

July 1991

FOCUS

The Magazine of the North American Data General Users Group

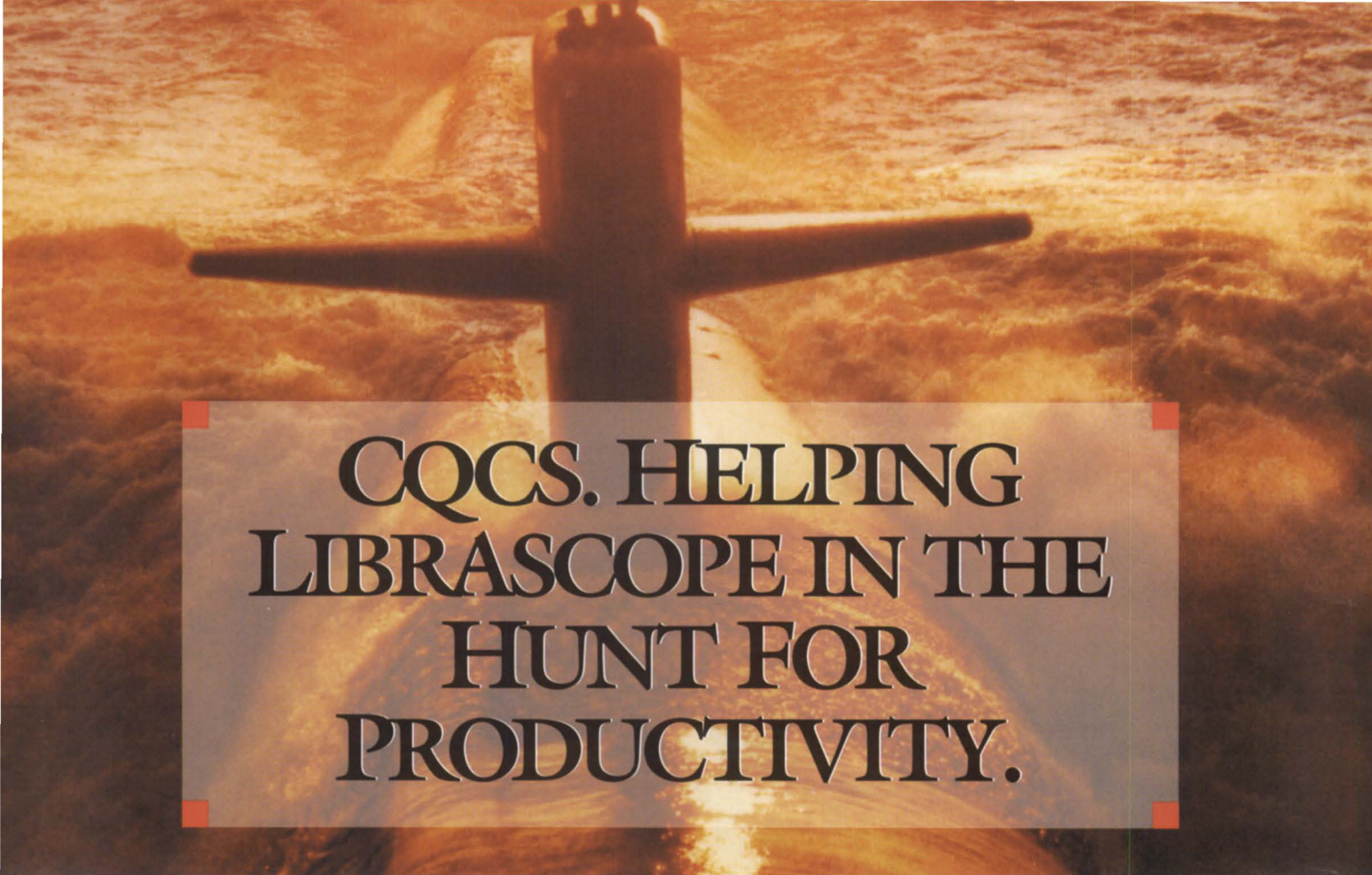
MV system performance



ELIZ SOTO

Hot tips for desk jockeys

Bulk Rate
U.S. Postage
Paid
Permit No. 38
Fulton, MO



CQCS. HELPING LIBRASCOPE IN THE HUNT FOR PRODUCTIVITY.

LIBRASCOPE, INC. designs weapons control display systems and workstations installed in attack class submarines for the U.S. and Royal Australian Navies.

See the movie, *"The Hunt for Red October,"* and you'll see Librascope devices in action.

When Librascope needed to upgrade their quality assurance systems, senior staff engineer Gary Rever began the search for a full-featured fourth generation language. His criteria? Fast rewrites of primary applications; machine efficiency; a seamless retrofit of older systems; and a powerful query structure.

And as a critical naval defense contractor, Librascope had to maintain responsiveness. "We needed something we could plug in and use right away," Gary recalls.

His choice: CQCS.

Gary's first project was a pivotal instrumentation testing application. "The original, written in C, took 8 months to write," Gary reports. "We rewrote it with CQCS in 4 weeks."

Bernie Abrams, Librascope's MIS manager of computer operations, put CQCS to work rewriting their entire financial processing system. "With CQCS, we expect to complete it in eighteen months," he says. "That's half the time it would have taken in COBOL."

In the area of report writing, the selection of CQCS paid off handsomely. "It's remarkably quick and easy to generate ad hoc reports," Bernie notes. "CQCS compiles very rapidly as compared with COBOL."

And learning the CQCS report writer was no problem at all, adds Gary Rever. "You can just sit down and use it right away."

As for machine efficiency, Gary describes CQCS as "excellent. There's no other word for it."

Librascope simply plugged CQCS into their existing hardware and software environment. So can you.

You can be writing even the most sophisticated applications 10 to 40 times faster than COBOL. And complete source code compatibility means your applications will run on DG MVs, AViiONs, DEC, PCs, PC networks, and various UNIX platforms.

In the U.S., call 1-800-451-1544 today. Let CQCS turn all of your data into useful information.

And bring you to new depths in your own hunt for productivity.

Cyberscience

C O R P O R A T I O N

Productivity with Performance

For the U.S., call 303-745-3900. For Australia, call 02-413-4666. For the U.K., call 0992-441111.

Photo: USS City of Corpus Christi, Courtesy of General Dynamics, Electric Boat Division and the US Navy. Our thanks to Librascope, Inc. for their assistance. Copyright 1991, Cyberscience Corporation, 10065 E. Harvard Avenue, Suite 800, Denver, Colorado 80231-5946. All rights reserved. AViiON and MV are trademarks of the Data General Corporation. DEC is a trademark of Digital Equipment Corp.

Circle 12 on reader service card.



To find the most powerful word processor for Data General, take this simple screen test.

Introducing WordPerfect® 5.0 for Data General AOS/VS.

Want to get into pictures? WordPerfect 5.0 makes it easy to combine graphic images with text in WordPerfect documents.

Center your graphic box between text columns and watch the text wrap around it. Move your graphic over to a corner. Make it big. Make it small. Put a shaded border around it. Write a caption under it in small italic print.

The *preview* feature shows you how your graphics will look before you print your document.

And it doesn't matter whether you're on graphic terminals or character terminals. WordPerfect 5.0 utilizes whatever character sets are available to represent graphics on nongraphics terminals.

Of course being a true star takes more than just looks. That's why WordPerfect 5.0 gives you more tools than ever to create stellar documents.

With WordPerfect 5.0, your AOS/VS system and your PCs can work together in supporting roles. You can write documents on your PC using WordPerfect 5.1 and then edit them on your AOS/VS system using WordPerfect 5.0.

With the *Fonts* feature, and the appropriate printer (WordPerfect supports over 600 of them), you can combine up to 250 fonts on a given page. You can also make your characters just about any size you want—from fine to extra large.

Kerning helps you reduce space between specific letter pairs, eliminating unnecessary white space.

Style definitions make it quick and easy to change formatting throughout a document.

WordPerfect 5.0 also lets you customize individual keyboards to make the function keys correspond to the keys used by other programs.

With WordPerfect 5.0, it's easier than ever to be a hit in the

Data General
AOS/VS world. Just
call (801)222-4100
for a major feature
presentation.

WordPerfect
CORPORATION

1555 North Technology Way, Orem, Utah 84057
Tel: (801) 222-4100 FAX: (801) 222-4177

WordPerfect is a registered trademark of WordPerfect Corporation. All other brand and product names are trademarks or registered trademarks of their respective companies. ©1991 WordPerfect Corporation.

PRESIDENT'S PAGE

On track for NADGUG '91

by Frank Perry

4

SYSTEM MANAGER'S LOG

Lighting up the scoreboard

With a passion for ensuring consistency and achieving lower performance overhead, BJ explains the ins, outs, and tricks of scoreboard-based transaction control

by Brian Johnson

16

BULLETIN BOARD

Bits and bytes from the bulletin board

24

UNIX NOTEBOOK

Join the migration

Consider carefully the advantages of switching to open systems. Ponder the limited future of proprietary architectures and software. Contemplate price, reflect upon speed and versatility of such new offerings as Data General's Avion. What are you waiting for?

by David Novy

26

OA TODAY

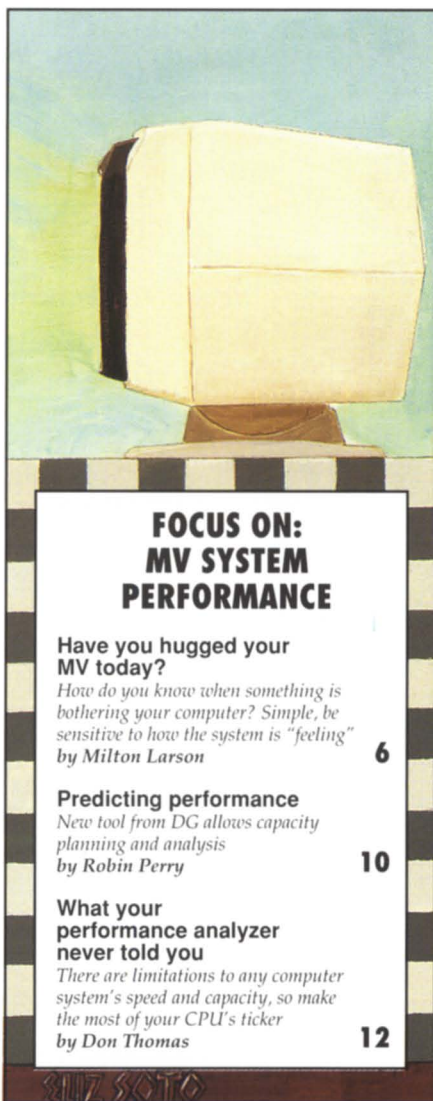
Getting the word out

Until human beings learn telepathy, office communications in the modern era of swirling information overkill will continue depending on imperfect tools such as e-mail. The problem remains: how to get the right note in time to the right people, and make sure they see it

by Kent Finkle

28

Cover illustration by Eliz. Soto



MV MACRO

Power pass

You need to pass parameters between QUICK, QUIZ, and QTP, but you can't use the JM switch with CL32. Don't despair, Powerhouse users. Here's an adapted macro and procedure that will solve your problem

by Andy Pook

32

SCREEN TEST

A revision to remember

"Greatly improved" doesn't begin to describe the features displayed by ICobol revision 1.60. Users will be pleased, says the author, because it's faster, more efficient, easier to write in, and much easier to debug

by Tim Boyer

34

NADGUG ROSTER

Use your connections

Our semi-annual listing of NADGUG leaders

38

PRODUCTS AND SERVICES

The latest products for DG systems

44

ON-LINE HELP

Who to call for information about NADGUG and Focus

50

IN GENERAL

News and notes from the DG community

52

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. NADGUG offices are located at Livingston Building, Suite 250, 3420 Executive Center Dr., Austin, TX 78731, phone 512/345-5316.

FOCUS, the Magazine of the North American Data General Users Group, is distributed to members of the North American Data General Users Group. Membership fees are \$60, of which \$48 is allocated to a subscription for FOCUS, the Magazine of the North American Data General Users Group. A one-year subscription (12 issues) to FOCUS, the Magazine of the North American Data General Users Group, costs \$48. For all memberships and subscriptions outside North America, add \$50 to defray costs of mailing. For information on NADGUG membership, call 1-800/877-4787. Address all other correspondence to FOCUS, the Magazine of the North American Data General Users Group, c/o Turnkey Publishing, Inc., Livingston Building, Suite 250, 3420 Executive Center Dr., Austin, TX 78731.

The cost of single copies is \$4. Requests to replace missing issues free of charge are honored only up to six months after date of issue. Send request to FOCUS, the Magazine of the North American Data General Users Group, c/o Turnkey Publishing.

NADGUG is an independent association of computer users; it is not affiliated with Data General Corporation, nor does it represent the policies or opinions of Data General Corporation. The views expressed herein are the opinions of the authors, and do not necessarily represent the policies or opinions of NADGUG or of Turnkey Publishing, Inc.

Advertisements in FOCUS, the Magazine of the North American Data General Users Group do not constitute an endorsement of the advertised products by NADGUG or Turnkey Publishing, Inc.

Copyright © 1991 by the North American Data General Users Group. All rights reserved. Reproduction or transmission of contents in whole or in part is prohibited without written permission of the Publisher. The Publisher assumes no responsibility for the care and return of unsolicited materials. Return postage must accompany all material if it is to be returned. In no event shall receipt of unsolicited material subject this magazine to any claim for holding fees or similar charges. Volume 7, Issue 7.

**NORTH AMERICAN
DATA GENERAL
USERS GROUP**

BOOST YOUR AViiON PERFORMANCE

High Capacity 4MB and 16MB Memory Modules for AViiON Workstations and Servers



Now you can enjoy the maximum performance and capacity from your AViiON workstation or server with high capacity memory modules from SIGNAL. Whether your application demands low cost memory or ultra-high capacity, SIGNAL has an AVRAM memory module to satisfy your needs.

100% Compatible

All AVRAM memory modules offer complete hardware and software compatibility with Data General AViiON workstations and servers as well as DG/UX. You get the "look and feel" of Data General. . . at a fraction of the price.

Unmatched Reliability

Every module is built and tested to the most rigid specifications. We use only the highest quality components to ensure long, trouble free use. The AVRAM modules are subjected to a minimum of 72 hour burn-in as well as final testing in an AViiON workstation. You get memory modules that work. . .and keep on working.

Unconditional Lifetime Warranty

We have complete confidence in our memory products and we prove it by backing them with the SIGNAL Lifetime Warranty. That's right! We will replace any defective AVRAM memory module for as long as you own it.

"Trade-IN, Trade-UP"

SIGNAL also offers a trade-in program for those users who want to get the maximum capacity from their AViiON. We will take a Data General memory module in trade when you purchase a higher capacity SIGNAL AVRAM module. Now you can get a great memory module and it will cost you less than ever before!

Features

- 4 MB and 16 MB Capacity
- 100% Data General compatible
- Unconditional Lifetime Warranty
- Trade-in, Trade-up Program
- Available for DG Service

Announcing . . .

Call or Fax to receive information about the new SIGNAL memory for large AViiON systems.



Signal Computer Products Inc.
411 Massachusetts Avenue
Acton, Massachusetts 01720
(508) 263-6125 • FAX (508) 635-0423



On track for NADGUG 91

NADGUG conference committee chairperson Jan Grossman called the other day to ask that I say a few words in this issue about the upcoming NADGUG 91 conference in Denver. That's right, upcoming! Even though November seems like a long way off, it's not too early to start making plans to be in Denver November 18-21. After all, planning for the conference has been underway for several months.

Last year was the first year that the NADGUG conference was combined with Data General's reseller conference and sales kick-off meeting. Much was gained from having the three groups meet together. It takes quite a bit of coordinating among members of all three groups to arrange the joint conference, but all in attendance would agree that it is worth the effort.

This year, Jan reports that even more activities are planned that will allow Data General users, resellers, and salespeople to rub elbows. In addition to offering valuable programs and sessions for Data General's MV users, this conference will offer special sessions that will appeal to Aviiion users. No matter what kind of Data General equipment you use, the NADGUG 91 conference will be of incredible value for you. Not only do you get to meet face-to-face with Data General representatives and other users with similar interests, in the exhibit hall you can get hands-on demonstrations of a myriad of software products and peripherals for your equipment. In view of Data General's recent successes and profitable quarters, this is going to be a conference that should not be missed. In fact, I think our conference theme sums

things up pretty well: "On track for the future."

Ask anyone who has attended a NADGUG conference in the past—if you are a user of Data General equipment, it is well worth your time to attend the largest gathering of Data General users in the world, this year to be held in the state-of-the-art Denver Convention and Visitors Center.

When making plans to attend the conference, I suggest you schedule time to stay in Denver for a while. At NADGUG's spring board meeting, I was introduced to the beauty of our host city. Denver has a rich history. The city is a fascinating mixture of sophistication and frontier spirit, and the nearby Rocky Mountains are breathtaking. While you may think that fall weather in Denver is on the cold side, the city actually has a very mild climate, with more annual hours of sunshine than San Diego or Miami Beach. Plan to make time to do some sightseeing or, if you like to snow ski, I hear that a post-conference ski trip is in the works.

If it hasn't arrived already, you should soon receive an announcement in the mail concerning the NADGUG 91 conference. If you are not a NADGUG member, return the self-mailer to be sure that you get more information about the conference, including a complete registration packet. If you are a NADGUG member, you do not need to return the self-mailer. You will automatically receive a conference registration kit later this summer. In the meantime, mark your calendars for November 18-21. And while you're sweating out the summer, think of cool mountain breezes. I'll see you in Denver in November. Δ

FOCUS

The Magazine of the North American
Data General Users Group

NADGUG LEADERSHIP

President
Frank Perry

Vice President
Dennis Doyle

Treasurer/Conference Committee
Jan Grossman

Recording Secretary
Tim Boyer

Audit Committee
Calvin Durden

Membership Committee
Chris Thorpe

Planning Committee
Lee Jones

Publications Committee
Maggie Morris

RIG/SIG Committee
Bart Bates

FOCUS MAGAZINE

Publisher
Greg Farman, Ph.D.

Editor
Robin Perry

Assistant Editor
Doug Johnson

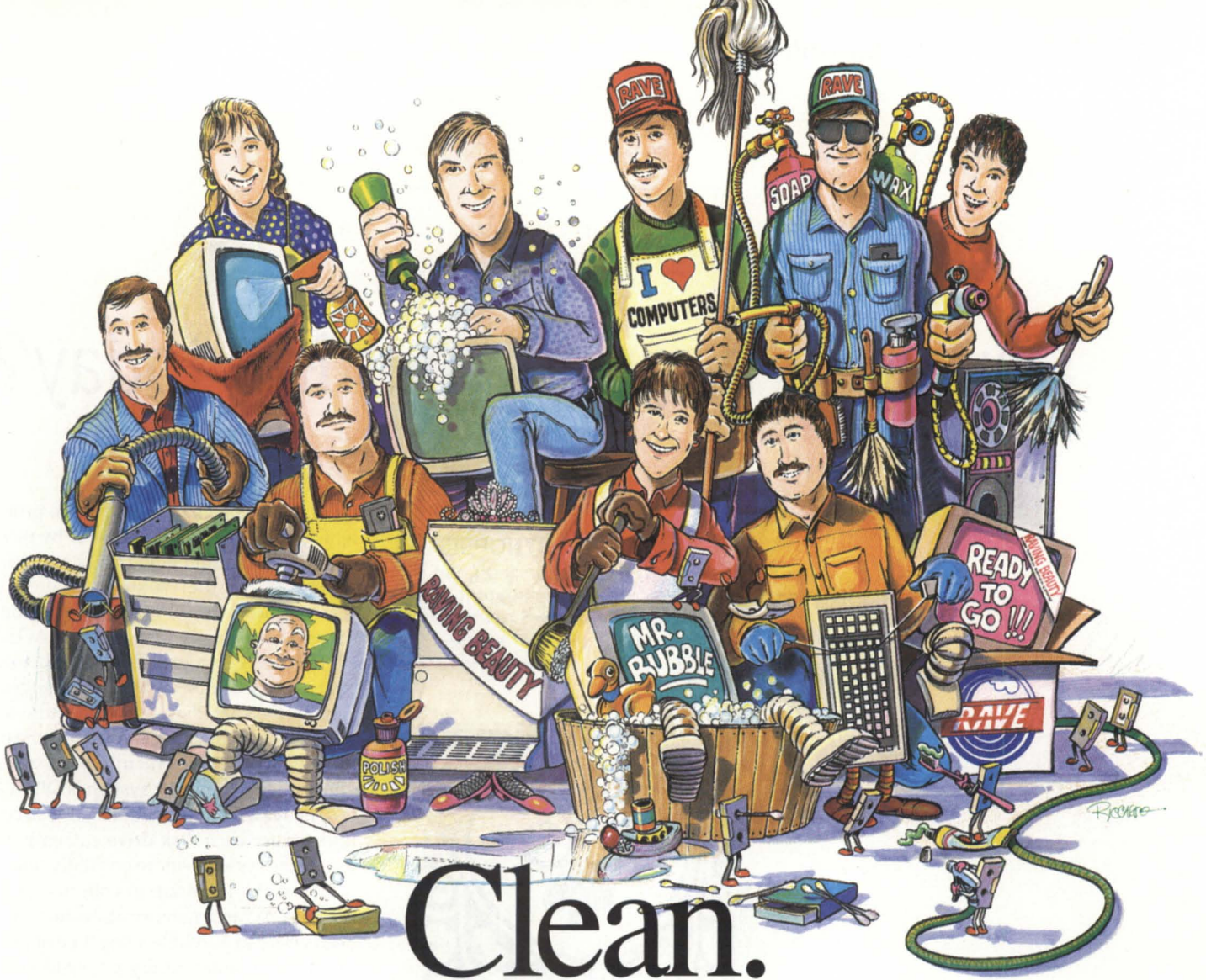
Contributing Editors
Tim Boyer
Brian Johnson
Doug Kaye
David Novy

Contributors
Kent Finkle
Milton Larson
Andy Pook
Don Thomas

Account Executive
Michelle Sentenne

Art Director
Pat McMurray
Production Artist
Casey Hunter

Office Manager
Paula Minton
Administrative Assistant
Debb Benzal



This is the scenario: You spend your hard-earned money on a computer from a second source supplier. It arrives dusty, stained and smudged. Nobody wants to get near the thing.

You can be sure that it didn't come from us, because Rave computers are Stronger Than Dirt! In fact, we guarantee it. (More on that later.)

Rave understands the importance of a good first impression. A sparkling-clean computer says something about our attitude towards our inventory — and, ultimately, our clients.

So when we refurbish hardware, we roll up our sleeves and do it right. Our components get a thorough cleaning, inside and out. We do it the old-fashioned way: By hand, using lots of elbow grease.

We want you to enjoy your purchase so much that we offer the exclusive **Raving Beauty Guarantee**. If you're not satisfied with the appearance of your hardware, we'll take it back.

No other second source supplier makes that statement.

Of course, we still warranty our equipment for 60 days, and give you the most competitive price in the industry. Call us. We love to talk while doing the laundry.

Rave Computer Association, Inc.
 36960 Metro Court, Sterling Heights, MI 48312
 (313) 939-8230 Fax: (313) 939-7431

New York
 (516) 929-5000 Fax: (516) 929-5007



Data General - Buy, Sell, Trade.
Sun Microsystems Also Available!

Circle 34 on reader service card.

Have you hugged your MV today?

SYNOPSIS

How do you know when something is bothering your computer? Simple, be sensitive to how the system is "feeling." Pay attention to disk optimization, average response times, and program file element sizes—and do something about them.



by Milton Larson • Special to Focus

Although I've been single all of my 31 years, I'd guess that the secret to system performance is much the same as the secret to a successful marriage. My parents have been happily married for more than 45 years, and while I'm sure there have been some tough spots along the way, they seem to have figured out how to keep things rolling along pretty smoothly.

