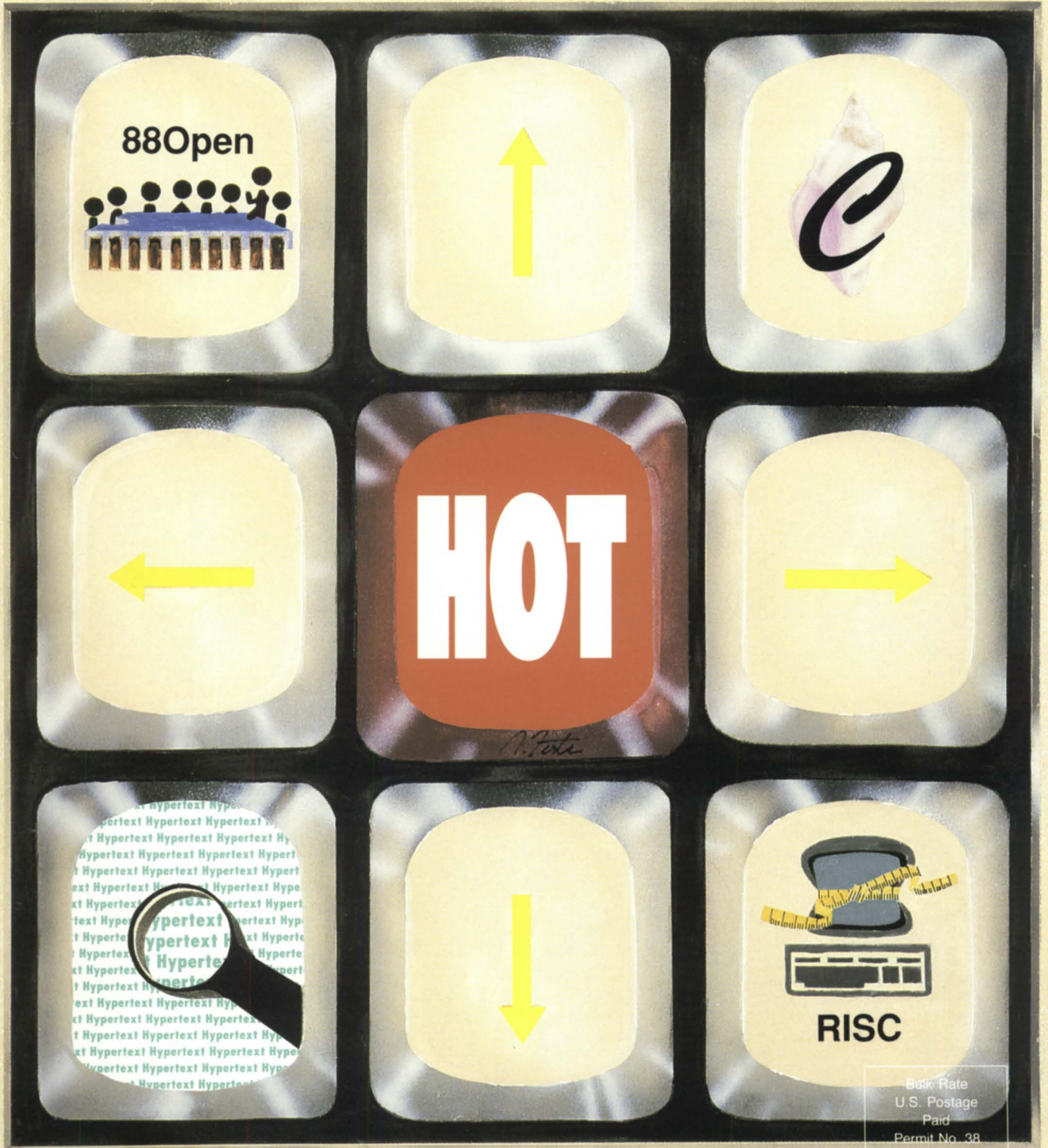


April 1989

# FOCUS

The Magazine of the North American Data General Users Group



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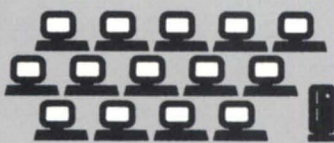
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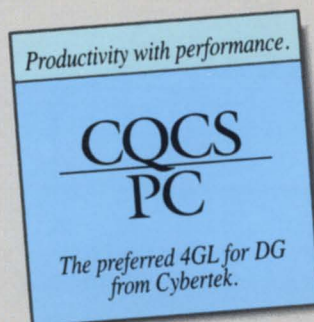
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# NADGUG and DG— partners for prosperity

by Donald W. Clark  
NADGUG president

I'd like to direct my comments this month to the growing number of NADGUG members who make their living as DG employees. As NADGUG has grown, more and more of you are participating in our conferences and other activities. We also know that an increasing number of you are reading *Focus* on a regular basis. You have become an increasingly valuable resource for all of us by giving presentations and straight answers to our questions. Like Bartles and Jaymes, we thank you for your support.

However, we think there's something you may have overlooked: do you realize the extent to which NADGUG could be a resource for Data General?

If you pay attention to all the people whose opinions show up in the industry publications, you know that DG is in the middle of a major reworking of its product line and business strategy. In addition to all the plant closings and reductions in force, we have seen big changes in management, and announcements of a whole new line of RISC and Unix products. Some of the analysts are saying this is a dire time for DG: if you don't get it right this time you may not get another chance.

Well, you'll have to take that part of their commentary with about a pound of salt. They were saying the same things about DEC just a year or so back. Still, it is a major change, and DG employees should be working extra hard to assure that you do "get it right."

That's where NADGUG has an important role to play. I can't think of a better forum for gaining an understanding of what the market wants. With RISC and Unix, price and performance may be the main things buyers are looking for, but there will also be lots of ways DG can tailor its offerings to make them stand out from the crowd. DG has always been known for its engineering and price/performance. What other factors are you going to stake the company's reputation on for this new product line? In my opinion, you would do well to spend a lot of time

talking to current customers to gain the clearest possible picture of what they are looking for.

The same is even truer for DG's traditional 32-bit products. The company is counting on the MV series and its associated software and services to generate a substantial—though declining—share of its revenues and profits during the next decade. It can improve the chances of that scenario working out right by spending more time than ever discussing desirable features with the current user base. Likewise with the marketing of these products.

During the last several months we have seen a classic example of miscommunication with respect to the new DG policy of offering old software products as new versions. By now, most DG users do understand the potential benefits of the idea of having separate versions of AOS/V5 and AOS/V5 II. However, there is still a lot of lingering bad feeling over the way the idea was introduced. Users were dismayed as one set of policies was first announced, then retracted, then modified. And the uproar over pricing of the new version for sites that were software subscribers couldn't possibly be justified by any additional revenues generated by the change.

That could have been avoided, or at least predicted, if the decision makers had been equipped with better information about what users are thinking.

I'd like to extend a sincere invitation to anybody within DG who needs this kind of information. NADGUG is here for you, too. We can help you put together groups of users for your research, and we're willing to join forces with you on statistical research projects. Tell us what it is that you need to know, and we'll work with you to get solid information that will help you remake the company.

As NADGUG members, we share your desire for the company to succeed and prosper. I hope you'll take us up on the invitation.  $\Delta$

# FOCUS

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# Start up down under

## Australian users attempt formal organization

After much discussion, a number of "humble/powerful" Data General users are attempting to organize a formal users group in New South Wales, **Australia**, according to **Nick Southcombe** of Sydney. The first meeting was held Monday, February 27. A keynote address was given by **Wayne Fitzsimmons**, Data General's vice president of the Americas/Far East region. This was followed by a business meeting, drinks, and "nibblies." Anyone requiring further information can contact Nick at (02) 261-7777.

The **Pittsburgh Area Data General Users Group (PADGUG)** has changed its meeting day from the first Wednesday of the month to the second Wednesday. On February 8, the group met at the Data General office in Greentree. The meeting included a synopsis of the disaster recovery course offered by Data General. **Rick Joslin** of Westinghouse gave a company overview and explained how Data General equipment is used in his organiza-

tion. Also, a representative from Fast Track Systems gave a presentation on disaster recovery in the Data General environment.

PADGUG's next meeting will be Wednesday, April 12, at 4 p.m. DG users in the Pittsburgh area should contact **Ken Krugh** at LMV Leasing for more details.

**GENISYS** users at law firms across North America will convene at DMS Systems in Salt Lake City April 2-5 for an initial users group meeting.

Among the topics to be discussed are litigation support, estate management, library organization, and pleadings generation (for class-action suits). These topics will be illustrated in a demonstration using GENISYS applications. There will also be training sessions on using the report writer and interfaces with word processing software.

The meeting will start with a welcoming reception Sunday evening and conclude with a half-day roundtable discussion at which users will develop a list of

enhancements they want incorporated in future versions of GENISYS. Then they will meet with the GENISYS development staff to discuss the list.

For a complete meeting agenda and an application form, please contact **Anne Keir** at DMS Systems 801/484-3333.

Data General users in Jacksonville, Florida are attempting to organize a regional interest group in the northern part of their state. They are testing the waters to find out how many DG users in the area are interested in signing up. For more information, please contact **Jim Savage** at Fortune Insurance, 2118 Gulf Life Tower, Jacksonville, FL 32207, 904/396-0579. Δ

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

# I have my reasons

We know at least 31 reasons to join NADGUG—can you help us name more?

By Cathlene Gentry • RIG/SIG coordinator

**O**ne of the most popular questions we are asked is "What do I get for being a member of NADGUG?" Most members and potential members are aware of the two most obvious benefits, the annual conference and a free subscription to *Focus*, but there are many other advantages to NADGUG membership. In order to let all DG users become

aware of these not-well-known benefits, we have compiled a list of "31 Reasons for Joining The North American Data General Users Group." You may have noticed the series of "Why Join NADGUG?" advertisements running in previous issues of *Focus*. These are taken from the 31 reasons.

In case you're wondering, "Why 31 reasons?" we don't really have a good answer. At first we only thought of 30, but

then somebody remembered that you can now charge your membership to a credit card. That made 31, which seemed to have a nice ring to it. We're sure there are other reasons out there—maybe you can help put them into words.

In fact, the *Focus* staff would like to challenge you to do just that. The person who sends us the 40th good reason for belonging will get a \$25 gift certificate to

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The 31 reasons are listed below. We hope these help you take advantage of all the benefits of your NADGUG membership. We also hope you will pass on the word to other DG users. For more information on NADGUG membership please contact Membership Coordinator **Suzanne Himes** at 1-800/877-4787.

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3. **A Gathering of Minds**—  
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4. **Good Advice**—  
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5. **A Wealth of Knowledge**—  
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6. **Strength in Numbers**—  
NADGUG is an effective two-way communication channel between Data General and the people who use DG equipment.

7. **Your Best Interests**—  
NADGUG supports a network of regional and special interest groups that address the needs of individual members.

8. **Great Parties**—  
At NADGUG's annual conferences, hundreds of users gather to discuss topics of common interest with Data General personnel and third-party vendors.

9. **Big Discounts**—  
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10. **Fingers Do the Talking**—  
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11. **Free Software**—  
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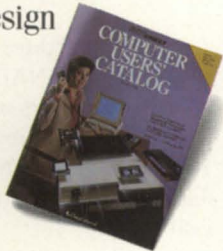
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**17. Take the Pulse—**

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**18. A Collective Voice—**

NADGUG speaks with the collective voice of thousands of Data General users. And Data General listens.

**19. Know-How—**

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**20. Product Knowledge—**

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**23. Good Buddies—**

People who meet through NADGUG activities already share a strong common bond—the source of many lasting friendships.

**24. Fast Solutions—**

NADGUG resources can help you find the products and services you need quickly.

**25. Learn What Works—**

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**26. Don't Spin Your Wheels—**

You don't need to reinvent the wheel if NADGUG can put you in touch with someone who already invented it.

**27. Emergency Relief—**

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**28. Be a Pro—**

Your NADGUG membership promotes professionalism, and that's good for all of us.

**29. Help Others—**

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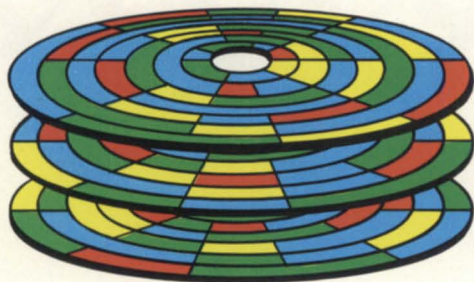
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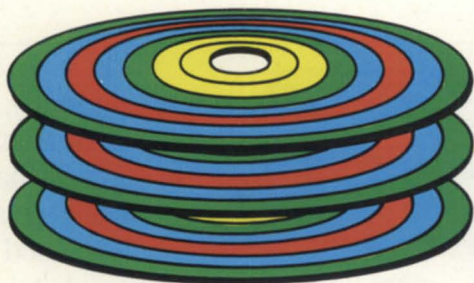
Directory information, frequent files, and available space scattered throughout the disk. High average seek distance and poor performance.

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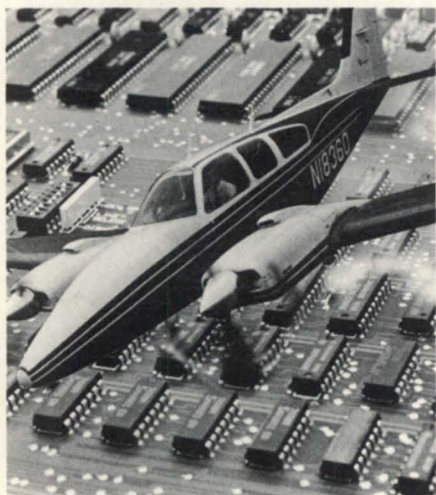
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# S&T Depot Express

We'll keep you on line.

# Aviion arrives

## RISC workstation, server, DG/UX 4.1 debut at Uniforum

by Greg Farman  
Focus staff



*Data General's new 88000-based family of industry-standard products includes the 88000-based system (below table) and personal workstations with 19-inch monochrome and 20-inch color displays.*

The audience didn't buy DG President Edson de Castro's explanation for the strange name DG hung on its new family of 88000-based processors. According to de Castro, the company was just trying to find a name that was reminiscent of "vision" and would make it through the legal department's trademark search. The double "i" in Aviion was there just to please the graphic designers. A voice from the back of the room called out a different theory: "We figured it out. Since this is a RISC machine, it's really the Nova II. You just rearranged the letters."

Whatever the reason for the name, the new processor family was a crowd pleaser. On display at the front of the auditorium were a high resolution workstation and a server about the size of an MV/4000 DC. The spec sheets handed out with the press

packets made it clear what was special about these otherwise unassuming boxes. The workstations will be available in two versions, with clock speeds of 16.7 MHz and 20 MHz. A low-end diskless version with 4 MB of memory, optical mouse, PC/AT keyboard, DG/UX 4.1 operating system, and 20-inch, 1280 by 1024 70 Hz flicker-free monitor would cost only \$7,450. Rated at 17 MIPS and 30,720 Dhrystones, the workstation would deliver about 20 percent better performance than a DECstation 3100 costing about \$13,000. DEC may have broken the \$1,000 per MIPS barrier, but the Aviion redefines the price/performance curve at less than \$500 per MIPS.

(A footnote on the benchmark figures: since the machines execute one instruction per cycle, their MIPS rating is the same as their clock speed. The Dhrystone rating is a measure of integer computations; it compensates for the advantage that hardware floating point units confer in Whetstone comparisons. No Whetstone ratings were given for the Aviion products, leading some to speculate that the Motorola 88000 chip family is not yet producing hoped-for floating point results.)

The workstations package a Motorola 88100 CPU and FPU, two 88200 cache and memory management units, and a hardware graphics coprocessor in a 2.5 inch tall base that sits beneath the monitor. Up to 28 MB of memory can be added via expansion cards small enough to fit in a shirt pocket. Optional mass storage devices include a 160 MB or 322 MB Winchester disk, 150 MB QIC cartridge tape drive, and 5-1/4 or 3-1/2 inch diskette drive. The SCSI peripherals fit in a compact desktop housing; up to three of the housings can be connected to a workstation.

The Aviion server also came in two versions, with either one or two processors. The single processor unit with 8 MB of memory, 322 MB Winchester disk, and

150 MB QIC cartridge tape was priced at \$52,000, and was rated at 20 MIPS. A similarly configured dual-processor model with 16 MB of memory costs \$90,000 and delivers 40 MIPS. Upgrading from the single-processor to the dual-processor requires nothing more than a board swap. Both versions are available in either deskside or rackmount packaging, and both include a 10-slot VME-compatible chassis, support for up to 208 MB of memory, and up to 2 GB (deskside) or 16 GB (rackmount) of disk storage.

The servers communicate through synchronous controllers (VSC/4) and the VME bus Ethernet controller (VLC). Up to 512 RS-232 connections can be made through VDA/128 terminal service adapter boards that connect up to 128 asynchronous devices via cluster controller boxes.

As usual, the new hardware stole the show, but the real news was in software. Departing from its traditional stance that DG software would be sold only to customers with a minimum configuration of DG equipment, de Castro announced that the company is ready to license its DG/UX 4.1 operating system to run on any vendor's machine. The company is currently talking "seriously" with three other vendors about licensing, and is very near to signing an agreement with one.

According to de Castro, DG/UX 4.1 is the first truly "scalable" Unix operating system; it is capable of running on any RISC machine that complies with the standards set down by 88Open, the 50-member consortium of companies working to promote the use of the Motorola 88000 processor family.

Herb Osher, division director of product marketing, said that DG/UX 4.1 will have definite advantages over Unix offerings from other vendors. Describing it as a "commercial-grade" Unix implementation, Osher said that DG/UX 4.1 is fully compliant with the following standards: SVID2 (System V Interface Definition Issue 2), SVVS (System V Verification Suite), Posix (IEEE specification P1003.1), 88Open Binary and Object Compatibility Standards, X Windows Version 11 release 3.0, and ONC/NFS 4.0. In addition, it complies with 108 out of 111 application-callable system calls in the Berkeley standard (BSD 4.2).



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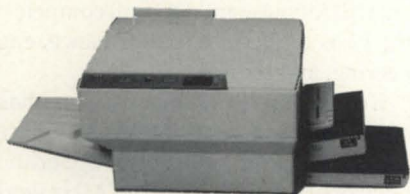
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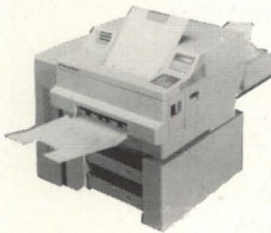
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DG/UX also claims to have smoothed many of the rough edges that have caused many analysts to say Unix was not ready for serious commercial applications. It offers fully-symmetric multiprocessor support, a re-engineered kernel for better portability and maintainability, a robust and flexible file structure, and an intelligent scheduler that provides better throughput and response time for multi-user applications. It also offers simplified system administration tools, a Berkeley C shell, and an enhanced AT&T Bourne shell with extensions for screen editing and history.

Licensing DG/UX to other vendors is a key element in DG's strategy for establishing a presence in the "industry-standards" market. By providing a superior implementation of Unix for the 88000 processor, DG will encourage applications developers to bring their software to the 88K platform. De Castro said that the marketing of DG's hardware and DG/UX will depend on being able to attract applications developers to the platform. If the applications are available, customers will follow—and DG will compete on the basis of its price/performance, engineering, and service.

Underlining the company's emphasis on attracting applications, DG announced a special discount for serious application developers. The diskless 16.7 MHz workstation with monochrome display and 4 MB of memory was discounted to \$4,900, and other systems got similar discounts.

88Open has already announced commitments from 29 applications developers to port their products to the 88K platform. By the end of 1989, there should be a complement of applications for communications, data base management, office automation, MS-DOS emulation, publishing, and system management. DG also hosted a special gathering of some 55 developers that were specifically invited to bring their products to the Aviiion platform. Among the vendors intending to make this port were Wordperfect, Cybertek, DMS Systems, and :Sysmgr.

According to Ward MacKenzie, vice president for Corporate Marketing, relatively few applications are expected before the end of the year, and the new Aviiion systems will not begin volume production until 1990. Δ

## Bits and bytes from the bulletin board

### Disk Fragmentation

From: Jon Cramer

Msg #5800 (which appeared in the March issue of *Focus*) posed a simple question: "Is there any way to tell how fragmented your disks are?" There are actually two kinds of fragmentation to be concerned about: *file fragmentation*, which is the physical distance on the disk between the elements of a file, and *disk fragmentation*, which refers to the gaps between allocated elements on the disk. One of the responses presented a crafty way to get a rough idea of the file fragmentation on your disk. It suggested that you run a program that accesses *every* allocated block on your disk in sequential directory/file order *once* and see what the average seek distance is. Although the response recommended any backup program, only the CLI DUMP will actually help you get a feel for the static level of file fragmentation on your disk. The other backup programs fire up a bunch of tasks to smother the disk with read requests so that you're getting a name block here, accessing a file there, getting an ACL block over there, grabbing a FIB here—all at the same time! So the distance that your heads travel is generally random and generally indicative of nothing.

This trick may give you a rough idea of static file fragmentation for every file on your disk, but it probably reveals little about the true nature of the files on your disk. The significance of a file's level of fragmentation (or a disk's for that matter) is directly related to how often your users access it, and *how* they access it. As an example, let's assume that you have a data base application system that is important enough to be paranoid about. So you set up an archive file to track every transaction against the data base, so that you can roll back a part or all of the data base in event of catastrophe. As more information is appended to the change journal, it will probably become fragmented, spread all over your disk filling in holes left behind by deleted files. However, your users never access the archive—the data base system only appends to it and very occasionally you read it (once) to repair

some damage done to the database. Yet, if the archive file is large enough and fragmented enough, the "rough idea fragmentation detector" will go nuts. So you dutifully DUMP/DFMTR/LOAD and . . . there's no difference in performance. This proves little except that DG really doesn't provide any tools to analyze disk and file fragmentation.

There are a few third party products that let you analyze your disks for fragmentation. The DMS Disk Optimizer and Management Utility (DiskOpt) shows how many files and directories there are on your disk and provides many measures for judging how many are fragmented, and how badly. Other features include surface analysis, change LDU Name and Disk ID, load PCOPY tapes (blipping over hard tape errors), disk performance monitor, formatted presentation of the Disk Information Block (DIB), Bad Block Table and Directory Data Blocks (DDBs), standalone capability (for system disk), block viewing, block tracing, file viewing, in-place conversion of all DIRs to CPDs, and of course, various ways to reorganize and de-fragmentize the files on your disk.

Anyone who wants to further discuss issues of disk performance or the DiskOpt utility can call Jon Cramer or Jim Schindling at DMS (801/484-3333), or leave a message on the RDS Bulletin Board.

### Maintenance

From: Mark Weber

A big headline in *Computerworld* read: "IBM moves to demystify service options." Highlights of the article included:

- Contract documents consolidated from over 25 to one.
- Estimated one-year fee based on number of systems to be maintained.
- Prepayment of maintenance fees for three to five years gains 18 to 30 percent discount.
- Less stringent mid-range service amendments available for high-end processors.

I've had this with DG (service) since I can remember. Sometimes you don't know how good you have it. Third-party service has to offer me more than lower price

(to convince me to switch). If I can find stable, reliable third-party service, I will consider it, but so far I have not seen one. I've seen one after another (third-party maintenance company) bite the dust. However, the fact that I am considering it keeps DG on their toes. A little competition never hurt anyone.

From: Tim Boyer

I'm just the opposite. I've been with Grumman since we got our machine (10 years). They could eliminate the 15 percent discount and I'd stay with them. As far as I'm concerned, anyone who switches service solely based on price is nuts!

From: Mark Weber

Tim, you are correct. In my case, none of the third parties that approached me had anything else to offer except lower price. They certainly could not guarantee the latest hardware revs on the boards they would replace and that was enough for me.

From: Richard Hankins

DG will sometimes require you to keep the drives on maintenance. However, we have been informed we could take our three drives off maintenance.

From: Walter Mosscrop

Our FE (field engineer) got it removed for us. DG's big concern was that the drive would damage something in the CPU and we wouldn't want to pay for it. Still, I wonder what those people with compatible drives must go through.

