based DG/PC*I networks, as well as user-developed applications. It enables users at a management terminal to monitor and control the communications resources of local and remote systems. That means a network manager can be located anywhere and still detect network problems and reconfigure the network resources to work around the problems. DG/Open is based on the latest draft ISO standards, so it can be used with systems from other vendors that also meet the standards. Δ

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Graphics Scanner for Office/Publisher software

Westboro—Data General has announced a Graphics Scanner interface for Office/Publisher, an electronic publishing software package that features complete CEO and Wordperfect integration. The new interface option enables users to incorporate photos, line art, and graphics directly into newsletters, proposals, and other documents.

Scanned images can be enlarged or reduced to the size needed. They can also be scanned at the exact resolution necessary for specific printer requirements.

The Graphics Scanner interfaces the Hewlett-Packard Scanjet Desktop Scanner, which is PC-compatible, to the Data General Eclipse MV series environment.

The Graphics Scanner ranges in price from \$250 to \$2,550, depending on the processor. Delivery is 45 days after receipt of order. Δ

Circle 80 on reader service card.

DG/Library facilitates information management

Westboro—Data General has announced DG/Library text-retrieval software that finds and retrieves documents from large text data bases. DG/Library is fully integrated with CEO and CEOwrite software, and runs on Eclipse MV series systems under AOS/VS.

DG/Library is syntax-free and searches for information according to user specifications. As a result, users can find the information they need without knowing its exact location. DG/Library can search for documents that contain specific words, phrases, or combinations; it can also search for words in a particular sentence or range, and use Boolean expressions such as "and," "or," and "not." Users can also choose to find documents created on a certain date or by a certain author. Searches can be repeated numerous times and the results saved for future use.

DG/Library is integrated with CEO's word processing, mail, print capabilities, and function keys. DG/Library keeps track of the CEO filing system and automatically recognizes new and modified documents that have been added to a CEO drawer and folder.

Prices for DG/Library range from \$3,000 for an MV/1400 DC to \$23,200 for an

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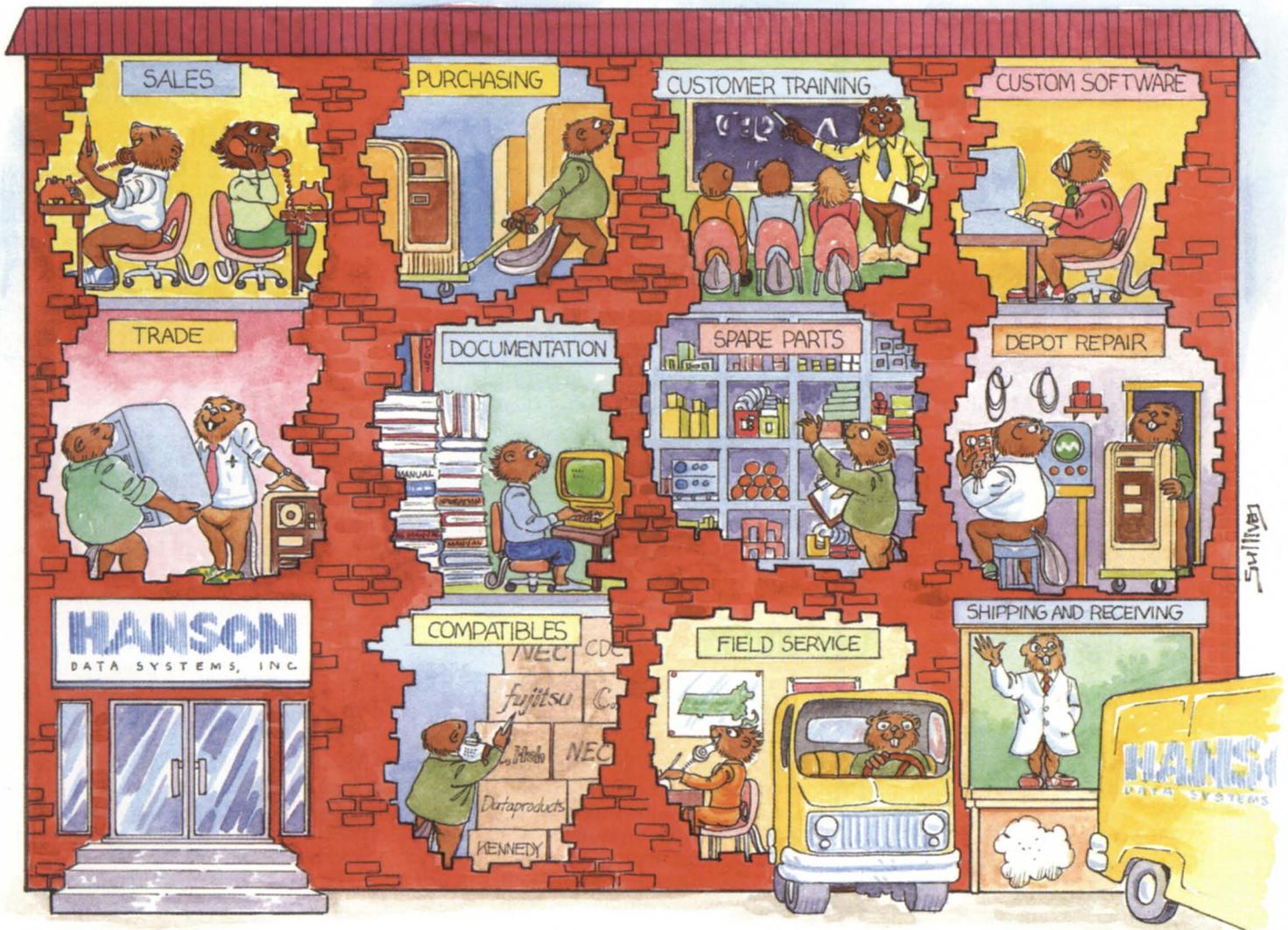
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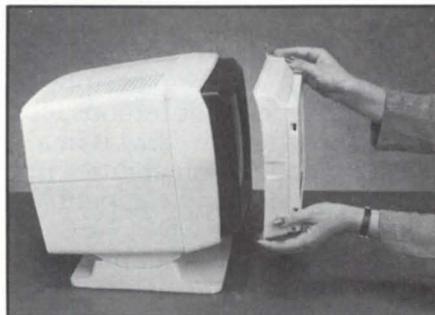
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PRODUCTS AND SERVICES

