

# FOCUS

The Magazine of the North American Data General Users Group

## ArchitEXT Digest

VOL. 1, NO.1

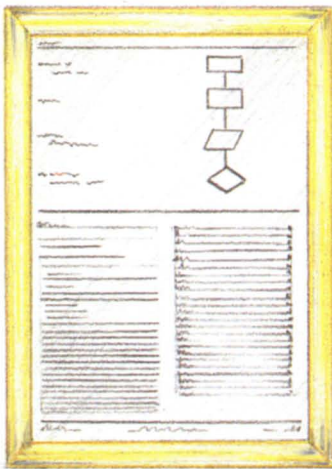
The latest in document processing

JUNE 1990

### Preview FRAMEMAKER

Publishing software coming soon to all Aviiion customers

By September, all Aviiion customers should have a copy of Framemaker 1.3, a professional-level



workstation publishing software. According to Data General Software Product Manager Brigitte Casamy, this promotion will give Aviiion customers "a chance to get to know Framemaker and fall in love with it."

Certainly Framemaker is getting rave reviews among the users we interviewed. See page 18

### Office/Publisher on the MV

A hospital's cure for publication needs

When Memorial Medical Center (MMC) purchased Intercon's Office/Publisher in January of this year, the hospital management was initially concerned

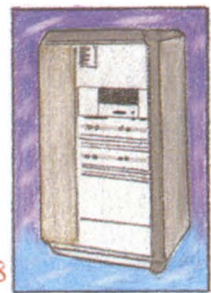


### Also inside:

**CPU on a chip is finally here!**

MV colors for the '90s  
IN: Battleship gray  
OUT: Putty

58



**New. Improved. Old-fashioned.**  
The NADGUG roster!

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**9600bps modems in a word: fast**

32



**Plus, BJ's definitive answers to the two most often asked questions**

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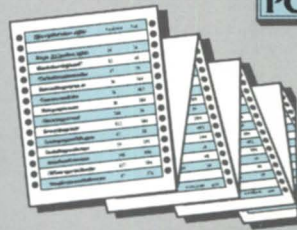
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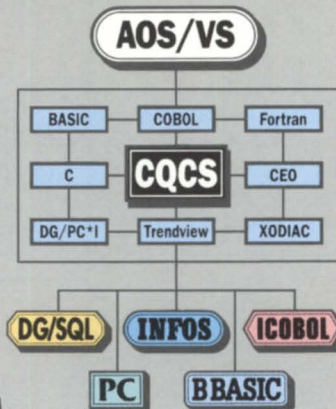


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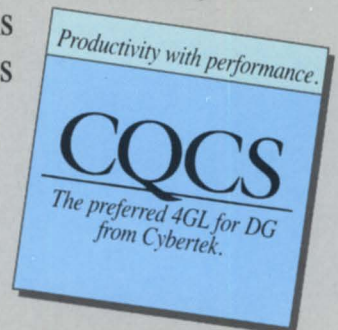
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MIGRATING TO AVIIION

## EDITOR'S NOTE

**Paper trail**  
by Robin Perry

## GUEST EDITORIAL

**Share the wealth of knowledge**  
by Ed McManus

## ROUNDUP

**New SIG gigs**  
Calling all healthcare and local government employees  
by Greg D. Goss

## NADGUG ROSTER

Current listing of the NADGUG Executive Board, regional, special, and international groups

## BULLETIN BOARD

Bits and bytes from the bulletin board

## RECRUITING

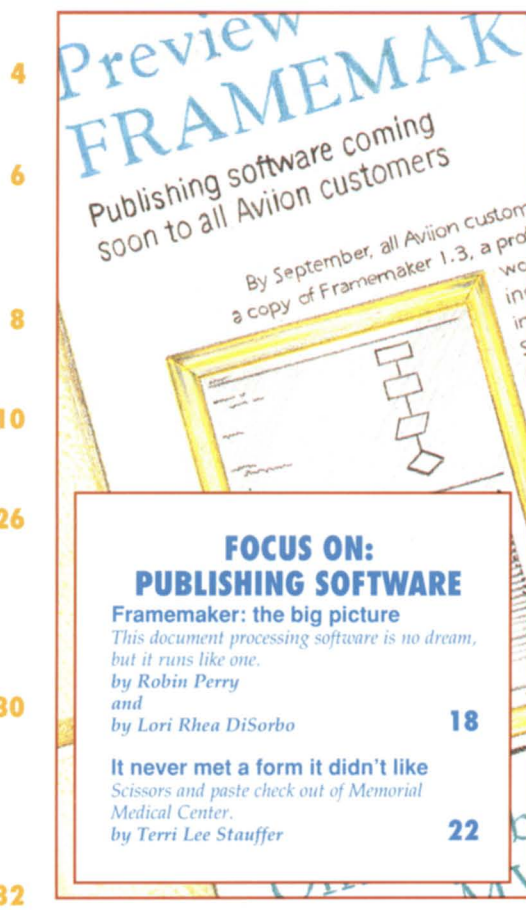
**Farewell to the Class of '90**  
As hardware vendors sit out a semester, new talent is lost to competitors. An MIT career services director suggests that recruiters do their homework before returning to campus.  
by Seemee Ali

## COMMUNICATIONS

**The fast lane**  
9600 bps modems are smarter and faster than their predecessors. In this comparison of models, the author finds that modem operators have to be smarter too.  
by Rainer McCown

## SYSTEM MANAGER'S LOG

**A call for action**  
If the MV cash cow dries up before DG's Unix business becomes profitable, then DG has effectively bet the company on Unix and lost.  
by Brian Johnson



**Preview FRAMEMAK**  
Publishing software coming soon to all Avion customers

By September, all Avion customers will have a copy of Framemaker 1.3, a professional word processing software.

**FOCUS ON: PUBLISHING SOFTWARE**

**Framemaker: the big picture**  
This document processing software is no dream, but it runs like one.  
by Robin Perry and Lori Rhea DiSorbo **18**

**It never met a form it didn't like**  
Scissors and paste check out of Memorial Medical Center.  
by Terri Lee Stauffer **22**

## UX VS. CLI

**Anatomy of a macro**  
In both Unix and CLI, arguments must "find themselves" before they can proceed with their basic functions—in this case, displaying a menu.  
by John Huddleston **44**

## DISCOVERIES

**Space savers**  
Utilizing Infos options like space management, and record or key compression can save time and disk space, at nominal costs.  
by Jim Siegman **46**

## SOFTWARE LIBRARY

A complete listing of the NADGUG software library **49**

## SCREEN TEST

**D:driving Miss Daisy**  
D:drive's winning qualities include true file redirection, file locking, flawless emulation, and peripheral sharing between PCs and MVs.  
by Tim Boyer **50**

## THE WORKSTATION

**A better API**  
While it might be reasonable to move an application and even an application programmer from AOS/VS to MS-DOS, there is still a big hole: "comms" stuff.  
by Doug Kaye **54**

## PRODUCTS AND SERVICES

The latest products for DG systems **58**

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Who to call for information about NADGUG and Focus **62**

## PRISM

Brief news from the DG community **64**

Cover illustration by Eliz. Soto

Focus, the Magazine of the North American Data General Users Group (ISSN 0883-8194) is the official monthly publication of the North American Data General Users Group (NADGUG) in cooperation with Turnkey Publishing, Inc.

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**NORTH AMERICAN  
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# You didn't buy the wrong hardware. You bought the wrong software.

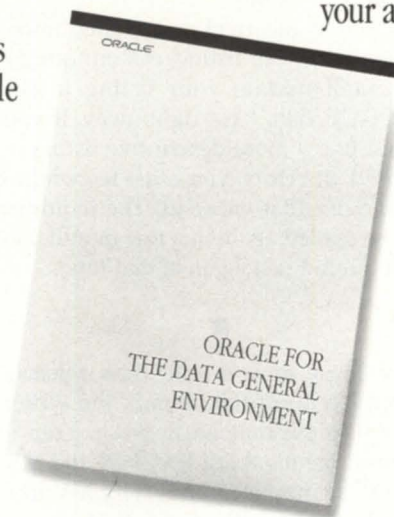
If you're a Data General user, you've got a lot invested in your MV system. Now, with Data General investing heavily in UNIX on AViiON systems, you're concerned about how to integrate DG's UNIX technology with your MV system today. The answer is ORACLE.

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	San Diego	May 15p
	San Francisco	June 13fp
	Santa Clara	May 2fp
		June 11cf
CO	Colorado Springs	May 8
	Denver	May 16c
CT	Farmington	June 21f
DC	Washington	May 8*
		June 12*
FL	Fort Lauderdale	June 13c
	Indialantic	May 22*
	Tampa	June 14c
GA	Atlanta	May 24* June 7c
IL	Chicago	June 6f#
		June 13f June 26*
IN	Indianapolis	June 19f
KS	Wichita	May 3
LA	New Orleans	May 11f
		June 15c
MA	Boston	June 12f
	Worcester	June 19f
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	Troy	June 14f
MN	Minneapolis	May 1f
MO	Kansas City	June 12f
	St. Louis	May 8fp
NE	Omaha	May 9 June 28*
NH	Merrimack	May 3f
NJ	Iselin	May 8f
		May 29c June 12f
NY	Buffalo	May 3p
	Melville	June 13p
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	Syracuse	June 14cf
OH	Cincinnati	May 3f
	Cleveland	May 1f
	Columbus	June 6f
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PA	Philadelphia	May 2f
	Pittsburgh	June 5f
TN	Nashville	June 12c
TX	Austin	June 8c
	Dallas	May 10cf June 12cf
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WA	Seattle	May 15f June 12c
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## CANADIAN SEMINARS

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OG FOCUS



## Paper trail

Purists in the publishing world will tell you that there is no such thing as desktop publishing. After all, you're not publishing *desktops*, are you? They'll rant about the differences between publishing (distributing information) and typesetting (composing). In my opinion, they're missing the point.

My own experience with desktop publishing began when I was in the fourth grade. Only my desk was made of wood, and it was painted red. I published a one-page newspaper for the other kids on my block. It was a labor-intensive job. I wrote the articles long-hand, and on foot delivered the "Wedgwood Warbler" to my neighbors.

It wasn't that long ago, friends, that I created the little newspaper. I can't wait to see the products of *my* children's desktops.

You can still produce a document by hand, but products like Framemaker from Frame Technology, Inc. make publishing of printed matter easier than ever before. New people at all levels are composing and distributing printed material. In the eighties, we were told about the revolutionary paperless office of the future. The paperless office is a myth. Humans will never get the same emotion from a screen as they do from a piece of paper. The real revolution has taken place in the publishing software.

When we planned this close-up look at publishing software several months ago, we did not know that Data General would be giving away copies of Framemaker 1.3, a combined word processor and document processing software, to every Aviiion customer. On page 18, we have reactions from some of the first Aviiion customers to use this state-of-the-art software, which was still in beta testing when the article was written.

We also examined a document processing product from Intercon Associates,

Office/Publisher. On page 22, you can read how a hospital uses its MVs and PCs to produce professional forms and other short documents.



The NADGUG staff appreciates all the comments that have been received on the 1990 NADGUG member directory. If you are a NADGUG member, you should have already received your copy of the new directory. A limited number of directories is available for purchase by non-members.

Some people wondered why there wasn't more information included with their listing. The information for each listing was gathered from response cards mailed to all NADGUG members. If we did not receive a response from you, we couldn't include any additional information in your listing.

If there is incorrect or outdated information with your listing, call our offices, and we'll update your listing in the NADGUG data base right away. If you would like a more descriptive listing in the 1991 directory, you must respond to the inquiry that we send. The inquiries will be mailed again in a few months, so we'll remind you again at that time.



For those of you who miss Michael Dupras' column this month, the writer asked us to say that, no, he was not reprimanded for his April spoof on the MV/88000, a completely *imaginary* MV machine based on 88K processor chips. He merely needs a vacation, and will return next month. An unfortunate typographical error appeared in his April article. Figure 1, which should have been labeled "MV/88000" processor board, was labeled "MV/8000." As you know, the MV/8000 is a completely *real* machine. Δ

# FOCUS

The Magazine of the North American  
Data General Users Group

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# TODAY'S TOP NETWORK NEWS.



*New SmartTerm 470 for File Servers is the first terminal emulation software to provide multi-user access to DG hosts. Now PC users on networks have even more to gain with SmartTerm 470.*

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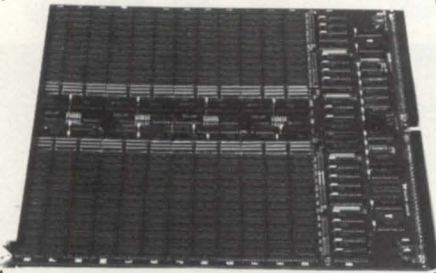
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## GUEST EDITORIAL

# Share the wealth of knowledge

Ed McManus  
Special to Focus

For the first time in Data General's history, its VARs, users, and sales and systems staff will be brought together in one city. I was recently asked by the *Focus* staff to describe from a Data General perspective the benefits of this joint gathering.

To show you what we expect to gain, I'd like to use an example. Traditionally, Data General has held sales kick-offs for its U.S. Sales & Service Division (USSD) in three or four different parts of the country. Last year, we coordinated these regional meetings into a single, national event. Sales and systems people from across the country networked with each other and heard from senior management, and R & D and marketing staff. The national sales kick-off was an incredible success. It exceeded any of our expectations. So when we heard about the possibility of bringing not only sales staff together at a national meeting, but also users and VARs, Data General groups were ecstatic.

We view the 1990 conference as a share the wealth experience in terms of knowledge. The advantages of bringing sales, marketing, development staff, and management together are multiplied with the participation of VARs and end-users. There is a tremendous amount of know-

ledge to be shared and gained at these meetings.

"United for the Nineties," the overall theme for the three conferences, really says it all. The conference of the North American Data General Users Group (NADGUG) will take place concurrently in Seattle, Washington with Data General's two major conferences, Source '90 (the worldwide reseller conference), and USSD. Source '90 will take place October 21-24, the NADGUG conference October 22-25, and USSD October 20-22.

While all three groups will have opportunities to interact, the programs for each conference will occur at different times and in different facilities to maintain a degree of privacy and integrity.

Bringing the three groups together will be social events and an exhibit open to all. It is at these events that we anticipate members of each group can meet and share information about products, services, and ways we can all work together more effectively.

Data General is extremely excited about the opportunities these joint conferences present and hopes that you are too. We are committed to making it a success for everyone involved.  $\Delta$

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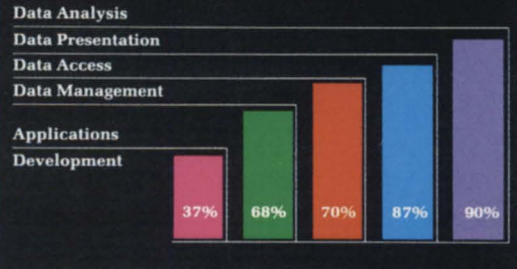
*Ed McManus, a Data General employee for 19 years, is the director of Data General Sales Support.*

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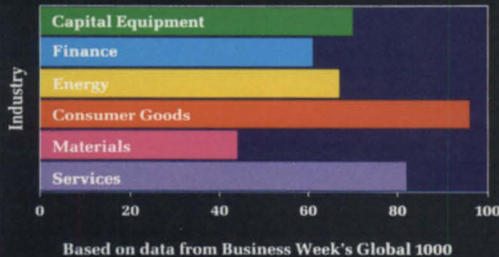
## Major Applications of the SAS System

Based on User Survey



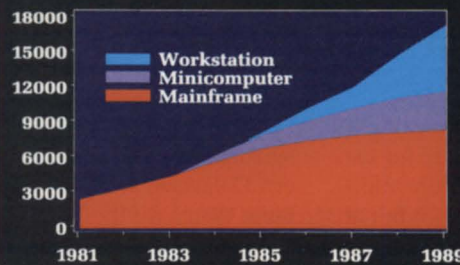
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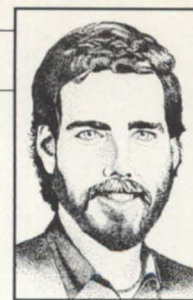
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The SAS System runs on mainframes, minicomputers, workstations, and personal computers.

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# New SIG gigs

## Calling all healthcare and local government employees

Efforts are underway to form two new special interest groups. If you work in the healthcare industry, contact **Bill Stranges** of Cain Associates. He is organizing a special interest group specifically for users in the healthcare field. For more information on this SIG, you can reach Bill at 718/448-8024.

Are taxes, billing, and other areas of municipal government part of your daily workload? Then you may be interested in joining a new group for those who work in local government. For additional information, contact **Kent Finkle** at Town Hall in North Andover, Massachusetts at 508/682-6483 or **John Teekell** of County Management Information Systems in Fayetteville, Arkansas at 501/575-5748.

These two groups are in the planning stages. Please reward the efforts of your fellow NADGUG members by participating. If there is enough interest, these groups can become full-fledged NADGUG special interest groups, with many benefits to members.

Groups that are officially recognized by NADGUG are listed in the regional and special interest group roster, which is updated and published semi-annually in *Focus*. (See pages 10-15.) Use this roster to locate the group in which you are interested. If there is no group that suits your needs, or if you are interested in starting a special or regional interest group, please contact me at the number below.