From: Ron Ralston

DG's field engineering policy has pretty much been that you have to have a minimal system configuration under maintenance. In order to get CPU maintenance, the system disk, a mag tape, and the operator's console must all be on the contract. There's often some confusion about what else needs to be maintained—the answer is pretty much nothing.

When a service call is placed and the DG FE shows up on site, the following

disclaimers apply: if the FE unplugs the non-maintained equipment and the minimal system passes diagnostics, it's a billable call; if the FE is able to determine that the non-maintained board died and zapped a maintained board on its way to PCB heaven, the call is billable as is the repair of the maintained board. Nobody finds fault with this concept.

The unhappiness occurs when the FE looks at the smoking Zebra DCH board and says "this sucker not only went and did a hari-kari, it did a kamikaze—looks like it toasted your MV/7800XP CPU board. That'll be \$200 for my time and \$8,000 for the CPU board."

This scenario never results in a completely happy ending—somebody always

feels "had" no matter what the outcome. If DG presses the charge issue, the user will typically complain that since DG built the controller, DG ought to bear some responsibility for its failure. If DG relents on the charges, it's because some helpful DG person went out on a limb to get the charges backed-out of the FE billing system. That's why DG strongly suggests that everything plugged into the CPU chassis be under contract so these disputes never arise.

From: Tom Moore

After speaking to an FE regarding the policy of removing drives from maintenance, he indicated that "because they might harm the CPU" is a poor reason. The reasons DG frowns upon such a thing is: if there is a system problem, they have to come out, and if it ends up disk related (i.e. controller, head crash, etc) then they have to bill for time etc., which causes the customer to get upset. Therefore, it is a kind of insurance for both parties.

**PID monitors**

From: Kevin Danzig

We have been trying to use various idle PID monitors/terminators but have not had any luck. We tried PIDbuster from the OIS Board and it cycled forever and left a log of who *should* have been terminated, but it didn't get rid of them. We took out any comment lines that would have prevented it from doing a term. We tried ERP from the NADGUG tape and it ran for its startup and blocks and never came back. Does anyone have any input on these two programs? We tried the Pascal program and had the same result but couldn't play around. We only have the compiled version and no Pascal compiler. Help!

From: Sharron King

We are successfully using the ERP PID termination program from NASA (NASA TM-86535). The Fortran source program was modified in subroutine LIMIT to check if idle time was greater than or equal to limits, rather than just greater than, to avoid skipped warning messages. Also, we added OPEN(12,FILE=@LIST', FORCE='YES') to ERP to avoid buffering messages to the log file. Sounds like your ERP hung in the MDELAY subroutine after executing the ?WDELAY call. Δ

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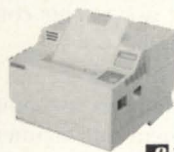
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# Radical enhancements to computing

New user interfaces rely on sound and graphics

by Michael E. Marotta  
Special to Focus

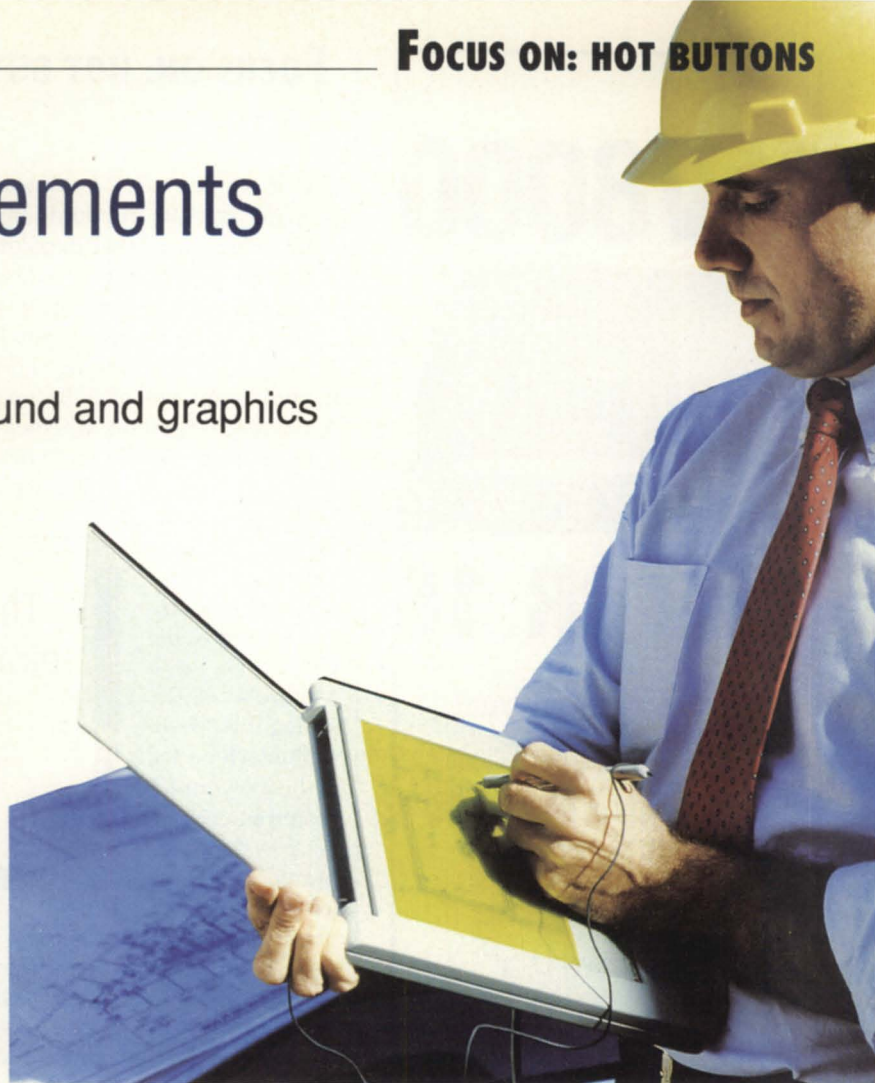
Don't throw away your keyboard. Ten years from now you will still need it to perform down-and-dirty system-level programming. However, routine daily tasks, from accounts payable to applications programming, will be done with any of several new kinds of user interfaces that are just breaking into the marketplace today.

Ten years ago, microcomputers were toys for hackers. Today, they are commonplace tools for business and industry. The 8-bit Radio Shack TRS-80s and Ataris lead directly to today's 32-bit machines based on the 80386 and 68030 chips. The cassette tape deck that took 15 minutes to load 32k has become the 60 MB streaming tape. Stand-alone desktop computers have become nodes on local area networks and intelligent terminals for mainframes.

Mainframes themselves have changed. A dozen users can be connected to a computer that does not require special air conditioning. Monsters the size of railroad locomotives have been replaced with powerful little demons no bigger than a camping refrigerator.

The next set of changes, coming to us through the 1990s, will focus on the user interface. The keyboard will still be used by some people. Many others will rely on a variety of pens and styluses, voice recognition, and speech synthesizing. It has always been the goal of computing to provide information. In the 1980s we learned to manipulate spreadsheets and databases. In the 1990s, we will search, select, organize, and share information in order to discover new patterns of profit.

Pointing to this company or that as a leader today is always dangerous. There was a time when General Electric and RCA made computers. Then came Data General. Yesterday's "leading edge" desktop computers from Exity and Imsai are



The next set of changes in how we use computers will be in the area of user interface. The Linus Write-Top pictured above allows users to write, draw, edit, and issue commands directly onto a flat LCD display. The Write-Top, produced by Linus Technologies, Inc., of Reston, Virginia, can even be taught to recognize sloppy handwriting.

today's museum pieces. Nonetheless, regardless of who is doing these things today, the fact remains that *someone* is. Consider the promises of productivity offered by these innovations:

### The CEO's "CEO"

Dr. An Wang earned his Ph.D. by inventing core memory. Running the company he founded, he discovered that 90 percent of computing focused on only 10 percent of his needs as an executive. Number crunching and report generation are but the tip of the iceberg for any top-level manager. Dr. Wang designed Freestyle to meet his own needs.

Freestyle runs on any 80286 PC/AT-style computer. With it, you can capture any screen, whether a report, spreadsheet, or chart. The captured screen becomes an electronic document. With the digitizing tablet and stylus, you can write on the document. Connected to your office telephone, the system allows you to make

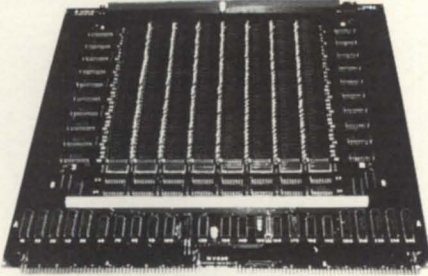
voice annotations as well. You can then send the document to any user on the network or with another device, FAX it out the door. When the recipient gets your message, the screen, your handwritten notes, and voice comments are transmitted also. "Freestyle" has the ability to connect to a digitizing scanner. You can make an electronic copy of anything that is printed. Based on point-and-shoot icons, you can "staple" documents together for transmission and "unstaple" what you receive.

Running on a network, the system keeps track of the history of every document. You send a memo to Jill, telling her to get with Bob on this matter. Later you can see what Jill did with the memo you sent her.

### The NeXT decade

Voice mail is also a feature of the NeXT computer. In fact, the sound output is in stereo! Created by Steven Jobs, cofoun-

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der of Apple, NeXT is targeted at the growing markets in education. There is subtle wisdom in that decision. Education promises to be one of the fastest growing fields over the coming 20 years. You cannot rely on the degree you earned in 1970. Constant re-training and improvement of employment skills are the order of the day. Education, whether public or private, institutional or ad hoc, at school or in your office, is a marketplace to be exploited by far-sighted business leaders.

About the size of a breadbox, the CPU runs on a Motorola 68030, giving this "desktop" machine the 32-bit power of a mainframe. NeXT is designed for graphics and "object-oriented" programming. "Object-oriented" programming refers to the concepts that come to us from Prolog and Lisp. COBOL and Fortran are "procedure-oriented" languages. You tell the computer to perform this or do that *until* something happens. With an object-oriented language, you direct the software to *find* and *list* those items that have some characteristics in common. Object-oriented programming is the basis of artificial intelligence.

### Picture this

Jobs' NeXT computer is also designed to make optimum use of graphics. There is no doubt that the graphical interface will continue to grow in importance. In the 1980s we got used to business graphics, those handy bar charts and line graphs that show production, sales, and profits. Computing in the 1990s will include realistic graphics that rival photography.

Pixar of San Rafael, CA, is just one of several research and development shops working on this technology. Industrial designers are an obvious set of users who will benefit from this. However, you can imagine the benefits to doctors who can create and manipulate images of their patients.

As electronics technology continues to expand, the picture improves. It is now possible to buy a visiphone for under

\$1,000 (from Sony, among others). The slow-scan television-telephone combination plugs into a common four-wire RJ-11 jack. You can imagine the possibilities when this is coupled with computer-based networks.

The wedding of technologies has already given us the optical disk for mass storage. Thousands of megabytes can be stored on a small platter accessed by a common desktop computer. These high-

There is a need for people to give directions to a computer while their hands do something else, for instance, operate an electron microscope

density devices and the new software that utilizes them (for instance the Excel spreadsheet) allow you to develop three-dimensional graphics from tabulated data.

Three-dimensional graphics can become tangible objects with a stereo lithography process developed by 3D Systems of Sylmar, CA. Based on plastics that react to laser light, the apparatus creates detailed realizations "virtually overnight." Within 20 years, this technology could replace the Erector set as the preferred Christmas present for the budding engineer. It will do wonders for the home craftsman, also.

### Now hear this...

The Freestyle and the NeXT are not the only systems that make good use of sound. Voice synthesizers and speech recognition systems have been used in several industries for many years. There is a need for people to give directions to a computer while their hands do something else, for instance, operate an electron microscope. In the last 10 years, as home computers reached millions, these technologies have also served the aged and handicapped.

Kurzweil Institute of Cambridge, Massachusetts (a little town down the road from Westboro) is a leader in sound sys-



tems technology. Its mainframes can produce realistic, human-like voices. They can also rapidly learn to understand the widest possible range of voices independent of accents or impediments.

Ten years from now, when the MV series carries enough zeros to require scientific notation, you will be able to tell your "smart desk" to "send those reports to Joanne in marketing and include a picture of the sample the shop made last night."

Understanding human speech requires more than making sense out of sounds. The system has to be able to parse English. This is already an integral feature of several software systems for desktop computers.

Best known, perhaps, is "Q&A" from Symantec. Available in retail computer stores, this database management system learns what you mean by what you say. You can type in a command using any of several formats. If the system doesn't understand, it will ask you to identify one or more words. "Show me all the patients discharged yesterday." "List all the people who signed out yesterday." "Display yesterday's discharges." It's all the same to "Q&A". Not bad for a package that sells for less than \$500.

**Let your system do the walking**

Apple Macintosh users enjoy the power of "Hypercard." This is an information management system that goes beyond the relational database. With it, you can enter data in any order and retrieve it by example. While ordered data is clearly a handy format, there are always times when you might want to make a special notation in a comment field. So, how many customers complained about backorders last year? Was it Jack Johnson or John Jackson who put his social security card in your automatic teller machine? Which Susan Smith from which Apex Manufacturing asked you to send her those samples? And while you're at it, for how many nephews do you have the correct shirt size?

Generically called hypertext, software systems like this are available for other kinds of desktop computers. There is even an IBM-PC Shareware version, called Black Magic. With hypertext systems, you have complete freedom to enter any kind of information in any format and let the

computer find it for you.

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bill from 1890. These were the punched cards that Herman Hollerith used. The 8-bit byte seems like a handy way to communicate with a binary machine. In fact, eight holes are about all you can get on a strip of paper tape read by an RCA teletype which (30 years ago) transmitted at 45 baud.

New user interfaces that rely on sound

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and graphics promise to bring us out of the stone age of computing. Adapting to these new modes will not be easy. According to a Wang sales representative, speaking about Freestyle, the first "sell" is weaning people away from dumping everything to hardcopy. Despite promises of an electronic office we generate more paper than ever before.

The best example of this is the user manual. User manuals can serve many needs. A book that describes your inventory control programs can be a good way to orient a new clerical worker without letting him or her loose on the system. On the other hand, a better approach might be to set up a test directory of sample data.

Modern applications software relies on context-sensitive "helps." It is relatively easy to create a program that shows the users information about what they are doing based on the location of the cursor. These systems are becoming increasingly popular, especially in the world of personal computing. Users of dBase, Lotus, etc., are already accustomed to this mode.

As you move away from staining dead trees, we can look forward to a time when annual reports exist on hardcopy, but more frequent output does not. The system manager may have fat manuals that explain all the tricks and traps. The users will no longer need to interrupt their work to get help. The best thing about high-resolution, three-dimensional graphics enhanced with voice annotations is that you can't do this on greenbar.

### Future shock

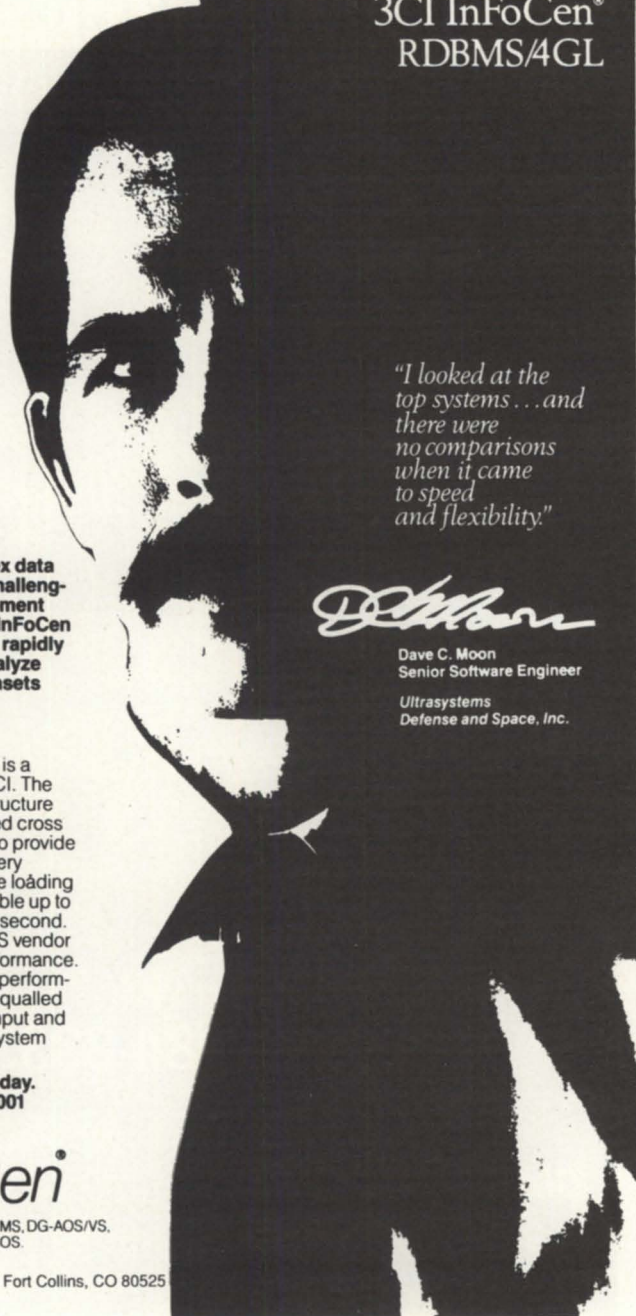
We like to put some distance between ourselves and the "horse and buggy" era. However, it is possible to become wealthy by selling saddles and bridles to equestrians. Horses haven't disappeared just because millions of people drive cars. Likewise, new user interfaces will not completely supplant the keyboard and CRT. Even so, horses are not the main mode of transportation—even if we still evaluate engines according to their horsepower. Computer technology on the horizon today will become commonplace tomorrow.

Today's news reports bring us stories of computer viruses: programs that make copies of themselves, much to the dismay of system managers. Yet the fact remains that a program that can make a copy of itself is a potential solution to the problem of backups and archiving.

Since 1950, we have seen whole nations brought from the pre-industrial to the post-industrial world. As we move into the last decade of the 20th century, there is no slowing of these trends. North America is becoming an information-driven society. Within that society, those entities (people, corporations, agencies) will prosper that best utilize computer technology. Δ

*Michael E. Marotta is a technical writer with a decade of experience on Data General and other equipment. He works in manufacturing and business environments.*

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Two years ago, *Focus* interviewed Don Lewine to find out what promising technologies were under development at Data General. Then a senior technical consultant, Lewine spoke frankly about the areas DG was strong in, and the directions the company found interesting. DG, he said, was best at taking a proven concept, and executing it magnificently.

Lewine now serves DG as the director of engineering, and represents the company on a number of industry organizations, including 88Open, Unix International, and the Open Systems Foundation. This month he took time out from his busy schedule to update NADGUG members on new directions for DG products.

**Focus:** About a year ago Data General announced that it was going to divide its development efforts about equally between Unix products and proprietary products. How long do you think it will take for DG to have as many Unix customers as it does AOS/VS customers?

**Lewine:** It's hard for me to even guess. I would say optimistically that it is probably going to be three or four years. That's partly because we expect that the AOS/VS customer base will be growing modestly also.

# Peaceful coexistence

## DG's choices lead to industry standards

**Focus:** At the end of February, DG is going to be announcing some additional details about the Unix products that have been under development for some time. That's as much as I know for sure, but can you give us any previews of what will be unveiled then? (*Editor's note: This interview took place before the February 27 announcement. For more information, see page 12.*)

**Lewine:** We're going to announce products. At the risk of saying something I probably shouldn't say, I'll say it anyway. Basically, as you come out of the box you tend to announce products that are aimed at the more sophisticated users—people who can sit down and use them without a whole catalog of off-the-shelf applications. But we will have a compiler and debugger. There is a faction here that believes you shouldn't really announce a general product under that sort of circumstance. Perhaps you should call it some sort of preview, but to use a term that seems to be pretty popular right now, what we're going to do passes the "duck test" for a product announcement. We are going to announce what the product does, how fast it runs, what we are going to price it at, and when you can get one.

**Focus:** Passes the duck test . . . I like that.

**Lewine:** That was George Bush's line for when he had other revenue enhancers that weren't taxes—if it looks like a duck, quacks like a duck, waddles like a duck, then it must be a duck.

**Focus:** So this isn't really a product an-

nouncement, but you will have everything that makes it look like one?

**Lewine:** Yes, there is a faction that is concerned with putting the product out there for people who aren't really qualified to use it. But we will have things like product prices and availability for qualified customers.

**Focus:** Am I right that we're talking about the first of the RISC machines based on the Motorola 88000 chip?

**Lewine:** Yes, I thought that was obvious.

**Focus:** Would you say it's a foregone conclusion that Unix will become the de facto standard operating system for multi-user systems within the next few years?

**Lewine:** I would actually say something a little bit more restrictive, but that's probably true. I believe that Unix is already the system of choice, or standard system, or whatever you want to call it, for people who are implementing fairly new applications. We will continue to sell tons of AOS/VS systems to people who need upgrades and want more CEO terminals and want all sorts of things to continue their business. But if they have a new idea they'd like to implement with a completely new system, or if they're going to automate a factory that previously was completely manual, they tend to want to put that on a standard Unix-type platform. I think that is already happening. Even IBM and the large proprietary customers are seeing that trend.

**Focus:** With so many flavors of Unix, there's a lot of maneuvering among vendors and organizations as they try to influence the standard that finally emerges. Since you participate on some of the committees that are trying to define those standards, you may be in a position to help sort out what is happening behind the scenes. In your opinion who are the major players, and which Unix do you think is going to prevail?

**Lewine:** Actually I think that's more of an issue for the media and the analysts than it is for the developers and the customers. I believe that there will be a set of capabilities that you will see in System V.4, or OSF1, or your favorite other Unix; by and large they are going to be common at the source level. If you implement your applications using the IEEE Posix standard, or even using the AT&T System V interface definition, you're going to run on anybody's Unix. OSF is going to make sure that they support all AT&T applications, and AT&T is going to make sure they support all OSF applications. It's going to get down to customer prefer-

ence, which way they think the internals are engineered better, and possibly things like fault tolerance and robustness. But I don't think these flavors of Unix are as big a problem for customers as the press seems to make out. The customers don't seem confused.

**Focus:** Could you back up just a little bit? You mentioned Posix and the AT&T System V interface definition. You're saying that the capabilities they offer are essentially equivalent?

**Lewine:** What I was saying is that the underlying operating system or System V.4 when it comes out, or OSF1 when it finally comes out, will contain all of the capabilities—and in fact an identical interface. By merely recompiling a standards-compliant program—one that meets Posix or System V interface definitions—you can run on those operating systems. That's really what people are concerned about. There may be a few capabilities of OSF1 or System V that are above and beyond any of the standards, but by and large the customer, if he writes

his source to follow Posix, is going to run on almost anybody's machine. If he follows the System V interface definition, which is much broader and offers more capabilities than Posix, he is going to run on a lot of people's machines. My sense in talking to the software developers and the programmers is they're aiming for that broad range of platforms and so they're using the standard interface.

**Focus:** Am I correct that the Posix standard is going to be required for the federal government or the military by 1990?

**Lewine:** Yes. There's a federal information processing standard that's essentially the same as the Posix standard, with a few mandatory things that are optional in Posix.

**Focus:** Will Data General meet that 1990 deadline?

**Lewine:** Oh, sure. Our first operating systems are going to be able to meet the whole Posix spec.

# What's hot, what's not

## Keeping up with current trends

by Greg Farman  
Focus staff

It may be true, as the saying goes, that the more things change, the more they stay the same. But when things change as fast as they have for DG users over the past year, it's hard even to remember what "the same" was. In our effort to keep readers abreast of what's what in the DG world, here's the official *Focus* guide to what's hot and what's not.

**Standards.** There are still too many of them to go around, but it's probably safe to go with anything that ends in an "x": Posix, Unix, DG/UX. Exception: MV/UX. Also, let the buyer beware if the standard begins with an "x": X.25, X.400, X.etc. In: CCITT. Out: Codasyl.

**DG Management.** Former IBMers are suffering attrition as Bob Miller moved to Mips and Frank Silkman plans to retire. Other outsiders on the ascendant, however: Ward MacKenzie and Ron Skates, and the new guy in sales. Herb Richman returns from semi-retirement to kick a little behind. Management shuffle for long-timers Dave Lyons, Michael Schneider, Raymond Fortune, and Frank Keaney.

