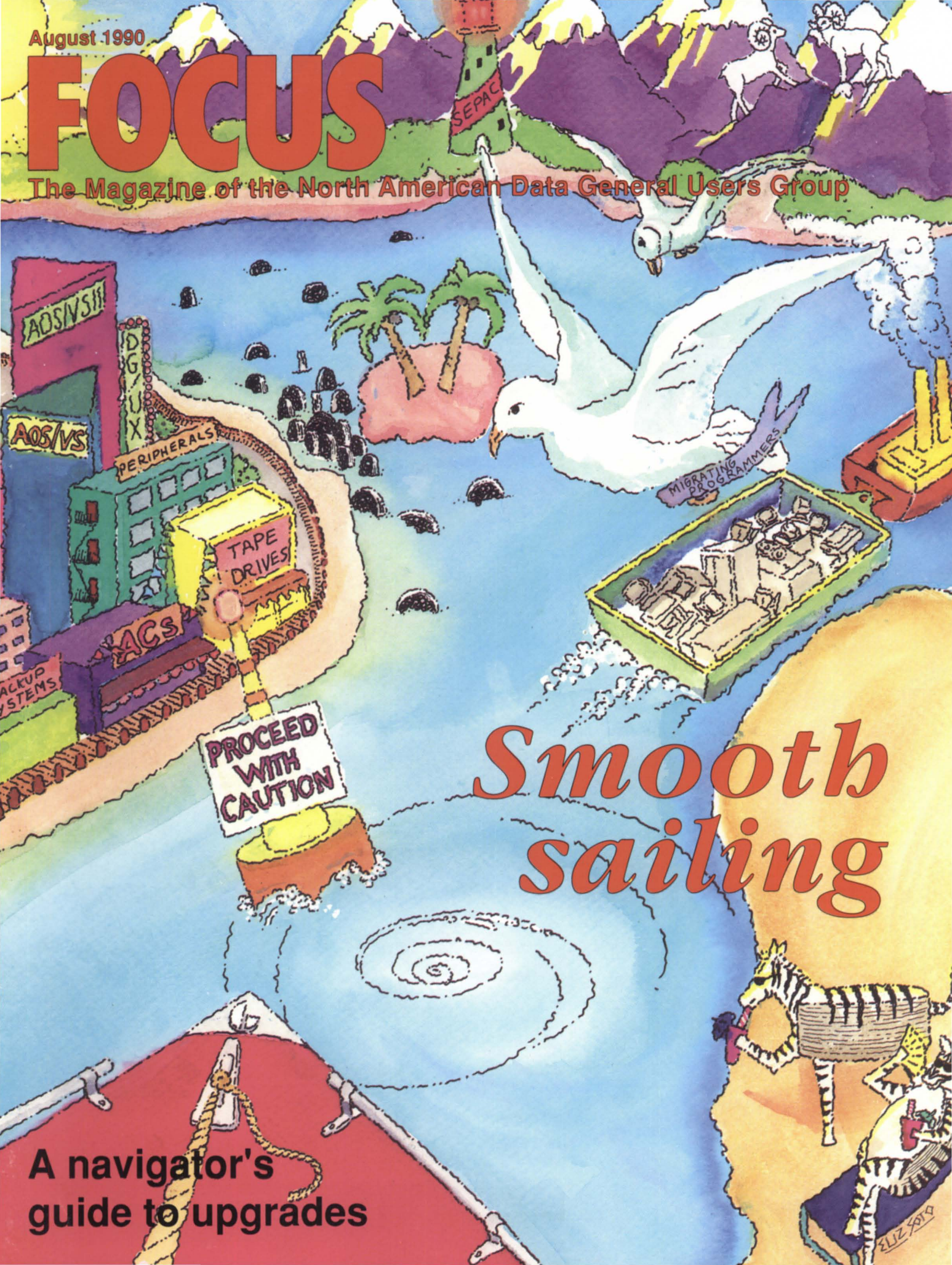


August 1990

# FOCUS

The Magazine of the North American Data General Users Group



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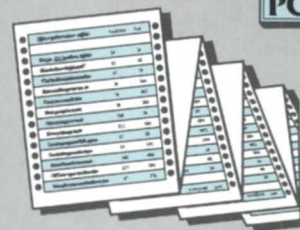
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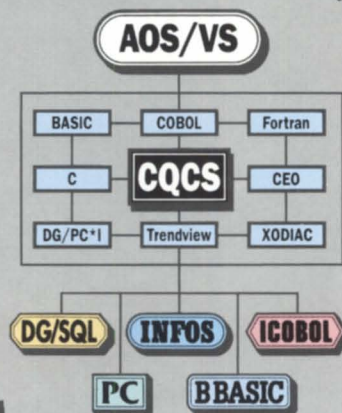


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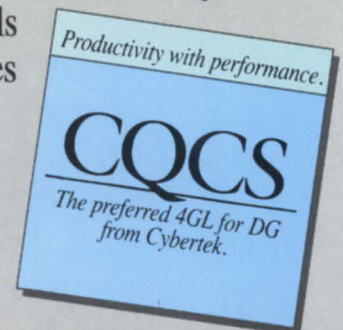
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MIGRATING TO AViiON