Eclipse MV/40000. Delivery is 60 days after receipt of order. Δ

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Glare filter custom made for DG Dashers



Santa Rosa, CA—Optical Coating Laboratory, Inc. (OCLI) now manufactures an anti-glare filter for Data General Dasher monitors. The Glare/Guard Profile filter, no. C-4, is customized to look like part of the Data General monitor. The optically coated Profile filter improves CRT readability by removing reflected glare, eliminating screen flicker, and enhancing contrast and character resolution.

Made of tempered glass, the Profile filter is mounted in a lightweight but sturdy plastic frame that matches the contour of the front of the DG monitor. The filter fits on the front of the monitor.

Two models are available: the Glare/Guard Vantage Profile, which reduces glare by 95 percent, costs \$69.95; the Glare/Guard Professional Profile, which reduces glare by 99 percent, filters out 98 percent of the VLF (very low frequency) radiation, and eliminates static shock and dust buildup, costs \$109.95.

Optical Coating Laboratory, Inc., 2789 Northpoint Pkwy., Santa Rosa, CA 95407; 707/545-6440. Δ

Circle 82 on reader service card.

Autodial announced for unattended file transfers

Alamogordo, NM—Applied Computer Solutions has introduced Autodial for Data General computers using the AOS and AOS/VS operating systems. Autodial is a batch control that works with everyday jobs as well as communications programs. Autodial uses a script language, so changing situations can be parameterized.

Log-on sequences and file transfers are the primary applications of Autodial. Only parameter changes for phone number, password, filenames, etc., are needed to

exchange files with similar satellite locations using the same script.

Autodial can be used instead of hiring extra help at night or on the weekend. For example, long-running batch programs that begin with interactive input may be started with Autodial instead of an operator.

Autodial works with Applied Computer Solutions' other Breakthrough products, BT-COM for Data General data communications, and MEX-PC for personal computer communications for networking and file-transfer problems.

Autodial is available with Breakthrough, or as a standalone product for \$200. Site licensing is available.