**Data Base Management.** INFOS refuses to die, but DG/DBMS, like Generalissimo Franco, is still dead. Bet on SQL.

**Litigation.** RDOS suits were great while they lasted, but even DG's competitors can't count on a good thing lasting forever. Is ADEX next?

**Backup Options.** Putting 2 gigabytes on a \$10 VCR cartridge makes sense—a lot more sense than those other itty-bitty cartridges that cost so much, go so slow, and hold so little.

**Advertising.** In: the "big face" ads touting the Data General difference. Out: flashy four-color ads showing oil and water, fire and ice, so on and so forth.

**Sales and Marketing.** The VAR channel is back in a big way. DG's own sales force never really learned how to sell directly to end users.

**Humility.** Definitely in. Ed de Castro now says profitability is unlikely for 1989. Three years of losses and 25 percent reduction in work force have all but erased the old "bastards say welcome" attitude. Δ

**Focus:** Will the government certify Posix in the same way that it certifies Ada?

**Lewine:** Yes, the National Institute for Science and Technology, which is the replacement for the old National Bureau of Standards, has a Posix verification suite that you can run the same way you run an ADA validation suite. And it says yes,

DG can fly.

**Focus:** I was listening to a news report on National Public Radio that named Data General as a supporter of yet another variant of Unix . . .

**Lewine:** I heard the report. It was about Richard Stallman and the Free Software

Foundation. He is working on another variant of Unix, but he's also got a C compiler that we are interested in. And we're also sort of interested in the notion of free software. We think it is a good idea and his particular way of doing things is a good idea. We've donated some cash and equipment and some space as well.

**Focus:** It strikes me as a little unusual for a corporation that's in the business of selling computers and software to be interested in free software. What is it about the Free Software Foundation that is interesting to Data General?

**Lewine:** Well, their basic notion—or you could say “religion” when you're talking about Stallman—is that computers got to be what they are today because everybody was able to look at the programs, improve them, and then incorporate their improvements in the next revision. He is sort of appalled at the way his Cambridge neighbors like Lotus Development keep the details of how their software works completely secret. That leaves no opportunity to let it evolve, let users add their own favorite features, and just allow the software product to grow.

He does have a license—it's not really public domain software—but the license terms are that you can't charge for it, and if you make any improvements, you have to make those improvements available to the Free Software Foundation so that everybody else has the potential of benefiting. In certain areas like compiler technology that seems to be producing good results at a very impressive rate. We're interested in supporting that kind of activity. The very nature of the beast says that it is not likely to cause all of the software sellers of the world to go out of business. But in a few areas they have been able to do very interesting things.

**Focus:** I understand that the Unix standard will provide source code compatibility, but I gather that through 88Open, Data General is also pushing for binary compatibility standards. Would you tell us about that? And how soon are we likely to see some of the standards?

**Lewine:** I could send you a draft today. Let's say you've got a program that's written to the Posix standard. Now, in converting that to binary to run on your computer there are a myriad of options

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available—basically arbitrary choices. Which ones you select matters not at all to the computer or to the user. What you'd like to do is to have the same degree of software compatibility at the shrink-wrap level that you've got, say with the IBM PC. If that's your goal, it's important that Data General, NCR, Tektronics, Unisys, and everybody else who is going to be building 88000 boxes make sure that those arbitrary decisions are all the same. The issue with binary compatibility is making sure that when you compile a program on a Data General box you will produce binary code that is effectively identical to what you could compile on an NCR platform or a Unisys platform or other people's boxes.

The big reason why we're doing this is that we want to attract applications, and we want to do it in a way other than paying software developers some huge porting fee. Data General, NCR, Motorola, and some other big computer vendors can all walk in together to a software vendor and say, "Port this thing once, and it'll run on any of our boxes. We might loan you a box to do the porting, but we aren't going to pay you anything. If you don't do it now, you won't get in front of the line." We find that they are very responsive. Whereas when Data General walks in and says, "We're Data General and we want you to port," they'd say, "Well, it's \$200,000 and we won't get to it until 1990." The idea of the consortium in simple terms is to make a bunch of companies that are relatively small compared to IBM look relatively large. Certainly if you add up all the revenue of the members of 88Open, we're probably the second largest computer company.

**Focus:** So you're having some success in being able to attract applications using the 88Open standard?


**Lewine:** We're having a lot of success attracting them. Now what the developers need to start doing their work is the set of products that we're going to announce at the end of February. A little arithmetic will tell you that we can't announce a product at the end of this month and also say we have 300 applications ready to run on it, even if we had 300 application developers ready to charge off and start implementing. So, while the number isn't 300, we do have a bunch of

application developers ready to start their ports, and later this year we'll have a bunch of applications ready to go.

**Focus:** As users move toward a standard platform, DG is going to be competing in a much broader market. What is DG going to be able to offer in order to get a competitive advantage?

**Lewine:** One of the things DG did in some sense completely wrong back in the early 80s was to build an awful lot of factory capacity, factory automation, and the ability to produce things very inexpensively. With our own proprietary product line, we never got the volumes to exploit that advantage. But our variable cost of building things is low, and our ability to engi-

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near things and to use the latest leading edge silicon is very good. We think our products are intrinsically going to be faster and less expensive than the competition.

Our basic strategy based on that assumption is that the more open the system, the more things will be like commodity markets, and the more that decisions are based on price/performance

issues, the better we'll look. If you look at DG's price/performance record in the minicomputer business for the past 20 years, we've had consistent price/performance leadership.

**Focus:** A little while ago you mentioned fault-tolerance as possibly one variable that could give a particular vendor an

edge. Is DG going to offer a fault tolerant platform?

**Lewine:** We're certainly looking very seriously at it. It's an area in which we can differentiate ourselves. We know what it takes to do that—I wouldn't expect one in the next six to nine months, but I would expect you'll see lots of products coming out eventually. We also expect to be able to offer products at any point in the product line customers are interested in, be it a 500 MIP high ECL multiprocessor or a \$9,000 desktop high performance graphics subsystem. We will have a very broad, dynamic product line and that will also help attract applications and customers.

**Focus:** About two years ago I interviewed you in a similar context, trying to give readers a look ahead at where DG was going. In your view, what has changed in the last two years—both in the market and the technology—and how has DG's R&D program changed over the same time?

**Lewine:** A lot of things have changed. I think the rush to Unix and the rush to standards has, if anything, been accelerating. You see things like the Open Software Foundation, and IBM and Digital and everybody else really lending a lot of credibility to the Unix world.

Another thing is that it's now real clear that RISC technology—a combination of both the RISC processing and the compilers that go with it—is just intrinsically able to give you better price/performance. That is only going to expand over time. If you're not buying a RISC computer today, you are eventually going to have to look at what you are paying for complex instruction set computers. Now if software compatibility and compatibility at the binary level is important to you, which it certainly will be for a lot of our AOS/VS customers, we're going to continue to support you with very cost-effective computers. But over time that technology is going to become intrinsically more expensive.

**Focus:** What advice would you give to current DG users who are trying to plan for an orderly migration to the environments that will be available during the 1990s?

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**Lewine:** Well, I think migration is probably too strong a term. What I think people would like to do is to add entirely new applications that peacefully coexist and interoperate with their MVs. To that extent it's certainly in our interest to have a lot of software tools to make sure that DG's Unix is as comfortable sitting next to AOS/VS as it could possibly be. Lots of customers will continue to buy and be quite pleased with MVs beyond the year 2000. We want to make sure that their applications and their data bases all cleanly interoperate with our standard platforms.

**Focus:** It is part of your job to keep an eye on new technologies that look promising. Are there any ideas out there that you find especially interesting for possible future developments?

**Lewine:** I guess the thing that looks the best for the next five years is to keep pushing on the technology that's out there today. For example, it doesn't look like gallium arsenide is going to take over. It will probably be 1994 or 1995 before we see any major technological breakthroughs.

**Focus:** In Austin there is a research consortium called Sematech that's actually housed in the DG plant that was closed about two years ago. There are similar consortiums springing up all over the U.S. to help domestic companies get more development out of their research dollars. DG belongs to some, I gather, but is it a significant part of your strategy to combine R&D efforts with, in some cases, your competitors?

**Lewine:** That's certainly something we are doing. Sematech is actually much more concerned with manufacturing equipment for semi-conductor companies. They're concerned that if the Japanese are the only people who make the tools you need for making semiconductors, then we may be at a real disadvantage and even a military and strategic dilemma. Data General is not concerned at this point about that. We're sure we can buy the semiconductors we need, and we don't feel we have to devote our resources to manufacturing semiconductors. We are concentrating on higher lev-

els of value added. Certainly, organizations like Unix International, of which we are a member, and Software Foundation, of which we are a member, and 88Open, where we're very active, directly benefit the mission of Data General.

We are very optimistic about Data General's future. We've been enduring a certain amount of pain—a large amount

of pain—to invest for the long term and to make sure we are able to support our existing customers and our AOS/VS and MV product lines well into the next century. At the same time we've been preparing to roll out a whole new product line. It's now beginning to bear fruit, and we're very happy with our position, where the industry is going. Δ

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Reason #24

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# Special delivery

## A comparison of three AOS/VS E-Mail options

by Tom Bishop  
Special to Focus

Electronic mail systems offer flexible ways to communicate in many environments; however, within the AOS/VS system the options are often confusing. CEO, Wordperfect, and Pipeline all offer electronic mail packages that will run under AOS/VS, but which one is right for you? In trying to decide, keep in mind that there are basically four ways to address mail.

1) A stand-alone system has a large population of users attached to a single mainframe (in one building, for example).

2) A cluster involves more than one CPU; users are each attached to a CPU that needs to communicate with other CPUs in the cluster.

3) A remote situation is one where it is difficult to get to the other machine easily (another city, state, or country).

4) A mixed environment is a combination of clusters, and/or remote or stand-alone sites.

### But what is mail?

Mail is a short message, memo, or electronic letter. That's simple enough, but each mail package looks at mail differently. CEO and Wordperfect Library both differentiate between phone calls and other messages. Pipeline does not have a key for phone messages.



Sending an AOS/VS file is a type of mail. It could be a .PR file, a document, or any other file that can be sent across the network. In CEO, you typically "mail a document," but what you are actually doing is moving AOS/VS files in the background.

Combining a message with a file is another option. In CEO and Pipeline, you can send a memo that says, for instance, "this file contains the latest release of so and so; here are your latest instructions for implementing and installing it on your system," and the file is attached. You could then save the file—in effect filing the program where you want it in your directory structure. (Library does not currently of-

fer this feature. CAI is running a beta copy of Wordperfect Office, which will replace the Library product this year. Office does allow combining a message with a file.)

### Features

Electronic mail packages allow you to send messages to a user name or an alias, but all mail needs an address. The most common form of addressing is to use the name on the system. I could mail to OP, Tom, or to whatever acronyms have been created to represent the individual users. CEO users can create an alias list—resolving a list of names to the same user.

User defined group names are supported in most electronic mail packages. This means that if I want to send a message to the 43 people in accounting, I can create a mail list with all of those names.

You can mail to all stores, certain departments, or all secretaries—as long as those groups are defined in advance.

The "hot key" is an invaluable feature because it allows users to hit one key for a display of all valid names within a specific group. Library and CEO have this feature. Pipeline uses CEO name lists only when integrated.

Figure 1: Common mail features

CEO	Library	Pipeline	
Y	Y	Y	Send/receive a short message
Y	Y	No	Phone message separate from short message
Y	Y	Y	Send/receive an AOS/VS file
Y	No	Y	Send/receive short message with AOS/VS file
Y	Y	Y	Send to/from username or alias
Y	Y	Y	User defined group names supported
Y	Y	No	Hot key to display all valid usernames
Y	Y	Y	Notify active user of new mail received
Y	Y	Y	Function keys used for some actions
Y	Y	Y	INBOX holds received mail
Y	Y	Y	Delete selected INBOX items with confirmation
Y	Y	No	Print mail directly from INBOX
Y	Y	No	Reply directly from INBOX (user friendly)
No	Y	Y	OUTBOX holds undelivered mail for follow up
Y	Y	Y	Status information available for each message
Y	Y	Y	CLI access via an interrupt key
Y	Y	Y	Security levels available

# WordPerfect® Announces Integration With CEO®

*WordPerfect supports the CEO filing system, calculator, and interrupt key.*

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*WordPerfect files transfer from one machine to another without a conversion program.*

**W**ordPerfect Corporation announces a new enhancement for Data General users: WordPerfect® with CEO® integration.

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 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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When you send a mail message, do you want the attention of the recipient immediately? If so, you have to watch the product you pick. If you choose either Wordperfect Library or Pipeline, the notification appears on the screen at the time you send a message. Regardless of what the user happens to be working on at the time, you will trigger an IPC message directly to the screen.

If you are in CEO, the user has to be running CEO to be notified of the message. If not running CEO, you will have to modify the software to integrate with the agent user interface (AUI)—which means finding the message and creating your own notification to the user.

### Some constants

Function keys are used with all the products. Status information, CLI access, and security levels are also fairly consistent.

An important standard feature is an inbox that holds received mail. CEO, Wordperfect Library, and Pipeline all have an inbox that you can access in basically the same way.

A nice option is being able to print mail directly from the inbox. Pipeline requires you to save the mail and then print it, but with the other products you can select the message to print and the printer to run it on.

An outbox holds messages you send to others on the system. This is an interesting feature that will be new to you if you are only familiar with CEO's inbox. Messages remain in your outbox until you take some action to remove them.

At first it may seem bothersome for the system to save not only incoming messages, but outgoing messages as well. After all, you've sent the messages, why keep them around? Because they contain information, that's why. You can tell if an individual has read and deleted your message; read and kept your message; hasn't read the message; or deleted the message without reading it (yes, this happens.) You can also delete a message you have sent before anyone has a chance to read it and send a corrected version.

### CEO—all's not lost

CEO is perhaps the most well-known package in the DG market. It is quite complete, and includes its own electronic

mail package. (Other mail packages cannot be substituted for CEO mail.)

Rev 3 contains several new features. One feature allows you to select the time you wish the message to be sent. CEO also has a feature that enables the user to mail an entire folder of documents. This means that a logical collection of AOS/VS files (a folder) can be sent in one command, rather than having to send each separately. Or, you could combine a dump file, transmit it, and then break it back out if necessary.

CEO allows you to restore deleted messages to your inbox; this is the only product that offers this option. Even if you have deleted an incoming message, it's possible to pull the message from the wastebasket before the CEO janitor program permanently cleans it out.

*When you send a mail message, do you want the attention of the recipient immediately? If so, you have to watch the product you pick*

#### Library's shell

There are a couple of things unique to Wordperfect's Library. It uses a main menu approach called the shell. E-Mail comes with the package and can be run separately, so it is a menu item on the shell.

The shell menu is Library's integration feature. It allows a user working in a word processing document to temporarily exit that program and to arrive at the main menu. With a single key stroke, the user can then exit the main menu and return to the word processing document at the exact place he left it. This is very similar to the CEO interrupt feature.

#### Pipeline schedules delivery

Unlike the other products, Pipeline

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## San Diego group re-charging!

The San Diego Data General Users Group is getting together and re-charging itself! The steering committee has been busy organizing and planning for future meetings. They want every San Diego DG user to be a part of the excitement.

Local users groups offer many benefits including networking with people close to home. These peers can pass on tricks and tips to make working with your DG system a little easier. These groups are also great sources for receiving the most up to date information, either in person or through a group newsletter.

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supports an asynchronous autodial environment. This permits CEO users to transfer outside of the CEO system and talk to another mail system—which means you don't have to buy CEO at all the sites (remote environments). All users can talk back to CEO, whether they are a CEO user or not.

Scheduled delivery of mail to remote systems is the heart of Pipeline. Because of the autodial environment, it is possible to store messages and send them at a scheduled time.

#### Comparing environments

CEO has a rigid menu structure; you don't play with it like you do some other products. You are told how to automate, and if you follow the rules, you'll be happy (and DG will offer support).

CEO has a logical, as-soon-as-possible delivery based on a software agent called post office agent (POA). POA is always up and running—it takes the mail and puts it where it's needed. Because of all the other features (it's a massive piece of software), CEO has the most overhead. Of the three products, CEO is the most expensive to put up and run.

Library has the look and feel of MS-DOS, which makes sense since Wordperfect has concentrated its products in the PC world, its largest market. Wordperfect's Data General group gets revisions after the product is released for PCs, and then develops software under AOS/VS that includes the new features.

Library's similarity to MS-DOS makes it popular. People enjoy the near instant response, the simplified way of handling things, and the combination of short commands and keystrokes to enter the data. It is not quite so rigid as CEO.

Library has a physical, as-soon-as-possible delivery made by ML\_SVR, Wordperfect's mail server. If you are mailing to a group, your terminal is actually locked in a \*Please Wait\* mode until mail delivery is verified. When this operation is complete, the server gives you back control of your terminal. This is unlike CEO, where, once you hit the New Line key, your terminal is back in business. The CEO POA agent gets the request and handles it from there—which gives you back your terminal a little bit faster.

Library is less expensive than CEO. Of course, some will argue that it also has fewer features, but that's for you to determine. It does have a small overhead compared to a CEO type product.

#### Pipeline is least expensive

Pipeline is very similar to Library in how it looks and feels. It can be run as a

time is better across the network.

Library stores messages when the network is down. Messages are set up in the queue, and are forwarded when the network comes back up. You don't receive a rejection notice of any kind; however, you can always interrogate the status by going to your outbox, finding the message, and requesting the status.

In Pipeline, the connection does not require a network or Xodiac. You can either have autodial modems on each machine, or you can have a direct cable connect between two async ports. For the cost of the cable and two ports, you have made a connection between two CPUs and no software is required. Again, it is a logical send. It stores messages when the

*Library is less expensive than CEO. Of course, some will argue that it also has fewer features*

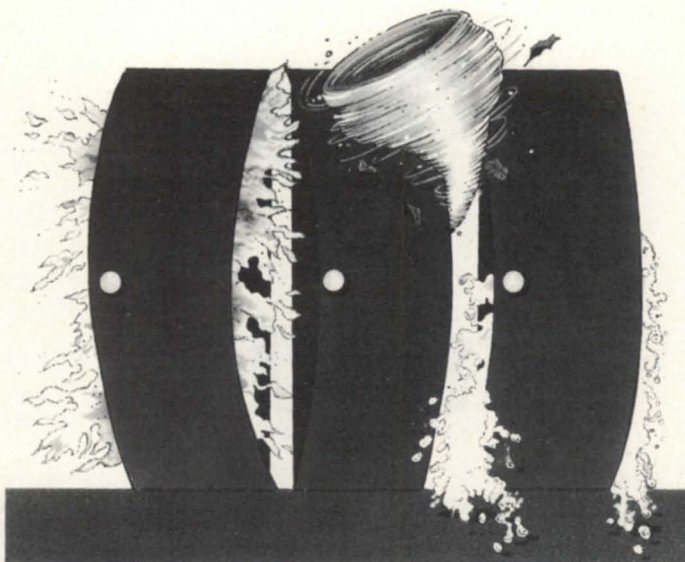
separate macro, has a logical, as-soon-as-possible delivery, and it uses a Pipeline agent. When you send a message, you have immediate control of your terminal. It is the least expensive of the three products and has minimal overhead, but it doesn't have some of the features of CEO and Library.

#### The cluster environment

In CEO you have only one choice. You must network with Xodiac (or XTS). POA will logically send to POA on the receiving machine. The mail is queued to cross the network, allowing you to do what you want at your terminal. POA will return a message to you at a later time if the network is down, or if mail delivery is incomplete for some reason. If you sent the message "URGENT", CEO will respond in a fairly short period of time, possibly before you have logged off the system to go out to lunch. If you sent it under normal mode, it might take a long time for a response, especially if your network is busy and the mail is in a long queue.

Library requires a Xodiac network. It also does a logical send, which is interesting. Across the network, Library is logical, but within the same CPU, it is physical, so to speak. At any rate, the response

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line is down, and will retry, according to what the system manager sets up for the retry schedule. If the retry limit is exhausted, then Pipeline will send a rejection notice to the sender, similar to CEO.

#### Remote

In addition to physical separation, a remote also applies to a mixed environ-

ment where there could be a cluster in the same room or across the telephone lines.

CEO requires you to have dedicated network lines. You must purchase Xodiac (or XTS) and run it on all CPUs. The restrictions for clusters are the same as for remotes and mixed environments.

The phone cost here are the major fea-

ture. Generally, you will have a large phone bill for connections if your network is geared for continuous operation (whether it is dedicated fiber optic or a WATS line).

Library presents the same problem because you need some type of telecommunications link. The cost depends on how much the system is used, but most situations require continuous operation.

Pipeline, on the other hand, uses dial-up lines. You put modems on them, and don't have to purchase the Xodiac product. You incur phone charges only for transmission time. For instance, you can set your system up to mail every 30 minutes. Every 30 minutes, the mailing system is interrogated to see what mail there is and where to send it. If there is a message, the system places a phone call, auto-dials the other site, establishes the handshake, delivers the mail, and hangs up in a matter of seconds. You are charged for one minute, unless you send something really big. Then you might be charged for a couple of minutes.

The major difference in these products can be explained in terms of the effect in the environment. Pipeline was designed for a CEO shop that did not want the expense of Xodiac software or dedicated line for a national network. It has been successful in that installation because the traffic from small offices back to the home office is not large enough to justify a dedicated network communication cost.

#### Postscript

I tried to include the CEO mail product that is supposed to go across to foreign (non-DG) processors, but all of the software is not released, or wasn't when this was put together. It might be interesting to you to use the TCP/IP if you have the money to spend for that type of connection.

If you plan on making a price comparison, you need to remember that anytime you have a second site, you have to add the cost for Xodiac to CEO or to Library (soon to be known as Office software). Pipeline is also known as P-Mail.  $\Delta$

*Tom Bishop is still happy as manager of the Systems Development Division of Concept Automation, Inc. in Sterling, VA; 703/450-6000. This article was produced with the assistance of Susan Miller.*

## Why Join NADGUG?

### Reason #21

# Buy & Sell

Whether it's through exhibits at the conference, advertisements in *Focus*, or just by word of mouth, NADGUG is the perfect place to find that product you just have to have. Business contacts made through the North American Data General Users Group can be invaluable, because NADGUG connects users with the people and products that can make life easier. You can also depend on fellow NADGUG

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## Understanding system administration for UUCP

By John Huddleston  
Special to Focus

Unix-to-Unix copy (UUCP), is a program that allows machines to communicate with one another. It was designed by M.E. Lesk of Bell Laboratories in 1976. The HoneyDanBer UUCP version written in 1983 by Peter Honeyman, David A. Norwitz, and Brian E. Redman is an improvement over the Lesk version. In this column I will explain how MV/UX uses the Lesk version of UUCP, and how DG/UX uses the HoneyDanBer version.

### What can UUCP do for you?

UUCP refers to all the programs, shell scripts, and files that make it possible to send and receive information between machines running UUCP. Many of the programs within UUCP execute as background processes. Others, such as mail and UUPICK, execute interactively. The following list includes some UUCP commands and their functions:

- mail sends electronic messages to other sites;
- UUCP copies files to other machines with a UUCP logon;
- UUX executes programs on other machines;
- UUSTAT displays the status of UUCP transfers;
- UUSEND or UUTO sends multiple files to a site;
- UUPICK receives files from other machines;
- UUCICO communicates with other machines using UUCP.

A non-Unix-based operating system may also use UUCICO as a communication transfer program. In all cases, transfer between machines is possible only if both machine names and permis-

sion levels have been specified in the UUCP file system.

### The UUCP file L.sys

In the Lesk version, the L.sys file in the /usr/lib/uucp directory contains the information and expected strings and responses, or chat scripts, for connection and logon to other machines. In the HoneyDanBer version, the systems file contains this information. Figure 1 shows an example of a UUCP logon to a Data

In all cases, transfer between machines is possible only if both machine names and permission levels have been specified in the UUCP file system

General machine that puts out a banner.

The first five parameters in the line are the machine name, connection type, port type, baud rate, and phone number. After these five parameters are the chat script sequences used by UUCP as it communicates with the modem and the host computer.