It seems the key, at least for them, has been paying attention to the little things—solving the little problems *before* they turn into big ones. And the way to discover those little problems is through constant communication.

The same holds true when dealing with system performance. You can almost always solve performance problems by throwing lots of money and hardware at

them. Many times however, those problems could be eliminated simply by paying attention to the little things and efficiently utilizing the resources you already have. So how do you know when something is bothering your computer? AOS/VS and VS II do a great job of collecting data to let you know how the computer is "feeling." What they don't do quite so well is make that information available to the user. One very useful utility DG gives you with the operating system is DISCO. It displays a wealth of information accumulated for each disk drive currently in use on the system—more on DISCO later.

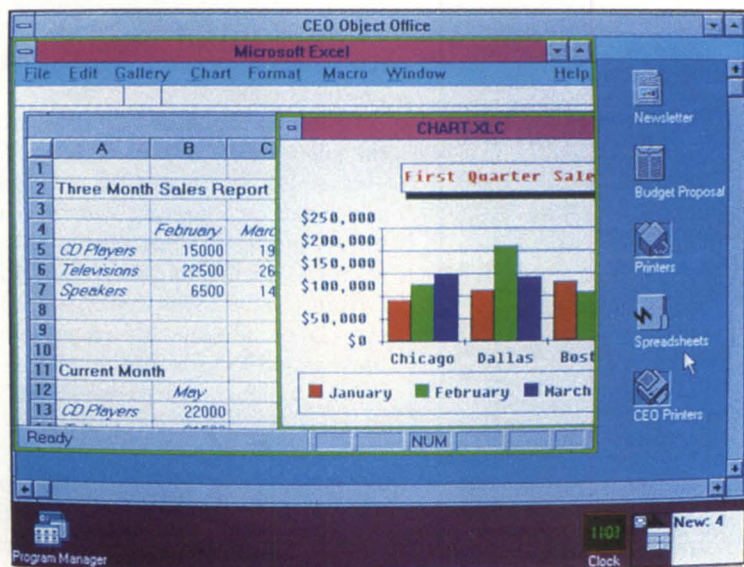
To see the information collected concerning CPU and memory utilization, you need either to purchase some type of performance monitor utility or write your own. If you enjoy digging into the system call dictionary and peeking around in the guts of the operating system as much as I do, writing your own can be a lot of fun. But then I freely admit I'm kind of a dweeb, and chances are you'd be a lot better off buying a product that some other dweeb will support for you. Good monitors are available from DG (a little pricey), General Data, :SYSMGR, and Eagle Software. I've also written a utility for Expert Systems called Exploit that, as a side benefit, reports key information about memory and LRU utilization.

Of course, one sure way to know when something is bothering your computer is when users start complaining about slow response times. But then you still need to rely on some kind of performance monitor to help locate the problem.

Okay, back to DISCO. To start DISCO on your system, type the following command from the CLI: X :UTIL:DISCO/CY=60.

Unless someone has deleted your copy

Meet the ultimate office worker!



New CEO Object Office software!

Office automation has taken a quantum leap forward with CEO Object Office software. CEO Object Office delivers the rich functionality of CEO software to LAN-based PCs—while integrating MS-DOS applications into a common user environment.

An ideal platform for 90's computing, CEO Object Office is...

- Object-oriented, with an icon-driven graphical interface
- Based on Microsoft Windows 3.0 and New Wave
- Supported on NetWare, Token Ring, TCP/IP and DG/PC*1
- Intuitive and easy to use
- Integrated with CEO and the MV/Family

For more information about the ultimate office worker—and a free demo diskette, call

1-800-DATA GEN

Data General

Life just got a whole lot easier!

CEO, CEO Object Office, and DG/PC*1 are trademarks of Data General. Microsoft is a registered trademark of Microsoft. NewWave is a trademark of Hewlett-Packard. NetWare is a trademark of Novell. © 1991 Data General Corp.

Circle 16 on reader service card.

of DISCO, the screen will clear and one line of information will be printed for each disk currently in use on the system. To exit out of DISCO, just press F11.

One of the things DISCO can tell you is whether or not the information on your disks is well organized. If heavily used information is clustered together in one area of a disk, the average seek distance (DISCO's middle column, labeled "Avg

Seek") will be low and the disk will retrieve information fast. If the disk is fragmented, the average seek distance will be high and the disk will take longer to retrieve information. As a general rule, if you see an average seek distance less than 75, you're in good shape, 75 to 100 is marginal, and over 100 probably means that the disk could use some attention.

What kind of attention? Reorganizing

your disks, or now more commonly referred to as "optimizing," is one of the bigger little things you can do. Disk optimization utilities go a couple steps beyond the old dump/format/reload reorganization technique, and produce far superior results. In most cases, you can expect to see a 30 to 50 percent reduction in average seek distance, and a 5 to 15 percent reduction in average disk response time.

For VSClassic users, two optimizer utilities are currently available: DISK_PAK from Eagle Software, and Diskopt from DMS Systems. The downside of each of these products is that they must be run while the system is down, or the disk is released.

For VS II users a third option will be available this summer. It is an on-line disk optimization utility that allows you to reorganize disks (including the system disk) without interrupting normal processing. It provides the same performance improvement and runs in a comparable length of time as current disk optimization utilities. In addition to running on-line, it's a kick to watch—showing how the disk is being organized and which file it is working on—like some of the PC products available.

Disk optimization on VSII also increases the effectiveness of data caching. When you request information from a disk on which data caching is enabled, the operating system reads a few extra blocks and saves them in memory for possible future reference. If the disk is well organized, the chances of subsequently using some of these extra blocks is improved. The end result is a reduction in the number of disk requests performed, and therefore improved performance.

Another thing DISCO can tell you is how well balanced is the diskload. If there is more than one disk on your system, performance will be best if all the disks are doing their fair share of the work. If the average response time (DISCO's rightmost column, labeled "Avg Resp Time") for all disks is within a few milliseconds, the load is well balanced. If the average response time for one disk is much larger than the others, then that disk is doing too much work, and some of the files should be moved to the other disks.

Determining which files to move is the trick. This is where a utility like Eagle Software's FILE_MONITOR can be very

YOU NEED DATA GENERAL AND DEC EQUIPMENT. YOU NEED IT NOW. YOU NEED IT PRICED RIGHT. AND IT HAS TO MEET YOUR SPECIFICATIONS.

DATA GENERAL

CPU'S

MV 20000 Mod 1 & 2 ...	CALL
MV 15000	CALL
MV 10000 w/AOS/VS	\$14,900
MV 10000	\$7,000
MV 7800 XP w/4 MB ..	\$9,900
MV 7800 w/4 MB	\$5,500
MV 4000	\$1,900
MV 2500	\$17,500
MV 2000	\$2,900
S/280	\$2,900
S/140	\$2,200
Nova 4X	\$1,600
Desktop Systems & Peripherals	CALL

DISK & TAPE

MV 2000 Disks and Tapes	CALL
6239 592 MB S/S	\$5,900
6236 354 MB S/S	\$2,675
6161 147 MB S/S	\$1,500
6160 73 MB S/S	\$1,200
6299 6250 BPI Tape ...	\$9,500
6125 Tape S/S	\$795
6026 Tape S/S	\$1,750

MEMORY

MV15 & MV20 32 MB	\$16,500
MV15 & MV20 16 MB	\$8,500
MV15 & MV20 8 MB	\$3,900
MV4 & MV10 8 MB	\$2,500
MV4 & MV10 4 MB	\$1,600
MV4 & MV10 2 MB	\$650
Memory For All Other DG Processors	IN STOCK

CRT's & PRINTERS

BP 1500 Printer	\$8,900
4374 Printer	\$5,000

CRT's & PRINTERS Continued

B1000 Printer	\$3,900
B600 Printer	\$2,200
B300 Printer	\$1,450
D461 CRT	\$475
D460 CRT	\$325
D411 CRT	\$395
D410 CRT	\$275
D462 CRT	CALL
D216 CRT	CALL

COMMUNICATIONS

IAC/16	\$2,400
IAC/8	\$875
ATI/16	\$400
AMI/8	\$200
LAN Controller	\$3,500
LAC-12	\$1,500

DEC

CPU'S

MicroVAX II, III	CALL
KA630 w/ck	\$2,500
11/785 XAAE	\$9,995
11/780 XAAE	\$1,995
11/750 XAAE	\$995
11/730 XAAE	\$500
11/44-DA	\$1,695
BA23-A	\$595
Rainbow PC IOOA	\$295
KDJIBB	\$3,250
KDJIBC	\$2,000

DISK & TAPE

RLV12	\$495
RA60-CA	\$2,500
RA81-AA	\$2,995
TK70 w/contr., new ..	\$5,800
TK50/TQK50	\$2,495
RA82	\$9,500
TSU05-AA	\$3,995

DISK & TAPE Continued

TSV05-AA	\$3,995
CDC 9715-160	\$1,500
Cipher 880	\$950
TU80-AA	\$950
RM05	\$500
RX02	\$295
UDA50-A	\$450
Kennedy 9600	\$3,295
KDB50-A	\$5,500
Fujitsu 2351A	\$2,000
Emulex SC03/BX	\$295
XT2190 (MAXTOR) ...	\$1,395

MEMORY & COMM

Deuna-AA	\$500
DELQA	\$2,200
DELUA-M	\$3,800
DHQII-M	\$1,275
DZQII-M	\$350
MS750-CA	\$100
MS650-AA	\$1,400
MS630-CA	\$2,250
MKII-CE	\$300
Dequana w/cab kit ..	\$500
Emulex CS02	\$575

CRT's & PRINTERS

B600	\$1,995
B1000	\$3,995
LA50-RA	\$295
LAIOORA	\$425
LA120DA	\$795
LA210-AA	\$795
LQP02 w/SF	\$400
LK201-AA	\$100
LP25	\$995
LP26	\$1,995
VTIOO-A	\$100
VT102	\$125
VT220A/B/C	\$300
VT320A/B/C (new) ..	\$415
VT240A	\$750

LARGE SELECTION OF EARLY-MODEL EQUIPMENT

SECURITY COMPUTER SALES, INC.

MINNESOTA

PHONE: (612) 227-5683
FAX: (612) 223-5524
622 ROSSMOR BUILDING
500 N. ROBERT STREET
ST. PAUL, MN 55101

ARIZONA

PHONE: (602) 861-0165
FAX: (602) 861-0313
11426 N. CAVE CREEK RD.
SUITE E
PHOENIX, AZ 85020

"THE SOLUTION"



Circle 37 on reader service card.

AViiON⁷⁰⁰⁰ ⁸⁰⁰⁰

Data General
*Life just got
a whole lot easier!*

**WE FIT 117 MIPS OF MAINFRAME POWER IN
A PIZZA BOX! 1-800-DATA GEN (WE DELIVER)**

- ✓ 117 MIPS
- ✓ STARTS UNDER \$100,000
- ✓ AVAILABLE NOW!

We've
just sliced
mainframe
power
down to size.

**Who just fit
Mainframe Power
in a pizza box?
Data General presents
the AViiON 7000
and 8000 systems.
(Ready for
delivery today!)**

Data General's AViiON 7000 and 8000 systems have 117 MIPS of mainframe power that fits in a pizza box! That's right. The brains of these next-generation Open Systems occupy the same space as your basic large pie. Thanks to our new disk array technology, you can get an amazing 48 gigabytes of storage on fault tolerant disks. Best of all, this mainframe power is yours for a price starting at less than \$100,000—and it's available right now! And we don't scrimp on software.

These binary compatible UNIX-based systems support all the leading databases, business applications and communications software.

Through advanced symmetric multiprocessing, AViiON offers large scale commercial system performance that used to take up a whole room.

With both our AViiON Open Systems or our ECLIPSE Family, Data General's 22 years of mastering technology has been making life easier for a lot of people.

Now it's your turn. For more information call

1-800-DATA GEN

Life just got a whole lot easier!

useful. It allows you to see quickly which files are receiving the most accesses on each disk. This information is also available on VS II rev 2 with the CLI32 F/ACCESS (filestatus) command. FILE_MONITOR also shows which processes are currently using a particular file, and displays other information not available from another utility or CLI command.

Here's an old idea with kind of a new twist. The old idea is to re-create data bases and other large files with big element sizes. This reduces the number of index levels (preferably to just one), and the number of index blocks competing for the cache. To check the element size and number of index levels of a file, use the command F/ELE/IND. Anything with two or more index levels would probably benefit from being re-created. Be aware that CLI and CLI32 report this information a little differently, and some of it pertains only to VS II.

So where's the twist? Well, as always, there are exceptions to the rule. Inner ring program files, like :AGENT.PR, are actually better off with a smaller element size. With the original element size of 32 blocks (or larger), the unshared area of :AGENT.PR receives six disk accesses every time a program is executed. However, with an element size of only four, that number is cut in half! And most places I've been, AGENT is one of the most heavily used files on the entire system.

There are even more things to consider when choosing element sizes for other program files. A utility called Exercise is available from Expert Systems that understands this, and can dramatically reduce the number of disk accesses caused when executing a program. Anyone will tell you that whatever you can do to reduce disk accesses is a step in the right direction.

What other little things can you do to keep your computer happy? There are far too many to describe in detail in one article, and many of them are dependent on your application. The old standby of bringing it flowers once in a while may not help, but it probably won't hurt! Δ

Milton Larson is president of Expert Systems, Inc., a company that provides performance enhancing products and services to AOS/VS and VS II users. He can be reached at 913/823-5600 or by writing Expert Systems, 2233 Shalimar, Salina, KS 67401.

Predicting performance

New tool from DG allows capacity planning and analysis

by Robin Perry • Focus staff

So you think your system could run better, but should you upgrade or should you add a new disk? How would the system react if you doubled the number of users? You can never be certain how such changes will affect performance until installation is complete . . . or can you?

The newest version of the AOS/VS and AOS/VS II Performance Package, rev 5.20, features CAPT, a capacity planning/analysis tool that lets users predict the performance of their systems under different loads. The new response times can be input to Trendview and plotted on a graph.

"Since it does a mathematical model, you can play 'what if' games," said Rick Strom, Data General product marketing manager for Operating Systems and Communications. "In other words, it will show you a data point of where you are now, and you can say, 'If I were to add 10 more users doing the same thing, what would the overall response time be?'"

Users can also simulate the effects of

new disks, faster disks, faster CPUs, and data caching. "One of the things we have found very useful," Strom said, "is that you can change the service time of the CPU. You can make the system twice as fast, so you can see what the system would be like if you upgraded your MV/7800 XP to an MV/9500." If you want to add a new application to the system, you can enter your own estimates of the utilization, and predict what overall throughput would be like.

CAPT works in conjunction with the AOS/VS and AOS/VS II MONITOR program, which takes a snapshot of the system during predefined operating periods. The data is processed by CAPT and reduced to operational parameters reflecting the demand for processing time of each device in the system. Pricing for the AOS/VS and AOS/VS II Performance Package rev 5.20 ranges from \$430 to \$5,520, depending on CPU. The following chart lists the contents of the package and availability under AOS/VS and AOS/VS II. Δ

Program	Description	VS II	VS
CAPT	Capacity Planning Tool	Yes	Yes
MONITOR	Systemwide statistics	Yes	Yes
MONITOR	User data caching	Yes	No
MONITOR	NFS statistics	Yes	No
MONITOR	MRC disk statistics	Yes	No
MSG	Monitor Screenfile generator	Yes	Yes
LINE_MONITOR	Console Line Statistics	Yes	Yes
MP_DISPLAY	Multiprocessor statistics	Yes	Yes
CLASP	Class scheduling package	Yes	Yes
SYSTUNE	System tuning program	Yes	Yes
WATCH	System histogram	Yes	Yes
WST	Process Working Set Tracer	Yes	Yes
DISCO	Disk statistics	Yes	Yes

INTEGRATING YOUR DG MINI

Linking your mini to your PCs isn't all that difficult.

And building a micro-mini LAN may be simpler than you think.

If you have a Data General minicomputer and a growing number of PCs, integration can make your life easier. But how far do you go? And how much do you spend?

Whether you're just getting started or have already installed a PC network, Rational Data Systems can help sort out the answers. We've been working on this problem since 1984 - long enough to become the acknowledged industry expert. We helped integrate Texaco, WordPerfect and a few hundred others.

There's a natural progression from isolated workstations to full-scale integration. As you grow, further integration helps keep your costs down.

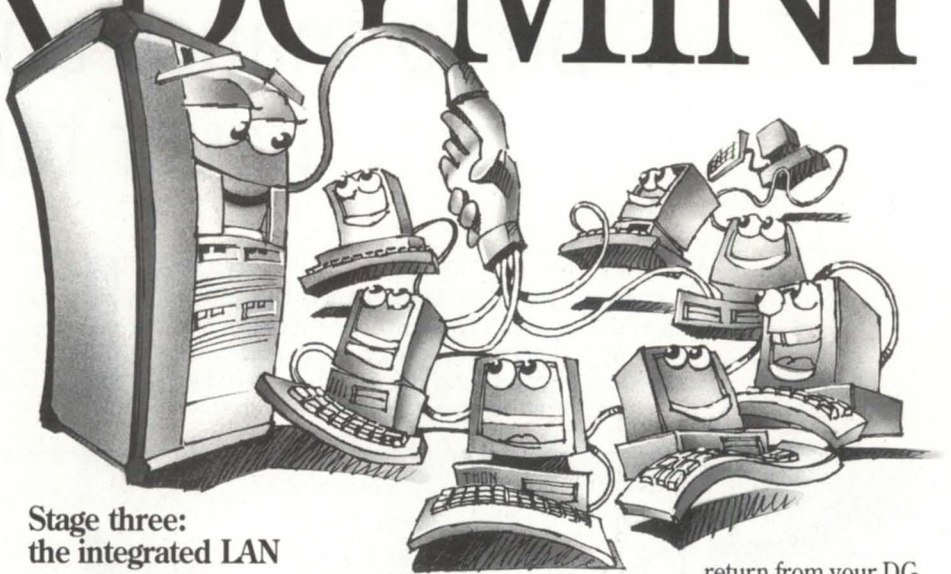
Stage one: programs for around \$100

The first step is to stop buying terminals. A program like PopTerm/410 turns a PC into a terminal at a keystroke for as little as \$65 per desktop. It works over a direct connection, modem or LAN, and it's the most painless first step to integration. Other RDS offerings have more bells and whistles. They offer a simple upgrade path when your needs get more complex.

Stage two: file and print services

When your workload outgrows your mini, there's no reason to buy a larger one. You stave off the purchase by turning the one you have into a departmental processor, which manages the workload and offloads some processing to your PCs.

PC/Remote provides this next step. For an additional \$400 or so per workstation, the PC can now use MS-DOS programs to process the mini's data and the mini can back up whatever your PC does - all over inexpensive async connections.



Stage three: the integrated LAN

Again, you're feeling the squeeze. It's time for the LAN, and probably time to supplement your mini with a high-end 80386 or 80486-based Novell NetWare file server. Our PC/VS is the high-performance package that pulls it all together. If your mini has the capacity, PC/VS can do it all, but if you've already got a Novell LAN, it's that much easier. PC/VS and NetWare make terrific partners.

Stage four: distributed processing

A completely integrated PC workstation can thread its way happily through everything you've got, including a vast array of DG, DOS and UNIX software. Now it's time for truly distributed applications. For CEO users, PC/Mail is already here. And later this year, we'll deliver the AOS/VS version of Portable NetWare. Even Data General looks to RDS for integration solutions.

There's a bible on the subject.

We wrote it. It's called *Report on PC Integration*, and the 1991 edition is just out. Read its 116 pages, and you'll really understand the opportunities and priorities involved in getting the most

return from your DG mini. Most of the press

run is already spoken for, but there are a few copies left. Get right back to us, and we'll send you one.

The book can help. So can the people at Rational Data Systems, with software and with counsel. Like the software, the counsel is the best in the business.

Call us toll free, or invest in a stamp and send us the coupon. Either way, you'll be taking an easy first step on a profitable path.

1-800-743-3054



Send me the book free. It may be more than I ever wanted to know, but I'm ready to dig in.

Call me. I'd like to discuss our situation.

NAME _____

COMPANY _____

ADDRESS _____

CITY/STATE/ZIP _____

(____) _____

PHONE _____



Rational Data Systems

1050 Northgate Drive, San Rafael CA 94903

What your performance analyzer never told you

SYNOPSIS

Granted, there are limitations to any computer system's speed and capacity. So make the most of your CPU's ticker. From remapping bad blocks to correcting memory and device errors, maximizing performance needn't be flashy, just smart.



by Don Thomas
Special to Focus

I still have a copy of Dave's AOS Notebook. It is dated 11/4/80 and the author is DG guru Dave Busse. I keep this antique around because it reminds me to keep things simple. I am going to tell you some things about system performance that few have ever considered when they seek to improve their system's throughput.

First, you have to understand that there are only X number of ticks to your CPU's clock, and the transfer rate of a given disk unit is only Y megabytes per second. Everyone generally understands that memory is of limited capacity.

You can't tune a CPU to deliver any more than X ticks of its CPU clock. You can either buy more CPU ticks, in the form

of a more powerful CPU, or better utilize the ticks you have. Performance tuning can't make more ticks. Performance tuning shows you how to better use the ticks you have.

Disks are another misunderstood area of system performance. Most of the time, the problem with disks is not the transfer rate but rather the time it takes a disk to complete a request. Sound like the same thing? Nope. They are very different. The transfer rate is a theoretical value. But transfer rate is seldom the problem with disk performance, anyway. The real performance hit comes when the disk heads must be moved from one cylinder or track to another.

So far, I've only touched on the main body of performance analysis. Everyone has an opinion about what is the best tuning technique, or where to find the best of the system's secret performance information.

If you want to conserve CPU ticks, you must reduce the amount of work the CPU is tasked with doing. One way is to transfer disk request processing to the disk controller. The CPU still must form each request, attach it to a queue, and jumpstart the disk. The disk handles request processing. If several requests are queued to a disk subsystem, the disk controller will process requests until the queue is empty. Queue processing reduces CPU overhead and eliminates some interrupt processing, because the controller will interrupt only if an error has occurred or the queue is empty. DPJ-type disks process requests from a queue. The controller scans the queue and performs the requests in a logical order, determined by intelligence on the controller. DPF-type disk requests



SERVING YOUR NEEDS WITH THE SUPPORT TO BACK IT UP.

When New or Used DG Equipment is your need, no one can serve you better than B.L. Associates. Along with a wide variety of compatibles from Zetaco, Dataram and SCIP, we offer competitive pricing and service that's prompt and friendly.

We also deliver the unexpected . . . 6 live New England Lobsters shipped *FREE* with your order of \$1000 or more.

So when you're in the market, have B.L. Associates serve your DG or compatible order and don't forget the lobsters.



A S S O C I A T E S

D.G. HARDWARE AND ALTERNATIVES

145 WEBSTER STREET, SUITE A, HANOVER, MA 02339

TEL. (617) 982-9664 • FAX (617) 871-4456

ZETA
AUTHORIZED STOCKING DISTRIBUTOR

Data General
AUTHORIZED SYSTEMS INTEGRATOR

DATARAM
AUTHORIZED DISTRIBUTOR

Circle 4 on reader service card.

FOCUS ON: MV SYSTEM PERFORMANCE

are handled one at a time, and the operating system must be involved with each request to start the disk and handle the interrupt generated when the request completes.

Eliminate bad disk block. Most Winchester disks can remap bad blocks at the hardware level. This makes the disk look error-free to the operating system. The operating system doesn't have to check

each disk request to see if a bad block is involved. When a bad block is involved, the request must be broken into several operations. This adds to the operating system overhead associated with the original request. The disk heads have to be positioned to the track where the data lives, and then to the track where the bad block was remapped. Moving the disk heads is the real performance hit here.