■

The **Tri-State Area Data General Users Group (TADGUG)** has scheduled its next meeting for June 20, at 1:30 p.m.

Hosted by the Data General offices in Blue Bell, Pennsylvania, the meeting topic is "Asynchronous Networking through LANs." Anyone from the eastern Pennsylvania, southern New Jersey, or northern Delaware areas is encouraged to attend. Watch for the TADGUG newsletter, as plans for publishing are underway. For more information on TADGUG or the June meeting, contact **James L. Linville** of High Industries, Inc. at 717/293-4444.

■

The **Southeastern New England Users Group (SEARIG)** held its spring meeting on April 18 in Brockton, Massachusetts. Focusing on disaster recovery, the program featured **Joe Cannata**, systems training specialist with Data General's Educational Services Group. A frequent presenter at NADGUG, Joe has written several articles for *Focus* magazine, and is often called in for disaster recovery consultation. Examining disaster recovery in the real world setting, Joe spoke on how to put together contingency plans, ways to make recovery easier, pitfalls to avoid, and how to get your system back on track quickly and painlessly. Also included in the program was a demonstration of Novell's Portable Netware on DG's Aviiion computer system.

The next meeting, scheduled for June 6, will feature a speaker from DMS Systems. For more information on this meeting or on the Southeastern New England Users Group, contact **Richard Wind** of South Shore Packing at 617/587-6900, extension 265.

■

The **Data General Users of Indiana** hosted a dinner meeting April 18 in Indianapolis. Guest speaker for the meeting was **Michael Duke**, senior computer audit specialist for Coopers and Lybrand. Mike spoke on internal controls for MIS, and covered such topics as disaster recovery planning, security, backup procedures, and documentation. For additional information on this or future meetings, contact **Nancy Miller** of CIC Enterprises at 317/253-1711.

■

The April meeting of the **Los Angeles End Users of Data General Equipment (LA EDGE)** was the annual "DG Night." Displays by Data General of the latest in hardware and software delighted the crowd. DG also spoke on the current status of the company and what lies ahead for the future.

LA EDGE will hold its next meeting at the Brookside Country Club in Pasadena, Tuesday, June 5 at 7 p.m. Accounting software will be the theme of the meeting. Dinner will be served prior to the evening presentations made by MCBA and Computer Associates.

For more information on this meeting or on LA EDGE, contact **Mark Speer** at 818/897-7777 or **Carolyn Naber** at 818/793-2141. Δ

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*Greg D. Goss is the RIG/SIG coordinator for NADGUG. He may be reached at Focus magazine, 4807 Spicewood Springs Rd., Suite 3150, Austin, TX 78759; 1-512/345-5316 or 1/800-USR-GRUP.*

---

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Note: Managers received a 10% increase.  
Others received a 5% increase.

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Tommie Allison	M	SECRETARY	8/19/81	\$ 5.80	\$ 6.09
Elizabeth Hills	F	SECRETARY	1/14/82	\$ 7.25	\$ 7.61
Nicole [unclear]	F	SECRETARY	0 [unclear]	\$ 6.50	\$ 6.82
[unclear]	F	SECRETARY	0 [unclear]	\$ 6.00	\$ 6.30
[unclear]	F	SECRETARY	05/24/78	\$ 12.50	\$ 13.75
Emma Lee [unclear]	F	MANAGER	12/0 [unclear]		

**DEPARTMENT 10 SUMMARY**

	Hourly Rate	Annual Salary
Total Old Rate	\$ 84.60	\$ 175,968
Total New Rate	\$ 89.75	\$ 186,680
Average Salary		\$ 14,360
Number of Employees	13	

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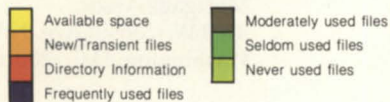
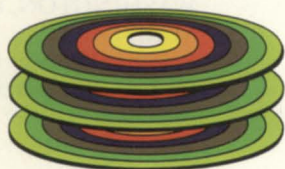


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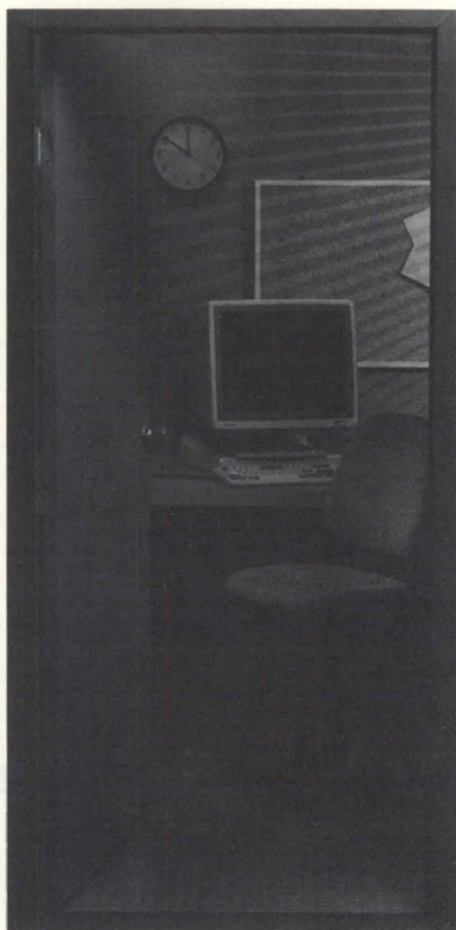
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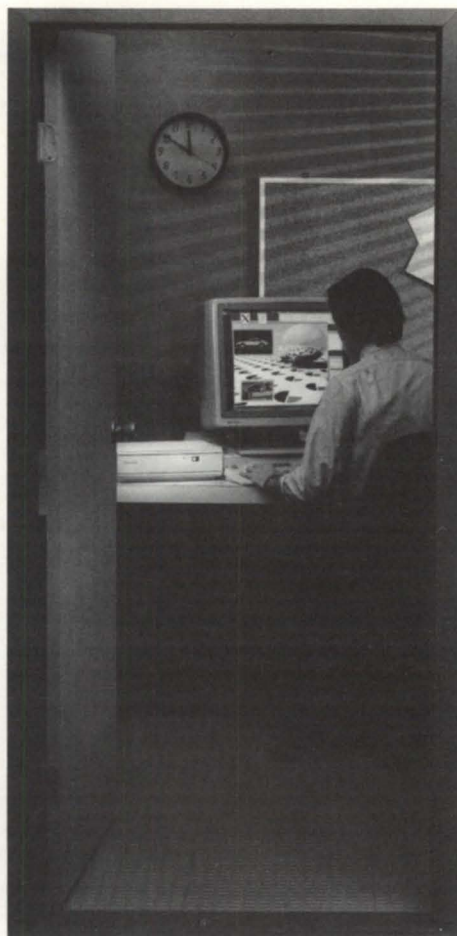


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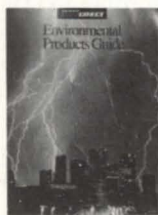
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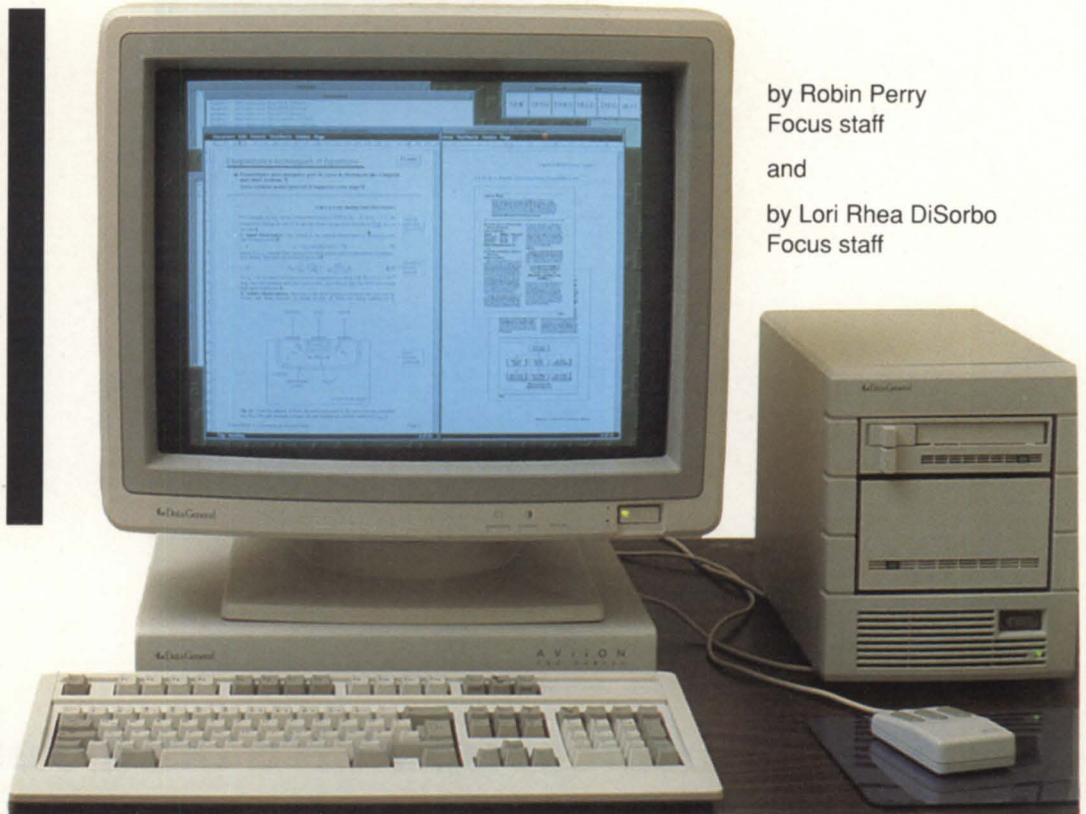
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## SYNOPSIS

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by Robin Perry  
Focus staff

and

by Lori Rhea DiSorbo  
Focus staff

**B**y September, all Aviiion customers should have a copy of Framemaker 1.3, a professional-level workstation publishing software. According to Data General Software Product Manager Brigitte Casemyr, this promotion will give Aviiion customers "a chance to get to know Framemaker and fall in love with it."

Certainly Framemaker is getting rave reviews among the users we interviewed, who are seemingly enraptured by the combined word processor, text layout, and graphics software from Frame Technology Corporation. Founded in 1986, this relative newcomer to the document processing world threatens to exceed the popular standbys Ventura Publisher and

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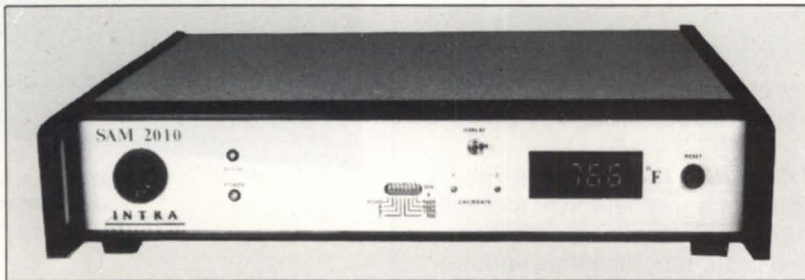
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Interleaf Publisher, and was recently proclaimed the next "King of Unix Desktop Publishing" by *Unix World* magazine.

Version 2.0 of Framemaker, already available on PCs and Sun Unix workstations (Framemaker's Unix platform of choice), is a more powerful program with over 100 enhancements over the earlier version. A DG-specific version of 2.0 with enhanced filters and fonts is currently under development, Casamyr said. A filter is a program that converts a text or image file from a particular format to a standard format recognizable by Framemaker. Fonts are assortments of given sizes of type, including capitals, lower-case, punctuation marks, italics, etc.

### Users respond

For want of fonts, Mary Falk would have already discarded her PC-based Wordperfect and Pagemaker document processing system in favor of Framemaker on the Aviion.

Falk, a technical writer for Data Systems & Management (a DG value-added reseller based in Minneapolis), uses Framemaker to produce technical manuals for her company's wholesale distribution software, WDS-II. Using Xwindows on the Aviion, she views several screens at once, and captures text and graphics from software running on both the Aviion and standard (Unisys) terminals.

At the time of our interview, Falk had been using a beta version of Framemaker 1.3 for the Aviion for approximately six weeks. Having worked with document processors like Ventura and Interleaf, as well as with Unix operating systems, she had no trouble learning to use the new software.

"Functionality wise, we pretty much learned it ourselves, but when we had problems, we were able to call Data General in Minneapolis and get help almost immediately. Their support has been excellent," she said. A co-worker who was not familiar with Unix also found Framemaker easy to learn. "She had more experience with DOS systems, but she was able to learn it quite quickly—and she was pretty nervous about it. She was pleasantly surprised. I would say that the user interface on Framemaker is real good for a beginning Unix user."

Especially useful has been Framemaker's text anchor option, not available on Pagemaker, with which "you

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are able to place a specific graphic at a specific spot on the text, and no matter how that text flows—if it flows to another page or if it goes back a page—that graphic will always stay right with that text," Falk said.

Falk says that Framemaker compares favorably with the other document processing systems she has used, with a major exception: fonts. Under Framemaker version 1.3, fonts and font sizes are limited. "You can only go up to 36 point, and the smallest size you can get is 10 [point]. That's not really an adequate font range."

With Framemaker's features like spell check and search and replace, she no longer needs a separate word processor like Wordperfect. Eventual plans call for the phasing out of Pagemaker altogether, but that won't happen at least until version 2.0 is ready for the Data General system.

"We really need version 2. We're assured it's getting a high priority at Data General. DG is working very closely [with Frame] to adapt Framemaker for the Aviion. That's one of the conditions under which we bought it."

Other Aviion/Framemaker users we interviewed were at Data General in-house installations. Production Editor Regina Zelaya, of the International Documentation Department, uses Framemaker to design and translate documents, including graphs and tables. Previously, this task was a convoluted process requiring different computers and software, even swapping of keyboards. Now all the work is done on the Aviion.

"We've been bringing documents from different systems . . . [and] converting them to work on Framemaker," she said. The original text is in varied forms—Wordperfect, ASCII, Interleaf—which are converted through Frame's Maker Internal Format (MIF). Framemaker has special options for translation work, including a built-in keyboard with all the international characters.

Robert Cousins, department manager of Data General's workstation development group, uses Framemaker to create slides, technical documents, presentations, and diagrams. Even so, he feels he has only begun to tap the many available tools. "One of its strengths is that you can learn to do useful things in a short period of time," he said, even if you don't know all the features. Δ

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# Physicians B U L L E T I N

## It never met a form it didn't like

*Scissors and paste check out of Memorial Medical Center, where installation of Office/Publisher has improved productivity and profitability of the public relations department.*

### SYNOPSIS

by Terri Lee Stauffer  
Special to Focus

When Memorial Medical Center (MMC) purchased Intercon's Office/Publisher in January of this year, the hospital management was initially concerned. Would they realize a cost savings? Would they secure a return on their investment? Did they want a desktop publishing product for the mainframe, or the personal computer?

Memorial is just beginning to explore PC/mainframe possibilities. Since 95 percent of MMC's office automation users access Data General's CEO system, Office/Publisher (integrated with CEO) is a logical choice. Users can share documents via a CEO terminal or printer.

MMC generates a number of documents. Many of the hospital's departments educate their patients with monthly newsletters. Upon discharge, patients receive guidelines on diet and exercise, and flyers that announce health seminars. Brochures and handouts are disseminated at seminars. Forms exist for everything: patient questionnaires, consent forms, confidentiality forms, medical record forms . . . the list is endless.

MMC's Public Relations Department produces the majority of these documents. It manages the hospital's public image and issues press releases. Hospital policy ensures that any information intended for

distribution outside of the hospital must be processed through the P.R. Department. P.R. representatives work full time to meet these needs. Before Office/Publisher, they used Wordstar on a PC, manipulated text with scissors and paste, and sent out the final draft to be typeset and printed. For MMC, Office/Publisher's ability to produce this considerable number and variety of documents is its greatest advantage.