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Cover illustration by Eliz. Soto

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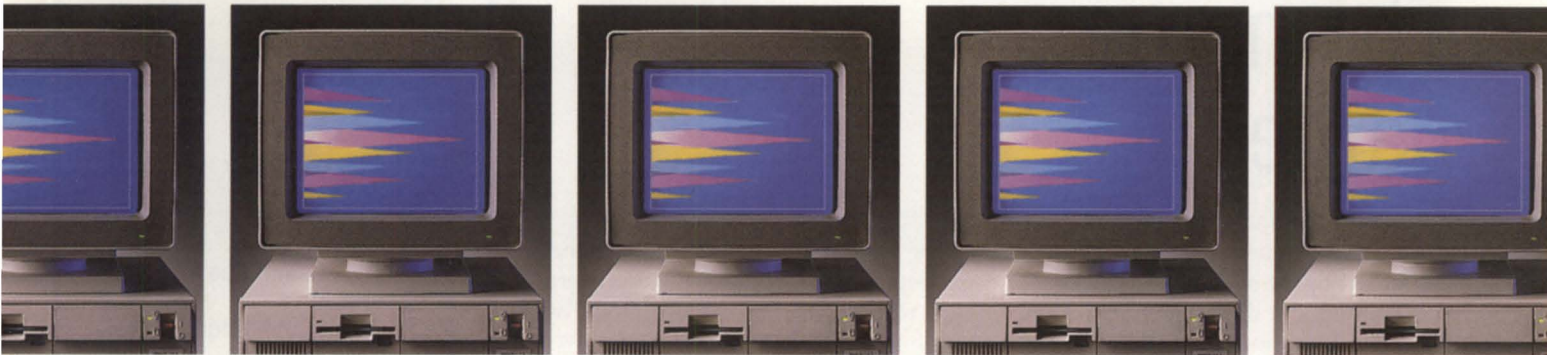
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# The name game

Ah, the lazy days of summer, when one relaxes by the backyard (kiddie) pool and ponders the deep questions of the universe. Questions like: what is the meaning of life? Do scarecrows have brains? (my 4-year-old insists that they do), and what's the significance of the numbers 5500 and 9500, as in the new MV/5500 DC and MV/9500?

Dave Ellenberger, DG's Director of Marketing for Eclipse Systems, agreed to shed some light on this urgent question. He was kind enough to refrain from suggesting that maybe, just maybe, I'd been in the sun a little too long.

"When it comes to choosing a name, there's a lot of legal work. It's not a scientific process. We do try to maintain consistency as much as we can, within our limitations," said Ellenberger.

Then he listed the basic requirements that must be met when assigning a number for a new Eclipse MV or Avion AV machine. The name must not conflict with any other MV or AV machine, and it must not resemble any other product on the market—computer or otherwise. After passing the uniqueness test, the name should have some significance for the machine.

It's the responsibility of the product manager of a particular machine to propose the numeric designation. Then the number goes through a lengthy review process. "Naming isn't the easiest thing to do," he conceded. "It's easy to outline the theory, but it's hard to pick out numbers that are not confusing." Back when the MV/2000 and MV/20000 were state-of-the-art, there was a lot of confusion among the two machines, Ellenberger said. So, Data General learned not to assign numbers that are similar to other products in the line.

The "DC" in the MV/5500 DC stands for Departmental Computer. This is a term that was popular in the early '80s, according to Ellenberger. "We have stayed with DC because it has come to designate a computer that has a small footprint." DC machines fit under or on top of the desk, and have an L-bus architecture. "Without ever having seen the machine, you know what its I/O architecture is, and what kind of structure it's going to take," he said.

The number 5500 is relevant in that the machine is more powerful than the MV/1000 DC or MV/2500 DC—but it is not *proportionately* more powerful.

"There may have been some sense that the number reflected performance," Ellenberger said. For instance, some people may think that an MV/40000 is twice as powerful as an MV/20000. However, "once you've built 10 years of hardware on a product line, it gets to where it's unrealistic for a number to express performance in a direct sense," he said. Thus, the newest mid-range MV is called the MV/9500, because the MV/9500 is a higher performance version of the MV/7800.

*Here's some news that MV customers will be excited about.* Ellenberger said there are new machines in the works for the MV line, but he couldn't reveal what numbers would be assigned to them. In fact, certain numbers are reserved for the MV line, and certain numbers are reserved for the AV line. DG has a slogan that proclaims "MVs are forever." However, MVs are not infinite. Ellenberger won't reveal the numerical limit, if any, of the MV family, but said "once you get up to over 100,000, it gets a little cumbersome."