Device errors

Device errors are another performance hit. A soft disk error will cost you one rotation of the disk media, or about 15 milliseconds per retry. The operating system must log every device error. Granted, it's not a great deal of time saved, but the little pieces add up to a significant savings. Consider that the next time you put an old scratch tape up and start generating dozens of soft tape errors.

Soft memory errors are more than annoying—they are a performance hit. The memory subsystem corrects all single-bit errors. There is little overhead involved when the hardware detects and corrects a memory error. You may have to wait a few hundred nanoseconds while the correction takes place. The real overhead associated with memory errors is logging the incident. It takes several memory errors to fill the error log buffer. Once the buffer is full, it is written to disk. Excessive memory errors mean additional disk activity, and unnecessary system overhead.

Very few soft memory or device errors are not worth being concerned about. Don't ignore them. I'll guarantee that a soft error left unattended will become a hard error eventually. Hard errors lead to the ultimate in system performance problems—downtime.

I've never heard any performance guru (except my partner, Bill Means) categorize system downtime as a performance problem. What is the response time while the system is down? How much work is lost? How long does it take to recover that lost work?

System users complain if they have to wait a few extra seconds for a request to complete, but will sit quietly for hours when the system is down. System administrators think nothing of asking the data entry crew to re-enter yesterday's work because the data base crashed last night due to a hard disk error and had to be reloaded from backup.

What's to be done? Simple: preventive maintenance.

Track those soft errors and eliminate them when they show signs of becoming more frequent or serious. Data General operating systems and hardware maintain error log information to help determine when a problem becomes serious. If you don't see your hardware maintenance representative doing preventive maintenance at least every six months, then call

Now with
ARCTape & ARCmerge

ARC[®]

COMPRESS and Library Files

PROVEN, RELIABLE, FAST COMPRESSION

Retains all DG File information, including File Type, UDA's ACL's, etc.!

Fully Compatible with ARC 6.xx on PC!

Includes
a commercial license
for PC version 6.02

*"ARC works beautiful.
It is user friendly and totally compatible . . . DG to PC and PC to DG"*

— Bill Smith, AMI

**With ARCTape, Archive to Magnetic Tape • Use ARCmerge to Merge Archive Libraries.
ARC is Officially Approved by the Creators of ARC for the PC!**

THE package includes: 1 year software subscription and hotline support!

- Already has a large existing base of users • VAST reductions in disk space •
- Automatic upgrades • Can be used for configuration management, and on-line libraries •
- Tremendous saving in file transmission and employee's time • Passes Superuser •
- Redirect Output to File or Printer • Supports Input from File List • Print Directly for Library

Just Look at the Results!

Name	Length	Stowage	SF	Size now	Date	Time	CRC
093_0002	50191	Crunched	66%	17099	16-Sept-88	2:01 p	01C9
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
TOTAL	3	587984	(91%)	56407			

Only \$995 For Single CPU Systems

And The Perfect Complement . . .

TurboTran[™]

XModem/YModem Protocol

" . . . TurboTran has the simplest method of transferring file I've seen."

— Focus Magazine

and now even better with . . .

The Smart Connection

Complete PC Integration with SmarTerm[®], and Perfect Integration with SmarTerm[®] and CEO[®]

For \$495 Look at What You Get . . .

- Efficient, Fully Supported DG/PC Integration • Software Subscription • Hot Line Support •
- CEO Integration • PC Support Utilities • AOS or AOS/VS • Low, Low CPU Impact •
- Runs at Baud Rates Up To 38.4 KB • and More! •

Call, Write, or FAX for ARC or TurboTran on a 30 Day Evaluation

Data Bank Associates, Inc.

**20010 Century Blvd., Suite 104
Germantown, Maryland 20874**

**Telephone (301) 540-5562
or FAX (301) 540-8105**

ARC is a registered trademark of System Enhancement Associates, SmarTerm is a registered trademark of Persoft Corp., CEO is a registered trademark of Data General Corp.

Circle 14 on reader service card.

the branch office and ask the manager why not.

Your system hardware is going to break sooner or later. It's a simple fact of life. Preventive maintenance is not going to eliminate all your unscheduled downtime. However, if you eliminate just one incident per year, you may save more than eight hours of system downtime. What is that worth when you view it as a performance issue? Did your last system tuning exercise give its users eight more hours in which to do their work?

In 15 years working with Data General equipment, I have noticed an interesting trend—customers who ignored soft errors had more disasters than did those who took early action against soft errors. This is a simple observation. The point is, a soft error is a potentially serious problem just waiting for an opportunity to cause you grief.

Hidden problems

Backups can become a performance hit. The time it takes to create a backup is time well invested, and can be very productive. That's not a performance problem. The performance hit comes when you have to rely on the backup to get you back on-line.

If your most current backup is one day old, then you are in a better position than if you must retreat to one that is older than a week or more. The cleverest performance guru can't tune your system enough to recover lost performance due to a week of system downtime.

When you have lost your data base and realize that your last backup was last year, the normal reaction is to back up the system daily. After the need has been established, backups occur on a frequent basis. As time passes the interval between backups increases, until the next disaster strikes. Identify your requirements today and establish a policy to meet those demands.

It's easier to keep to a plan that is in writing and a part of the computer operations manual. Put a daily backup plan together and stick to it. You'll see better overall performance from your computer.

IVERIFY can be a killer performance problem if you don't run it frequently.

Don Thomas is president of NSTS, Inc., and can be reached by phone at 404/923-1383 or by fax at 404/923-3998.

Hidden problems in a data base tend to surface at the wrong time. It's possible to have a corrupt data base and to run for weeks before the corruption becomes evident. By then, your backup tapes are of little use and your data base is worthless. If you have a second system, perhaps one used for development, you should back up your data base and, using those tapes, load the data base onto this machine. Run

IVERIFY against this data base and learn two things: your data base structure is sound; and your backup tapes are good.

There are many aspects to system performance. You should never forget that when your application is down, your performance factor is zero. No amount of sophisticated tuning can recover your lost productivity. That reminds me of one more topic. How reliable is your power company? Δ

The most popular DG Color Graphics Terminal Emulator for IBM Micros now includes **NETWORK SUPPORT!**

EMU/470's
newest release,
Version 3.1,



Files; Foreign
Keyboards and
Character

provides significant capabilities and enhancements, to include: Network support, complete emulation for all DG terminals; support for all graphic adaptors, including compressed mode to 135 columns on VGA, EGA, MCGA, CGA, and Hercules cards; both text and binary file transfers plus XMODEM, YMODEM, and Kermit protocols.

Support including Code Page 850; Graphics on IBM Proprinters and HP Laserjets; 70+ Macro Keys, Auto Dial & Logoff; Unlimited Configuration Files; and complete Mouse Compatibility.

Rhintek offers a comprehensive line of products spanning the entire Dasher Terminal Line, priced from \$95 to \$249. We offer volume discounts and unlimited free technical support.

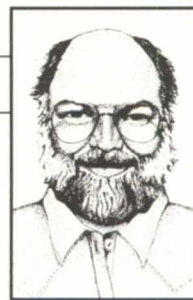
Plus numerous Bonus Features:
Built-in System Diagnostics;
Command Language and Script



Rhintek, Inc.
DG Terminal Emulators since 1983.

P.O. Box 220 Columbia, Maryland 21045
VISA and MC Accepted 301-730-2575

Circle 35 on reader service card.



Lighting up the scoreboard

With a passion for ensuring consistency and achieving lower performance overhead, as well as an altruistic desire to help those seeking an alternative to the Infos Request Group feature, BJ explains the ins, outs, and tricks of scoreboard-based transaction control.

SYNOPSIS

:OLD_BUSINESS

Several callers pointed out a couple of errors in the CHKPTR.COB program listing in the March column. Both errors have been corrected in items SML9104 and CHKPTR on the :SYSMGR BBS.

The first error involved a minus sign that got mistaken for a discretionary hyphen and dropped during typesetting. The statement involved was the one beginning with COMPUTE PCTROUNDED . . . ; it should end with ") - 100" instead of ") 100".

The second error involved a misplaced PERFORM GET-CPD-SPACE in the DO-CHECKPOINT paragraph; it should be the last line in the paragraph, not the first, so that the space gotten is the new base space after the checkpoint.

:CONSISTENCY

Several people have called for clarification on the use of the term "logically consistent" in my March column. Logically consistent means that the data base structure is correct from Infos' point of view; all of its internal pointers and counters are correct, and an IVERIFY would be uneventful (barring unlikely, but possible, inconsistencies caused by bugs in Infos itself).

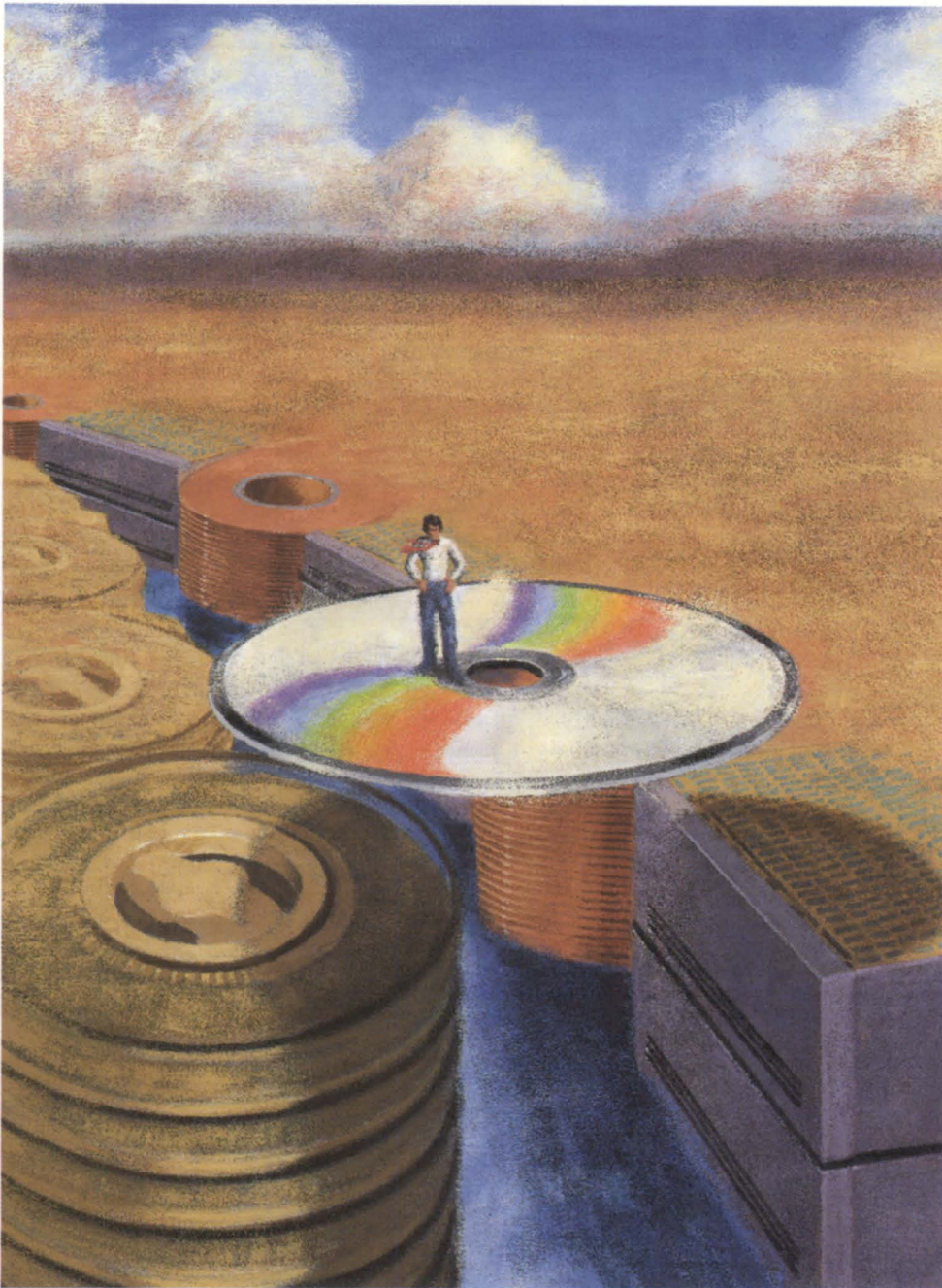
What I didn't mean by logically consistent is that the data base is correct from the application's point of view. For example, in an accounting data base involving double-entry bookkeeping, or in a collection of separate data bases that are all involved in a transaction, it is quite possible for the data base(s) to be logically consistent from Infos' point of view, but to be quite inconsistent from the application's point of view. These inconsistencies are caused when a program aborts in the middle of a complex transaction involving multiple (re)writes, or when a forced checkpoint catches a data base in mid-transaction, and the system fails shortly thereafter.

The most common method of ensuring transaction consistency is the use of the Infos Request Group feature. Unfortunately, the Request Group feature imposes considerable overhead, it doesn't work with transactions involving multiple data base(s), and, sadly, Request Groups have had a rich STR history.

There is an alternative method that imposes negligible performance overhead, and is just as easy to manage in your application code as Request Groups. In addition, this method is the only one that works when transactions involve multiple Infos data bases. Unfortunately, this method requires a couple of moderately tricky COPY files, subroutines, and utility programs which, as far as I know, haven't yet been published.

This month I'm going to describe this method in some detail and hopefully that will stimulate somebody to produce generic versions of the COPY files, subroutines, and servers, and then publish them on either the NADGUG or :SYSMGR BBS. Alternatively, some enterprising programmer might produce the package as a product. As part of the effort to write this column I put together a prototype using C (Cobol is too verbose and would have

© 1991 Zetaco. Zetaco is a Division of the Carlisle Systems Group.



Least Expensive. Most Expansive.

Presenting NETstor™ Server, a UNIX file server for workstation networks using NFS. It bridges the gap between high-performance magnetic disks and off-line tape with high-capacity, cost-effective optical storage.

Zetaco's Transparent Optical File System (TOFS™) provides transparent access to 80 gigabytes of on-line storage. The flexible, open systems design allows NETstor Server to run industry standard applications such as Informix and Oracle. Zetaco's NETstor Server. Call today for a free, detailed brochure.

North America:
11400 Rupp Drive Burnsville, Minnesota 55337 USA
Phone: 800-423-3020

Europe:
No. 2 Marash House
2/5 Brook Street Tring HERTS HP235ED
England Phone: 442-891500

ZETA 
The Network Storage Company

Circle 48 on reader service card.

taken longer), but it will not be available on the :SYSMGR BBS.

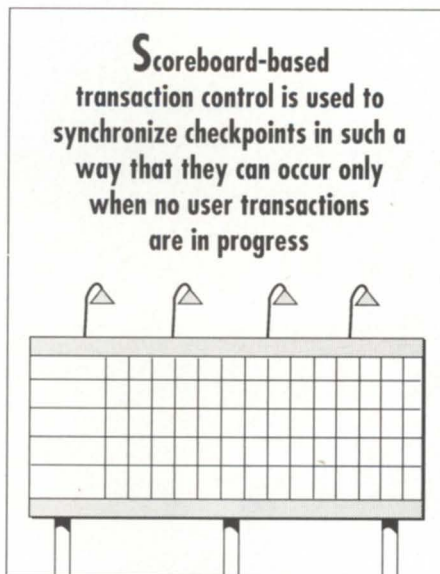
:CANDLESTICK_PARK

The method is called scoreboard-based transaction control. As far as I know, it was first devised and implemented by DG's System Division as part of some large data base projects for their customers. Since then I've seen variations of the method at several sites, but each appeared to have been custom designed and none has been published until now.

Scoreboard-based transaction control is used to synchronize checkpoints in such a way that they can occur only when no user transactions are in progress. What constitutes a transaction is entirely up to the application program; it simply calls a subroutine to mark its scoreboard status accordingly when it starts and ends a transaction.

The three possible checkpoint states (CHKPTR-STATE) are (I)idle, (P)ending, and (A)ctive.

The four PID states (STATE(PID)) are



(U)ninvolved, (B)etween transactions, (T)ransaction in progress, and (W)aiting for a checkpoint to complete.

To achieve minimal overhead accessing, the scoreboard file is used as a shared file so that each process that opens it sees

the same copy of the scoreboard simultaneously and any changes are reflected in all other users' copies simultaneously.

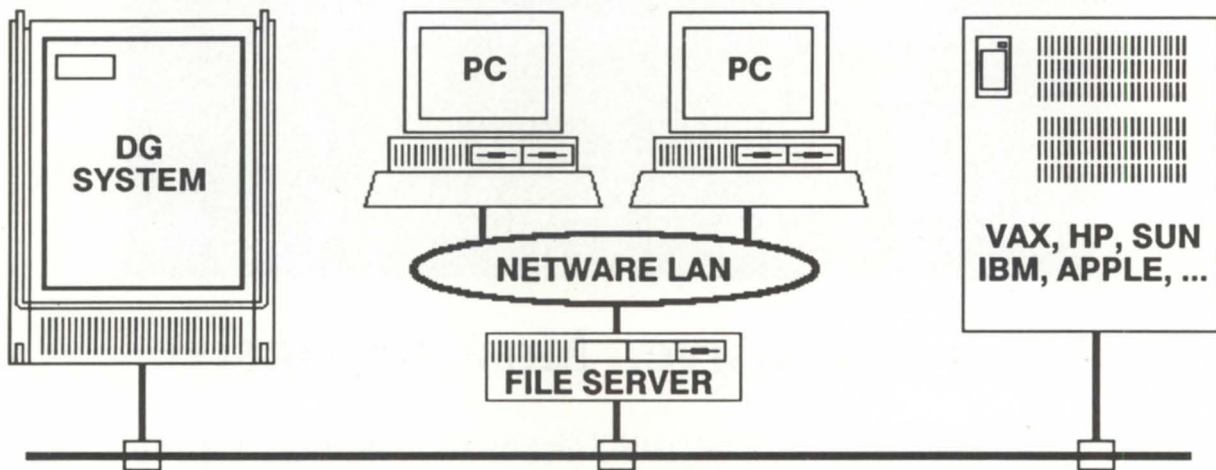
:COMPONENTS

In order for a scoreboard-based scheme to work, you need the scoreboard file itself, a set of Cobol-callable subroutines to access the scoreboard, a cyclical checkpoint global server similar to the one that I published in my March column, and a global server to cleanup after processes that terminate rudely.

Although not strictly required, there is one other component that makes for very snappy demos when the executive types come around. It's a PED-like program to monitor the current state of the scoreboard in real-time, displaying overall statistics and the status of each scoreboard user. It's really fun to watch.

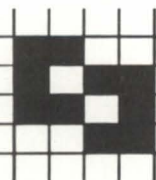
Scoreboard-based transaction control can be implemented in any language that has an Infos interface and allows direct access to system calls. No multi-tasking is required. For the rest of this column, I'm

INDUSTRY STANDARD NETWORKING



- * FOR ALL DG SYSTEMS
- * AOS/VS II, AOS/VS, AOS, RDOS
- * FTP FILE TRANSFER
- * LPR REMOTE PRINTING

- * TCP/IP ETHERNET NETWORKS
- * IBM-PC & NETWARE INTEGRATION
- * TELNET VIRTUAL TERMINAL
- * SMTP ELECTRONIC MAIL



Clafin & Clayton, Inc.

203 Southwest Cutoff

Northboro, MA 01532

FAX (508) 393-8788

Telephone (508) 393-7979

Circle 6 on reader service card.

going to assume that the implementation language is Cobol.

OK, let's take a look at the specs for each component.

:THE_SCOREBOARD

The scoreboard file is simply a disk file whose length is a multiple of 2,048 bytes (a page) and whose element size is a multiple of 4 (a requirement for shared page I/O). The layout of the scoreboard file is shown in Figure 1. Creating new scoreboard files and initializing them is done by the Mortician server described below.

Getting the scoreboard to end up in the shared part of an application or server program's address space is accomplished by using the EXTERNAL attribute on the 01-level data item, and by adding SCOREBOARD/ALIGN=10/SHARED to the CLINK command for each component.

:SUBROUTINES

Six Cobol-callable subroutines are required by the application programs:

Figure 1: SCOREBOARD.WS

```

01 SCOREBOARD EXTERNAL.
05 LOCK-WORD      PIC 9(4) COMP.
05 LOCKS          PIC 9(9) COMP.
05 SPINS          PIC 9(9) COMP.
05 TRANSACTIONS  PIC 9(9) COMP.
05 TRANS_NOW     PIC 9(4) COMP.
05 CHKPTR-STATE PIC X(1).
05 CHKPTR-PID    PIC 9(4) COMP.
05 CHKPTR-UID    PIC 9(4) COMP.
05 WAITERS       PIC 9(4) COMP.
* Set this OCCURS to maximum data base users.
05 WAITQ OCCURS 100 TIMES PIC 9(4)
  COMP.
* The following items are indexed by PID.
* Set OCCURS to your maximum PID count.
05 STATE OCCURS 500 TIMES PIC 9(4)
  COMP.
05 UID OCCURS 500 TIMES PIC 9(4) COMP.
05 TRANS-ID OCCURS 500 TIMES PIC X(31).
* Size the filler to make SCOREBOARD a
* multiple of 2,048 bytes in size.
05 FILLER        PIC X(2027).
    
```

Open/close the scoreboard
 Lock/unlock the scoreboard
 Start/end a transaction

In addition, a trivial assembly language subroutine is required to provide access to the MV's WSZBO instruction that is used by the lock/unlock subroutines. A listing of the subroutine is shown in Figure 2 (page 20). In other languages, such as PL/I and C, there is already a library routine for WSZBO.

:SUBS:OPEN

The calling sequence is:

```

CALL "SBOPEN" USING DB-PATH,
  SCOREBOARD,
  READ-ONLY, CONNECT, CHANNEL.
    
```

The scoreboard file is located by appending ".SB" to the Infos data base pathname. It is opened using the ?SOPEN system call and READ-ONLY is used to determine whether the open allows read/write or just read. CONNECT is used to indicate



ENERGIZE Your Data General System

EAGLE SOFTWARE'S POWER_PAK™

Three powerful time-saving products in one package:

DISK_PAK™

The premier automatic disk optimization product for MVs.

VS_TOOLBOX™

Powerful tools to tighten security, improve performance, and optimize INFOS®.

FILE_MONITOR™

The file system spy and disk balancer.



Now available MAID™ for CEO®

Eagle's newest utilities keep your electronic office running efficiently.

Call today.
 Dial 800-477-5432
 and ask about our
 30-day trial copies.

EAGLE Software, Inc.
 169 East Cloud
 P.O. Box 16
 Salina Kansas 67402-0016

Phone (913) 823-7257
 Fax (913) 823-6185

POWER_PAK, DISK_PAK, VS_TOOLBOX, AND FILE_MONITOR are trademarks of EAGLE SOFTWARE INC. INFOS and CEO are registered trademarks of Data General Corp. © 1991A EAGLE Software, Inc. 047

Circle 22 on reader service card.

Who can give you performance and value in memory & I/O expansion?



It costs surprisingly little for the extra performance you get when you expand with **SCIP MEMORY** or **IAX16s**.

Why is this? We work the old fashion way to provide you with, not just clones, but intrinsically better products.

- ✓ MV5500 double your memory limit with our 32 MB module
- ✓ MV6000/8000 expand to 16MB
- ✓ IAX16s increase thruput by 60%
- ✓ MV7800/XP expand to 28MB
- ✓ MV15000 thru MV20000 runs 15% to 20% faster
- ✓ MV9500... get 128MB of memory for the price of 32MB
- ✓ AViiON workstation 4MB & 16MB available from stock

...so give us a call or contact your Dealer Dan to get the facts on how a **SCIP** value can add value to your system.....

(213) 282-8700

FAX 213/839-4464

SCIP

441 S. Beverly Dr. #2
Beverly Hills, CA 90212

SYSTEM MANAGER'S LOG

whether the caller becomes a customer of the Mortician server. This allows use of the same subroutine by the other servers who don't normally want to connect to the Mortician because there is no cleanup to do at termination. CHANNEL is the returned channel number for use when closing the scoreboard.