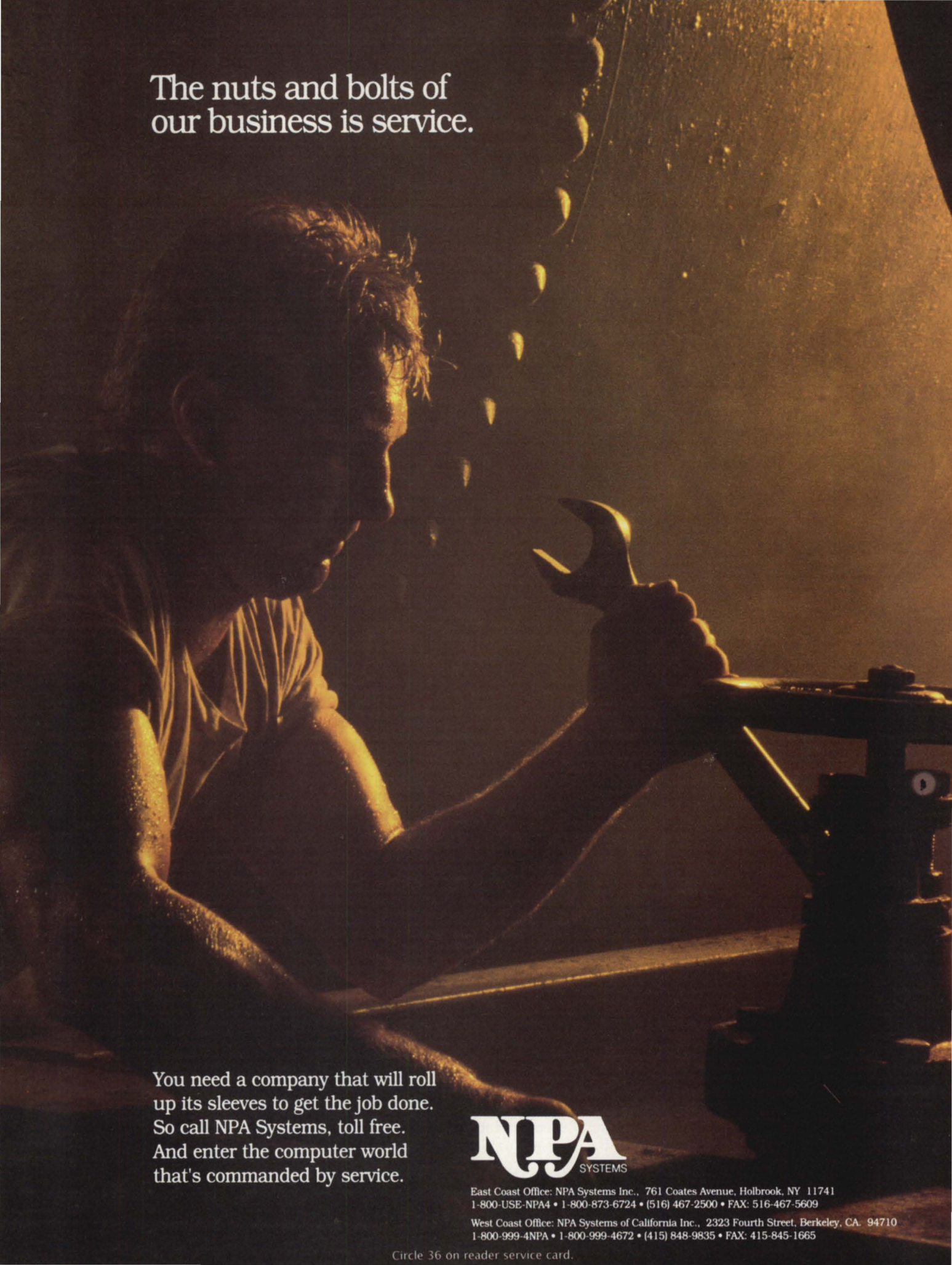
Other departments produced in-house brochures, overheads, and flyers on Wordview, a CEO integrated software from Data General. Dropping Wordview was the second strongest advantage to acquiring Office/Publisher.

Printing a multi-page Wordview document can require 50 to 75 percent of the CPU's idle time. Through its unique processing capabilities, Office/Publisher compares with the printing of any normal word processing document . . . taking less than 10 percent CPU time. Documents are printed through a batch queue. Graphics take more time to print depending on their size, but multiple users working at one time do not degrade the system to the extent that Wordview does. Increasing the CPU's idle time improves performance. Eliminating Wordview entirely from the system by fall is the goal.

### In control

Office/Publisher can also restrict





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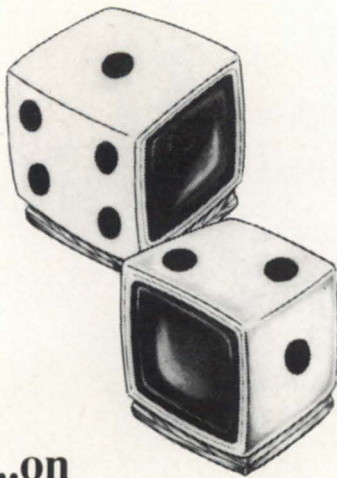
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access to the software. There is nothing worse than an untrained user, and with Wordview, anyone can change document type in the document summary and create documents. Office/Publisher uses a normal word processing document type, but users cannot print through Office/Publisher without being defined in the user profile. No one accesses it without attending the basic training class. Through user commands, codes are entered into the document specifying margins, 1-4 column snaking, headers, footers, and placement of artwork. Another user command prints the Office/Publisher document.

The ability to scan artwork, include it in documents, and print out a typeset final copy has been the greatest cost savings. It allows Public Relations to establish its own deadlines. Users are no longer limited by the uncontrollable time constraints of an outside graphic art business, and the P.R. rep's time is no longer monopolized with tedious cutting and pasting.

Scanning graphic artwork is made easy with Intercon's graphic interface capabilities and CEO terminal emulator. Through Microsoft Windows on the PC, a user can access CEO, click with the mouse back to the Window's directory, scan artwork, move back into CEO, and transfer the documents to AOS/VS. MMC has two Hewlett Packard scanners for this process. Artwork that is shared throughout the hospital—logos, seasonal clip art, etc.—resides in the :MACROS directory on the system. Artwork pertinent to a specific department (example: Nephrology's Kidney Man) resides in the individual users' :UDD directory. Scanned artwork is not imported. A public drawer provides everyone with the names of the public artwork and a brief description, including examples of how to use it in a document. With CEO mail, everyone is updated on additions.

MMC uses three type styles, but there are many more to choose from. The different type styles are accessed via a font cartridge placed on the right side of the printer. The printer cartridge resides in the left slot. The highest point size, or pitch, as it was once referred to, is 24. For the 27 users currently trained, there are 7 Data General 6456 printers defined for use with Office/Publisher and 10 Hewlett Packard (HP) Laser Jet Series II print-

ers. Five of the HPs have additional memory. They now hold 1.5 MB of memory. The larger font sizes are downloaded to the HPs. Next fiscal year, hopefully there will be additional memory in all of the HPs and additional, larger font sizes.

### Limitations

This month, the 27 trained users met as a group to discuss Office/Publisher. Besides the above advantages, a few disadvantages surfaced. One limitation is the inability to preview documents on the screen. To actually have WYSIWYG (what you see is what you get) capabilities, a graphics monitor is required. Point sizes are not distinguishable on the D460 and D461 terminals. Page breaks can be determined in larger documents, though it is hoped that future revisions will contain more expanded layout controls. The user group discussed and developed work-arounds to use in the meantime. Users of Office/Publisher are slowly changing their language from characters per inch to picas, from lines per inch to line leading, and from pitch to point sizes. If you consider purchasing Office/Publisher, remember to buy pica rulers. It helps!

In the eight weeks that Office/Publisher has been in use, the hospital has realized a return of over \$1,200. Everyday users are becoming more familiar with its capabilities, thus utilizing it more. A committee of CEO users trained on the software will help with the task of duplicating forms in CEO. Memorial Medical Center's in-house print shop is responsible for storing these originals. A department will merely send the print shop a request for the desired number of forms.

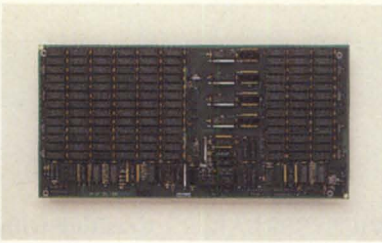
Public Relations is using Office/Publisher for additional newsletters. At \$50 a page (six typeset newsletters in four months, three to five pages each), MMC will save an average of \$1,800. Ten forms a month at \$50 a page is another \$500 a month. This doesn't include brochures, flyers . . . in a year's time, MMC will recoup 80 percent of the original software price. Consensus . . . it was worth the risk! △

*Terri Lee Stauffer is an Office Automation Specialist with Memorial Medical Center. She may be reached at Memorial Medical Center, 800 North Rutledge, Springfield, IL 62781; 217/788-3392.*

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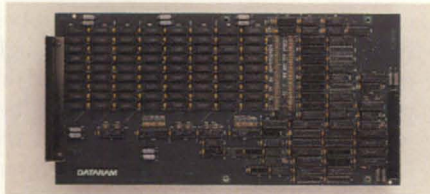
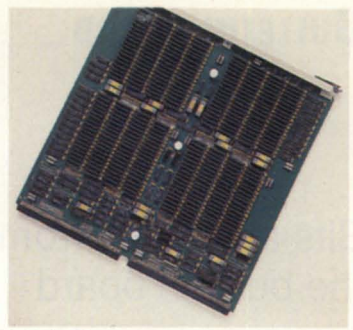
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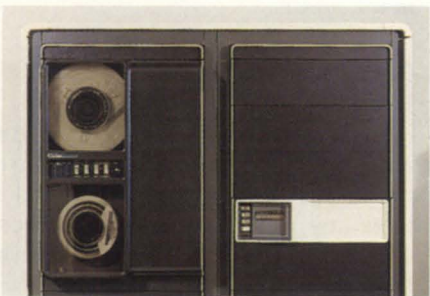
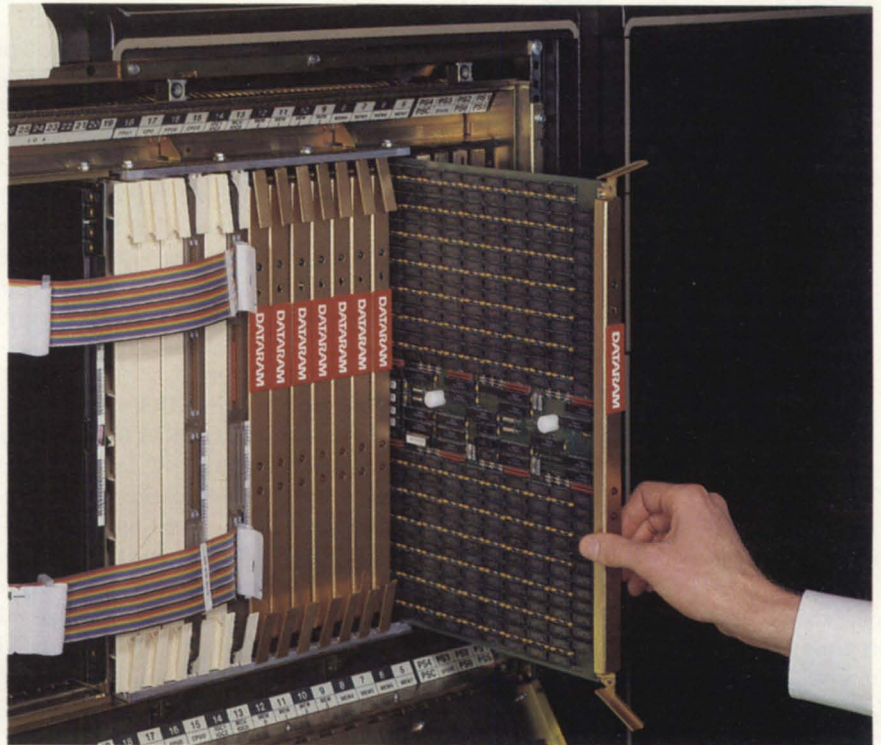
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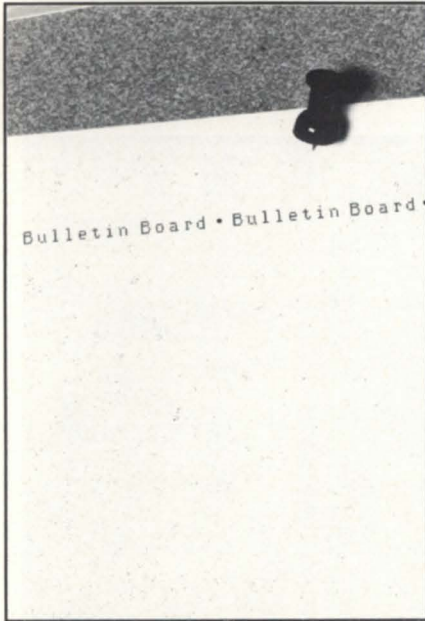
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## Bits and bytes from the bulletin board



### The terminator

From: Joe Wesner

I am having trouble terminating a console when it shows that log on/off is in progress. The terminal locks up and I can't do anything with it. I've tried disabling it, but it shows that it will be disabled when the log-on process is complete. Any clues as to what I should try next?

From: Thomas Carey

It's been a while, but there was one rev that had problems in logoff if you had a log file set. You might experiment for a bit or check STRs for a fix.

From: Jeff Campbell

You need to issue the CLEARDEVICE command to that console number. You can transmit this command from the master console or your own, if you can get into system manager mode. Type in "JPINIT xxx" to enter system manager mode. Then, type in the command "CLEAR/RXON @conxxx." That should clear the logon/logoff mode message. Hope this helps.

From: Tim Boyer

Warning! If you're running 7.65 and

you issue CLEARDEVICE/SBREAK, your system will come down.

### Doing the dumps

From: Olav Torvund

I need to convert from RDOS ICobol to AOS/VS ICobol (about 170 programs and 55 data files). I have an AOS/VS MV/4000 DC. My client, who is in a foreign country, has his RDOS stuff on an S/120, I think. He sent me two tapes of programs/data (15 MB cartridges), but I can't read them with my machine. I get an "illegal dump format" error. Unfortunately, I don't know RDOS. How should I advise my client to do the dumps? I heard that the RDOS command BUILD with a subsequent IMOVE to tape would work, but what switches, etc., would I use to dump a whole directory onto tape, for example?

From: John O'Keefe

You can read an RDOS dump file by running the X RDOS LOAD/V @tape-name command under VS, as long as your tape drives are compatible. It runs real slow, but it's the easiest way to convert. The X RDOS DUMP goes the other way. If you're loading source code (or any text file), use X RDOS LOAD/V @tapename filename/C to convert the CRs to NLs. Don't try that with the .PDs and .DDs though. Check out the RDOS utility in the CLI manual for more info.

### Ps and Queues

From: Richard Kouzes

I have a batch queue under rev 6.04 with four streams that has been running for five years. I'd like to increase the number of streams in the queue to eight. What would I have to do?

From: Doug Rady

Upgrade to rev 7.5x or greater.

From: Richard Kouzes

That's not an option. What are the actual steps to do it?

From: Wally Beddoe

Recreate the queue:

cx create/streams=8 queue-type queue name

cx open queue name

cx continue queue name.

### Crashing with TELNETD

From: Bill Benedetto

We are running 7.60 on our MV/8000 and MV/20000, and are running 7.65 (all AOS/VS) on our MV/7800. They all crash. The error shows up in both the operator's console and the log file for either TELNETD or TCP/IP (I don't remember which, but I'm sure we've had errors posted to both files.) DG is supposedly looking at this problem with its highest priority. We told them we've had this problem for one to two years, and they were shocked that we had waited this long. Anyway, our TELNETD program crashes on an average of once per day. Of course, when it crashes, everyone logged on dies. Most of our users don't have too much love for this software. Is anyone else having trouble running a mixed bag of Unix on workstations and AOS/VS (classic) on DGs, with TELNET as the primary tool for talk? Any solutions?

From: Richard Kouzes

We had lots of TCP/IP problems that were fixed by several patches and putting the LAN board in a high priority position in the chassis.

### Restrictions wanted

From: Kevin Blanks

I want to restrict users to one logon, and I don't want them to log on to two or more terminals with the same user id. Is there any way to restrict users to one logon per user id? I've set up the LOGON.CLI macro, but I wonder if there is any other (better) way to restrict it?

From: Wally Beddoe

There is a product called PCS (password control system) offered by DG. I installed PCS a few months ago and I love it. It does all the things you would expect from a security package. (Including limiting number of sessions in a day!)

Δ

*Do you have an answer, comment, or question? Call the NADGUG/RDS electronic bulletin board, available to all NADGUG members. The phone number is 415/499-7628. There are no fees for use other than the telephone charges.*

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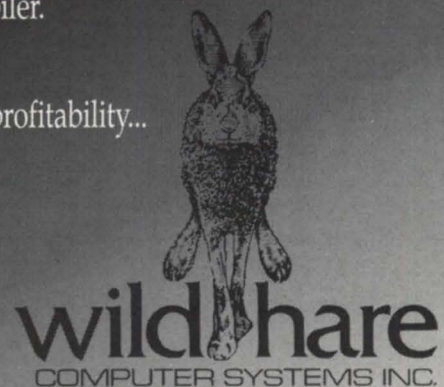
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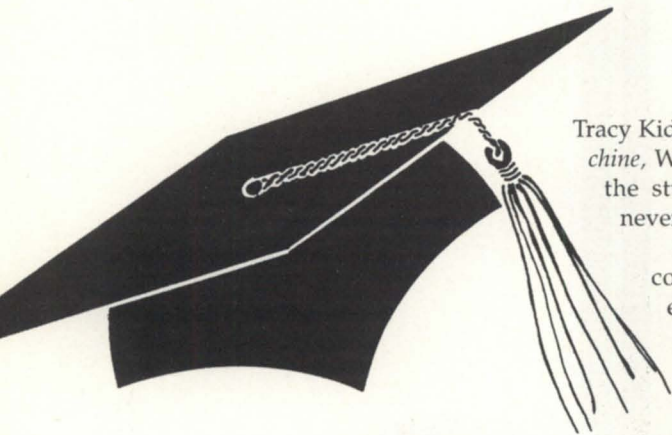
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# Farewell to the Class of '90



Tracy Kidder's *The Soul of a New Machine*, Weatherall said, but many of the students he sees now have never heard of the book.

