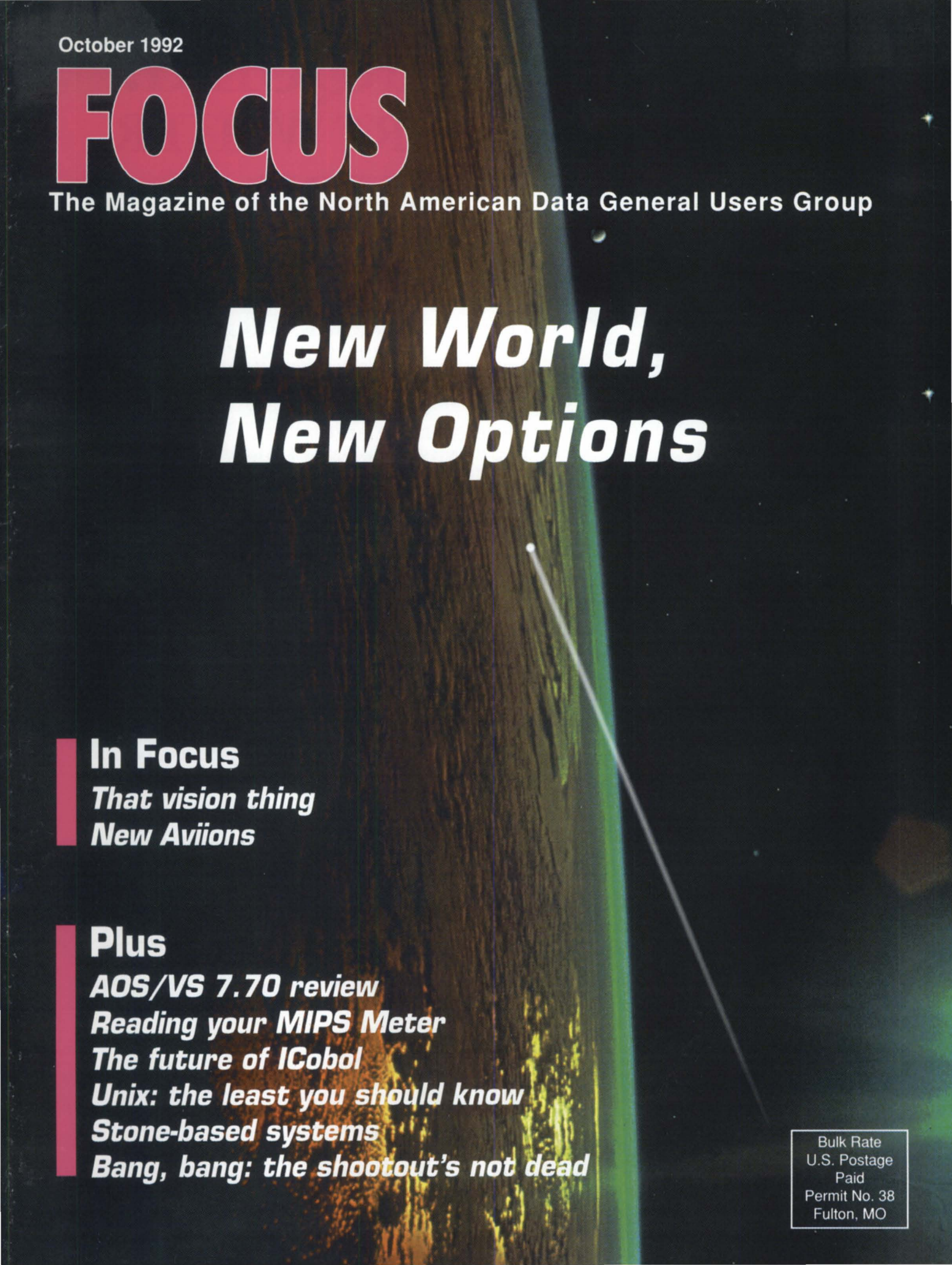
October 1992

FOCUS

The Magazine of the North American Data General Users Group



New World, New Options

In Focus

That vision thing
New Aviions

Plus

AOS/VS 7.70 review
Reading your MIPS Meter
The future of ICobol
Unix: the least you should know
Stone-based systems
Bang, bang: the shootout's not dead

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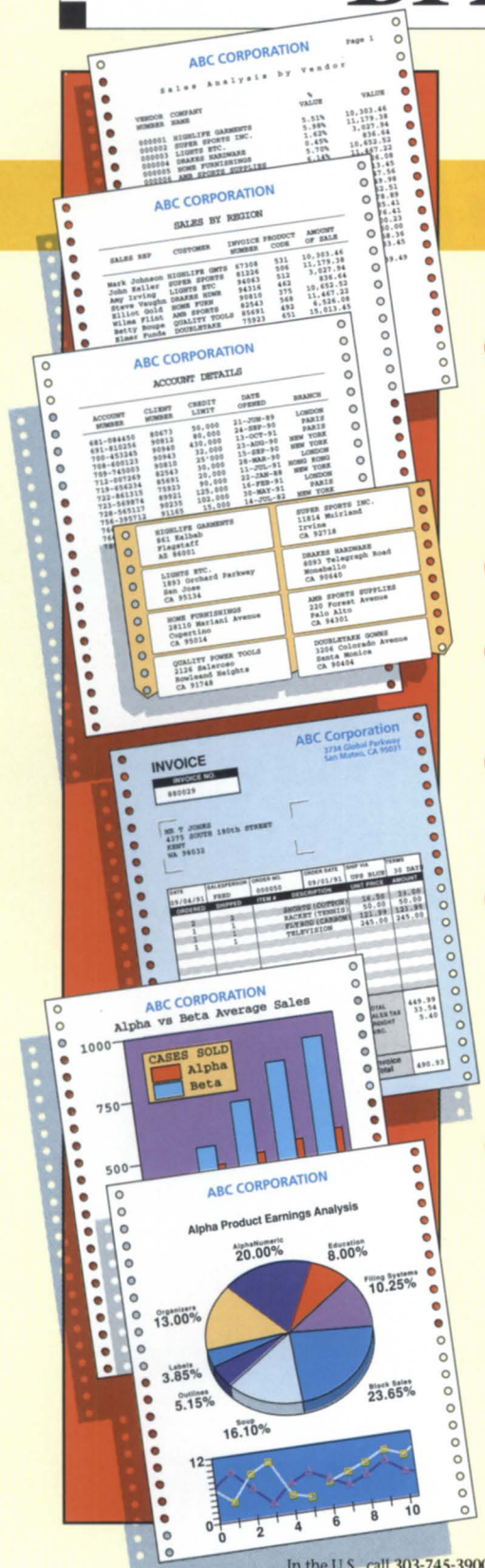

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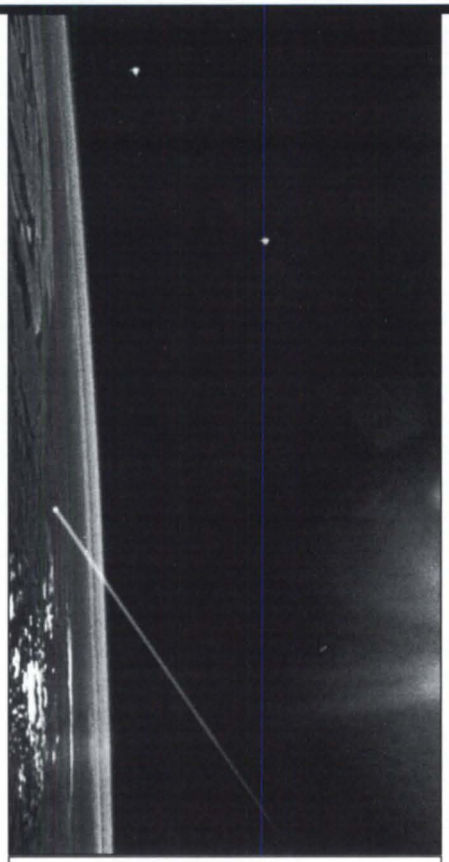

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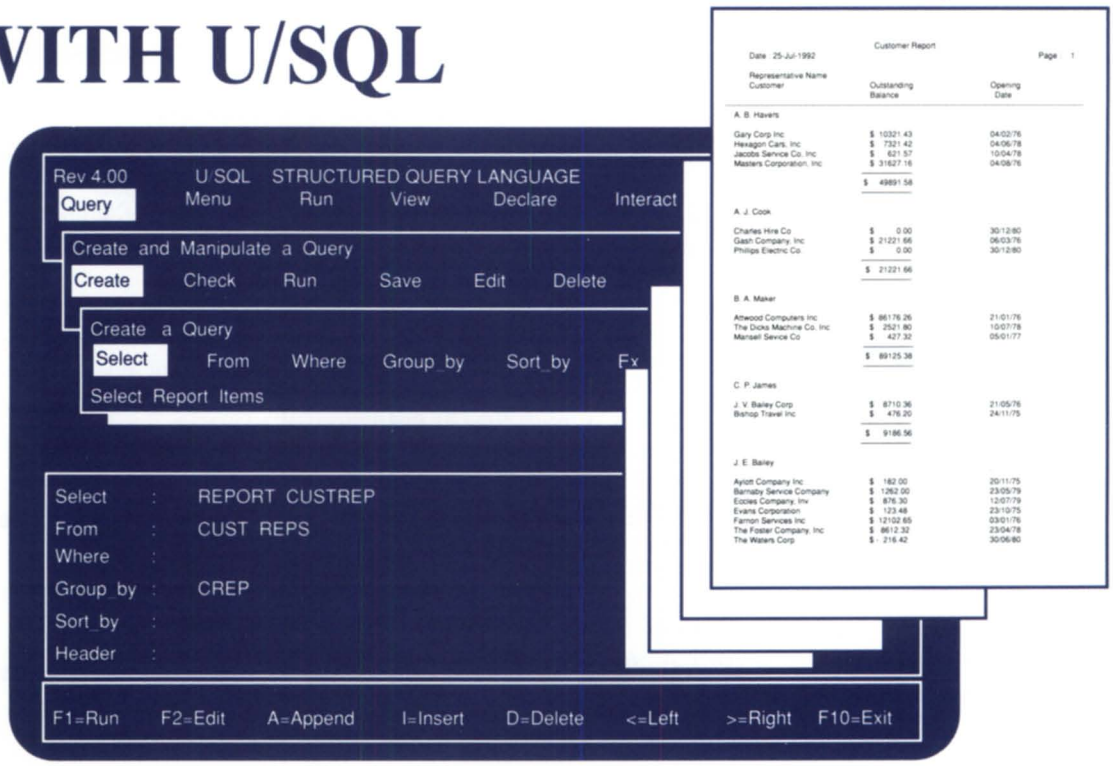

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Dennis Doyle

Thanks for joining us

As this edition of *Focus* is delivered to members, many of us will be fortunate enough to be reading it in Kansas City, as our yearly conference is unfolding. This is our third triple conference in a great city. Members from throughout the world will be here to exchange ideas, concerns, needs, and solutions.

Our profession is helping shrink the world, and KC is the place for everyone to meet. Once the event begins, you will notice that there are more breakout sessions and exhibitors, making NADGUG92 the largest "opportunity" offering we have ever been able to provide.

Many hours of work go into the conference, directed on the NADGUG side by Vice President Jan Grossman, as well as Nancy Miller, our next conference chair; and our track chairs Ron Branom, Calvin Durden, Brad Friedlander, David Novy, and Steve Pounds, who put together the breakout sessions. Their efforts are coupled with the excellent staff of our management firm, Danieli & O'Keefe Associates, who orchestrate the exhibition hall.

Working hard to coordinate the event from the Data General side is Debra Bedrosian, and from the DG/VAR arena, Geri Rebello. Many thanks from the Board of Directors and myself to all who have planned and worked to make Kansas City a reality. Lastly, from all of us at NADGUG, thank you to the excellent companies in the convention center hall that are taking their time and effort to present products, ideas, and services that will help us do our jobs better.

Where does an attendee start? Review the carefully prepared registration kit. Take in as many breakout sessions as you can and talk with the presenters. Spend as much time as possible on the exhibit floor looking at and talking about all the innovative products that are being demonstrated. Attend the after-hour events and take advantage of a low-key time to get to know other members, DG staff, and exhibitors. Be sure to visit the NADGUG booth, let us know how you are doing, and take the time to turn in the conference survey.

Join our special interest group meetings, as they are scheduled. Jump into our newest member benefit: the request for enhancement (RFE) development stream. Each SIG will open the floor to review existing RFEs that have not been submitted to DG development, and will also draft new ones and assign a priority to them. Do not pass up this opportunity to help shape the products that you use. Data General needs and wants our input.

Another communication avenue awaits you throughout the week. Take advantage the time slots that are available to everyone to sit down with the DG executives. Let them know what problems you may be having, where product lines should be going, what you like, and what you feel the corporation needs to be doing to help us.

For everyone who likes to plan ahead, keep October 1993 open for next conference. Where? Atlanta, Georgia. Watch *Focus* for dates and other details. Block out the time, with significant payback for yourself, your job, and your company. Thanks for joining us!

Dennis Doyle is NADGUG president.

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Conference 1992: New World, New Options

by Brad M. Friedlander
NADGUG Conference Committee

In 1492, Christopher Columbus linked the New World to the Old World. Five hundred years later, in 1992, we also are linking a New World to an Old World.

And, like Columbus and his sailing crew, there are many new, exciting, and risky options for us to consider.

Let us learn from history and seek ways to link the old world and the new world, while retaining the best of each world.

What is the New World, and what are the new options?

The New World is GLOBAL, DYNAMIC, and STANDARD. This applies to our business and our technology.

Global

The business world is changing. Businesses and organizations are multinational, or have international customers and suppliers.

Technology must support the global business with worldwide networks, distributed data and applications, and internationalized systems.

Dynamic

The map of the world has changed more since our last conference than it had in a generation. Business must accommodate rapid expansion into new markets.

Technology must support this dynamism; however, technology itself is very dynamic. New options appear faster than we can analyze existing choices.

Standard

Business has recognized the need to standardize in this new world. Europe is becoming a single market with a common set of standards. Electronic Data Interchange (EDI) provides standards for inter-company business activities.

Technology is becoming more standards-based. New standards are no longer proprietary. However, there are often multiple standards that serve the same ends.

For NADGUG, the Old World is MV/Eclipse and AOS/VS, while the New World is Aviion and DG/UX. Both have much to offer, but neither is always the right choice. Often, we can use a combination to best satisfy our business requirements.

NADGUG 92

To learn about the new options, your best bet is to come to NADGUG's Conference 1992. The sessions this year provide a great balance of the old, the new, and joining them together.

Don't come alone—there are far too many exhibits and sessions of interest to you.

Kansas City, here we come! Δ

Brad Friedlander is chairperson of NADGUG's By-Laws Standing Committee.

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That vision thing

SYNOPSIS
Squinting into the far-out future of computing is something you should be doing right alongside the prognosticators. And NADGUG 92, by the way, is a good place to get started.

by Doug Johnson
Focus staff

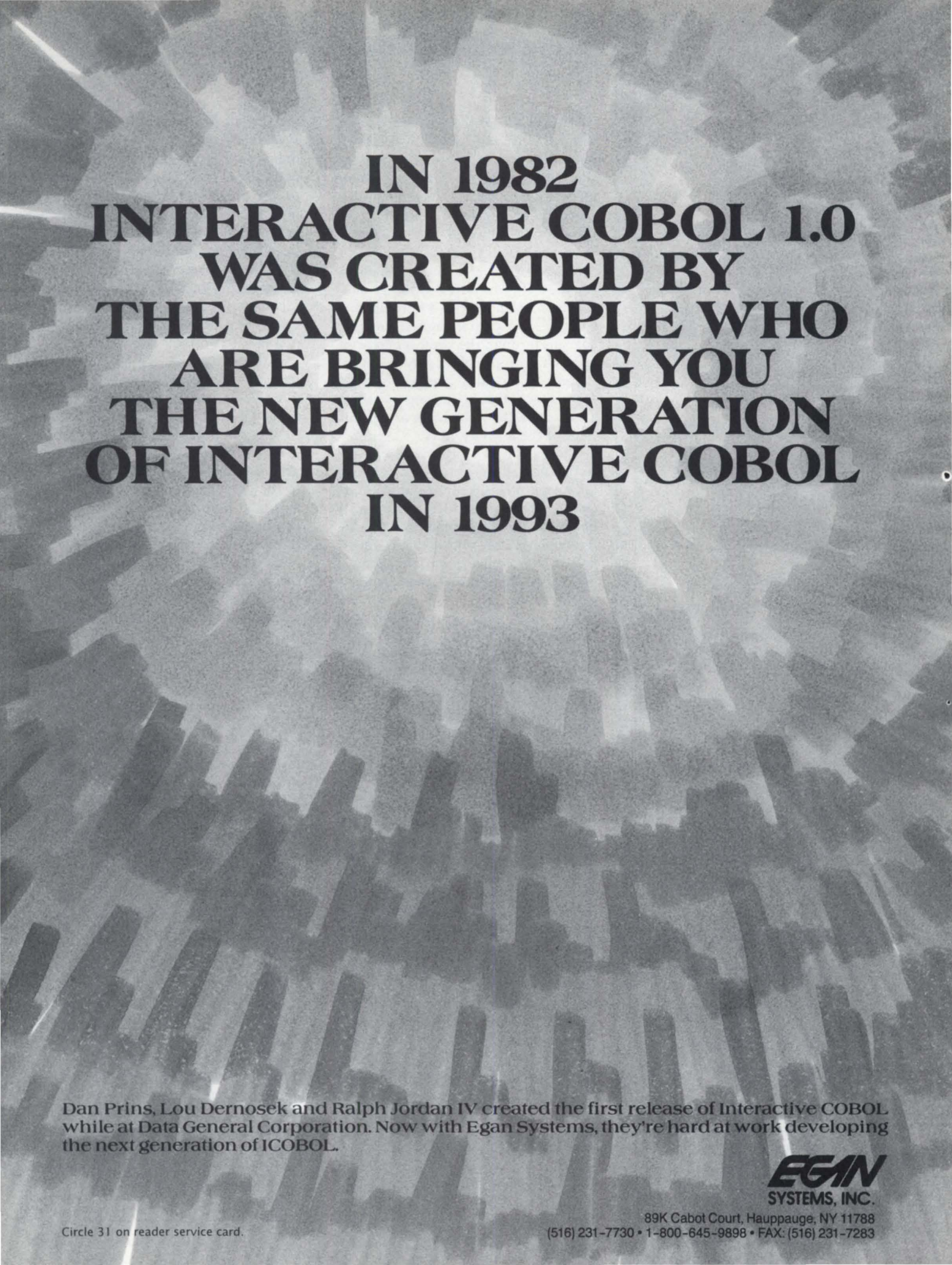
How does the computer industry—or *any* industry, for that matter—cope with and anticipate fundamental change? Not very well, you might say as you take a quick look around at what exhibits all the signs of rampant chaos here in the early 1990s.

Venerable giants like IBM and Digital are groaning in acute financial agony and distress. Wang drowned recently in the Red Ink Sea, and rubberneckers at the scene doubt if the body will surface. You'd think the big guys need their own support group.

Smaller companies riding the PC wave slash prices about every other week and take swipes at each other in between. Some of them rapidly become big companies. They stand to gain from the pain of the giants, but who's to say it won't be *their* turn to hurt sometime down the road?

Data General itself in recent years shed the corporate equivalent of lots of pounds, returned to profitability briefly, and (for now) slid back into losses again. These days the company marches onward to make war on the battlefield with other workstation and server manufacturers, wielding a multibladed weapon called the Aviion, whose name evokes (well, it might for some) some enchanted kingdom.

Industry news spreaders such as *Computerworld* have profiled misery and angst expressed by legions of laid-off information systems executives, who find themselves generally unwanted and unloved, and fighting an image problem in the squeezed job market because they used to work with those—an appropriate shudder here—*expensive mainframe dinosaurs.* "This is the worst stretch of unemployment in the data processing field I've seen in 10 years," went one observer-expert quote.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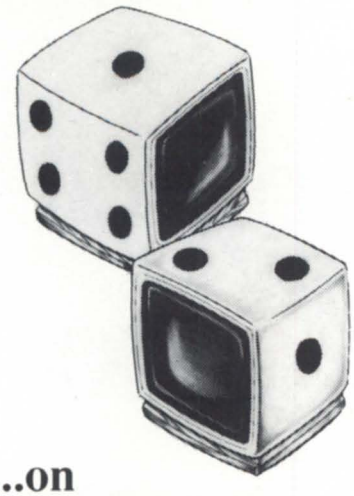

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Thick in the air these days are terms like "downsizing" and "rightsizing," denoting a decentralization away from those big machines. But even behind all the alarmist hype, something fundamental does seem to be going on. Is the comfortable old world coming apart at the seams?

Instead of seeing it all as a bad disaster movie—computer industry as a capsized ocean liner or a burning skyscraper—set your imagination free, soar up through the stratosphere; rest your gaze on the gloriously beautiful expanse of an entire planet as viewed from space, full of shining promise, and . . . yes, that's the cover art for this issue of *Focus*. Pretty, huh.

Maybe it's as simple as stepping back and taking a new look. It can sound pointlessly philosophical, but the future of computing may well belong to those who can think in different ways. That "vision thing" anticipates changing ways of doing things, and seizes opportunities in a changing world.