The next step is to release the pages associated with SCOREBOARD via ?RPAGE and replace them with the pages

from the scoreboard file using ?SPAGE.

If CONNECT is non-zero, then a connection is established via ?CON with a process whose name is "OP:" and concatenated with the filename part of the data base pathname (the mortician server for this scoreboard). This effectively limits data base filenames to 15 or fewer bytes, but that shouldn't be a problem. Finally, the caller's PID (via ?PNAME, call it MYPID) is obtained and used to set the caller's Unique ID (via ?UIDSTAT) into UID(MYPID) and to set STATE(MYPID) to B.

Only server processes should call with CONNECT set to zero. Application programs should call with CONNECT set to non-zero.

:SUBS:CLOSE

The calling sequence is:

```
CALL "SBCLOSE" USING CHANNEL,
SCOREBOARD, DISCONNECT.
```

STATE(MYPID) is changed to U and UID(MYPID) is set to zero. The scoreboard file is then closed via ?SCLOSE with bit 0 of the channel number set to force release of the scoreboard pages.

The value of DISCONNECT should match the value of CONNECT used in the SBOPEN call; non-zero to disconnect via ?DCON and zero to not disconnect.

Only the server processes should call this subroutine with DISCONNECT set to zero. Application programs must set it to non-zero.

:SUBS:(UN)LOCK

The calling sequences are:

```
CALL "SBLOCK" USING SCOREBOARD.
CALL "SBUNLOCK" USING SCOREBOARD.
```

The lock scheme used is referred to in the school books as a "spin lock." An attempt is made using CBSZBO to set bit 15 of the lock word. If the attempt succeeds then the scoreboard has been locked successfully and the LOCKS data item is bumped. If the attempt fails then the SPINS data item is bumped and a reschedule is done via ?RESCHED before attempting to set the bit again. If 100 failures occur in a row then the subroutine aborts the program on the assumption that some other program has terminated while holding the lock.

Figure 2: CBSZBO.SR

```
;COBOL-callable subroutine for WSZBO
;
;Usage: 77 WORD <any picture>.
;        77 BIT-NO      PIC 9(4) COMP.
;        77 BIT-VALUE  PIC 9(4) COMP.
;
;        ...
;        CALL "CBSZBO" USING WORD,
;        BIT-NO, BIT-VALUE.
;        IF BIT-VALUE = ZERO THEN
;            bit was set
;        ELSE
;            bit was already set.
;
;The indicated bit in the word is tested. If zero,
;it is set to one. The previous value of the bit is
;returned in BIT-VALUE. The instruction is
;guaranteed;non-interruptable.
;
;To assemble: ) XEQ MASM CBSZBO
;
;TITLE CBSZBO
;ENT CBSZBO
;NREL 7 ;Shared code
;
;ARG1 = ?OAC0-4 ;WORD PIC 9(4) COMP.
;ARG2 = ARG1-2 ;BIT-NO PIC 9(4) COMP.
;ARG3 = ARG2-2 ;RESULT PIC 9(4) COMP.
;
CBSZBO: WSAVS 0 ;Save the world
;
XWLDA 0,ARG1,3 ;BP(SCOREBOARD)
WMOVR 0 ;BP->A
XWLDA 2,ARG2,3 ;BP(bit no.)
WMOVR 2 ;BP->A
XNLDA 1,+0,2 ;Bit no. value
WSUB 2,2 ;The result
WSZBO 0,1 ;Try to set the bit
WINC 2,2 ;No such luck, set result to 1
XWLDA 3,ARG3,3 ;BP(prev bit value)
WMOVR 3 ;BP->A
XNSTA 2,+0,3 ;Return the prev bit value
;
WRTN ;We're outta here
;
.END
```

The rule with spin locks is that they can be set only for short periods of time, microseconds as opposed to milliseconds, and that no system calls can be used while the lock is set. The lock should be held only for as long as it takes to update the scoreboard. Failure to follow this rule will cause excessive CPU consumption and increase the probability of a false lock failure occurring.

The prototype I used for testing handled 100,000 transactions from 30 application simulator processes at a rate of 10 per second without a single spin being recorded. That's a pretty good indication of how efficient the spin lock is in this case.

Unlocking is the soul of simplicity: simply store a zero in the lock word. Any other process spinning on a lock attempt will seize the lock.

:SUBS:DEQUEUE_WAITER

The calling sequence is:

CALL "SBDEQUE" USING SCOREBOARD, PID.

This routine is called with the scoreboard locked and returns with it still locked.

It checks WAITERS. If it's zero then it returns PID=0. Otherwise set PID=WAITQ(0), slide WAITQ(1) through WAITQ(WAITERS) down to WAITQ(0) through WAITQ(WAITERS-1), set WAITQ(WAITERS) to zero, decrement WAITERS, set STATE(PID) to B, and return PID.

:SUBS:START_TRANSACTION

The calling sequence is:

CALL "SBSTART" USING SCOREBOARD, TRANS-ID.

This logic is a bit tricky. Start by locking the scoreboard and then examining the checkpoint server status. If it's idle, change STATE(MYPID) from B to T, move TRANS-ID to TRANS-ID(MYPID), bump TRANSACTIONS, bump TRANS_NOW, unlock the scoreboard, and exit.

If a checkpoint is pending or active, change STATE(MYPID) from B to W, bump the count of the number of waiters (WAITERS) and add the current PID to the FIFO queue (WAITQ(WAITERS)=MYPID).

Then unlock the scoreboard and wait for a signal that the checkpoint is complete via ?WTSIG. When signaled, start all

over again at the top of the sub-routine.

:SUBS:END_TRANSACTION

The calling sequence is:

CALL "SBEND" USING SCOREBOARD.

This logic is even trickier. Start by locking the scoreboard, decrementing TRANS_NOW, changing the current PID's status from T to B, and moving spaces to TRANS-ID. Then check for a pending checkpoint.

If checkpoint isn't pending, then see if anybody's waiting in the queue (WAITERS NOT = ZERO). If not, just unlock the scoreboard and exit. If so, get the first waiter's PID and dequeue him, unlock the scoreboard, wake up PID/UID(PID) via ?SIGNL, and exit.

If a checkpoint is pending, then see if this is the last transaction (TRANS_NOW=0). If not, just unlock the scoreboard and exit so that the other transactions can finish. If so, unlock the scoreboard, wake up the checkpoint process using CHKPTR-PID/CHKPTR-UID and ?SIGNL, and exit.

:CHECKPOINT_SERVER

The checkpoint server uses the same logic as I showed in my March column, but when a decision is made to checkpoint the logic is a bit more complicated.

At startup the checkpoint server opens the scoreboard in read/write with CONNECT non-zero. Then it sets CHKPTR-STATE to I, moves STATE(MYPID) to CHKPTR-PID, UID(MYPID) to CHKPTR-UID, and zeros both STATE(MYPID) and UID(MYPID). This establishes the checkpoint server and enables the mortician to disconnect it properly if you should decide to stop checkpointing for a while (like during a batch run).

When it's time to do a checkpoint, the server begins by locking the scoreboard and setting the checkpoint status to P. If TRANS_NOW is zero, then change the checkpoint status to A, unlock the scoreboard, and start the checkpoint. If TRANS_NOW isn't zero, then unlock the scoreboard and wait for a signal via ?WTSIG indicating that the last transaction has finished (SBEND will send it when TRANS_NOW goes to zero). When the signal arrives, lock the scoreboard, set the checkpoint status to active, unlock the scoreboard, and start the checkpoint.

When the checkpoint completes, lock

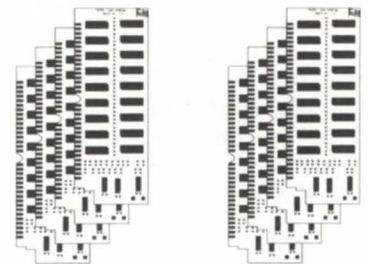
DATA GENERAL

MV to AViiON Server Conversion



- ✓ UNIX Capabilities
- ✓ Open System
- ✓ Reduced Maintenance
- ✓ More Software Available

AViiON Compatible Memory



Memory Manufactured by Digital Data Systems

- ✓ 4MB & 16MB Add-in Modules
- ✓ Lifetime Warranty
- ✓ 24 Hour Replacement

Workstation & Server Sales, Integration and Custom Software



- ✓ Advanced Implementation of UNIX (DG/UX)
- ✓ Open Networking
- ✓ Superior Graphics
- ✓ State-of-the-art Performance & Reliability

DDS DIGITAL DATA SYSTEMS, Inc.

1-800-762-7811
305-792-3290

1551 N.W. 65th Avenue
Fort Lauderdale, FL 33313

AViiON, DG/UX & MV are trademarks of Data General Corp.
UNIX is a registered trademark of AT&T Bell Laboratories.

the scoreboard, set the checkpoint status to I, and check WAITERS. If nobody's waiting, then unlock the scoreboard and go back to checking the checkpoint criteria again. Otherwise dequeue the first waiter, unlock the scoreboard, wake up PID/UID(PID) via ?SIGNL, and go back to checking the checkpoint criteria again.

Once you wake up the first waiter, he will wake up the next waiter when he's done, and eventually all the waiters will be awakened in turn and in the order they were queued (see SBUNLOCK).

:MORTICIAN

The mortician server checks for the existence of the scoreboard file. If it doesn't exist, it creates it and writes a zeroed copy of the scoreboard to it. If it exists, it checks the use count (via ?FSTAT) to make sure that it's not already open, and complains if it is by reporting it and exiting.

Then it establishes itself as an official server via ?SERVE, opens the scoreboard file in read/write mode with CONNECT=0, sets its PID (via ?PNAME) and UID (via ?UIDSTAT) into CHKPTR-PID and CHKPTR-UID, and then loops processing obituary messages via ?IREC.

Obituary messages arrive whenever someone who has connected (via ?CON) with the mortician server terminates for any reason. The message includes the PID of the deceased. See the description of ?IREC, port ?SPTM, and termination code ?TBCX in the AOS/VSSystem Call Dictionary for details on the format of obituary messages and how to receive them.

When sad news arrives, the mortician locks the scoreboard and checks whether the deceased was the checkpoint server (by matching PID against CHKPTR-PID) or an application program.

If it was the checkpoint server, it sets CHKPTR-STATE to I and zeroes both CHKPTR-PID and CHKPTR-UID.

If it wasn't the checkpoint server, then it saves STATE(PID) and TRANS-ID(PID), changes STATE(PID) to U, and zeroes UID(PID), moves spaces to TRANS-ID(PID), and decrements TRANS-NOW if the status was T. If the status was W, it searches WAITQ for a matching PID, deletes the entry by sliding the PIDs above down by one, and decrements WAITERS. Warning: wait until later to report the transaction failure; do not report it while the scoreboard is locked!

Finally, for both cases it unlocks the

scoreboard and acknowledges the disconnection via ?DRCON. Warning: servers that fail to acknowledge disconnections can result in "lost PIDs" that never get re-used.

If the deceased was not the checkpoint server, and its state was T, then a message is sent to the Operator and/or logged to a file indicating that an application terminated in mid-transaction, the TRANS-ID was involved, and that some sort of data base repair is needed.



:MONITOR

The monitor program is simple: just open the scoreboard file in read-only mode with no connect and devise a fancy display format for the data. Then just loop updating the screen every 10 or 15 seconds. No need to lock/unlock the scoreboard, but I prefer MOVEing SCOREBOARD to OLD-SCOREBOARD and then DISPLAYing OLD-SCOREBOARD. There's more chance that TRANS-NOW will match the actual number of PIDs with T status. WAITERS may not match the number of PIDs in WAITQ if your snapshot catches the queue during an insert or delete. To avoid the problem my monitor only DISPLAYs non-zero entries in WAITQ (that's why SBDEQUEUE zeros the last entry).

:ENHANCEMENTS

The OCCURS values in Figure 1 should be set to reasonable values for your particular system. WAITQ only needs to have as many elements as the maximum number of application PIDs that will have the scoreboard open simultaneously. STATE, UID, and TRANS-ID need to allow for the maximum PID number. TRANS-ID's

length should be the minimum needed to store a unique transaction identifier. Note that Cobol limits TRANS-ID to a maximum of 65,538 bytes.

I purposely omitted a lot of error checking from the subroutine descriptions for the sake of brevity. The real versions should do things like check that STATE(MYPID) protects against an application program calling SBSTART or SBEND twice in a row.

:NOTES

There is a very slight chance that TERMINATEing or Control-C Control-Bing an active application program will occur while the scoreboard is locked, necessitating that all other application programs be restarted (they will quickly abort the next time they attempt to lock the scoreboard). However, idle application programs that are not in transactions can be zapped safely. Use the monitor to check that their current state is B before zapping them.

A much more likely scenario is that an application program will be TERMINATED or fail within a transaction. In this case, the mortician will report the fact and fix the PID's status and TRANS_NOW. You can then manually repair the data base based on the reported TRANS-ID without interrupting other users.

This scheme is amenable to multiple scoreboards. Just remove the "01 SCOREBOARD EXTERNAL." line from the COPY file in Figure 1 and specify multiple external scoreboard 01s with different names followed by a COPY SCOREBOARD.WS statement after each.

Multiple scoreboards are only necessary in applications that do transactions against multiple data bases that are not ordinarily involved with each other, such as posting to the General Ledger data base from the Order Entry data base. Δ

BJ is the President of B.J. Inc., a San Francisco based consultancy specializing in system auditing, system management, and performance analysis. :SYSMGR is a division of B.J. Inc. BJ can be reached at 109 Minna St., Suite 215, San Francisco, CA 94105, 415/550-1444 (voice) or 415/550-1072 (fax). The :SYSMGR bulletin board number is 415/391-6531 (300/1200/2400 with optional MNP class 5, CHAR/605X/CHARLEN=8/PARITY=NONE/AUTOBAUD) or 415/550-1454 (voice).

If you live in one of these cities, life just got a whole lot easier!

Atlanta, GA

Boston, MA

Chicago, IL

Houston, TX

Los Angeles, CA

New York, NY

Washington, DC

These are some of the select cities where Data General will be sponsoring a "Technology Forum." You'll be able to find out first-hand how Data General ECLIPSE® systems can help you change the way you work.

Namely, for the better and the easier.

For more information about the "Technology Forum" in your city, call **1-800-DATA GEN**



Data General

Life just got
a whole lot easier!

® ECLIPSE
is a registered trademark
of Data General
© Data General Corp. 1991

Circle 17 on reader service card.

Bits and bytes from the bulletin board

*Editor's note: "Do you have an answer, comment, or question?" reads the usual tag line with this column, but we at **Focus** devote the space more commonly to straightforward answers and questions. Commentary usually takes a back seat. But one particular item out of this month's batch generated a profusion of responses and perhaps illustrates an issue worthy of further debate.*

Copy protection scheme bombs with user



From: Jim Bageant

What is the general consensus on how copy protection is used in the Data General environment?

I've just run into a problem—a built-in time bomb that disables software if you don't pay up. That's right, 90 days after installation it turns itself off, if you have not paid your bill and loaded an update file. In my case, the product passed through a reseller who did not pay on time (even though I paid *him*). All of a sudden, we get a strange error code not listed in the manual.

A quick call to the software vendor confirms that this is a collection technique, and we were supposed to get a warning from the software two weeks prior to expiration. Guess who was on a two-week vacation? That's right, our programmer! Also, there is no notice of such a "feature" in the documentation or contract. No problem, says the

company. Just give us your modem number and a logon, and we'll download it.

Right! I compromise my system security to protect your software. No way! Latest news in my case is that this is permanent. The software expires every two years, just to make sure it doesn't get copied. We are going to dump the product, and the company seems quite willing to walk away from a large sale.

I will not compromise the security of my system to protect a vendor's product. I agreed contractually to protect the product, and I will not work with a vendor who assumes all his customers are thieves. I have seen this one other time in the DG environment, in which a product used an unlocking code at install time. At least this was known up front, and it was a utility program, not something used for production.

Wake up, software vendors! The PC market has learned its lesson. The only ones locks keep out are honest people! The soapbox is now free.

From: Kevin Danzig

What you are seeing is pretty standard for most decent minicomputer software today. I don't think it is an apples-to-apples comparison linking PC software to minicomputer applications. Two of the products we own create an unlock code based on physical disk address space as well, so if we have to clean up the disk . . . we have to un-mung a parent directory. When we reload, we are locked again and have to call for an unlock code. Then we run the unlock program ourselves while we have them on the phone.

From: Ephraim Nussbaum

When I was previewing the software Jim Bageant was using, we ran out of time also. I asked them for more preview time. I was willing to give them my modem number, but for some reason they couldn't get on. They allowed me to download a file from their bulletin board, and then told me over the phone how to unlock the software. I don't think they insist on getting on your system; that just makes it easier for you. They can unlock you this alternate way as well.

From: Jim Bageant

I think the PC comparison is very valid. It would seem more likely to me that PC software would be in greater danger. A lot of PC software is sold to individuals, or is under individual control. That's not usually true for [non-] PC software, which is under the control of a system manager who hopefully would think twice about copying (if for no other reason than he has probably written code for a living at some point). Let me ask a question: What do you do if you have a disk failure at night or on the weekend, and have to reload? Do you have to stay down until you get your software unlocked? How do you explain this to your boss, who is standing behind you wanting to know why 200 users are sitting around twiddling their thumbs after the hardware guy has come and gone?

From: Kevin Danzig

Not all protection schemes need a new unlock when they are reloaded from a dump. Wordperfect Corp. is a good example. They have a time bomb and you can extend it over the phone. Once it is unlocked, it will run on the same machine, same processor ID, without a new unlock.

From: Jim Bageant

Why should I have to experience any discomfort to protect somebody else's product? Certainly I should at least be warned in advance of built-in time bombs (I wouldn't have bought the product had I known). Do tires melt if the buyer doesn't pay for them?

From: Tim Boyer

No, tires don't melt. But they might, if one person could buy a set and then let all of his friends use them simultaneously.

From: Doug Kaye

Our customers compare the prices of our DG products to those of PC products and expect some alignment. The realities of the economics of software products in the DG market demand some form of lock/key. Otherwise, we'd have to charge five times what we are charging now. I, too, am willing to listen to any better alternatives.

From: Thomas Carey

Certainly, the comments about the economics of software development vis-a-vis the market are valid, but it's *outrageous* when those time bombs exist and they go off with absolutely no warning. Seems highly unethical to me that those products are sold without the buyer knowing *up front* and *in advance* about those conditions. What other product do you buy that can self-destruct with no warning and in potentially damaging circumstances?

From: Jim Bageant

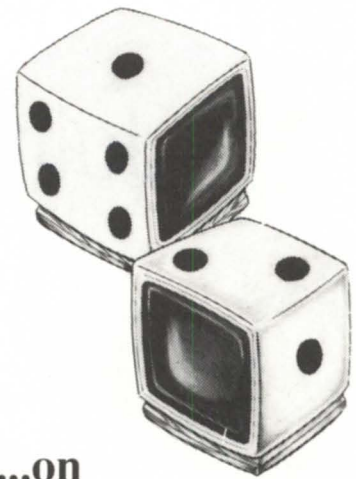
I can't say there was no warning from the software in my case. You do get a warning for two weeks prior to the expiration. We just did not happen to use the product during that period. My complaint is it is not mentioned in their advertising, contract, or documentation. Even the error code given when it craps out is not in the documentation. We have decided to pass on it, and now we have to go back and rewrite 10 weeks of programming.

From: Brian Johnson

I can tell you that the copying problem is large; half of our customers are OEMs with multiple machines, especially lots of the same CPUs, so that blows the CPUID idea. I can also tell you that various utilities I wrote while at DG in the old days, and distributed to two or three different users, later surfaced at hundreds of sites, including Europe and the Far East. So much for the knowledge/access argument. I agree that strong copy protection schemes are more palatable on non-critical utilities vs. production software, but unfortunately that implies that license fees for the latter must be higher, which in turn fosters more copying, and so on. My site has five MV/4000s now; if CPUID were the only deterrent, then we'd need only one license. Instead, I prefer reasonable (50 percent or less) fees for subsequent systems under control of the same licensee, and that's what we currently do. Δ

The NADGUG/RDS electronic bulletin board is available to all NADGUG members. Call 415/499-7628. There are no fees for use other than the telephone charges.

Why gamble...



**...on
someone offering
disaster recovery
as a sideline?**

With **DG/hot site** from Data Assurance, you get:

- Dedicated DG computers
- Dedicated Communications
- Dedicated Recovery Experts

Over 150 DG users, spanning the U.S. and Canada, don't gamble with their information based assets - or their choice for a hot site. They use the dedicated people, experienced in actual recoveries and hundreds of tests, and dedicated disaster recovery resources of

Data Assurance Corporation

Denver • New York • Philadelphia

(800) 654-1689

12503 E. Ucluid Dr., Ste 250, Englewood, CO 80111
(303) 792-5544 • FAX (303) 792-0218

Data General has qualified DAC as a provider of **DG/hot site**, based on criteria established by DG. DAC is an independent company offering its disaster recovery services to users of

DataGeneral
equipment.

Join the migration

SYNOPSIS

Consider carefully the advantages of switching to open systems. Ponder the limited future of proprietary architectures and software. Contemplate price, reflect upon speed and versatility of such new offerings as Data General's Aviion. What are you waiting for?

I have been asked to become a regular contributor to *Focus* magazine on the subject of open systems and Unix. I was a bit hesitant to do so at first, because I am not the world's greatest authority on the technical internals of Unix. However, the more I thought about the idea, the more I began to realize that the problems many people have with Unix and open systems are more philosophical than technical, and I do have strong philosophical opinions regarding the use of open systems and Unix.

What I hope to do in this column is remove some of the mystery from the use of open systems and Unix for the reader, to challenge ideas about the way people use computers to support their businesses, and to share some of the experiences I have gained from my late-night sojourns into the world of Unix systems management. If we can all have a little fun in the process of doing so, so much the better.

Book report

If any of you are evaluating whether or not to migrate from AOS/VS to Unix and open systems, there is a book that will be extremely useful in helping your decision-making process: *Open Systems—A Business Strategy for the 1990s*, by Pamela Gray (McGraw-Hill Book Company, 1991). The book's main theme is that there will be a need for computer systems running on proprietary platforms for the foreseeable future. However, there is little economic justification for doing any further large-scale software development work on computers with proprietary architectures, or that use proprietary software.

Gray does an excellent job of describing on two levels what open systems are, why one should use them, and how one should

use them. The first part covers the open systems topics at a basic level, while the second half explains particular issues of current importance. The book also describes how to interface open systems with existing proprietary systems.

The importance of considering open systems can be shown by the following example. A company in the Midwest was looking for a platform on which to run a data base application. Because the data base application was based on open systems, at least three platforms were available to run the application: IBM, Digital VAX/VMS, and Data General Aviion. The IBM solution cost in excess of \$1 million. The Digital VAX/VMS solution cost about \$700,000. The Data General Aviion solution cost \$250,000. Not only was the Data General solution considerably cheaper than proprietary solutions, it was faster as well.

It does cost time and money to migrate from proprietary to open systems solutions. However, I can tell you from personal experience that six months after the transition is made, you will be asking yourself why you waited so long. I can also tell you from personal experience that DG/UX is an excellent operating system.

The need for speed

One aspect of open systems I tended to overlook until last week was how the speed of the workstation CPU could affect the speed of data transfer. The reason for this is important: the most common method of moving data between Unix workstations and from workstations to file servers is by means of tcp/ip running on an ethernet. Tcp/ip is the Unix equivalent of Xodiac. Tcp/ip stands for trans-

mission control protocol/internet protocol. What Xodiac stands for, I have no idea. At any rate, tcp/ip was developed by the United States Department of Defense in order to allow it to obtain connectivity among the myriad of computer systems that it used. Because tcp/ip was non-proprietary and because it was very cost-effective, it was adopted by Unix vendors as the principal protocol for transferring data among Unix systems, and for many years it was the only way to transfer data to and from Unix systems. As the popularity of Unix grew, so did the use of tcp/ip.