Weatherall noted that complaints about a lack of engineering talent from institutions like the Massachusetts High Tech Council and big local corporations like DG have died down recently. Financial pressures on these firms have forced them to cut back their recruiting efforts. But in the past, he said, the complaints have been vociferous, and especially pointed at the academic hothouses in Massachusetts that somehow fail to channel their students' energies towards Massachusetts-based corporations like DG.

"They didn't reflect very much on how poorly their own companies recruited," Weatherall observed. "I can't excuse Data General from that. The technical people who came recruiting would be different people almost every year. I can remember many different people from Data General, but I can't just at this moment name the person this year."

Data General is certainly not alone in its campus image problems. Recently, a couple of speakers, both in their fifties, addressed job-seeking MIT students and counseled them on how to choose a company. One of the speakers worked for Polaroid, and the other worked in the defense sector. Both urged students not to be impatient, and to plow ahead slowly in their careers.

It was ironic to hear these men promote caution, Weatherall said, when "they themselves had gone with companies, which back in the fifties were in a go-go situation." Today's students are saying, "No, that sounds like very old-fashioned

advice to me. I want to go where the action is," the career counselor observed.

Companies can improve students' perceptions of them by using inventive effort and energy, Weatherall advises. "One cardinal fault is that they don't think it (recruiting) deserves as much attention as the other things a company does."

Typically, college recruiting is approached haphazardly by companies. "It's very characteristic that the person who's responsible for college recruiting thinks 'Who can I send to MIT next week?' . . . They ask around the company who's available, and then say 'OK, we can send you and you and you.'

"Three guys, or women, get sent, and they're hardly briefed on what this interface with the university's all about. So they come, and they interview the students, and they report back to the company. But they haven't done any type of marketing at all, and the company hasn't pushed them to, hasn't thought it was worth doing."

Weatherall says that firms should start talking to the faculty and career counselors like himself *before* making their trip to campus. He compares recruiting to marketing a product, involving the same procedures of cultivating client interest and using a calculated marketing strategy.

Hewlett Packard is the model Weatherall refers to again and again as a textbook example of effective recruiting strategy. HP takes a team approach to recruiting, and sends the same team to a given campus every year. The team leader is usually a technical manager at Hewlett Packard, with a business card in MIT's file that's "well thumbbed," Weatherall says.

The advantages of HP's approach include a sense of responsibility among the team members to recruit the best crop of students, and "also to sort of 'sell them' [the students] inside the company," MIT's career counselor explained.

As HP employees move into other companies, they take their recruiting techniques with them. Weatherall told of an Apple employee who used to work for Hewlett Packard. "He was telling the Apple folks that at Hewlett Packard, being sent recruiting is deemed an honor, and a privilege. You've been picked for it . . . and he was urging his colleagues at Apple to think of it the same way. I was applauding him." Δ

## SYNOPSIS

As hardware vendors sit out a semester, new talent is lost to competitors. An MIT career services director suggests that recruiters do their homework before returning to campus.

by Seemee Ali  
Focus staff

Data General didn't go to MIT this semester. Neither did Tektronix, and neither did IBM. The industry is in a slump, and it's not in the mood for new recruits.

Robert Weatherall, director of career services at the Massachusetts Institute of Technology, reports "the computer industry has been pulling back." He says young engineers are being lured by software houses and consulting firms, rather than hardware vendors, with Oracle Corporation and Anderson Consulting, Inc. being the most aggressive and most popular recruiters.

Oracle is "bouncing with youthfulness," Weatherall explains, "Arthur Anderson is the same way . . . They haven't seen any trailing off or plateauing."

In the face of such youth and vigor, companies like Data General have a hard time grabbing the attention of an undergraduate. DG enjoyed a degree of fame in the early eighties with the publication of



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by Rainer McCown  
Special to Focus

## SYNOPSIS

*9600 bps modems are smarter and faster than their predecessors. In this comparison of models, the author finds that modem operators must be smarter too.*

My experience with the V.32 9600 bps modem is truly humbling. I am an electrical engineer who has been involved in the computer field for 25 years. The last eight years include heavy involvement in the communications field with DG terminal emulation products, EMU/220 and EMU/470. Given my background, I assumed I would have little difficulty in controlling this new technology.

I was wrong. The complications that I encountered sent me to the modem manuals too many times. Increases in the capability and sophistication of these modems make it difficult to stay in the know.

File transfers at 9600 bps are a substantial improvement over the 2400 bps modems in common use only a short time ago. Four times the speed means that a whole floppy diskette's worth of data (360K) can be transmitted in slightly more than five minutes (approximately \$1.25 in long distance charges). This speed makes transmission a more cost effective form of data interchange than mailing diskettes (45 cents postage, 50 cents for

## So what do all the hieroglyphics mean?

MNP (Microcom Network Protocol) Classes 2 through 9 are a set of technologies developed by Microcom and adopted by many other modem manufacturers. The sophistication of the algorithms increases as the class number increases, and each higher class is a superset of the lower classes. Some classes deal with error checking and correction, while other classes define data compression algorithms.

*MNP Class 4* is the most widely implemented error correction standard.

*MNP Class 5* is the most widely implemented data compression standard. Most modem manufacturers have integrated MNP Class 5 into their products. This compression works best on ASCII text files where the character frequency pattern is similar to that of natural language. Compressions of up to 2 to 1 can be realized using MNP Class 5.

*MNP Class 9* is the highest MNP Class currently available, although I have heard

of Class 10 coming soon. This class includes V.32 operation (CCITT 9600 bps) and Class 7 data compression, which provides up to 3 to 1 compression on text files.

V.32 is the CCITT (an international standards body; the abbreviation is French for something like "Consultative Committee for International Telephone and Telegraph") definition of the standard for a dial-up full duplex 9600 bps asynchronous modem protocol.

V.42 defines the CCITT standard for error checking. This standard is a superset of the MNP Class 4 (see above) definition.

*V.42bis* (not to be confused with V.42) is a new (late 1989) CCITT standard for data compression. As of this writing, there are no V.42bis modems on the market. This standard is not upwardly compatible with MNP Class 5 (see above). V.42bis provides compression factors of up to 3 to 1 on text files. △



envelope, 33 cents for diskette, not to mention the time delay).

In an attempt to better understand these speedy, upgraded models, I prepared and ran a schedule of tests on selected 9600 bps modems. The modems had to meet the following conditions: 9600 baud, V32 compatible, and self-contained standalone. The models I chose were the Multi-Tech MultimodemV32, the US Robotics Courier HST dual standard, and the Microcom QX/V.32c.

My test results were not what I expected. Some tests failed, some produced erratic results, others produced results that made no sense. Note: To test a 9600 bps modem with the capability of a 3 to 1 data compression, the computer communications port must be set to at least three times 9600 bps (38,400 bps) to handle the compression. That number is larger than the common computer integer range, -32,768 to +32,767 (16 bit integer), and may cause incorrect results. Data General did not support 38,400 bps asynchronous ports until recently. EMU/470 began supporting 38,400 bps with version 3.0 released in February 1990.

**Greater computing power, and its consequences**

Before delving into specific descriptions of the above three modems, discussion of the upgrade process might be helpful. The V.32 9600 bps modems are built using substantial microcomputing power. The Microcom QX/V.32c, for instance, uses a Motorola 68000 microcomputer chip—the same computer chip used in the original Apple Macintosh. This computing power provides features and flexibility, but at the price of a more complicated installation and control procedure.

Compatibility with the installed base is an important subject for a "new and improved" product. Every time a faster or more sophisticated modem is produced, it also must be compatible with the majority of modems that came before it. The 9600 bps modems being reviewed also support 2400 bps, 1200 bps, and 300 bps.

Each of these bit rates uses different data encoding schemes and handshaking protocols. To form a connection, each modem will send a sequence of identification tones to the other modem. When both modems agree on a protocol, they "lock up" and establish a connection. After the two modems lock up, a second

sequence of data is exchanged to determine what error correction or data compression to use. Obviously, the goal is to connect at the highest common bit rate with the best error correction and the highest data compression. This goal is not always realized—especially when connecting between different brands of modems.

Part of the V.32 specification is error

fallback. If the error rate gets too high, causing too many retransmissions, the modems will drop the bps rate back from 9600 bps to 4800 bps. Part of the MNP Class 4 error correction specification is to optimize the packet size. When the telephone line is good and there are few errors, the packet size is increased to reduce the packet overhead. However, if the line quality is poor with many re-

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transmissions, the packet size is reduced to decrease the amount of data that must be retransmitted.

A modem with data compression and/or multiple bit rates must communicate with the second modem at the rate determined at connect time. In addition, it must communicate with the computer at the communications port rate. The computer port rate will limit the overall data trans-

mission rate if it is not higher than the phone line rate times any compression effect. Thus, with a 9600 bps phone line rate and a 2 to 1 data compression rate, the computer port rate must be 19,200 bps or higher.

Multiple line rates, error retransmissions, and data compression all imply a character buffer in the modem. This, in turn, implies a mechanism of flow con-

trol between the modem and the computer. For text files, XON/XOFF flow control (which uses control characters) is a viable approach. For binary files, however, the file data could contain the same bit patterns as control characters and the modem would mistake them for flow control instead of data characters. For instance, the Xmodem protocol uses a binary character for the block number. When the block count reaches 16, the next block is 17 (the value for an XON). The modem absorbs the control character, corrupting the block of data, and the Xmodem transfer stops.

The problems I experienced are common when installing modems. Because the modem cannot communicate to the computer once the modem is locked up and data transfer begins, these configuration options must be defined during the initialization phase. Thus, if the line quality is poor, causing many retransmissions, or if the modems fall back to a lower bps rate, or if they lock up with a lower level of error correction or compression, there is no recourse other than hanging up, reconfiguring the modem, and dialing again. Realizing the existence of these potential problem areas is the first step to configuring the modems for your application.

### Lights, power . . .

The V.32 modems tested were external models with lights on the front, configuration switches accessible from the outside, and a power supply integral to the power cord. The front panel lights are invaluable when programming the modems, monitoring the call progress, and diagnosing any communications problems.

The modems are software configurable from the computer. This design reduces the requirements for hardware switches. The remaining switches do not need to be changed from the default settings unless unusual interface requirements are present. The power cord/power supply design has several advantages. Modem size is reduced and the heat dissipation is moved away from the modem. However, the large lump in the power cord (which for the modems tested was at the plug end) causes conflicts with other plugs at the power outlet. These power cords obscure at least the adjacent outlets, and as many as five outlets on a power strip.

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BILLING.LOG	532000	Crunched	94%	36087	31-May-89	11:41 p	3E91
EMPLOYMENT.AGR aka EMPLOYME...00	5793	Crunched	45%	3221	15-Jan-89	3:55 p	1D1C
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34

June 1990

XON/XOFF flow control is a real problem for Data General computer users. The control characters used for flow control (Ctrl-Q, Ctrl-S) are not reserved in the DG Dasher terminal command set. Therefore, XON/XOFF flow control cannot be used for many DG terminal applications.

The terminal instruction that causes the most flow control problems is the position cursor command. It uses the binary values in the next two characters to define the cursor offsets. When the offsets are 17 or 19 (corresponding to bit values for Ctrl-Q or Ctrl-S), these values are interpreted as flow control requests, causing undesirable things to happen. Thus, if you are running a screen-oriented Data General application, you need to turn off modem flow control and consequently turn off data compression.



Microcom, Inc.  
500 River Ridge Drive  
Norwood, MA 02062  
617/551-1000  
QX/V.32c MNP Class 9  
1-year warranty  
\$1,799



This modem is Microcom's top of the line dial-up V.32 product. It supports MNP Class 9, the highest class of error correction and data compression defined by Microcom.

Microcom technology for error correction and data compression as defined by various MNP (Microcom Network Protocol) classes has been widely adopted. All modems in this review support MNP Class 5. I highly recommend that this level of compatibility be a "must have" in your next modem purchase.

A modem supporting MNP Class 5 provides up to 2 to 1 data compression for text files. A MNP Class 7 modem provides up to 3 to 1 compression. MNP Class 9 is Class 7 data compression with V.32 operation.

In the "out of the box" default configu-

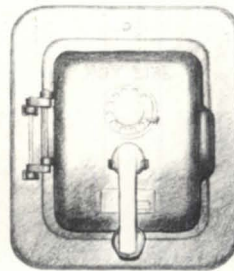
ration, this modem came up and transferred text data the first time it was connected. XON/XOFF flow control was enabled by default for data compression of text files. Flow control must be turned off for binary files or protocol transfers.

The computer port rate can be set as high as 38,400 bps. This rate is required by the 3 to 1 data compression over the 9600 bps communication rate. Until

V.42bis becomes commonly supported, a pair of these modems will provide the fastest effective dial-up data rate.

This modem does not have an on/off switch. However, it does have a reset button. I prefer the on/off switch because I like to leave the modem off when it is not being used. Also, I am never sure how much of the modem is reset by the reset button.

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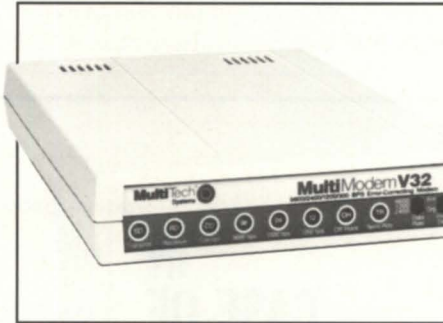
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\$1,095



The MultimodemV32 is the least expensive of the V.32 modems tested. This modem includes MNP Class 5 data compression (approximately 2 to 1 compres-

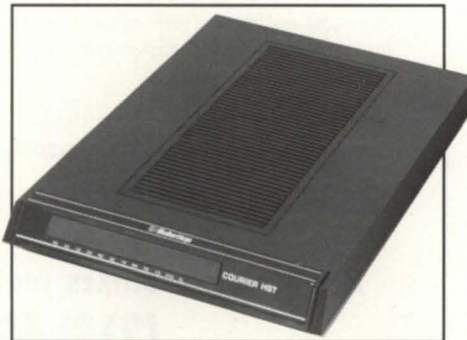
sion of text files) plus error correction. Multi-Tech Systems has announced future support for V.42bis data compression (approximately 3 to 1) as well as MNP Class 7 compression. Currently, Multi-Tech supports computer port rates up to 19,200 bps. They will support 38,400 bps when the V.42bis becomes available.

This modem has an on/off switch on the back of the case, which I consider superior to a reset button. It has a cream color case that blends well with most computer and office products.

The default modem configuration needed to be changed for my testing because when the modem connected, the computer port bps rate changed to match the line bps rate. This change prevented the software from communicating with the modem. This was unnecessarily confusing, especially as the default mode. There is a section in the manual detailing the commands that can be used to mitigate this problem. Using these commands, I had no trouble with this modem.



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There are three types of US Robotics high speed modems. The HST (developed before the V.32 specification), the V.32 compliant modem, and the dual standard (both HST and V.32). The HST modem lists for \$995. The V.32 modem lists for \$1,099. The HST protocol supports bps rates up to 14,400, which is an advantage if the connecting modem also supports HST mode. HST has been popular for PC bulletin boards. Because of the more re-

cent V.32 standard, the HST mode will be relegated to niche markets as time goes on.

The dual standard modem tested has an auto answer light. This light is a big advantage if you want to use the modem for a bulletin board or other answering type operations. The HST protocol modem is in use with many PC-based bulletin boards, as were the previous generations of US Robotics modems.

This modem has an on/off switch, which I prefer to a reset button. I had to modify the default modem configuration to perform my tests, because the computer port rate changed when the modem connected at a different rate. After defining a new configuration string to the modem, I completed the testing.