Global, global, global

In his position statement on page 6 in this issue, NADGUG conference track committee chairman Brad Friedlander offers concepts like "Global, "Dynamic," and "Standard" to describe what's happening in the "New World, New Options" theme for NADGUG 92.

The future offers globalization of everything: networks, software, data base access—mainly a fundamental increase in the scope and scale of things. The changes will be driven by visionary people and companies, but also by the kinds of events already happening in Europe and the Pacific Rim.

"People are finding that it's not reasonable to try to be doing business one way in Europe, and another way here [in the U.S.] without significant integration of those two efforts," Friedlander says. Offices in different countries that in the past shared little or no information flow and management must now expand their perspective—responsibilities spanning between countries. "You globalize their view, and that's the starting point."

"And so you have globalization linking Europe with the U.S. in terms of systems information flows," Friedlander says. "That then extends to the Pacific Rim countries, and eventually to any place that you're going to do business. So one aspect of globalization is that it's being forced by the European Community decision in Europe. It's being forced by economic realities—trade between the U.S. and Europe, and the U.S. and the Pacific Rim countries. And, for most of us, it makes good business sense."

Practical realities like language differences will intrude into a global computer environment. "The whole world doesn't deal in English," says Friedlander. "And particularly if you have global support people for your business, they need to be able to support it in the language of the country. Your systems should support them in the language that they're used to speaking. Otherwise you have to pay lots of money to find English speakers who can also speak the local language."

Also part of globalthink will be internationalization of applications, and ways to go about that can include standards in the Unix environment. "As you develop your systems, you have to develop them with the idea that the user interface will be multilingual," says Friedlander.

"The paradigm shift that we're going through is to distribute information—and particularly to distribute processing—to the desktop workstation. The desktop workstation could be a PC, it could be a small Aviion, or it could even be a large Aviion; it could be any number of other things."

Friedlander, a NADGUG past president who has been attending NADGUG conferences since the mid-1970s, suggests that those attending NADGUG 92 should seek out the new and different.

"You're looking to get a better understanding of improvements in existing products and technologies," he says. "You're looking to get an idea of where Data General is headed in terms of the paradigm shift that we're talking about. What's their commitment to it? What kind of things are they looking to do as they move into the future, to support the new computing environment that we're working with?" Δ

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Consider Data General

by Rick Havourd
Special to Focus

SYNOPSIS
Ultimate success for the Aviion could be merely a question of visibility, of getting past the "Who is Data General?" question.

A couple of weeks ago my partner and I decided to take advantage of the fine weather we'd been having. So we parked ourselves streetside at one of the many outdoor cafes in downtown Ann Arbor. Over a couple of pints of Kilians we got to talking about life, liberty, and the state of the computer industry—especially as it related to Data General.

We began by extolling the benefits of working with DG (having just picked up our fourth workstation for quite a bargain—thanks, Ray). We were delirious about the amount of horsepower contained in our office: four programmers each with 20 MIPS (and at least as many meg) sitting on their desks. All said and done, the average price for each machine comes to a little more than a comparably equipped 486 (sans a 19-inch color monitor).

"How can it be that everybody isn't buying these machines?" my partner asked. After much debate and another round, we'd settled on two reasons:

1. Lack of cheap software (okay, some of it's only inexpensive); and
2. Lack of strong market presence.

For now, let's leave the software issue out of it. Every manufacturer not basing its product on a commodity Intel platform—i.e., MS-DOS or SCO Unix (sorry, Sequent)—suffers the same problem. More importantly, though, is market presence.

Has this ever happened to you . . . "I'd like you to look at our new product; in this case we're using a Data General Aviion to . . . ." Before finishing the sentence the customer comes back with "Data who?"

Problem #1: I have to explain *who* Data General is. After this interruption we begin again, only to be interrupted with, "Data General, yeah. Didn't their stock fall through the floor? I hear blah, blah, blah . . . ."

Problem #2: People are actually making technology decisions based on NYSE quotes. My customer wouldn't let Michael Milken break a dollar bill, yet here he is basing the future of his business on the whims of Wall Street.

Notice anything familiar here? Nothing about the quality of product is even considered. What about the cost, especially over five years; no respect for off-the-shelf components. Everything is personal bias. I must admit that I was once a DEC zealot, and it took a bad experience before I even looked elsewhere (re: *Focus*, Dec. 1991). Now that I'm in the DG camp I look at things from a different perspective—like who's been putting blinders on all the free thinkers of the world?

Had enough? Me, too. Let's talk about some of the things that I think could be done to improve the situation. First and foremost would be a two-tiered approach to advertising. Great, they can fit a mainframe in a pizza box and send an old IBM hurtling through space. Maybe this works for their classic data center shops, but just ask Bob Dylan and he'll tell you "the times they are a-changing." The margins on RISC machines are trivial; volume is what counts now. So why not target the smaller organizations? Go after them on the departmental level. Yeah, the profit margin is smaller, but that's a given when selling an Aviion anyway. Besides, these people are going to buy a lot more smaller machines than will ever be touched in quad-processor sales.

Anybody see "Patriot Games" last

summer? Well, the CIA in that movie uses DG terminals, PCs, and Aviions. If it's good enough for the CIA, it's good enough for me! (wink, wink).

Let's say that the workgroup is a good target. Now that we're in at a lower level with a much lower cost, you can sell to the office manager and stay within his budget. Make the sale to people who are actually going to use the machine. Once the benefits of this low-cost, highly functional purchase proves itself, the users themselves will begin to sell the product to other departments.

Sure, putting 500 users on an AV 7000 will accomplish the same thing in one shot, but in the meantime all of the individual departments have gone out and purchased PCs and Netware LANs, leaving the AV a glorified file/print server. What's needed is a method for getting that first Aviion in the door. Nobody wants to be the guinea pig, but for $15K you may just find an audience.

Do whatever is necessary to get machines into the hands of people who've never considered DG before.

Since Joe "3-Martini-Lunch" isn't the only game in town these days, go after Joe Six-Pack. Get some converts where it counts—the system administrators and (semi)independent consultants who still think that Netware and SCO Unix will save the free world.

Do whatever is necessary to get machines into the hands of people who've never considered DG before. Ship low-end machines out for them to use. It isn't even necessary to preload the software. The documentation is good enough that anyone can break the shrink-wrap and have a working machine up in a matter of hours. This fact alone could bring in a sale. I picked up a couple of issues of *Sys Admin*, and the demand for books on setting up Unix, X, and UUCP is amazing. Tell them they don't need a good book, they need a better machine. "Try this Aviion and consider Data General next time you buy."

While the subject of trade journals is here, let someone like *Unix Today* or *Open Systems Today*, if you prefer, work with one for a while. That place is the hotbed of SCO propaganda. Who cares if they buy one; what about the 100,000 readers who see someone else had great success with the machine? Now Data General becomes more than just a company with full-page ads showing a plain pizza. I don't want a plain pizza, I want something exciting, something different, something that works.

On to the local sales offices. DG just pulled all the field MVs and replaced them with terminal servers tied into a central MV at some undisclosed location. Hey! What about the AV 3000s and 4000s that never got sold? Why not use these surplus machines in the sales office and switch over to AV (Object) Office—office automation is DG's forte, right?

Load these systems with AV Office and Portable Netware, then train the sales office to effectively use it. Now you can *prove* that you're not just talk—this stuff really works. Instead of glossy brochures and endless hype about standards adherence, your salespeople have something tangible they can show potential clients. I get real-life demonstrations of this every day. Unfortunately, it's usually on a Native Netware LAN with not a hint of DG, or DEC, or IBM in sight. In fact, the server of choice in these situations is typically manufactured by "Joe's Auto Shop and Computer Repair."

All of this is going to require some changes in the way that DG thinks and does business. Maybe it's not what they want. Fine, then what does DG want beyond "To be the premier supplier of Unix systems?" I would rather hear Data General lauded for its foresight and wisdom rather than for the dull thud it made hitting the floor. So next time you're talking to a potential client, remember these three words: "Consider Data General." Δ

Rick Havourd is a partner with Micro Sage Software Systems. He may be contacted at 130 South First Street, Ann Arbor, MI 48104; 313/663-0444.

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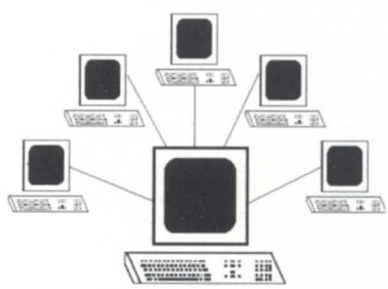

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The new Aviions

by Doug Johnson
Focus staff

SYNOPSIS
Check out the latest additions to DG's growing Aviion family.

A healthy family is one that grows. Well, by that measure, the D.G. Aviion bunch there on Computer Drive is positively thriving. And if you're looking for concrete examples of what NADGUG 92 conference organizers mean when they select "New World, New Options" for the theme, take the opportunity to check out what's new in Data General's line of open systems servers, systems, workstations, storage subsystems, and even a new version of the DG/UX operating system.

"Organizations today are using computer systems to run their businesses, not simply monitor them," said Joel Schwartz, vice president and general manager at Data General. "This makes

The eight-processor AV 6280 and the deskside AV 4605. Also shown is the High Availability Disk Array II subsystem.

AVIION OPEN SYSTEMS

	AV 4300	AV 4605	AV 4320	AV 4625	AV 5200+	AV 5225+	AV 5240+	AV 6200
Processor	single	single	dual	dual	single	dual	quad	single
MIPS	29	39	58	78	29	58	117	29
Cache	32 KB	96 KB	64 KB	192 KB	64 KB	256 KB	512 K	64 KB
Clock Speed (MHz)	25	33	25	33	25	25	25	25
Memory (min/max)	16/128	32/128	32/128	64/128	16/528	64/576	16/512	16/784
VME Options								
Available slots	2	2	2	2	8	8	7	9
Form factor	6U	6U	6U	6U	6U/9U	6U/9U	6U/9U	6U/9U
Packaging	deskside	deskside	deskside	deskside	office	office	office	rackmount
Mass Storage Disk								
Max internal	1.9 GB	1.9 GB	1.9 GB	1.9 GB	4.7 GB	4.7 GB	4.7 GB	none
Max supported	8.4 GB	58 GB	8.4 GB	58 GB	125 GB	125 GB	125 GB	240 GB
Tape								
Cartridge	2 GB 525 MB	2 GB 525 MB	2 GB 525 MB	2 GB 525 MB	2 GB,150 MB 525 MB	2 GB,150 MB 525 MB	2GB,150 MB 525 MB	2GB,150 MB 525 MB
Reel to reel (1600/6250)	yes	yes	yes	yes	yes	yes	yes	yes
Communications								
LAN	1 INT/2 VME	1 INT/2 VME	1 INT/2 VME	2 INT/2 VME	4 VME option	4 VME option	4 VME option	6 VME option
Synchronous	3 lines VME	2 INT/3 VME	3 lines VME	2 INT/3 VME	4-16 lines	4-16 lines	4-16 lines	4-24 lines
Asynchronous	2-257 lines	3-258 lines	2-257 lines	3-258 lines	21020 lines	2-1020 lines	2-1020 lines	2-1275 lines
Parallel	1 integrated option	1 integrated option	1 integrated option	1 integrated option	1 integrated option	1 integrated option	1 integrated option	1 integrated option
UPS								

having immediate access to data at all times extremely important."

New servers

Announced in mid-July, the new AV 6280 and AV 8000-8 high-end servers are eight-way CPU systems capable of processing 235 million instructions per second (MIPS). Priced starting at less than $200,000 and to be available in the fourth quarter of calendar year 1992, they are DG's most powerful servers yet.

The AV 6280, is a rackmount system featuring eight Motorola 88100 RISC processors configured in pairs on four system boards. A two-level cache design is used to enhance performance and offer scalability. A 128 KB instruction/data cache supports each CPU, and a secondary 1 MB cache is provided per CPU pair, bringing total system cache to 5 MB.

System memory for the AV 6280 ranges from 128 MB to 768 MB, and may be configured with one or more HADA II subsystems for maximum disk storage of more than 300 GB.

The AV 8000-8, a packaged system consisting of an eight-processor AV 6280 CPU and an HADA subsystem, may also be configured with an optional uninterruptible power supply.

"These eight-way systems provide a clear and powerful upgrade path for those customers who have invested, or will invest, in single, dual, or quad-processor systems," said Schwartz. "Customers most likely to be interested in the new systems are companies with large data base requirements and MIS departments looking to downsize or offload their mainframe-based applications."

The single-processor AV 4605 and dual-processor AV 4625 are mid-range servers offering 39 and 78 MIPS, respectively. Based on Motorola's 88100 RISC processor, they feature a 96 KB data/instruction cache, 32 MB of system memory (upgradable to 128 MB), up to 1.7 GB of internal disk storage, SCSI and Ethernet interfaces, and two-slot VME bus.

The AV 4605 is the first deskside Aviion system to offer a RAID-based disk array for high availability of data. Pricing will start at $19,995 for a single-processor AV 4605 configured with 32 MB memory, a 520 MB hard drive, and a 525 MB cartridge QIC tape.

HADA II

Data General's second generation high availability disk array (HADA) provides redundant array of inexpensive disk (RAID) storage to the entire Aviion product line, from the AV 4605

SERVERS & SYSTEMS

AV 6200-20	AV 6225-20	AV 6240-20	AV 6280-20	AV 7000+	AV 8000	AV 8000-8	
single	dual	quad	eight	quad	quad	eight	**Processor**
29	58	117	235	117	117	235	**MIPS**
64 KB	256 KB	512 KB	5 MB	512 KB	512 KB	5 MB	**Cache**
25 **(MHz)**	33	25	25	25	25	25	**Clock Speed**
16/784 **(min/maz)**	64/832	64/768	128/768	16/512	128/768	128/768	**Memory**
							VME Options
19	19	18	13	6	17	13	**Available slots**
6U/9U	6U/9U	6U/9U	6U/9U	6U/9U	6U/9U	6U/9U	**Form factor**
rackmount	rackmount	rackmount	rackmount	office	rackmount	rackmount	**Packaging**
							Disk
none	none	none	none	4.7 GB	none	none	**Max internal**
8.4 GB	58 GB	8.4 GB	58 GB	125 GB	125 GB	125 GB	**Max supported**
							Tape
2 GB,150 MB	2 GB,150 MB	2 GB,150 MB	2 GB,150 MB	2 GB,150 MB	2 GB,150 MB	2GB,150 MB	**Cartridge**
525 MB	525 MB	525 MB	525 MB	525 MB	525 MB	525 MB	
yes	yes	yes	yes	yes	yes	yes	**Reel to reel (1600/6250)**
							Communication
8 VME option	8 VME option	8 VME option	8 VME option	4 VME option	8 VME option	8 VME option	**LAN**
4-40 lines	4-40 lines	4-40 lines	24 lines	4-16 lines	4-40 lines	24 lines	**Synchronous**
2-1275 lines	2-1275 lines	2-1275 lines	2-1275 lines	2-1020 lines	2-1275 lines	2-1275 lines	**Asynchronous**
1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	**Parallel**
option	option	option	option	3.6 KVA	12 KVA	12 KVA	**UPS**

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❑ Overview ❑
❑ Disk I/O ❑

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❑ Highlights key performance statistics on a single DG/UX system
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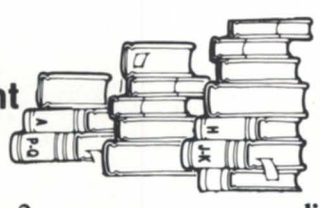
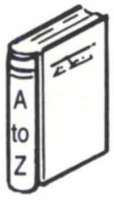


And Reduce it to this.



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Circle 13 on reader service card.

to the High-end AV 8000-8.

In its base configuration, the HADA II (prices starting at $35,000) comes with five 500 MB or 1 GB, 3.5-inch SCSI-2 Winchester disk drives. The subsystem can provide 2.5 GB to 20 GB of data storage capacity.

HADA II offers a choice of RAID levels, along with independent disk operations, so users can customize the disk array to specific applications. It can concurrently support RAID levels 0, 1, 3, and 5 for maximum configuration flexibility.

DG/UX 5.4.2

In conjunction with its new Aviion servers and HADA II subsystem, Data General announced version 5.4.2 of the DG/UX operating system. Performance improvements are offered for TCP/IP, streams, libraries, and commands functions.

A key differentiator for the Aviion product line, symmetric multiprocessing (SMP), improves performance by spreading application workloads equally across many processors.

Because DG/UX uses true SMP, as opposed to the more commonly found master-slave variation, Aviion systems are scalable across the entire product line.

A single-processor AV 4300, for example, supports 159 AIM III users, while a quad-processor AV 6240 (running the same operating system) offers more than five times the performance, at 880 AIM III users.

"The scalability of the Aviion family, a direct result of fully symmetric multiprocessing, makes it possible for customers to run the same operating system and application software as they add processors or move to larger systems," said Schwartz.

DG/UX's file system incorporates aspects of the classic Unix file system, NFS file system, the Berkeley fast file system, and others. Important features of DG/UX include a memory-mapped file structure, a logical disk architecture that allows files to span multiple disks.

The system adheres to a variety of standards to optimize portability. DG/UX is compliant with both POSIX 1003.1 and FIPS 151-1. Pricing for DG/UX 5.4.2 starts at $550 and varies according to configuration. Δ

Wild Hare Announces The Future of ICOBOL... Again.

Who's on first?

A major announcement has shaken the ICOBOL community. Data General has just stated that it will no longer actively continue its ICOBOL product development. Instead, they will turn that responsibility over to a third party vendor and claims they will bring "new features" to ICOBOL in about a year. While we applaud their effort, you should know that Wild Hare already introduced those features-and a lot more-years ago.

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While others have been wondering what to add to ICOBOL, Wild Hare has already delivered. New features, new technology and new products. All bit-for-bit compatible with your current ICOBOL programs and data files. All compatible with any popular platform and operating system, from PCs to mainframes. All giving you the latest open system technology and benefits. Today. And for your future.

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So if you depend on ICOBOL-compatible solutions, ask some tough questions. Who's been delivering open system ICOBOL products since 1984? Who supports the broadest range of operating environments and platforms? Who has new advanced-technology products dedicated to preserving your investment and maximizing your return? Who's committed to your future? Who's still around?

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Circle 61 on reader service card.

Brian Johnson

Eagles return to roots

SYNOPSIS

BJ gives his assessment of AOS/VS 7.70, muses a moment about Unix kernels, and fulfills a promise made earlier for a Grey Eagles update complete with gossipy details.

:AOSVS_7.70

I've hinted over the past few months that I'd be in a position shortly to give you a take on the new AOS/VS 7.70 rev. The time has arrived.

I installed 7.70 on one of the four MV/4s here back on June 22 (I'm writing this on August 18th) and, except for the usual tidying up of element sizes and file types, which I described last month, it was pretty much a slam dunk.

Except for a few weird problems with CLI32, which were promptly corrected (one of them actually got fixed overnight!), and one strange kernel weirdness, the last two months have been like the definition of a good airplane flight: uneventful.

As near as I can figure the primary reason for 7.70, other than getting a plethora of 7.69 patches incorporated into the source code, was to bring AOS/VS into sync with AOS/VS II 2.20—7.70 and 2.20 share a common CLI and a common EXEC and the three dwarves (XBAT, XMNT, and XLPT).

In terms of differences between 7.69 and 7.70, the only real visible ones are the new VSGEN facility for handling mux lines as named groups, and the new BROWSE utility. Unfortunately, they never sent me a manual or a keyboard template for BROWSE, and an attempt to bludgeon through it using its built-in HELP facility was less than spectacular. It smells like a Unix utility that got ported to AOS/VS one night by some Unix hack suffering from terminal ennui. Maybe when the real 7.70 package arrives, complete with manuals, then I'll give it another test drive.

On the other hand, one very strange new invisible weirdness got introduced into 7.70. For a long time now both AOS/VS and AOS/VS II have used a schizophrenic approach to handling terminal I/O. IACs, LACs, and their brethren (xACs) were handled by two PMGRs; the global one at PID 1 (:PMGR.PR) and the local one (:LPMGR.PR) that operated as the AGENT's roommate in each user's Ring 3. Then a few years ago something called Terminal Services came into existence under AOS/VS II to handle the (then) new Termserver hardware. Starting with AOS/VS II 2.20, all character I/O, including xACs, gets handled by Terminal Services in the kernel. PMGR is still around, but it's pretty much vestigial. Lo and behold, AOS/VS 7.70 now uses the same strategy, but with a different Terminal Server.

So what's the net-net with respect to the new Terminal Services? For you, nothing; it doesn't seem to be noticeably slower or faster. But for me and the handful of other miscreants who use the undocumented, but up 'til now quite stable, logic in PMGR to monitor character I/O traffic, it's a whole new can of worms. Not only is the interface to the Terminal Services data structures undocumented, it's an order of magnitude more complicated. And to top it all off, AOS/VS and AOS/VS II use completely different labels for the data structures involved. Now you know how I'm spending my nights these days; trying to figure out how to get :PERFMGR to report something other than just the master console's character I/O statistics.

One noticeable effect of the addition of Terminal Services to the kernel is that the kernel got bigger (what a surprise!), but PID 1 (PMGR) shrunk by just about the same amount, so it's a wash.

So, my advice based on what I've seen so far is to go ahead and install 7.70 as soon as it arrives, but only after you first locate somebody else in the neighborhood who's already

installed it, so you can compare notes if anything doesn't work as expected.

:UNIX:PERFMGR

I get a lot of calls from :PERFMGR users asking if I have anything similar for the Aviion specifically, or for Unix in general. The quick answer is no, but I thought you might find the details of why not interesting.