It has reached the point where tcp/ip is available on almost every major computer platform. In order to transfer files between systems, tcp/ip uses ftp (file transfer protocol). Ftp is the equivalent of the Xodiac FTA (File Transfer Agent). On the average, ftp between machines of less than 20 MIPS (million instructions per second) was about 30,000 bytes per second. Now last week I had the chance to test file transfers between a 57 MIPS workstation and a 25 MIPS Aviion file server. The ftp bytes per second is faster than the speed of disk-to-tape on most computer applications that use client/server architectures, i.e., where the application is run on a local workstation and the data used by the application is stored centrally on a file server. The local computation/central data storage approach is important because it is the most cost-effective and one of the most secure ways of administering an open systems environment. Therefore, a ten-fold increase in the rate at which data can be moved between a central server and a local workstation is extremely important. It is one of the two best ways to obtain user acceptance of the central storage of critical data. (The other way is to have their hard

disk crash and to have them lose several months' worth of work because they did not back up their hard drive.) So if you are pondering whether or not to migrate to open systems, remember that computer speed can have a positive impact on your organization in more areas than just application speed.

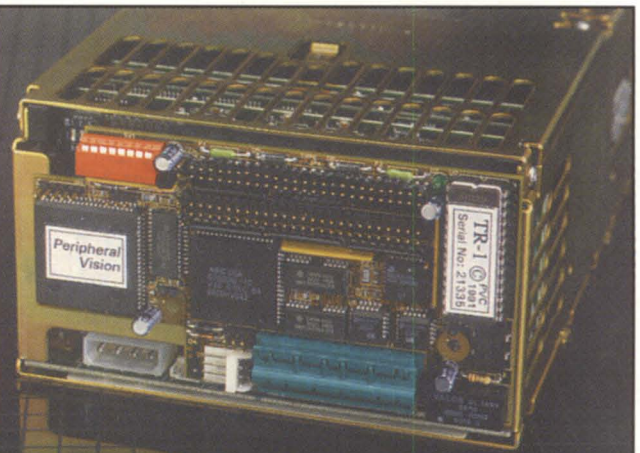
Case sensitivity

In the above paragraph, I am sure that many of you keen-eyed readers noticed that every time I referred to a Unix application, I used lowercase and every time I referred to an AOS/VS application I used uppercase letters. (No, I have not been reading e.e. cummings lately). The reason I did this is to emphasize the fact that Unix is a case-sensitive language and although AOS/VS is not case-sensitive, all file name storage in AOS/VS is done in uppercase. An instance where this case sensitivity can cause problems is if one uses the [!FILENAME] pseudo-macro or AOS/VS TAR to transfer AOS/VS files to a Unix directory, then all the transferred file names will be in uppercase. In addition, one should also realize that there are certain characters that are acceptable to one operating system and treated like poison by another. As an example, a Macintosh will accept file names with forward slashes (/). However, if these files are stored on a Unix file server by means of NFS, they will not be backed up by the file server because a Unix file server will deal with this character as a directory delimiter. It is also a good idea not to use characters in filenames that are interpreted as special characters by the Unix shell, i.e., *, /, and space.

So if you want to avoid unhappy file server customers, make sure that you teach them to use file names that contain letters acceptable to both the file server and the machine generating the files. If you do this, you will be their friends for life after their hard disk crashes and your file server backups of their data save their projects. This is not far-fetched. If you have 10 PCs or Macintoshes with hard drives, it is nearly certain that one of those hard drives will lose all its data during the next 12 months by means of mechanical failure or human error. Δ

David Novy is a technical computing specialist at 3M in St. Paul, Minnesota. He is past chairman of the AOS/VS special interest group and current chairman of NADGUG's SIG/UX.

**Data Compression
for Exabyte can't
get any easier
than this!**



**But here are two 800 numbers
that make it even easier**

\$895
Quantity 1 Price

800-442-0303
Toll-free Order and Info Line

Just plug the new TR data compression module onto the back of your Exabyte. Instantly, it's transformed into an ExTRabyte, with capacity never before possible and performance you won't believe.

No extra cables, no power cords, no software changes. Just the power

of the world's fastest SCSI-to-SCSI data compression.

TR modules are TRansparent to just about any hardware/software platform: DEC, Sun, AT&T, HP, Apollo, IBM, Sequent, Pyramid, and Prime to name a few.

So plug on TR and plug into the

capacity and performance you need.

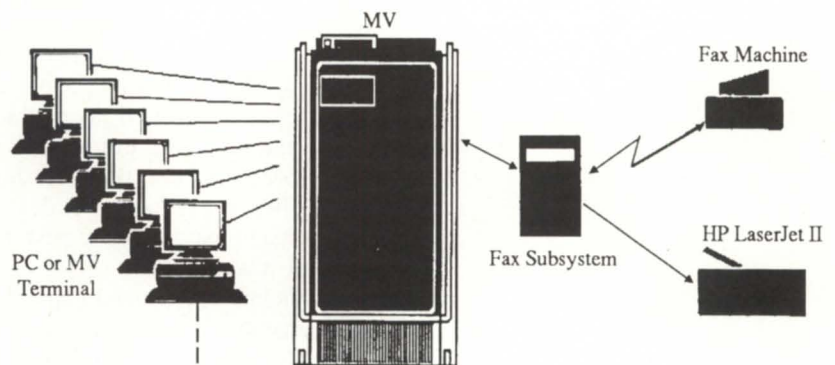
Installation takes only a minute (no tools are required), and the benefits last for years.



7712 Paseo del Rey • Playa del Rey, CA 90293

Circle 32 on reader service card.

DG FAX Server! CAI's RUSH



Let your Data General MV system serve the FAX needs of your entire computing community. With CAI's RUSH, a single Fax subsystem can send and receive faxes for all your terminal and PC users, includ-

ing access control, scheduled calling and chargeback auditing. WordPerfect and CEO integration, ASCII text support. Tremendous cost savings with Fax management.

Call today to learn more!



Concept Automation, Inc. 1319 Moran Road Sterling, VA 22170

703/450-6000 703/430-6185 (fax)

Circle 11 on reader service card.

Getting the word out

by Kent Finkle • Special to Focus

SYNOPSIS

Until human beings learn telepathy, office communications in the modern era of swirling information overkill will continue depending on imperfect tools such as e-mail. The problem remains: how to get the right note in time to the right people, and make sure they see it? Get ready to equip your Wordperfect Office with auto-notes.

Didn't I tell you? Didn't they tell him? Why weren't we informed?

It seems like there's always someone who doesn't get the word.

People are busy. As time goes by, volume increases for print jobs, batch processes, program updates, and restores. Result: the number of people who need to be notified of these events grows. When someone has not been notified, it creates tangles. Or, someone may have been notified, but was it the right person? Even if *one* of the right people was notified, were *all* the right people notified? If they were notified, were they sent the right message?

Shift work complicates matters because workers are not present simultaneously. The situation is complicated further if the shifts work in different parts of town, as they do here in North Andover. How will night shift in Building A communicate crucial, time-dependent information to the day shift in Building B, especially when Building B is locked after the day shift has gone home? The night shift people could take the time to shoot electronic mail across town to the day shift. But what if they don't? Sooner or later, they will forget. Even if they remember, will day shift workers read their e-mail the next morning before it is too late?

Even the most organized manual procedures eventually fall short. It is too easy to forget to tell people what they need to know.

Purpose

Let's create an automatic notification (auto-note, for short) system that will never forget to give the right information to the right people at the right time, and will make sure that they see it. You will need:

- the Wordperfect Office
- a text editor
- an AOS/VS operating system.

Types of auto-notes

I will look at four types of auto-notes: user-to-user, operator-to-user, user-to-operator, and system-to-operator. In a user-to-user auto-note, one user takes an action and one or more other users are notified. For instance, the night shift sending messages to the day shift discussed above is a user-to-user auto-note.

Similarly, in an operator-to-user auto-note, the system operator does something—a restore, for example—and users are notified. More on this later.

Obviously then, a user-to-operator auto-note lets the system operator know by e-mail when a user takes an action. I have a user who likes to try some "interesting" things in Wordperfect, so I could set up a user-to-operator auto-note when she starts the program.

A little less obviously, a system-to-operator auto-note has the system send e-mail to the operator when certain conditions exist. (My favorite is the system-to-operator type; it keeps me current on what my system is up to, and if no human beings send me any mail, I still get some from the old MV.)

Sample operator-to-user notification

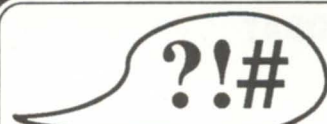
First, using an editor, create a file that contains the auto-note message. We're a real high-tech operation here in North Andover, so we might need to send a message like this:

Mr. Sagan, please be aware that the sunspot data from our x-ray satellite has been restored from last night's backup.

(OK, OK, maybe we don't have a satellite. Would you rather read about sewer usage data?) Save your file as Notification.

Figure 1: Send_files.cli

```
[!equal,comment,]
Macro name:
  send_files.cli
Description:
It sends e-mail messages without entering WPMail interactively or from the command line.
Sends files to a single user.
Parameters:
  1 - Subject
  2 - Username
  3,N - File1 File2 File3 etc
Sample call:
  sendfiles Meeting Robinson Darkhills Metrostation
[!end]
      COMMENT save cli environment
push
  prompt pop
  char/nrm/off/8bt/esc
      COMMENT don't report error messages
  class(1,2) ignore
      COMMENT Delete old shell macros
  del ?ssend?.shm;
      COMMENT Create a new shell macro, a type 157 file
  cre/ty=157 ?ssend?.shm;
      COMMENT If there is no first parameter on the command line
[!equal,%1%,]
      COMMENT we know that this is interactive so ask for a subject
  string [!read Subject: ]
      COMMENT And write it out to the file we are building
  write/l=?ssend?.shm m[!string]
      COMMENT ask for user to send the files to
  string [!read Send to: ];
      COMMENT And write username out to the file
  write/l=?ssend?.shm [!string] [!ascii 232 232]
  fa/ty=150/ty=udf/ty=txt
      COMMENT Get the file or files to be sent
  string [!read File[!ascii 250]s[!ascii 251]: ]
      COMMENT write file or files to the file
  wr/l=?ssend?.shm [!asc 227][!str] [!asc 371 367 116 367 367]
      COMMENT There is a first argument so this not interactive
[!else]
      COMMENT write parameters subject, user, and filenames
      COMMENT to the file
  write/l=?ssend?.shm m%1%
  write/l=?ssend?.shm %2% [!ascii 232 232]
  wr/l=?ssend?.shm [!asc 227]%3-%[!ascii 371 367 116 367 367]
[!end]
[!equal,comment,]
  run the macro. The noshell switch dumps the user back to CLI rather than going to the
  Wordperfect shell. Lib.pr is the Wordperfect Library program. The ml switch runs e-mail.
  The m switch runs a shell macro.
[!end]
x :wpoffice:wpoexe:lib.pr/noshell/ml/n= ./m=?ssend?
write [!ascii 210 227]
pop
```



Confused by CLI32?
Don't worry!
Hook-Bang-Crunch
makes it all very clear.

All new Revision 2 for CLI32!
The definitive Manual on CLI Macros
Format: 354pp A4, 3-hole drilled, Binder not supplied.

Revision 2 PRICES	\$US	\$CAN	\$A
?!# Manual	100.00	112.50	125.00
?!# Mag-Tape	100.00	112.50	125.00
Shipping / Handling	15.00	20.00	5.00

Allow 4 to 6 weeks for delivery.

Send order with Cheque or Money Order to:

Shalless Software Pty Ltd



P.O. Box 469, Malvern
Victoria 3144, Australia

Tel: (+61-3) 822-9157
Fax: (+61-3) 696-4928

(incorporated in Victoria) Nos include International Prefix

Circle 38 on reader service card.

SERVICE

Data General Terminal Repair

- D100, D200, D210
- D211, D214, D215
- D216, D450, D461
- D462, D410, D400
- D411, 6053, D412

\$95 Flat Rate
most repairs



COMPUTER
MAINTENANCE
CORPORATION

609 North 4th Street
Stillwater, MN 55082
(612) 439-0279

Circle 9 on reader service card.

Next, we need to write a Wordperfect Office Shell macro that will e-mail this file to the correct user without entering WPmail. The macro in Figure 1 (page 29) was adapted from the sample macro provided in the Office 2.1 manual. Wordperfect tells me that, in future releases of Office, it will include a version of Send_files.cli on the Office release tape so you won't have to type it in as I did.

Besides the comments, the main difference between this macro and the one in the manual is that this one is a little shorter. The one in the manual checks for a second parameter after it already knows that there is no first parameter, something it doesn't need to do. Note: you can of course leave out the comments and the macro will still work. Later, you can refer to the article if you want to see the comments again. Using a text editor (Pedit is fine, if you have it), enter the macro in Figure 1. Save the macro as Send_files.cli.

Suppose that our restore macro is called Restore.xrays.cli. Using your text editor, create the file in Figure 2. Save it as

Figure 2: New.Restore.xrays.cli

```

COMMENT Tell the sender what is about to happen
write Notifying Sagan by e-mail about the restore
[!equal,comment,]
the screen goes blank for a second here. Send_files sends e-mail automatically. Restore_done
is the subject of the e-mail message. Sagan is the user being notified. Notification is the file
containing the text
[!end]
Send_files Restore_Done Sagan Notification
COMMENT restores the files
Restore.xrays
    
```

New.Restore.xrays.cli. From now on, when the x-ray data is restored, run the New.Restore.xrays macro. It "wraps around" Restore.xrays.cli, shooting out an auto-note and then calling Restore.xrays.cli. Dr. Sagan gets an auto-note.

But what if Dr. Sagan sometimes doesn't read his e-mail? All we need to do is to have Dr. Sagan's setup.cli put him in e-mail automatically if he has mail. Use your text editor to create the macro in

Figure 3.

Save it as automail.cli and put it on your searchlist. Then insert the command AUTOMAIL at the top of Dr. Sagan's setup.cli macro. From then on, if Dr. Sagan has mail, he will automatically run e-mail when he logs on. If he does not have any mail, his setup.cli macro will proceed normally.

Sample system-to-operator auto-note

If I want to know if the system has

The B52 is an aircraft well used to superlatives. Massively powerful, its versatility and adaptability have extended the B52's lifespan in an age when technology has outpaced most other weapons systems and has left them outdated almost as soon as they enter service.

Designed in the 1940's the B52's role in the inventory of the USAF has been projected to the end of the of the century-few aircraft will have proved so long lived.

The longer and harder you push B32 Business Basic the more you'll appreciate the comparison.

Powerful - Versatile - Adaptable

B32 - Basically The Best

B32 Software (US) INC.
 4412 Carver Woods Rd
 Blue Ash, Ohio 45242
 Contact: Felix Decsi
 Phone (513) 791-6172
 Fax (513) 791-6290

Synergistic Software Co. Ltd.,
 Hughenden House, Main Street
 Collingham LS22 A4
 United Kingdom
 Contact: Tony Deakin
 Phone 44-937-73446 (24hr)
 Fax 44-937-66903

Circle 3 on reader service card.

**WE'VE
 PURCHASED
 DATA GENERAL**

As a result of all of our purchases of Data General systems and peripherals, new, used, all shapes, sizes and descriptions, McIntyre's is offering you unbelievable savings on all types of Data General systems, peripherals, communications equipment, terminals, etc. You can realize big savings on all Data General systems, including the Avion, MV and Dasher series CPU's, plus disk drives, printers, tape drives and more!

McIntyre's has been in the business of buying, refurbishing and reselling Data General hardware since 1978.

Whether you have a need to buy, sell or upgrade call McIntyre's and deal direct with.....

"THE DATA GENERAL MARKET PLACE"

1-800-783-5550



Mini-Computer Sales Group Inc.

2660 Auburn Rd., Suite 700, Auburn Hills, MI 48326
 (313) 853-9800 • (800) 783-5550 • FAX (313) 853-0013

Circle 29 on reader service card.

Figure 3: Automail.cli

```
[!equal,comment,]
Macro name:
  automail.cli
Description:
  insert this macro at the top of the user's setup.cli.
  user goes automatically into WPmail if user has e-mail
  otherwise the macro does nothing
Parameters:
  none
Sample call:
  automail
Notes:
  The first line is a bit tricky. It says if it is NOT true that there are NO files in the user's
  mail inbox there must be some e-mail for this user so put them in e-mail

[!end]
[!equal,[!filenames,;WPOFFICE:wpml:in:[!username]],]
  COMMENT then put the user into e-mail
  wpmail
[!end]
```

Figure 4: Error message

```
[!equal,[!filenames,;udd:kentfinkle:ErrorFile], ]
  send_files ErrorLastNight Kentfinkle ErrorMessage
[!end]
```

generated a certain, say, error file, I could look for it all the time. But why? Suppose the error file the system generates is called ErrorFile. Why not put this macro (Figure 4) in the batch that occasionally generates the error report? The ErrorMessage document might say: Kent, the batch job last night generated an error report. Might want to check it out. When I come in the next morning, that message will be in my e-mail in-box.

Conclusion

Coordinating a multi-user, multi-site computer system is complex, but with auto-notes, much worry disappears. You know that the system will drop the right e-mail in the right in-boxes every time. After all, we have to keep our satellites orbiting. Δ

Kent Finkle gives seminars on using Wordperfect, and is the computer system manager for the Town of North Andover, Massachusetts. He may be reached at 508/682-6483.

Data General • Buy • Sell • Trade

Processors:

MV40000 32MB	SAVE \$
MV20000 Model 1 16MB	SAVE \$
MV20000 Model 2 16MB	SAVE \$
MV20000 Model 1 to Model 2 upgrade	SAVE \$
MV15000 Model 20 8MB	SAVE \$
MV15000 Model 8 to Model 20 upgrade	SAVE \$
MV15000 Model 10 to Model 20 upgrade	SAVE \$
MV10000 4MB Meter high cabinet	\$3,500
MV8000-II 8MB Meter high cabinet	2,500
MV9500 8MB AOS/V5 II	47,000
AViiON All Models	SAVE \$
MV8000 Model 9300	950
MV7800 4MB 16 slot chassis	2,100
MV7800XP 4MB	7,500
MV4000 2MB	700
MV4000DC 2MB, 120MB, floppy	2,250
MV2000 Enhanced 4MB 160 MB disk	5,200
MPT100 Dual floppy	350
MP100 8520-D	350
S-140 256KB Floating point	1,500
Desktop 10 Floppy, 15MB disk	875
Desktop 20 Floppy, 15MB disk	1,295
S-120 256K 16 slot	550
S-280 2MB	1,900

Processor Options:

8997 Expansion chassis MV15, 20	\$5,500
8819 Second IOC for MV10000	1,800
8762 Expansion chassis MV10,8,4,S280	3,500
8749 Battery backup for MV10000	1,100
8746-B Battery backup for 8762	
EXP Chassis	900
8704 Floating point unit MV8000	500
4543-B MCP1 8 Async 2 Sync DCH Ptr	1,900

4463-ZT USAM-4	\$275
4380 ISC-2 (Synch)	600
4370 IAC-16 RS232, 20MA, W TCB	1,450
4623 IAC-24 w/TCB-24	6,250
4367 IAC-8 RS232, 20MA Modem Cnt	850
4532-A ILC	2,900
4560 LAC-12	1,100
4608 10 Port term. serv	2,800

Disk Storage Units:

6161 147MB Disk subsystem	\$850
6236 354MB Disk subsystem	1,100
6239 592MB Disk subsystem	3,200
6329 120MB MV2000/MV1400	800
6363 160MB MV2000/MV1400	1,200
6491 322MB for MV2500 or CSS	2,100
6554 662MB for MV2500 or CSS	3,100
6581 500MB R.A.M.S. Disk	Call
6720 CSS2 1.0GB Disk subsystem	11,300
6685 1.0GB Disk Drive A/O	5,500
2351 Fujitsu w/BMX3	3,200
6061/6122 Zebra Disks or Parts	Offer
Zetaco ARZ and SKS subsystems	Call
Zetaco Laser Disk subsystem	Call

Terminals:

6165 D460 Monitor with keyboard	\$195
6166-X D410 Monitor with keyboard	165
6169-X D211 Monitor with keyboard	165
6391-X D214 Monitor with keyboard	200
6392-X D215 Monitor with keyboard	225
6393-X D411 Monitor with keyboard	175
6394-X D461 Monitor with keyboard	375
6500 D216 Monitor with keyboard	380
6682-A D217 Monitor with keyboard	395
6567 D412 Monitor with keyboard	475
6568 D462 Monitor with keyboard	795

Tapes:

6021 800 BPI new style	\$400
6026 800/1600 BPI Brown, FCC compliant	1,250
6125 1600 BPI Streamer, FCC compliant	500
6311 15MB Cartridge MV4 DC/7800DC	650
6341-A 1600 BPI Streaming Tape	3,500
6270 15MB Cartridge for Desktop	650
6299/6300 1600/6250 BPI Subsystems	3,500
6586-A Galaxy Tape	5,200
6590M 2GB Tape Backup add-on for CSS	3,800
Megatape 2GB Subsystem	Call
Kenedy 9400 w/ BMX2 Subsystem	Call

Specials

D 411 Terminal	\$165
CSS (SCSI) Disk & Tape Subsystems	Call

International Computing Systems

P.O. Box 343 • Hopkins, MN 55343

1-800-522-ICSC
(612) 935-8112
FAX 612/935-2580

Memories:

MV40000, All sizes
MV20000, All sizes
MV15000, All sizes
MV10000, All sizes
MV9500, All sizes
MV8000, All sizes
MV7800XP, All sizes
MV7800, All sizes
MV4000, All sizes
MV2000, All sizes



Circle 26 on reader service card.



COMPUTER
WHOLESALEERS, INC.

DATA GENERAL SPECIALS!

MV 2500 w/8MB 322MB LAC-12...	\$16,900
4626 LAC-32 w/TCB.....	3,400
6581 RAMS 500MB S/S	11,500
6554 622MB Disk Drive.....	3,500
6239 592MB Argus S/S	2,900
6236 354MB Argus S/S	1,200
4374 1200 LPM Printer.....	3,400
4532 Ethernet LAN	2,900

PARTIAL EQUIPMENT LIST
CALL FOR QUOTES ON ALL DG HARDWARE
CALL FOR DEPOT MAINTENANCE QUOTES

COMPATIBLES

DATA RAM
FUJITSU
ZETACO

CALL US!

800-229-BUYS (2897)

404-455-4542
FAX 404-457-5841
3246 MARJAN DRIVE
DORAVILLE, GA 30340

Circle 10 on reader service card.

MACRO

Power pass

by Andy Pook
Special to Focus

If you're a user of Powerhouse, the 4GL application development product from Cognos, then you know that it is sometimes desirable to pass parameters between the three components QUICK, QUIZ, and QTP. An easy way to do so is to use the /M switch; however, this feature does not work so well with CLI32.

First, some background information. QUICK generates menus and screens for on-line applications, QUIZ is a data extraction and reporting tool, and QTP is a volume transaction processor that edits, moves, and modifies large volumes of data. Slash M means, take as a command input the following lines of the current macro up to but not including the next close bracket ")". (Note: the bracket must be in column one.)

For example: consider a report called ACCOUNT_DETAIL that prompts for the ledger code and account number to report on.

RUN_REPORT.CLI

```
quiz/m
exec account_detail nogo
set report device printer queue %1%
go
%2%
%3%
)
```

The report can then be run by the following command:

```
RUN_REPORT ACCOUNTS_PRINTER
LEDGER_01 1234
```

In this case, a report of account 1234 in LEDGER_01 will be printed to a queue called ACCOUNTS_PRINTER.