He's right about that. △

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The Magazine of the North American Data General Users Group

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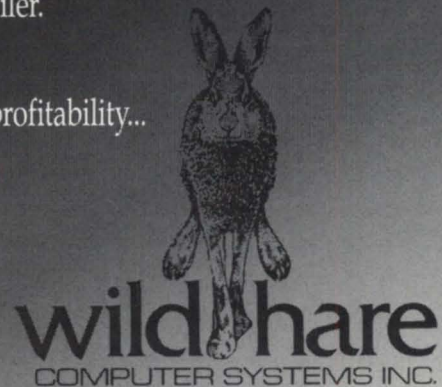
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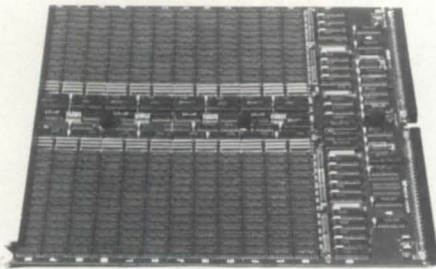
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## LETTERS

# Sales force with an attitude

In Brian Johnson's June "System Manager's Log," he commented on the Data General sales forces' commitment and attitude toward the MV product line. Specifically, he said, "The problem is that the sales and SE staff don't really believe the MV and AOS/VS part [of the DG strategy . . . Their attitude] will be the kiss of death to the MV line."

I believe Brian's information is incorrect, and that he is receiving a distorted view of the DG strategy and its implementation. MVs are not dead, nor does the sales force believe them to be.

Speaking for the New England Region, we are actively prospecting for both MV and Aviiion business. We've just completed two mailing campaigns—totaling over 2,000 pieces of mail—dedicated to our proprietary product offerings. These were sent to installed MV and 16-bit customers, as well as to prospects with whom we're looking to do business for the first time.

Do we push Aviiions? Of course we do—right along with the MVs, PCs, networking products, and everything else we have to offer our customers. I agree 100 percent with BJ when he says that Unix is a non-issue for many MV sites. We're not looking to convert our MV customers to Aviiions. That's not going to increase our market share. We will only grow as a company by selling into new areas—with whatever solution set makes the most sense—and by maintaining and growing a strong installed base of MV customers.

Yes, the sales force is excited about Aviiions and Unix. We have to be. We're also excited about the continuing growth and expansion of the MV Family. And I'll put our attitude up against those of DEC,

IBM, and HP anytime.

Jeffrey G. Merzel  
Regional Manager  
New England Systems Engineering  
Data General Corporation

*(Thank you for writing and sharing your enthusiasm. If every Data General salesperson had the same outlook, we would not receive letters like the following—Editor.)*

I am not renewing my NADGUG membership because I hope to soon be out of the DG world. DG abandoned AOS and other customers like me who were unable to afford moving to AOS/VS and the closed systems required to run it. DG always seems to be on the verge of going out of business and can't focus its business. If it wasn't for NADGUG, small customers like me would be left out in the cold with no contact with DG. DG needs to learn how to treat *all* of its customers.

Ronald R. Getz  
Meteorologist  
National Weather Service  
Auburn, Alabama

### *Your turn to talk*

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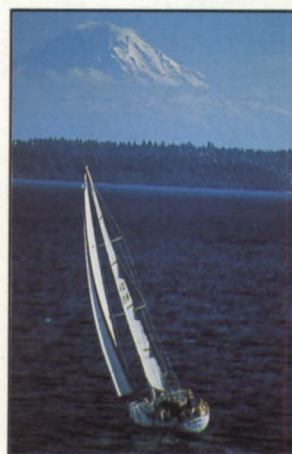
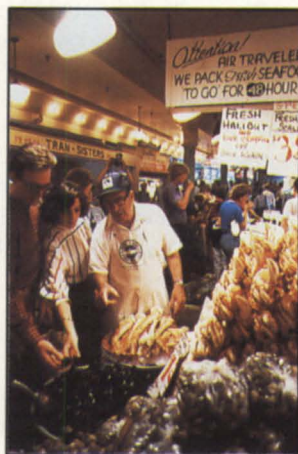
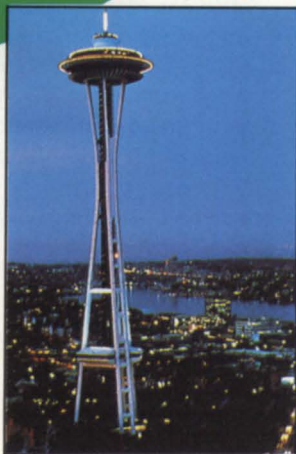
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# Seattle



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# The secret to DGUI's success

The **Data General Users Group of Indiana (DGUI)** received generous feedback from its workshop held in May. Much of the praise was focused on the "how-to" laser printer manuals provided along with a laser printer presentation. **Compusystems** bolstered group support by hosting the July meeting. The guest speaker was **Andy Wilkes** of **SEPAC**, who discussed utilities that should be examined frequently in order to maintain system performance, and how to understand examination results. Also, the local DG office offered new product announcements.

Now in its 18th month of existence, and proud of a strong, established core group, DGUI recently repaid its interest-free loan, which was given by NADGUG to assist with the group's start-up.

President **Nancy Miller** stated "Much of our success belongs to the examples and help other groups have provided." She also credits group success to the one-on-one phone calls that are made prior to each meeting, further commenting, "Such calls have helped attendance immensely."

For additional information on DGUI, please contact Ms. Miller at **CIC Enterprises**, 317/253-1711.



For its final meeting before summer break, the **Southeastern New England Users Group** met June 6 at the Ramada Inn in Seekonk, Massachusetts. The program featured **Tim Maness**, president of **DMS Systems**.