Every popular Unix kernel I've looked at collects gobs of information. Unfortunately, none of them collect all of the stuff necessary to do anything other than cursory performance analysis and capacity planning. Worse yet, each of the kernels collects a different set of data and in a different way, so even if sufficient information were available it would require a different product for each kernel variant. That sort of kills any chance of the tool being portable.

Another problem with the data collected by the kernels is that 90 percent of it has to do with the various internal kernel algorithms. That's of immense interest to kernel freaks during late-night debates over a case of Jolt Cola about whether it's better to manage kernel lists with binary searches or hashing. It has nothing to do with answering the basic questions of interest to system managers; am I out of: a) memory; b) CPU; or c) disk I/O capability.

Is there a chance that Unix Systems Lab or BSD or SCO will get their poop in a group and produce a reasonable spec for performance data that will then be adopted by all other kernel porters? Well, I recently got a clue that the chances are slim. USL finally got around to releasing just such a spec. It's more than an inch thick and weighs about 10 pounds. Does it take this big a spec to describe the data necessary to answer a couple of simple questions? Nope.

The real problem has to do with who's producing the spec. My personal opinion is that the Unix kernel mentality is incapable of dealing with the basic issues of commercial data processing. After 20 years, Unix still treats spooling and batch as issues best addressed by add-on shareware products. That's nice, but true batch and spooling require the cooperation of the operating system in order to be done right.

Kinda makes you long for the days of that Benevolent Dictatorship known as Proprietary Systems. Sometimes there's something to be said for having basic facilities like spooling and batch *not* involve a choice between a zillion third-party products; they're simply a part of the standard operating system.

:UPDATE:GREY_EAGLES

A few months back I mentioned an upcoming Grey Eagles bash in Baltimore and promised some gossipy details. For those of you not in the know, the Grey Eagles is a group whose membership is restricted to graduates of the University of Data General (ex-DG employees). It was started in 1980 as a way for us to keep in touch and hire each other in any new ventures we got involved in. God forbid we should let any new talent into the computer field. Back in 1981 we got together at the National Computer Conference down in Texas, and *Computerworld* sent a reporter and photographer. After the group picture, the reporter asked for a picture of just those of us who are presidents or CEOs of companies, and it turned out to be about 20 of

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the 60 or so members present. Pretty impressive.

Anyway, the Baltimore bash was intended as a welcome to one of our newest members: DG co-founder and badge no. 4, Herb Richman. In retrospect, "bash" is not the right word; "garden party" is more apt. Except for Herb's biker girlfriend (hi, Toni Lee), it looked and sounded more like a yuppie reunion. Especially when the host, Stan Joseph, fired up his laser karaoke machine and tried to get us all to sing with it. Not very reminiscent of the sleazy old days at DG, making the rounds of the topless bars and massage parlors.

On the flight back from BWI, I started thinking that the Grey Eagles had lost track of its roots and needed a few hundred CCs of craziness injected into it. So when I got back home I called a couple of other members of the Rowdy Subcommittee, and we decided to wrest control of the Northern California chapter of the Grey Eagles away from the yuppie scum who currently run it, by force if necessary.

I was determined that we wouldn't have any more meetings at fancy restaurants with valet parking, so I called a little joint call the Brass Rail in Sunnyvale and reserved their back room for a meeting on August 13th to execute the overthrow. Then I printed up a few hundred flyers announcing the intention of the Revolutionary Cabal to toss the bums out, and mailed them to all the Northern California members.

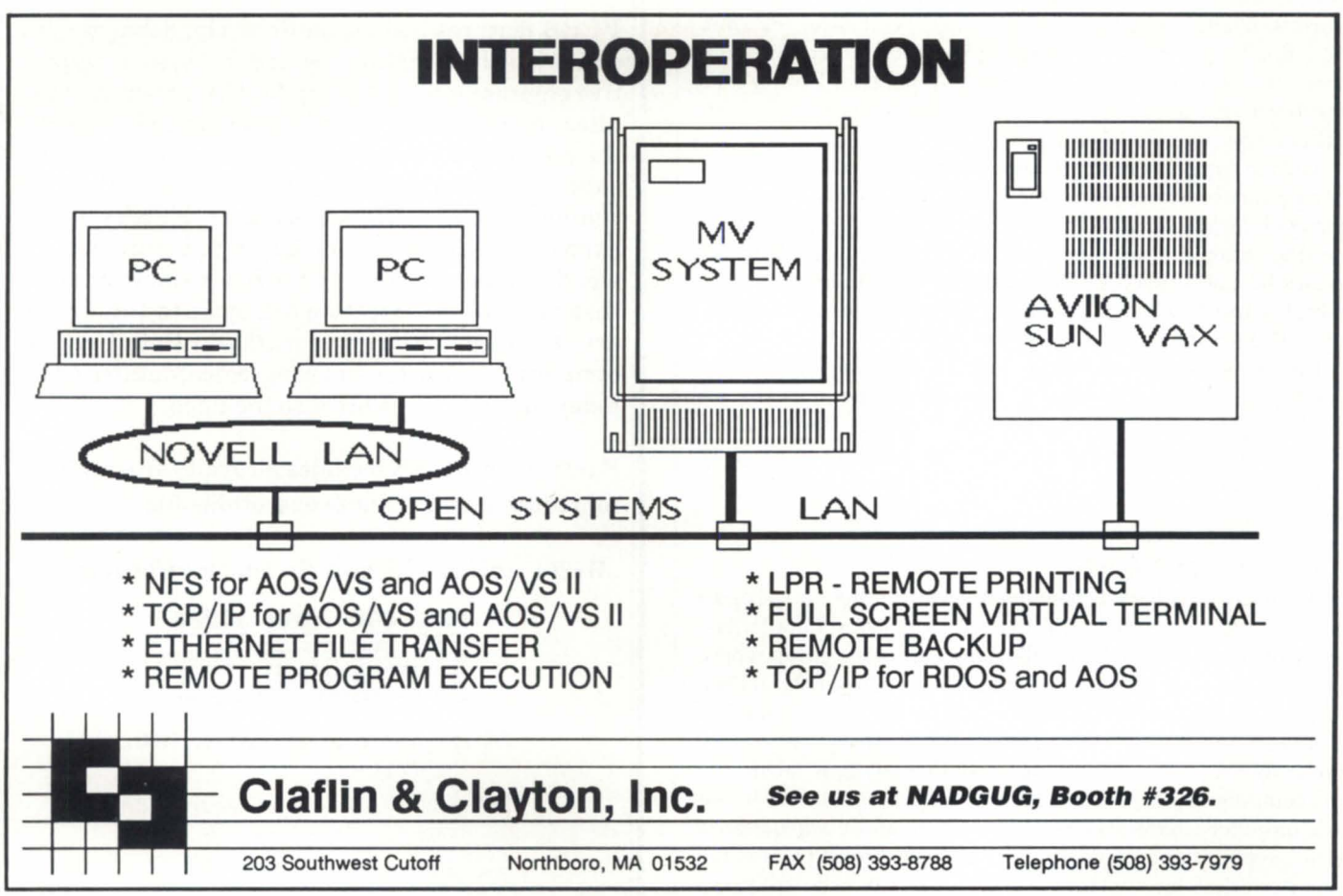
The choice of the Brass Rail needs a little explaining for those of you who aren't from the neighborhood.

Back in February 1972 when I joined Data General, the office was in Palo Alto and consisted of three salesmen, two field service engineers, and a secretary. About the second or third day I was there, one of the salesmen asked me what I was doing for lunch. I told him I had no idea since I didn't know the area very well. He said, "Come with me kid," and the next thing I knew we were standing in line for a corned beef sandwich in the back room of the Brass Rail. In the front room were a couple of pool tables, a lady in the process of getting naked on a long runway, and most of the employees of Lockheed Missile & Space Sciences, which was located right across the street.

The salesman and I didn't get out of there until just before the 2 a.m. closing. By that time I had determined that: a) they cashed paychecks; b) my pool game needed a lot of work; and c) the girls in California looked a whole lot better than the ones I had left in Chicago a few months before. Of course the copious quantities of neural lubricants I ingested between lunchtime and 2 a.m. might have had something to do with that assessment.

Over the course of the next four years I spent thousands of hours and cashed hundreds of paychecks in the Rail. Lots of very fond memories.

Needless to say, the Grey Eagles meeting was a big success.



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By tradition, the next leader of each of the local Grey Eagle chapters, and even of the national organization, is selected from among those who either didn't show up at the meeting, or from those who snuck out early. We took it one step farther. A guy named Ray Fortune was supposed to show up but couldn't make it because he was badly beaten during a mugging while on a business trip in Sydney, Australia, a few weeks back. Most reasonable people would be sympathetic. Yeah, sure. Congratulations Ray, you're the new leader.

:TRASH_FROM_THE_ TRADES

I had kinda given up on reporting the insane, idiotic, bizarre, and just plain stupid stuff I run across in each week's pile of trade rags, but a couple of this week's items are worth sharing.

From the August 17 *San Francisco Chronicle:* Wang filed Chapter 11 today. My analysis: Kiss one more of the good 'ol boys good-bye.

All of the following are from the August 17 issue of *Information Week:*

From the Executive Summary: AT&T's Information Management Services Division inked a deal worth $800,000 with Four Seasons Software to distribute and support its applications development tool, SuperNova.

From the Executive Summary: "We had a client who was rewriting a core billing system, and when I asked how it was going, he said, 'Well, we're four years into our two-year project.' "—Robert Kaplan, directory of McKinsey & Co.'s IS and technology practice.

From Microsoft, IBM Exchange Numbers: . . . Microsoft has been dogged by rumors that only 10 percent to 30 percent of the Windows copies shipped are actually used.

Only a few pages later, according to a survey conducted in June, 95 percent of the 150 Federal offices surveyed plan to use Windows in the next three years.

:KANSAS_CITY?!?

Is there any truth to the rumor that the only reason that the NADGUG Convention is in Kansas City is because it's Ron Skates' home town? Δ

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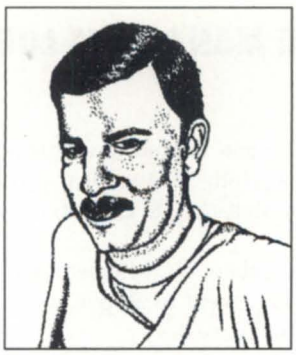

Tim Boyer

The future of ICobol

SYNOPSIS

Data General's recent agreement with Egan Systems to merge ICobol and ICHOST represents big change and promising possibilities. But it also raises questions. Those attending the ICobol Roundtable at NADGUG 92 will hear the very latest info.

I hope you're reading this article in Kansas City, because this is an ICobol roundtable that you do not want to miss. I know I've written that before, but at the risk of crying "Wolf!"—this time I really mean it.

On July 28, Data General announced the biggest change to ICobol in the product's history. The announcement, a brief mention of which appeared in last month's *Focus*, began as follows:

"Data General Corporation and Egan Systems, Inc., will merge their respective ICobol and ICHOST interactive Cobol compiler/runtime products into a single, feature-rich development environment. The new product will be ANSI 1985 compliant and will run on the AOS/VS, AOS/VS II, DG/UX, I/UNIX, and DOS operating systems. Data General will continue to support its current ICobol product in addition to the new combined compiler/runtime product when available."

Wow, scary stuff.

Data General was kind enough to give NADGUG President Dennis Doyle and me some advance notice. We've been talking it over for the last week or so. The preliminary opinion is that if everyone lives up to what's been promised, this will be a good thing for the user group. Here's a little background on the cast of characters, and a synopsis of the way this transfer is going to work.

Envyr Corporation, an Egan subsidiary, will be responsible for all development work on the combined product, as well as for maintaining the existing ICobol. Data General will continue to be the primary support location, and will maintain an ICobol staff to do so.

Ralph Jordan, president of Envyr, was department manager for languages at Data General, the man behind the transformation of ICOS to ICobol. He knows the product as well as anyone alive. About five years ago he started Envyr and brought out that company's ICHOST product. ICHOST is a multi-user, multi-platform ICobol-compatible compiler and runtime system. How compatible is it? Compile a program under ICHOST. Move the .DD and .PD to an ICobol system. They'll run just fine. Move an ICobol program to an ICHOST system, and the same will happen. The ICHOST system is so compatible, you can even instruct it to conform to ICobol's mistakes—those mistakes are spelled out in the ICHOST manual. This is not some offshore programming shop where DG is sending its code.

Merging and adding

Egan plans to spend the next year merging the products and adding planned ICobol 1.80 features: ANSI '85 compliance, pop-up windows, Distributed MINISAM server, and so on. In addition, the utilities from ICHOST will be brought into the product. ICHOST has a multitude of features not available in ICobol, such as the ability to bind one or more set of .DDs and .PDs into a library file. I know I'm slowing down the AOS/VS search function by having 2,200 object files in one directory—I just don't have much choice. With the library function, I'll bind them all into one large file. ICHOST also has STRING/UNSTRING, screen attributes

such as BOLD, DIM, REVERSED and UNDERLINED, and other enhancements. There are new system calls, which will be carried over to AOS/VS: ##D to get disk space, ##U to do an unconditional and immediate shutdown, and others.

ICHOST also has the file utilities you've become accustomed to, in ICREORG, CHKISAM, PACKISAM, and STATISAM. These do pretty much what the names imply.

I firmly believe that if ICobol is going to survive and prosper in the open systems world, it must not only be ANSI '85 compatible—it has to have features that other Cobols don't. One reason for ICobol's early popularity was its pioneering of a SCREEN SECTION. I think we can count on Egan to work in this direction. The company's manual states that ICHOST will have many new extensions while striving to be compatible with the ANSI Cobol 85 standard.

One requirement for ICHOST is a security device that plugs into a parallel or serial port. This will be continued on PC and Unix products, and added to the MV line probably as a device on an IAC port. I've got a few of these gadgets hanging out the back of my PC. Aside from making the computer look like a tower case with a tail, they haven't affected my operations.

This is an unobtrusive method of copy protection, especially on a mini. It won't affect any of us, because I'm positive there's no one out there running ICobol without a valid license—right? If you are, you've got a year to get legal. Include it in your next MIS budget.

The new ICobol

So in a year or so, a new product will appear on the market, tentatively called ICobol II. This will be ICHOST's upgrade from 3.30, and ICobol's upgrade from 1.70. There will be an as-yet-undetermined (but hopefully minimal; here's question #1 for the roundtable) upgrade fee. What happens if you don't want to upgrade?

Basically, the same thing that happens now. Data General will support a particular revision for six months after the next version comes out. After that, you're on your own. There are many sites out there still running 1.40 in order to avoid the file system change. Heck, there may be sites out there still running ICOS. If you don't want to upgrade, stick with what you have.

But you're gonna want to. Egan has always been responsive to its customers, and I don't see that changing. To illustrate, take the aforementioned file system changes that have caused ICobol customers headaches. Do you upgrade and have to convert all of your customers' files? Or stay with 1.40 and miss out on compiler enhancements? Egan decided to allow ICHOST to handle all file revisions transparently.

I realize that ICobol has had to adhere to standards, but I can't help feeling that of the ICobol, ICHOST, and Choice! products, ICobol was the anchor holding things back—sometimes for good reasons, and sometimes for

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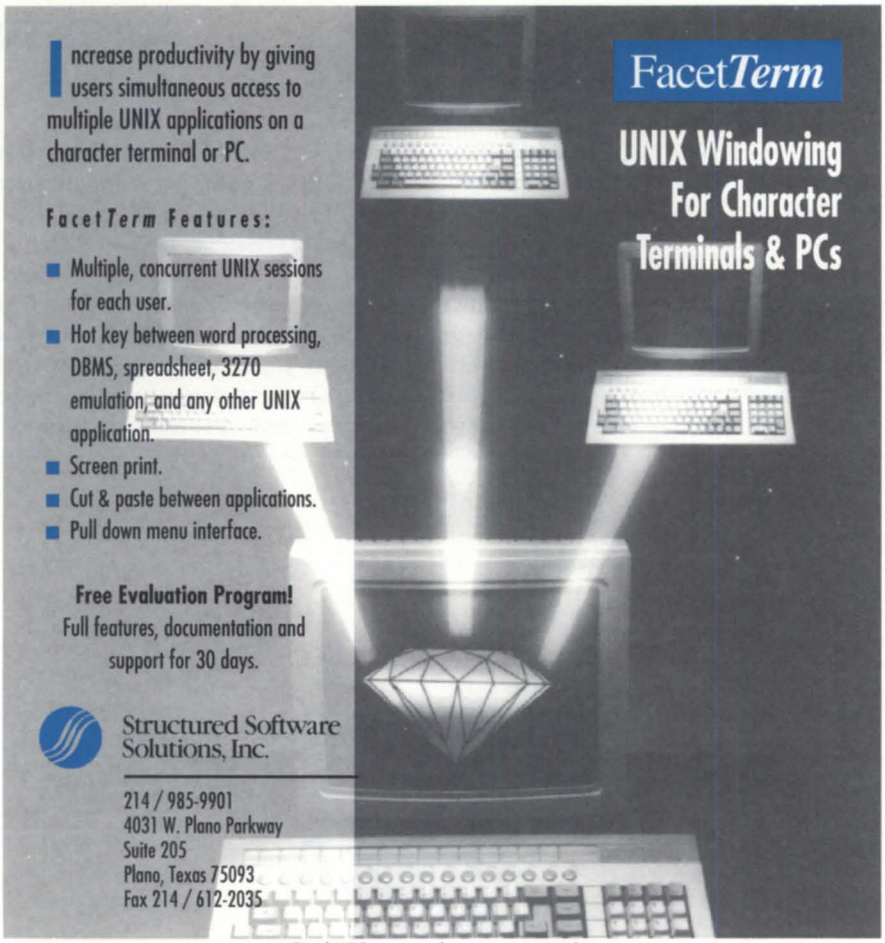

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marketing reasons. I'm sure there are features the other compiler makers have wanted to include, but weren't able to because of compatibility issues. I think we'll see that change now. For instance, the new ICHOST file system has 16 alternate keys, and file status codes that tell you if there's a duplicate key for a particular alternate.

And if all that doesn't convince you to upgrade, here's the clincher: you get PASS back! Yes, ICHOST has kept the Printer Access Scheduling System that we old-timers remember with fondness from our RDOS days. I for one can't wait to erase the kludge I wrote as a substitute.

Questions, questions

This column is being written on very short notice, so I haven't had a chance to get the answers to a number of questions. I hope to be in Kansas City with a long list. In the meantime, here are some I had the presence of mind to ask.

What about a debugger? ICHOST doesn't have one, and ICobol just got a decent one. Are we going to have to go back to the ICOS debugger again?

Beginning with rev 3.30, ICHOST has a debugger at the opcode level. This means that you can set breaks at calls, opens, I/O, and so on. The disadvantage to this is that you need to know the ICobol opcodes to use it (Ha! another column!). The advantage is that this type of debugger is always available—there's no need to compile a program for debugging. Egan has promised a true MXDB-type debugger in ICobol II. I'd like to encourage them to look at a Borland product's debugger.

What about Screen Demon? If ICobol II will have pop-up windows, where does that leave them? Will my programs that make extensive use of Screen Demon routines run under ICobol II? Here's a question that will have to be repeated at the conference. Egan and Threshold have worked closely together before, and I hope they will continue to do so. I feel that this is a non-issue, though. If Threshold can put its hooks into ICobol without seeing any source code, I'm sure that the company can do exactly the same with ICobol II. And even if ICobol II comes with its own windowing system, I'll still be using

Screen Demon because of its Turbo Screen, mail facilities, string calls, and so on.

What about RDOS ICobol? Apparently, Data General is keeping the right to RDOS ICobol rather than assign it to Egan. Obviously, keeping such a valuable asset on its books is helping to shore up DG's stock prices. RDOS users of the world, unite—and complain. This may be your only window of opportunity to get an updated ICobol.

Is ICHOST on the Aviion multithreaded? This came up because someone told me that Aviion ICobol is single-threaded. Nonsense, I thought—that doesn't make any sense, especially in a server environment with a large array of disks. Make everyone wait on one person doing I/O? Shades of RDOS!

Wrong. ICobol is single-threaded. ICHOST on the Aviion isn't. ICobol II on the Aviion won't be. This should speed some of those Unix systems considerably.

To whom should we send our STRs and RFEs? DG people will still handle all of the support for the systems they sell, which means any STRs. Requests for Enhancements will still come in to Data General also. This means that the ICobol SIG will continue prioritizing these requests.

Will there really be a support staff? Or will there be a switchboard operator with Egan's number taped to the phone? No, there really will still be an ICobol support staff at Data General—one whose knowledge exceeds a casual perusal of the ICobol manual.

Will current ICHOST users have to go through Data General for support? No. If you bought ICHOST from Egan, then Egan will be responsible for your maintenance. After all, ICHOST not only works on Data General machines, but on platforms such as the RS 6000, SCO Unix and Zenix, and Sun OS. If you buy from DG, you will see no difference at all in your current support.

Tim Boyer, is EDP Manager at Denman Tire Corporation. He may be reached at 400 Diehl South Rd., Leavittsburg, OH 44430, 216/898-2711, faxed at 216/898-5256, on the NADGUG bulletin board at 415/924-3652, or on the CSC bulletin board at 800-DASH-CSC.

Data General has been saying for years that it's not a software company. This is just a case of putting money where the mouth is. Egan is a software company, and only an ICobol software company, and I think Egan will do well with ICobol.