In a QUICK screen, the parameters may be prompted for or be part of a retrieved record. They are then concatenated together into a defined item.

```
DEFINE d-command CHAR*40 = "RUN_REPORT
"+ field-1 " " + field-2 & " " + field-3
```

The command can then be run in a DESIGNER procedure or as part of POSTUPDATE with the following line:

SYNOPSIS

You need to pass parameters between QUICK, QUIZ, and QTP, but you can't use the /M switch with CLI32. Don't despair, Powerhouse users. Here's an adapted macro and procedure that will solve your problem.

SEMINAR 101
SEMINAR 101
SEMINAR 101
SEMINAR 101
SEMINAR 101
SEMINAR 101

Finally.
An AOS/VS
& AOS/VS II
Performance
Seminar for Normal Humans.

Brian Johnson will be leading a three-day seminar on performance analysis and capacity planning. Seminar101 is specially designed for system managers who are not system programmers.

Call for information on prerequisites and to request a registration package.

September 9-11 San Francisco \$1250

:SYSMGR A Division of B.J. Inc.
Software for System Managers

109 Minna St., Suite 215, San Francisco, CA 94105
(415) 550-1454 FAX (415) 550-1072

Circle 41 on reader service card.

RUN COMMAND d_command CLEAR
SCREEN RESPONSE

or there are several ways of suppressing or logging the output to a file for later checking. Slash M is intended to work only on commands such as CREATE and XEQ, so how does this work?

The QUIZ/M line runs a macro that executes QUIZ.PR by placing the /M on the XEQ command. The CLI then reads the next line of the current macro (QUIZ.CLI), and comes to the end without finding anything (except some [!end]s). So it reads lines from the calling macro (RUN_REPORT.CLI) and expands the dummy parameters.

/M and CLI32

If you're using CLI32, this feature does not work. It was decided during the development of CLI32 that the boundaries between macros should be tighter, so that each macro was a self-contained whole. In revisions less than 2.02, there is a bug that causes the CLI to crash in a very ugly way.

In revision 2.02, the bug is fixed; but the dummy parameters are expanded by QUIZ.CLI and not RUN_REPORT.CLI. As no parameters are passed to QUIZ.CLI, they expand to nothing.

There is a loophole. If QUIZ.CLI is rewritten, so that the XEQ is not contained in any conditional pseudo-macros ([!eq] [!else] and [!end]), the /M will work again.

This can either be done for each of the Powerhouse modules, or you can write one macro that is used by all modules.

QPOWER.CLI

```
[!equal, [!path,PH_LOCATION],]
write SETPOWERHOUSE has not been done.
f/2=error/L@null ::
[!end]
[!nequal,%/chain/cha/cha%,]&
chain%/chain/cha/cha%[!else]xeq%/%%[!end].&
[!eprefix,[!path,PH_LOCATION]]%0%,%-%
```

Now create links for each module:

```
CREATE/LINK QUIZ.CLI QPOWER.CLI
CREATE/LINK QTP.CLI QPOWER.CLI
```

Andy Pook is a programmer for the Haynes Publishing Group, Sparkford, Somerset, England.

The %0\% on the last line will expand to QTP or QUIZ without switches.

The filestatus on line 3 causes the macro to stop instead of getting an error when XEQ QUIZ is attempted. The above macro and links should be placed in a directory that precedes :COGNOS:POWERHOUSE:CURRENT on the searchlist.

Extra arguments can be added to the last line to specify your default

dictionary or terminal type, etc., which can reduce typos in your applications macros.

Addendum

It is this tightening up of macro boundaries that causes READ_FILE.CLI (AOS [/VS] Tricks, pg. 49 *Focus*, May 1988) to fail under CLI32. Fortunately, it can be rewritten using !OPEN !READ !CLOSE. Δ

Why Join NADGUG?

Reason #3

A Gathering of Minds

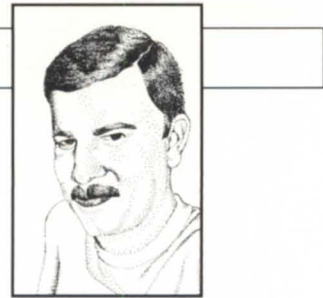
Thousands of people like you work hard every day to keep their Data General systems operating at peak efficiency. It's a job that makes you use your head. To do it well, you have to stay informed and always be looking for a better way. But you don't have to do

it by yourself. With thousands of members ready to share their thoughts and experiences, the North American Data General Users Group is an incredible resource

when you need answers. Take part in a gathering of DG minds—Join NADGUG today •

**NORTH AMERICAN
DATA GENERAL
USERS
GROUP**

1-800-USR-GRUP
512/345-5316 (outside U.S.)



A revision to remember

SYNOPSIS

“Greatly improved” doesn’t begin to describe the features displayed by ICobol revision 1.60.

Users will be pleased, says the author, because it’s faster, more efficient, easier to write in, and much easier to debug. (If you don’t like it, you’ll know who to blame.)

Every few years, there seem to be certain revisions of ICobol that are unforgettable enough to stick in my head. ICobol 1.10 was one, as was the first 32-bit release, 1.30. I think revision 1.60 is going to be one of those releases. Making the transition isn’t without some pain, albeit a lot less than the switch to the new file system was—but in the end, I think you’re going to be pleased.

Rev 1.60 is the first time that ICobol has been ported from Unix. Before we go any further, I’d like to commend the good people down at Research Triangle Park who did the port. One of my big fears was that AOS/VSI Cobol was going to become an orphan product, as RDOS ICobol has, receiving updates (if any) too little and too late. The speed with which the AOS/VS version followed the Unix version has helped allay those fears, and given me a bit more confidence in AOS/VS ICobol’s future. Now, as long as we get the 1.70 port as quickly . . . but that’s another column.

Anyway, as I mentioned in the last column, DG found an insidious way of stifling my quality assurance gripes. They made me a beta tester. This means that I’ve been playing around with this code for three or four months, and it seems to be extremely solid.

There are four major improvements with this version. There’s a new debugger, the

error handling and reporting have been vastly improved, new verb constructs have been added, and a source code optimizer is included.

For me, the biggest improvement in 1.60 was the debugger, ICDEB. I know there are a number of you out there who had become so discouraged by the other debugger that you gave up using it entirely. This one is worth a new look.

This new debugger is, like the old, invoked from within the runtime system. There the similarity stops. ICDEB has a couple of dozen commands. To hit the high points:

- BREAKPOINT is like the old command TRAP, except that a BREAKPOINT can be set to any line number containing a statement, or a paragraph name, or a section name. No more guessing what your program is doing in between paragraphs.

- WATCHPOINT can be set to notify you when a value changes.

- COMMAND allows you to enter commands to execute when an event occurs. The WATCHPOINT and BREAKPOINT commands are associated with an event. That is, if you enter WATCHPOINT CUSTOMER-BALANCE, the debugger returns Event 10 set for CUSTOMER-BALANCE. Typing COMMAND 10, then, allows you to enter commands to be executed when CUSTOMER-BALANCE changes:

```
icdeb> COMMAND 10
) DISPLAY CUSTOMER-BALANCE
) LIST
) MOVE 110 TO CUSTOMER-SALES-YTD
))
```

- HEX-DUMP is just what it sounds like. Does that variable have a value of SPACES or LOW-VALUES? HEX-DUMP will tell you. I’m pleasantly surprised that DG didn’t include an OCTAL-DUMP instead.

- LIST lets you see the actual code that’s

running, instead of having to print a program listing each time you make a change.

There's more, but it should be apparent that ICDEB is a vast improvement over DEBUG. I can think of some enhancements—I'd love to have the macro capability that the Unix version has—but I'll be content with the fact that, for the first time, I can debug a program without putting a bunch of dummy paragraph names around each statement.

The most striking feature of the new compiler is the error handling. "Greatly improved" does not begin to describe the orders of magnitude of enhancement. For instance, I had code that looked like so:

```
77 APPLICATION-NAME      PIC X(20)
   VALUE "SALES MENU".
01 MENU-SELECTION      PIC 9(2).
```

and I tried to add a number to APPLICATION-NAME. The old compiler looked like this:

```
COMPILED 03/22/91 AT 11:36 AOS/VS
INTERACTIVE COBOL REV. 1.50
2      PROGRAM-ID. OESANLMENU.
11     IF ESCAPE-CODE = ESCAPE-KEY
ERROR: NUMERIC OPERAND REQUIRED
ERROR: NUMERIC OR NUMERIC EDITED
OPERAND REQUIRED
```

while the output from 1.60 looked like so:

```
Compiled on 22-Mar-91 at 11:37:12 by AOS/VS
Interactive COBOL Revision 1.60
Options: ICobol
Source: TEST.CO
```

```
TEST.CO:69 (uncorrected error)
Numeric or numeric-edited operand required
1 uncorrected errors
```

The TEST.CO:69 means that the error was found on line 69 of the source. Sure enough, get into your editor and go down 69 lines and you're sitting on SET APPLICATION-NAME UP BY 1. Note also that where the old compiler gave you the name in PROGRAM-ID, the new one actually shows which source program you're compiling. For those of us who have a couple of dozen programs named TEST001.CO, but are notoriously neglectful about changing the program ID, this is extremely helpful. In the code above, I left the quote off of the end of the APPLICATION-NAME literal. 1.53 gave me the following error:

```
5 01 MENU-SELECTION PIC 9(2).
   ERROR: QUOTE MISSING
   ERROR: UNRECOGNIZABLE WORD
```

This is the error message in 1.60:

```
TEST.CO:20 (uncorrected error)
"SALES MENU." is an unterminated literal.
```

I could go on with examples for the

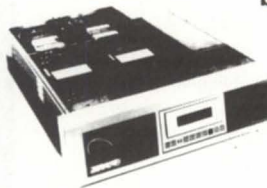
whole column. But you get the idea the major advantage of this compiler is that it gives you information that was never readily available in an ICobol compiler before. What the error is, for example, or where the error really is.

That's the upside of the improved error handling. Of course, there's also a downside. It seems that this compiler catches mistakes that I've been making all along,

ONLY THE BEST FOR YOUR DG SYSTEM

DISK & TAPE COMBO

High capacity disk plus cartridge tape backup both in a single chassis



DISK DRIVE

- Argus emulation
- High performance
- SCSI interface
- Compatible w/AOS/VS & AOS/VSII
- High reliability

TAPE DRIVE

- Cartridge tape 4mm or 8mm
- High capacity
- High reliability
- Fast access time
- Up to 2.3 GB/cartridge

Also available as separate disk or tape subsystems

OPTICAL DISK DRIVE

With all the advantages of optical technology

- Erasable
- Looks like a Mag disk
- Random access
- Superb data performance



Also: Multi-function optical drive, both WORM and MO

PRINTERS

Same as DG printers



BAND PRINTERS

300 LPM-1500 LPM
DG Models 4595, 4596, 4598, 4599



LASER PRINTERS

6 PPM-26 PPM
DG models 6474-6479

Also: Complete line of accessories and supplies for all Dataproducts and most DG printers

NATIONWIDE INSTALLATION & SERVICE AVAILABLE

Your First Choice for DG Solutions

interscience
COMPUTER CORPORATION
5171 CLARETON DRIVE, AGOURA HILLS, CALIFORNIA 91301

CALL (800) 627-2007
FAX (818) 707-1627

Circle 27 on reader service card.

that I didn't know were mistakes. For instance, I had a couple of hundred programs with a screen called ANY-CHANGE-SCREEN, and a procedure section named the same. That's a no-no. I had identical paragraph names in two different sections, and a GOTO to one of them in a third section. Not only is that an error now, but I can't figure out how this one ever worked. Just lucky, I guess. The, well,

let's be generous and call it "unorthodox" coding that I used to do—like moving spaces to a numeric edited field, or PERFORMing a varying alphanumeric field—are now officially forbidden. The bottom line is that it's time for ICobol users to clean up their acts. Their compiler isn't as sloppy as it used to be.

The other downside to the error handling is one that I'd like to see fixed. It

seems that object code is no longer generated until you have a clean compile. That makes sense in a production environment, but when I'm developing a program and I get an error that I know is of no consequence—for instance, trying to display a nonexistent item when I know the code will never get there—I'd like to be able to tell ICobol to generate the code anyway. Maybe a new switch would do it.

Rev 1.60 also has some new verb constructs. For 32-bit Cobol users trying to switch to ICobol, these new constructs help to minimize the conversion needed. For me, they are simply convenient and efficient. Verbs like END-IF allow me to change this:

```
IF INVENTORY-ITEM-FILE-STATUS = I-0-OK
  IF FIRST-TIME-FLAG = SPACES
    MOVE "1" TO FIRST-TIME-FLAG,
    PERFORM PRINT-DAILY-ITEM-SALES-
      ITEMS UNTIL DAILY-ITEM-SALES-
        FILE-STATUS = AT-END OR DAILY-
          ITEM-ITEM-NUMBER > ITEM-
            NUMBER
    ELSE PERFORM PRINT-DAILY-ITEM-
      SALES-ITEMS UNTIL DAILY-ITEM-
        SALES-FILE-STATUS = AT-END OR
          DAILY-ITEM-ITEM-NUMBER > ITEM-
            NUMBER.
```

to this:

```
IF INVENTORY-ITEM-FILE-STATUS = I-0-OK
  IF FIRST-TIME-FLAG = SPACES
    MOVE "1" TO FIRST-TIME-FLAG,
  END-IF,
  PERFORM PRINT-DAILY-ITEM-SALES-
    ITEMS UNTIL DAILY-ITEM-SALES-FILE-
      STATUS = AT-END OR DAILY-ITEM-ITEM-
        NUMBER > ITEM-NUMBER.
```

Instead of PERFORMing paragraphs, I can now make them in-line, and use the END-PERFORM verb to finish the statement. And those arithmetic statements that you put in a separate paragraph because of the ON SIZE ERROR clause can now be terminated by an END-MULTIPLY.

Speaking of arithmetic statements, they've also been enhanced. It's now perfectly legal to have ADD A B GIVING C D E, at least with code revision 8.

The last major improvement for this revision is ICOPT, the ICobol optimizer. ICOPT takes object code and, depending on the switches you feed it, in-lines the



What Do:

Naval Surface Warfare Center
Public Works Canada
Lord Chancellor's Department (U.K.)
New York State Assembly
3M Health Information Systems
Exxon Chemical Corporation
Harp Ireland, Ltd. (Eire)
ESPN
Thomson-CSF (France)
Citicorp Information Resources
AT & T Bell Laboratories
Handelsbanken (Sweden)

North Carolina Central University
U.S. Department of Justice
California Credit Union League
New Zealand Industrial Gases
U.S. Federal Aviation Adm.
Waste Management of NSW
(Australia)
Southwestern Bell
Texaco, Inc.
Rockwell International
British Broadcasting Corporation
and hundreds more...

Have In Common?

GUARDIAN

ACCESS CONTROL & INTERNAL SECURITY

- Automatic Password Control
- Control access by time with Automatic Log Off
- Control access by group
- Restrict access by console
- XODIAC Support
- Batch creation of profiles
- Detailed Management Reports
- 500,000 easy to remember password phrases
- Set 61 User Privileges with one screen & window

DataLynx • 6659 Convoy Ct. • San Diego, CA 92111
(619) 560-8112 • FAX (619) 560-8114

Le Software Man • Box 545 • London N78DF U.K. • 01-809-2762

Circle 18 on reader service card.

paragraphs, removes branches to unconditional branches, and replaces certain instruction sequences with faster, smaller sequences. Note that I said object code. This utility can be used to optimize ICobol code revisions 4 through 8, and source code is unnecessary. So even if you're still running ICobol 1.40, you can take advantage of the optimizer. The optimizer may be invoked either on the compile command line, or as a separate utility. The resulting object code can be run on any platform.

How optimal is it? It's hard for me to judge. I've got the SBTEST benchmark suite, which really isn't what ICOPT is meant to optimize. It's designed for the real world, where you get a little sloppy and PERFORM a paragraph that PERFORMS a paragraph that PERFORMS a READ. Data General, using the 10,000 iteration version of USSTEEL, came up with a 42 percent performance gain between 1.53 and 1.60. Their AR64 benchmark showed a 5-10 percent performance gain. In other words, your mileage may vary—but there's a significant gain, the utility is free, and it works with any rev of ICobol. Nice enhancement.

Along with these big changes are some small but certainly not insignificant changes. You can now program in ICobol using upper and lower case, just like any real programming language. This doesn't make my code any more efficient, but it sure makes it more readable. ANALYZE has been enhanced to enable it to get file information, even if it can't get an exclusive open for the file. And MLS has two new commands, ENABLE and DISABLE, which will let you control logging onto the MLS server. This is going to change the way I currently do backups, which is kick everyone off and disable their terminals. Now, they can use their terminals—they just can't mess up my files.

A major loss is the end of support for indexed source programs. This, along with the lack of support for ICEDIT, may spell doom for ICobol.

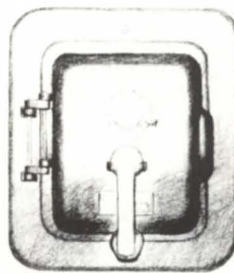
There really isn't much to criticize about this release. About the only improvement that I could suggest is an increase in the compile speed. While the Unix and MS-

DOS platforms are chugging along at 15,000-plus lines per minute, my MV/8000 is chugging along at around 2000, or 500 if I use the optimizer. Now, I'll admit that part of this is my fault (I've heard that they've come out with faster drives than the Zebra, but I just hate to take a chance on new, untested technology), but some of it has to be blamed on DG. That said, I'll freely admit that I rarely care how long a

compile takes. I just batch it up and go about my business.

So what more can I say? ICobol 1.60 is faster, more efficient, easier to write in, and much, much easier to debug. It's going to force us to start living up to standards, something that I don't think is bad at all. Hard to find fault with a product like this (especially since I get my STRING and UNSTRING verbs next revision!). Δ

**IN
CASE OF
EMERGENCY**



**CALL
FAST TRACK
SYSTEMS, INC.**

FAST TRACK is best equipped to provide disaster recovery services to your company

Look at the facts:

- Multiple hot sites for better geographic coverage
- Fully equipped locations: Manhattan, Brooklyn NY, and Chicago
- Largest base of installed equipment, and most equipment per subscriber of any Data General disaster recovery firm
- Facilities manned 24 hours a day, 7 days a week by trained operators
- Data General VAR authorized to provide disaster recovery services
- The only Data General hot site facility with its own off-site high security data storage vaults offering 24 hour, 7 day a week courier service
- Fully equipped computer room, office space and conference room facilities dedicated to disaster recovery subscribers
- On-site inventory of hundreds of modems, multiplexors, and terminals
- Private communications network available in most major U.S. cities
- In-house Data General communications expertise ready to provide solutions to your networking needs

Before disaster strikes, you need FAST TRACK SYSTEMS™

(718) 522-7373

FAX (718) 260-4375

Data General has qualified FAST TRACK SYSTEMS as a provider of **DG/hot site** services based on FAST TRACK having met criteria established by Data General.



FAST TRACK SYSTEMS, INC.

61 Broadway New York, NY 10006

FTS is an independent company providing its disaster recovery services for users of Data General equipment.

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.

Circle 23 on reader service card.

Use your connections

On the following pages you'll find our semi-annual listing of the NADGUG roster. The roster is provided by NADGUG so that you may connect with other DG users with similar interests.

The Executive Board and the Standing Committee chairpersons are the NADGUG leadership. Special interest groups are made up of users who represent a particular software, operating system, or industry. They usually meet once a year. Regional interest groups are geographically defined users of Data General equipment, and may meet several times a year. Each listing contains a contact individual.

To learn more about the benefits of joining NADGUG, or to report changes in the roster, please contact the NADGUG staff at 1-800/877-4787 (outside the U.S. call 512/345-5316).

The Executive Board

President

Frank Perry
2074 Flat River Road
Coventry, RI 02816
401/397-3533

Vice President

Dennis Doyle
Dennis Doyle & Associates
8355 S.W. Sexton Mtn. Ct.
Beaverton, OR 97005
503/641-8772

Treasurer

Jan Grossman
H. A. Holden, Inc.
1208 Harmon Place
Minneapolis, MN 55403
612/333-5353

Recording Secretary

Tim Boyer
P.O. Box 951
Warren, OH 44482
216/898-2711

Standing Committee Chairpersons

Advisory Council

C.A. Miller
Southern States
Cooperative
6606 W. Broad St.
Richmond, VA 23230
804/281-1284

Audit

Calvin Durden
Tractor & Equipment Co.
P.O. Box 2326
Birmingham, AL 35201
205/591-2131

Bylaws

Brad Friedlander
Arthur D. Little
25 Acorn Park
Cambridge, MA 02140
617/864-5770

Conference

Jan Grossman
H. A. Holden, Inc.
1208 Harmon Place
Minneapolis, MN 55403
612/333-5353

Membership

Chris Thorpe
Delphi Data
2220 Hartford St.
San Diego, CA 92110-2335
619/275-2892

Planning

Lee Jones
Gulf Coast Systems, Suite 1J
10200 Hempstead Hwy.
Houston, TX 77092
713/681-2308

Publications

Maggie Morris
510 Third Ave. NE
Minneapolis, MN 55413
612/379-8334

RIG/SIG

Bart Bates
Gibson Petroleum
900 Guinness Hse.
727 - 7th Avenue SW
Calgary
Canada T2P 0Z5
403/298-9367

Sig Vice Chair

Edward E. Lindberg
Western New England College
1215 Wilbraham Rd.
Springfield, MA 01119
413/782-1246

Vice Chair

Chuck Goes
9610 S. Mason
Oaklawn, IL 60453

Vice Chair

Bernie Abrams
Librascope Corp.
833 Sonora Ave.
Glendale, CA 92101-2433
818/502-7443

Vice Chair

Nancy Miller
CIC Enterprises
4720 Kingsway Drive
P.O. Box 55647
Indianapolis, IN 46205
317/253-1711

Vice Chair

Kathi Gudmundson
Winona State University
Johnson & Sanborn Streets
Winona, MN 55987
507/457-5240

Vice Chair

Al Devitt
Sarpy County
Data Processing
1210 Golden Gate Drive
Papillion, NE 68046
402/593-2324

Special Interest Groups

AOS & AOS/VS

Edward E. Lindberg
Western New England College
1215 Wilbraham Rd
Springfield, MA 01119
413/782-1246

Business Basic (BB SIG)

George Henne
The Eastwood Group
235 Eastwood Rd.
Toronto, Ontario
Canada M4L 2E2
416/694-5777

CQCS

Ray Walther
AIM Management Group, Inc.
Suite 1919
11 Greenway Plaza
Houston, TX 77046
713/626-1919

Educators

Marsh Price
Douglas College
P.O. Box 2503
New Westminster
BC V3L 5B2
Canada
604/527-5334

ICobol

Dennis Doyle
Dennis Doyle & Associates
8355 S.W. Sexton Mtn. Ct.
Beaverton, OR 97005
503/641-8772

Infos II

Jim Siegman
548 Walnut
Elmhurst, IL 60126
708/941-8214

Law Enforcement (LEDGUG)

Captain John Myers
Black Hawk County
Sheriff's Dept.
316 East 5th Street
Waterloo, IA 50703
319/291-2557

Lions Gate

Bart Bates
Gibson Petroleum Co.
900 Guinness Hse.
727 7th Avenue SW
Calgary T2P 0Z5
Canada
403/298-9367

Music and Recording Industry

Paul Duck

Abacus Software
2600 McCormick Dr., #200
Clearwater, FL 34619
813/726-6511

Office Automation Special Interest Subcommittee (OASIS)

Linda Klatt
Time Insurance Co.
P.O. Box 3050
501 W. Michigan Ave.
Milwaukee, WI 53201-3050
414/299-6053

PERFSIG

Jess Brown
Techno-Dynamics
P. O. Box 765
Bowie, MD 20715-0765
301/390-6331

SIG/UX

David Novy
3M
3M Center
Bldg. 235-1D-19
St. Paul, MN 55144-1000
612/733-3320

SMBasic

Keith Long
CI Systems
P.O. Box 960
Asbury Park, NJ 07712
201/681-0083

Regional Interest Groups

ALABAMA

Alabama Data General
Users Group
Randy Smith
SPMS, Inc.
2910 Linden Avenue, Suite 100
Birmingham, AL 35209
205/871-8602

CALIFORNIA

Northern California
Frequent Users
of Data General Equipment
(No Cal FUDGE)
Steve Tyler
Airco Coating Technology
P.O. Box 4105
Concord, CA 94524
415/680-0501

Los Angeles End-Users of Data General Equipment (L.A. EDGE)

Bernie Abrams
Librascope
833 Sonora Ave.
Glendale, CA 91201-2433
818/502-7443

San Diego Data General Users Group

Chris Thorpe
Delphi Data
2220 Hartford St.
San Diego, CA 92110-2335
619/275-2892

COLORADO

Colorado Data General Users Group (CODGUG)

Bruce Cary
The Association of
Operating Room Nurses
10170 E. Mississippi Ave.
Denver, CO 80231
303/755-6300

CONNECTICUT

Phoenix

Justin Appi
South Central Regional
Water Authority
90 Sargent Drive
New Haven, CT 06511
203/624-6671

FLORIDA

South Florida Data General Users Group

Anthony M. Gentile
Cigna Dental Health, Inc.
P.O. Box 4650
Miami, FL 33269-1650
305/620-9922

IDAHO

Boise Area Users of Data General Equipment (BUDGE)

Dan Homer
Ore-Ida Foods
P.O. Box 10
Boise, ID 83707
208/383-6389

ILLINOIS

Chicago Area Data General Users Group (CADGUG)

Carol Switzer
Adams Hall Room 410
Northern Illinois University
DeKalb, IL 60115
815/753-1455

BUSINESS BASIC UNDER MS-DOS!