The modem's computer port can communicate at 38,400 bps. In HST mode, the modem can communicate at 14,400 bps. The 38,400 bps is required when data compression is used. Δ

*(Copyright © 1990, by Rainer McCown.) 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 may be reached at P.O. Box 220, Columbia, MD 21045; 301/730-2575.*

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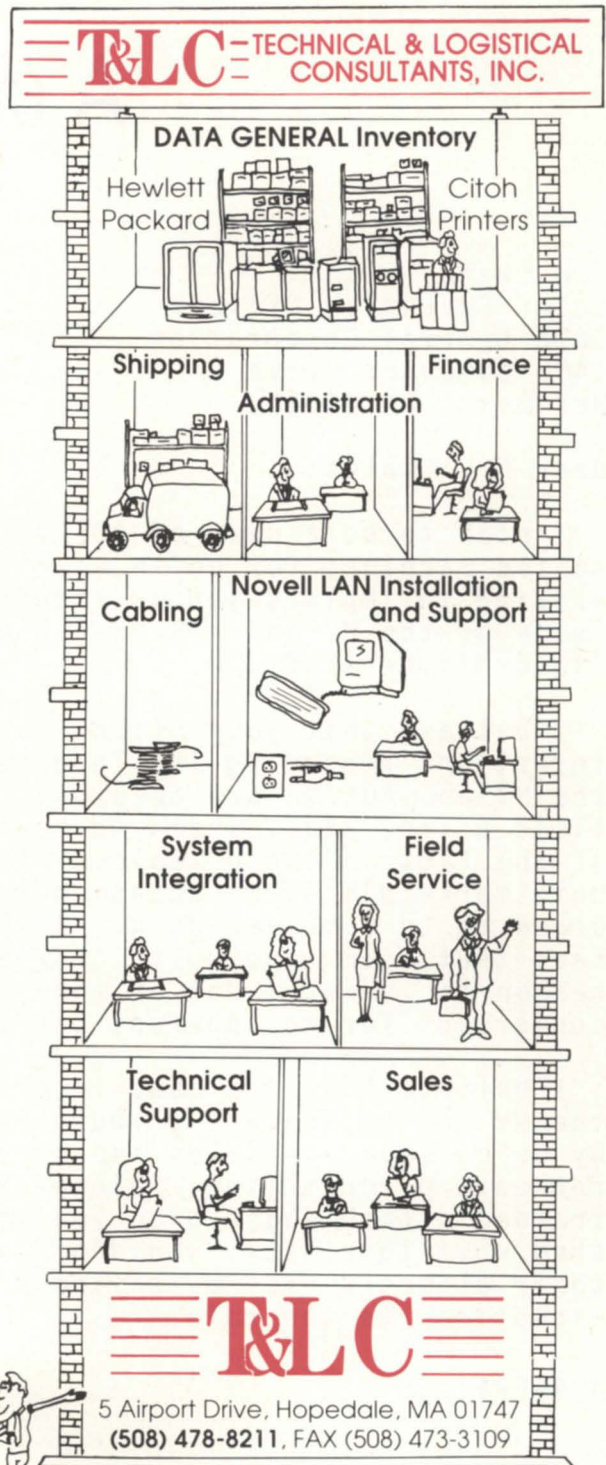
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Dear Mr. Skates:

I plan to be a user of AOS/VS on my MV series machines for quite a while, and I am writing to implore you to strengthen the image of the MV and AOS/VS among your own field office staff.

I believe that your often stated intentions regarding the long-term future of the MV and AOS/VS are credible, but your field office staff seems to have lost sight of the fact in their zealous leap into the Unix marketplace. On occasion your staff has urged me to consider Unix, in spite of the fact that I am happy with AOS/VS and have no reason to invest a lot of money in a conversion for no apparent benefit.

I believe that the best interests of both the MV and Aviiion users would be best served by using separate sales and support staff for each product line. Salespeople are like trained attack dogs; once you've trained them what to attack, you don't want to blunt their effectiveness by trying to teach them exceptions to the rule.

Regards

## SYNOPSIS

*If the MV cash cow dries up before DG's Unix business becomes profitable, then DG has effectively bet the company on Unix and lost.*

## :OUT\_OF\_THE\_CLOSET

This month, I'm going to answer the two questions that I've been asked more than any others in the last year; what do I think of Unix, and what do I think of DG's long-term prospects?

Let's get the easy one out of the way first.

## :PROSPECTS:DG

In February, the Chicago Area DG Users Group (CADGUG) was kind enough to invite me to a panel discussion on system performance issues. Someone in the audience asked us to comment on what we thought DG's long-term prospects were. Here's the answer I gave, as near as I can remember it.

I view DG's chances of succeeding based solely on its ability to compete in the Unix fracas as questionable. Once the 100 MIPS Taiwanese generic Unix boxes hit the market, high ticket suppliers of hot boxes will experience what IBM did when the clones gobbled up the PC marketplace.

I view DG's chances of succeeding based on a broad-range MV offering running AOS/VS as excellent. If they wake up and smell the coffee before it's too late. Too late is getting closer.

The Big Mistake that DG made, and is



still making, is that it didn't immediately partition the engineering, software development, sales, and marketing into two groups; proprietary systems and standard systems. To be effective, the partitioning can't just be dotted lines on an organization chart, it should be physical. DG should have turned over the keys of the RTP facilities to the Unix groups, and made Massachusetts the exclusive territory of the proprietary groups. Then, it's simply a matter of seeing if either or both of the groups can turn a profit. I believe both would; but if only one did, then the failing half could be sold off. My bet would be that the Unix half would get sold before the MV half.

From my contacts with various DG sales offices here and overseas, it's clear they have been told that Unix is where the company's future lies, but that DG is still committed to the MV and AOS/VS for the foreseeable future. The problem is that the sales and SE staff don't really believe the MV and AOS/VS part; they've been subjected to a barrage of corporate marketing stuff designed to convince the Unix marketplace that DG is totally committed to Unix, and from that they figure the MV commitment stuff is just part of a secret plan to keep the MV cash cow producing until Unix takes over. Their doubt shows in the approach they take to existing customers; they keep asking what we're doing about porting our stuff to Unix, and they can't understand why someone wouldn't be interested in doing so. They don't seem to understand that for many MV sites, Unix is a non-issue, unless the MV has no future.

Contrast this situation with the attitudes at DEC, IBM, and to a lesser extent, HP. They are satisfying the requirements of their customers who insist on Unix without losing sight of the desirability of maintaining the sales of their own proprietary hardware and software.

The attitude of the DG sales and SE staff will be the kiss of death to the MV line. If the MV cash cow dries up before DG's Unix business becomes profitable, then DG has effectively bet the company on Unix and lost.

**:UNIX**

It's very tempting, and very easy, to simply engage in a bit of Unix bashing. Recently, a group of "Say No to Unix" users have been venting their spleens to

that effect on the NADGUG BBS. A psychiatrist would have a field day analyzing the comments. It's predictable that a person who's invested years in becoming familiar with AOS/VS is going to get a bit defensive when faced with the prospect of starting all over on a new operating system.

My frustration is not with Unix, it's with the great horde of computer lem-

mings who blindly lunge toward the current computing fad, regardless of what makes sense for their application and their situation.

Over the past 25 years I've seen it happen with distributed processing, data base management systems, relational data bases, workstations, networks, and languages. This is the first time I've seen it happen with operating systems.

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I admit that in some cases, you don't have a choice. Take the case of when one of your VPs is playing golf with one of his buddies, and his buddy brags that they're switching to Unix because "everything is portable, you can buy your hardware from anybody." Next thing you know, your VP is standing in your office on Monday morning saying "What are we doing about Unix?" Are you going to try to explain to some computer illiterate corporate officer the complexities and nuances of why different operating systems are preferable to others? Do you launch into a dissertation on the myth of portability? Hardly. Then the guy takes a look at DG's financial state, and suddenly you find yourself with a memo that says "no more DG purchases." As scary as this sounds, it's now happened to more of my clients than I care to admit.

The funny part is that this same VP would kill anyone who suggested that he trade in his Mercedes for an industry standard car available from multiple vendors with interchangeable, shrink-wrapped parts and options.

And herein lies the source of my belief that there will always be proprietary hardware, software, and automobiles. There will always be customers hungry for the added features and performance available only on a system that takes better advantage of the underlying hardware architecture and is more responsively tuned to its applications. Unix had its beginnings as a small, cheap, timesharing system aimed at scientists, engineers, and software developers. It could run 32 users on an unmapped 128 KB PDP 11. It has since been extended in an attempt to encompass general-purpose, end-user commercial computing, but it falls woefully short compared to the facilities and performance available on more mature commercial timesharing systems.

### :QUO\_UNIX?

Some advocates of Unix point to its widespread adoption by many hardware suppliers, especially producers of RISC systems, as proof of its superiority. Nothing could be farther from the truth.

The only reason we have Unix to contend with is because the nature of the computer marketplace has changed, not because Unix has anything significant to offer compared to AOS/VS, VAX/VMS, MPE, PRIMOS, or whatever.

Back when DG was started in 1969, if you had a novel new idea for a really hot box, you could borrow some money, hire a couple of engineers to design the circuit boards, and a couple of programmers to write an editor, assembler, and debugger. In fact, DG's original Nova came with just these tools, and no operating system. Within 12 months you could be shipping your box to OEMs who would add the necessary software and peddle the box to their customers. The cash flow from the OEM sales would tide you over for the additional 12 months it took to write a few simple compilers and a basic disk operating system so that you could then hedge against a down-turn in the OEM marketplace (usually caused by the entry of some new cheaper hot box) by going directly after end users, which was much more profitable anyway.

The last company to succeed at this scheme, albeit with kids replacing the OEMs, was a little outfit called Apple Computer. The kids financed the development of the Macintosh.

Nowadays, you could come up with the hottest box in the world, but there's a serious impediment to bringing it to the market; even OEMs now expect a full-featured operating system on announcement day, replete with a rich set of compilers, and network capability. That's several man-centuries worth of software, which is out of the question for a startup that has to ship a product before the borrowed money runs out.

Enter Unix. Suddenly the entrepreneurs had a way out; they could simply buy a Unix license, port Unix to their box, and show up at the announcement with a bag full of software available. Problem solved.

Sounds good so far, but there's a subtle disadvantage to using this scheme. Many architectural breakthroughs on your hot box will be masked by the Unix port, with an attendant loss in performance. The problem with Unix is that, like most operating systems, it makes some fundamental assumptions about the capability of the underlying hardware architecture that may not necessarily match the capabilities of the new hot box. In the rush to get to market, which do you think the new company will do; change the box to make the Unix port easier and get to market faster, or make massive changes to Unix to take advantage of the new capabilities of the box? Knowing the

mind-set of the venture capitalists, I'd bet on the former. As a result, there is a stifling effect on the prospects for new architectural break-throughs.


**:RALLYING\_CRY**

OK, so what can we do on our part as users of DG proprietary stuff to help make sure that DG survives?

The only way I see that happening is if

we can make one hell of a noise at this year's NADGUG Conference to make it crystal clear that we don't all view Unix as a natural stepping stone from AOS /VS.

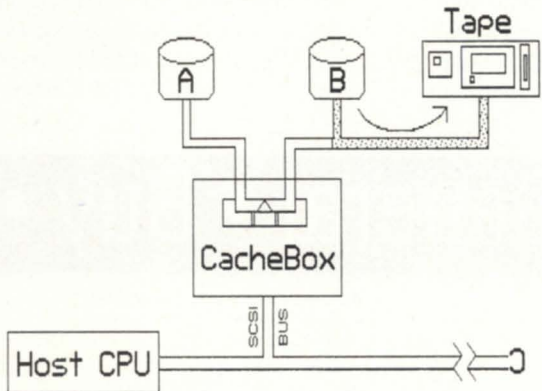
Assuming that Ron Skates and the other movers and shakers really do believe in the future of MVs and AOS/VS, and I believe they do, we must convince them to relay that message to their troops as




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unambiguously as possible. The easiest way to do this is to separate the sales force into proprietary and standard systems. You can't program a salesperson to believe that two different product lines are both the ultimate solution, so you have to hire a different salesperson to flog each line.

Hence the form letter to Ron Skates on page 38. If you're one of those whose long-term plans include MVs and AOS/VS, then please sign your name to the letter and drop it in the mail. Let's see if we can nudge DG back onto the right track.

### :CLASSICS:UPDATE

Three months ago, I listed some "classics" that I'm fond of re-reading periodically. Since then, I was asked by a client to survey the current literature in the area of system performance enhancement and system modeling. As a result, I read about 20 books ranging in quality from appallingly bad to potential classics. I won't bore you with details on the appallingly



bad ones, except for one anecdote that follows, but I did find three books worthy of note.

### :BOOKS:SACHERTORTE

The first book is a mixture of appallingly bad and startlingly good; *The Sacher-torte Algorithm (And Other Antidotes to Computer Anxiety)* by John Shore, Pen-

guin Books, 1985, is a book about the trouble that non-technical types have dealing with computer systems produced by technical types, and about the problems of software reliability and correctness. The author holds a Ph.D. in physics and, like many PC experts, his computer knowledge appears to have been self-taught. The title refers to a particularly hilarious attempt on his part to convert his Aunt Martl's four-line recipe for Sacher-torte into a precise pseudo-code algorithm; the result is the clearest example of why programming computers is as fraught with difficulty as it is.

Chapter 3 should be read only as a sterling example of the regrettable trend among publishers to let anybody with a PC write books on computer science without having them reviewed for accurate technical content. Here's an example:

"When no special hardware is involved, the wordprocessing program is some-

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times called a **text editor**. Systems that are intended to be used primarily as word processors often include special hardware. The most common examples of such hardware are so called **function keys**. (emphasis as in original)

I remember seeing function keys on a CRT back in 1969, at least 10 years before two guys from a little Utah firm called Satellite Software International showed up in the DG San Francisco office, where I was working at the time, to demo a little program they had written called "Wordperfect."

The parts of Shore's book that are the most enlightening to us "techies" are the parts in which Shore represents the users and lambastes us, the programmers, for foisting error messages like "Physical Unit Failure" on poor non-technical users. Also excellent are the sections on user interfaces, program reliability, and program correctness. These latter sections contain some amusing real-life software horror stories.

**:BOOKS:PEARLS**

The second book, *Programming Pearls* by Jon Bentley (Addison Wesley, 1986), is certainly becoming a classic. It was written as a follow-up to *Elements of Programming Style*, a book I cited previously as a classic. In '88, Bentley published a sequel: *More Programming Pearls, Confessions of a Coder*. Both books are just chock full of real-life examples of unique approaches to programming problems, with heavy emphasis on creativity and insight, instead of blind application of classic algorithms.

The chapter entitled "The Back of the Envelope" struck a particular chord with me because my college training involved


studies in both engineering and computer science. As Bentley points out, engineers are naturals at "what if" computations done on whatever scrap of paper is handy, but programmers are more likely to just start coding without doing any "what if" calculations ahead of time. The anecdotes regarding the approach taken by several people to the question "How much water flows out of the Mississippi River in a

day?" is wonderful. A lot of my clients could have saved a lot of money (and cost me a lot of income) with a few judicious back-of-the-envelope calculations before they started coding.


One of the things that distinguishes these three books from the others I read is something that I have been striving to achieve for years; a format that is both entertaining and informative. Δ

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# Anatomy of a macro

## SYNOPSIS

*In both Unix and CLI, arguments must "find themselves" before they can proceed with their basic functions—in this case, displaying a menu.*

by John Huddleston  
Special to Focus

In this article, I'll design a generic UX shell script to display menus, retrieve user responses, and pass arguments. A collection of links to the shell script, with various names, will comprise a system of scripts for intelligent processing. We'll start with the CLI macro shown in Figure 1. (Since DG supports Unix on a variety of operating and hardware platforms, I'll refer to both DG/UX and MV/UX as UX throughout this article.)

In Figure 1, I added the CLI pseudo-macro `!EFILE` to the macro we used in last month's article to produce the filename at the end of a pathname. If a user typed the full pathname to a macro, the CLI macro would have failed on the intelligent processing test for existence of a CLI macro. By using `!EFILE`, the CLI macro ensures that only the name to the right of the last colon is used.

The analogous command in UX is 'basename', which produces the filename out of a pathname to the right of the last '/'. Similar to the `!EFILE` pseudomacro, all extensions of the filename are included in the return from 'basename'.

In Figure 2, the 'basename' of the shell script argument \$0 (its own name) is placed into the variable \$BASE by inserting backquotes around the UX command.

### Parse the arguments, please

In order to keep the CLI macro and the UX shell script as one-to-one as possible, I will begin with the test to confirm the existence of the first argument. The first line of Figure 1 performs this test by asking whether or not the argument is equal to zero. Equivalent statements in UX are 'if test -n "\$1"' or 'if [ -n "\$1" ]'. The UX argument variable '\$#' will also check for

the number of arguments, so that the test 'if [ \$# -eq 0 ]' can also be used in this example.

The UX 'cat' command is the same as CLI's TYPE command. By setting up all the lines in a menu in one file, the lines can be displayed to the screen with just one command. Usually, it's faster to read a file and display it on the screen than it is to make multiple WRITE or 'echo' commands.

You may be tempted to put all the lines to be printed in one 'echo' statement. However, since we're working with a larger, menu-based system, it's easier to keep track of multiple menus using separate files in a directory. In the CLI macro, the directory is :USR:MENUS. In the UX script, it's \$HOME/menus. Both these directory paths are for example only; you will probably want to set up your own individual system paths.

The CLI `!READ` pseudomacro can be emulated with two UX commands: one to print a prompt and the second to read the response. An 'echo' statement with a '\c' at the end will suppress the linefeed at the end of the 'echo' command. UX's command 'line' copies from the standard input up to a linefeed. The input from the keyboard (or from redirection) is then stored in a variable \$ANSW.

Now, if the user presses the <Newline> key, the test 'if [ -n "\$ANSW" ]' will be false. The test will be true if the length of "\$ANSW" is non-zero. If there is a response, the calling macro is called again, with the response. The 'exec' command prevents the processing of a new shell. This is the normal mode of CLI macro execution (i.e., a new process id is not created each time a CLI macro is called).

### Test the argument for its status

If an argument passes to the UX shell

script, the first test for non-existence fails, and the argument moves on to the 'else' section. As Figure 2 shows, the next test determines whether the argument is readable with 'if [ -r "\$1" ]'.

One of the requirements of CLI-based processing is the test for an argument that ends with a '.CLI' to set up any necessary environmental conditions. This can still be achieved in the UX shell by keeping shell script files non-executable. In this way, you can test first for readable, but not executable files. The executable files are the result of source code having been compiled and then linked into binary files. The 'exec' UX command calls the script if the test is true.

If the test for readability fails, the next test determines executability by checking the combination of the basename and the argument. In the CLI environment, an XEQ command is necessary before executing programs. This is not necessary in the UX shell. If the combination of the basename and the argument is neither readable nor executable, a check is made to see if it is a HELP file. Failing this possibility, an error message is printed and the macro calls itself.