But I wonder what this means for the future. I can't imagine that this is an isolated case. What other deals are in the works? Will BJ get AOS/VS? Or George Henne BBASIC? Stay tuned.

NADGUG 92: Be there

The ICobol Roundtable is at 10:15 Thursday, October 15. The ICobol Special Interest Group meeting will be immediately afterward. Representatives from Data General, Egan Systems, and Envyr will be there. So should you. Δ

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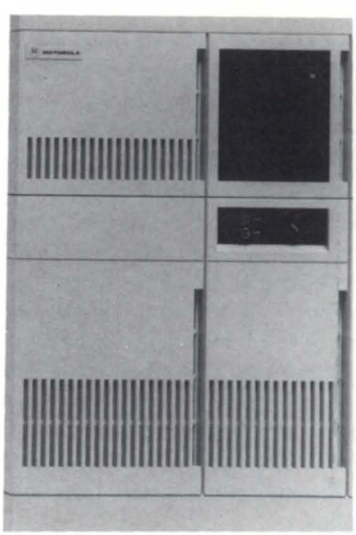

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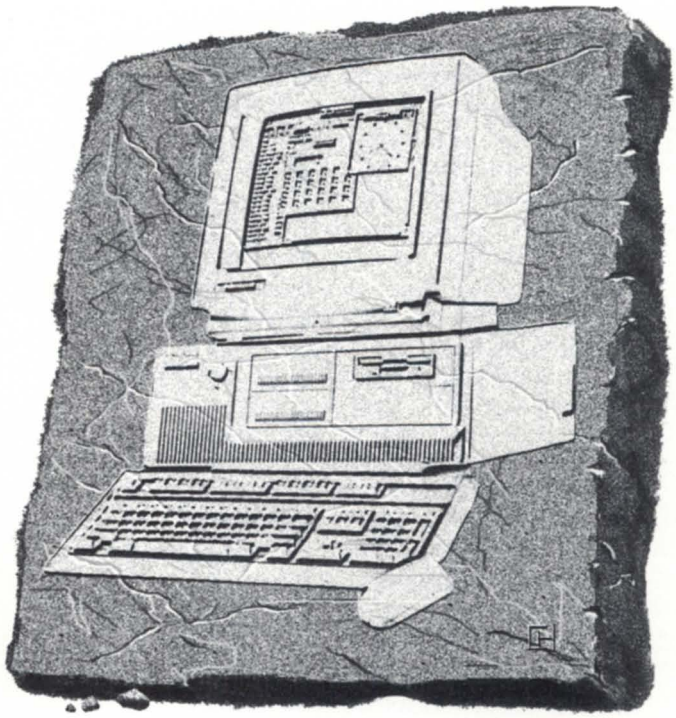
Why paper won't make it



SYNOPSIS

Snapping at the heels of every new technology are the authoritative pundits who say it'll never work. It has ever been thus.

by Kent Finkle
Special to Focus

Recently, the government of a large Middle Eastern nation began construction of an immense facility for long-term document storage. When the contractor broke ground, workers unearthed a number of ancient stone tablets dating to the pre-Christian era. These appear to contain the very first article about information systems known to man. Given the content of the work, it is interesting to note that the article appears to have survived intact for thousands of years. It gives us a vivid image of the important issues of its day. Archaeologists translated the inscriptions on the tablets into English, as follows:

Why paper won't make it
by Sibbecai the Hushathite
Vice President of Tablet Marketing, Chisel Systems, Babylon

For ages, pundits have proclaimed annually the long-awaited Year of Paper (Note for my fellow members of the chisel generation: "Paper-based" technologies employ a black liquid called "ink." Ink is applied using a stylus or "pen" to form characters as it dries on a flimsy material called "paper," derived from, believe it or not, trees.) The astounding popularity of paper has led some immoderate proponents to go so far as to announce the "death" of stone-based systems. This claim so far overstates the case that I felt it incumbent on me to set the record straight.

Paper will *not* replace stone as the most important writing medium, not now nor at any time in the foreseeable future. Let me touch briefly on only a few of the reasons.

First, we should consider the properties of paper because, as a new technology, many of you are unfamiliar with it.

Paper is easily damaged or destroyed. As we all know, the hallmark of stone as a text storage and retrieval medium is its high availability. Stone does not tear, burn, fold, spindle, or mutilate. Paper, for those of you who have never touched it, is the most vulnerable of materials. A "sheet" of paper can be crumpled to a ball in your hand, torn to pieces by a small child, reduced to ashes by a candle flame. Mold stains it, time yellows it, and insects eat it. The world will never turn over its record-keeping to something as impermanent as paper.

Paper does not inspire trust. Humans are tactile creatures. We like to touch things, feel them in our hands, sense their strength. When we purchase a tract of land, we feel secure when we receive the deed to the property inscribed in stone. Paper will never be adapted by users for important uses because it feels flimsy. Someday we may find paper parking tickets on our chariots, but will we allow a contract to be written on paper? A marriage license or birth certificate? Would you consider for one moment accepting treatment from a physician whose walls were adorned with *paper* diplomas? Of course not.

Paper is easily stolen. Even if paper were not subject to all these perils, matters of security would render it unusable for critical work. Literally thousands of letters and numbers can be written on paper that would fit in a common goatskin sack. How would you feel if an employee walked out the door with hundreds of sheets of paper on which were written thousands of your customers' names? By comparison, ever try folding up an HA Stone Tablet™? It isn't easy to slip out the

company's door inconspicuously with 200 pounds of marble under your toga.

Paper is easily forged. The idea that important information will be kept on paper is absurd. Text on stone can be trusted; text on paper cannot. With little effort, "ink" can be erased and modified to read whatever one wishes it to read. What will be suggested next? Paper money?

Scalability. The feebleness of paper has profound implications for its scalability to larger projects. A paper note to a co-worker is conceivable, but is paper appropriate for the inscription on Egypt's new pyramids?

Paper costs much more than it first appears. Next we come to the economics of the matter. Technical matters and user acceptance aside, is paper practical?

Converting the installed base is prohibitive. Consider first the scale of the task. To put it plainly, the bulk of the business of the civilized world, from Persia to the Pillars of Heracles, is done on stone. The quantity of data stored is incalculable, even with the most powerful Peking Abacus™. What possible productivity gain could justify the effort required to paperize that mountain of information?

Scribes would require monumental retraining costs. Now let us turn to a matter of direct concern to the scribes. We scribes have long held a virtual monopoly on the production of the inscribed word. The sheer weight of stone, the dexterity demanded by the chisel, the careful planning required by the unforgiving nature of the medium, all tend to exclude the weekend hobbyist. We are a "priesthood," if you will. There is little or no crosstraining benefit in a move to paper. Paper is cheap, there are no chisels, and no dust on the floor. The cost of retraining scribes means that paper is out of the question. Fortunately for us.

The bottom-line benefit of paper is hard to quantify. The use of paper-based technology has been on the increase for some years now. Yet, studies show virtually no improvement in productivity as a result. We all know how difficult it is to justify even those technologies with obvious productivity gains, such as new chisels. Corporate boards remain unimpressed by paper because the large investment has produced such a small profit.

Stone still has a lot of life in it yet. Those who regale us with tales of the obsolescence of stone habitually fail to take into account the improvements that will be made in the future versions of the product. They claim that there are inherent limitations in the stone medium, and that stone vendors are thrashing about in a desperate attempt to extract the last few dollars from an obsolete technology. They could not be more wrong. Here at Chisel Systems, Inc., because we are coming out with new stone-based systems all the time, we can remain very price-competitive. Boulder Vision™, version 1467.6.3.4, is now on the carving board. Our research and development department tell me

LET'S REVIEW . . .

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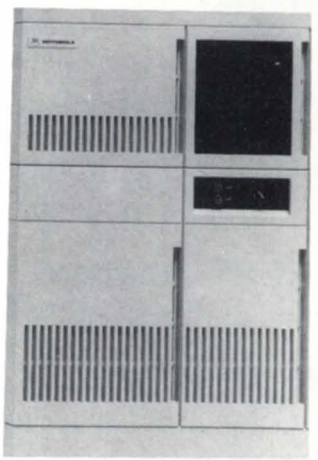

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that BV 1467.6.3.4 will have all of the important features of paper with none of the drawbacks. While no ship date has been announced, it will be available real soon now.

How can we expect users to do the work of scribes? A fundamental flaw in the paper argument is that paper will bring writing to the masses. Well, I don't know about you, but the last thing I want my people doing is fooling around with ink all day and pretending to be scribes. If I wanted scribes, I would have hired scribes. I want my people to work, and I don't see what sitting around writing all day has to do with meeting a payroll or making a profit.

Exaggerated reports of layoffs in the stone industry. Last year was a very strong one for Chisel Systems. We finished the year ahead of our expectations. Our movement to lower headcount occurred because of the recession. There is some softness in stone orders, but this is not due to competition from paper; customers were holding back in anticipation of the new version of BV™.

VARs are not ready for it. VARs (value-added resellers) exhibit no great enthusiasm for paper. I recently spoke with a leading VAR, and he told me that paper is not standardized enough. He said that his company's most popular product is currently written in stone and that he was thinking of doing some of the planned enhancements in paper but paper is not yet available in all of his markets, plus what paper is available is not standardized enough—legal, letter, A4, not to mention color. He concluded by saying that paper is not practical at this time for many projects.

The issue is not black and white. This is not a question of either/or. Such faulty black-and-white thinking is characteristic of paper bigots. Some jobs, simple temporary work, require paper, while others cry out for stone. Further, your investment in legacy stone systems can often be preserved by the following method. A paper front end can support many users without degrading stone's response time. Just make sure that you have available a well-designed stone emulator on your paper system. Chisel Systems, Inc., offers Pop-Rock™, a stone emulator system optimized for paper front ends to sandstone systems.

Conclusion

Both paper and stone will be with us indefinitely. The idea that paper will replace stone in 99.99 percent of applications is simply wrong, for the reasons outlined above. Instead, the future is one of heterogeneous paper/stone systems, and the profits will belong to those organizations that best solve the problem of integrating paper- and stone-based systems into one seamless whole. Δ

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

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Solution on page 66

Word List
(look horizontally, vertically, diagonally, backwards, and every which way)

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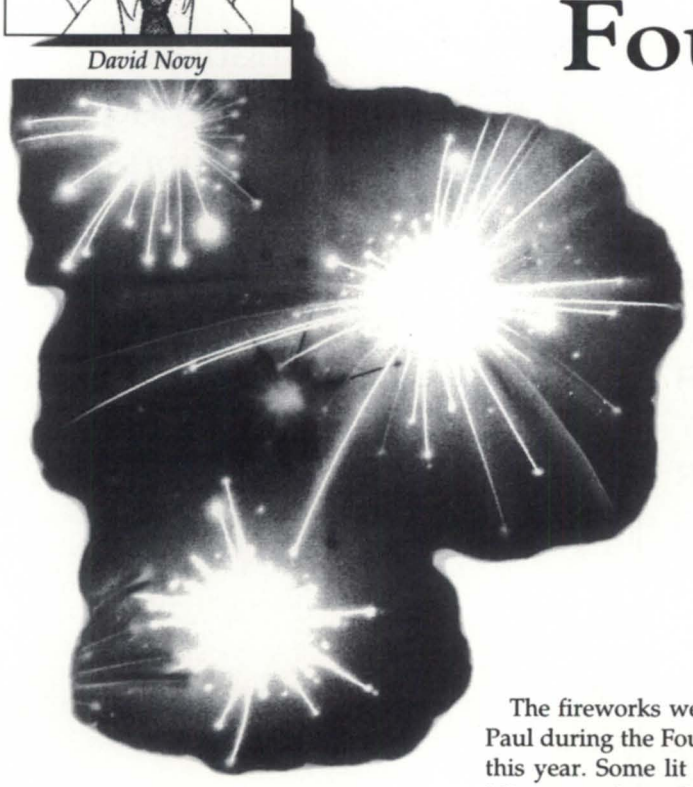
Westport
Workstation

David Novy

Debugged on the Fourth of July



SYNOPSIS

RAID technology should see explosive growth as more companies recognize the importance of keeping system downtime to a minimum.

The fireworks were spectacular in St. Paul during the Fourth of July weekend this year. Some lit up the sky over the Minnesota State Capitol building, and others lit up our computer center. No, there were no *actual* fireworks in the computer center. These fireworks were the sparks from a new idea.

I spent the weekend of the Fourth helping two engineers from the Storage Computer Corporation of Nashua, New Hampshire, debug the operating system of their RAID 7 disk array. (Yes, RAID 7 really does exist). In the process of watching these two engineers work, I learned a great deal about SCSI disk drives, RAID technology, central European history, and an appreciation of the freedoms that Americans often take for granted.

One of the engineers was originally a Czech citizen, and the other came from Hungary. At first, I said that they came from eastern Europe because people of my generation have always thought of Europe as being East and West. They quickly corrected my geographical error, correctly stating that until World War II, Hungary and Czechoslovakia were at the center of Europe. And according to the Czech engineer, this caused big problems for his native country.

Only the Czechs, he said—a small nation of less than 10 million people—would have the audacity to live in the middle of Europe. They were on everyone's invasion route, and they were without enough people and resources to defend themselves. After hours of conversation with these two engineers on such wide-ranging topics as history, life, and SCSI disk drives, I really began to appreciate the freedom and resources we have in the United States. I also enjoyed the opportunity to be present when RAID 7 technology moved from great potential to reality because of indirect help from Data General.

Until that weekend, the Storage Computer engineers had been able to test their product only to a certain level in their labs. They'd never had the opportunity to face the combined forces of an Aviion 6225, a Sun 670 MP, and ten 1.9 GB Seagate disk drives. After that weekend, the engineers gained a healthy respect for Aviion file servers and the DG/UX operating system. The Aviion 6225 tested their product as

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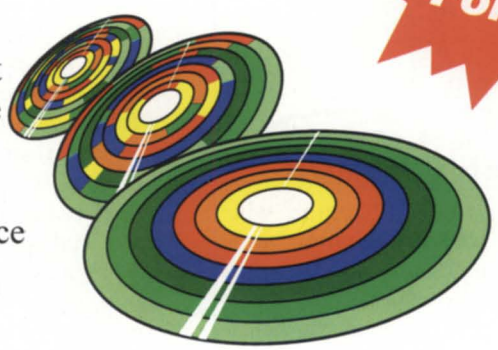

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never before. When their machine could deal with the demands the Aviion could require of it, they new their machine was ready for the marketplace.

RAID: a review

What exactly is RAID 7? Perhaps the best way to describe RAID 7 is to describe RAID levels 0 through 6. RAID itself is an acronym for redundant arrays of inexpensive disks. RAID level 0 is a single, non-redundant disk. RAID 1 is defined as parallel data transfer to a pair of disks (disk mirroring). RAID 1 requires 100-percent redundancy. RAID 2 through 6 generally require 25 percent disk redundancy. Because of technical, economic, and performance reasons, RAID 2, 4, and 6 are not commercially viable, and are not found in the marketplace today.

RAID 3 is a parallel array that is bit or byte striped, and has a dedicated parity drive. It is generally recommended for systems with large read/write demands. It's rarely mentioned that RAID 3 is difficult to expand rationally. Also, its format efficiency is often only a small percentage of the available drive megabytes. Its capacity utilization for small writes can be woeful. And its performance on small reads and writes can be as low as 1/20 of single-spindle results. Worse yet, successful RAID 3 implementations usually depend on having exactly matched drives.

RAID 5 is also a parallel architecture, but parity is rotated across all drives. It is striped at a sector or block level. Touted for its ability to deal with high levels of small read/write groups, RAID 5, however, has problems dealing with large numbers of writes. Writing information to a RAID 5 system requires four operations: read the old data, read the old parity, write new data, and write new parity. Data General's high availability disk array (HADA) is one of the best RAID 5 systems on the market today. Recent enhancements allow it to support RAID 3 and RAID 1.

RAID 7 is not a parallel array, but a totally asynchronous architecture, with a real-time operating system controlling access to the disk drives. It is the only RAID architecture that can exceed single-spindle performance for all four basic disk metrics of small reads and small writes, and for large reads and writes under all conditions.

The RAID 7 system I tested was outstanding on reads. Doing "fsck" it performed in excess of 450 I/O operations per second. On writes (file system build), it sustained between 50 and 60 I/O operations per second. There was a good reason why disk writes were much slower than reads on the system I tested. The disk reads took advantage of cache memory, which greatly improved read performance compared to a single spindle. For write operations, disk cache memory could have been used and the system would easily have performed in excess of 150 I/O operations per second.

However, I did not use disk cache memory because I felt that it would have resulted in an unacceptable risk. When utilizing cache memory, SCSI disk write commands were acknowledged on write to cache and not write to disk. In the system I tested, disk cache was a single point of failure. If cache or the RAID 7 CPU had failed, up to 32 MB of data (the cache resident data) could have been lost. I was not willing to trade speed for a large potential data loss, so I chose to acknowledge SCSI writes after completion of write to disk, and accept its inherent lower write performance.

Storage Computer is working on a fault tolerant version of its RAID 7 product. It will cost more, but it can fully utilize disk cache memory and thus offer performance of at least five times that of a system where disk cache memory is not used. This system should be available by the beginning of 1993.

I really enjoyed the Fourth of July fireworks I saw this year, *inside* as well as outside. From reports I have seen in computer newspapers and magazines, and from my own experiences, it is apparent that RAID systems will see explosive growth during the next three years, as more companies recognize the importance of keeping system downtime to a minimum. 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.

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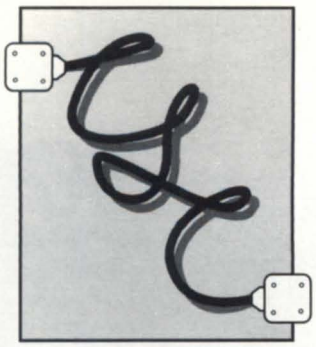

DASH items

SYNOPSIS

Notices and queries posted on the Direct Access to Support Help bulletin board.

Category: DG/UX

Author: Joe DiBenedetto
Subject: **Growing the /usr file system**

Upon attempting to grow the /usr file system on an Aviion 7000 with a 5 GB disk array, I ran into a Catch-22. The system said it could not add the space I requested because the filesystem /usr was "busy."

I couldn't unmount /usr for the same reason. I tried coming in from level 's' so /usr wouldn't be mounted, using diskman directly, but it still wouldn't do it.

Reply by: Pierre Asselin

One thing you can do is run "/etc/fuser /dev/dsk/usr" and find all the processes that have a hold on /usr. If you want to unmount it, you have to kill those processes.

Catch-22: when you unmount /usr, you lose access to diskman! You can try making a copy of diskman in the root filesystem.

And one more suggestion: *do a full backup before you start!*

Reply by: John Gareri

What you really need to do is boot the standalone version of diskman. Do this by booting the release tape.

Author: Michael Keck
Subject: **MS-DOS file systems on DG/UX 5.4.1**

I know there were some problems with manipulation of MS-DOS file systems in DG/UX 5.4. Have all the problems been corrected in DG/UX 5.4.1? Will my DOS machine be able to read a floppy created by DG/UX 5.4.1?

Reply by: Karl Litterer

I have been able to read both 3.5-inch and 5.25-inch diskettes just fine after upgrading our systems. Before upgrading, there were some problems reading and writing the 3.5-inch diskettes.

Author: Terry Adelsberger
Subject: **Wang to Aviion**

We have been busy for the last year moving MAI Basic Four users to Data General Aviions. We developed our own translation software, etc. . . . to do the job.

Now we want to start moving Wang users to DG Aviions, and would like to talk to anyone that has done this. We are interested in how you did the translation and in general your experience.

If there is special software created that does the work, we would consider the purchase. I must add that we have secured "KCML" for the DG Aviion and the popular Wang software called "AIMS". Our next step is the Wang translation—then we can start this project in our Baltimore/Washington area.

Author: Mark Saunders
Subject: **Adding a port service**

I have tried to add a modem to a port on a syac using sysadm's "add a port service" menu. After adding the port service, going back into sysadm to modify or delete the port service results in a core dump, and exits to the system prompt. I have been following the guidelines set up in the manual for this procedure, but perhaps I'm doing something incorrectly.

Reply by: Wiley N. Johnson

You should not have to add a port service to add a modem. Make sure the port you want to put the modem on is not already supported by a port service set—like ttymon1. You can make another incidence of ttymon for just the modem, but if you have a port that is currently being used under a ttymon, then change the line type to a M2400 and that will set it up correctly.

Author: Ephraim Nussbaum
Subject: **UUCICO**

Perhaps someone in DG land can solve this unimportant mystery. When I send mail with uucp, the ps command shows a process called UUCICO. Why is it in upper case? The transfer program's name is uucico. There is no file on my system called UUCICO. I thought that a process name was the name of a program file, but I guess that's not strictly true. Does anyone out there know why the process shows as UUCICO?

Reply by: Jack Alexander

The capital letters means that it's been restarted after the previous one was terminated. It is invoked via the exec() system call, where you can call a program anything you want (for ps purposes), regardless of the path used to invoke the process.

Author: David Woo
Subject: **HP Laserjet III on v5.4.1**

I recently upgraded from DG/UX v4.3.0 to v5.4.1 on an Aviion 4120 and had an HP Laserjet III, connected to a 16-port syac cluster, working fine.