ROYALTY FREE

Personal Computer Business BASIC[®]

PCBB is an easy to use product which allows you to convert your existing double and triple precision D.G. Business BASIC applications and data over into a single or multi-user MS-DOS or PC-DOS environment. Binary compatibility allows data and index files to be moved and utilized without modification.

PCBB features include on-line help, debugger, an editor which offers the look and feel of an interpretive environment and Compiler Driver which expedites the process of compiling source code without the creation of batch files. Special features such as support for extended or expanded memory, 128 user channels, allowing labels to be utilized instead of line numbers and a Block Common area that can range in size from 512 bytes to 10K in size are standard. Utilities to maintain Data General compatible screen files, param, logical database and index file structures are also included.

Purchase of **PCBB** includes a royalty-free right to reproduce and distribute executable files.

Write, call or fax now for more information

MAS[®]

MarcAlan Software, Inc.

22096 North Pet Lane
Lincolnshire, Illinois 60069-4113
Voice: 1-800-728-7387
Fax: 1-708-634-9460

PCBB is a registered trademark of MarcAlan Software, Inc. All other product names and logos are trademarks or registered trademarks of their respective owners.
© MarcAlan Software, Inc. 1990

INDIANA
Data General Users
of Indiana
 Nancy Miller
 CIC Enterprises
 4720 Kingsway Drive
 P.O. Box 55647
 Indianapolis, IN 46205
 317/253-1711

KANSAS
Kansas City Area
Users Group
 Tom Duell
 Eagle Software
 P.O. Box 16
 Salina, KS 67402-0016
 913/823-7257

MARYLAND
 (See Washington, D.C., area)

MASSACHUSETTS
Southeastern New England
Users Group
 (See Rhode Island)

MINNESOTA
Minnesota Area Data
General Users Group
 Kerwin Stenzel
 Minnesota Department
 of Health
 717 Delaware Street, S.E.
 Minneapolis, MN 55440
 612/623-5593

MISSISSIPPI
Mississippi Users Group
(MS-DG-UG)
 Thomas Bounds
 Mc Carty Farms
 P.O. Box 366
 Magee, MS 39111
 601/849-3551

MISSOURI
Kansas City Area
Users Group
 (See Kansas)

St. Louis Area Users Group
 David Battleson
 Greenville College

Greenville, IL 62246
 618/664-1840

NEBRASKA
Mid-Plains Users Group
 Joyce Carter
 15024 Brookside Circle
 Omaha, NE 68144
 402/330-3683

NEW YORK
Can-Am (Upstate New York)
 Denise Martin
 Color Forms, Inc.
 340 Wales Ave.
 Tonawanda, NY 14150
 716/693-3899

Central New York
Data General Users Group
 Bob Albanese
 Parsons Child
 & Family Center
 60 Academy Rd
 Albany, NY 12208
 518/426-2600

Metropolitan New York Data
General Users Group
(NYC & NJ)
 Gary Gittleson
 Bobst Group, Inc.
 146 Harrison Ave.
 Roseland, NJ 07068
 201/226-8000

NORTH CAROLINA
Charlotte Area Users Group
 Steve Pounds
 Security Forces
 P.O. Box 36607
 Charlotte, NC 28236
 704/334-4751

Smokey Mountain Users of
Data General Equipment
(SMUDGE)
 Daniel W. Shook
 Wilcox Travel Agency, Inc.
 1705 BB & T Building
 Asheville, NC 28801
 704/254-0746

ASSET REMARKETING CORPORATION



**LOOKING FOR A RELIABLE SOURCE FOR NEW
 AND USED DATA GENERAL EQUIPMENT?**

BUY • SELL • LEASE

We maintain a substantial stock of new and used, thoroughly tested Data General equipment at our facility in Dallas, Texas. In most cases, we can ship the same day.

SPARE PARTS ARE OUR SPECIALTY.

**PROCESSORS • COMMUNICATIONS • CABLES • PRINTERS
 MAGNETIC PERIPHERALS • DISPLAY TERMINALS • ACCESSORIES**

ASSET REMARKETING CORPORATION

4561 South Westmoreland
 Dallas, TX 75237
 800/383-9898
 (214) 330-0404
 FAX: (214) 330-8840

Circle 2 on reader service card.

TEXTBASE™

TEXTBASE/IMG

TextBase/IMG is the integration of a new technologically advanced management system designed to specifically manage free-form text in a relational database management system and a technologically advanced process for scanning, character recognizing, displaying and printing images in an image processing management system into custom text and imaging applications.

- High Speed Text Search
- Thesaurus Searching
- Menu Driven
- Review & Report Features
- Versatile Image Display
- EGA, VGA, Hercules Formats
- Compression ratios range 15:1
- Windows 3.0 Compatible

TextBase Imaging Corp.

901 Dover Drive, Suite 242, Newport Beach, CA 92660
 (714) 722-9648 FAX: (714) 722-6927



TextBase runs on the DG MV and DEC VMS series of computers.
 TextBase is a trademark of TBI. Windows is a trademark of Microsoft Corporation.

Circle 44 on reader service card.

OHIO
NODGBS (Northern Ohio Data General Business and Science)
 Tim Boyer
 P. O. Box 951
 Warren, OH 44482
 216/898-2711

Tri-State Area Data General Users Group
 James Linville
 High Industries
 P.O. Box 10008
 Lancaster, PA 17605
 717/293-4444

TEXAS
Heart of Texas Data General Users Group
 Ramona Brown
 City of San Marcos
 630 E. Hopkins St.
 San Marcos, TX 78666
 512/353-4444

Betsy Koeler
 Medeco Security Locks
 P.O. Box 3075
 Salem, VA 24153
 703/380-5000

OKLAHOMA
Oklahoma Data General Users Group
 Stan Pedzinski
 Oklahoma Blood Institute
 1001 N. Lincoln Blvd.
 Oklahoma City, OK 73104
 405/232-0670

RHODE ISLAND
Southeastern New England Users Group
 Richard Wind
 Southshore Packing
 P.O. Box 4150
 Brockton, MA 02403
 508/587-6900

Dallas Area Users Group
 Marco Fehlbaum
 Fannie Mae
 13455 Noel Rd
 Dallas, TX 75240
 214/770-7555

WASHINGTON, DC & MARYLAND
Potomac Users of Data General Equipment (PUDGE)
 Jess Brown
 P. O. Box 305
 Bowie, MD 20715 - 0765
 301/390-6331

PENNSYLVANIA
Pittsburgh Area Users Group
 Ronald D. Rabatin
 A.J. Turchetta & Assoc.
 150 Robins Station Rd., #10
 N. Huntingdon, PA
 15642-2074
 412/864-9333

SOUTH CAROLINA
Southeast Area Regional Interest Group (SEARIG)
 Steve Handlos
 Productivity Systems
 P.O. Box 1931
 Summerville, SC 29484-1931
 803/851-6577

Houston Area Data General Users Group (HADGUG)
 Shelly O'Neal
 Stewart & Stevenson
 8787 East Freeway
 Houston, TX 77029
 713/671-6332

WISCONSIN (WISRIG)
Milwaukee Area Users Group
 Linda Klatt
 Time Insurance Co.
 P.O. Box 3050
 501 W. Michigan Ave.
 Milwaukee, WI 53201-3050
 414/299-6053

VIRGINIA
Southwest Virginia Data General Users Group

STOP

And let us
quote on your next DG
equipment purchase or sale.

Guaranteed Lowest Prices.

- Quality Equipment
- Guaranteed Maintenance
- 30 Day Warranty
- Buy—Sell—Rent

Your New Formula for Savings:

$$\frac{(MD+VA+DC) + (NC+MA)}{DDS} = Q\$$$

The Solution -

QUALITY Service and \$SAVINGS
on your Data General hardware maintenance.

Design Data Systems has offices servicing Maryland, Virginia, Washington, DC, North Carolina and Massachusetts. We maintain a complete line of MV Systems.

Take a Break from High Maintenance Costs - Call DDS Today!

	Corporate	(301) 424-7870
	Raleigh/Charlotte	(919) 954-9330
	Boston	(617) 878-4511

EQUIPMENT RESOURCES

A Division of Dyna-Med, Inc.

(813) 867-3210

Fax # (813) 864-1670

403 1st Avenue South, Tierra Verde, FL 33715

Circle 49 on reader service card.

Circle 19 on reader service card.

CANADA

Ontario (see Can-Am RIG under New York)

Quebec Area 17 (QUADGUG)

Tod Rich
Institute of Canadian Bankers
1981 McGill College Ave., #675
Montreal, Quebec H3A 2X2
Canada
514/282-9480 ext. 206

International Groups

Australia

Nick Southcombe
The Hoyts Corporation
GPO Box 110
Sydney, NSW 2001
02/261-7777

Belgium

Stany van den Bossde

Data General SA
191, Boulevard de Souverain
Bte. 11
B-1160 Brussels
Belgium

Germany

Data General Anwendervereinigung (DGAV)
Dr. Wolfgang A. Slaby
Kath. Universitat Eichstatt
Ostenstrabe 24
D-8078 Eichstatt
Germany

Holland

Mrs. C. deVries
DG Nederland BV
Postbus 23080
1100 DN Amsterdam
Holland

Finland

Leevi Raasina
Data General OY
Nihtisillantie 3D

P.O. Box 61
SF 02631 Espoo 63
Finland

Mexico

Victor M. Ramirez
Data General Cypensa
Eje Central No. 2
Mezannine
Torre Latinoamerican
06007 DF
Mexico
905/512-9866

Japan

Shinichi Noda
Nippon
4-3-13, Toranomon, Minatoku
Tokyo 105
Japan

Portugal

A. Sendin A. Bras Gomes
Cassel Data Computadors
Esistemas, Lda., Lisbon-Sintra

Casal Do Garoto-Estrada
P.O. Box 100
Amadora
Portugal

Singapore

Kam Fai Lee
Data General Singapore
141 Market St.
05-00 Harapan Bldg.
0104 Singapore

Sweden

Kjell Nyhlen
Data General AB
Box 28
164 93 KISTA
Sweden

United Kingdom

Sheila O'Reilly
DGUA Administrator
14 Thistleworth Close
Isleworth
Middlesex, TW7 4QQ
United Kingdom

△

REMINDER

If you want to use
your PC
as a DG terminal -
**@Con/PC is still
your best choice.**

Complete D210 through D411
terminal emulation

Still only \$99 & \$149*

*Includes fast, error-free file transfer
(with software for MV),
and script language (macros).

Network licenses and volume
discounts available.



Flying Point Sales
516-725-3622
20 Collingswood Dr.
Sag Harbor, NY 11963

"Top Ten Utility"
-- Randy Berndt, DG Review

Circle 24 on reader service card.

FOR ALL YOUR HARDWARE NEEDS
CALL

ELLEN MOORE

MORE COMPUTERS, INC
869 SAVAGE RD.
BELLEVILLE, MI 48111
FAX# (313)699-4161

(313) 699-0259

FOR ALL YOUR HARDWARE NEEDS
CALL

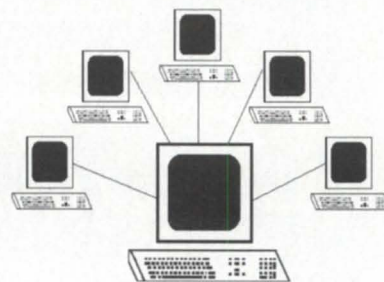
ELLEN MOORE

MORE COMPUTERS, INC
869 SAVAGE RD.
BELLEVILLE, MI 48111
FAX# (313)699-4161

(313) 699-0259

Circle 30 on reader service card.

Turn on Eight
terminals with
just one!



With MultiView Windows
and just one console line
you can have the equivalent
of eight terminals.

DEMO ONLY \$49



DIGITAL
DYNAMICS INC.

3055 Plymouth Road, Ann Arbor, MI 48105
(313) 995-2400 FAX (313) 995-3232

Circle 21 on reader service card.



Computer
Engineering
International

2231 Star Court
P.O. Box 81755
Rochester, MI 48308
MI Phone: 313-853-0770
FAX: 313-853-0775

WORLD WIDE



Providing intelligent solutions and personalized service around the globe.

Call

800-462-2344

New & Refurbished DG Hardware
Compatible Peripherals
Depot Repair Service

WORLD WISE



The latest products for DG systems

SoftPC links MS-DOS and Unix

Westboro—With SoftPC, Aviion users have full functionality in the DG/UX environment, supported by thousands of popular, shrink-wrapped MS-DOS applications, as well as the full Unix applications spectrum.

SoftPC provides a virtual PC environment allowing users to run MS-DOS applications on Data General Aviion systems. MS-DOS and Unix applications can run simultaneously and cooperatively on the same computer. For occasional MS-DOS users, SoftPC integrates the PC operating system within the DG/UX multitasking environment, allowing access to the DG/UX for Aviion file system and virtual terminal integration.

Customers with a current support contract for OpenPC (either SSS or Support/Plus) as of May 1 will receive SoftPC at no charge. Customers without a support contract may purchase an upgrade. Upgrade prices range from \$280 to \$1,120, while first-time user licenses range from \$695 to \$2,495.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4087.

Circle 50 on reader service card.

Netware v3.11 for Dasher PCs certified by Novell

Westboro—Netware v3.11 packaged servers for Data General Dasher PCs have been certified by Novell, Inc.

Novell's flagship Netware product, v3.11, provides dedicated file/print services for MS-DOS, Windows 3.0, and OS/2 PCs, and supports Apple Macintosh systems through an optional Netware loadable module (NLM).

The announcement from Data General Corp. is part of an open LAN (local area network) strategy of integrating PCs and workstations with dedicated and multi-function servers. Sophisticated networks are available for users to share applications and SQL data base services.

A variety of packaged Netware v3.11 servers are offered. An entry-level configuration providing a 20-user license on a 386-based desktop CPU is priced at \$10,995. A high-end configuration is priced at \$19,795, providing a 100-user license on a 486-based system.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4087.

Circle 51 on reader service card.

Trade up, Aviion users

Acton, MA—Signal Computer Products offers Data General users a "Trade In, Trade Up" program for their Aviion workstation and server memory requirements.

Users now can enhance Aviion performance by trading in a Data General 4 MB memory module and applying a \$500 credit toward a Signal AVRAM 16 MB module. The add-in upgrades offer hard-

ware and software compatibility with the Aviion family and the DG/UX operating system. The boards are backed by a lifetime warranty and the Signal Hot Spare Policy, which provides a replacement board in 24 hours. AVRAM modules are also available for Data General service. Volume, OEM, and university discounts are available.

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

Circle 57 on reader service card.

Portable modems, small footprint

Norwood, MA—With a footprint the size of an index card, 7-oz. Microporte V.42bis portable modems from Microcom, Inc., fit easily into attache or laptop cases and feature a number of performance enhancements.

The two Microporte modems—the Microporte 1042 and 542—connect to any computer platform. Features include V.42 error correction and V.42bis data compression, and a number of accessories: batteries, cables, and an optional travel kit. The package also features Microcom's Carbon Copy Plus remote control/file transfer software.

The 1042 model provides dial-up communications of the Public Switched Telephone Network or cellular links. The combination of V.42bis data compression and Microcom Turbo Mode delivers through-

Wild Hare Announces More "Know Knows for the 90s"

- ✓ Know complete compatibility.
- ✓ Know increased productivity.
- ✓ Know new market accessibility.
- ✓ Know greater profitability.

Nobody "knows it all," but when it comes to your hardware and software investment, ignorance isn't exactly bliss.

And that's why *Choice!*[™] - our full-featured ICOBOL run-time system - is so important. *Choice!* protects your software and hardware investment by supporting just about every platform. Like DOS, OS/2, UNIX, XENIX, AIX, VAX/VMS, AOS/VS, PC Networks, Macintosh, AViiON and more. And as you may already know, that kind of compatibility yields one other thing: increased profitability.

Then there's *Axis*, our performance-tuned ICOBOL compiler. *Axis* is packed with features like windows, menus, input time-outs, environment variables, screen attributes, and color support. And portability that will take you just about anywhere you want to go — including under Data General's own ICOBOL run-time system.

Individually or together, we guarantee that *Choice!* and *Axis* will give you the know-how to go as far as you want to. To know more call (303)442-0324.

We're Wild Hare.

We're behind you all the way.

Wild Hare Computer Systems, Inc.
P.O. Box 3581 Boulder, CO 80307-3581 U.S.A.
TEL: (303) 442-0324 FAX: (303) 440-7916



wild hare
COMPUTER SYSTEMS INC.

puts exceeding 12,000 bps.

The 542 model delivers up to 9,600 bps using V.42bis 4:1 data compression. It runs on a 9V battery and provides 1.5 hours of connect time.

Available 30 days ARO, the Microporte 1042 is priced at \$649. The 542 retails for \$449.

Microcom, Inc., 500 River Ridge Drive, Norwood, MA 02062-5028; 617/551-1000.

Circle 55 on reader service card.

New DG laser printers, video terminals

Westboro—Data General's three new desktop laser printers provide 16-pages-per-minute capability in a variety of font styles. Intended for small and mid-size workgroup applications, the 6771, 6772, and 6773 models print 300 x 300 dpi text/graphics output in landscape and portrait modes on various sizes of paper, envelopes, labels, and heavy stock.

The 6771 is equipped with 512 KB of memory, 14 internal fonts, and 24 symbol sets. The 6772 offers a built-in, 35-font Adobe Postscript controller and 1.5 MB of memory. Model 6773 features a built-in, 17-font Postscript controller and 1.5 MB of memory. All three printers offer Centronics parallel interface, 250-sheet input paper cassette, a face-down output tray, and comprehensive LCD control panel. They emulate fully the H/P Laserjet Series II, working with Data General applications and all major third-party software.

Printer models 6771, 6772, and 6773 are supported by the Eclipse MV family and Aviiion systems, as well as Dasher workstations.

A new line of DG monochrome display terminals offers new enhancements. The new D217 and D413 sport a modern, more ergonomic look, new grey color, and a smaller footprint. The 14-inch display screens (in green or amber phosphors) are more flicker-free and offer improved system diagnostics, local printer support,

screen saver features, special symbols, and 14 international languages. Dual porting allows interfacing to two separate host systems. There is enhanced emulations support, including DG-Unix, for use with DG's MV and Aviiion systems. They are also backwards compatible with Dasher D200/D400 terminals, and fully supported by popular software packages such as CEO and Wordperfect.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4087.

Circle 52 on reader service card.

Insurance RISC

Westboro—Showing its continued commitment to healthcare and insurance-related markets, Data General Corporation announced the immediate availability of seven insurance software products for the Aviiion RISC-based computer systems:

- Independence Technologies, Inc.—an on-line, transaction-based distributed processing system for health insurance

INDOCOMP

L-BUS SOLUTIONS

Indocomp boards for your MV/1400, MV/2000, MV/2500, or DS/7500 computers

- VME bus adapter
- DRV-11 interface
- Voice processing
- SCSI controller
- Industrial I/O
- Co-processor boards

Custom boards available for your application.

INDOCOMP SYSTEMS, INC.
P.O. Box 157
Drayton Plains, MI 48020
Phone: (313) 666-9715
Fax: (313) 666-1001

Circle 25 on reader service card.

IT'S NOT JUST FOR COBOL ANYMORE!

SCREEN DEMON supports AOS/VS 32-bit languages such as PL/1, C, B32 and others.

SCREEN DEMON may be added to most existing AOS/VS 32-bit programs, including SED, CL132, and CEO.

- Faster screen display
- View the screen and enter data on a remote terminal
- Powerful window functions

C-thru provides Screen Demon compatible features for ICObol and MicroFocus COBOL on AViiON systems.

Threshold, Inc.
(205) 821-0075
Fax (205) 821-0122

DEMON

Circle 45 on reader service card.

The North American Data General Users Group is an incredible resource when you need answers.

*So, don't go it alone - join **NADGUG** today!*

and managed care markets.

- NRM Computer Systems, Inc.—a fully integrated health claims processing and risk management system with document image control.
- Harte Systems—the Insurance Agency Management System (IAMS), designed to meet needs of large insurance brokers and agents.
- I.E.P., Inc.—geographic information systems to monitor flood and ground hazard exposure in insurance communities.
- Resource Information Management Systems—Quickclaim/2, a comprehensive health claims and employee benefits administration system.
- A & S Consultants—a comprehensive risk management software, "Risk-watch," targeted to *Fortune* 1000 companies considering in-house administration.
- Advanced Interactive Systems—Advanced Life, an individual life insurance administration system for the home office.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4087.

Circle 53 on reader service card.

Message handling on Aviion servers

Westboro—Data General and Action Technologies will extend Message Handling Service (MHS) to Unix platforms, starting with Aviion servers. Action Technologies' strategy is to port its pioneering MHS to Unix and other non-DOS platforms.

MHS is the messaging engine for electronic mail and other messaging-based applications that run on Novell's Netware local area networks (LANs). By extending MHS to Aviion, the Aviion servers for Data General Open Systems Office/pc.DAA (OSO/pc.DAA) can provide MHS messaging services that will allow communication among OSO/pc.DAA installations, and between Aviion servers and PC-based applications.

Until now, MHS has run only on PCs. Porting MHS to Aviion systems will eliminate the need for Aviion customers to buy a PC in order to run MHS. Messaging is an important element of Data General's new OSO/pc.DAA and MHS provides a fun-



The Computer Specialist

SYSTEMS EXPRESS LIMITED

For European Users:

Why buy Data General equipment 5,000 Kilometers away?
EEC Based Data General Sales Specialists

- Prices will be better from us !
- Delivery will be faster from us !
- Power specifications will be the same from us !
- No import duty from us* !
- No export licence needed from us* !
(*ECC countries)

We will be happy to quote for and supply:

MV55 and MV95 upgrade boards - the latest Data General MV technology, featuring an MV family CPU on a 5 MIPS single-chip board.