An expert in analyzing system perform-

ance, Mr. Maness' topic was "Monitoring and Managing System Resources." His discussion covered how to use software tools to manage VS systems for maximum performance, and how to identify bottlenecks in computer systems. Several tools that are low-cost or free, were examined including PED, Disco, and Resource Accounting System on AOS/VS and AOS/VS II. For additional information on this meeting or on the Southeastern New England Users Group, contact **Richard Wind** of **South Shore Packing** at 508/587-6900, ext. 265.



The **Office Automation Special Interest Subcommittee (OASIS)** presented a seminar May 17-18 at the Sheraton Den-

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ver Tech Center. The local DG office was very helpful in providing transportation, setup, and equipment to assure the meeting's success.

**Bruce Evans** from DG Software Development gave a demonstration and discussion on CEO Object Office. Mr. Evans also took part in a panel with **Blake Birdsall** of **Wordperfect Corporation**, comparing CEOwrite and Wordperfect on Data General equipment. **Bryan Scoggins**, of DG's Customer Support Center in Atlanta, spoke on hardware and software support. **US&T's (Unified Solutions and Technologies) Jim Lynch** spoke on wide area networks (WANs) in the DG environment, while **Mike McGill** shared **Rational Data Systems'** objectives concerning local area networks (LANs) in the DG world.

For additional information on the OASIS, contact **Denise Sikorski** at the Chicago Board of Trade, 312/347-5141.



I always knew that NADGUG members were a vocal bunch; this year's **Member Concerns Survey** just proves it. At the end of May, every NADGUG member was mailed a survey. Approximately 800 of you returned the surveys by the early-June deadline. In fact, NADGUG offices were still receiving surveys from our overseas members at the end of June.

The response was over-whelming! Not only did the *number* of surveys returned greatly exceed expectations, but most surveys were thoroughly filled out, including the "essay" portion that asked for additional concerns about Data General.

At the time that this article was printed, the NADGUG staff was busy tabulating your responses. Once the surveys are tabulated, the results will be delivered to members of the **NADGUG Executive Board** in preparation for their annual meeting with **Data General management**.

The results are not complete, but what

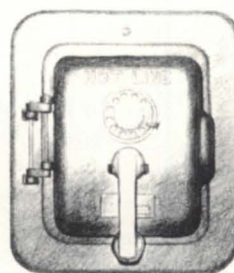
follows are the topics that users seem most concerned about:

- The future of AOS/VS
- The future of Data General Corporation
- Data General's visibility (or lack of) in the computer arena
- Data General's relationship with third-party vendors

- Lack of confidence in the sales staff.
- Price of hardware, software, and service

In 1989, DG was very responsive to the needs expressed in the Member Concerns Survey. Thanks to the measure of response you have shown this year, the NADGUG executive board can look forward to another successful meeting with Data General management. △

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

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## CONFERENCE OUTLOOK

# What's in in connectivity

### SYNOPSIS

*The theme of the 1990 NADGUG Conference, "Connecting for the Future," goes beyond simply wiring independent systems together.*

by Brad M. Friedlander  
Special to Focus

The computer systems of the 1980s consisted of many independent systems that were wired together without really being connected. In the 1990s, we'll see these systems become fully connected by addressing the issues of interconnection, integration, and interoperability.

The theme of this year's conference connotes two important aspects for our conference attendees. First, we'll focus on the technical issues of building systems that are connected to support our business needs. Second, we'll be connecting with other professionals who will form the network we need to solve the technical problems that arise in constructing these solutions.

What will it take for our systems to be connected?

Most of today's systems rely on terminal emulation and electronic versions of punched card file transfers to achieve a level of inter-system linkage. This is wholly inadequate. To satisfy the business needs of the 1990s, independent systems must be connected so that they become a single system from the perspective of the users, operators, administrators, and programmers. This will be supported by vendor-provided interconnection, integration, and interoperability.

*Interconnection* is the most basic level of connectivity. It consists of the physical connections among systems and the higher level protocols that support useful communications between applications. The systems of the future will provide standard methods for applications to communicate with each other in homogeneous and many heterogeneous environ-

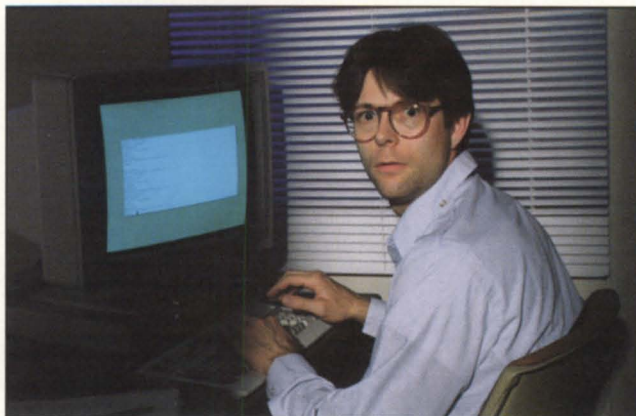
ments. This will include extensive support for client-server relationships and remote procedure calls. Although many of these capabilities exist today, application developers frequently need to reinvest the highest levels of the protocol stack for each new application.