Continued on page 64

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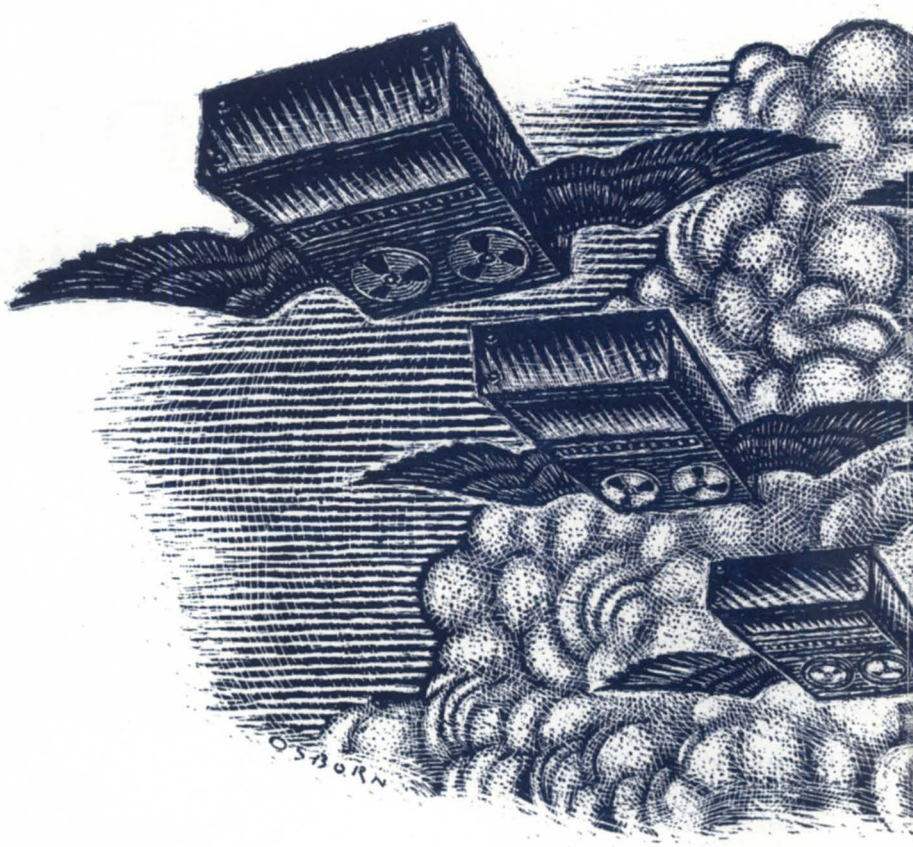

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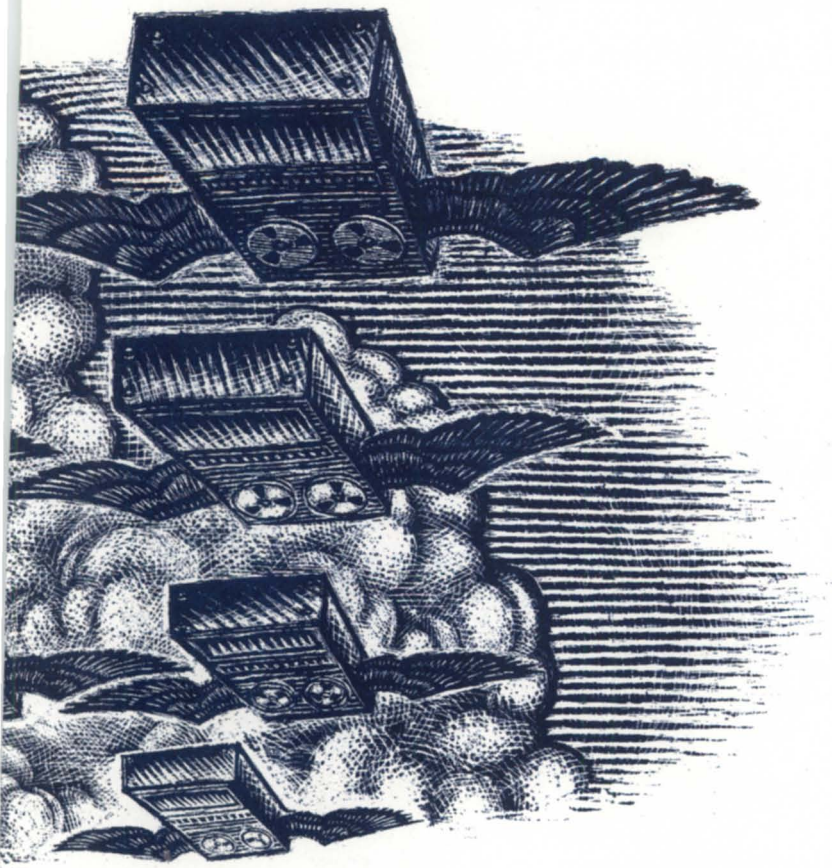

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Tim Chu
President, Alpha Omega Systems

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Kim Medlin

Shoot-out rebuttal

SYNOPSIS

The author continues our August issue's "Language shootout" feature, rebutting points made about fourth-generation languages (4GLs).

I hope you enjoyed the "Language Shootout" articles in the August *Focus*. I sure did. When I was invited to participate in the debate, I knew it may get a little rough. For instance, the following quote appeared in George Henne's article:

"Articles such as [Kim] Medlin's have misled too many managers about the true nature of software projects, and resulted in many expensive mistakes."

The last thing I want to do is mislead anyone about software development technology. So I'd like to take this opportunity to clear up a few points that were raised.

First, a brief comment about the source of the information for this article. I've worked for Data General's Systems Integration Services group for more than 12 years. Virtually all of that time has been dedicated to custom software development. In recent years that effort has been concentrated in fourth-generation languages (4GLs). Most of our 4GL projects have been with large and visible companies that you would recognize immediately if I mentioned their names. Anything I write about in *Focus* articles is a direct result of personal involvement in real-world projects.

Point by point

If my shootout article "misled too many managers," certainly they are thoroughly confused about 4GLs after reading the shootout series. Let me set the record straight:

1. There was a complaint about the lack of a definition for 4GLs, yet the following was offered: " . . . industry pundit James Martin once defined them as a language that allows development 10 times as fast as 3GLs, that could be learned by its intended users in a couple of days."

Actually, Martin's definition goes a lot further than just those two characteristics. Here's the full list of 4GL parameters as espoused by James Martin:

- The language is user-friendly
- Nonprofessional programmers can obtain results with it
- A DBMS (data base management system) is employed directly
- Programs have an order of magnitude less code than 3GLs
- Nonprocedural code is employed
- Intelligent default assumptions are provided
- Structured code is enforced
- The code is easy to maintain
- Non-DP users can learn a subset of the language in two days
- Debugging is easy
- Results can be obtained in an order of magnitude less time than 3GLs.

These parameters are definitive properties that distinguish 4GLs from 3GLs; I'd say they provide a rather concise definition.

2. A claim was made that BBASIC's development productivity is comparable to a 4GL's. As an acid test of 3GL-4GL productivity, I described a typical business function and stated that our statistics show the average Cobol programmer would take 37.5 hours to complete and test the program. I developed it using a 4GL, and it took me 43 minutes. One of the other shootout authors claimed he could write the same function in four hours using BBASIC. Bear in mind that the function discussed represented a multi-user, master-detail screen with scrollable details, pop-up pick lists, horizontal scrolling, field validation, etc. I have serious doubts that a comparable 3GL program can be developed in four hours, but I never, ever say "never."

3. There was mention of the supposed limitations of 4GLs: "In the 4GL, if the feature isn't there, you're either stuck or you have to go through unbelievably

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Figure 1: PL/SQL example

```
    /* Calculate closed business total from detail records. */
begin
  select sum(rp.qty*rp.price) into :ag.tot_closed
    from rev_prod rp, acct
    where rp.acct_cd = acct.cd
      and acct.group_cd = :ag.cd;
  if :ag.tot_closed > :ag.tot_projected then
    :global.mgmt_control_code := 'X';
  end if;
  exception
  when no_data_found then
    :ag.tot_closed := 0;
end;
```

time-consuming and inefficient contortions to achieve your objective."

That may be so with some products, but the major 4GLs incorporate procedural languages to facilitate those occasions when the 4GL won't automatically solve a problem. For example, Oracle's procedural language is called PL/SQL. In fact, PL/SQL is the current procedural language in the proposed ANSI SQL3 standard. PL/SQL meets virtually *every* programmatic need that the 4GL doesn't directly address. It is a block-oriented language that is easy for a programmer to pick up. For an example, see Figure 1.

4. One of the other authors raised doubts concerning the 4GL industry's proclaimed 10-to-1 productivity gains. I share these same doubts, but only to a degree. The other author finds that 4GLs result in only a 10 percent total elapsed time savings. After many man-years of writing 4GL applications, we have found the overall savings ratio to be 3 to 1. That's a 67 percent savings—not 10 to 1, but a dramatic improvement nonetheless.

So why can't the other author obtain that level of productivity improvement? Maybe he answered that question himself when he wrote, "It all comes down to using the right tool for the right job." As with 3GLs, you've got to choose the right 4GL for the job, too!

5. It was asserted that a major flaw of 4GLs is an inability to share data with existing applications. While not all 4GLs are created equal, the major 4GLs do provide facilities for data sharing. For example, Oracle provides several approaches for solving this problem. First, you can use an Oracle product called SQL*Connect, which allows 4GL programs to access non-Oracle data. SQL*Connect currently supports more than 50 different data base engines. And what if your data base isn't on the list? Then you can write a 3GL subroutine that can be called from the 4GL to perform the required non-Oracle processing. This 3GL subroutine mechanism takes only a little longer to implement than writing the I/O statements in a standalone 3GL program, and it allows you to take advantage of all the 4GL benefits simultaneously.

The last word

4GLs don't solve every business problem. However, they are designed to quickly and easily solve traditional business data processing challenges. Managers, don't dismiss 4GLs until you're sure your requirements, both near and long term, are better served by a 3GL; 4GLs have proven themselves to be viable alternatives. If you need additional convincing, give me a call. The real world is successfully using 4GLs more each day. Δ

Kim Medlin is a senior consultant with Data General's Solution Services group in Atlanta, Georgia. Solution Services specializes in custom software design, development, implementation, and consulting. Medlin's address is 3617 Parkway Lane, Norcross, GA 30092. He may be reached at 404/448-6072, extension 2007.

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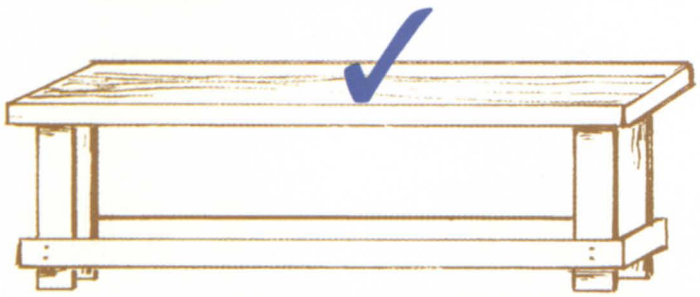

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Cobol lacunae

SYNOPSIS

Cobol programmers may be so used to their beloved language's shortcomings that they don't even realize what they're missing. So contends the author, who suggests some enhancements.

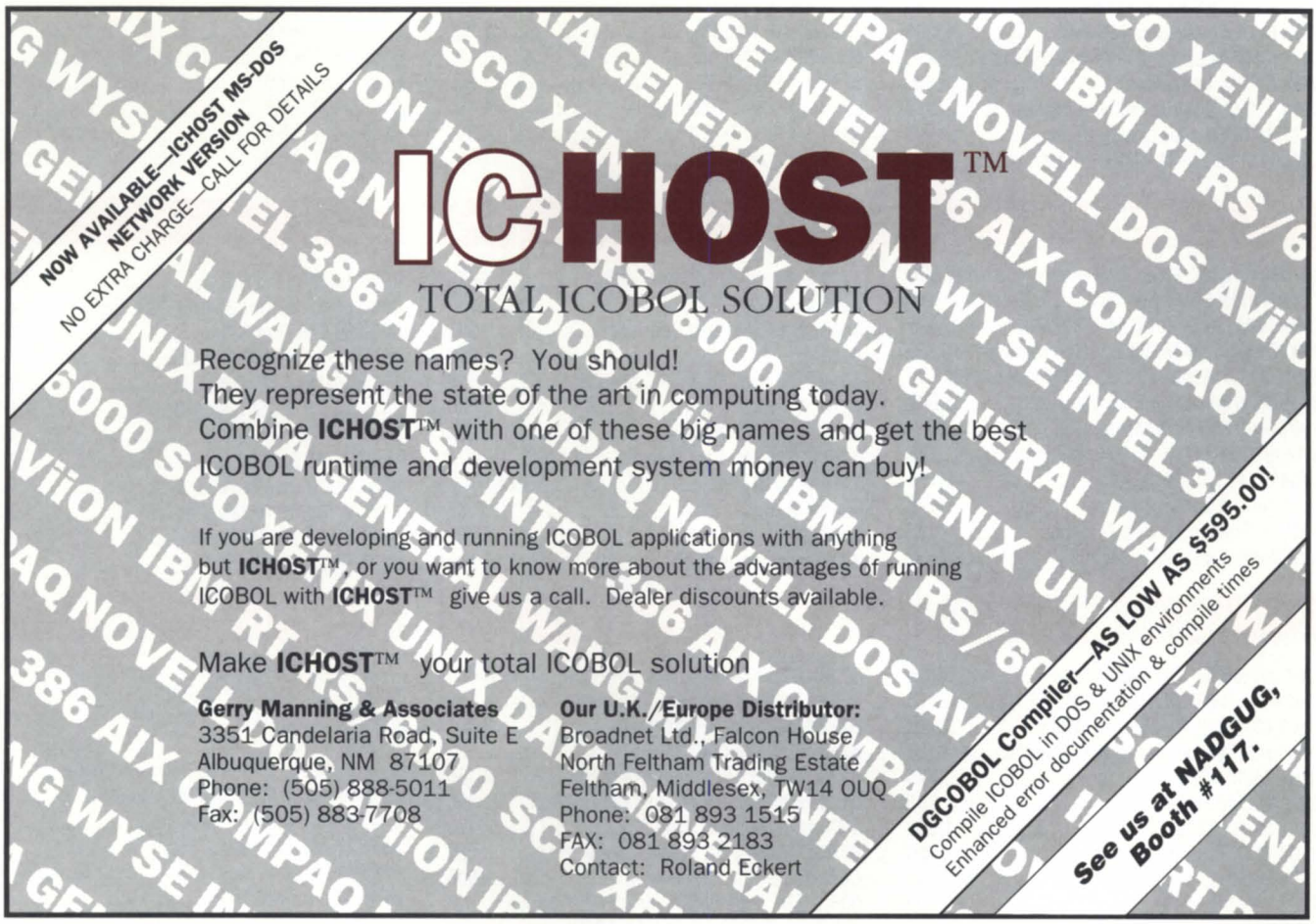
by Ephraim Nussbaum
Special to Focus

Let's face it, (I)Cobol has some serious deficiencies. I know them's fightin' words to many, but hold your ire and give me a chance to explain. First, I *like* ICobol. I've been using it for about a dozen years. I can generally use it to get any request done reasonably quickly.

There are enhancements I would love to have, but it wouldn't be fair to call not having them deficiencies. A deficiency is lack of a fundamental need. Every so often I bump up against one of these and have to abandon some idea. I'm getting more and more tired of saying (to myself and others), "You can't do *that* in Cobol."

We Cobol programmers are so used to these shortcomings that we don't even realize what we're missing. However, programmers new to Cobol sometimes express frustration at the extreme difficulty of doing some basic things. Cobol programmers consider themselves to be very clever indeed, perhaps justifiably, when they write a resource-eating routine to accomplish something that should have been done with one or two statements. If you don't know what I'm talking about, either you don't know Cobol or you are a Cobol programmer.

My goal in this article is to do some consciousness-raising. To start with, here are five needed improvements to string handling.



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1) Substrings: One of Cobol's great strengths is its ability to define levels of subfields. Still, there are many situations in which this just doesn't suffice. Levels are defined at compile time. Sometimes it's necessary to access a subfield whose position is determined at runtime. It should be possible to access a subfield by its starting and ending position. Perhaps like this:

```
MOVE FIELD-1 [ID-LIT1, ID-LIT2] TO
FIELD-2.
MOVE FIELD-1 TO FIELD-2 [ID-LIT1,
ID-LIT-2].
MOVE FIELD-1 [ID-LIT1, ID-LIT2] TO
FIELD-2 [ID-LIT3, ID-LIT4].
```

This would always be an alphanumeric move (byte by byte), regardless of the picture clauses of the sending and receiving fields. My syntax uses square brackets to distinguish from parentheses.

ID-LIT2 would default to the end of the field. If either ID-LIT is out of bounds, I think it should not return an error, but act according to some standard rules.

2) Move alphanumeric field to right of receiving field instead of left:

```
01   FIELD1 PIC X(5)
VALUE "    ABCDE".
01   FIELD2 PIC X(10).

MOVE RIGHT FIELD1 TO FIELD2.
```

would result in FIELD2 being
"   ABCDE".

If you think that's what the JUSTIFIED clause does, check it out.

3) Strip white space: It is very difficult to line up fields by their first printable character. It's even harder to line up fields by their last printable character. It takes more statements and temporary fields than I'm usually willing to bother with. The added statements may slow down a program so much as to render it impractical.

Suppose you have the following:

```
01 NAME-LIST.
   05 FILLER PIC X(15)
VALUE " EENIE      ".
   05 FILLER PIC X(15)
VALUE " MINY       ".
   05 FILLER PIC X(15)
VALUE "        MOE     ".
01 NAME-LIST-R REDEFINES
NAME-LIST.
   05 A-NAME OCCURS 3 TIMES PIC
X(15).
```

You would like to print them aligned either right or left, like this:

```
EENIE
MINY
MOE
```

or like this:

```
EENIE
 MINY
  MOE
```

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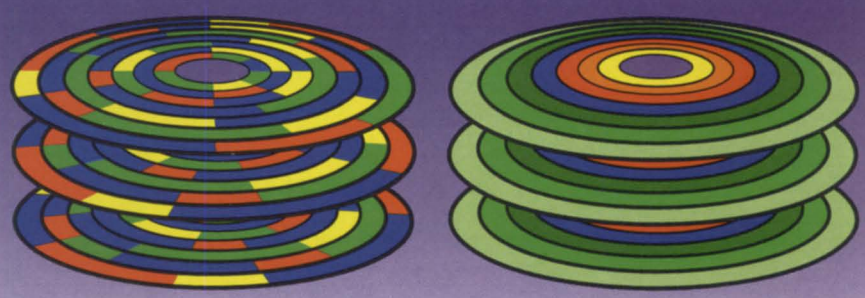

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It usually isn't worth the effort. Instead, you instruct your data entry clerks to be more careful. Why should it be so hard to do something so fundamental? Besides, there are sometimes important reasons to align fields. Perhaps the statement could look like this:

```
01      FIELD1  PIC X(10)
VALUE "    JOE BLOW "
01 BEST-FIELD   PIC X(10).

MOVE DATA FIELD1 TO BEST-FIELD.
```

to strip white space and align by first printable character. BEST-FIELD would then be "JOE BLOW ".

Note that this syntax does not create a new reserved word. By the phrase, "MOVE DATA", I mean move the data only, stripping leading and trailing blanks and tabs (or other nonprinting characters), move the stripped field to the receiving field, and pad with spaces again if necessary.

"MOVE STRIPPED" might be better syntax, but requires a new reserved word. As a side benefit, this statement could be used to convert leading and trailing nonprint characters (ctrl characters, low-values, etc.) to spaces. Combined with the previous suggestion, we would have:

```
MOVE DATA RIGHT FIELD1 TO
BEST-FIELD.
```

to strip white space and align by last printable character giving:

```
"    JOE BLOW".
```

It would also be wonderful if some clause in the screen section would automatically strip input fields and align them left or right.

4) Length function: To return the length of an alpha field—yes, I know Cobol has fixed length fields. What I want is the number of characters, exclusive of *trailing* white space:

```
MOVE LENGTH ANY-FIELD TO WS-
FIELD-LENGTH.
MOVE LENGTH ANY-FIELD [ID-LIT1,
ID-LIT2].
```

5) Match function: To return the position of one ID-LIT within another. The INSPECT verb only finds a single character, not a string. The INSPECT verb could be modified to allow:

```
INSPECT FIELD1 TALLYING WS-
COUNTER FOR ALL CHARACTERS
BEFORE LEADING ID-LIT.
```

where ID-LIT is any string. Combined with substring handling, we would have:

```
INSPECT FIELD1[ID-LIT1, ID-LIT2]
etc.
```

Or better, create a whole new verb and syntax to solve this problem:

```
MATCH (ID-LIT1, ID-LIT2) TO WS-
```


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```
MATCH-POSITION.
```

to set WS-MATCH-POSITION to the position of ID-LIT1 within ID-LIT2.

As it is now, the difficulty of finding the position of one string within another is simply maddening. Note that I want to find literals within identifiers, and identifiers within literals.

The five suggestions listed here would not be of great value individually. Put them together and I can finally do some things I've been wanting to do for years.

The new STRING and UNSTRING statements partially solve these problems, and I'm grateful. I'll use them occasionally.

6) Convert formatted-numeric field to numeric: Suppose you want to read in a print file and reprocess the data. Each line contains fields, such as:

```
24.50
$ 24.50
$243,567.80-
```

You want to move the value of these fields to standard ICobol numeric fields. A Cobol programmer would not ordinarily dare *think* of such a thing. Why *shouldn't* we have a way to do this?

Several interpreted languages can do it. I've done this myself in ICobol (feeling very clever indeed), so the compiler writers can certainly handle it.

As to possible syntax . . . hmmm, let me think a minute. Well, maybe what we need is a new data type: PIC FF formatted numeric data.