In Figure 1, the two quotes following the phone number tell UUCP not to expect a response from the modem and to send it the next command, "AT\r". The "\r" tells UUCP to send a carriage return and the "\c" tells UUCP not to send a linefeed. The next response to look for from the modem is an OK. It is shown in the chat script as "OK—OK" to tell the UUCP system that there may be some

delay. If it doesn't come within a certain period of time then UUCP will resend the "AT\r" command.

In developing the L.sys lines, you should understand that the modem being used is critical to the chat script. For instance, in Figure 1 the next two series of chat sequences program a Microcom modem. In both of these cases the expected response from the modem is an OK. In addition, we have found that with our modems and the MV/UX operating system running under AOS/VS, we need to tell the Microcoms to dial out with an ATDT command. UUCP then waits for three asterisks that appear within the logon banner.

If you are communicating with a machine that doesn't put out a prompt or banner, then the chat script sequence may be "CONNECT \d\r", where "CONNECT" is the response from your modem when it connects to the other modem and "\d\r" is the delayed carriage return response from your system to the host system. If the host system immediately puts out the username prompt then the "\d\r" response can be changed to "\d\r\r". Although this sequence cycles through the username-password once, it will work on host systems with multiple telephone ports where the logon prompts vary.

Finally, the last two sequences contain the username and password chat script sequences. Note how only the last five characters are used. This provides for a successful logon even if the prompt is changed from "Username:" to "username:". If the prompt had been "Login:," the expected string in the chat script can be "in:". My suggestion for system administrators creating and maintaining this

file is to put enough of the string into the chat scripts to make them unique but make them short enough to be universal. A blank line or a comment line (a line beginning with a "#") must follow each line entry in the L.sys file.

Figure 1: L.sys example line

```
# Data General Logon to a machine called sample
sample Any ACU 1200 9,234,5678 " AT\r OK—OK AT\A0\r OK AT\N1\r OK
ATDT9,234,5678\r **** \r name: uucp word: work
#
```

### The UUCP Files L.cmds and L?devices

In the Lesk version, the L.cmds file contains a list of programs that other machines may execute with the UUX command. In the HoneyDanBer version, the permission files contain these commands with the subtle difference that you can specify different commands for different machines. Another file that is important to the use of ports is the "L?devices" file. (In the HoneyDanBer system this is the device file.) The following is a sample line from the L?devices file:

```
ACU con7 con7 1200 g ATDT
```

Note the ACU definition and remember that it was one of the information parameters in the L.sys file. This line defines the port to be used, the baud rate, a "g" parameter, and the dialing prefix. In the HoneyDanBer system, there is a separate dialers file that contains additional chat script sequence to be used before dialing the number. For example, a Microcom sometimes needs to be interrupted and its attention brought back to the UUCP program. In order to do this, a sample line for a Microcom modem might be:

```
microcom =-, "" +++\c "" AT\r/c "" AT\r/c OK  
ATH\r/c OK ATDT\r/c CONNECT
```

The three plus signs tell the Microcom to return attention back to the local port. The two quotes tell UUCP not to wait for a response. Two AT commands are sent to elicit a response for the user's benefit. The ATH command tells the Microcom to hang up any connection and the ATDT command tells the UUCP system to dial out. The "\T" tells UUCP to insert the telephone number. Since the Lesk version does not contain a dialer's file, these chat script sequences would be put directly into the L.sys file if they were to be used.

In the next article I will describe how the user can use UUCP to transfer files or information to other machines.  $\Delta$

John Huddleston is vice president of the NADGUG SIG/UX. He can be reached at the USDA Soil Conservation Service, 511 NW Broadway, Portland, OR 97209; 503/221-2843.

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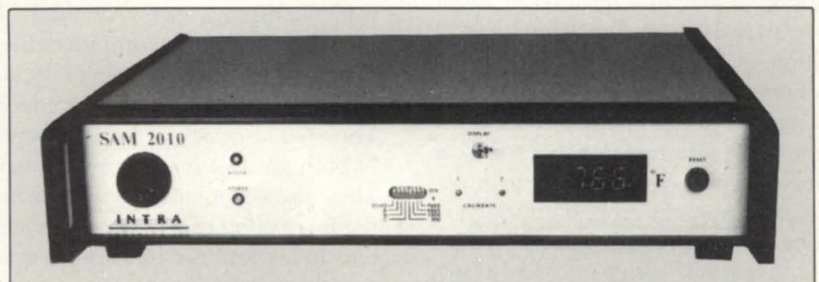
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# Writer's cramp

Courts hold that copying a program's design is equivalent to paraphrasing a novel

By John Land  
Special to Focus

It has been said in the legal profession that the law lags behind society by 10 years. At least with respect to computers and software, there is probably a large grain of truth to this belief.

The U.S. judicial system is by nature conservative. Courts do not actively look for problems to solve, they wait for problems to come to them. With a new industry, disputes take time to come to a head and find their way to a courtroom. The computer industry is no different.

## The mainframe years—negotiations

The computer industry in its infancy saw little in the way of litigation. Computers were expensive, and buyers put substantial effort into investigating a computer system and negotiating favorable warranties and representations. In addition, at least in the earliest years, a buyer knew in advance that a lot of effort was needed to program a mainframe computer. Programming was usually an engineering and systems analysis project that started from the ground up, and time deadlines were honored mostly by their breach. In general, both parties had a fairly clear idea of the risks involved in a transaction.

Disputes did arise, but most were resolved by negotiation. While the computer industry was building its foundation, the courts heard few cases.

## The mini years—breach of contract and fraud

In the late 1960s and well into the 1970s,



the computer industry was maturing, and its relationship with its customers began to change. Mainframe systems increased in power and decreased in price. Standard and "tailor-able" software became the norm. Huge growth occurred in the number of third party software vendors. Longtime computer users became more sophisticated and less willing to accept delivery delays and major bugs in hardware and software. They negotiated tougher agreements with vendors. The customer began to view a lawsuit as an appropriate weapon against a vendor who could not meet contractual obligations.

Possibly the most important factor behind the growth of litigation in the computer industry was the emergence of small mainframes and minicomputers. These machines reached new users who were usually less sophisticated than the pioneer mainframe users. Although enticed by the prospect of computerizing their business, smaller companies lacked the resources of their larger predecessors. They relied more on the representations of both hardware and software vendors. They also often failed to understand that the translation of a manual business system to a computer-based system is normally not a straight one-for-one mapping. And in many cases, advertising hype replaced deliverable systems and good system design. (A number of well regarded vendors had problems in this area; IBM, Data General, Burroughs, Honeywell, NCR, and Phillips are examples.)

As suits were filed, attention focused on the written agreements of the parties. Contracts were often written by the ven-

dor and, just as often, not reviewed by an attorney knowledgeable in the area of computers. Many contracts covered price and due dates and identified the deliverables, but failed to clearly define function or performance standards, or test criteria. Vendors sought to contractually limit their liability, and users sought to set those limits aside, alleging fraud and misrepresentation. (IBM's service bureau subsidiary lost a case in the early 1970s on the basis of an *innocent* misrepresentation, where the user's expectations were not met and the court found that IBM, being in the position of superior knowledge, should have more clearly defined what the data processing system could do for the user.)

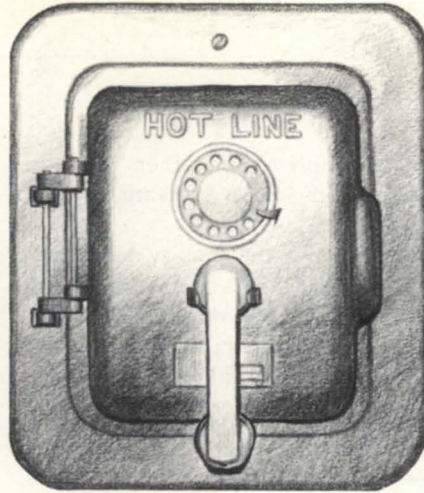
For all of the high tech aspects of these cases, the courts by and large were equipped to deal with the issues raised: What were the parties' obligations? Were the obligations basically met? Was any fraud involved?

With hardware, the analysis of these issues was no more complicated than in other areas involving sophisticated equipment. However, where the main culprit in a dispute was the software, a judge often needed more education simply to understand what the software was supposed to do and to decide if the software performed as the parties had bargained.

## Software as a secret asset

In the late 1960s and early 1970s, another aspect of computer law began to develop in earnest—misappropriation of trade secrets. Software was rapidly be-

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coming the most valuable aspect of a computer system. Then as now, software was expensive to write and easy to copy. Programmers were highly mobile, and for some the ethics of copying software were unclear. Consequently, cases began to appear concerning former employees who had allegedly used an ex-employer's software as an easy way to enter competi-

tion, or simply to cut corners in the development of similar software for a new employer.

Superficially, the inquiry made by a court in such a case is simply whether the defendant had misappropriated a trade secret of the plaintiff. But unlike most of the contract and fraud cases, this inquiry required the courts to delve into a com-

parison of software code. The defendant may have adapted the plaintiff's code to run on a different operating system, or translated the code into a different language.

The most difficult situation of all was the case where the original code was simply used as a flowchart from which completely new code was written, often with numerous changes as new or better features were added. Since the law of trade secrets protects the holder from unauthorized use or disclosure of *any* aspect of a program that is not generally known to others and that gives the holder a competitive advantage, even non-patentable but clever data processing techniques and algorithms are protectable. The factual inquiry required of a court often became quite complex.

One such case in the early 1970s was *Cybertek Computer Products, Inc. v. Whitfield*, in which a former employee and his new employer were found liable for software trade secret misappropriation. The employee took no tangible items; no tapes, no listings, no documentation from the former employer, but only his high level knowledge of the plaintiff's approaches and solutions for a software package directed to the insurance industry. In short order, the new employer began marketing a competitive package to the same market.

Rather than personally acquiring the knowledge necessary to make a meaningful comparison of the two programs in issue, the judge in the *Cybertek* case referred the matter to a master. The master (in this case, a professor of computer science) undertook the lengthy task of reviewing the code, understanding the program sequence, flow, and function, and reporting back to the court the similarities and differences in the programs. The court was able to significantly reduce the size of the learning curve otherwise necessary to resolve the case. Still, in this and similar cases, a substantial amount of time (which translates directly into attorneys' fees) was required to give the judge an adequate background to understand the terminology used by the witnesses. Concepts and terms like "flowchart", "algorithm", "I/O", and "subroutine," which were second nature to anyone in the computer industry, were not part of the everyday lexicon of a typical

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```

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3-Password life: 90                        26-Superprocess: N
4-Initial program: :GUARD_USR.PR           27-Use IPC: N
5-Initial IPC file:                         28-Use console: Y
6-Initial directory:                       29-Use batch: Y
7-Default user priority: 2                  8-Max. queue priority: 1

-----Extended Options-----
101-Initial user program: :CLI.PR
102-Primary start time: 07:30              103-End time: 12:00 104-Days: 1-5
105-Secondary start time: 13:00           106-End time: 17:00 107-Days: 1-5
108-Use time windows in batch: N          109-Mins. after window to logoff: 0
110-User group number: 0                  111-Force new password selection: N
112-Use GET_PASSWORD macro: N             113-User choose own password: Y
114-Maximum concurrent logins: 0          115-Number failed logins allowed: 0

116-Consoles not allowed:
117-Other host ID#'s:
42-Comments:

Edit which field?
"Help line:"...
```

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judge (who most likely was an English or history major in college 30 years before).

### The personal computer age

History repeats itself in many ways. The development of computer law conjures up images of how courts dealt with the automobile industry in its infancy. After enough cars were around for enough time, the extraordinary became ordinary.

The same thing appears to be happening with the computer industry. With the introduction of personal computers in 1975, the impact of computers on society took a leap forward, which became a quantum leap a few years later when Apple and IBM created their respective marketplaces. Before that time, and even though the "computer age" had been touted for over a decade, most people's contact with a computer consisted of reading utility bills or banking statements and making airline reservations. Usually only universities and businesses owned computers, and most of the businesses were simply batch processing accounting data. Word processors cost \$10,000-\$20,000 per station in 1975, often using tape drives for storage.

At present, there are probably 10 to 20 times more computers of all types than in 1975. A great percentage of students and a fair number of the populace in general have had some hands-on experience in using computers, and many have had exposure to programming. Judges (or at least their law clerks) use PCs to research the law in legal data bases and to write opinions. Court clerks keep a docket on a computer system. Attorneys walk into trial with a PC in tow, able to access a synopsis of all prior testimony and documents in seconds. Simply put, computers are less remote and less mysterious to the judicial system. The general level of understanding by the courts of computers and software has increased.

Computer related litigation still occurs in the same areas as before—contract, fraud, and trade secret misappropriation. Indeed, in some ways, the history of the mainframe and minicomputer industries is repeating itself on a "smaller" scale. It is predictable that as personal computers become more powerful and more firmly embedded in business systems, more and more litigation will occur, principally in

the areas of custom or customized software.

### The copyright aspect of computer law

The courts have gotten a handle on the contract and fraud issues of computer law: who promised what with respect to the hardware and software. In the area of trade secrets, the courts know how to deal

with the basic problem: was a secret stolen and misused? It is the dilemma of defining the boundaries of protection for software that represents the cutting edge of computer law.

Although protection of computer software can be accomplished by trade secrets, copyrights, and patents, the area of copyright law has been the most active in

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## LAW

determining the scope of protection allowed by the law.

Patents require a high degree of inventiveness and take years to obtain. A marketplace can be lost before meaningful protection can be obtained. Software loses its trade secret status unless carefully licensed in a manner that can be policed by the licensor. Copyrights offer meaningful, easily obtained protection for all software, and have been the weapon of choice in a number of important court decisions.

The first major question addressed by the courts was whether Congress really meant the copyright laws to protect all computer software in any form. In *Apple v. Franklin* (1983), Franklin copied Apple's ROM based operating system. After initially fending off an injunction at the trial court level, Franklin lost on appeal. The appellate court held that an operating system is simply a computer program, and copyright can exist in a computer program expressed in source or object code, whether embedded in a ROM or not.

The courts next dealt with the issue of paraphrase copying. Where Franklin had copied Apple's software virtually verbatim, in *Whelan v. Jaslow* (1986), Jaslow transformed Whelan's program from one language to another. The court held that copying the sequence and flow of a program was equivalent to paraphrasing a work of fiction. If more than one way existed for accomplishing the same function, then such paraphrase copying of a computer program violated the copyright laws.

More subtle issues have been considered, but related concepts remain to be heard. Is microcode copyrightable? One trial court has said yes (in the *NEC v. Intel* (1989) case). How about the code for programmable logic arrays? To a judge, the distinction between the 1s and 0s of microcode and the 1s and 0s embedded in a PAL may be too subtle to grasp. Display screens are separately protectable from the underlying code (*DCA, Inc. v. Softklone Distributing Corp.* (1987)), and the "total concept and feel" of screens can be protected by copyright (*Broderbund Software, Inc. v. Unison World* (1986)). But can Apple shut down Microsoft's Windows on the same theory?

Is it an infringement of the copyright in one program if a second program can read, write, or store data in a format first

specified in the original program? One court expressly said no (*Synercom Tech. v. University Computing Co.*), but a higher court in another circuit said yes (*Whelan v. Jaslow*). The issue remains open for further debate and, inevitably, litigation.

Arbitrary lists of words have long been held to be protectable by copyright. Does this mean that the first developer of a programming language can claim copyright in its reserved command words, and thereby prevent others from marketing a compiler or interpreter that uses the same commands? While a number of policy and legal arguments can be made against this outcome, the answer is unclear as yet. Accordingly, aggressive software companies have taken the position that their languages are protected by copyright law (notably Adobe with its Postscript language, and Ashton Tate with its dBase language).

Although a number of questions of software copyright law have been resolved, the open issues that remain ensure that this aspect of computer law will be an active area of litigation. In all of the cases discussed, the courts have dealt in depth with the heart of software development. It is a tribute to the increasing sophistication of litigating parties, their counsel, and judges, that meaningful and relatively clear guideposts have been set forth in the decisions to date.

### The future outlook

The computer industry is growing dramatically as increasing resources are devoted to hardware and software development. Whenever society invests significant time, energy, and money in an industry, disputes inevitably arise over rights and obligations. Equally inevitably, the judicial system will strive to catch up to society and resolve the issues raised by the computer industry as it attempts to build a framework of legal rules and commercial expectations upon which a true computer age can be based.  $\Delta$

*John Land, a member of the law firm of Spensley Horn Jubas & Lubitz, practices primarily in the areas of computer, patent, trademark, copyright, and trade secret law. His technical expertise is in electronics (particularly digital devices and circuitry) and in computer software.*





# Check it out

DG/Library retrieves text, locates 'misplaced' CEO files



When I was asked to evaluate DG/Library, quite frankly, I didn't even know what

it was for! When the people at DG explained that it was a tool for retrieving text from CEO documents, my next thought was that if all of us would just use keywords as we filed our documents there wouldn't be a need for such an animal.

I don't know about you, but when I create a document, the last thing I think about is attaching keywords to it. Now don't get me wrong—keywords are a great tool for CEO users, but like many tools, they don't always get used when they should. I was interested in trying a product that would overlook my negligence and still get results.

The DG/Library Text Retrieval System was developed to quickly search the CEO filing system for all documents that contain a word or words that you specify. It is fully integrated with CEO and CEOwrite; it operates within the CEO environment and is structured like a CEO menu. When invoked, it searches for the words you specify, whether they appear in the text or in the attached CEO keywords.

Just as in CEO, a user searches for a document or group of documents by defining guidelines in a free-form text string that may include one or more words, or parts of words. The user can also search for keywords. The search procedure is syntax-free, making it less cumbersome than commands.

DG/Library has an on-line HELP facility identical to that of CEO. By pressing SHIFT-F1, a HELP directory will give you information to complete your task. The system also comes with a user's guide that walks you through installation. It is accessed through a public application within CEO.

## Hello, DG/Library, this is CEO drawer

One of the first steps is to "introduce" a CEO drawer to the DG/Library system. Since DG/Library is a separate product, it has no way of knowing which drawer to access. The procedure is simple—it asks

you which drawer you want to search. If DG/Library doesn't recognize that drawer, it will ask if you want to introduce it. If you do, you simply reply "Y" for yes. It will then create a data base for the CEO drawer indicated and display a maintenance utility for that drawer. The maintenance utility screen is shown in Figure 1.

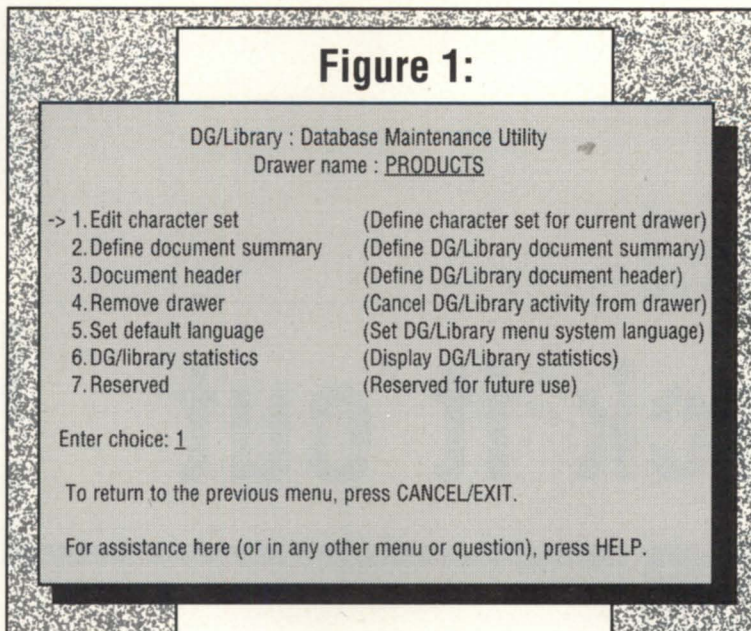
The user's guide gives a detailed explanation of each of the selections. One thing I found, however, is that the online HELP facility was not consistent with some of the usual CEO keystrokes. For example, when accessing HELP, the screen will tell you to press the down arrow key or any other key to go to the next screen. On the next screen, it says to press the PREVIOUS SCREEN (F3) key to return to a screen, or press any other key to exit. I found myself having to spend too much time reading the instructions for the screen, rather than reading the HELP information. I have talked to the developers about this and it is being "taken into consideration."

Without making this into a training manual, I'll simply say that the first thing you have to do is create a document summary as a standard for each document within this data base. It allows you to create a document summary similar to that in CEO, but you create the screen

image yourself. I guess you might call it a screen generator utility. From the maintenance utility menu, you can also look at the statistics for a particular data base. The word counter will give the total number of unique words in the data base. The number of duplicate word occurrences is not shown, because DG/Library's data base is only as large as the number of unique words in the data base. To decrease overhead, the status line will not be updated interactively unless you hit Control-F2.

**So, what's new?**

After introducing the drawer to the data base, you must update any documents that have been created or eliminated. This



**Figure 1:**

**Maintenance utility screen**

is done from the main menu of DG/Library. After completing this preparation, a screen will appear that gives you update statistics. (See Figure 2.)

Depending on the number of documents to be updated, this can take several minutes. The update drawer procedure can also be run outside of CEO in the CLI batch stream.

**I want all the juicy details**

To retrieve text from the defined data base, you use the Search option from the main menu of DG/Library.

Don't let the form scare you. Once the manual walks

you through each step, it all falls into place. The screen is divided into three sections: the Textual Field Description Line (TFDL), which is the first line in the

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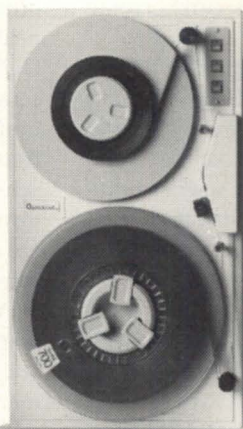
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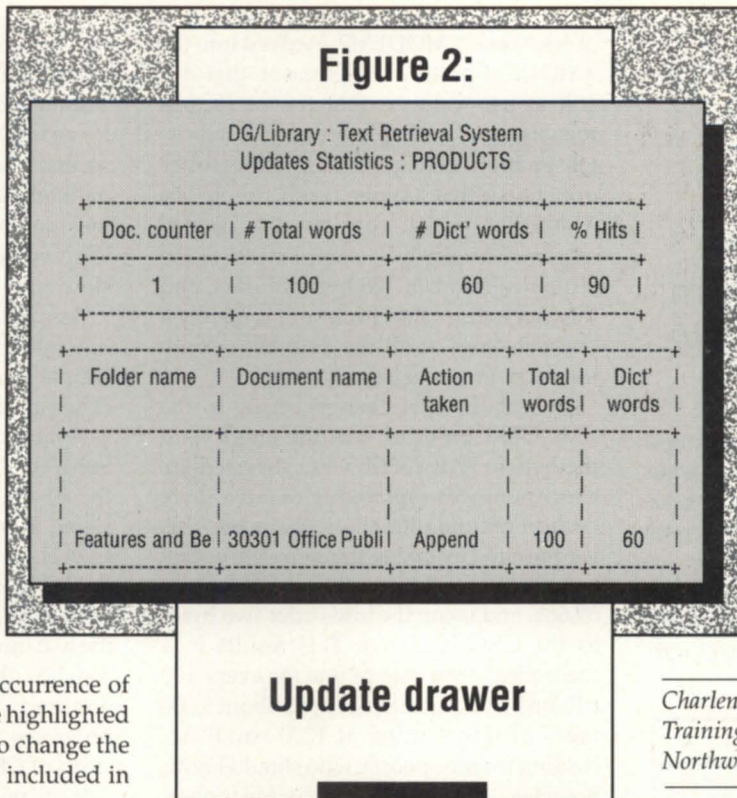
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screen; the Textual Request Window (TRW), which contains the boxes for entering text; and the Non-Textual Fields (NTF) window, which is the description. DG has designed this for use with function keys instead of commands. Those are also outlined in the user's guide.

When a search is complete, DG/Library informs you of the number of documents that were found to contain the specified word and the number of occurrences of the words in the documents. Once located, you can view the documents. Each occurrence of the searched-for word will be highlighted in the document. You can also change the search to look for words not included in



the data base.

**Don't forget to write**

Each time a new document is created in CEO, it will have to be updated in the DG/Library. It is not done automatically. However, if you delete a CEO drawer from the system, CEO will take care of removing the associated DG/Library data base for you.

Other than finding a couple of inconsistencies in the online HELP facility, I found the product to be extremely easy to use and easy to learn. I'm looking forward to the opportunity to use this product frequently—not that I ever forget where I've filed things!

Δ

*Charlene Kirian is president of Computer Training Associates, Inc., BB&T Building, Northwestern Plaza, Asheville, NC 28801.*

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# Transfer student

## A close look at how BLAST, TEX, Softerm, and Smarterm handle file transfers

A couple of years ago, I reviewed some of the popular terminal emulators on the market. In this column, I'd like to take another look from a slightly different angle—this time I'll be concentrating on the file transfer capabilities of these emulators. Vendor and revision information on the four packages I tested this month are shown in Figure 1.

**Figure 1: Vendor and revision**

<p>BLAST II rev 8.1                      Communications Research Group                      5615 Corporate Blvd., 3rd Floor                      Baton Rouge, LA 70808                      Price: PC \$250; DG \$495-\$1,295                      504/923-0888                      Contact BLAST Sales Department</p>
<p>Smarterm rev 4.0A                      Persoft, Inc.                      465 Science Drive                      Madison, WI 53711                      Price: \$175                      608/273-6000                      Contact Tracy Schinnick</p>
<p>Softerm rev 3.00                      Softronic, Inc.                      7899 Lexington Drive, Suite 210                      Colorado Springs, CO 80920                      Price: \$195                      1-800/225-8590                      Contact Mike Baye or David Weimer</p>
<p>TEX                      Shareware                      91-561-5504                      Price: \$45                      Contact David Down</p>

### Historically speaking

Since most of these transfer programs use some variation on XMODEM, it behooves me to include a (mercifully) short discussion of the XMODEM protocol. In 1977, Ward Christensen had a need to move data between microcomputers. His

quick "hack", MODEM7, evolved into the XMODEM protocol. The reason that it is still in use today is that it was simple, reliable, and, most importantly, Christensen immediately put it into the public domain so that anyone could use it. The XMODEM packet consists of a header, sequence number, 1's complement of the sequence number, 128 bytes of data, and the check sum. The check sum is merely a one-byte sum of all the data bytes, with the carry immediately discarded.

One of the first changes made to the XMODEM protocol was the check sum method. In XMODEM/CRC, the one-byte check sum was replaced with a two-byte cyclical redundancy check character. This is computed by taking the complete packet as a single 1,024 bit number, dividing by 69,665, and using the low-order two bytes as the CRC character. This results in a theoretical error rate of one for every 100 trillion bits transmitted. That's about 3,000 years of transmitting at 1200 baud! According to some people who should know, however, this theoretical accuracy is overstated. There seems to be a real need for a true "error-free" protocol.

The other popular protocol, Chuck Forsberg's YMODEM, is also based on XMODEM. YMODEM uses a 1,024-byte data packet in order to remove some of the transmission and CRC calculation overhead. However, the advantages of this must be weighed against the disadvantage of having to retransmit eight times as much data if a bad packet is encountered. Moral: go with YMODEM if you have a good line, and XMODEM otherwise. Okay, back to reality.

### What to look for

As far as I'm concerned, there are only three things to look for in a file transfer package: accuracy, speed, and ease of use. Ease of use, of course, is highly subjective. Some people prefer a command-line protocol, where every parameter can be specified when the program is invoked. Others prefer a menu-driven protocol. Most of the packages that I'm reviewing will do both, so you can take your choice.

The other option that most packages offer is a straight ASCII capture. My first bit of advice is to ignore these completely, at least in hard-wired situations. I tried some experiments on a 60 KB program. First, I simply TYPed it. That took 1 min-

ute, 22 seconds. Then, I sent it to the PC using an ASCII capture scheme. That took 1 minute, 37 seconds. I then sent the same file using XMODEM. It took 1 minute, 16 seconds. So, not only is the ASCII capture method *slower* than XMODEM, it also includes absolutely no error checking. Why bother with something that's both slow and inaccurate?

As a baseline to check both speed and line integrity, I used David Down's two simple XMODEM assembler programs. (They are available as shareware through several sources, including the NADGUG Software Library; I got my copies from the BJ, Inc.'s :SYSMGR bulletin board.) Using Pereline on the PC, I transmitted LOAD\_IL.PR to the PC, transmitted it back to the MV, and compared the files. At 9600 baud over a hardwired connection, the two transfers took 45 minutes, or about 734 bps (bytes per second). No errors occurred, even though the assembler programs use check sum correction instead of CRC.

If all you do is a plain transfer on a hardwired line once a month or so, here's your starting point. XMREC and XMSND will send and receive XMODEM files on the line you're using, at the speed it's set for, and that's about it.

### TEX

I took a look at a package that many NADGUG users are already familiar with—David Down's TEX. The current rev (2.21) will send and receive using XMODEM, XMODEM/CRC, YMODEM, and Kermit protocols, as well as MacBinary for the Macintosh and AOS/VS batch for transfers between MVs. TEX is exclusively command-line driven. To send my TEST file using YMODEM, for instance, I type TEX -sy TEST. To dial a PC BBS system and use logon script "BBS", the command line would be X TEX -mhd555-1212=BBS.

There's nothing fancy about TEX. It simply works, and works well. Using XMODEM/CRC, my 1 MB test file got to the PC in just under 22 minutes, or about 767 bytes/second. TEX's main advantage is that it was written for MV machines by someone who knows MV machines. Thus, David has provided for contingencies that many other packages don't contain, such as transferring Wordperfect files. And if TEX doesn't have exactly what you want,

David is usually found hanging around the NADGUG and OIS bulletin boards. Tell him what you need, and it will probably make the next revision.

Although TEX is available on the NADGUG library tape, I'd like to emphasize that it is not public domain software. You may use it for free for 30 days, and then if you decide to keep it, the price is \$45. At that price, it's not going to break anyone's budget.

### BLAST

Next, I tried the granddaddy of them all, BLAST, from Communications Research Group. My copy used the BLAST (rev 8.1) error-free mode. From the PC side, BLAST is extremely simple to use. When you initiate a file transfer, PC BLAST will bring up MV BLAST automatically, ready to send or receive your file. The first time I transferred a file, I had to run the test three times to make sure I wasn't doing something wrong. At 9600 baud, BLAST transferred LOAD\_II to and from the PC in 7 minutes, 6 seconds. That's 4700 bps! Slowing down to 1200 baud, the transfer took only 34 minutes, or 978 bps. That's about eight times as fast as we have a right to hope for.

Obviously, there's some kind of fast and sophisticated compression algorithm at work here. To see what kind of effect file compression had on the transfer rate, I used ARC 5.12 to compress LOAD\_II. There was the kicker—it seems that LOAD is an extremely compressible file, cramming down to 6 percent of its original size. So I wrote a small BASIC program to create a truly unARCable file—1 MB of completely random data. This brought BLAST back down to earth.

When I sent the random file, it took almost 26 minutes to transfer to the MV—a much more pedestrian 467 bytes/second. At 1200 baud, it took 3-3/4 hours to send the same file, a throughput of 58 bytes/second—about one-third of what BLAST claims on its data sheet. I tried again with something in between the two—a bunch of programs copied together—and got a result of 1470 bytes/second. At 1200 baud, this was 184 bytes/second, or almost exactly BLAST's claimed throughput.

One feature that's unique to BLAST is full-duplex transmission. In normal file transfers, this means that BLAST isn't sit-

ting there waiting for an acknowledgement from the remote. It also means that BLAST can send files both ways simultaneously. I tried it with LOAD\_II going both ways. It took about 18 percent longer to send the files simultaneously than to send a file one way, which is not an unreasonable overhead. If you're both sending to and receiving from a remote loca-

tion, this feature can save you plenty. The bottom line is that if the files you're sending are able to take advantage of compression, BLAST will give you significantly greater throughput. Otherwise, while not as fast as the basic XMODEM programs, BLAST still came in as fastest of the "error-free" protocols. However, there's a price to pay. While running

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BLAST, I decided to see what the CPU was doing. It turns out that BLAST was consuming about 52 percent of the CPU. While BLAST may be the fastest protocol, it doesn't appear to be very efficient.

Smarterm, in contrast, ran at about 15 percent; Softerm never got above 10 percent; and TEX runs very quietly at about 5 percent. If you need to have more than

one person transferring files, you're quickly going to run out of horsepower. Two copies of BLAST consumed 85 percent of the CPU. If, on the other hand, most of your activity takes place at night in batch jobs, BLAST is probably the protocol to use. It comes with an incredibly rich script language that will allow you to fully automate most of your file transfers.

**Softerm**

Softerm (rev 3.00), from Softronics, includes source code with its error-free protocol, so that you can incorporate the routines into your own programs if you're writing in Fortran. The protocol is initiated at the MV end by typing SOFTRANS. Unfortunately, there are no instructions included on how to stop the protocol at the MV end, so I end up using ^C^B to get out of it. This will definitely make it hard to automate any procedures. The documentation states that full SOFTRANS information is included on the Softerm bulletin board in the file SOFTRANS.INF. How big could this file be, and why not include it with the release?

Softerm transferred the files at 747 bps using XMODEM, and 1505 bps using its proprietary SOFTRANS protocol, which leads me to believe that some type of data compression is occurring here too, though not as well as BLAST's. Again, I tried it with my test file. SOFTRANS transferred this at 740 bps in XMODEM, and a little less than 335 bps in error-free mode. However, as mentioned in the BLAST discussion, a slower speed may give you better throughput depending on how many copies are running and what else you're doing with the machine.

**Smarterm**

Smarterm, from Persoft, also includes a proprietary Fortran error-free protocol. Smarterm rev 4.0A's file transfer utilities for the MV were unique. I've never heard of anyone shipping source code only; but that's what they include. This is so that you can incorporate these routines into your own programs. Unfortunately, unless you're running Fortran on your machine, they won't do you any good. I realize that DG's runtime license requirements make it a problem to give out object code, but without object code these routines aren't going to be much good to most of us.

For this test, however, I borrowed an F77 compiler from the DG Cleveland office, got the programs compiled, and set to work. It really wasn't worth the trouble. Smarterm's error-free transfer routines are extremely slow. My top rate was 220 bps, less than one third of XMODEM's speed, and less than half of BLAST's slowest speed.

I can see that I'm running out of room,

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and I need to get a few ICOBOL items in here, so the rest of the packages will have to wait until next month. My impressions thus far: TEX and BLAST were designed to be MV-to-PC transfer programs. Sof-term and Smarterm were designed as afterthoughts to their terminal emulation packages.

**The dreaded response**

I need to say a few mea culpas now. First, what's the worst possible reply to an STR? It has to be, "We were unable to reproduce the problem," right? Well, that's what I got on my ICINQUIRE bug. So I tried it again. It works perfectly. I was unable to reproduce the bug. I have no idea what I did the first time, but ICINQUIRE works just fine.

Next, a few corrections from the folks at RTP. I wrote that user connects are going

to 2,048, PIDS to 32,767, and the index size to 4 GB "the same as the .XD." User connects and PIDS are both going to 4,096, and the .XD is staying at 2 GB. I was told that either I wrote it down wrong, or marketing got it wrong on their slides. Since DG marketing has taken the blame for everything else in this decade, I'll take the rap for this one.

Finally, something from my friends at Threshold. In my last column, I asked for some type of timeout mechanism.

They've given me a beta test version of Screen Demon with two types of timeouts: global and local. The global timeout will close the files and terminate the interpreter after a set number of minutes. The local timeout allows you to set the interval in your program, and will skip to the statement following the ACCEPT after the interval has expired, returning an ESCAPE-CODE of 99. Everything I asked for!

In addition, they've come up with a three-line patch that stops ICOBOL from discarding data after the underscore, and have given me permission to publish it. (figure 2) It will work with any 1.40 interpreter (the problem goes away as of 1.50). Δ

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

**Figure 2: Patch to preserve ACCEPTed underscores**