*Integration* takes connectivity to the next level of usefulness by ensuring that different applications in the same environment are able to work together. This begins with such visible elements as the user interface and extends into areas of interest to system managers such as support for centralized management of all resources in a networked environment. Integration will also bring together telephone and other information channels, such as video. A major element of integration will be cooperative data base management systems (DBMS) that work from a common logical data dictionary.

*Interoperability* will address the remaining connectivity problems. Using international standards, such as the ISO OSI, vendors will provide the mechanism for applications to communicate with each other, even when the underlying systems use different protocols. This capability will place some restrictions on the functionality in return for a universal mechanism for systems to operate in a totally heterogeneous environment.  $\Delta$

*Brad Friedlander is a member of Arthur D. Little's Information and Telecommunications Systems Section, a past president of NADGUG, and chairman of the NADGUG Bylaws Committee. The 1990 NADGUG Conference will be held October 22-25 in Seattle, Washington. For registration information, call Jennifer Foye at 1-800/877-3763 or 1-512/345-5316 (outside U.S.).*

# OFFENSE vs.



# DEFENSE



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Circle 14 on reader service card.



*Developing upgrade opportunities and innovative upgrade programs for Data General customers is a primary focus of Upgrade Product Line Manager Glen Barrett.*

# An ounce of prevention

by Robin Perry  
Focus staff

**FOCUS:** Many things can effect the performance of a computer system. How does one know when an upgrade is the right solution?

**Barrett:** There are several ways to determine when an upgrade may be appropriate. The first, and least desirable, is to wait until user response times or batch run elapsed times are no longer acceptable. Then, using some type of resource usage monitor, you must determine what type of upgrade is required—CPU, memory, disk, or some combination thereof. Care must be taken in making this decision, since relieving one bottleneck may change the overall system environment to the point that other bottlenecks develop.

The most desirable approach is to establish good system management procedures early on. This involves regular monitoring and reporting of system resource usage to establish growth trends in the areas of CPU, memory, filing system, disk response times, etc. Factoring this data with such things as: How many new users have been added? What changes have taken place in the

application environment? How many users are we going to add in the future? What new or modified applications will be added?—one can begin to “predict” when upgrades should be scheduled, rather than wait for a performance crisis to occur. In other words—operate in “crisis prevention mode.”

Data General offers a number of software products and services to aid in establishing these procedures—Performance Monitor, VSPAC/One, consulting services from Data General’s System Evaluation and Performance Analysis Center (SEPAC), to mention a few.

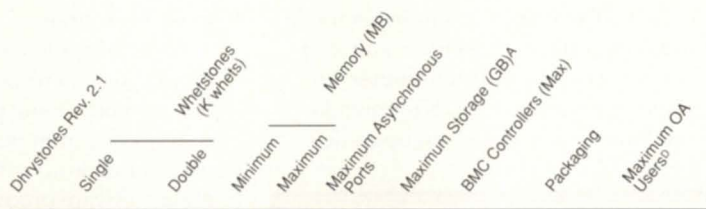
**FOCUS:** Even if there are no performance problems, are there other situations in which an upgrade is appropriate?

**Barrett:** Every day presents a situation for looking at upgrading. Technology advances so rapidly that you have to pick your head up from the regular routine and see what is going on in system improvements. A system may be handling the current user base and applications quite well. However, there may be upgrade opportunities that will improve performance even more, while reducing total cost of ownership.

For example, an MV/10000 is humming along just fine. However, with a little research, you would see that an upgrade to an MV/9500 would actually save money while increasing system performance. How, you say? In most cases, the reliability of the upgrade results in lower service costs that pay for the upgrade in five years or less. Plus, there are savings on AC power consumption, air conditioning, floor space, and rack space. This all adds up to a significant savings and performance increase, which is a good reason to upgrade, even if your system is not overburdened.

**SYNOPSIS**  
*DG’s manager of the Upgrade Product Line explains how DG can guide you through the endless sea of upgrade options.*