MV 18,000 Range	MV 10,000	MV 2,500	MV 1,400
MV 15,000 Range	MV 7,800XP	MV 2,000	MV 1,000

Spares for all your Old Eclipse/Nova/Micronova Systems.

Full range of AViiON and 386 UNIX machines, workstations and the PLUS-type, AViiON-compatible terminals with twin-host working.

Data General Compatible equipment.
Fujitsu, Dataram, Kennedy, MegaTape, Zetaco

THE BEST SUPPLIER FOR THE NEW EUROPE !

Systems House, Rear of 23/29 Daws Lane
Mill Hill, London NW7 4SD
Tel: 44-081-906-8191
FAX: 44-081-906-8638
Telex: 8954111 Replay G

Circle 43 on reader service card.

SYSGEN DATA Ltd. MARKETING

Data General COMPUTERS & PERIPHERALS WORLDWIDE

MV 15000 MOD 10, 8MB	\$13,750	IAC 8-2	\$950
MV 15000 Floating Pt.	2,850	TCB-8 and 16	200
MV 2000 4MB, Flpy	2,500	MCP 1 w/TCB	1,200
MV 20000 Model 2 Upgrade	14,750	LAC 12	800
MV 15000 MOD 20	18,500	DG 70MB Drive (2000 Format)	400
MV 4000 CPU 0 MB	500	DG 160 MB Disk	1,500
Genicom 3320/3318 Printers	250	4327 B300	600
6239 S/S 592MB	3,500	4364 B600	1,950
4307H Tape Drive	3,500	LB 615 Printer (New)	3,250
6299 Tape Drive S/S	6,500	32 MV Memory (MV 20000 Style)	17,000
322MB S/S	CALL	6236 S/S...1,250 D210	150
WIOC (MV 10000)	1,500	D460.....215 D410	195
LAN BOARD (15000 Style)	2,750	D411.....225 D211	175
LAN BOARD (2000 Style)	750	D214.....175 D215	225
MV 4 & 10 Memory 2MB	450	D216 New.....365 D400	75
MV 4 & 10 Memory 4MB	1,500	MV 2000 4MB Memory	1,350
MV 4 & 10 Memory 8MB	3,150	DG 16MB Mem..6,500 Dataram 16MB Mem.3,500	
IAC 16 (RS 232)	1,350	8MB Memory MV 20000 Style	1,500
IAC 16 (RS 422)	1,200	DG 6321 Printer w/ Sheet Feeder	350

SYSGEN SPECIAL DG 6321 Printer

.....\$350	MV 20000 MOD II Board ..	\$14,750
Motorola Delta 3000	Motorola Delta 8000	CALL

DATARAM
AUTHORIZED DISTRIBUTOR

BUY • SELL • TRADE • LEASE

PRICING SUBJECT TO CHANGE WITHOUT NOTICE
ALL EQUIPMENT SOLD IS WARRANTED FOR 30 DAYS

Authorized
WordPerfect
Motorola VAR

12 ELKLAND ROAD, MELVILLE, NY 11747 (516)491-1100 fax: (516)491-1559

damental building block for the sophisticated office platform.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4057.

Circle 54 on reader service card.

Data compression installed easily on Exabyte drives

Playa del Rey, CA—Peripheral Vision Corporation announces the TR-1 data compression module for Exabyte tape drives. Designed specifically for the EXB-8200 and EXB-8500 8 mm tape drives from Exabyte, the TR-1 can be installed on any 8 mm Exabyte in less than one minute.

The TR-1 is a redesigned and enhanced version of the 4Sight data compression module, introduced by Peripheral Vision in May 1990.

Through the use of advanced CMOS

VLSI and double-sided, surface-mount technologies, the TR-1 is a 5.3-inch by 2.7-inch printed circuit card that attaches directly to the rear of Exabyte tape drives by way of a patented SCSI interconnector. Because the TR-1 requires less than a half-inch of space at the rear of an 8 mm tape drive, it can be installed in virtually any existing cabinet or enclosure. The TR-1 requires no additional power and no changes to existing cabling.

Incorporating a high-performance, 16-bit microprocessor, the TR-1 data compression engine operates at a 40 MHz clock rate. Data is compressed at speeds averaging greater than one megabyte per second. Dual SCSI interfaces move data to and between the host computer and the Exabyte tape drive. Also provided is a 256 KB cache buffer of 80-nanosecond DRAM, and a 32 KB compression buffer of 45-nanosecond SRAM.

Operating transparently on any Exabyte tape drive, data is compressed and decompressed automatically without operator intervention. The TR-1 also automati-

cally recognizes both compressed and uncompressed data formats and adapts accordingly. Data compression can be turned off through the use of simple standard operating system commands that can be entered at the user's console or in a batch file. This allows the creation of ANSI-standard uncompressed tapes for data interchange.

TR-1 compression ratios average greater than 3:1, and in some applications, compression ratios of 5:1 or more can be achieved. Tape drive performance improvements equal to the compression ratio may be realized if the host computer is capable of transferring data at the increased data rate.

TR-1 data compression modules are available now at an end-user quantity-one price of \$895. Quantity discounts, VAR, and OEM pricing are also offered.

Peripheral Vision Corporation, 7712 Paseo del Rey, Playa del Rey, CA 90293; 213/574-1144. Δ

Circle 56 on reader service card.

PereLine 3.0
IBM PC Terminal Emulation
for D210-D410 Terminals



ONLY!

\$49⁹⁵

Try it!
30 Day Money Back Guarantee

Features:

- ★ Display 132 Columns
- ★ Connect Directly or via Modem
- ★ Full Screen Editor
- ★ File Transfer in Background
- ★ Also Includes
DEC, IBM & Compuserve

1(800) 359-6612

(9:00am to 5:00pm PST)

PereLine Data Systems, Inc.
750 Camden Ave. Suite B
Campbell, Calif. 95008

Circle 31 on reader service card.

WHO?
WHAT?
WHEN?
WHERE?
WHY?

:PERFMR

can help you find the answers to these and other questions about your configuration.

Includes a logging facility with report generator, real-time monitoring screen, file and directory structure analysis utilities and a tutorial on AOS/VS and AOS/VS II system performance analysis.

Any questions?

AOS/VS :PERFMR	\$750
AOS/VS II :PERFMR	\$750
10-DAY TRIAL COPY	FREE!

A Division of B.J. Inc.

:SYSMGR

Software for System Managers

109 Minna St., Suite 215, San Francisco, CA 94105
(415) 550-1454 FAX (415) 550-1072

Circle 42 on reader service card.

DG & MOTOROLA
BUY • SELL • LEASE

<p>CPU</p> <p>MV/15000, 20000 MV/10000 MV/8000 MV/7800 MV/4000, 4000DC MV/2000 NOVA 4-C, S/20 S/140, S/280, C350</p> <p>MEMORY for all MV & ECLIPSE for all NOVA & MICRO</p> <p>PRINTERS 4320 55CPS LQ GENICOM 3318 Data Prod B300, B600 OKIDATA 192, 292 HP LASER JET</p> <p>DESKTOP DG/10, 20, 30 PKG DISK UPGRADES USAM-4, USAM -1 CARTRIDGE TAPE MEMORY</p>	<p>COMMUNICATIONS</p> <p>IAC-8, IAC-16 TCBs COM BASIC I/O ATI-16, AMI-8 ALM-8, ALM-16 MCP-1 W/TCB</p> <p>DISK / TAPE 354, 592 MB 96, 192 MB 73, 147 MB 10, 12.5, 20, 25 MB 6231 CART N/E 6026, 6123, 6125 6299, 6300, 6021</p> <p>CRT'S 6053, D-100, D-200 D-210, 211, 410, 460 D-214, 215, 411, 461 D-216, 412, 462, 470</p> <p>COMPATIBLES ZETACO CDC FUJITSU SCIP DATARAM STC</p>
---	--

SPECIAL | MOTOROLA UNIX
★ ★ ★ ★ | COMPUTER SYSTEMS

AMES SCIENCES, INC.

1787 Chancellor Point Rd., Trappe, MD 21673
(301) 476-3200 • Fax 301-476-3396

Circle 1 on reader service card.

FOCUS

The Magazine of the North American Data General Users Group

Do you need information, **today**, about products or services advertised in this issue?
Focus Magazine makes it easy!

1. Copy this page, or cut it out.
2. Find the ad you're interested in (the ad index is located on the following page).
Focus has requested that advertisers include their fax number in their ads. Write it down.
3. Fill in the information about you and your company.
4. Add any comments about the specifics of your request.
5. Then FAX it directly to the company. You'll receive the information you need fast!

Advertiser's company name: _____

Advertiser's FAX number: _____

I am looking for the following information: _____

Your name: _____

Your company's name: _____

Your fax number: _____

Your phone number: _____

**AD
D
F
A
X**

*Now wasn't that easy?
You'll be excited about the quick response you'll get to your request!*

ADVERTISER!
This is a hot lead from *Focus Magazine*. Please give this prospect your immediate attention!

Ad INDEX

Company	PG#	RS#	Company	PG#	RS#
Ames Sciences, Inc.	48	1	More Computers, Inc.	42	30
Asset Remarketing Corporation	40	2	NADGUG	33	-
B32 Software (US), Inc.	30	3	NADGUG	46	-
BL Associates Peripheral Division	13	4	PereLine Data Systems	48	31
Cantel Computer Services, Ltd.	C3	5	Peripheral Vision Corporation	27	32
Clafin & Clayton	18	6	Rational Data Systems	11	33
Clearpoint Research Corporation	C4	7	RAVE Computer Association	5	34
Compuplan International, Inc.	51	-	Rhintek, Inc.	15	35
Computer Engineering International	43	8	SCIP	20	36
Computer Maintenance Corporation	29	9	Security Computer Sales	8	37
Computer Marketplace	51	-	Shalless Software Pty. Ltd.	29	38
Computer Wholesalers	32	10	Signal Computer Products	3	39
Concept Automation, Inc.	27	11	Sysgen Data Ltd.	47	40
Cyberscience Corporation	C2	12	:SYSMGR, a division of B.J. Inc.	32	41
Data Assurance Corporation	25	13	:SYSMGR, a division of B.J. Inc.	48	42
Data Bank Associates, Inc.	14	14	:SYSMGR Bulletin Board	51	-
Data General Corporation	7	16	Systems Express Limited	47	43
Data General Corporation	9	15	TextBase Imaging Corp.	40	44
Data General Corporation	23	17	Threshold, Inc.	46	45
DataLynx	36	18	Wild Hare Computer Systems, Inc.	45	46
Design Data Systems	41	19	WordPerfect Corporation	1	47
Digital Data Systems	21	20	Zetaco	17	48
Digital Dynamics	42	21			
Dyna-Med, Inc.	41	49			
Eagle Software, Inc.	19	22			
Eagle Software, Inc.	51	-			
Fast Track Systems, Inc.	37	23			
Flying Point Software	42	24			
Indocomp Systems, Inc.	46	25			
International Computing Systems	31	26			
Interscience Computer Corporation	35	27			
MarcAlan Software, Inc.	39	28			
McIntyre's Mini-Computer Sales Group, Inc.	30	29			
Minitab Statistical Software	51	-			

PRODUCTS AND SERVICES

Company	PG#	RS#
Data General Corporation	44	50
Data General Corporation	44	51
Data General Corporation	46	52
Data General Corporation	46	53
Data General Corporation	47	54
Microcom, Inc.	46	55
Peripheral Vision Corporation	48	56
Signal Computer Products, Inc.	44	57

ON-LINE HELP

Who to call for answers about NADGUG and FOCUS

NADGUG

Membership, RIGs, SIGs

NADGUG staff 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:

c/o Turnkey Publishing, Inc.
Livingston Building, Suite 250
3420 Executive Center Dr.
Austin, TX 78731
FAX: 512/343-7633

FOCUS Magazine

512/345-5316

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

Information about advertising Michelle Sentenne

FOCUS back issues Turnkey Publishing staff

MISCELLANEOUS

OPPORTUNITY!

Focus magazine is seeking individuals interested in writing product reviews, and technical or feature articles. You won't get rich writing for *Focus*, but you will be rewarded by having your name and article in front of the most active and influential group of Data General equipment users. If you would like to discuss your ideas with the editor, or would like to receive a copy of our editorial schedule and writer's guidelines, please call Robin Perry at 512/345-5316 (phone) or 512/343-7633 (fax).

SOFTWARE

Statistical Software

- Powerful
- Fast
- Easy-to-use
- Inexpensive

MINITAB 
 STATISTICAL SOFTWARE
 3081 Enterprise Dr., State College, PA 16801
814-238-3280

SERVICES

EAGLE SOFTWARE
 Can Help You With

- INFOS File Reconstruction
- Disk Recovery Services
- INFOS to UNIX Conversions
- Application Development
- Performance Consulting



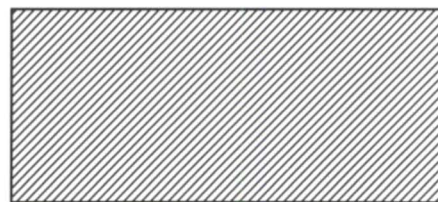
CALL TODAY!
1-800-477-5432

169 EAST CLOUD • P. O. BOX 16
 SALINA, KS • 67402-0016
 Phone: (913) 823-7257 • FAX: (913) 823-6185

NADGUG Software Library tapes now available for the cost of the tape!

NADGUG's software library gives you access to dozens of useful programs and macros! If you have wanted a copy of NADGUG's software library and just haven't gotten around to sending in your tape, here's a deal for you! NADGUG is now offering to its members software library tapes for a \$30 charge (plus shipping), which covers the cost of the tape. VISA, MasterCard, American Express accepted. We will also bill your company. Call today or fax your order!

1-800-USR-GRUP 512/345-5316 (Outside U.S.) FAX: 512/343-7633



EQUIPMENT

IBM RISC / 6000™

**New & Used
 CALL THE LEADER**

CALL TODAY!

(714) 735-2102 Dave Roekle

(702) 782-5208 Mike Nelson

**COMPUTER™
 MARKETPLACE**

205 East 5th Street
 Corona, CA 91719
 Fax (714) 735-5717

RISC/6000 is a Registered Trademark of International Business Machines, Inc.

- MACHINES
 - FEATURES
 - UPGRADES
 - MEMORY
 - DISK DRIVES
 - PARTS
 - ADD-ON'S
 - MAINTENANCE PARTS
- 7010-7012-7013
 7015-7016**



We Do D.G.!
**Small Ad
 BIG Savings!**

Compuplan

1-800-228-8889
 Texas or Nationally

DIAL-UP BULLETIN BOARDS

:SYSMGR BBS specializes in file transfer of RDOS and AOS[VS] DUMP files - no messaging facilities. XMODEM, YMODEM, and KERMIT supported. 415/391-6531 (one line), 2400 baud (Micom M 3124 EH), 8 data bits, 1 start /stop bit or 415/550-1454 (voice). System is MV/4000, terminal mode is CHAR/605X.

Data Specific

Water under the bridge

Any lingering doubts over Data General's winning of a contract to supply 6,000 Aviiion servers and workstations to the **United States Geological Survey** were laid to rest officially on May 5 when the **U.S. Supreme Court** let stand a federal appeals court ruling that upheld the awarding of the \$127 million dollar contract. Data General has been shipping Aviiions to USGS offices since last fall.

CEO facelift, freebie

Remember CEO, the revolutionary of-fice tool of the 1980s? If you haven't looked lately, Data General has greatly expanded CEO's functionality. For example, CEO's Object Office rev 3.00, based on **Microsoft Windows 3.0** and **Hewlett Packard's Newwave 3.0**, provides an object-oriented, icon-driven interface with windowing and document management for desktop PCs.

DG is offering free CEO software with the purchase of any Eclipse MV family fifth-generation machine; that includes the MV/3500 DC, MV/5500 DC, MV/9500, and the MV/30000. The deal also includes a 30-user CEO license, CEOWrite word processing license, media, documentation, and At-A-Glance manuals. For the future, DG promises even more enhancements to CEO, add-on products, plus interoperability between CEO users on MVs and Open Systems Office users on Aviiions.

What, me worry?

A survey of 500 Data General systems users indicates that third-party maintenance users are satisfied that they receive the same or better quality service from the vendor as the manufacturer. The respondents also indicated that disaster recovery was equally important to MIS needs as hardware maintenance, yet only a small percentage had an in-house disaster plan. The survey was conducted by California-based **NPA West**.

MV over the sea

A newly installed Data General Eclipse MV/3500 handles reservations for the **Sea Cat Tasmania**, a ferry that operates on the Bass Strait off the Australian Coast, shuttling passengers and cars between Victoria and Tasmania.

The Eclipse's major application is a passenger and booking system using **IBC SpaceTrack** software. Data General's CEO will be fully integrated with the reservation system. Leased lines will connect terminals in cities of the two states.

The Sea Cat Tasmania is a wave-piercing catamaran that carries up to 350 passengers and 84 cars with a cruising speed of 35 knots or 65 km/hour. It is the sister ship of the Hover Speed Great Britain, which recently broke the 40-year-old speed record for the crossing of the Atlantic Ocean by a passenger vehicle. The Sea Cat Tasmania is expected to open new tourism markets in Tasmania.

In print

A May 6 *Computerworld* article on the relationship between DG President **Ron Skates** and Senior Vice President **J. Thomas West** quotes West as saying that "both of us realize that we work better together than we do against each other. We have forged a relationship of trust—the kind that usually happens after going through hell together."

Warranties simplified

DG announces a new, simpler warranty system. Warranties on CPUs and attached peripherals will be standardized, more logical, and easier to understand. VARs (value-added resellers) and end-users will now receive the same equipment warranties. The two warranty codes that appear on the packing list are Code A and Code F.

Warranty Code A provides 90 days of on-site service with next-day response. This warranty applies to all Eclipse MV/family products; Aviiion servers and workstations; printers; disks, tapes, and communication products that go into the above products.

Warranty Code F provides a one-year overnight replacement of parts with ei-

ther customer installation of parts or next-day dispatch of a field engineer, if needed. This warranty applies to PCs; terminals; Walkabout family systems; DG/500; disks, tapes, and communications products that go into the above products.

Aviiion calling

Data General will supply **British Columbia Telephone** in Canada with \$2 million worth of Aviiion workstations. The workstations are part of the utility's Operation Workstation project, which replaces random application terminals on test engineers' desks with a single workstation.

With one month to prepare its offer, Data General came out ahead of 14 competing firms. Data General products were chosen on the basis of adherence to standards, performance, and DG/UX operating system strengths and support. Δ

User notes

Comeback attempt

Phoenix, the regional interest group for DG users in Connecticut, like its namesake, will attempt to rise from the ashes. **Justin Appi**, manager of information systems for the **South Central Regional Water Authority** in New Haven, is leading the group's comeback attempt. If you are interested in helping Phoenix fly again, please contact Appi at 203/624-6671.

Heard in Houston

Shelly O'Neal has taken over leadership of **HADGUG (Houston Area DG Users Group)**. She can be reached at Stewart & Stevenson, 713/671-6332. Former HADGUG president **Jeff Campbell** resigned upon being hired as a National Systems Support (NSS) Consultant by Data General. (Yes, DG is hiring!) Δ

No 1 DURING '91

CANTEL COMPUTERS HAVE THE WORLD'S LARGEST STOCKS OF NEW & USED EQUIPMENT AVAILABLE. CALL YOUR LARGEST INDEPENDENT DATA GENERAL HARDWARE DISTRIBUTOR AND SUPPORT SERVICE IN EUROPE FOR THE BEST POSSIBLE PRICE & SERVICE.

**ANY D.G. HARDWARE SUPPLIED
AND SERVICED FROM EARLY NOVA'S
TO MV40000. CALL NOW!**

EXPRESS DELIVERY WORLDWIDE

THE FIRST U.K. INDEPENDENT DISTRIBUTOR TO:-

SELL AND MAINTAIN AVIION'S
SELL AND MAINTAIN MV15000/20
SELL AND MAINTAIN MV15000/10
SELL AND MAINTAIN MV15000/8
SELL AND MAINTAIN MV9500
SELL AND MAINTAIN MV7800XP
SELL AND MAINTAIN MV2500
SELL AND MAINTAIN MV2000
SELL AND MAINTAIN MV1000
SELL AND MAINTAIN DG500



CANTEL COMPUTER SERVICES LTD.

BRUNEL DRIVE, NEWARK, NOTTS, ENGLAND
TEL: 44 636 701830. FAX: 44 636 605255

LOMBARD BUSINESS PARK, PURLEY WAY, CROYDON, ENGLAND
TEL: 44 81 684 1978. FAX: 44 81 683 1453

AVIION, NOVA & MV ARE TRADE MARKS OF DATA GENERAL CORPORATION

BUY, SELL, RENT, TRADE, SERVICE

Circle 5 on reader service card.

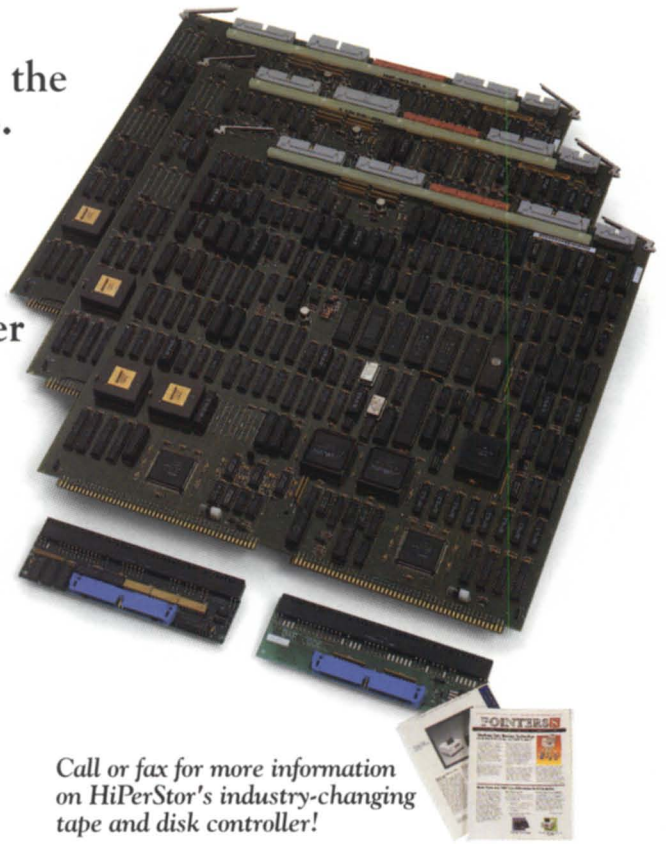
**CALL CANTEL
NOW**

The I/O Solution of the 90s from **HiPerStor**™

High Performance Storage Solutions for the MV Family

Take advantage of unprecedented performance options with the DGMS-SC family of tape and disk controller subsystems:


1. High-performance dual BMC/dual SCSI-2 tape and disk subsystems
2. 500+ I/Os per second, over 2x the performance of DG's R.A.M.S. (DG's highest performance subsystem)
3. Supports 14 SCSI disk and/or tape devices from one controller
4. Each SCSI bus can be configured to support single-ended or differential devices
5. Data General R.A.M.S. and CSS emulation including hardware mirroring (RAID 1)



HiPerStor's design team, with over a century of peripheral experience, has just re-written the book on MV family subsystem performance.

Call or fax for more information on HiPerStor's industry-changing tape and disk controller!

HiPerStor™

HiPerStor is a wholly-owned subsidiary of  Clearpoint

HiPerStor/Clearpoint™
35 Parkwood Drive
Hopkinton, MA 01748
(508) 435-2000
1-800-CLEARPT
FAX: (508) 435-7530

High Performance Storage Solutions

Clearpoint is a registered trademark of Clearpoint Research Corporation.
MV, BMC, R.A.M.S., CSS, and DG are trademarks of Data General Corporation.
HiPerStor is a trademark of Clearpoint Research Corporation.

Circle 7 on reader service card.