```

;This patch prevents ICX from truncating ACCEPTed data at the first underscore.
;
;With this patch, only trailing underscores are replaced by spaces.
;
%PROGRAM
RDFD+1160 [XWLDA 0,11,3] [WBR RDFD+1166]
^+1 [] [NOP]
RDFD+1170 [WBR RDFD+1132] [NOP]
;
;End of patch.
    
```

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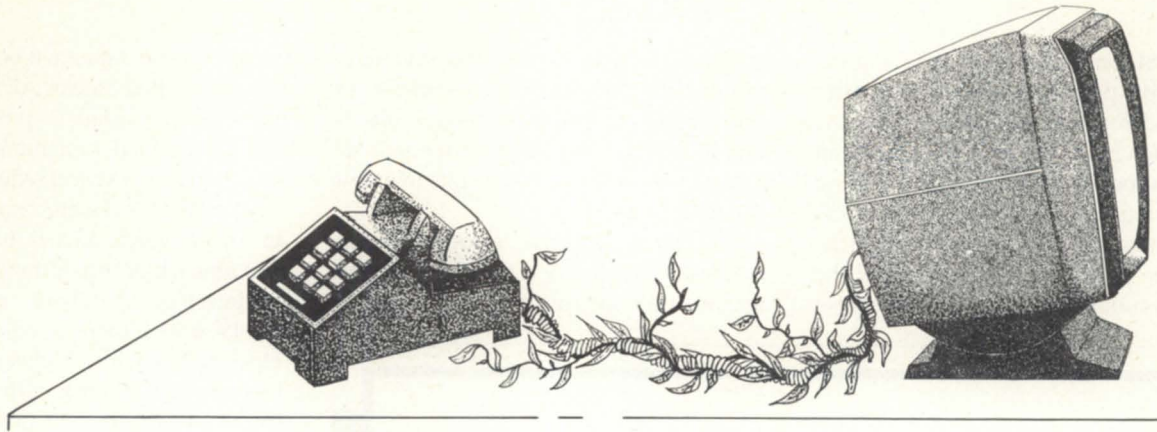
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# Weeding out noise

## Snap-crackle-pop makes trouble for data transmission

By Rainer McCown  
Special to Focus

Noise is extraneous communication, much as a weed is an extraneous plant. It can take the form of background conversation, a buzzing or hissing, or a distortion of the intended communication. Noise can create problems in the reliable transference of data. Other factors, such as software bugs and hardware failures, can also introduce errors in data transference.

Noise in communications has many origins. We often think of the telephone as the obvious villain. Line noise is familiar to all of us because it can often be present in our speech communications. Because it is so pervasive, there are a plethora of solutions: conditioned lines, error correcting modems, as well as dozens of software protocols designed for noise reduction via the telephone. However, it's hard to suppress all the sources of interference.

For instance, Ethernet communications have a potential for data collision when two independent signals are placed on the cable at the same time. Each sender completely destroys the signal of the other.

### Noise sources

A direct connection between a terminal, or PC, to a Data General minicomputer can be very reliable. I cannot recall any instance of an erroneous character being generated between our DG and PC. I know that errors can happen, however, because I have heard of this type of error. The older Data General RS-232 ports used a low voltage drive signal. When an installation required a long cable between the DG and PC, the communication was unreliable, unidirectional, and often non-existent.

Networks are driven by special electronics and will, at first glance, seem immune to noise problems. However, networks have severe noise problems. The collision problem mentioned above on Ethernet networks is replaced on token ring networks by another problem: increased hardware sensitivity. A token ring is like an old-fashioned string of Christmas tree lights; when one node fails the whole string fails. Special circuitry switches out a failing node, but if a node is intermittent, the fault is not easily detected and the data is garbled. This is a particularly bad problem in a ring configuration since the data is retransmitted by each node in turn until it is received by the node addressed by the information. (The worst error is if the address is garbled; the data circulates around and around the ring until it times out.)

Let's say that PC#1 sends data to PC#7 on a token ring network. The data goes to PC#2; it says "This is not for me" and sends it on. Likewise, PC#3, PC#4, PC#5, and PC#6 do the same. PC#7 says "It's for me" and swallows the data. Now, suppose that PC#3 has a noisy connection and garbles the data; the data will travel on to PC#7 but will not be correct.

Telephone lines present the most varied selection of noise sources. Anything that can be imagined can be done to the data. Changed bits, added bits, dropped bits, and delayed bits describe the major types of digital errors. Since the phone line is an analog medium, the actual signal is distorted in many other ways: weak signal, interfering signals, frequency shifts, and phase distortions. When the analog signals are converted back to digital signals for the computers, all of the line noise is converted to digital noise. For this article our interest is centered on digital signals.

### Other error sources

Let's talk about yet another error source—software. As you know, nobody writes software as well as you do. Therefore, other people will have bugs in *their* software. To be kind, software may be bug-free and still cause communication errors. Examples include situations where AOS/VS is busy helping someone else and misses your data; the flow control function decides to send an XOFF in the middle of your data, or the heavily loaded system does not respond quickly enough and the other end times out.

### Error detection and correction

There are several aspects to error detection. Sometimes detection at a modest error rate is not really important. Fax transmissions have a high error rate but a few extra dots on the page don't obscure the message. The fax modem chips are designed for speed and low cost with error rate being a secondary consideration. Because of the high error rate, data modem manufacturers do not use these chips for their high speed modems.

Originally, data communications used

a parity bit on each byte of data. For example, odd parity meant that the parity bit would force an odd number of one bits in each byte of data being sent; if an even number was received, something was obviously wrong. As communications technology became more reliable the use of the parity bit dropped out of the data communications mainstream—espe-

cially since doing so had the advantage of doubling the size of the character set. The ASCII character set uses 7 bits to define 128 characters; the extended ASCII set of the IBM PC uses 8 bits to define 256 characters.

The most popular error detection method in use today is the check character. In order to use the check character

technique the data must be grouped into bunches called blocks. All of the data in the block is added to produce a check sum or applied to a more complicated equation call a cyclical redundancy check (CRC). The blocks are required in order to know which data is being summed and which blocks to retransmit if an error is detected. The check sum technique works fine if there is one bit error per block or less; with a higher error rate, two bits per block, there is a finite chance that the two error bits will cancel each other out.

This straightforward technique of detecting and retransmitting bad block works well if the error rate is low. For higher error rates, error correction codes can be used to avoid retransmission of the whole block. If an error is detected the receiver simply applies the correction algorithm. Errors on disk drives are often caused by surface defects. Error correcting codes are standard on disk drives because just rereading a bad sector (block) will often keep the error.

In communications, however, it is unlikely that the same error will occur on two succeeding blocks, which makes retransmission generally successful. Error correcting codes require substantial processor cycles to calculate the codes and require several extra data bytes to be sent with each block. This reduces the overall throughput. Therefore, in modem terminology, error correction generally means detection and retransmission.

### Speed considerations

Speed of transfer is a primary consideration when selecting a modem for a PC-to-DG mini connection. Slow file transfers require expensive people to sit and wait and, in a long distance situation, also increase line charges. The cost of the modem increases with modem speed, but the modem's noise immunity decreases as a function of speed. Ironically, in a noisy environment, this could actually reduce the data transfer rate below that of a slower speed modem. Some modems are designed to detect this situation and drop to the lower rate automatically. This technique is used by Fax modems but not with computers because the modems changing their communication rates would confuse many computers.

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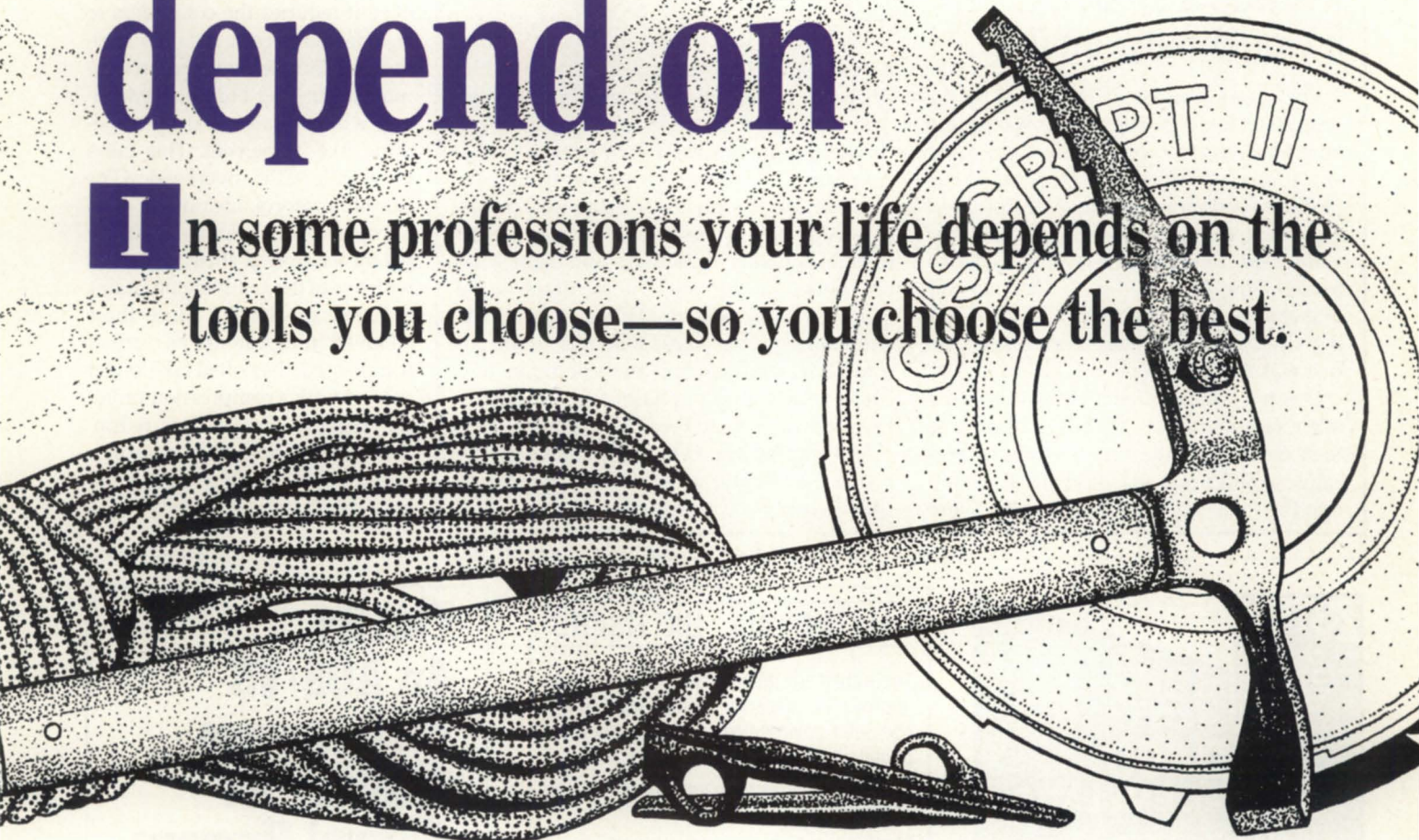
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If it was a snake,  
it would have bit you

The speed of modems is defined by the time that it takes to send one bit of information. Many years ago, modems were rated at 100 baud, 150 baud, or 300 baud. These modems used a transmission protocol called frequency shift keying (FSK). Four tones were used, two for transmitting and two for receiving. (The modem at the other end interchanged the transmitting and receiving tones so that it could receive what the first was transmitting.)

One tone represented a "1" bit while the other represented a "0" bit. A baud was then defined as the time each tone was active to determine the bit value. The baud rate then was equal to the bit rate. These

tones were at frequencies near 1000 Hertz and 2000 Hertz. At something like 600 baud there was just barely enough time to identify the tonal frequencies. Thus to get to baud rates above 600, something else had to be done.

The answer was to transmit more than one bit per baud. Thus by transmitting two bits per baud, a 1200 bit per second (bps) modem was developed. To go to even higher speed modems more bits need to be sent at a time. Don't forget that to send 8 bits per baud there must be 2 to the 8th or 256 separately distinguishable states. These states are the product of eight separate amplitudes and eight separate phases of the tone. The accuracy of the signals is well beyond the accuracy of the telephone system. These modems must continuously monitor the line condition and continuously apply phase and amplitude correction signals to the incoming data.

Now that you know the difference between bits/sec and baud rate I expect everyone to use the correct terms henceforth.  $\Delta$

## Data compression

Data compression is a way to get something for nothing—or is it? By applying data compression techniques, the effective transmission rate can be increased. However, it requires the computers to encode and decode the data at either end. Simple compression techniques, such as Huffman encoding, will compress text by something like 25 percent. This takes very little CPU overhead. (The Kermit protocol includes a data compression scheme.) Many people compress their data files with one of the archiving programs available on the PC. Since these archived files cannot be further compressed, they often take longer to send with a compression protocol. Because there is less redundancy in the data, data compression does not work as well on binary data.



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The original modem protocol specifications were made by AT&T. After the breakup of AT&T much of their power was lost and the standard-setting leadership went to Europe and the CCITT (Consultative Committee for International Telegraph and Telephone). Unless you have a special need or know that you only need to communicate with certain locations it is very important that you buy a modem that follows international standards: Bell 212A for 1200 bps, CCITT V.22bis for 2400 bps, and CCITT V.32 for 9600 bps. With the new integrated modem chips, the 9600 bps modems built to the V.32 specification are just becoming available at reasonable prices. The Courier HST 9600 bps modem is not CCITT-standard, but it is a popular choice if you need a cost effective high speed modem today.

**Practical solutions**

Communication practices, like most other things, seek practical solutions. Noise can be a nuisance to people trying to communicate via text, Fax, or voice. Computers are not as forgiving when binary data gets corrupted. Thus, extra care must be taken when computer data is communicated. This extra care generally takes the form of a data packet that has an error detection code appended to it. Networks and modem communications use this technique. These tried and true techniques will provide good service and, in all but the most severe cases, will get the job done.

Besides getting the job done, the data administrator should look toward minimizing the expenditure of critical resources. Sometimes it means a faster modem with built-in data compression and error correction, and sometimes it means a direct connection between a personal computer and a Data General mini-computer. In any case, understanding some of the factors involved will help you make a better decision in designing your future data communications solutions. Δ

*Rainer McCown is president of Rhintek, Inc., a Data General system software ISV since 1977. He has been heavily involved in inter-connecting PCs and DG minis. He can be reached at P.O. Box 220, Columbia, MD 21045; 301/730-2575.*

# St. Louis RIG

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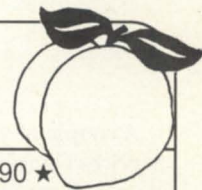
The St. Louis Area Data General Users Group is holding its next meeting April 24. For more information about this upcoming meeting or about membership in the St. Louis Area Data General Users Group, contact Bob McCarthy, Southwestern Bell Telephone Company, 1 Bell Center 14Q04, St. Louis, MO 63101-3099, **314/235-2077**.

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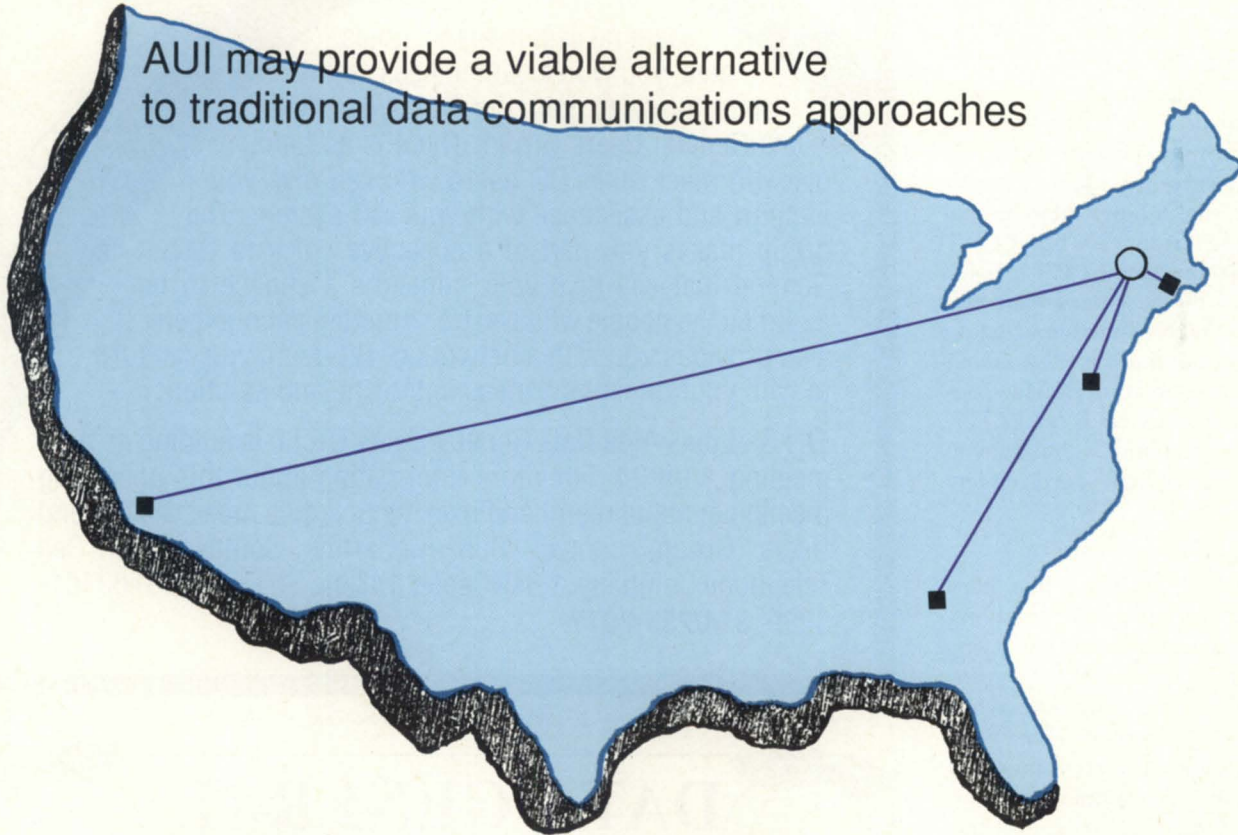
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# Secret agent

AUI may provide a viable alternative to traditional data communications approaches



A couple of years ago Data General's Software Products and Services Division (SPSD) wrote an application that incorporated classic components of a distributed system. The application consists of four remote sites and one central site. Data originating at the remote sites is transferred to the central computer on a monthly basis.

I'm sure you've seen many articles concerning data communications for commercial applications. So, what makes this one different? I'm going to tell you how, with virtually no data communications expertise, you can create an application that uses data communications.

The functions I'll describe use Data General's Agent User Interface (AUI). AUI acts as the interface between your application and the data communications world.

## AUI allows data communications functions

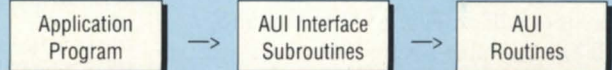
AUI consists of routines that enable user programs to interface with the CEO server processes. Frequently-used routines perform functions such as:

- display CEO status line on CRT line 1
- access CEO calculator
- invoke CEO INTERRUPT function key
- send CEO messages.

(For a description of how to automatically supply basic CEO integration functions, see "Get SMART" in the May 1988 issue of *Focus*.)

However, for data communications, we need to go beyond

**Figure 1: Access to routines**



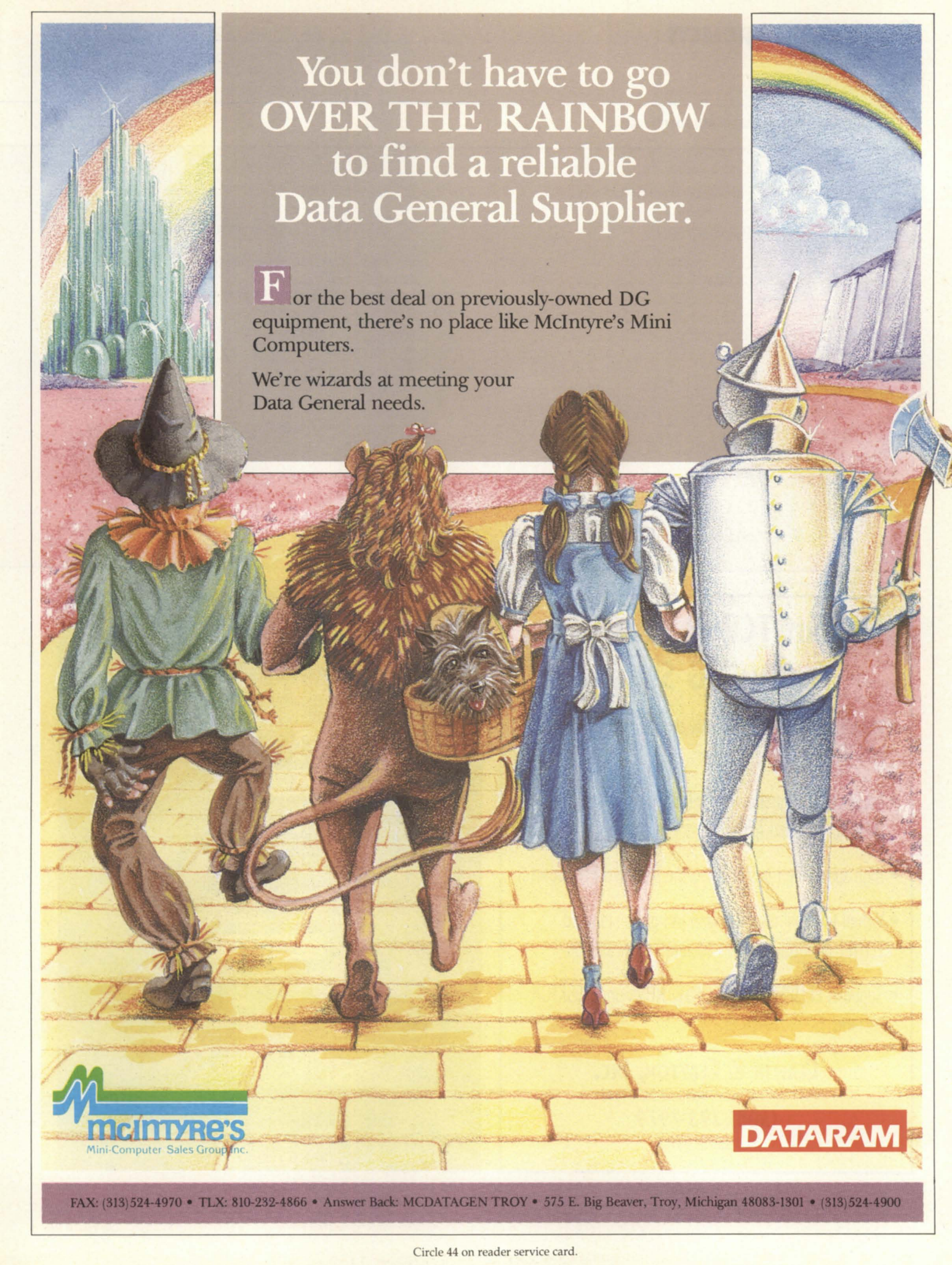
**Figure 2: COBOL AUI subroutine call**