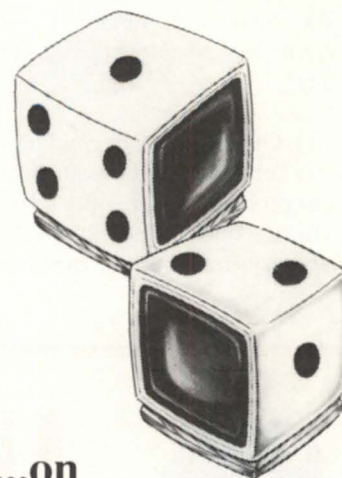
# Eclipse MV family systems



	Dhrystone Rev. 2.1	Whetstones (K whets)	Memory (MB)	Maximum Asynchronous Ports	Maximum Storage (GB/A)	BMC Controllers (Max)	Packaging	Maximum OA Users		
<b>Low-End</b>										
MV/1000 DC	1,405	966	778	4	12	32	3.3	NA	Desk-top	24
MV/2500 DC	2,400	1,617	1,304	8	24	64	4	NA	Under-the-desk	47
MV/5500 DC	7,112	4,681	2,487	16	32	144	4	NA	Under-the-desk	100
<b>Mid-Range</b>										
MV/9500	7,112	4,681	2,487	8	128	624	77	8	10.5" Rack-mount	123
MV/18000 Model 1	4,397	2,482	1,376	16	64	768	67	7	10.5" Rack-mount	90
MV/18000 SX	4,338	4,634	3,963	16	64	768	67	7	10.5" Rack-mount	94
MV/18000 Model 2	8,574	4,840	2,683	16	64	768	67	7	10.5" Rack-mount	163
MV/15000 Model 20	7,340	7,133	5,052	8	64	768	67	7	10.5" Rack-mount	148
MV/20000 Model 1	7,340	7,133	5,052	16	64	1,008	153	16	Meter-high	148
MV/20000 Model 2	14,313	13,909	9,851	16	64	1,008	153	16	Meter-high	212
<b>High-End</b>										
MV/40000	14,375	14,558	11,940	32	128	2,928	160	16	Free-standing	232
MV/40000 HA Model 1	14,375	14,558	11,940	64	256	4,224	1,152 <sup>B</sup>	NA <sup>C</sup>	Free-standing	232
MV/40000 HA Model 2	28,031	28,388	23,283	64	256	4,224	1,152 <sup>B</sup>	NA <sup>C</sup>	Free-standing	418
MV/40000 HA Model 3	41,688	42,218	34,626	96	256	4,224	1,152 <sup>B</sup>	NA <sup>C</sup>	Free-standing	580
MV/40000 HA Model 4	55,344	54,048	45,969	128	256	4,224	1,152 <sup>B</sup>	NA <sup>C</sup>	Free-standing	742

A Maximum disk storage capacities for MV/9500, MV/18000 Series, MV/15000 Model 20, MV/20000 Series and MV/40000 systems do not include optional interface to MRC subsystem. Each MRC subsystem can support 192 GB of additional storage.  
 B With 6 MRC subsystems.  
 C Not applicable with MRC subsystems.  
 D User counts based on AOS/VS II, CEO Rev. 3.10 with standard user mix.

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



**FOCUS:** What are the obvious fixes that one should look at before considering an upgrade?

**Barrett:** Obvious fixes depend on if there are "obvious" and unique bottlenecks or problems. As mentioned earlier, relieving one bottleneck may cause another resource to become the bottleneck.

If you are in a performance crisis situation, one thing we suggest before going to an upgrade is a thorough analysis and tune-up performed by SEPAC. The results will include a set of recommendations that should be implemented in order to optimize the performance of your current system environment. In some cases, after these recommendations are implemented, no upgrade is

necessary. If system and/or application tuning does not provide all of the performance improvement required, the data and analysis can be used to help determine what hardware upgrade is most appropriate.

We also highly recommend that if regular system resource monitoring is not currently being performed, that procedures be put in place to effect this very valuable activity using SEPAC or other software products. "An ounce of prevention is worth a pound of cure" is very appropriate here.

**FOCUS:** If you think you may need to upgrade, who should you call *first*?

**Barrett:** The first person to contact is your Data General representative. Once you make contact, the representative will work with the appropriate groups to provide you with all the information you need to make the right decision.

**FOCUS:** There is a seemingly endless number of options for a customer to consider in an upgrade. What services does DG offer to guide customers along the upgrade path?

**Barrett:** The first level of service is the DG rep. In addition, there is the Upgrades Group which provides configuration assistance and analysis. We also have a custom cost-of-ownership program that allows us to run a configuration against various options. The result is that a user can see which upgrade offers the best performance and cost-of-ownership in relation to the budget.

**FOCUS:** What is included in the price of an upgrade?

**Barrett:** A number of things come with a Data General upgrade. First, there is a full warranty with the product. In addition, we take the old system in trade at fair market value. Also, on non-customer installable upgrades, we de-install the old equipment, pack it, and remove it from the customer site and install the new upgrade. If it is a CPU upgrade, we include a "right to use" operating system license (RTU) as part of the package.

**FOCUS:** What do you do with the



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Circle 26 on reader service card.



equipment you replace?

**Barrett:** The equipment that we take in trade-in is turned over to our Refurbished Equipment Group. It is fully refurbished and resold. By the way, our refurbished equipment is sold with the same type of warranty as our new equipment.

**FOCUS:** Why should someone go through DG, as opposed to a used equipment dealer?

**Barrett:** First, when you say "used equipment dealer," it suggests that our upgrades are based on used equipment. That is not the case. Over 95 percent of the upgrades we sell are new equipment. When we sell a used upgrade, it is because the customer is looking for that, usually due to pricing constraints.

Why come to Data General instead of going to a used equipment dealer? There are a number of reasons. First of all, with us, a customer gets an operating system RTU license when they buy a CPU or system upgrade. In addition, as part of the upgrade price, they get a full warranty, installation, and de-installation and shipping of the equipment being removed. We have heard of many situations where a customer trades his old equipment to a dealer or broker and then sits on it for months, waiting for the broker to find a buyer. Data General upgrade packages are designed to provide customers with an extremely competitive price on the best product for their needs and with as little disruption and downtime as possible.

**FOCUS:** What's the difference between an add-on and an upgrade?

**Barrett:** An add-on is something you attach to an existing system. An upgrade is the replacement of a system or pieces of an existing system to achieve the performance benefits a customer is looking for. We do have a few upgrades that do not replace equipment, but are packaged together as one model number for convenience and ease of ordering.