Applied Computer Solutions, 2336 Union Ave., Alamogordo, NM 88310; 505/434-0206. Δ

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EMS Data Conversion System available in North America

New York—The EMS Data Conversion System is now available in North America exclusively through Thomas West, Inc. The system transcribes data from source media in one physical format and operating system to target media in another physical format and operating system. It converts data from virtually any physical media to any other, and between different operating systems and recording formats. The system currently converts data between more than 1,000 different computer systems, including laptops, desktop micros, minicomputers, and mainframes.

Simultaneously as it transcribes data from source to target media, the system can also change ASCII to EBCDIC or vice versa; uppercase to lowercase or vice versa; strip off the eighth bit; merge, split, reorder, or rename files; convert characters or strings of characters so they become other characters or strings selected by the user; and perform a variety of other functions.

The product includes both hardware and software. The hardware consists of disk drives or other storage devices connected to one another and to a 386 CPU through a Small Computer Standard Interface (SCSI) adaptor. Software resides on the fixed disk of the computer.

The price varies with the number and type of storage devices purchased. A basic configuration usually costs less than \$40,000.

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(continued from page 14)

disagreement within DG about the new policy and how to implement it. Specifically, a couple of policies were announced along with the MV/40000, such as the bundling of language runtime licenses with the operating system, but then were rescinded. How solid is the policy at this point?

Kenney: I'm not sure what you mean by solid, but they certainly are finalized. This is what we will implement. The reason for the change in the inclusion of the runtime licenses goes back to the cost situation. There's a cost associated with including the runtime licenses, and that translates to a price increase to our customers. The benefit would have applied primarily to system developers and VARs. We want to do something to help the VARs, but we don't want that solution to result in a cost to end-users or to those who don't have the problem.

Focus: Some users are saying they don't intend to pay for Support Plus on AOS/VS, but will just wait a year or so, save their money, and then buy the new version when they finally need it. How would

you answer that kind of strategy?

Kenney: It's their choice. I'm not sure how practical it is, given the realities of the computer industry. It's our intention to provide the best value and service we can for those who subscribe. Whether they subscribe or not is up to them—they have to measure the value against the services we provide.

Focus: What proportion of the customer base do you expect to stay with the older versions of software? If significant numbers choose to stay put, won't that stretch the resources DG has available for supporting multiple versions?

Kenney: In terms of a number, I don't know . . . this is the first time we've really given them a choice in this area. In terms of the maintenance resources, that's exactly why we've isolated the maintenance for the older versions. We have a separate group dedicated to maintaining them.

Focus: What types of changes will that group be making to the older version of AOS/VS?

Kenney: Clearly, bug fixes, and where

practical, support of new peripherals. I would describe it as a mature product after eight years.

Focus: The old AOS/VS and DG/UX will now be covered by Support Plus rather than SSS. What differences will that make for users?

Kenney: The old update service was the same charge no matter what class of system you had. What we've done is make SSS proportional, and of course, Support Plus already was proportional. Now what do customers get for that? They get telephone support—that's the Atlanta Center. They get the on-site assistance and dispatch. They get remote software support, the On-line Information System, and microcode subscription. Whenever the existing agreement expires, customers can renew Support Plus at the discounts I mentioned earlier. Take the example of the MV/20000 model I. Prior to the change, the old SSS would have been \$1,600, and the discounted price for Support Plus would probably be in the range of \$3,500. For an MV/2000 or MV/1400, it would be about \$2,220. Δ

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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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ON-LINE HELP *Who to call for answers about NADGUG and FOCUS*

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In Canada416/823-7830

NADGUG membership, address changes

NADGUG staff.....508/898-4067

Information on RIGs or SIGs

Cathlene Gentry512/345-5316

Editorial questions, comments, article suggestions

Greg Farman or Carolyn

Kelly (please send product

announcement to the address

listed below).....512/345-5316

Information about advertising in FOCUS

Sharon Dennis.....512/345-5316

Back issues of FOCUS

Turnkey Publishing staff.....512/345-5316

Addresses:

NADGUG staff

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3400 Computer Drive, MS C-228
Westboro, MA 01580

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Let the North American Data General Users Group (NADGUG) connect you with other Data General users who have a similar special interest and who want to share information, ideas, problems, and solutions. No matter what the special interest is behind the group — equipment, systems or application software, major language, operating system, industry type — the reason is the same: to work together to exchange ideas on how to get the best performance out of your DG system.

Listed above are NADGUG's current special interest groups. If you are interested in making the connection with one of these groups, or if you have an interest that needs a group, please contact NADGUG's RIG/SIG coordinator, Cathlene Gentry, at 512/345-5316 for further information.