```

WORKING-STORAGE SECTION.
01  CAO-MSG-TO                PIC X(32).
01  CAO-MSG-SUBJ              PIC X(70).
01  CAO-MSG-TEXT-ALL          PIC X(869).
01  CAO-MSG-TEXT              REDEFINES CAO-MSG-TEXT-ALL
                              OCCURS 11 TIMES

                                PIC X(79).
01  CAO-MSG-FLAGS             PIC 9(04).
01  CAO-PATHNAME              PIC X(256).
01  CAO-ERROR                 PIC 9(04).
...

PROCEDURE DIVISION.
...
CALL "??SEND_FILE_CEO" USING      CAO-MSG-TO,
                                  CAO-MSG-SUBJ,
                                  CAO-MSG-TEXT-ALL,
                                  CAO-MSG-FLAGS,
                                  CAO-PATHNAME,
                                  CAO-ERROR.
  
```



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Figure 3: Subroutine to enable AUI data transfer

```

WS_ERROR = 0;
CURR_POS = 1;
IF WS_TO = "" THEN
  DO;
  WS_ERROR = CAO_ERR_BAD_USERNAME;
  GO TO EXIT;
  END;
IF INDEX(WS_TO,"<0>"C) = 0 THEN
  DO;
  N = 0;
  DO X = $$uname_len TO 1 BY -1 UNTIL (N > 0);
  IF SUBSTR(WS_TO,X,1) ^= "" THEN
    N = X + 1;
  END;
IF N = 0 THEN
  SUBSTR(WS_TO,$$uname_len,1) = "<NUL>"C;
ELSE
  SUBSTR(WS_TO,N,1) = "<NUL>"C;
END;
IF INDEX(WS_SUBJ,"<0>"C) = 0 THEN
  DO;
  N = 0;
  DO X = $$subj_lengt TO 1 BY -1 UNTIL (N > 0);
  IF SUBSTR(WS_SUBJ,X,1) ^= "" THEN
    N = X + 1;
  END;
IF N = 0 THEN
  SUBSTR(WS_PATHNAME,1,1) ^= ":" THEN
  DO;
  WS_ERROR = CAO_ERR_NOT_ROOT_PATH;
  GO TO EXIT;
  END;
N = INDEX(WS_PATHNAME,"<NUL>"C);
IF N = 0 THEN
  DO;
  N = INDEX(WS_PATHNAME,"C");
  IF N = 0 THEN
    DO;
    WS_ERROR = CAO_ERR_ILLEGAL_FILENAME;
    GO TO EXIT;
    END;
  ELSE

```

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```

SUBSTR(WS_PATHNAME,N,1) = "<NUL>C";
END;
LAST_TEXT_LINE = 0;
DO N = CAO_MAX_MSG_LINES TO 1 BY -1 UNTIL
    (LAST_TEXT_LINE > 0);
    IF WS_TEXT_LINE(N) ^= "" THEN
        LAST_TEXT_LINE = N;
END;
DO N = 1 TO LAST_TEXT_LINE;
    X = INDEX(WS_TEXT_LINE(N),"<NL>C");
    IF X = 0 THEN
        X = $$line_length;
    SUBSTR(WS_TEXT,CURR_POS,(X-1)) =
SUBSTR(WS_TEXT_LINE(N),1,(X-1));
    CURR_POS = CURR_POS + X - 1;
    SUBSTR(WS_TEXT,CURR_POS,1) = "<NL>C";
    CURR_POS = CURR_POS + 1;
END;
SUBSTR(WS_TEXT,CURR_POS,1) = "<NUL>C";
WS_POA_FLAGS = $$_p_std;
IF WS_FLAGS_1 = 1 THEN
    WS_POA_FLAGS = WS_POA_FLAGS + $$_p_cnf;

```

```

IF WS_FLAGS_2 = 1 THEN
    WS_POA_FLAGS = WS_POA_FLAGS + $$_p_urg;
IF WS_FLAGS_3 = 1 THEN
    WS_POA_FLAGS = WS_POA_FLAGS + $$_p_crt;
IF WS_FLAGS_4 = 1 THEN
    WS_POA_FLAGS = WS_POA_FLAGS + $$_p_rct;
WS_POA_ERROR = 0;
CALL POACON(WS_POA_ERROR);
IF WS_POA_ERROR ^= 0 THEN
    DO;
        WS_ERROR = WS_POA_ERROR;
        GO TO EXIT;
    END;
CALL POAMLAOS (WS_TO, WS_SUBJ, WS_TEXT, WS_POA_FLAGS,
    WS_PATHNAME, WS_POA_ERROR);
IF WS_POA_ERROR > 0 THEN
    WS_ERROR = WS_POA_ERROR;
WS_POA_ERROR = 0;
CALL POADCON(WS_POA_ERROR);
EXIT;
RETURN;
END;

```

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these types of functions. We need to accomplish such tasks as:

- file transfer between computers
- notification of data base changes between users
- batch processing notification for time-consuming tasks.

## Interface subroutines

SPSD used subroutines written in PL/I to interface our COBOL application to AUI. These subroutines made the actual AUI requests, thereby eliminating the AUI learning curve. See how the application programs never directly accessed AUI in Figure 1.

The COBOL code used to call the subroutine is straightforward and simple to implement (Figure 2). Although the interface subroutine code that performs the AUI call is not complex, it is much more involved than the COBOL call. Look at the PL/I code (Figure 3) from a subroutine that enables AUI data transfer (for the sake of brevity, I've excluded the declare statements and comments).

As you can see, the subroutine code that actually interfaces with AUI is much more involved than the COBOL code that calls the subroutine. The primary advantage of using the subroutine technique is to eliminate an AUI learning curve.

The application that SPSD developed with four remote sites and one central site illustrates how we used AUI to perform data communications functions.

## File transfer

To send monthly data from the remote locations to the central computer, a user at the remote location runs a program that:

- selects the appropriate data to send
- writes the data to a sequential file
- sends the data to a CEO user at the central site
- deletes the sequential data file.

AUI accomplishes data transfer from the remote site to the central without developer or user intervention.

At the central location, users file the transferred data from their CEO inbox to a sequential file and run a program that:

- imports the data from the sequential file into the application data base
- deletes the sequential file.

## Data base update notification

Non-critical data changed by the application is not included in the monthly data transfer process. Instead, the application program builds a CEO short message describing the change. The short message is then sent to the appropriate sites and users update their data bases accordingly.

## Batch processing notification

The application performs certain tasks that can be too time consuming to run on-line. For these tasks, the program is sent to the batch queue for low-priority processing. When the program

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is finished, a CEO short message stating that the process has been completed is sent to the person who started the program. The message, for instance, may inform the recipient that a complex report has finished and the output has been queued to a particular printer.

This method of notification is superior to QBATCH/NOTIFY in several ways:

- The user receives notification in a clear and concise English message as opposed to a relatively cryptic operating system message.
- The user could have logged off the system when the batch job finished and the notification would be received later.
- The user would receive notification even if logged onto a different computer.

### Disadvantages of AUI data communications

With multiple users handling a data file, there is margin for error. When a data file is sent, someone at the receiving end must file the data from the inbox and run an import program to merge the data into the data base. This may be an unacceptable situation in some environments.

The users in our particular application have not mishandled any data to date. We help ensure this success rate by providing software that offers informative prompts and appropriate warning messages.

### Advantages of AUI data communications

There are several significant advantages to using a scheme like this to transfer data between distributed computers. First of all, the data communications portion of the software development effort is minor. The developers never need to work with the intricacies of data communications. AUI automatically takes care of it.

No extra code is needed to handle recovery from a data communications failure. If the line drops for some reason during a transmission, the file or message is rejected back to the sender by the appropriate CEO agent process. The sender then re-mails the data at a later time.

Most importantly, AUI allows SPSD to maintain the "KIS" principle (Keep It Simple).

If your application exists in a CEO environment and needs to communicate with users on other computers, AUI may provide a viable alternative to traditional data communications approaches. Δ

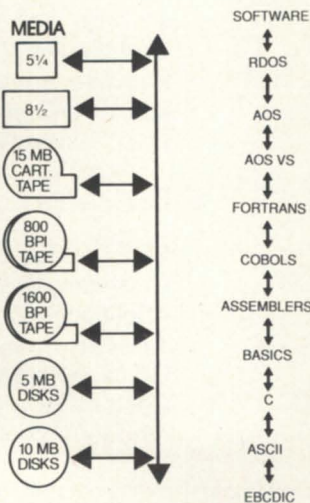
*Kim L. Medlin is the software project manager for the Commercial Software Development Group of Data General's Software Products and Services Division. He can be reached at Data General, 3617 Parkway Ln., Norcross, GA 30092; 404/448-6072 ext. 2007.*

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# Almost too good to be true

## Only a fool wouldn't love these new policies for software support

I had a very interesting phone call the other day. It was from a new Data General marketing manager in Westboro. She introduced herself as Dr. Susan Do Nim, a recent import from Nippon DG who is spending a year in DG corporate headquarters learning the way Americans do business. It sounded like an interesting exchange program, but I wasn't able to find out more on this subject—especially who the poor soul was that had to put up with a one-year all expenses paid trip to the Land of the Rising Sun.

Dr. Sue called to talk to me about the marketing and distribution of some of DG's older and supposedly mature software products. She called me because in recent issues of *Focus* I have criticized the methods used to introduce several "new" software products. She thought that if I liked the new plans two things might result; other people would like them, and I might help them get some positive publicity.

Well, over the next three weeks we exchanged a number of phone calls that resulted in several developments. First, she gained respect for some of my ideas that she felt were realistic, workable, yet creative and remarkably innovative. (Wow! I thought they were just off-the-wall, ridiculous, and crazy.) Second, I gained a great deal of respect for her ability to

work within corporate DG to get things done, even when it meant getting the marketing gurus to do something they didn't want to. Third, the adjustments that we made to the original plans would definitely fall into the minor overhaul and rebuild category as opposed to the quick and dirty tune up. Fourth, well . . . we better stop at three.

### **Old software never dies, it just takes longer to loop**

The first topic concerns older software for Novas and Eclipses. Since these machines haven't been made for years and most users have upgraded to the MV series (in other words, have dropped off of subscription), they represent virtually no

marketing task and will provide DG with periodic updates to RDOS for the Nova and Eclipse line. They, of course, agreed to certain guidelines that DG has always followed; only bugs will be changed, anything else is an addition. This preserves the integrity of user software so that recompiling or modifications for future updates will be required only if there is a new feature.

Since DG will no longer have much control over what gets fixed and when, subscription service won't be necessary. All known RDOS users will be contacted via a mass mailing each time a release or update comes out. Dr. Sue explained the procedure to me and it seems quite simple. If you want a new update, just fill

out the form, include a check or credit card number (no purchase orders) for \$200 plus a media charge (which ranges from \$10 for tape to \$900 for a 196 MB disk), and send it in. (It seems DG has found a less expensive source of tapes). In this manner, DG will have all costs of distribution covered. It will forward a fee to the de-

velopers, with no guarantees as to when or how often updates will be available. This sounds just like software for the PC industry; what an innovative 10-year-old concept!

While this is a new and radical approach for DG, it seems to be a perfectly viable way of maintaining old software without making a major financial commitment. If the developers do a good job then DG benefits. Also, if this marketing program works, Dr. Sue will recommend a similar one for 16-bit AOS and its compilers and utilities.

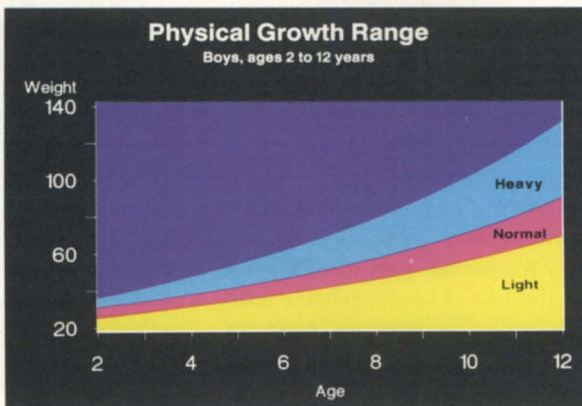
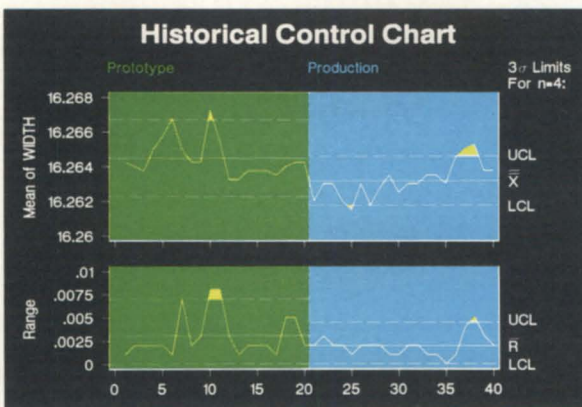
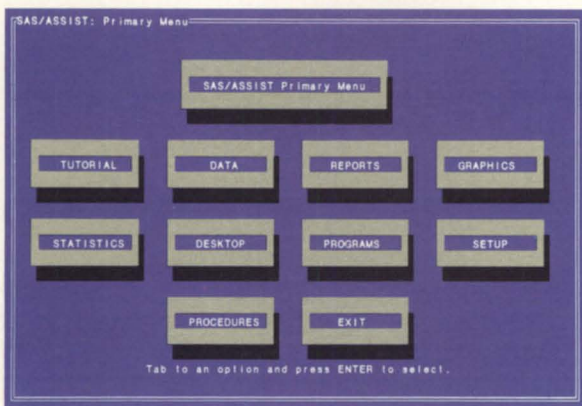


***She introduced herself as Dr. Susan Do Nim, a recent import from Nippon DG who is spending a year in DG corporate headquarters learning the way Americans do business***

revenue. On the other hand, there is a wealth of excellent software for smaller systems. These software products will be placed in a new category of support. Dr. Sue negotiated a five-year agreement with one of the largest remaining RDOS sites in the country to make its continuing developments available to DG.