```
01 PRINTED-FIELD PIC F(10)
VALUE "   -999.89 ".

    MOVE PRINTED-FIELD TO
WS-NUMBER.
```

A move to a formatted field would just be an alphanumeric move. A move from a formatted field to a numeric or numeric-edited field would cause the compiler to convert to the format of the output field. What happens if the field is not a valid number?

```
01 PRINTED-FIELD PIC F(10)
VALUE "  ABV9.98".
    MOVE PRINTED-FIELD TO
WS-NUMBER.
```

Take your pick: (a) it moves a zero; (b) it ignores the invalid characters; (c) results unpredictable; or (d) it returns an error. I could be happy with any of these, but I'd prefer the first.

As I see it, these additions to Cobol are necessary for the language to be complete. Sure, a programmer can manage when he has to. What I meant by "You can't do that in Cobol" was, "You really *don't want to* do that in Cobol." Δ

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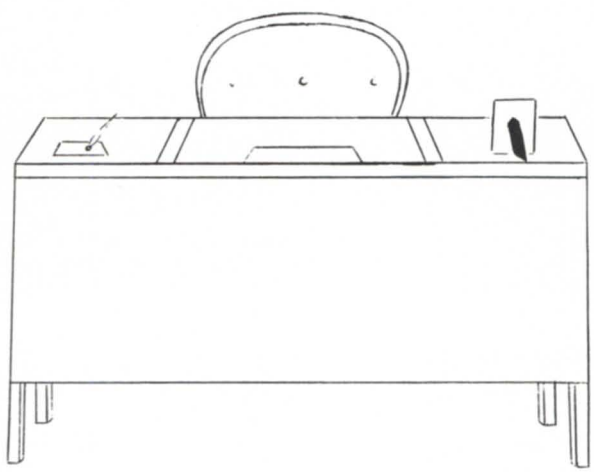

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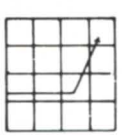

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DG/UX: the least you should know about it

SYNOPSIS

This article is intended for Unix newcomers. The main goal: to point you in the right direction without getting into too much detail. It's a cultural education, rather than a step-by-step guide.

by Alan Braxton
Special to Focus

Let's begin with some basic concepts:

Accounts

An account needs to be set up for you by your system administrator, to allow you to log onto a DG/UX system. You need to know the username and the password. This username is how you will be known to the DG/UX system and to other users. For example, if your username is "Fred," and another user wishes to send you electronic mail, the other user will specify Fred as the message's recipient.

Files

A file is a collection of data that's been given a name, and is permanently stored on the disk. DG/UX has different file types, but only two are important to us:

Ordinary files. These are usually test, data, programs, or executable binary files. Following are some attributes associated with ordinary files:

- filename
- file size in bytes
- data last modified
- permissions
- owner and group.

Directories. This is a special type of file containing information necessary to keep track of other files. Directories for DG/UX are tree-structured (very similar to MS-DOS). Directories may contain files and other directories.

DG/UX on-line help

Before you actually start experimenting with DG/UX commands, you should know that DG/UX is case-sensitive (*ls* and *LS* are not the same command).

Help. Type *help* at the operating system prompt. You will get the following screen:

help: DG/UX System On-Line Help

choices	description
s	starter: general information
l	locate: find a command with keywords
u	usage: information about commands
g	glossary: definitions of terms
r	Redirect to a file or a command
q	Quit

Enter choice >

Type *s* for starters, and you will get the following screen:

starter: General DG/UX System User Information starter provides general information for system users. Enter one of the choices below to proceed:

choices	description
c	Commands and terms to learn first
d	Documents for system users
l	Local DG/UX System information
r	Redirect to a file or a command
q	Quit
h	Restart help

Enter choice >

As you may have noticed by now, help is a good place to start. If you are not sure how to use a command, you can always type:

usage command-name

where command-name is the name of the command on which you want help.

For example, if you want help on the *cat* command, type:

usage cat

you will get something like this:

cat: Description
Syntax Summary: cat [-su] [-v [-et]] [file_name ...]

where: *file_name* is the name of a file.

Description: *cat* is shorthand for "concatenate." Use *cat* to send the contents of a file to standard output. If more than one filename is used, *cat* prints each file in sequence on the standard output; *cat* echo's standard input if you do not list a filename, or if you use "-" as an argument. See also: cp(1) and pr(1) for commands with functions similar to *cat*.

Choices: o (options), e (examples), DG/UX_command, p (print list), r (redirect), q (quit)
Enter choice >

- man

If you cannot remember all the flags and the exact syntax of every single command, don't worry. There is another way to get help. For example, if you want to find out what are the options for the *ls* command, you can type:

man ls

This will show you the options available for the command, and generally will include some examples as well.

Your shell

The commands that you give the DG/UX system are processed by a program called the "shell." This program accepts your commands, interprets them, and executes them. You can write programs using your favorite shell. These programs are usually referred to as "shell scripts." If you are familiar with MS-DOS, you can think of them as equivalent of batch files.

There are different verions of the shell, but the default for most systems is the Bourne shell.

Bourne shell. If you are not sure what shell you are running, just type *sh*. This will start a new shell. You can start typing commands, and when you are done type *exit*.

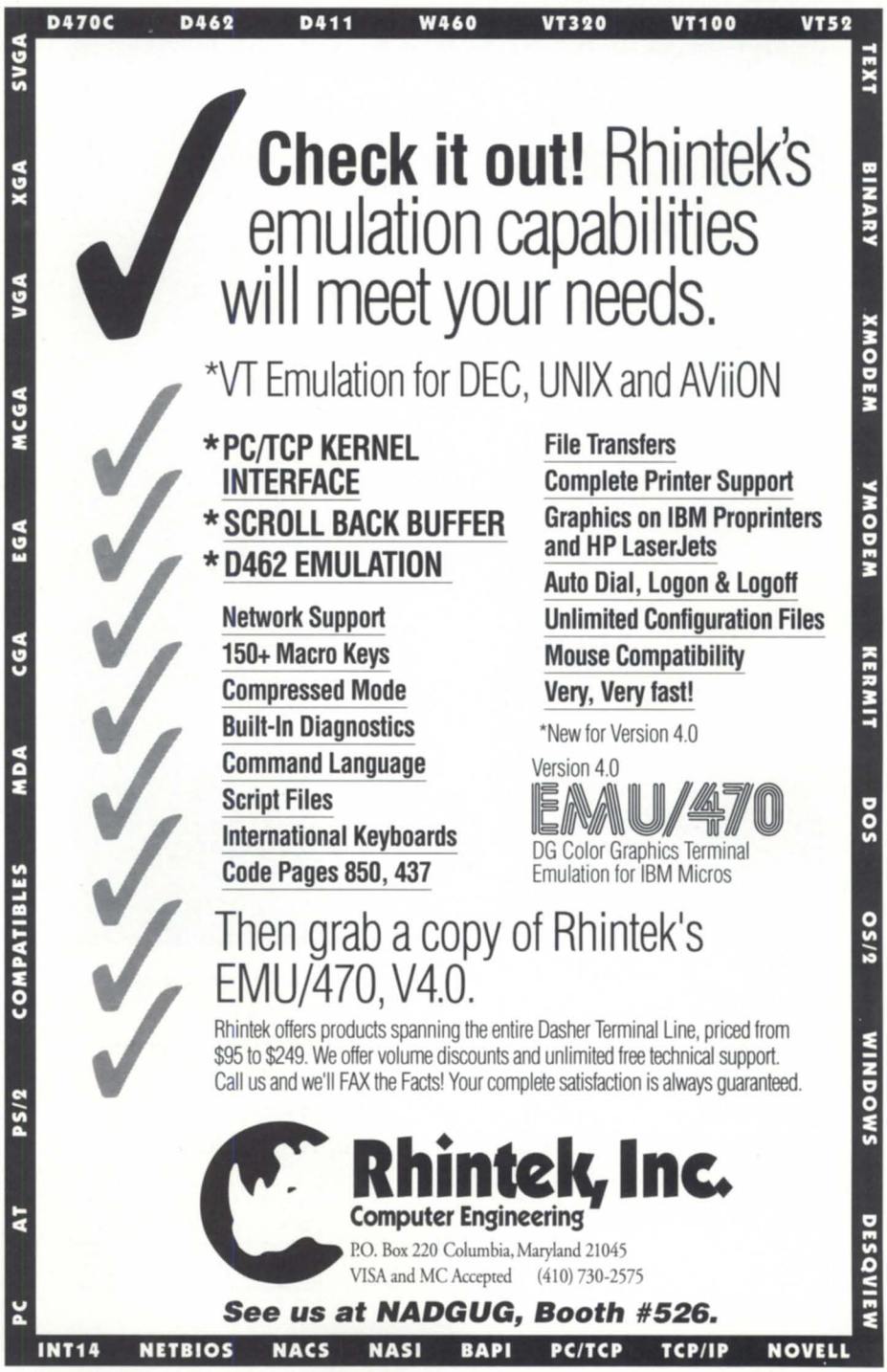
C shell. As the name suggests, this is a more "C"-like shell. If you want to run this shell, type *csh* and type *exit* when you are done. If you are already familiar with C, it should be relatively easy for you to start writing scripts in C shell.

Creating and using program

Editors. There is a large number of different editors available for the DG/UX system. You will need to select one of them and get familiar with it. The editor that we will cover here is *vi*, because it is always available, and it is free! If you decide you don't like *vi*, try *emacs*. It is available from various sources, but generally you can get a copy from your local users group.

A full-screen editor, *vi* is included in the DG/UX operating system. We will go over the most basic functions here. It has two modes: command mode and insert mode.

Command mode. When you are in this mode, your keystrokes are treated as commands. Uppercase and lowercase letters have different meanings. Gener-



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ally speaking, an uppercase command acts before the cursor, and a lowercase acts on text after the cursor. You can hit the escape key to get back in command mode.

Insert mode. To enter test into the file, you have to be in this mode. Enter a lowercase *i* to get into insert mode, and hit the escape key to get back out.

Let's start *vi* and edit a file called delete.me. Type *vi delete.me* and this will start your editing session, putting you in the command mode. Let's get in the insert mode by typing a lowercase *i*. Now you can start typing text. When you are done entering text, hit escape to put you in command mode. Now move the cursor over a part of text that you want to delete, and type *x*. This is how you delete text. To re-enter it, just type *i* again and type the text in. After you are done with the text and want to save the file, hit the escape key and type *:wq*. This writes the file and quits the editor. If you want to quit the editor without saving the file, you can type *q!*.

Now you know the basics of how to use the editor.

Commands to learn first

Some you need to know to get started:

cd

Lets you change directories. Example: *cd /usr/fred*.

ls

This is the Unix version of the MS-DOS directory (dir) command; it lets you see the list of files in directories, and their attributes, such as size and owner and permissions.

cat

This types the contents of a file to the standard output (your screen). Example: *cat myfile*. If you have a file called "myfile", you can type it out to your screen this way.

cp

Lets you copy files. Example: *cp myfile newfile*. This example copies the first file (myfile) to a new file called "newfile".

pwd

Lets you know where you are. Example: If your default directory is /user/fred, typing *pwd* will result in the operating system typing the following line to your screen: */user/fred*.

Conclusion

The aim of this tutorial is to teach you how to start using the DG/UX system quickly and painlessly. For this reason, I have not provided you with complete information about each command. Information is available in the DG/UX documentation and in a variety of books. Δ

Alan Braxton is in systems administration at Acucobol, Inc., 7950 Silverton Avenue, Suite 201, San Diego, CA 92126; 619/689-7220.

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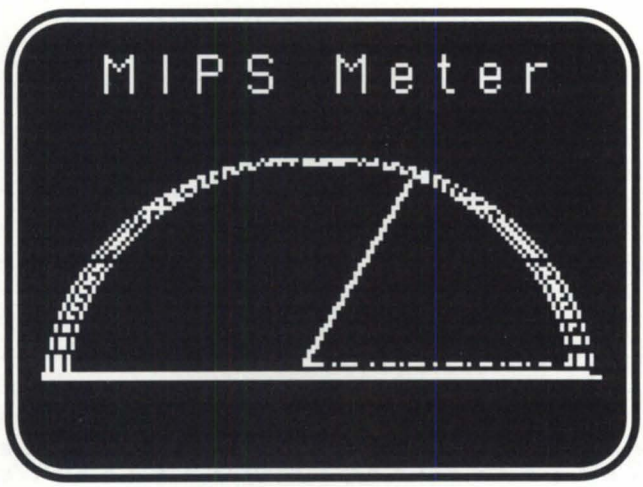
Is your CPU cookin'? MIPS Meter tells all



SYNOPSIS

Are MIPS really just a Meaningless Indicator of Processor Speed? Or do they represent something useful? How can we see MIPS on a system? This article will discuss performance metrics in the Wonderful World of MVs, and describe some free (that's right, free, no charge, no obligation!) software from Data General—the MIPS Meter and the Disk I/O Meter.

by Tom Gutnick
Special to Focus

MIPS is actually an acronym for Millions of Instructions Per Second. This certainly sounds simple—but which instructions are we talking about? On a typical complex-instruction-set computer, such as the Eclipse MV family, some instructions execute in a single machine cycle while other instructions may require several cycles.

The mix of instructions affects how many of them can be processed in a second. And it gets even more confusing now with RISC (reduced instruction set computing) processors such as the Motorola 88000 used in Data General's Aviion systems: every instruction executes in a single cycle, but the work done by a single CISC (the "C" is for "complex"—the opposite of RISC) instruction may require a loop of a dozen RISC instructions. Thus, the differences in instruction sets mean that MIPS ratings from different manufacturers, and even different architectures from the same manufacturer, are not readily comparable.

Because of possible confusion and the lack of a precise meaning, Data General tried for years to ignore MIPS ratings—but the marketplace demanded them! So for several years, Data General based its MIPS ratings on the Whetstones rating for each processor.

The Whetstones benchmark was developed in England in the 1960s. Based on an analysis of 949 Algol programs, it is a Fortran program that runs what was considered then to be a typical mix of instructions. There are a few problems with relying on Whetstones as our measure. The benchmark primarily tests floating-point number-crunching performance, but it also really tests the speed of the hardware's subroutine linkage mechanism and the quality of the compiler used!

More important is the fact that floating-point performance is not an accurate predictor of system behavior for most commercial users. Having a faster floating-point unit doesn't generally make CEO or Cobol/Infos applications run any faster. In any case, the MV/20000-1, for example, can process 7,133 single-precision kWhetstones per second, so we used to call it a 7.1 MIPS system.

The dhrystones benchmark was developed in the early 1980s, in an attempt to run a more typical instruction mix than the Whetstones programs. Dhrystones was originally written in Ada, but we use the C version. It

tests CPU functions such as integer arithmetic, character manipulation, and array indexing. Again, the benchmark measures compiler quality as much as the speed of the CPU, but it provides a somewhat more accurate picture for typical users.

The choice of Whetstones vs. dhrystones didn't used to make a whole lot of difference to the average Data General customer. Data General's published Whetstones ratings were always obtained with any optional hardware floating-point units. For earlier machines, the Whetstones and dhry-stones ratings tended to be similar. But the newer members of the MV family have been designed to optimize commercial DP performance rather than floating-point number-crunching. The systems based on the "Washi" chip (i.e., the

Figure 1: MV family processors, low-end systems

Processor	Announced	MIPS	OA Users	DDP Ratio	dhry-stones	kWhet-stones (S/P)	kWhet stones D/P)	Max Mem (MB)	Max Async Ports	Max BMC Ctrlrs	DCH /BMC /MRC	Packaging
MV/1000DC	4/89	1.4	24		1,405	966	778	12	32			Desktop
MV/1400DC	7/87	1.4	24		1,419	966	778	12	12			Pedestal
MV/2000DC	10/85	1.4	28		1,419	966	778	12	64			Pedestal
MV/2500DC	7/88	2.6	47		2,567	1,646	1,279	24	64			Pedestal
MV/3200	**7/92**	**3.0**	**30**	**3,054**	**2,316**	**1,845**	**24**	**40**				**Desktop**
MV/3500DC	8/90	4.6	42		4,640	4,200	2,490	64	56			Desktop
MV/3600	**7/92**	**6.2**	**77**	**6,220**	**5,815**	**3,508**	**64**	**104**				**Desktop**
MV/4000DC	2/85	1.1	12		1,130	702	546	8	32			Pedestal
MV/4000	11/82	1.1	12	1,130	702	546	8	64	4			Meter-high
MV/5500DC	4/90	7/2	100		7,196	4,681	2,839	32	144			Pedestal
MV/5600	**7/91**	**9.6**	**145**	**9,578**	**6,545**	**4,033**	**128**	**208**	*			**Pedestal**
MV/7800DC	10/86	1.4	31		1,379	1,127	808	14	48	1		Pedestal
MV/7800DCX	6/87	2.0	42		1,998	1,643	1,175	28	48	1		Pedestal

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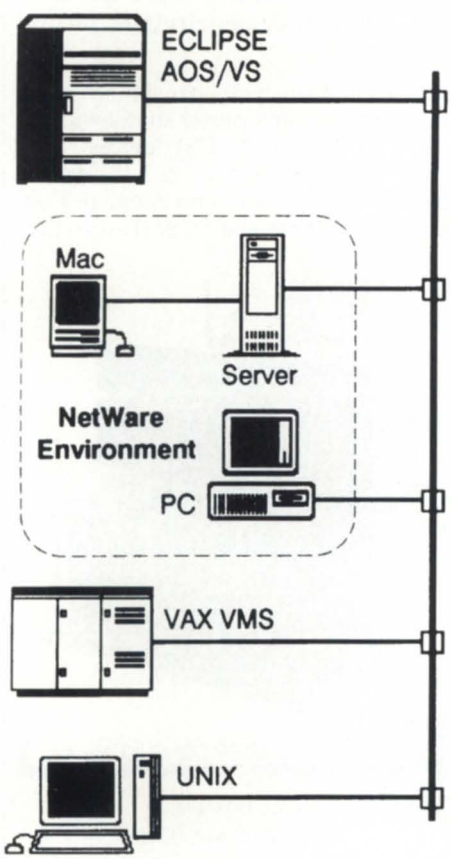
micro MV processor) do not have a separate FPU. The MV/9500, for example, has a kWhetstones rating (for single precision) of 4,681 but a dhrystones rating of 7,196. So do we call it a 4.7 MIPS machine or a 7.2 MIPS machine? Two years ago, we basically stuck a wet finger in the wind and arbitrarily called it a 5 MIPS machine.

Effective with the announcement of the MV/35000 and MV/60000HA series (April 1992), Data General is now basing MIPS ratings on the dhrystones benchmark exclusively. And we are restating the MIPS ratings of the entire MV family, including older processors, based on the dhrystones benchmark. Figures 1-4 show the MIPS ratings along with various other performance metrics for current and older processors.

Figure 2: MV family processors, mid-range systems (1)

Processor	Announced	MIPS	OA	DDP Users	dhry-Ratio	kWhet-stones	kWhet stones (S/P)	Max stones D/P)	Max Mem (MB)	Max Async Ports	DCH BMC Ctrlrs	Packaging /BMC /MRC	
MV/7800	6/86	1.4	31		1,379	1,127	808	14	128	4	1/1/2	Rackmount	D
MV/7800XP	6/87	2	42		1,998	1,643	1,175	28	128	4	1/1/2	Rackmount	
MV/8000 II	6/83	1.8	27		1,800	1,502	1,300	12	128	6	1/1/2	Meter-high	
MV/9300	**7/91**	**4.9**	**75**	**52**	**4,861**	**4,640**	**2,372**	**128**	**624**	**8**	**1/1/2**	**Rackmount**	
MV/9500	4/90	7.2	123	78	7,196	4,681	2,839	128	624	8	1/1/2	Rackmount	
MV/9600	**7/91**	**9.6**	**159**	**107**	**9,578**	**6,545**	**4,033**	**128**	**624**	**8**	**1/1/2**	**Rackmount**	
MV/10000	3/83	3.7	80		3,725	3,212	2,694	32	192	16	1/2/2	Meter-high	
MV/10000SX	1/85	4.2	80		4,237	4,365	3,579	32	192	16	1/2/4	Meter-high	
MV/15000-8	1/87	2.7	59		2,661	3,057	2,634	64	432	7	1/1/4	Rackmount	
MV/15000-10	1/87	4.4	94	73	4,401	4,567	3,964	64	432	7	1/1/2	Rackmount	
MV/15000-20	1/87	7.3	148		7,340	7,133	5,052	64	432	7	1/1/2	Rackmount	
MV/18000-1	10/89	4.4	90	73	4,401	2,482	1,376	64	768	7	1/1/2	Rackmount	
MV/18000SX	10/89	4.4	94		4,401	4,567	3,964	64	768	7	1/1/2	Rackmount	
MV/18000-2	10/89	8.8	163	123	8,802	4,840	2,683	64	768	7	1/1/2	Rackmount	



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DDP Ratio

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I could easily write several detailed articles describing the various benchmarks that have been developed in the computer industry. But for now, let's keep things simple.

The challenge is to develop a meaningful benchmark that gives a useful indicator of what the system can do. But if you've ever done any performance analysis, you know that raw CPU power doesn't tell it all.

We have to look at memory management, disk I/O, character I/O, operating system design, and more. In one sense, the only valid benchmark is your own application—but this frequently is not practical, so the quest continues.

One test that Data General has used internally for several years is called the DDP Benchmark. This test does transaction processing against Infos data bases,

Figure 3: MV family processors, mid-range systems (2)

Processor	Announced	MIPS	OA	DDP Users	dhry-Ratio	kWhet-stones	kWhet stones (S/P)	Max stones D/P)	Max Mem (MB)	Max Async Ports	DCH BMC Ctrlrs	Packaging /BMC /MRC
MV/20000-1	10/85	7.3	148	100	7,340	7,133	5,052	64	1,008	16	3/2/4	Meter-high
MV/20000-2	10/85	14.7	212	151	1,680	13,909	9,851	64	1,008	16	3/2/4	Meter-high
MV/30000-1	10/90	7.2	123	70	7,196	4,681	1,453	256	2,472	24	3/3/4	Rackmount
MV/30000—2	10/90	14.4	220	122	14,392	9,128	2,830	256	2,472	24	3/3/4	Rackmount
MV/30000-3	10/90	21.6	306	165	21,588	13,575	4,210	256	2,472	24	3/3/4	Rackmount
MV/30000-4	10/90	28.8	392	199	28,784	18,022	5,590	256	2,472	24	3/3/4	Rackmount
MV/35000-1	**4/92**	**9.6**	**196**	**111**	**9,578**	**6,545**	**4,033**	**512**	**2,472**	**24**	**3/3/4**	**Rackmount**
MV/35000-2	**4/92**	**19.2**	**363**	**197**	**19,156**	**13,090**	**8,066**	**512**	**2,472**	**24**	**3/3/4**	**Rackmount**
MV/35000-3	**4/92**	**28.7**	**530**	**277**	**28,734**	**19,635**	**12,099**	**512**	**2,472**	**24**	**3/3/4**	**Rackmount**
MV/35000-4	**4/92**	**38.3**	**706**	**354**	**38,312**	**26,180**	**16,132**	**512**	**2,472**	**24**	**3/3/4**	**Rackmount**
MV/35000-5	**4/92**	**47.9**	**858**	**415**	**47,890**	**32,725**	**20,165**	**512**	**2,472**	**24**	**3/3/4**	**Rackmount**
MV/35000-6	**4/92**	**57.5**	**1,019**	**476**	**57,468**	**39,270**	**24,198**	**512**	**2,472**	**24**	**3/3/4**	**Rackmount**