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DG recently fine-tuned the details of its restructured software licensing and support policies. Following several months of uncertainty, the policy was announced at the same time as the MV/40000. However, some details were still being worked out as late as the end of October. The new policy has several components:

- DG has unbundled AOS/VS II from its MV/40000 hardware, while reducing the hardware purchase price somewhat, so the total cost for computer plus operating system remains about what it would have been. When originally announced, the unbundling was to apply to all MV systems, but now it has been restricted only to the MV/40000 series.

- When software products get major enhancements, they will be treated as new versions, and separate licenses will be sold. The first products in this "versioning" program are the AOS/VS II operating system and XTS II networking products. Customers who pay for the Software Subscription Service will not automatically get the new versions. However, customers who want to "trade in" their existing AOS/VS licenses for AOS/VS II will receive a 70 percent discount on the license cost for the new version.

- The original policy change announcement said runtime licenses for languages were going to be included with the cost of the operating system, but DG has decided to return to its earlier policy. Customers will continue to buy separate license fees for each language runtime.

- Software support for 32-bit software products will be extended from 90 days to one year, at no additional charge.

- DG will price Software Subscription Services in proportion to the CPU model, rather than the earlier flat charge regardless of CPU size or number of units. If additional processors are using the media provided under SSS, a right-to-copy option must be purchased.

- AOS/VS and DG/UX Software Subscription Service will be discontinued and placed under the Support Plus program.

Because of the magnitude of these policy changes, *Focus* has interviewed Frank Kenney, the manager who is responsible for administering them, to assess their impact on the DG user community. See page 12 for details.

Having signed major agreements with two large banks, Data General is emphasizing its role in the branch automation

niche of the banking industry. Combining DG's CEO office automation products with Broadway & Seymour's Ultrastar and Diversified Computer Products' Comprehensive Banking Office (CBO) software packages, DG is selling the ability to address teller and platform functions along with office automation needs.

Orders for more than 50 of the newly announced MV/40000s worth upward of \$30 million were on the books even before the press conference at which the products were introduced. A \$20 million order was placed by the Technical Service group of the French Air Traffic Control agency, Service Technique de la Navigation (STNA). The STNA computers will be used in a national air traffic control system. This order is part of a previously announced five-year, \$35 million contract.

In addition, World Computer Corporation of Michigan, a DG VAR, purchased four MV/40000 computers to be used in credit unions throughout North America. Another Data General VAR, HBO & Company, has also ordered 10 MV/40000 systems to be installed in hospitals throughout the country.

Additional orders have come from Airtours of the U.K. and Professional Healthcare Systems of Los Angeles.

Digital Equipment hid a recent price increase by eliminating its vaunted one-year warranty program on new equipment, and beginning to charge for equivalent service coverage. When IBM raised prices by 3 percent to 5 percent last July, many observers predicted Digital would follow suit. When the announcement finally came (on the Columbus Day holiday, presumably to avoid publicity), it was under the guise of giving customers a choice so they could pick the maintenance level best suited to their needs. However, DEC concedes that it will advise customers to opt for the standard warranty coverage, which costs about 6 percent to 9 percent of the purchase price for a year's coverage. DEC will also raise prices on software and add-on hardware by about 2 percent.

Data General has completed another round of cost cutting, resulting in the clos-

ing of two plants and the loss of about 800 jobs. At the same time, the company will continue to hire personnel for Sales, Systems Engineering, and Research and Development.

Plans for consolidation in manufacturing, repair, distribution, and other functions have been made in order to pare an estimated \$50 million off the annual budget. To implement these changes, DG has "taken a charge" of \$45 million against operations in its recently elapsed fourth quarter.

The manufacturing of high-end mini-computers will be moved by next spring from a Portsmouth, New Hampshire, facility, to newer plants in Durham, New Hampshire, and Apex, North Carolina. Product repair services will be moved from its present site in Fountain, Colorado, to the Southboro location and other appropriate manufacturing plants. Parts distribution will be moved from Colorado to Southboro also. Both the Fountain and Portsmouth facilities will be sold.

Data General Educational Services offers two new computer-based training courses for AOS/VS system managers, and training seminars for three new DG AEC products. The seminar courses cover TEO/3D, a computer-aided design graphics software; DG/Arose, a civil site engineering design package; and DG/Geo, a new Geographic Information Systems (GIS)/Mapping application product.