I can't reveal the name of the site, but the people there are highly competent and rather well known. They have fixed most of the few remaining bugs in RDOS and many of the RDOS languages and utilities. They will take over the program-

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**CEO WP vs. CEOwrite, is there a choice?**

There isn't a choice and that was the second topic of our discussion. (Actually it was the third but her social schedule is our business.) CEO users were given a choice between licensing a new word processor or rev locking themselves on an old one that didn't work quite right. Naturally, they felt like this was wrong. After all, what were all those maintenance fees they paid being used for? In an attempt to make amends with these folks, Dr. Sue has convinced DG to give a six-month software subscription credit to sites that fit the following criteria: 1) you must have had software subscription for the two years leading up to the announcement, or from the time you bought the license until the announcement, 2) you must have bought the new license, and 3) you must currently be on software subscription. If you meet all three, DG plans to award you a 50 percent reduction on your next annual renewal.

In the event you decided to drop subscription and rev lock yourself, you will be eligible to upgrade for 50 percent of the license price. Implementation plans for both offers are being finalized so stay tuned.

**First Coca-Cola, now AOS/VS**

The last major plan worked out was for the AOS/VS Classic vs. AOS/VS II controversy. DG has begun to realize that although the versioning of products may well be an idea whose time has come, using AOS/VS II to replace rev 8 was not a popular idea. Therefore, as a compromise, DG will increase the 70 percent discount on the new software to 90 percent with a \$1,000 minimum to anyone who can show they were on software subscription for the two-year period prior to September 1988 (since it was the support revenues from this period that paid a major portion of the new file system development). Also, you will have to take at least a year of support under the new system. Because annual support costs have gone up \$50 per month, many sites can look at this as a 20-month retroactive price increase. The same logic was used to increase our home water bill 50 percent to fund construction of a system to get water from Lake Michigan. You're just paying some of the cost before you get it.

By the way, these plans take effect just about the time this issue hits the street. The target date for all of them is April 1. However, I doubt that even Sue Do Nim could pull it off this April Fool's Day.

For those of you that read this far and have suddenly discovered what I was getting to, don't feel bad. I do have some real information for you.

**The mailbox is empty but the phone still rings**

In February I said that I could not think of a utility to produce cross-references of COBOL files in programs. Well, my memory was not up to its usual performance that week, but on the other hand, it's been several years since I have seen the full set of software tools avail-

**There is a set of COBOL tools that shows the file structures from FD statements and builds all screens**

able from Northboro. There is a set of COBOL tools that shows the file structures from FD statements and builds all screens; it even finds all the I-O statements to produce cross-references of which programs read files and which write or rewrite data. This cross-reference can be generated all the way to the field level. All data entry is done by the utility itself as it scans the source files and copy libraries. There are more tools in this toolkit and it is available for a reasonable price. Contact Jim LeRoi at (312) 328-1106 for full details.

Also, I said I had a utility to produce copy file cross-references from COBOL and ICObOL source. Send \$35 to the address below and I'll send you the latest rev of our utility. It can run either as an ICObOL program or as a 32-bit COBOL and INFOS program. Both versions will be included although the ICObOL takes two to three times as long as the compiled version.

**When in doubt, read the instructions**

I was recently talking to a site that was

interested in a utility I had written in 32-bit COBOL that reads records directly from a MINISAM file. It bypasses the index and reads them from the data portion the same way REORG does when you use switch /D. The programmers were planning to spend several weeks writing programs to unload all of their MINISAM files into sequential files for a migration to 32-bit COBOL with INFOS (yes, it was justified). My utility would allow them to do it with one program. When I asked why they didn't use REORG, I couldn't believe the answer: "We've never used it and aren't sure how to."

I knew it wasn't April Fool's Day, yet here was an ICObOL site with an in-house programming staff that didn't know about REORG! They used ICObOL programs to unload and reload all of their data files when they wanted to repack them. REORG does that at least three times as fast.

Since I didn't want to read the manual to them, I sent them my program. Benchmarked against one of the largest files on our system, it runs in about seven minutes. I then typed in the command "REORG FILENAME/I FILE.SEQ/S" and had the sorted output in about four minutes. I then entered "REORG FILENAME.XD/D FILE.SEQ/S" and had the same output as my utility produced but in under two minutes. Even FILCOM ran without output against the two output files.

This is a case of writing megabytes of software to do what can be done in minutes with a CLI macro—and doubling your throughput in the process. Two to four hours research into the ICObOL manual and playing on the system would have saved them weeks of programmer time and unknown amounts of operations time each year. Readers, please don't fall into the same trap. After all, ignorance may be bliss but it's a lousy way to keep a job. △

---

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

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# Cooking school

## A pinch of this and a handful of that



There are few people for whom the Coca Cola Classic vs. New Coke metaphor has more relevance than it does for me. I drink a couple of six packs a day of Classic. My company

logo even bears a passing resemblance to that of Coca Cola.

For me, the decision on whether to switch to New Coke or stick to Classic (albeit not the same product as Old Coke) was an easy one: New Coke has the same "slimy" sweetness as Pepsi. I don't like Pepsi.

The decision on whether to stick with AOS/VS Classic or switch to AOS/VS II has been a lot more difficult. I have no compelling reason to move to AOS/VS II, other than to just stay current. But DG recently made the decision a lot easier on me; they presented me with a quote for upgrading two MV/4000s to AOS/VS II. As a result, I regret to announce that I won't be upgrading to AOS/VS II. The quote from DG is shown in Figure 1.

This quote doesn't even include the upgrade fee for the new Data Sharing Architecture, which apparently will require that we upgrade our two current RIA licenses to DSA. Theoretically, we could stay with XTS I and RIA on AOS/VS II, but then part of the potential appeal of the upgrade (improved XTS performance) would be lost.

Now that I have established an upper limit on what I think it's worth to stay current (something less than \$15,984 . . .

and I don't foresee DG allowing us to dicker on the price), I guess I'll be staying with AOS/VS Classic.

Incidentally, this simple quote took two people from the local DG office quite a while to generate. Apparently the upgrade policy has been conveyed to them in less-than-crystal-clear terms. A check with Westboro afterwards showed that they had blown the quote by about \$3,000 on the low side. The quote here is the (presumably?) correct version.

So what about supporting our software products on AOS/VS II? The high price for the upgrade versus the price of a shiny new MV/1400 with a bundled AOS/VS II license means that it makes a lot more sense for us to just order one of those for the purpose of checking out new releases of our stuff on AOS/VS II.

The decision to stick with AOS/VS Classic was also made a lot easier as a result of the experiences we had with the beta test version of AOS/VS II (see my Jan '89 column). There simply aren't enough significant differences between AOS/VS Classic and AOS/VS II at this time to warrant the cost of switching. The New FIXUP-less File System is pretty much transparent to users, and we rarely run FIXUP anyway (AOS/VS Classic is extremely stable, and ESD works). The new TLA suppression isn't implemented very well (it works only for SUPERUSERS, and only when reading the file, not when reLOADing or MOVEing it), so the new functionality still doesn't address the much STR'ed problem of identifying which files haven't been accessed in a long time and are therefore eligible for archiving/deleting. The much ballyhooed dynamic bad block remapping only works on mirrored drives (non-mirrored drives still require a DFMTR/partial and simply lose the file data involved, as happens currently). And finally, the thought of XTS mucking about in the operating system kernel sends chills up

my spine. (Anybody out there remember the years of watching RDOS-INFOS panic because of INFOS bugs?)

I expect that after a year or two of maturing and enhancing there will be some compelling features on AOS/VS II that might make me reconsider upgrading, but even then it will be hard to justify paying \$16,000 in software upgrade fees for two systems each purchased two years ago from CPD for not much more than that (with bundled AOS/VS, INFOS, COBOL, and SORT licenses)!

For the short term, I expect that the

**Figure 1: Quote for upgrading to AOS/VSII**

2	X	31585-W91N	VS II upgrade fee	\$ 9,000
1	X	31585-49N	Right-to-copy	\$ 160
1	X	31585-E61H	1 yr add'l Support+	\$ 4,680
2	X	31641-E91N	XTS II upgrade fee	\$ 1,440
1	X	31641-49N	Right-to-copy	\$ 44
1	X	31641-E61H	1yr add'l Support+	\$ 660
<b>TOTAL COST</b>				<b>\$15,984</b>

only users of AOS/VS II will be first-time DG customers, large corporate customers who round the line amounts on their financial statements to the nearest \$100,000, and customers forced to get AOS/VS II in order to use a particular piece of software that requires it (like the new DG/FTAM).

The U.K. Users Group has decided to adopt a policy statement in favor of boycotting AOS/VS II. I suspect the upgrade pricing may be more effective than their boycott at keeping AOS/VS Classic users from upgrading.

### **:XLPT\_UPDATE:MEA\_CULPA**

As a result of the STRs submitted by myself and others on the new (7.62) XLPT last fall, and as a result of some of the columns I've written on XLPT in the past, DG has made significant modifications on the new XLPT and has done an in-depth analysis of its performance versus the "old" XLPT. In the process, they called me several times during December and



January and we've had numerous discussions about my tests of the CPU consumption and my complaints that certain features had been left out of the new XLPT.

As a result of the discussions with DG and my own retesting, I have to confess the following:

- My CPU consumption numbers could not be reproduced, either by DG or by me. I even back-revved one of the MV/4s to 7.57 to rerun all of the tests. I can't explain how I came up with the original numbers, but I can tell you that the rerun tests demonstrated that the new XLPT matches or out-performs the old XLPT in every respect, except for memory consumption at low printer counts, and even that's a modest difference.

- As I mentioned last month, I was in error about the old XLPT stripping trailing blanks: it apparently never has. Good news: the new "New" XLPT does.

- I am unable to find an old rev of XLPT that doesn't do unconditional tab expansion for printers attached to serial ports. For the record, XLPT expands tabs in all cases except for data channel printers with DAVFU units (e.g., LPBs). I'm still sure that some previous rev didn't expand tabs on serial ports with /ST turned off, but I can't figure out which rev. This problem will apparently be addressed in a cleaner way in a future rev of XLPT that will allow VFU downloading even on serial printers as long as they have some sort of hardware VFU logic. That will allow both standard and non-standard tabs to be processed properly.

Just when everybody seemed to be pretty much satisfied and in agreement, my February column hit the developers' desks with a splat. The timing couldn't have been worse; now I have a bunch of developers upset with me.

The column recounted the increased CPU consumption test results, and detailed the remaining XLPT STR issues that I still had outstanding at the time. Unfortunately, that column had been written last November just after the STRs had been generated, but before DG was kind enough to call to discuss the problems and work to resolve most of them.

So, both an apology and a vote of thanks go out to the XLPT group.

## :PRIORITIES

It seems like every adequately config-

ured system I see these days with massive response time problems has some truly bizarre process priority organization. Apparently there are some OEMs and some DG system engineers running around preaching some nonsense about how heuristic scheduling under AOS/VS is flawed and that round-robin scheduling using Group I or Group III is the recipe for sparkling response time. If that's true, why am I getting calls from the victims (three this week alone!) pleading for a way out of the madness.

I've written about setting process priorities for minimum worst-case response time in several previous columns, but apparently the message bears repeating.

If you want to see if this column applies to you, just do the following:

```
) XEQ PED/BATCH/LIST=PNQ.LS/PID/USER/
PROC/PROG/PNQ
```

Print out PNQ.LS and check the column labeled PNQ for the following conditions: all values are between 417 and 424, except for processes that handle physical device controllers directly (e.g., PMGR, XTS, and GSMGR) and well-behaved economical processes (e.g., XLPT), all of which should have PNQ values less than 417, and batch jobs, which should have PNQ values greater than 424.

PNQ stands for "Priority eNQue factor" and indicates the nominal priority of the process, plus an adjustment based on its past behavior if it's in Group II. Value 417 corresponds to a well-behaved process at priority 2. Value 424 corresponds to a persistent consumer of CPU at priority 2.

## :RESPONSE\_TIME

First of all, let's define "massive response time problems." Fact is, there is no universal measure of "good response time." It depends on what constitutes a transaction on your system. For example, a text retrieval system might define good response time as a minute or two. A typical accounting system might define good response time as a few seconds to do a posting to the general ledger. A CEO system might define good response time as no more than one or two seconds to get a reaction from CEO after entering a command.

To my mind, "good response time"

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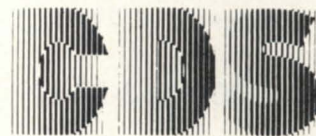
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## SYSTEM MANAGER'S LOG

means two things: 1) the on-line users can work at a comfortable pace, and 2) the average time it takes for the system to react to an on-line user does not vary dramatically from minute to minute, hour to hour, or day to day. Batch job turnaround times can vary, but online reaction time shouldn't.

Poor response time includes things like taking more than 15 seconds to get logged on with a brief initial IPC file, and more than a handful of seconds to accomplish relatively simple tasks like XEQing a program that does little or no initialization (like SEDing a small text file for which a valid .ED file already exists).

Process priorities typically get mangled during periods just prior to installing necessary hardware upgrades. They begin as temporary work-arounds and end up being permanent fixtures after they are no longer appropriate, if they ever were.

To add a little spice to this inherently boring subject, I'm going to make yet another rash statement (YARS), and then try to defend it. Here it is:

*I guarantee that if your system has adequate memory and you arrange your process priorities as described below, you will never experience a worst-case CLI prompt response time that exceeds a few seconds.*

(CLI prompt response time is the time between hitting NEW LINE while in the CLI and getting the next prompt.)

### :PRIORITIES:RX

The general principles behind my favorite priority scheme are:

1. No process should be *resident* unless it is a prerequisite for the system calls it uses (e.g., ?IDEF or ?LMAP). If so, the process should change itself to resident. Using the resident process types indiscriminately simply squanders precious memory.
2. No processes should be *preemptible*. The preemptible process type exists primarily for downward compatibility with AOS. Making a process preemptible simply allows it to sit on memory pages that could undoubtedly be put to better use by others, but never will be because a *swappable* process cannot preempt the memory of a preemptible process, even if the preemptible process is blocked.
3. All on-line users should be scheduled heuristically, using a single priority

(SWAPPABLE 2). Attempting to use multiple priorities will only allow the higher priority processes to shut out lower priority processes for extended periods of time.

4. Servers should be at the same priority as their customers (SWAPPABLE 2). To do anything else is unfair to users who don't happen to use that particular server, and runs the risk of having the server shut out all lower priority users whenever it goes CPU-bound.

5. Giving high priorities to global servers that use minuscule amounts of CPU (e.g., RLS2, INFOS) is unnecessary (think it through) and squanders memory, so make them the same priority as their customers (SWAPPABLE 2).

6. Batch streams should have priorities below on-line users, preferably in Group III (259...511). The reason for this is that batch jobs do not collect salaries. If your CPU is not capable of reasonable batch throughput while on-line users are active, does it make sense to pay salaries to people who are competing with batch jobs for CPU access? Nope. If you can't get acceptable batch job turnaround times because of the load imposed by on-line users then the only real solutions are to get a faster processor, or schedule the batch jobs to run only when the on-line load is light.

### :JULIA\_CHILD

Here's a cookbook approach for setting process priorities using these general principles:

- 1) Add a "PRIORITY 2 2" command to the front of your system UP macro to get around the problem that AOS/VIS defaults the master console to priority 1. This will also ensure that any PROC/DEFed sons come up at SWAPPABLE 2. The argument that the master console must be at a higher priority in order to terminate runaway processes is a myth. The master console will always have a higher priority than a runaway program; heuristic scheduling guarantees it.
- 2) Remove any /PREEMPTIBLE, /RESIDENT, and/or /PRIORITY= switches from the PROC commands for all global server processes, except for GSMGR (because it's the only DG global server that validly requires residency and is too stupid to change itself to resident during its initialization). None of the DG-sup-

plied "UP" macros for global servers specify anything other than default process type and priority. If your copies do differently, then somebody changed the as-supplied versions.

3) Do the same as above for any third-party software global servers that do not access physical device controllers directly. If you're not sure, use common sense or check with the supplier. If the supplier tells you that the process does not access physical devices, but has to be resident or preemptible with a high priority in order to "provide good service," then ignore his advice and make it SWAPPABLE 2 for sure.

4) Leave XLPT at SWAPPABLE 2 (the default) if most of your printers are buffered serial printers (e.g., laser and dot matrix). You can try changing XLPT to SWAPPABLE 1 if a) parallel line printer output is erratic, and b) you don't have a large number of printers. You can get away with this because XLPT is a fairly well behaved program when it comes to not consuming large blocks of CPU at a time.

5) Set all the batch streams to SWAPPABLE (the default) with priorities in Group III (259 . . . 511). To check your handiwork, reboot the system and repeat the PED test I described previously.

## :GOTCHAS

There are two potential problem situations that can arise when using this scheme. One pertains to poorly behaving global servers that require short response times, and the other pertains to certain disruptive programs that do excessive system calls and drive other more well-behaving users crazy when they run (e.g., BLAST).

On the odd chance that you have some global server that needs to be accorded some minimum CPU on a guaranteed basis regardless of its behavior, the optimum solution is to use SPRED and either CLASP, or a fairly easy-to-write utility program, to turn on class scheduling with the parameters set to allocate a guaranteed amount of CPU to the server during periods of CPU contention. If you need help writing such a utility program in lieu of using CLASP, call me for a sample of the code.

The only solution for programs that are disruptive due to excessive system

calls is to modify the program to eliminate the excessive calls, or try the following patch to your system file:

```
:Patch AOS/V5 to punish processes
:which do certain system calls.
%AOSVS
TUNPBLK 040000 077000
:End of patch
```

The patch should be used as a last resort. And if it doesn't seem to noticeably help, please remove it.

## :KUDOS:AOSVS\_GROUP

The long awaited auto-baud detection for asynch ports has finally arrived (on AOS/V5 7.64) only eight years after all of DG's major competitors had it. Now we can get rid of all those separate phone lines for 1200 versus 2400 baud lines. To celebrate, I've converted the :SYSMGR BBS to support 1200/2400 dial-ins.

Just so you don't think that my mentioning auto-baud detection in a column a few months back stimulated DG into action, bear in mind that their lead time on software releases is even longer than my lead time on writing columns about XLPT. AOS/V5 7.64 was actually produced back in mid '88.

## :STOP\_PRESS

An anonymous source just called and submitted the following unofficial patch for AOS/V5 7.64.

```
:Speed up EXEC logons
%PROGRAM
x$_long_copyright_mess 400 0
:End of patch
```

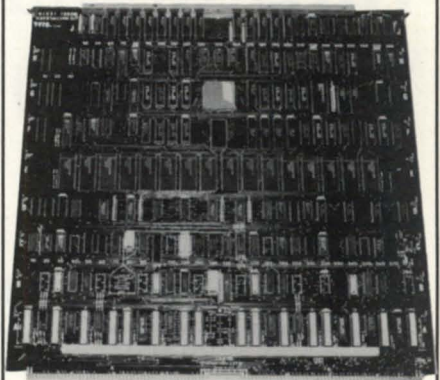
The entire collection of unofficial patches, including the one above, for various AOS/V5 revs is available on the :SYSMGR BBS. Δ

---

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

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# How to make files disappear

Using /APPEND to add a disk file to a tape can produce unwanted results



## Problem:

Suppose you have a tape containing an unknown number of tape files and you want to copy some disk files to the next tape file. The copy method is unimportant: perhaps COPY, DISPLAY, DUMP, or DUMP\_II. What is the number of the next tape file to be written on the tape?

## Solution 1 (awkward)

Try to read each

file on the tape (with COPY @NULL . . ., LOAD/N, DISPLAY, etc.) until you get an "ATTEMPT TO POSITION PAST LOGICAL END-OF-TAPE" error. For example if you get an error on:

```
) LOAD/N @MTB0:23
```

then file 23 is the next available file.

## Solution 2 (wrong!)

If you are using either COPY or DISPLAY to copy the files, you might think you can use the /APPEND switch to append a file to the tape. No! This is wrong. Remember that AOS/VS treats everything as a file (even tapes). Filename "@MTB0:14" is identical to ":PER:MTB0:14" which is, in effect, file 14 in directory :PER:MTB0. Using /APPEND on either COPY or DISPLAY will append to the file, not the tape! Since a reference to "@MTB0" contains an implicit reference to file 0, i.e. "@MTB0:0", an attempt to append to "@MTB0" with /APPEND will not append to the tape, but rather to file "@MTB0:0", extending file 0 and effectively erasing all of the other files on the tape!

## Solution 3 (NEXTFILE)

The NEXTFILE program (Figure 1) will scan a tape quickly, counting files until a logical END-OF-TAPE (double END-OF-FILE) is encountered. It returns (via XEQ/S) the number of the

Figure 1: Program NEXTFILE

```
.title nextfile
.ent nextfile ;for subroutine call

;>>>constants
length=5 ;99999 (actually 32767)
one=1

;>>>variables
.nrel 0 ;unshared

;packet for ?gtmes
gpkt: .blk ?gtln
.loc gpkt+?greq
.word ?garg ;"get argument"
.locgpkt+?gnum
.word 1 ;arg 1
.locgpkt+?gres
.dword filename*2 ;put name here
.loc gpkt+?gtln

;packet for ?gopen
opkt: .blk ?oplt
.loc opkt+?opch
.word ?opme+?opam ;exclusive, ADM
.loc opkt+?oplt
```

next file to be written on the tape. You can then use this with COPY or DISPLAY.

If you use the /V switch, program NEXTFILE will emit a "." on the screen each time it encounters a file. This allows you to track the progress of program NEXTFILE. The NEXTFILE.CLI macro (Figure 2) illustrates one way to use the NEXTFILE program. After the macro announces the name of the next tape file, the user can then use the appropriate COPY, DUMP, etc. command to copy the files. You can automate the copying procedure by writing another macro that implements the COPY or DUMP command directly after NEXTFILE returns the next tape file number. Each set of data can then be automatically

NEXTFILE can be quite useful for routine backups of disk files to tape. Each time a backup is done the files can be automatically copied to the next file on the tape

copied to the next available file on the tape, without the user having to know how many files are on the tape.

NEXTFILE can be quite useful for routine backups of disk files to tape. Each time a backup is done (daily?) the files can be automatically copied to the next file on the tape. If many or large files are backed up in this manner, the use of NEXTFILE

<pre> ;packet for ?rdb rpkt: .blk ?pbit     .loc rpkt+?psti         .word 0     .loc rpkt+?psto         .word 0     .loc rpkt+?pcad         .dword buffer     .loc rpkt+?prnh         .word 0     .loc rpkt+?prnl         .word 0     .loc rpkt+?prcl         .word 0     .loc rpkt+?pres         .word 0     .loc rpkt+?pbtl  ;packet for screen ?open/?write screen: .blk ?iosz     .loc screen+?ich         .word 0     .loc screen+?isti         .word ?ofot+?icrf+?rtdy     .loc screen+?isto         .word 0         </pre>	<pre> ;position, not read ;reserved ;nominal buffer ;tape file number ;position to block 0 ;#bytes to read (n/a) ;reserved ;aos/vs supplies channel ;output, dynamic ;n/a         </pre>	<pre> .loc screen+?imrs     .word 0 .loc screen+?ibad     .dword dot*2 .loc screen+?ires     .word 0 .loc screen+?ircl     .word 1 .loc screen+?irlr     .word 0 .loc screen+?irnw     .word 0 .loc screen+?irnh     .dword 0 .loc screen+?ifnp     .dword console*2 .loc screen+?idel     .dword -1 .loc screen+?iosz  ;various other stuff filename: .blk ?mxpl/2 channel: .blk 1 file: .blk (length+1)/2 buffer: .blk1         </pre>	<pre> ;block size ;byte address of message ;reserved ;write one character ;returned by ?write ;reserved ;n/a ;byte address of filename ;default delimiter table ;maybe pathname if LNK ;notused         </pre>
---	--	--	--

(Figure 1 continues on page 74)

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(Figure 1 continued from page 73)

```

progress: .word 0                ;default: no progress
vswitch: .txt "V"
console: .txt "@output"         ;for progress report
dot: .txt "."                   ;progress report
subroutine: .word 0             ;default: program entry

;>>>>begin subroutine
nextfile: wsavs 0
    wadc 1,1                    ;-1
    xnsta 1,subroutine          ;subroutine=.true.
    xwlda 0,arg1,3              ;get byte address arg 1
    wbr open                    ;open tape

;>>>>begin program
;—>get the tape drive name (argument 1)
start: ?gtmes gpkt
    wbr oops

;—>open the tape drive & get the channel number
    xlefb 0, filename*2        ;byte address of filename
open: wadc 1,1                  ;aos/vs supplies channel
    ?gopen opkt
    wbr oops

    xnlda 0, opkt+?opfl        ;get flag + channel number
    wandi 77777,0             ;clear flag

    xnsta 0,channel
;—>check for /V for progress report
nldai ?gtsw,0
    xnsta 0,gpkt+?greg
    xlefb 0,vswitch*2
    xwsta 0,gpkt+?gsw
    wsub 0,0
    xnsta 0,gpkt+?gnum
    wadc 0,0
    xwsta 0,gpkt+?gres
    wsub 0,0
    wsub 1,1
    ?gtmes gpkt
    wbr oops
    wsge 0,0
    wbr go

    ?open screen
    wbr oops
    wadc 0,0
    xnsta 0,progress

;and save it
;request type is
;. . . test for switch
;. . . /V?
;. . . on argument 0
;. . . don't want value
;switch present?
;no
;any non-zero for .true.

;—>position to block 0 of each successive file
    
```

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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.