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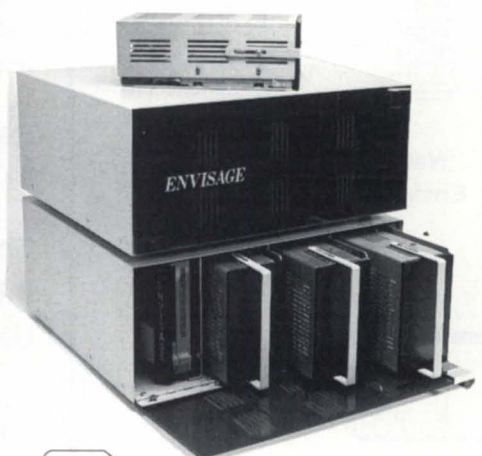

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so there's plenty of disk I/O activity. We configure hardware for the tests with enough memory and disk spindles that they don't constitute a bottleneck. Multiple copies of the program are run (in fact, as many as can be run until CPU saturation occurs). Memory management, disk I/O, character I/O, operating system overhead—all these factors enter into the measurements.

Each "transaction" consists of a read request from one Infos data base, four read requests against a second data base, one screen display, one write request to a third Infos data base, plus some minor arithmetic calculations. Even this isn't a perfect benchmark, but we have found that it gives a fairly accurate indicator of the relative performance of different MV family processors, when used for typical commercial applications.

In fact, the DDP benchmark has turned out to be a highly accurate predictor of CEO performance. Unlike more synthetic benchmarks, this test gives us a reliable indication of how well a multiprocessor system scales—how much we benefit by adding job processors to the system.

Figure 4: MV family processors, high-end systems

Processor	Announced	MIPS	OA	DDP Users	dhry-Ratio	kWhet-stones	kWhet stones S/P)	Max stones D/P)	Max Mem (MB)	Max Async Ports	DCH BMC Ctrlrs	Packaging /BMC /MRC
MV/40000	10/88	14.4	232	133	14,375	14,558	11,940	256	2,928	16	3/3/2	Free-standing
MV/40000HA-1	10/88	14.4	232	133	14,375	14,558	11,940	256	4,224	32	4/4/6	Free-standing
MV/40000HA-2	10/88	28.8	418	223	28,750	28.388	23,283	256	4,224	32	4/4/6	Free-standing
MV/40000HA-3	10/88	43.2	580	297	43,125	42,218	34,626	256	4,224	32	4/4/6	Free-standing
MV/40000HA-4	10/88	57.5	742	356	57,500	54,048	45,969	256	4,224	32	4/4/6	Free-standing
MV/60000HA-1	**4/92**	**29.7**	**489**	**271**	**29,732**	**10,322**	**5,442**	**1024**	**5,736**	**48**	**6/6/12**	**Free-standing**
MV/60000HA-2	**4/92**	**59.5**	**892**	**475**	**59,464**	**20,.644**	**10,884**	**1024**	**5,736**	**48**	**6/6/12**	**Free-standing**
MV/60000HA-3	**4/92**	**89.2**	**1,299**	**665**	**89,196**	**30,966**	**16,236**	**1024**	**5,736**	**48**	**6/6/12**	**Free-standing**
MV/60000HA-4	**4/92**	**119**	**1,709**	**841**	**118,928**	**41,288**	**21,768**	**1024**	**5,736**	**48**	**6/6/12**	**Free-standing**

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Effective with the April announcement mentioned above, DG is now publishing a new metric based on the DDP benchmark, called the DDP Ratio. This ratio is calculated as an index, based on an MV/20000-1 as 100. Thus, the MV/9600's DDP ratio of 107 means that it runs typical commercial applications roughly 7 percent faster than on an MV/20000-1. Whereas MIPS or dhrystones is an absolute measure, DDP is a relative measure. Since we don't know anything about your application, it's hard to say how many users you can support on a specific CPU. But we *can* help you predict the performance benefits from upgrading to other processors. (Note that Figure 1 has the DDP Ratios only for newer members of the MV family.)

Measuring MIPS

At the NADGUG 90 Conference in Seattle, Data General showed a program called the MIPS Meter. It looks like a tachometer! The farthest position is labeled 14.7 MIPS, based on the dhrystones rating. An indicator needle shows that at a particular moment, for example, the system is using 8.65 of those MIPS, based strictly on the percentage of CPU time being consumed. Histograms at upper left show the breakdown of CPU time during the current cycle—system, user, and idle time—for each job processor. Pressing D toggles the display. Now you have display showing the breakdown of CPU time over the last several (up to 100) cycles.

A point to remember: the MIPS Meter doesn't tell you the whole story. A speedometer by itself doesn't tell you the whole story of how an automobile is doing. To properly assess your car's performance, you need to monitor the tachometer, fuel consumption, vacuum, and oil pressure. Similarly, you can't properly analyze your computer system's performance without looking at I/O and memory utilization. But the MIPS Meter does give you one useful indicator.

A companion tool is the Disk I/O Meter, which was displayed at NADGUG 91 in Denver. It shows the number of I/O requests being processed, for up to three disk controllers. The upper portion of the display is another tachometer-like display, showing I/O throughput for the current cycle. The lower portion is a histogram, showing the throughput over time, with up to 100 cycles displayed. By default, the program takes 100 I/Os per second as the "red line," but you can specify other values. For an Argus or SCSI controller, 50 is probably a good value. Most sites don't get more than 50 I/Os per second through those controllers, regardless of how many drives are on the controller. But for a fully loaded R.A.M.S. or SCSI-2 controller, 300-400 I/Os per second may well be attainable. (This is a simplistic program; press ^C^B to exit.)

Free software!

"Okay, I'm hooked. How do I get it?' It really is free. Data General decided to make this software available to its customers at no charge.

One way to get the meters is through the NADGUG Software Library. We donated the meters to the NADGUG library (see page 58 for information about obtaining software from the library).

The other way is from DG's Systems Analysis and Performance Evaluation Center (SEPAC). On request, SEPAC will send you a tape with a 30-day trial copy of their Real-Time Performance Monitor and a non-expiring copy of the MIPS Meter, with no obligation. Write to: SEPAC, Data General Corporation, 3617 Parkway Lane, Norcross, Georgia 30092; or phone 404/448-6072.

Like I said before, MIPS are only part of the story, and a system with performance problems should undergo proper performance analysis. But with these tools, at the very least you'll be able to see whether your CPU is really cookin'—although not, we hope, smokin'!

Δ

Tom Gutnick is a Systems Engineering Consultant for Data General. He has been playing with computers for nearly two decades, and specializes in operating system performance and security issues. He can be reached at 7927 Jones Branch Drive, Suite 200, McLean, VA 22102; 703/827-9669;Internet:Tom_Gutnick@dgc.ceo.dg.com.

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The latest products for DG systems

SQL sequel rev 6.00

Westboro—Revision 6.00 of DG/SQL, Data General's native relational data base management product for Eclipse MVs, has been formally released. This latest revision includes support for the timestamp datatype, precompiled stored procedures, new runtime and data base attributes, new DDU switches, and monitoring and configuration enhancements all promoting more effective resource allocation, data base management, and system performance. Some highlights of major additions and changes:

- Timestamp datatype gives the user the ability to store, retrieve, and manipulate date and time values through a set of formats and functions
- Five new attributes and one for the data base give the user more flexibility for matching resource allocations with environment requirements; new runtime attributes include maximum numbers for data bases open, concurrent transaction locks, transaction lock instances, servers, and clients; the new data base attribute is maximum number of attaches
- New SQL_Monitor enhancements provide a more logically organized presentation of an expanded set of access method statistical information; this is complemented by improved defaults, context-sensitive help information, and the ability to run concurrent monitor sessions on different data bases
- Flexible precompiled stored procedures callable through precompiled programs or other stored procedures

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reduce communication and context switching overheads, thereby increasing performance in a client-server environment.

A revision 6 data base is required with DG/SQL rev 6.00. Revision 5 data bases may be upgraded to revision 6 through the use of the DDU command UPGRADE data base.

The complementary 4GL products from Cognos (Powerhouse 6.05) and Cyberscience (CQCS rev 4.10) have been qualified with DG/SQL rev 6.00; the next revision of DG/Ingres (6.40, expected this calendar year) will further capitalize on its enhancements.

Virtually all major DG/SQL STRs (software trouble reports) have been resolved in rev 6.00.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4056.

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HADA II

Westboro—Data General Corporation introduced the High Availability Disk Array (HADA) II for maximizing system uptime throughout all system levels.

In its base configuration, the HADA II subsystem is packaged with five 500 MB or 1 GB, 3.5-inch SCSI-2 Winchester disk drives. HADA II can provide 2.5 GB to 20 GB of data storage capacity, along with one or two input/output processors (IOPs), DC power supplies, and cooling fans. Each drive is housed in a hot-repairable drive module that can be removed from a redundant group without disrupting operations (in RAID 1, 3, and 5 configurations).

The intelligent RISC-based Input/Output Processor (IOP), which controls the disk groups through five synchronous SCSI-2 buses, is the heart of the HADA II subsystem. The IOP manages the array's environment, automatic diagnostics, and disk formatting. Each disk can be managed individually or as part of a logical group in the disk array. In the event of a failure of a disk within a logical group or a disk channel (SCSI bus), the IOP automatically rebuilds the data to maintain operations.

HADA II can be easily configured with two IOPs, each managing its own logical disk groups. Dual IOP configurations provide redundancy at that level, eliminating this component as a point of failure. Dual-IOP configurations also support dual porting, which allows multiple Aviion host systems to share the HADA II subsystem.

The second generation of DG's high-performance disk array subsystem, HADA II is designed for Unix-based Aviion systems and servers, including the newly announced AV 6280 and AV 4605/4625. Prices for HADA II start at $35,000.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4056.

Circle 71 on reader service card.

UPS systems

Westboro—Data General announced new on-line UPS systems with power capacities of 15KVA and 18KVA. Designed for use in three-phase, 60-Hertz 208/240 volt environments, they support high-end Aviion servers, large Eclipse systems, and multi-system environments.

Like other UPS systems from DG, these provide continuous power to the entire supported computer system during a voltage sag or blackout. Maintaining computer operations during blackouts with battery reserve enables users to shut down the system in an orderly manner, preventing disruptive crashes. There is also power conditioning protection against surges and transients that can damage hardware and corrupt software.

The new UPS systems offer a comprehensive front control/indicator panel; a full RS-232 communications interface; an emergency power-off switch; system bypass; hard-wired input; optional power distribution module; and optional Data-Guard software.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4056.

Circle 72 on reader service card.

Gateway to e-mail

Westboro—MHS Gate for Aviion systems, a new electronic mail gateway from Data General Corporation, allows Novell Message handling System (MHS) mail users to send electronic mail to and from a variety of systems. MHS Gate for Aviion provides e-mail interoperability for $995 per server, for any number of network users.

Users are provided with text and attached document messaging between public and host-based X.400 mail systems, Unix SMTP mail, DG's CEO and AV/Office office information solutions, and popular LAN-based and remote MHS mail systems. MHS Gate may also be used by many non-MHS, LAN-based e-mail systems, such as cc:Mail and Wordperfect Office, via the MHS gateways available on those systems.

MHS Gate is designed to operate with MHS for Aviion systems software. The MHS Administrator can configure additional gateways to allow MHS users to access SMTP, CEO, AV/Office, and X.400 mail systems.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4056.

Circle 73 on reader service card.

Office computing

Westboro—AV Object Office 2.0 from Data General Corporation is a graphical-based departmental office system for PC LAN configurations, combining Microsoft Windows 3.1 and Hewlett-Packard's Newwave 4.0 to provide a broad range of office services.

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Features include: sophisticated electronic mail; integrated incoming and outgoing fax capabilities from Gammalink; mailing lists and alias names; folder-based filing; Novell Netware for Avion file and print services; network installation and diskless PC support; and integrated MS-Windows-based terminal emulation using Dynacomm Asynchronous from Futuresoft Engineering, Inc., for access to server-based data bases and applications.

AV Object Office 2.0 is fully interoperable with other members of the AV OIS product suite, including AV Office and Uniplex's Jason client/server product, as well as DG's CEO Office Automation System.

The system is packaged by user counts and sold in 8, 16, 32, 64, 128, and 250-user models. Prices range from $3,495 for the 8-user model ($437 per user) to to $65,495 for the 250-user model ($262 per user). The system is available in eight languages (English, French, German, Spanish, Swedish, Italian, Dutch, and Kanji).

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Circle 19 on reader service card.

Document management AV

Westboro—Saros Corporation of Bellevue, Washington, will port its Mezzanine platform onto Data General's Avion servers. DG will develop the user interface for workstation and Microsoft Windows clients that will incorporate Mezzanine's document and data management capability through DG's AV Office Information Systems (AV OIS) product suite.

Mezzanine includes program interfaces for network file access from within standalone or group applications, simplifying the use and management of multi-server LANs in file-intensive environments. Mezzanine manages network storage resources on multi-server LANs, including file backup and automatic disposal of dated files. The system is transparent for users of DG's AV Object Office 2.0 and AV Office 2, which is based on Uniplex's Jason (formerly codenamed "Medley") Office Information Systems.

Mezzanine is priced according to the number of users on the network.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4056.

Circle 75 on reader service card.

ICobol-ICHOST merge MV PC

Hauppauge, NY—Egan Systems, Inc. announced that the company has reached an agreement with Data General Corporation to merge DG's Interactive Cobol software with Egan's ICHOST. The resulting product will be called Interactive Cobol 2.0, to be developed and owned by Egan Systems and marketed and supported by both companies. Development and technical sup-

Products and Services, continued on page 59

A complete listing of the NADGUG software library

compiled by Tim Boyer

ACK • A terminal emulator Xmodem/Ymodem file transfer program from Benchmark Products. Operates under AOS/VS and AOS. This is an updated version (2.03). 510 blocks.

BIGBRO • An auto-logoff program, written in F77. From the Forest Service. 170 blocks.

BJ_BBS • A directory containing programs from Brian Johnson's :SYSMGR BBS. Some are Brian's, and some have been put on the board by others. 6,762 blocks.

CCOMP • A Benchmark Products C compiler. It is *almost* fully functional; several items have been left out of the demo version. 864 blocks.

CONCEPT • Two submissions from Concept Automation: NOTIFY lets you know when another process terminates; PRIOS lists the priorities of processes. 162 blocks.

CRTEDIT • The old RDOS editor ported over to VS. 49 blocks.

DBCHECK • Our first submission from Europe. Lee Dickinson of IBIS Information Services, offers a program to check the open status of an INFOS file; examines checkpointing status of a file. 187 blocks.

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

ERP • Another inactive PID terminator. Developed by NASA and modified by Manville. Written in F77. Kevin Danzig found some bugs and corrected them. 454 blocks.

FILEMNGR • Allows manipulation of files through a screen-oriented program. Move, copy, delete, view, and several other options. This is a shareware program. If you continue using it, you are requested to pay a registration fee. 656 blocks.

FOCUS • A directory of programs related to articles published in *Focus*. 1,908 blocks.

FTNCVT • A Fortran-5 to Fortran-77 translator. It was apparently included in early F77 releases by DG to smooth the transition from F5. 232 blocks.

GAMES • Accumulated from various places. Most can be accessed from the GAMES.CLI macro. But a couple, like MONOPOLY and CB, use disabled console and are not included in the main macro. 18,836 blocks.

GUTNICK • Utilities donated by Tom Gutnick of DG. The MIPS_METER and DISKIO_METER require a graphic terminal, and do what their names imply. The SYSLOG_FILTER programs allow choice of which SYSLOG events to record. This feature requires AOS/VS 7.69 or later, or AOV/VS II 2.10 or later. 832 blocks.

IMSLUTIL • A collection of CLI macros, Cobol routines, and Assembly routines callable from Cobol Donated by IMSL, Houston. 4,894 blocks.