**FOCUS:** Is there anything else about DG's upgrade program that you'd like to mention?

**Barrett:** Yes. I'd like to mention that we offer a wide range of programs that allow our customers options in making the right upgrade choice. Here's a list.

- Cost-of-ownership analysis
- 30-day loaner program
- Custom-built upgrades
- Customization of standard upgrades
- Multi-site upgrades

- Refurbished upgrades
- SEPAC analysis
- Leasing
- Sales and support technical assistance

Your readers can contact their Data General representative for more information on any of these programs. Also, if they use your reader service card, we will be glad to send them information. Δ

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# The joy of upgrades, or, nothing's ever as simple as it seems

by Don Thomas and by Bill Means  
Special to Focus

There are many things to consider as you prepare to upgrade your computer system. You have to address these issues at one point or another, so you might as well get them out in the open so you can deal with them more easily. I know this takes much of the mystery and spontaneity out of the upgrading process, but it also can prevent premature aging and retirement.

## Prescription for an overworked MV/4000

### SYNOPSIS

*With expanded memory, increased user capacity, and the right price, the MV/9500 proved to be the cure for a sluggish system.*

by Wendell C. Putney  
Special to Focus

When Southern Optical's brand new MV/4000 rolled in the door back in September of 1984, it was a giant step forward for an optical wholesale laboratory with five users on a Nova 4/X. With 2 MB of memory, 354 MB of disk, and capacity for up to 16 users, the MV/4000

**SYNOPSIS**

*Before launching an upgrade to your system, pause for a moment to review this navigator's chart. Without a thorough plan, you could end up operating in a Bermuda Triangle.*

What follows is not in any particular order, nor are the topics covered in depth. This is intended as a navigator's chart of troubled waters. If you plan on passing through some of these waters, you will know there are sand bars, reefs, and strong currents that you may wish to avoid.

**Hardware**

Can you make use of your existing peripherals? What costs are associated with those devices? This is a trick question. Your disks are paid for, but they may need extensive ECO (engineering change order) work to allow them to operate with your new CPU. Check to see if ECO work is covered under your hardware maintenance contract, or if the vendor will do

the work as part of the sales agreement.

Consider that you might negate improved CPU performance with a bottleneck created because your old disk subsystem doesn't have the throughput to support the new environment. Compare the maintenance costs associated with the devices you wish to incorporate into the new system. You might find the new disk will pay for itself in maintenance savings alone. Then you have increased productivity as a bonus.

Are your older peripherals capable of exploiting any architectural enhancements of the new hardware environment? Yes, AOS/VS does support Data Channel (DCH) versions of some disks. However, the Burst Multiplexor Channel

(BMC) offers greater band width. There are software and hardware disk mirroring options to consider. Are you a candidate for a Message-based Reliable Channel (MRC)? Seriously consider that your system revolves around your peripherals. These devices can enhance or severely detract from your system's performance and reliability.

Which asynchronous communications system will you use? If you had ALMs or ATIs (gasp!), you may find that the new IACs, LACs, CPIs, and term servers are not 100 percent compatible with your existing cabling. Even your existing terminal devices may require attention. What's a parent to do? Plan. There's more to consider than just the iron you plan to buy.

*See Joy, page 18.*

would be enough machine for a long time, right?

Well, beginning in 1989, after we maxed out on memory and IAC ports with 55 users running CEO, 20/20, and B32, that box didn't look so big any more. We started looking at options for upgrading, and kept hearing words like MV/15 mod 8, expansion chassis, additional cabinet—and numbers like \$75,000. We decided to do the best we could until something more affordable came along. We shelved requests for additional terminals, and we put off installing the next revision of CEO, fearing that it would overtax our memory and CPU cycles.

In early 1990, we started hearing rumors about codename WASHI, the MV/20000 on a chip. Then our value-added reseller (VAR) Mike Byers with ICS Computer Systems, called to ask if we were interested in a pre-release installation of a new machine: the MV/9500. He mentioned a performance range between an MV/15000 mod 10 and mod 20, a board swap upgrade, and the same processor

class as an MV/4000. For about \$50,000, we could double our memory to 16 MB.

By this time, we were swearing *at* the MV/4000, instead of swearing *by* it. Idle CPU time was hovering around zero. During peak times, logging on and getting to an applications menu took up to two minutes. Users got in the habit of keying several screens ahead, then doing something else while the system caught up. People came in evenings and weekends to work on 20/20 spreadsheets so they could have decent responses.

We knew we had to do something, but the prospect of leaving AOS/VS appealed to very few people. We love CEO electronic mail, for one thing, and our two-man systems staff was not anxious to learn a new operating system. It took us only a couple of days to decide to go ahead with the upgrade to an MV/9500.

Shipping time was typical for Data General at the end of a quarter: one week. It looked like everything was there, including tapes for rev 7.67 of AOS/VS (required for the MV/9500). We were ini-

tially concerned about being guinea pigs for a new processor *and* a new revision of AOS/VS, but when we looked at the release and saw lots of fixes with only a few enhancements, we stopped worrying about the operating system. And, with the special support we were getting from Data General systems and service personnel, we weren't worried about the new processor either.