Circle 74 on reader service card.

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```

go :wsub 0,0
   xnsta 0,rpkt+?prnh           ;first file is 0

next :wsub 0,0                  ;reserved
     xnlda 1,channel           ;channel number
     ?rdb rpkt
     wbr done?
     xnisz rpkt+?prnh         ;incrementxfilename
     nop

;...progress report
     xnlda 0,progress
     wsne 0,0                  ;progress?
     wbr next                  ;no—next file
     ?write screen            ;yes
     wbr oops
     wbr next                  ;next file

;—>if eot, next available file is last file tested
done? :wseqi erpet,0           ;logical eot
     wbr oops

     xnlda 0,rpkt+?prnh
     nsbi one,0                ;subtract 1 (prev file)

;—>if subroutine return as arg2

```

```

xnlda 1,subroutine             ;get sub/program flag
wsne 1,1                       ;program?
wbr string                     ;yes—convert to string
ldafp 3                         ;restore frame pointer
xwsta 0,@arg2,3                ;return as integer*4
wrtn ;return to caller

;—>if program, convert file number to a string
string: wflad 0,0               ;float it (for wsti)
        wldai 4s26+length-1,1 ;code for wsti
        llfcb 3,file*2         ;byte pointer to buffer
        wsti 0

;—>return with tape file number (pick up with XEQ/S)
wsub 0,0
llfcb 1,file*2                  ;byte pointer to message
wldai length,2                 ;message length (bytes)
?return
wbr oops

;>>>unknown error
oops:wldai ?rfec+?rfcf+?rfcr,2
?return                          ;crash & burn
wbr oops

.endstart

```

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**Figure 2: NEXTFILE.CLI macro**

```
[!equal,%1%,]
  write Argument 1 must be the tape drive name, i.e.:
  write,,,,,NEXTFILE @MTB0
[!else]
  push;prompt pop
  xeq/s NEXTFILE%0/%%1%
  var0 [!string]
  write The next file to be written is "%1%:[!var0]"
  pop
[!end]
```

may not be useful, since the tape may be full after one or two backups.

The source listing for NEXTFILE.SR (Figure 1) can be implemented as an executable program and/or a subroutine (callable by F77 or other DG languages that use the VS/ECS calling standard). Regardless of how it is to be used, assemble it as follows (LANG\_RT\_PARAMS.SR is supplied with LANG\_RT):

) X MASM LANG\_RT\_PARAMS.SR/S NEXTFILE

To create program NEXTFILE:

) X LINK NEXTFILE

If you have an application program that writes to the tape (instead of using CLI commands), you can call NEXTFILE as a

subroutine. Argument 1 is the tape drive name (character) and argument 2 is the returned next file number (integer\*4):

```
integer*4 ifile
call NEXTFILE("@MTB0",ifile)
```

Your application can then write to tape file IFILE. To LINK the application, just treat the assembled NEXTFILE.OB as a subroutine:

) F77LINK my\_application NEXTFILE . . .

Note that an "END-OF-FILE" (EOF) is not used to trigger the program because an EOF only occurs if a block is READ. The NEXTFILE program only positions the tape: it doesn't actually READ anything. Therefore, the only trigger point is "END-OF-TAPE" (EOT) as an attempt is made to position the tape past the second EOF of the double EOF that defines an EOT. NEXTFILE should only be used on tapes created by an operating system (like AOS or AOS/VS) that guarantees a double EOF (EOT) after the last file on the tape. If the last file is only followed by a single EOF, NEXTFILE will not work correctly. Δ

*John A. Grant is a geophysicist with the Geological Survey of Canada. He is also system manager, chief cook, and bottle washer for the Airborne 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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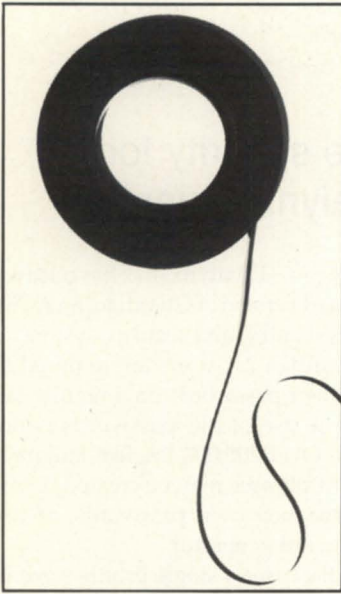
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# A complete listing of the NADGUG software library



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

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

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

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

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

## Big Brother

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

## B.J.'s BBS contributions

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

## CRTEDIT

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

## DBCHECK

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

## DUMpload

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

## ERP

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

## FILEMNGR

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

## FTNCVT

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

## Games

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

## Glossary

Glossary is a program from John Grant that builds a list of words used in a document and shows where they are used. 616 blocks.

## IMSLUTIL

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

## JAG\_UTIL

JAG\_UTIL consists of several programs: Filecount, Userspace, Scan, and Laminate. 1,501 blocks.

## Kermit

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

## Logout

Another auto log-out system. 246 blocks.

## Look

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

## Macbook

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

## MENUDIR

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

## Misc Kerm

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

## QHelp

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

## SKLSCRN

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

## Softrans

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

## SWITCHES

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

## TEX 2.25

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

## VT100KER

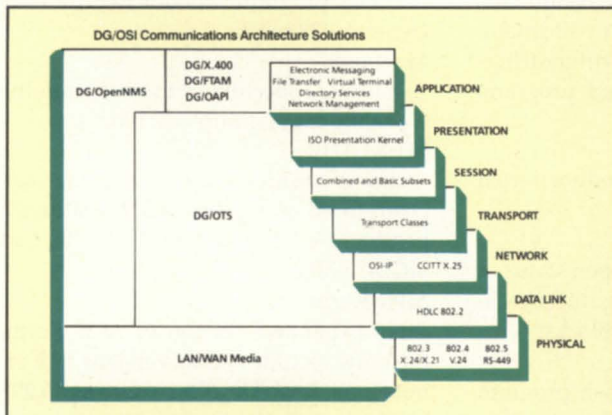
VT100KER is the VT100 emulator from John Grant. 1,135 blocks.

## Xfer

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

## New DG/OSI products part of strategic triad

Westboro—Data General expanded its line of software based on the Open Standards Interconnection (OSI) model with the announcement in February of DG/OSI Communications Architecture. OSI is Data General's key connectivity strategy.



DG/OSI Communications Architecture is designed to help customers work with different brands of computers in one environment. The new product suite implements the seven-layer OSI model for communications developed by the International Organization for Standardization, and includes the following products:

- DG/File Transfer, Access, and Management (DG/FTAM), a software package that lets DG users on an OSI-based system perform file transfers with other systems that comply with the same specifications;
- DG/OSI Applications Platform Interface (DG/OAPI), a toolkit for value-added resellers and sophisticated users to create OSI applications that can communicate across mixed networks;
- DG/OSI Transport Services (DG/OTS), a superset of the XODIAC transport services that provides routing and end system transport services over local and wide area networks;
- DG/Open Network Management System (DG/OpenNMS), a software package introduced in 1988 that provides network monitoring and control for DG/OSI Communications Architecture, DG Xodiac networking architecture, the DG/

PC\*I platform, and user-developed network applications.

• DG/X.400, an OSI-compliant message handling system announced in March 1987 that allows DG CEO office automation users to transfer messages and documents to users operating on other OSI X.400-compliant systems.

"Introducing DG/OSI Communications Architecture is the next step to multivendor interoperability—aimed at letting customers connect, interoperate, distribute, and manage applications and files among equipment from various vendors," said Joseph Forgione, Data General's director of Communications Product Marketing.

According to Colin Crook, senior vice president for the Communications Systems Group, DG regards OSI as part of a standards triad that also includes ISDN and SAA.

"As a full service communications and computing supplier, we are committed to providing effective combinations of these three standards in the form of products and systems," said Crook.

"In addition to OSI, SAA and ISDN (integrated services digital network), we believe TCP/IP (transmission control protocol/interactive protocol) will remain a strong de facto networking standard well into the 90s," said Forgione.

DG/FTAM requires DG/OTS, DG/OpenNMS, and AOS/VS II. Available in the fourth quarter of 1989, DG/FTAM pricing will range from \$1,500 for an MV/1400 to \$17,400 for an MV/40000 HA Model 4.

DG/OAPI, a library of C language subroutine calls, requires DG/OTS and AOS/VS II. Available in the fourth quarter of 1989, it will be priced from \$2,500 for an MV/1400 to \$29,500 for an MV/40000 HA Model 4.

DG/OTS requires AOS/VS II. Also available in the fourth quarter of 1989, its pricing will range from \$900 for an MV/1400 to \$10,440 for an MV/40000 HA Model 4.

The DG/OpenNMS software package requires Xodiac Transport Services II (XTS II) and AOS/VS II. Available now, its price

varies depending on network configurations. The network management package, required for all DG/OpenNMS networks, is \$10,000. Additional pricing ranges from \$150 for an Eclipse MV/1400 to \$1,740 for an Eclipse MV/40000 HA Model 4.

Also available now, DG/X.400 requires CEO, XTS, and AOS/VS. It is priced from \$1,375 to \$15,950, depending on CPU class.

Data General Software Products and Services Division, 3400 Computer Dr., Westboro, MA 01580. △

Circle 75 on reader service card.

## More security for Datalynx' Guardian

San Diego—Datalynx, Inc. has released an updated version of Guardian, an AOS/VS access control and security system.

In Guardian 2.0, users are required to change their passwords on a regular basis, and re-use of old passwords is not allowed. Over 200,000 English language password phrases may be created. Users can create their own passwords, or use the password generator.

Guardian uses a single profile screen/window to set and control a user's system privileges. Default values may be changed using any existing profile as a template, or by changing single items. The number of controllable user privileges has increased from 47 to 61 in the new revision. These include:

- For users of XODIAC, 2.0 adds a profile field that specifies the host names of all processors to be updated when a profile is changed;
- Another new field allows specification of consoles not available to a profile;
- Another field permits limitation of the number of concurrently active jobs a username may have running.

Guardian 2.0 enhances its control over the time windows when users may log in a system by allowing definition of primary and secondary days of the week, and by sending a warning message to users already on the system whose time window has closed.

Datalynx, Inc., 6659 Convoy Court, San Diego, CA 92111; 619/560-8112 △

Circle 76 on the reader service card

## DG announces ESP analysis tool

Westboro—Data General Corp. has announced an enhanced statistics package (ESP) to help customers do their own system analysis on MV computers under AOS/VS and AOS/VS II. It is targeted at end users and VARs who need to analyze performance data on multiple MV systems. The software was developed by Data General's Systems Evaluation and Performance Center (SEPAC) based in Norcross, Georgia.

"With ESP, Data General now offers Eclipse MV family customers the same set of tools that SEPAC performance experts have been using to analyze and increase system efficiency," said Ed Conner, director of DG's Software Products and Services Division.

ESP consists of three components: data collection, a comprehensive statistics package, and the AOS/VS data analysis environment. The data collection software is used to gather raw performance data at the customer site. Using this information, SEPAC generates a statistics package that includes reports, charts, and color graphs of AOS/VS system performance during the data collection period.

Pricing for ESP services varies according to the customers' configuration requirements. DG is offering a number of support options through SEPAC, including telephone support services, software trouble reporting, technical consulting, and seminars.

*Data General Software Products and Services Division, 3400 Computer Dr., Westboro, MA 01580.* Δ

Circle 77 on the reader service card

## Threshold announces Screen Demon 2.0

Auburn, AL—Threshold, Inc., has released revision 2.0 of Screen Demon, a pop-up window package for AOS/VS. The routines can be linked with COBOL, ICOBOL, C, or Assembler programs to provide pull-down menus, a pop-up calendar, a notepad, electronic mail, and hot-key access to other programs. Screen Demon also provides a redraw screen key

and the ability to print screen images to a system printer or to a disk file.

According to Mark Painter, Threshold's president, this new revision adds a number of supervisory functions to Screen Demon. "A system manager or support person can call up a copy of the screen currently displayed by programs running on other terminals. From that point, the

remote user's screen can be monitored in real time," he said. Screen Demon can also write a copy of all terminal output to disk.

Revision 2.0 provides automatic termination of inactive programs and remote termination of programs from any terminal on the system. Both types of termination provide an orderly shutdown with

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no file corruption. With Screen Demon, ICOBOL users have the same ACCEPT with time-out capability as 32-bit COBOL.

Interfaces to both Wordperfect and CEO help integrate existing or new applications. Screen Demon is available for AOS/VS ICOBOL 3.20 or higher and ICOBOL 1.40 or higher. Cost is \$950.

*Threshold, Inc., 165 E. Magnolia Ave., P.O.*

*Box 165, Auburn, AL 36830; 205/821-0075.*

△

Circle 78 on the reader service card

## Infodex has Resource ICOBOL decompiler

Guttenberg, NJ—Infodex announced plans to service customers using Resource,

a decompiler for Data General's ICOBOL, beginning in March. Resource will be offered initially as a service for end users with missing or out-of-date source for their ICOBOL applications. Infodex expects to release the product later for use by value-added resellers (VARs).

Resource runs on the firm's MV/7800 XP under AOS/VS, and reconstructs compilable source code from PD and DD binary object files. Infodex will attempt one-day turnaround, accepting object files as input and returning source code suitable for editing and recompiling. Don Klein, company president, said he expects to have an enhanced version of Resource available by license sometime this year.

Infodex, a consulting firm, has been in the end user support business since 1984 and is the originator of Macrolock, a utility that safeguards proprietary software from unauthorized copying and tampering without requiring a hardware locking device.

The Resource service is priced from \$250 up.

*Infodex, 7000 Boulevard East, Guttenberg, New Jersey 07093-4808; 201/662-7020.* △

Circle 79 on the reader service card

## Rational Data Systems signs NE distributor

Pasadena, CA—Rational Data Systems announced an agreement with TLC, Inc., of Hopedale, Massachusetts, for the distribution of RDS's PC integration products in New York and New England.

TLC Systems is a software services and consulting company that specializes in application integration from PCs to minis and mainframes.

The RDS products distributed by TLC Systems include: Popterm, a memory-resident D410 terminal emulator; PC/VS, a high-performance LAN-based package; PC/Remote, for low-cost asynchronous applications; Netlink, an add-on product for Data General's PC\*I platform; and PC/Mail, for PC-based CEO-compatible electronic mail.

*Rational Data Systems, 150 South Los Robles Ave., Pasadena, CA; 818/568-9991. TLC Systems, Inc., 5 Airport Dr., Hopedale, MA 01747; 508/478-8211.* △

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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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Two computer industry veterans recently joined the Data General fold. **Angelo Guadagno** was named vice president of the North American Sales Division. Guadagno joined Data General from **Apollo Computer, Inc.**, where he served four years as vice president of sales, technical support, field marketing, and national accounts for all Apollo products and services in North America. Previously, he worked for **Digital Equipment Corporation** for 16 years in a number of senior sales management positions.

Guadagno replaced **Frank Keaney**, who was named vice president of a tactical marketing group focused on Eclipse MV family systems.

**Data General** is expanding the scope of its Software Business Unit and has tapped **Joel Schwartz** as the unit's new vice president. Schwartz, 46, is the former president and chief operating officer of **Polygen Corporation**, a developer of software applications for the chemical and pharmaceutical industries. He was also formerly associated with DEC, where he served 18 years in a variety of senior marketing, sales, and general management positions.

The Software Business Unit is Data General's focal point for software business strategy and execution. It is responsible for recruiting third-party system-level and applications software in the company's targeted vertical markets of government, manufacturing, legal, and financial services.

Schwartz and Guadagno will report to **Herbert J. Richman**, executive vice president of marketing and sales.

**Holland & Hart**, a Denver-based law firm with 225 attorneys, will install a computer system to integrate both word and data processing, providing information to eight offices from the Rocky Mountains to Washington, D.C., according to an announcement from Data General.

The system, valued at \$2 million, will include a network of over 250 PCs with dual Data General MV/20000 Model 1 computers serving as hosts in the Denver office. The PCs in each branch office will be networked to the Denver office via a LAN/WAN (local area network/wide area network) communications bridge. Data General's network services organi-

zation will provide the network planning and design, and complete installation.

Holland & Hart is one of the largest Data General PC\*I installations in the legal market to date. DG/PC\*I allows a network of personal computers to share data, applications, and peripherals by using any of the MV series computers as servers.

Data General has joined the **OSI/Network Management Forum (OSI/NMF)**, based in Bernardsville, New Jersey. Focusing on the delivery of interoperable network management systems, OSI/NMF is creating management specifications based on the Open Systems Interconnection (OSI) model.

"In a technology field that is relatively embryonic in its development, a collective effort aimed at delivering interoperable OSI-based network management systems has great practical value to Data General and its customers. Our decision to join OSI/NMF is yet another key element in our commitment to an open network management system," said **Bharat Mehta**, manager of the Data General Network Systems Group.

This announcement follows on the heels of the introduction of the DG/Open Network Management System (DG/OpenNMS), a software package that provides network monitoring and control for DG/OSI communication architecture, Xodiac networking architecture, the PC\*I platform, and user-developed network applications.

"Moving into the Information Age: Integrated Telecommunications Services and Networks" was the theme of Data General's exhibit at Asia Telecom '89 in Singapore.

Asia Telecom '89 is a worldwide user and application-oriented exhibition and forum organized under the auspices of the **Telecommunications Authority of Singapore (TAS)** in cooperation with the **International Telecommunications Union (ITU)**. The event brought together communications users and providers from 164 countries. The Data General booth featured on-line demonstrations of value-added data exchange, voice/data/video applications and transport, network-wide

information access, and open network management.

"These technologies are under development in Data General's laboratories worldwide and are being coordinated in Singapore through the Asian Software Development Center," said **Colin Crook**, senior vice president of the Communications Systems Group. "They are building blocks that will allow Data General to provide service platforms to strategic partners."

Two Data General customers were recently recognized for outstanding achievement in system design.

The Awards for Achievement in Managing Information Technology honor individuals who have made outstanding contributions to their organizations through the use of information systems and communications technology. One of five system designers honored this year is **Phylliss Gardner**, director of the Office of Management Programs in the Civil Division of the **U.S. Department of Justice**.

Gardner implemented a network of terminals on dual local area networks that allow attorneys to share files and office workers to perform word processing. The result has been a 27 percent improvement in clerical productivity and a \$29.4 million savings over six years. The network consists of IBM PCs and DG/One 2Ts linked to Data General MV minicomputers, IBM S/38s, and Amdahl mainframes. The network is used by 2,400 workers located in 10 buildings in Washington and 35 field sites nationwide.

The **St. Louis County Police Department** earned a \$100,000 grant from the 1988 Innovations in State and Local Government Awards Program for its Computer Assisted Report Entry (CARE) Program. CARE was developed and implemented on the department's Data General computers.

With CARE, police officers complete their duty reports faster. It also gives police field commanders quick access to the latest statistical data. The CARE program has reduced by nearly 80 percent the amount of time the police officers spend writing reports.



# Gilt-Edge Security: Memory from Dataram

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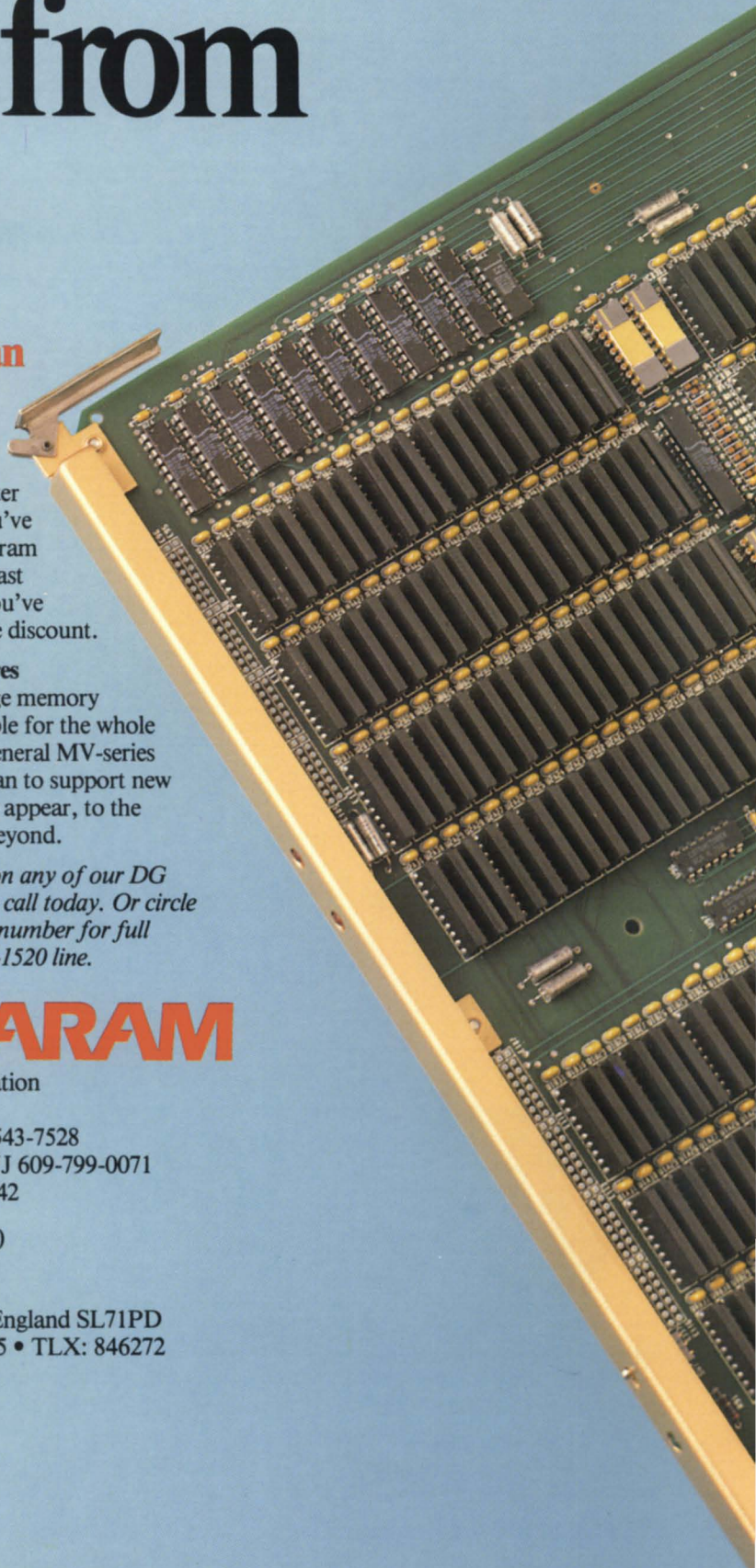
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