### Summary and implementation

You may have noticed that both the readable shell script and the executable programs have been set up in a directory that's separate from the /bin and /usr/bin directories of the UX system. We now need to establish the rule that shell scripts will be readable but not executable, and that programs will be executable but not readable. This will allow the generic shell script to process shell scripts before executable programs.

How could you use this macro? When would programs be executed? If the generic shell script name is 'cfs' (a name we

**Figure 1: CLI macro**

```

[!EQ,%1%,]
  TYPE :USR:MENU:[!FILE %0%]_MENU
  STRING [!READ Enter the menu option of your choice ]
  [!NEQ,(!ISTR),(!)]%0% [!STRING][!END]
[!ELSE]
  [!NEQ,[!PATH %0%.%1%.CLI],]
  %0%%1% %2-%
[!ELSE]
  [!NEQ,[!PATH :USR:BIN:[!FILE %0%].%1%.PR],]
  X :USR:BIN:[!FILE %0%].%1% %2-%
[!ELSE]
  [!EQ,%1%,HELP]
  TYPE :USR:HELP:[!FILE %0%]_HELP
[!ELSE]
  WRITE You may have entered the wrong option
  %0%
[!END]
[!END]
[!END]
[!END]

```

**Figure 2: Generic Unix menu script**

```

BASE="basename $0"
if [ -z "$1" ]
then
  cat $HOME/menu/$BASE
  echo "or press the <Return> key to exit \c"
  ANSW="line"
  if [ -n "$ANSW" ]
  then
    exec $0 $ANSW
  fi
else
  ARG1="$1"
  shift
  if [ -r "$HOME/bin/$BASE.$ARG1" ]
  then
    exec $0.$ARG1 $*
  else
    if [ -x "$HOME/bin/$BASE.$ARG1" ]
    then
      $0.$ARG1
    else
      if [ "$ARG1" = "help" ]
      then
        cat $HOME/help/$BASE.$ARG1
      else
        echo You may have entered the wrong option
        $BASE
      fi
    fi
  fi
fi

```

use on our MV/8000 for the "Centralized Forecast System"), the menu for 'cfs' in the \$HOME/menu directory would have a text file with the following four lines:

```

prog - programs within the CFS system
util - Utilities within the CFS system
help - Help for all CFS programs
Enter one of the acronyms above

```

If 'cfs' executes, and the user passes the argument 'prog', the shell script would then look for the existence of a readable file called 'cfs.prog' in the \$HOME/lbin directory. If 'cfs.prog' was itself a menu, it could be a link to cfs. Alternatively, 'cfs.prog' could be a shell script that sets up environmental parameters before executing a program, or it could be the name of a program.

As it turns out, the 'cfs' system is composed of an entire tree of menus terminating at programs and utilities. If the system were to be rewritten in UX shell scripts, the first layer would consist of links to the 'cfs' shell script (because they are only menus), created as follows:

```

ln cfs cfs.prog
ln cfs cfs.util
ln cfs cfs.help

```

You would then create text files in \$HOME/menu with each of these three names. The benefit is that in a large menu system, you only have to maintain one file. The obvious limitation to this type of menu system is the filename length. On our AT&T 3B2, for instance, we can only use 14 characters to define a filename, though MV/UX allows 32-character filenames.

The intelligent processing example discussed in this article is only hypothetical. The conceptual design was based on a 220 CLI macro-based CLI menu system. I've described it in this fashion to demonstrate the power of UX processing.

### Till next time

Unless I receive a deluge of requests for more UX information, I will next write about transferring binary files from one Data General machine to another using Xmodem and a personal computer. Δ

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



# Space savers

## SYNOPSIS

*Utilizing Infos options like space management, and record or key compression can save time and disk space, at nominal costs.*

The decisions you make about Infos file creation options can have dramatic effects on your system performance. This month, I review some of those options.

### Space management

Although I normally eschew the practice of making general statements, I will do it anyway: you will nearly always benefit from enabling space management.

Space management is disabled by default. Without space management, Infos automatically adds new records to the end of the file. When an application deletes a record, a flag is placed in the record header set to indicate the record was deleted. As the data base grows, deleted records can accumulate and account for a large percentage of disk space.

With space management, you instruct Infos to keep track of how much free space is in each page of the data base. When there is no room in the last page of the data

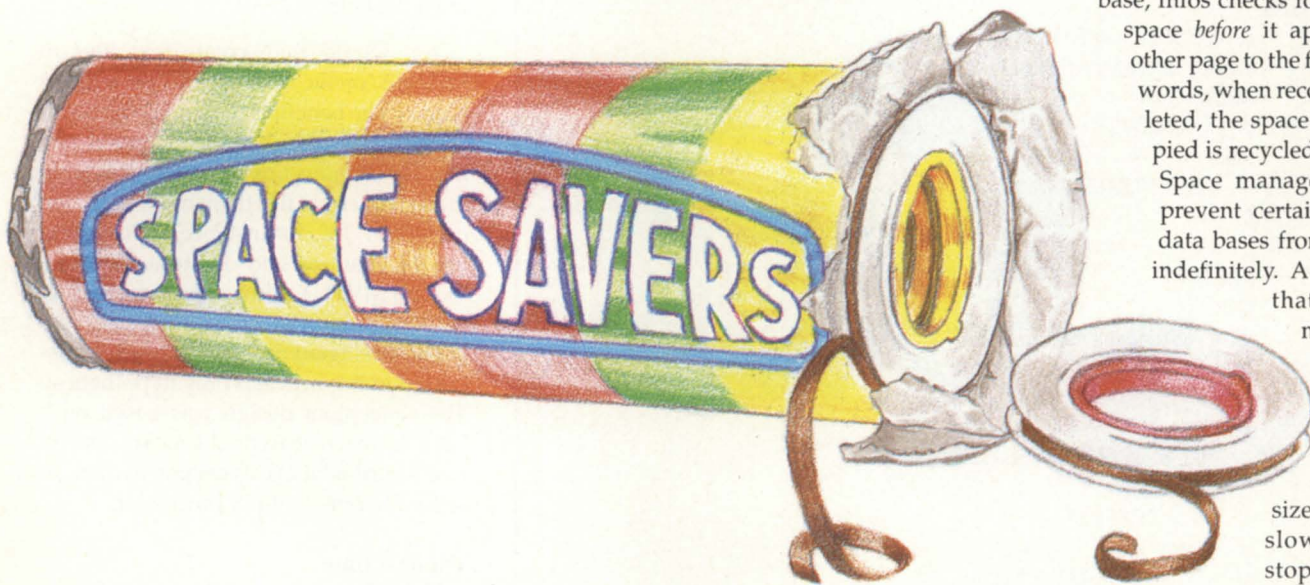
base, Infos checks for available space *before* it appends another page to the file. In other words, when records are deleted, the space they occupied is recycled.

Space management can prevent certain types of data bases from growing indefinitely. A data base

that serves a non-archival function will tend to grow to a certain size and then slow or even stop, depending on business

activity. But if the data base is of an archival nature, then space management can only help if you are using record compression (discussed next) and you frequently update the information in the records.

Space management is one of the features that gives Infos an edge over ICobol's Minisam. Minisam won't reuse deleted space, unless you write a new record with the same key. Consequently, on ICobol systems, you must periodically use the REORG utility to reorganize your data





files and reclaim the unused disk space. The performance gains with space management are twofold: you use less disk space, and you don't spend time reorganizing your files.

What are the costs of these advantages? Because space management pages are allocated on disk, the only real overhead in using space management is CPU time and a few extra disk I/Os.

In summary, the more dynamic your data records are, the more space management will help. There is little overhead associated with it. If I could change only one thing about Infos, it would be to change the default to enable this feature.

(One last note—this space management scheme sets a maximum of just over one million pages (1,024 x 1,024) per data base. Using standard 2,048 byte pages puts a limit of 2 GB on each Infos volume. That's enough for almost anybody.)

**Record compression**

Record compression is an Infos technique that uses a few bytes to store long strings of identical bytes, resulting in a significant savings in disk storage. Typically, a data base can undergo a 20-30 percent reduction in size after compression. This savings doesn't come cheap though. CPU use can be significant.

A less obvious problem is that of indirect records. Suppose you write a compressed record to disk. Later on, you write more until that page fills up. Then you rewrite the compressed record, but because you've changed the data, it takes up too much space. Infos will find a new location for it, and in the original location write an indirect record, or pointer, that tells where the real record is.

If too many records become indirect records, the savings in disk space and transfer time will be wiped out by the extra disk reads needed to pick up the indirect records. The only way to combat the accumulation of too many indirect records is to periodically "reorg" your data base, that is, to completely unload all the data and reload it into a new data base.

Factors to consider in using record compression are CPU speed, disk speed, idle CPU, disk fullness, and indirect record buildup. If your data base is full of addresses with lots of blank spaces, record compression will probably be good for you. If, on the other hand, your data

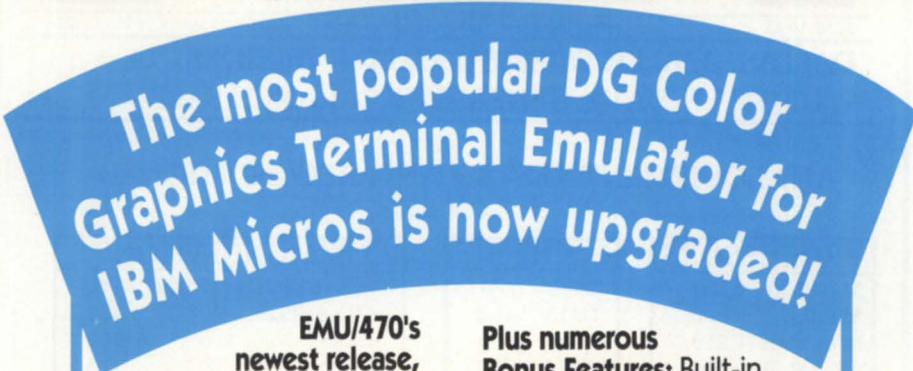
base is full of numeric data (much of which is signed or computational), record compression probably won't do you much good. Borderline cases should consider the relative speeds of the CPU vs. the disk. The higher the CPU-to-disk ratio, the more likely you'll benefit from record compression. If you use it, be prepared to monitor the indirect record count and rebuild the data base when it starts

to affect your performance.

**Key compression**

Key compression is similar in concept to record compression, but is implemented differently. Key compression saves space when the beginning of keys are the same; it does not compress spaces of repeating characters. Space savings occurs when you have lots of keys start-

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ing with the same value. The first key with the common value serves as a reference key with all the others pointing to it. The problem is that when you delete the reference key, it takes a while for Infos to change all of the pointers.

### Multiple volumes and element sizes

By default, Infos creates all data volumes with an element size of 32, an im-

provement over the standard system default of four, but in most cases, still below the optimum. For large data bases, I create a larger element size for the first volume, frequently up to 1,024 blocks. The largest I've used was 4,096 blocks.

Any good sized data base should be created with a large element size, but there is a danger. The larger the size, the more likely it is you will run out of large con-

tiguous blocks before the disk fills up. To guard against crashing a data base due to a "full" disk (when you actually have lots of space), I create an overflow volume with the default size of 32. With luck, the overflow volume will never be used. If it is, then your disk may be approaching a level of fragmentation that is costing too much in system performance.

Another reason for creating multiple volumes is if your data base can not fit on a single logical disk. There are two ways to allow an Infos data base to span multiple disks. The first is to create logical disks that contain multiple physical disks, the second is to create multiple volumes and move them to different logical disks.

### Merit factor

I'll keep this one short. Don't use it. This feature dates back to early AOS days when a 50 MB Zebra drive was both huge and fast. You could locate different volumes on different disks (including RAM pseudo-disks) and let Infos keep track of how often the different records were used. It then did internal shuffles, moving often used records onto the high-speed disks and infrequently used records onto the slower disks.

### Next month

We have discussed nearly all of the important features of Infos data base design that you can control with ICREATE. Next month, I'll have more tips on efficient Infos use.

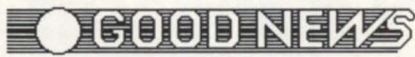
### What could I have SED?

The "Insert from" and "Append from" commands in SED have a feature that I was recently made aware of. You can control the text retrieved from a file by specifying its line number range. It seems like it would be a lot of trouble to keep track of the physical line numbers holding the text. Perhaps this feature could be useful coupled with the /P= switch for batch mode operations.

I find this feature fascinating and would like to find out how one might take advantage of it. How about it readers? Does anyone out there have a good use for this feature? If you do, write to me at the address below. △

*Jim Siegman is a contributing editor to Focus and treasurer of the Chicago Area Data General Users Group. Send comments or questions to him at 548 Walnut, Elmhurst, IL 60126; 708/941-8214.*

News



News

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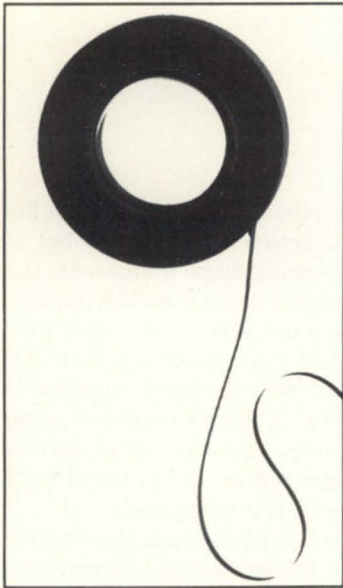
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# A complete listing of the NADGUG software library



**ACK** • Updated version 1.70. Terminal emulator/file transfer program for both AOS/VS and AOS machines. 365 blocks.

**Big Brother** • Automatic log-off program written in Fortran 77. Donated by the U.S. Forest Service. 169 blocks.

**B.J.'s BBS contributions** • 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. 6,761 blocks.

**CRTEdit** • The old RDOS screen editor ported over to VS. 49 blocks.

**DBCHECK** • Checks the open status of an Infos file and examines the checkpointing status of a file. 187 blocks.

**DUMpload** • A Macintosh program to dump and load AOS/VS-compatible dumps on a Macintosh. 137 blocks.

**ERP** • A process-termination program developed by NASA and modified by Manville. In Fortran 77. 454 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. 654 blocks.

**Focus** • *Focus* magazine articles. 1774 blocks.

**FTNCVT** • A Fortran 5 to Fortran 77 translator. 232 blocks.

**Games** • A collection from various places. Enjoy. 19,216 blocks.

**IMSLUTIL** • A collection of CLI macros, Cobol routines, and assembly routines callable from Cobol. By IMSL of Houston. 4,893 blocks.

**JAG\_UTIL** • JAG\_UTIL by John Grant consists of several programs: Filecount, User-space, Scan, Glossary, Laminate, and Qhelp. 4,325 blocks.

**Kermit** • A file-transfer protocol developed at Columbia University. Uses 9,697 blocks.

**Logout** • Another auto log-out system. 178 blocks.

**Look** • Used to view text files, Look allows you to move forward and backward in a file. Donated by Data General. 202 blocks.

**Macros** • A collection of macros from various sources. 441 blocks.

**MENUDIR** • An initial user menu that can chain to other applications and features a password-control system. From the Fed SIG. 486 blocks.

**Misc Kerm** • An expanded version of AOS Kerm, this now includes other versions of Kermit including DG/One Kermit. 6,709 blocks.

**Notify and Prior** • Two contributions from Concept Automation. Notify tells you when a process has terminated. Prior lists the priorities of processes. 162 blocks.

**RDOS Kermit** • Now available. You must request the Kermit tape (rather than the library tape) to get RDOS Kermit.

**Softrans** • A file-transfer protocol written in Fortran 77 used to communicate with proprietary PC communications packages. 462 blocks.

**Spell** • Checks the spelling of a word or spell-checks documents. Submitted by Richard Kouzes. 5,108 blocks.

**TEX** • Version 2.26a is now available. TEX (Terminal Emulator with Xmodem) is a terminal-emulation program written by David Down. He has revised the TEX software to include a command language. TEX is distributed as shareware. At the end of 30 days, either remove it from your system or send the author a \$45 fee. 463 blocks.

**VT100KER** • VT100 emulator from John Grant. 1,043 blocks.

**Xfer** • A tape-conversion utility. 607 blocks. △

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

Randy Berndt, Building 4, Suite 321, 5300 North Braeswood, Houston, Texas 77096

MV/2000 and MV/1400 users should send one formatted, error-free tape cartridge. Software contributions should be sent to the same address. Be sure to include your membership number. Allow 4-6 weeks for delivery.

Thanks to Brian Johnson and :WFFCA, the library is now able to provide 1200 ft. copies to AOS/VS rev 6 users. Thanks to Kevin Danzig for duplicating MV/2000 tapes. To leave a question regarding non-standard library distribution call 713/988-5342.

Please include a self-addressed envelope with sufficient return postage. In compliance with postal regulations, do not date the postage. Either disable the date printing completely, or set the date to "--" or zeros.