The new CBT courses offered are "AOS/VS System Management Techniques" and "AOS/VS Operator Using SMI (System Management Interface)."

George R. Bowden was the winner of the drawing for a \$500 United Airlines gift certificate given away by Liberty Electronics at Conference 88. Bowden was selected from a pool of NADGUG entries.

Data General has signed a VAR contract with Healthcare Affiliated Services, Inc. (HAS) of Pittsburgh. HAS is a subsidiary of Blue Cross of Western Pennsylvania that offers information and management packages for the mid-tier hospital marketplace. The three-year contract for DG low-end and mid-range systems includes the MV/1400, MV/2000 DC, and the MV/7800 XP. Δ

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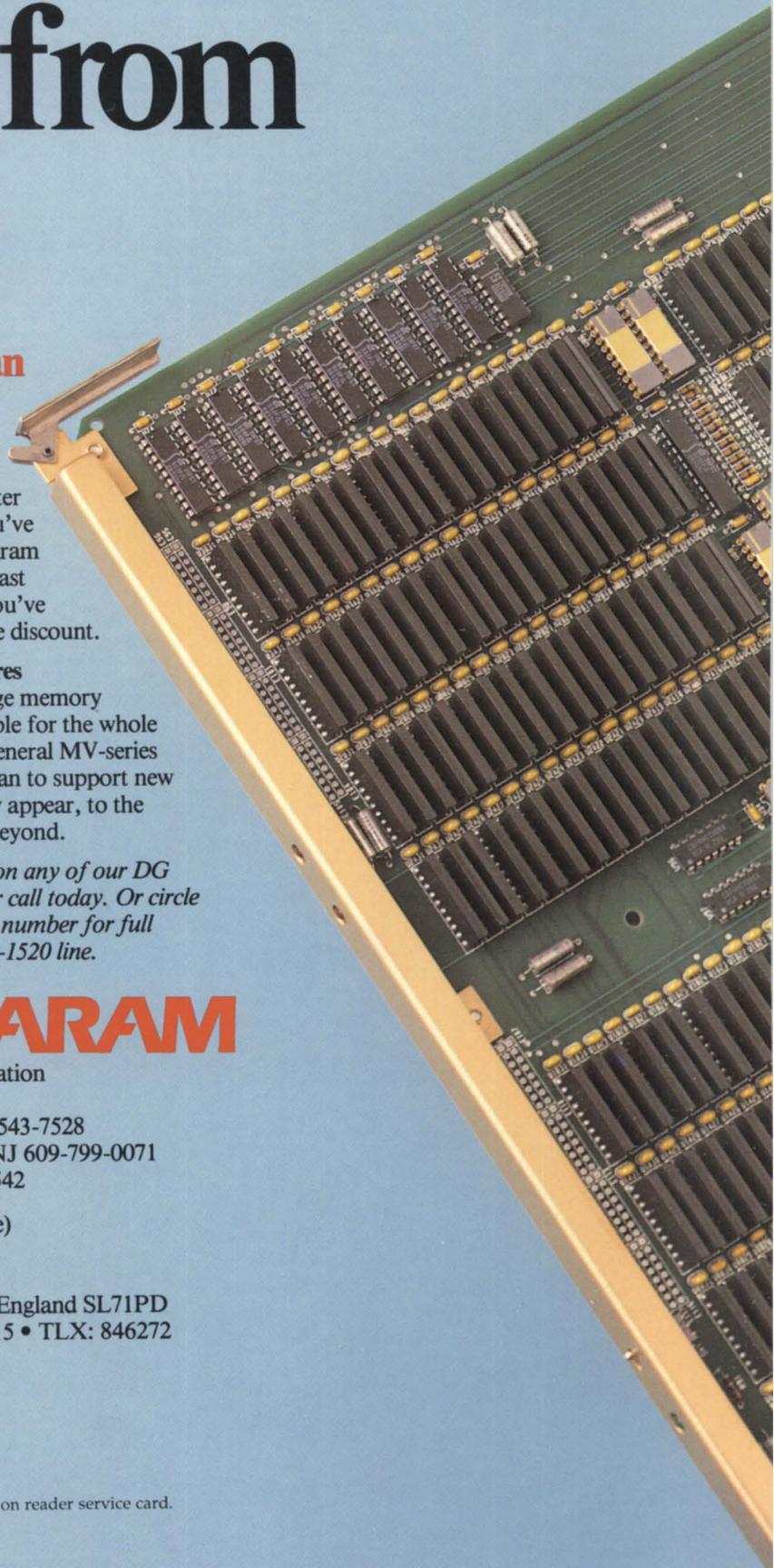
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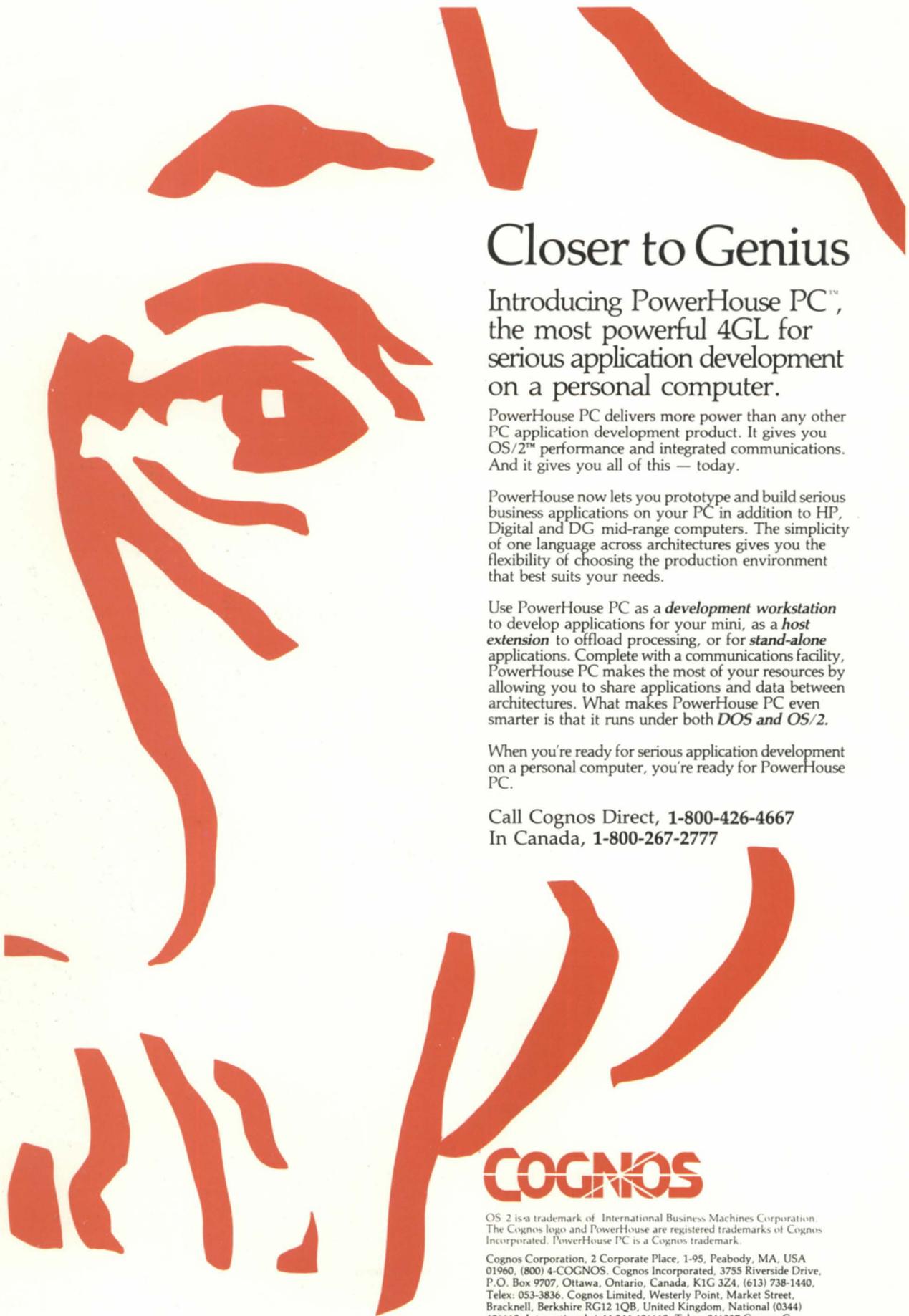
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