JAG_UTIL • MISCUTIL contains several programs. FILECOUNT lists counts and

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combined sizes of files, based on various selection criteria. USERSPACE counts the space used by CPDs within :UDD. SCAN searches for strings within multiple files at the same time. LAMINATE allows you to combine two test files in various ways. QHELP generates tree-structured help files (like VMS has). SWITCHES allows you to painlessly add minimally unique switches to any 32-bit compiled program. GLOSSARY builds a file of word usage. 4,325 blocks.

KERMIT • A file-transfer protocol developed at Columbia University. This version was ported by Phil Julian from the Unix C code. Also included is an EMACS editor. There are also several compression programs. KERMIT is public domain. 9,697 blocks.

LOOK • Used to view text files. Move forward and backward in a file. Donated by DG. 203 blocks.

MACROS • Contains miscellaneous submissions: MACBOOK. 508 blocks.

MENUDIR • From FEDSIG (Federal User's Group), allows you to control (and require) password maintenance by users. 486 blocks.

MISCKERM • My official "KERMIT non-categorized storage facility." If it doesn't have anything to do with Phil Julian's version, but it is related to KERMIT, it goes here. Of special interest is the DG/1 KERMIT (the DG/1 uses different comm chip, and can't use regular IBM PC KERMIT). Source of most of these versions is nebulous at best, so *caveat emptor*. 6,495 blocks.

MSDOS • A program to read MS-DOS 5.25-inch diskettes on AOS/VS systems. 978 blocks.

SOFTRANS • A file-transfer protocol used by a commercial PC communications package. This F77 version is being distributed with the permission of Softronics, the author (per Mike Bay, 10/13/88). 426 blocks.

SPELL • Checks the spelling of a word; SPELLALL spell-checks a document. Submitted by Richard Kouzes, Princeton University. 5,108 blocks.

TEX • (Terminal Emulator with Xmodem) A terminal emulation program written by David Down. Allows Xmodem and Ymodem transfers with options to simplify transfers between DG MVs and various types of PCs. Now features a command language. Distributed as shareware; use for 30 days, then get rid of your copy or send David Down a registration fee. 463 blocks.

VT100KER • The VT-100 emulator from John Grant, part of a KERMIT implementation that does not have the file-transfer protocols working yet. 1,044 blocks.

XFER • A tape-conversion utility. 607 blocks. Δ

NADGUG members interested in receiving the software collection should direct requests to: Michelle M. Dube, NADGUG Association Manager, c/o Danieli & O'Keefe Associates, Inc., 490 Boston Post Road, Sudbury, MA 01776.

Include your membership number, a ship-to address, type of media you require, and payment of $30 to cover cost of the media, shipping, and handling. The library is available on MV/2000-style 20 MB cartridge or 1,200-foot, reel-to-reel tape. Allow 3 to 4 weeks for parcel post delivery. Send software contributions to the above address. For information about non-standard library distribution, call 800/253-3902 (continental U.S. only) or 508/443-3330.

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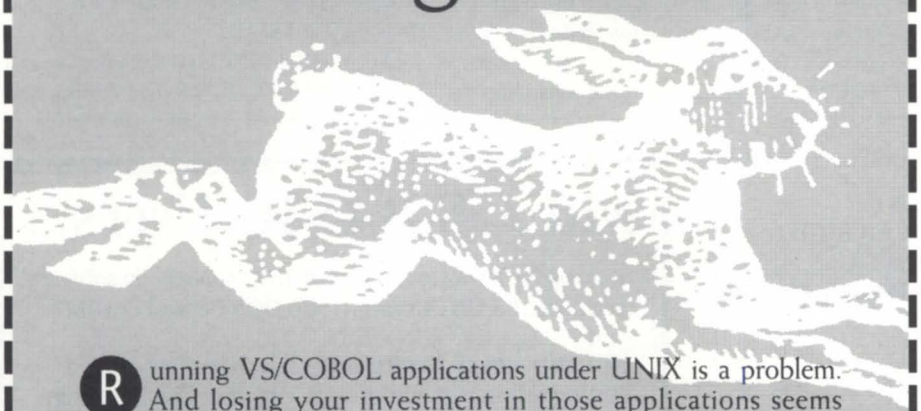

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Circle 62 on reader service card.

Continued from page 56

port for Egan's products is provided by its wholly-owned Envyr subsidiary, located in Raleigh, North Carolina.

This next generation of ICobol will be a true open system language, expected to be faster than other Cobol dialects, with full ANSI '85 high compliance. ICobol will run on all popular Unix versions, as well as on DG's AOS/VS and AOS/VS II operating systems. When installed on a single MS/DOS PC, it will support up to 129 simultaneous users.

Egan Systems, Inc., 89K Cabot Court, Hauppauge, NY 11788; 516/231-7730.

Circle 77 on reader service card.

Stats and graphs

Corvallis, OR—Statware, Inc., released Statit 3.0, an upgrade of its statistical and graphical data analysis system for Data General Aviion family systems.

Designed for end users as well as VARs, Statit 3.0 offers point-and-click or command-line input in its menu interface, as well as context-sensitive help, and the ability to be expanded or changed by the user.

Other features include: user-designed data entry forms; tabular reporting; contour plots; design of experiments; fitting autoregressive vector models; additional nonparametric tests; and new contingency table statistics. For quality control, there is the addition of exponentially weighted moving average (EWMA) charts, cumulative sum based on the *u* chart, and options to handle problems of assignable cause.

Statware has also changed the perpetual licensing of Statit, allowing it to be based on the number of concurrent users needed for each module.

Pricing for Statit's Base System, providing descriptive statistics, data management capabilities, and high-resolution graphics, begins at $695. Optional modules for advanced statistics, custom graphics design, system integration, procedure writing, and SQL data base interface have a starting range of $295 to $395 each.

Statware, Inc., 260 SW Madison Avenue, Corvallis, OR 97333; 503/753-5382.

Circle 81 on reader service card.

PC 'look and feel'

Boulder, CO—Harestylist, a RAD (rapid applications development) tool from Wild Hare Computer Systems, Inc., adds named-object windows and pop-up and pull-down menus to ICobol applications.

Requiring no changes to an application's existing code, Harestylist allows users to give their applications a PC look and feel, providing object-oriented capabilities to ICobol and giving existing applications a true WYSIWYG (what-you-see-is-what-you-get) form. Harestylist is terminal, operating sys-

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Security packages

San Diego, CA—Datalynx, Inc., announced new releases of Guardian and The Unix Guardian access security packages for AOS/VS and Unix System V.4.

Guardian revision 3.2 includes an interface program for the EXEC custom logon feature available in AOS/VS and AOS/VS II. This feature allows the system manager to monitor invalid login attempts for an account, and to inactivate it after a specified count.

Also included in the new release is a second-level access check for critical profiles such as "op" or "sysadm". Accounts using this feature require the user to identify themselves by their personal username and password. All such login attempts will automatically log the identity and location of the person requesting the login.

The Unix Guardian revision 1.10 includes new options for controlling and monitoring user access to the system:

- account access by the "su" command can be restricted
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Datalynx, Inc., 6659 Convoy Ct., San Diego, CA 92111; 619/560-8112.

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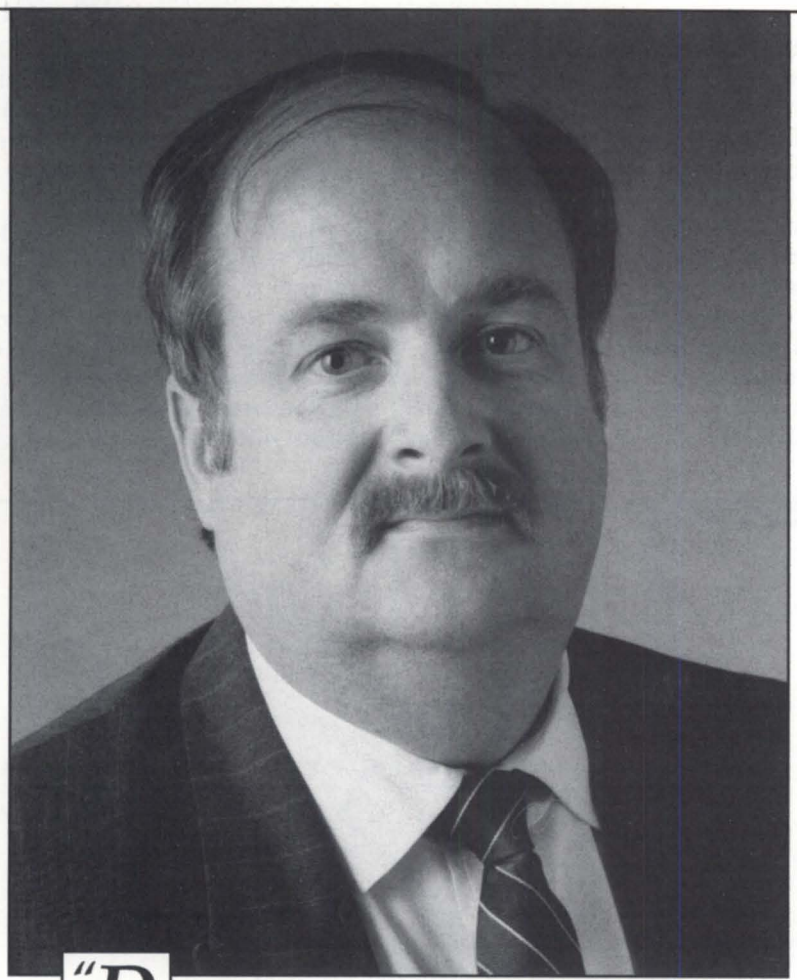

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LAN fax server

West Caldwell, NJ—Faxcom 4000 and 5000, local area network fax server products from Biscom, Inc., offer integrated conventional fax-machine-based fax communications with computer-based faxing at every level of computing, from PC to corporate mainframe.

Biscom's proprietary fax control language (FCL) permits system integration of fax and image communications capabilities with applications for nearly all major computer systems, including Data General and Unix-based systems.

The Faxcom line is built around five servers ranging in price from $4,995 for a single-port model to $32,960 for a top-of-the-line, 16-port, rackmounted server.

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CSC Forum,
Continued from page 33

After upgrading to v5.4.1 and the new lp spooling system, I have had continual errors with the device timing out.

I have made sure that there isn't a ttymon on the port (tty08), and set the port to clocal through

sysadm->device->printer

. . . etc., since I used XON-XOFF (async_9600) on DG/UX v4.3.0. I'm still getting "Device not ready" mail messages delivered to root. Anyone know how to wire the HP LJ III for hardware DTR control?

Reply by: David Lawver

We had the same experience. DG told us not to use hardware flow control . . . we are still fighting that one out with our consultant, who says *always* use hardware flow control. The solution in our case was to add clocal to the stty options; apparently 5.4 runs -clocal by default. We have been running this way to several Laserjet IIIDs and a Laserjet III for about a month with no problems. By the way, we made some other minor modifications to the interface script that do things like get rid of the pesky extra sheet of paper at the end of jobs that do their own FF, etc. If you are interested, we would be glad to share.

Reply by: David Woo

Thanks for the info. I read the release notes for 5.4.1 again and confirmed that 5.4.1 lp scheduler "relied on modem control signals from the printer to indicate printer status." The problem with the HP Laserjet III is that pin 20 (DTR, I believe) changes state to follow flow control—not just to signal an unrecoverable error. After I put a breakout box on, this was very evident. By the way, another gotcha that the release notes mention is to completely blow away the port in the terminals part of sysadm—not just disable it. I'm sure that this was another part of the problem I was having.

Category: AOS/VS

Author: Tom Hayes
Subject: **File transfer**

Does anyone know of a file-transfer program besides Blast for use on an MV/40000 and AOS/VS II rev 2.03 that will let me transfer files to a PC using Procomm Plus?

Reply by: Tim Boyer

The NADGUG release tape has a number of utilities that will work with VS, including Xmodem, Ymodem, and Kermit. Call the number listed in *Focus* to get a copy of the tape. Δ

DASH runs on an Aviion 5200 server located at the Customer Support Center in Norcross, GA. The bulletin board is available 24 hours per day, 7 days per week, free charge. Call 1/800-DASH-CSC (1/800-327-4272) for the modem rotary.

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Shed those notions

by Doug Johnson
Focus staff

The shift away from mainframes and minicomputers and toward decentralized PC networks and distributed processing is definitely happening—you've probably read your fill of "downsizing" articles this past year. The tricky part is in getting past the hoopla to understand just how it will affect *your* business and computing.

Rational Data Systems' fourth annual report on this rapidly evolving topic presents a sound grounding in history to explain the trend, from the standalone PC in 1982 to departmental processors, PC servers, high-end servers, and "Where We Stand Today (1992-1995)."

The section, "Developing an Integration Strategy," explains the "formalization of the PC integration process, and outlines four stages of PC integration: 1) terminal emulation, 2) async file transfer, 3) local area networks (LANs), and 4) distributed processing. Also addressed are a multitude of products—LANs, Netware for AOS/VS, and electronic mail, and others from RDS.

Quite clear up front is the report's philosophy: "If you bought this book hoping to find the answer to the question, 'Which is *better*, minicomputers or PCs?', you will be disappointed, and if you cling to a prejudice, one way or another, you will severely limit your ability to use each technology to its best advantage." Openmindedness is the key.

The 1992 *Report on PC Integration* goes a long way toward demystifying PC Integration as a concept, and moving on to explain the practical aspects of achieving it.

1992 Report on PC Integration, 116 pages, $24.95; Rational Data Systems, 800/743-3054. Δ

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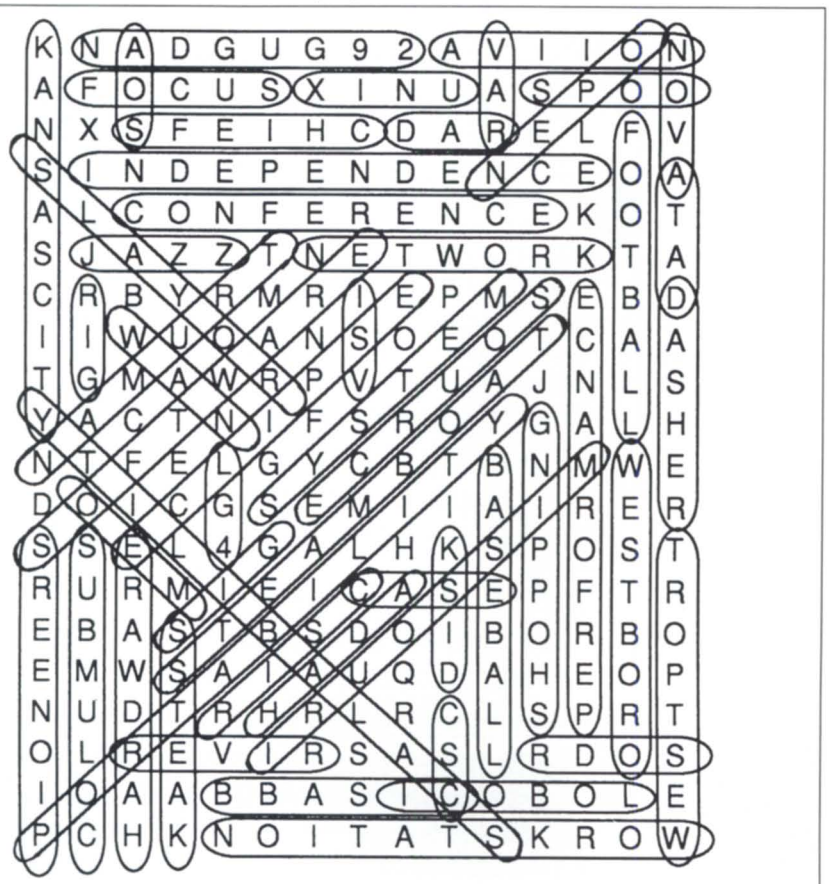
Solution to Word Puzzle on page 29



BULLETIN BOARD

Bits and bytes

DUMP_II under AOS/VS II

From: Bill Hobgood

I'm on vacation in Cocoa Beach and ran into a real nice fellow who's having a serious problem with DUMP_II on his MV/6000. It seems that he has a SCSI controller, Zetaco's SCZ-3-2 running a 600 MB Seagate drive. The operating system is AOS/VS II rev 2.03. He was running 1.21 prior to upgrading. Nearly every time he tries a backup using DUMP_II, the job will abort with user trap, validity, and the usual accumulators. Diagnostics pass OK and he even obtained a complete set of system boards, but is still having the problem.

The error occurred in both 1.21 and 2.03 and never happens in the same spot on tape. Files on disk have checked clean. Dump by itself under CLI 16 works fine, but he is having trouble doing a complete system backup because of its limitations. We adjusted the throttle rate on the disk controller and then received a hardware protection violation #71239. I'll be around enjoying the beach for a few more days if anyone has any thoughts on the matter.

From: Walter Mosscrop

Have you tried to eliminate DUMP_II as the problem by using it to dump to @NULL? We had a similar problem on an MV/2000 where it would do random aborts during both dumps and loads—the problem in this case was a bad revision of microcode.

From: Bill Hobgood

Thanks for the tip. We tried dumping to @NULL after reading your message and had no failures at all. We now understand from a third-party broker that the 6026 tape controller may be a rev too low for AOS/VS II.

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

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Data Specific

Third-quarter losses

Westboro—**Data General Corporation** reported a net loss of $11.7 million, or 35 cents per share, for its third quarter ended June 27. During the same quarter last year the company reported net income of $35.6 million. (see chart).

Revenues for the third quarter of 1992 were $259.2 million, down from revenues of $301.2 million for the third quarter of 1991.

Ronald L. Skates, DG's president and CEO, said revenues continue to suffer from "the weak worldwide economy and industrywide competitive pricing pressures." While overall revenues were down, revenues on the company's Aviion family of open systems computers again increased, and now exceed the revenues from the proprietary Eclipse MV product line.

The Aviion line was further strengthened in July with the introduction of the AV 6280 and AV 8000-8 high-end systems, along with mid-range servers, the AV 4605 and AV 4625. DG also introduced its second generation of high availability disk storage subsystems based on RAID technology, as well as a series of enhancements to its DG/UX Unix operating system. On the Eclipse side of the picture, DG introduced during the third quarter new high-end and mid-range systems, the MV/60000 and MV/35000.

For the first nine months of fiscal 1992 DG reported a net loss of $63 million, including a restructuring charge of $48 million resulting from costs associated with a workforce reduction. For the same period last year, the company reported net income of $67.3 million. Revenues for the three quarters this year totaled $827.8 million, down from $933.3 million for the same period a year ago.

Data General Corporation Condensed Consolidated Statements of Operations
(in millions except per share amounts)

	Quarter Ended		9 Months Ended	
	6/27 1992	6/29 1991	6/27 1992	6/29 1991
Revenues:				
Product	$151.4	$198.2	$501.3	$605.3
Service	107.8	103.0	326.5	328.0
Total revenues	**259.2**	**301.2**	**827.8**	**933.3**
Costs and expenses:				
Cost of product revenues	92.9	97.3	289.8	308.7
Cost of service revenues	63.7	60.6	195.3	190.8
Research & development	27.4	25.1	83.6	76.2
Selling, general, & admin.	85.1	92.0	269.8	294.2
Restructuring charge	—	—	48.0	—
Total costs & expenses	**269.1**	**275.0**	**886.5**	**869.9**
Income (loss) from operations	(9.9)	26.2	(58.7)	63.4
Gain on sale of subsidiary	—	13.0	—	13.0
Interest income	2.7	2.2	8.7	4.6
Interest expense	3.6	2.8	10.9	8.9
Income (loss) before income taxes	(10.8)	38.6	(60.9)	72.1
Income tax provision	0.9	3.0	2.1	4.8
Net income (loss)	**$(11.7)**	**$35.6**	**$(63.0)**	**$67.3**
Primary & fully diluted net income (loss) per share	(0.35)	1.05	(1.93)	2.10
Weighted avg. shares outstanding	33.1	33.8	32.6	32.1

RAID board

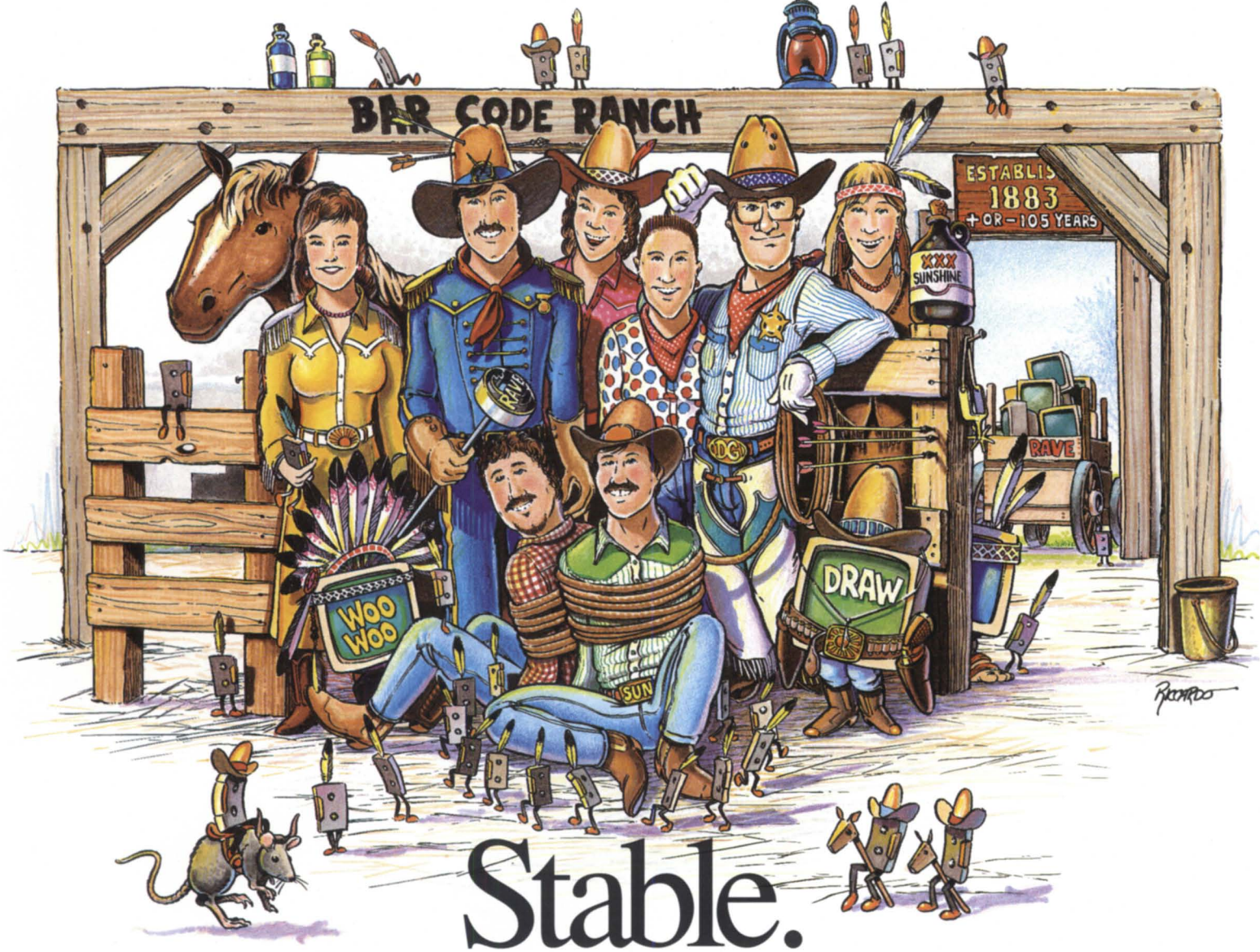
The newly established RAID Advisory Board met for the first time last August in Minneapolis, Minnesota. Ten charter-member companies make up the board. Aside from Data General, there are: **ARRAY Technology, Ciprico, Inc., Core International, ENDL, HI-DATA Arrays Limited, IBM, NCR, Seagate Technology, and Technology Forums.**

Joe Molina, president of Technology Forums, serves as chairman of the new consortium, which is devoted to promoting RAID technology and coordinating disk array standardization. For more information, contact Molina at 612/784-2379.

LAN support

Healthnet, now offered by Data General's U.S. and Canadian service divisions, is a new local area networking support service designed to ensure high availability for today's networks.

"Healthnet allows users of small-and-simple to large-and-complex networks to effectively outsource network management support in a cost-effective manner to maximize performance of their IS staffs," said **Ethan Allen,** vice president of DG's U.S. Service Division. According to **Rosemary Coley,** program coordinator, Healthnet is a package of three new network support services: Helpnet, Watchnet, and Advisenet. Δ



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