# D:driving Miss Daisy

## SYNOPSIS

*Though it may not garner as many awards as the movie Driving Miss Daisy, D:drive does have winning qualities, including true file redirection, file locking, flawless emulation, and peripheral sharing between PCs and MVs.*

I seem to be on a LAN roll. This month I've got D:drive, a local area network operating on asynchronous lines. The product uses true file redirection rather than virtual disks, so that the MV directory looks like another DOS disk drive, and you can manipulate files from both the PC and the MV ends.

D:drive's installation program is straightforward and easy to use. On the PC side, it asks a few questions about your drives and communications parameters, installs the program on your hard disk, and modifies AUTOEXEC.BAT and CONFIG.SYS to include the D:drive device drivers. On the Data General side, you specify each console number and assign a username, directory, ACL, and whether the user should be brought up under D:drive or EXEC. If you're already wired for asynch terminals, no additional wiring or boards are necessary.

The only improvement that I'd suggest is making the update of the AUTOEXEC and CONFIG files optional. There are two reasons for this—first, I seldom allow *any* installation program to modify my files (I just don't trust them), and second, D:drive doesn't always do the modification correctly. I've found extra "Ds" in the file after running DDCHANGE (SET DDDDRIVE=d:, for instance).

Accessing D:drive from the PC is just as simple. The "D:" in D:drive is meant to show that you'll have an additional drive—it may or may not actually be named D:. In my case, it was G:. You access the drive the same way you would access a DOS disk, by typing "G:". D:drive takes a few seconds to build an image of the drive the first time it is accessed, but after that, you're looking at MV files on your PC. One item to note—once D:drive initializes a drive, it doesn't update the files it sees when new files are moved from the MV into the directory. If I bring

up D:drive, and then move a bunch of files from :PROGRAMS into :UDD:TIM, D:drive won't find them until I run the utility DDINITDG on the PC. There's nothing wrong with this, but it takes a little getting used to.

D:drive uses DOS services, so filenames that can't exist under MS-DOS don't show up on the drive. Although D:drive will translate as many names as possible, it just can't handle something like TESTING.1.2.3.TESTING, so it will ignore the file. Therefore, to use these files you'll either have to rename them or create a link to them with a valid DOS filename. On the other hand, if you have files that you don't want the DOS user to see, here's an easy way to hide them—toss in a spare period or two.

The current version of D:drive (1.3) has added file locking. Since it's possible (and probably likely) that multiple users will be sharing the same file, it's also possible that some changes will be wiped out. Although up to 16 versions of the file may be opened simultaneously, only the last one written to will have the modifications saved. In order to prevent a catastrophe (such as your boss finding out that you've wiped out his last four hours of work), D:drive now includes the utilities DDLOCK and DDCLOSE. DDLOCK will exclusively open a file for your use. When you're finished with it, DDCLOSE will release the file.

The first thing that I tried, naturally, was a COPY. I moved a file in :UDD:TIM called ICOBOL.ARC to the C drive using the regular DOS command

```
COPY D:ICOBOL.ARC C:
```

The transfer itself was fast—over 750 bps, while using about 5 percent of the CPU. This is as fast as any of the Xmodem /Ymodem transfer programs I've tested.

D:drive puts up a nice banner on the top of the screen, with the number of sectors remaining to be transferred. The sectors counted down from 127, the banner blanked out, and . . . it started over again. It took me a while to realize that this is what the program is supposed to do, and that it wasn't caught in some kind of loop. The number of sectors counted down from 127 11 times, until the whole file was transferred.

This needs to be changed. Showing the number of 127-sector blocks remaining is a good idea. Although this display can be changed to any number from 2 to 999, you're still going to have some confused people if the file is over 999 blocks long.

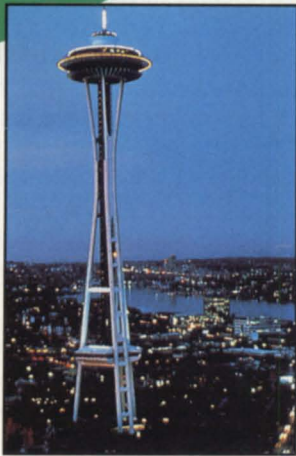
Copying text files to and from the MV is always a problem. Some programs, like Blast, allow you to specify during the transfer that the file is a text file. Since D:drive doesn't have any kind of transfer utility—all you are doing is using the DOS command—D:drive includes a utility program to enable text files to be transferred between AOS/VS and DOS. The utility DDCOPY allows you to specify which way the transfer is going, and works without a hitch.

Next, I tried to TYPE a file. This worked, of course—but not nearly as well as it should. Apparently, for a large file D:drive has to read a block of 127 sectors before it can begin to display the file. Thus, when I entered TYPE PARU32.SR I watched the banner for 90 seconds, the file displayed for 40, the banner for another 90, and so on. It's easier to go to the CLI.

Speaking of which—if D:drive has control of the asynch line, how do you log on to the MV? Well, just as Rational Data has integrated Popterm into PC /Remote, Digital Dynamics has included a very nice emulator called DDTERM that handles the intricacies of D:drive.

As an emulator, DDTERM worked

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flawlessly. Typing DDTERM brings up a pull-down menu screen. The emulator allows text uploads and downloads (which seem to be about 90 percent of the traffic in our installation), and includes an ENVIRONMENT menu that lets you specify such esoterica as whether your backspace key should be a backspace or a delete, which codes your function keys generate, and even allows you to assign

macros to each function key. DDTERM passes the CRTEDIT test, which I've found to be the MV version of Microsoft's Flight Simulator—if an emulator works on CRTEDIT, it'll work on anything. It's also possible—if a little cumbersome—to use another emulator with DDTERM. But you have to get into DDTERM anyway, so it's really not worth the bother. The only handy additions to this emulator

would be the ability to handle COM3 and COM4.

DDTERM allows you entry to the MV in two ways—PUSH and SWITCH. PUSH merely pops up the CLI, without asking for username or password. However, the only directories available to you are your D:drive directory and its subdirectory, and you aren't allowed superuser privileges. According to the manual, at least. I couldn't become a superuser and I got the "File access denied" message in : and :UDD, but I was able to get into :UTIL and :PROGRAMS just fine. X FED LOAD.PR executed without a glitch, and a malicious user could really do some harm.

This is dangerous, and *must* be changed. Of course, none of you out there have any files with an ACL of +,OWARE—do you? SWITCH, on the other hand, merely logs you onto the system and requests username and password.

When you're through with AOS/VS, select "D:DRIVE" on the pulldown menu bar, and you're back on your PC. This should also exit from the AOS/VS CLI and get you ready to use D:drive again. Well, yes and no. It recovered just fine from a PUSH, but always seemed to leave the line enabled after a SWITCH. This resulted in a hung program the next time I tried to go to disk D:, and an "Internal Stack Overflow" message requiring a cold boot on the PC. So for now, the situation is: PUSH works just fine, but is a potential security disaster. SWITCH won't let you get back to the PC without rebooting. SWITCH may be partially my fault, though. I'm running DOS 4.01 and neither God nor Bill Gates knows what DOS 4.01 is doing.

Like any good LAN, D:drive allows peripheral sharing. This was one of the nicest features of D:drive, because it allows you to use forms control while on the PC. All you need to do is set up a file on the MV side named QUE . . . <file-name>. The two periods ensure that the file is transparent to D:drive. The file then specifies the device, whether it's a printer or plotter, page limit, delete after printing flag, number of copies, and the name of the forms file. Once this is set up, the print command on the PC is simply

COPY <printfile> <filename>

and the output is automatically queued.

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From QUATTRO, I specified output to a file, and gave the file name as D:\MAIN. A few seconds later, the spreadsheet printed on our Linewriter.

On the whole, I liked D:drive. There were a couple of problems, but they're the sort that can easily be fixed. The PUSH option can best be fixed by eliminating it—it may be a pain, but I'd rather have to log on each time I want the MV than to leave my files unprotected. I liked being able to use forms control while printing, and the emulator is one of the better ones around. At \$795 for the program and \$125 for each PC, it's possible to set up 16 terminals sharing the MV for under \$3,000. D:drive is available from

Digital Dynamics, Inc.  
3055 Plymouth Road  
Ann Arbor, MI 48105  
313/995-2400

A demo version is available for \$49.95, refundable with purchase.

**Odds and ends department**

I just broke myself of an RDOS mind set, and I wonder how many of you out there have the same habit. After running ICobol under RDOS for 10-plus years, my programs directory is scattered with files like APVNHSTINQ.CO, and FILES is clogged with things like MAN PRHSTFL.XD. After spending an afternoon looking for a program that I still haven't found, a flash of inspiration came to me "Hey, I'm running AOS/VS!" From that point on, my file names started looking like AP\_VENDOR\_HISTORY\_INQUIRY.CO and MANPOWER\_HISTORY\_FILE.NX.

I know I'm not alone in this. I've seen a couple of commercial programs adhere to the RDOS 10 character limit, even though they'll only run on AOS/VS. If you're a VAR, writing for multiple operating systems, this makes sense. If you're writing for yourself—or if your programs will only run on VS— why not make life a little easier, and spell it out?

I've got a friend in Florida who recently

*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.*

switched from VS Cobol to ICobol. He needed a speed increase, and I told him that making the move to ICobol and dropping Infos would at least double his processing speed. I just got a call from him—with his boss looking over his shoulder. He ran the year-end payroll on two identical MV/2000s. The ICobol program finished in less than one-third the VS Cobol time!

There's been a lot of Unix bashing on the bulletin board this month. If anyone's really interested in killing off Unix, I've got a sure-fire method. Recent experience has shown that every time I move up to a new operating system, DG drops it like a hot potato. So those of you interested in getting rid of Unix once and for all, simply send me a used Aviiion. Unix will be dead within the year. Δ

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# A better API

## SYNOPSIS

*Most DP/MIS shops have an investment in both programs and programmers on their AOS/VS systems. While it might be reasonable to move an application and even an application programmer from AOS/VS to MS-DOS, there is still a big hole: "comms" stuff.*

I've been touting "distributed applications" since 1985, and while it makes perfect sense to me, very few system designers have actually implemented such a scheme.

If distributed processing makes so much sense, why haven't more of you adopted this strategy? We asked around and heard one overwhelming answer: it's too difficult.

For the past five years, all of RDS' products have included application program interfaces (APIs). Typical APIs include the XNS and TCP/IP protocols, or the dreaded Netbios interface.

While these are promoted as tools for the network programmer, clearly a significant gap exists between the application programmer at one end and the communications programmer at the other. It may seem straightforward to us comms types—but we all have our specialties. I couldn't write an inventory package if my life depended on it. It's time for an API without concepts such as "timeouts," "connections," "sockets," "ports," or "sessions."

## RPC: The latest API

RDS has developed a high-level API for application programmers: the Remote Procedure Call (RPC). RPC is now provided as part of RDS' PC/VS and PC/Remote products and allows an applications programmer to develop a distributed application with little or no knowledge of networking.

Figure 1 shows the structure of the RPC mechanism. When planning distributed applications, the first step is to design the remote procedures for AOS/VS. These procedures can be as simple or as complex as you like. A simple remote procedure might return the status of a global variable, whereas a complex one might extract information from an Infos data base and return the results.

Your AOS/VS procedures will be linked directly into each user's clone process. This process is created when the user logs on via the underlying platform, PC/VS or PC/Remote. RDS provides the clone program. This allows your remote functions to be invoked without a program swap or other context switch. This design also means you don't need to worry about connections, sessions, logons, security, access control, etc. The underlying platform products take care of these issues and guarantee that when your functions are called, they will be done so by a valid AOS/VS user.

## The PC side

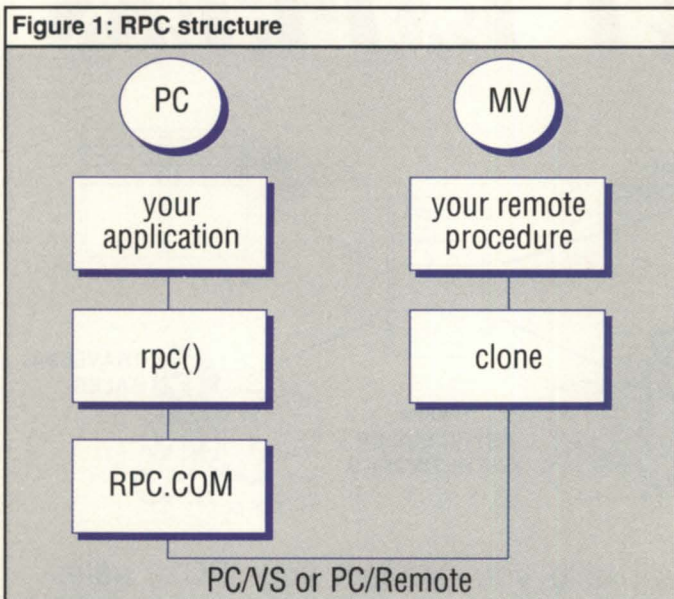
Once your remote procedures are available under AOS/VS, they may be called from your MS-DOS applications. You can develop PC applications in C, Cobol, assembler, or any other compatible language.

Let's take a look at an example of RPC modules written in C. To save space, I removed error-handling code and some declarations that are not required to understand the mechanism.

The example is a simple one: we want the MV to open a file, read a specified record, close the file, and return the record to the PC.

The first step is to define parameters that will be passed and returned between the PC and the MV. These are declared in a structure (see Figure 2) used by code on both sides.

The next step is to code the remote AOS/VS function that will perform the task. (See Figure 3.) We've named this function "RPC07." This symbol will be resolved by the AOS/VS linker to



**Figure 2: Parameters**

```

#define unsign16 unsigned short

typedef struct read_request {
    char fname[128]; /* filename */
    unsign16 num; /* record number */
    unsign16 size; /* size of records in bytes */
} REQUEST;
  
```



Figure 3: The remote function

```

/*****
long RPC07 (data, request, max, response)
/*****
char *data;
unsigned request,max,*response;
{
    REQUEST *r;
    FILE *fd;
    unsigned record, recordsize;

    r = (REQUEST *) data;          /* extract parameters*/
    record = r->num;
    recordsize = r->size;

    fd = fopen(r->fname,r);        /* open the file */
    fseek(fd, record*recordsize, 0); /* position file */
    fread(data, recordsize, 1, fd); /* read data */
    fclose(fd);                    /* close the file*/
    return(0);                      /* return ok */
}

```

define this routine as RPC function number seven.

All remote functions are called with the same four parameters and may return a 32-bit integer. The parameters are:

*data*: the address of the parameters passed in both directions;

Figure 4: The local function

```

/*****
read_record (filename,recordsize,recordnumber,buffer)
/*****
char *filename,*buffer;
unsigned recordsize,recordnumber;
{
    REQUEST *r;

    r = (REQUEST *)buffer; /* copy parameters to structure */
    r->num = swapb(recordnumber);
    r->size = swapb(recordsize);
    strcpy(r->fname,filename);

    rpc(7,buffer,buffmax,sizeof(REQUEST));
}

```

*request*: the length of the data passed to the remote function;  
*max*: the maximum length of data that may be returned from the remote function;  
*response*: a return parameter for the length of the data actually returned by the remote function.

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RPC07 first extracts the parameters from the structure, then performs the file operations and returns the data.

The final step is to write a *local* function on the PC to call RPC07. Note (in Figure 4) that we refer to the identical structure used in the remote procedure. This guarantees that both ends will agree on the definition of the parameters being passed.

The `read_record()` function can be called from anywhere within our MS-DOS C program to read a record from any AOS/VS file. We simply pass it the name of the file, the record size and number, and where we want the record placed upon completion. All that is left is to call "rpc()" indicating that we want to invoke remote function number "7," and include the parameter structure and buffer information.

You may notice the use of the function `swapb()` in Figure 4. When a 16-bit integer is transferred from MS-DOS to AOS/VS, the order of the bytes is reversed. While this presents no problem for character strings, binary numbers must have their bytes swapped at one end or the other. Why swap bytes on the PC? While it might be faster to swap the bytes for one user under AOS/VS, it is always a good idea to move this kind of operation to the workstation. Imagine the benefits to the total system throughput when hundreds of users are each swapping bytes on their own microcomputer.

## Debugging

It is important that remote procedure calls can be made by

programs using any memory model, and that the application programmer's source-level debuggers continue to work. We accomplished this by placing all of the nuts and bolts of RPC in a TSR, while providing a small language-specific library file for each programming language.

Sounds great, but have you ever tried to debug a communications-based program under SWAT? Especially one that doesn't have an AOS/VS console? We've solved that too, and in a unique way. You simply disable one console from EXEC and feed that console number to RPC with a simple command. Voila! SWAT appears automatically at the designated console ready for you to begin setting breakpoints and snooping around. And what happens if while you're setting and snooping, the underlying communications protocols time out and your connection ends? No problem, for when you start your debug session you simply ask RPC to disable all low-level timeouts. If you've ever had to do it, you know how difficult it can be to debug stuff like this.

It's great to have a good interface like RPC, but what does it really buy you? Curious to find out exactly what the typical benefits of a distributed processing environment might be, we selected a simple application for testing.

We started with an existing MV-based mailing list program written in C and using Infos as its data manager. The data base was a two-level DBAM structure that utilized a single record with multiple keys. The application was straightforward and

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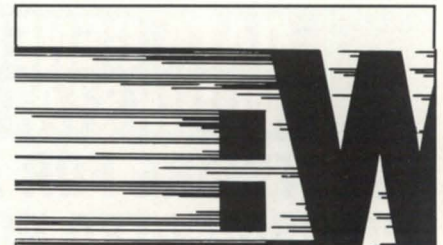
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initially considered to be a poor candidate for conversion as there would be little savings other than terminal input/output. Were the programmers ever surprised!

We implemented a number of Infos calls as remote procedures that allowed us to write a C program on MS-DOS that made Infos calls as though Infos existed on the PC. To improve the user interface, we re-coded the screen I/O to make use of pull-down menus and pop-up windows—something that is only possible on a PC.

We developed some simple tests such as searching the data base for a record, entering a new record, modifying a record, and scrolling through a window of 13 records on the screen. The total MV CPU times (in CPU seconds on an MV/4000) and the savings attained in the distributed version are shown:

Operation	Standard	Distributed	Savings
Read & display a record	0.258	0.065	75%
Enter, write, & invert	0.291	0.082	72%
Search for a record	0.271	0.064	76%
Read next record	0.209	0.060	71%
Read previous record	0.340	0.057	83%

We also tested the results of developing the sample program in the two environments. The following shows elapsed time in seconds:

Operation	Standard	Distributed	Savings
Compile and link	192	66	66%

Note that the PC used was a 12 MHz AT clone with a slow disk, hardly a state-of-the-art workstation. Using a faster PC can result in far greater savings in development time.

This shows a typical two-thirds improvement in programmer productivity, which would increase substantially if the MV family computer were not idle and dedicated to use by a single programmer. What is not shown here is the 100 percent reduction in impact of development upon production, since compilation and linking no longer require any AOS/VS resources whatsoever.

### The future

Already, some of our ISVs and OEMs are porting their applications to RPC. PC/VS and PC/Remote users have just received these tools as part of release 4.00 of each of these platform products. I am hopeful that RPC will be our *last* API for some time. Δ

*Doug Kaye is CEO of Rational Data Systems. He can be reached at 1050 Northgate Drive, San Rafael, CA 94903; 415/499-3354. For a free copy of the RDS Report on PC Integration, contact RDS at 150 South Los Robles Av., Pasadena, CA 91101, 818/568-9991. Copyright © 1990 Rational Data Systems, Inc.*

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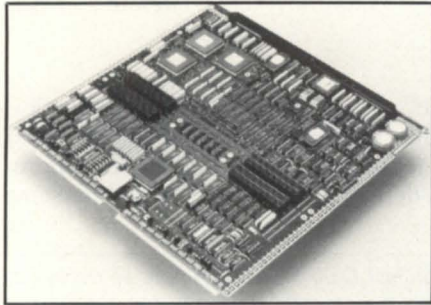


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## MV/5500 DC and MV/9500 boost price/performance



The system board for the MV/5500 DC and MV/9500 is based on a single-chip, high-density CMOS CPU. Reduced chip count allows more room for memory, I/O, and other features.

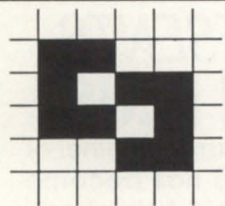
Westboro—Data General introduced the first Eclipse MV family 32-bit CPU architecture on a single integrated circuit: the low-end Eclipse MV/5500 DC and mid-range Eclipse MV/9500. With reduced chip count, this technology allows more space on the system board for memory, I/O, and other features that enhance reliability and overall system performance.

Based on the same microprocessor, the 5500 and 9500 deliver a processing performance of 5 MIPS. Cost-per-MIPS on the new Eclipse MVs is considerably less than that of its predecessors, and of comparably configured MicroVAX machines.

The Eclipse MV/5500 DC is packaged as an under-the-desk system that can be installed and upgraded by the customer. It can function as an application or data base server in client/server PC LAN en-

vironments or as a standalone compute engine. This MV features 16 to 32 MB of main memory and is expandable in 8 MB increments. It supports 144 asynchronous ports, multi-channel and multi-protocol communications, and up to seven mass storage peripherals. Also, it is compatible with AOS/VS, AOS/VS II, and DG/RDOS.

The Eclipse MV/9500 is packaged in a 10.5-inch high NEMA-standard rack-mount chassis and supports the full range of Eclipse Burst Multiplexor Channel (BMC) and Data Channel (DCH) peripherals and controllers. It features up to 128 MB of main memory, expandable in 8 or 32 MB increments. This new system supports up to 624 direct-connect asynchronous ports for terminals and printers and up to 76.8 GB of Winchester disk storage on the BMC.



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It also supports the Message-based Reliable Channel (MRC) subsystem. The MRC provides an I/O channel for data base and peripheral sharing from multiple Eclipse MV family systems, and high-availability functions such as on-line diagnostics, repair under power, and complete hardware redundancy. The 9500 is compatible with AOS/VS, AOS/VS II, DG/RDOS, and AOS/RT32.

The Eclipse MV/9500 also provides an economical, board-level upgrade path from older Data General systems. System-board upgrades are available for a range of 16-bit systems such as the Nova 4, and 32-bit systems like the Eclipse MV/7800 and MV/4000. Customers who purchased DG systems over 10 years ago can upgrade their systems while preserving their investments in packaging, current peripherals, and software, and attain significant performance increases and user counts.

The base price of an Eclipse MV/5500 DC with 16 MB of memory, a 320-MB disk, and operating system right-to-use (RTU) license is \$53,100. The MV/9500 with 8 MB of memory, a NEMA-standard chassis, and operating system RTU is \$62,000. Additional features include gray cabinets with more space, increased power and thermal capacities, and lower maintenance. Both systems are available 60 days after receipt of order.

*Data General, 3400 Computer Drive, Westboro, MA 01580; 508/898-4051.*

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## Rewritable optical for DG MVs

Minneapolis, MN—Zetaco announced Model SKR-600, a rewritable optical subsystem compatible with Data General's MV series of minicomputers.

SKR-600 includes a desktop magneto-optical drive in the 5.25-inch form factor, a Data General-emulating disk controller, and a 9-foot SCSI cable. Its 5.25-inch removable media cartridges hold 594 MB of data—297 MB per side of the platter.

Gary Becker, product manager, explained that the product strictly adheres to industry standards. The drive interface is SCSI so that in the future it can attach to an Aviiion or other workstation, and the media meets ISO standards.

The magneto-optical disk technology uses a low-powered laser beam, in conjunction with a magnetic field, to record, read, erase, and re-write data an unlimited number of times.

SKR-600 subsystems are available now, 30 days ARO, for \$16,000 each. The subsystem carries a two-year warranty on the disk controller and a six-month warranty on the optical drive.

*Zetaco, 6850 Shady Oak Rd., Eden Prairie, MN 55344; 612/941-9480.*

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Corporation added Data General's AOS/VS to the list of operating systems supported by its Intelligent Query (IQ) visual report writer.

For MV family users, IQ offers a menu-driven point and click interface for accessing ICobol files. Information can be easily extracted and formatted with little support from DP. Data fields are selected from pop-up menus, then instantly dis-

played, printed, or graphed. Users may also format reports using a visual screen painter to produce labels, letters, or other more formal reports.

Available for immediate shipment for ICobol, IQ's end-user interface will be released for Infos in the second quarter of 1990. IQ ranges in price from \$2,500 for an MV/1000 DC to \$25,000 for an MV/40000HA Model IV.

*Programmed Intelligence Corporation,  
3295 River Exchange Dr., Suite 550, Norcross,  
GA 30092; 404/446-8880.*

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## Officeaccess around the globe

Upper Saddle River, NJ—Western Union introduces Officeaccess for Data General, an integrated application program linking the Data General Eclipse MV family of systems to Western Union's Easylink electronic messaging services.

Officeaccess can expand Data General CEO communications worldwide by enabling users to send messages for delivery anywhere as facsimile, telex, Easylink electronic mail, Mailgram message, cablegram, telegram, or Priority Letter—directly from their workstations.

Officeaccess uses familiar CEO screens, functions, and menus, so extensive training is not required.

In addition to providing a fully integrated interface to CEO software, Officeaccess benefits the Data General user and system manager. Messages can be created in CEO Word, CEOWrite, or Wordperfect. Officeaccess will also operate on Eclipse MV family systems not utilizing CEO, and it supports public and private directories.

Officeaccess can be ordered directly from Western Union for a license fee of \$2,225 to \$24,145, depending on the particular Data General MV system installed.

*Western Union Corporation, One Lake Street, Upper Saddle River, NJ 07458; 201/818-5000.*

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## TPS for AOS/VS

Memphis, TN—BTB, Inc. now supports Transaction Processing System (TPS) software running under AOS/VS. TPS facilitates information processing in a multi-terminal, on-line environment for a wide range of user needs.

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— Vicki Jackson, Information Manager  
USDA Forest Service, Timber Management

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Control System (FCS), a versatile screen manager. FCS features include field back-space, field level editing and validation, tab to a specific field, required entry, repeat data from a previous record, and array processing.

TPS AOS/VS comes complete with a demo application that allows quick installation and checkout with any AOS/VS system. The AOS/VS version of TPS allows continued software development and includes a Cobol compiler, runtime library, two indexed data base access methods, sort utility, and file management utilities.

The software is available for lease only. BTB, Inc., 6820 Stout Road, Memphis, TN 38119; 901/757-5928.

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## Metamorphosis

Cleveland, OH—Thunderstone/Expansion Programs International, Inc., announced its advanced retrieval and correlation software, Metamorph, is now available for Data General's Aviion family of RISC-based workstation servers and multi-user systems.

Unlike lower level search and retrieval programs that perform literal searches for key words, Metamorph also searches for correlated ideas and concepts. Metamorph has been implemented by NASA, the Pentagon, Secretary of the Air Force, U.S. Navy, members of the U.S. Intelligence community, and many corporations.

Mike Pincus, president and CEO for Thunderstone/EPI, Inc. said that not only can Metamorph search and correlate static information on hard drives, but the software can also handle live wire feeds.

Metamorph can perform on Aviion systems running DG/UX, and on DG's Dasher/386 family of PCs running MS-DOS or 386ix.

Thunderstone/Expansion Programs International, Inc., 2401 Superior Viaduct N.W., Third Floor, Cleveland, OH 44113; 216/771-7880.

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## Turbotran ver 1.41, a smart connection

Germantown, MD—Data Bank Associ-

ates (DBA) announces that TurboTran version 1.41 (Xmodem/Ymodem protocol) now includes automated text file conversion for PC files, non-DG terminal support, improved performance, and advanced integration with the Persoft Smarterm product line.

Text file conversion is accomplished with no significant impact on the speed of the file transfer. Using the "/PC"

switch, PC text files automatically strip or add the carriage return to the file, depending on the target.

Turbotran now displays messages and accepts information from non-DG terminal emulators without "wrapping off the page." Also, independent tests have shown TurboTran uses eight percent less CPU than leading competitors.

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## ON-LINE HELP

### Who to call for answers about NADGUG and FOCUS

#### NADGUG

##### Membership, address changes

Jennifer Foye ..... 800/877-4787  
(Outside the U.S.) ..... 512/345-5316

##### Information on RIGs or SIGs

Greg D. Goss ..... 800/877-4787  
(Outside the U.S.) ..... 512/345-5316

##### Electronic bulletin board

(300 or 1200 baud modem)  
Rational Data Systems ..... 415/499-7628

#### NADGUG staff and Focus Magazine address:

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4807 Spicewood Springs Road  
Suite 3150  
Austin, TX 78759

#### FOCUS Magazine

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Editorial comments, article suggestions.....Robin Perry  
(please send product announcements to the address listed above)

Information about advertising.....Michelle Sentenne

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*Data Bank Associates, Inc., 20010 Century Blvd., Suite 104, Germantown, MD 20874-1118; 301/540-5562.*

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*Data General Corp., 3400 Computer Drive, Westboro, MA 01580; 508/898-4074. Δ*

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### for **NADGUG** Membership information contact:

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First-day orders for DG's new Eclipse MV/5500 DC and MV/9500 exceeded \$15 million, which included an order to automate the **Labor Exchange** offices of **The Netherlands** with 47 MV/5500 DCs worth \$6.5 million. The Dutch government placed a total order from Data General worth \$16 million, which includes systems and software development, and three high-end Eclipse MV/40000 computers.

Another first-day order was received from **MacDonald Dettwiler Technologies Ltd.** of Vancouver, which reportedly chose the MV/5500 over Unix alternatives. The MV/5500 "is a cost-effective solution that allows us to preserve our significant software investment while increasing price/performance," said Mark Townsend, director of manufacturing.

Among the other initial purchasers of the new low-end MVs are two healthcare VARs, **HBO & Company** of Atlanta, and **PHS**, of Marina Del Rey, California, plus two Japanese companies, a Paris bank, and a New Zealand VAR.

For more information about the new systems, see Products and Services, page 58.

What does "CPU on a chip" really mean? According to Data General, what fits on a single Eclipse MV/9500 board took four Eclipse MV/20000 boards, and as many as 10 Eclipse MV/8000 boards. The chip measures 14 millimeters high by 14 millimeters wide, or about one half square inch. It contains 600,000 transistors.

The microprocessor was co-developed by design teams in Westboro (system design, logic design, microcode development), Sunnyvale (circuit design, chip layout and verification), and Japan (fabrication by **Hitachi**). While in development, the new microprocessor was code-named Washi, the Japanese word for eagle. You may recall that eagle was the code name for the first Eclipse MV.

**Western Micro Technology, Inc.**, a specialty high-technology distributor based in Saratoga, California, is the first distributor of Aviion systems. **Eric Binder**, director of distribution channels for DG, said that Western Technology will provide standard and custom configurations, and complementary third-party products.

As part of the agreement, Western Technology will drive focused marketing programs, sales promotions, and technical support.

**Norsk Data**, Norway's leading computer manufacturer, signed a value-added reseller agreement with Data General valued at \$6 million. Under the agreement, Norsk Data is reselling Aviion workstations as part of its Uniline 88 product line. Norsk Data, based in Oslo, had revenues of \$350 million in 1989 and employs 2,600 people worldwide.

Data General moved into the **Pick** operating system marketplace with the signing of an original equipment manufacturer (OEM) agreement with **VMark Software**. Pick is the third most popular operating platform world-wide, behind MS-DOS and Unix. Under the agreement, DG will market and support **DG/Universe** software, enabling over 4,000 commercial applications running Pick and Prime Information software to run on Aviion systems.

Data General is edging closer toward profitability, or at least the break-even point. That's the rose-colored view taken

by DG officials after the release of second quarter fiscal reports showing a net loss of \$8.6 million, or 29 cents per share. This is an improvement over the first quarter of fiscal 1990, during which DG recorded a net loss of \$20.5 million, or 69 cents per share.

**Ron Skates**, president and chief executive officer, said the company's hopes are buoyed by the positive response to the Aviion family of industry standard operating systems, and by the initial orders for the new Eclipse MV/5500 DC and MV/9500.

In addition, the results of DG's cost reduction program implemented last year can be seen in reduced operating expenses, which were lower by \$6.6 million, Skates said. Operating loss was \$7.3 million, down from an operating loss of \$18.4 million in the first quarter.

"Our goal of becoming a balanced supplier of open and proprietary systems remains on target," Skates said. "For the remainder of the year, we expect that demand will increase and that second half results will show an improvement over the results of the first six months. We are beginning to see that the strategic steps we have taken will allow us to grow and become profitable." △

#### Data General Corporation Condensed Consolidated Statements of Operations

(In millions except per share amounts)

	Quarter ended		Six months ended	
	Mar. 31, 1990	Mar. 25, 1989	Mar. 31, 1990	Mar. 25, 1989
Revenues:				
Product	\$205.5	\$233.0	\$391.9	\$429.0
Service	109.3	109.7	213.6	222.3
Total revenues	314.8	342.7	605.5	651.3
Costs and expenses:				
Cost of product revenues	101.4	114.1	192.6	212.6
Cost of service revenues	65.6	65.7	133.9	134.2
Research and development	41.6	42.5	81.8	82.6
Selling, general, and administrative	113.5	119.3	222.9	238.3
Total costs and expenses	322.1	341.6	631.2	667.7
Income (loss) from operations	(7.3)	1.1	(25.7)	(16.4)
Gain on sale of real estate	-	8.5	-	8.5
Interest income	1.9	2.6	4.2	4.9
Interest expense	2.2	2.6	5.1	6.3
Income (loss) before income taxes	(7.6)	9.6	(26.6)	(9.3)
Income tax provision	1.0	2.6	2.5	3.2
Net income (loss)	\$ (8.6)	\$ 7.0	\$ (29.1)	\$ (12.5)
Net income (loss) per share	\$ (.29)	\$ .23	\$ (.98)	\$ (.43)
Weighted average shares outstanding	29.9	29.9	29.8	29.2

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Centronics Page 8 Laser .....	700	Mannesmann-Tally M4201 (new) .....	500
Data Products 2230 .....	200	Mannesmann-Tally MT290 (as-is) .....	200
Data Products 2260 .....	300	NEC 5515 .....	300
Data Products 2290 .....	400	Okidata 182 .....	175
Data Products B300 .....	1,200	Texttronix 4531 Hard Copy .....	100
Data Products B600 .....	2,000	TI 820 KSR (as-is) .....	200
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Diablo 1345A .....	50	Wang 5575 Dot Matrix .....	300
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