We scheduled the installation for a Friday, in case we needed a few extra days to get things up and running, and we genmed rev 7.67 on Thursday night (one copy for the old machine and one for the new). When UPDATE.CLI took only 10 minutes to run, we felt even better about the whole thing. We exercised the new revision overnight, with no surprises.

DG Field Service checked to make sure we had the proper version of diagnostics and everything else we needed for the installation. Then it hit—on Thursday, we were told that a power cable for the backplane was missing. The cable was required to allow a 1-board CPU to run in

*See Prescription, page 18.*

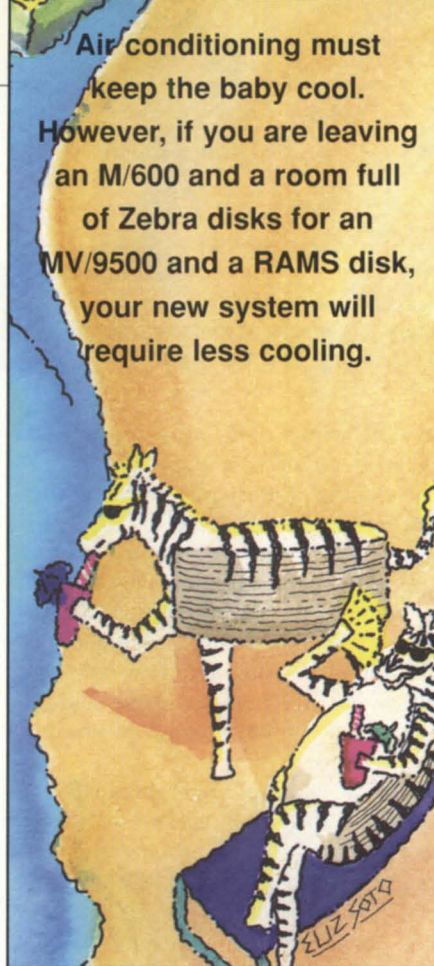
# FOCUS ON: UPGRADES

Joy, continued from page 17.

## Software

Your application is the real reason for a computer system in the first place. Will your business run on the new system? If the answer is no, you must consider three options. You may convert, rewrite, or start over. If you're involved in a radical upgrade, say from a C/350 to an MV/9500, then you would benefit from the last option. Starting over allows you to exploit every design enhancement of your new system. It costs like crazy, but is more than worth the investment in time and money. To cut costs, you might chose to convert while the development process continues. Data General makes this an attractive option because there are many support functions built into their operating systems for this expressed purpose.

What's available in the new environment? An application written in Fortran 4 may be difficult to convert directly to run on an AOS/VS system because the support for that language no longer exists. You should convert your process from 16 bit to 32 bit to take advantage of the new system architecture. This gives you



more flexibility and reduces the system overhead for your program. What will it cost to acquire expertise and manpower to accomplish this transition?

Where is the world going? Four-GLs, open systems, PCs, LANs, WANs, and whiz-bang-go-faster CPUs are all changing the way people see computer systems. The days are gone when each system was an island unto itself and each shop was dedicated to a single vendor. Data General is one of a scant few vendors capable of implementing a communications scheme that ties virtually every make of computer into a fully functional network environment. At this point, I must reemphasize "fully functional." There are many who pretend to communicate with other vendors. Let the buyer beware. This brings us to the next topic.

## Operating systems

Which operating system should you choose? AOS, AOS/RT32, AOS/VS, AOS/VS II, DG/UX, MV/UX, RDOS (16 bit, 32 bit, under AOS/VS or on a PC), and Unix are the choices. I forgot MUMPS,

Prescription, continued from page 17.

our chassis. Data General assured us that the cable would be in on Friday, and that we shouldn't worry. Worry? I had premonitions of being down for a week, unexplainable data base glitches for three weeks, and only a marginal improvement in performance. I was ready to start updating my resume. I even left in place my plans to go to Charleston for the weekend, leaving our analyst, Kelly Hale, in charge from Friday afternoon on. If it was going to blow up, I didn't want to see it. Worry about a power cable?

The cable arrived Friday morning at 11

a.m. DG's Field Service crew started their work, which included removing the chassis from the cabinet in order to get to where the power cable needed to go; this was the most time-consuming part of the job. After getting the hardware back together and running diagnostics, the system was brought up around 4:30 p.m. When I called Kelly from the airport, he reported that things looked great, but the final verdict rested in the hands of the users who would return to the office on Monday.

I needn't have worried at all. Users got response like they were the only ones on the system—only faster! With the combined effect of the new CPU and the expanded memory, run times for reports and updates were typically one-fourth of what they were before. Monitor loaded its screen files and displayed the first screen in 25 seconds; on the MV/4000, this took five minutes or more. CPU idle time rose to over 50 percent. A monthly report that previously took four hours to run now took 40 minutes. People who

used to start printing a document in CEO, then walk over to the printer to load the paper, found that they could no longer stop at the drink machine on the way!

Since the system upgrade, we have installed CEO 3.13 with only a minimal impact on system performance. We added 10 additional terminals, and the system keeps clicking along. We run Blast in the middle of the day without slowing everything down. We gave our salespeople laptop computers, and told them to dial in to check their accounts and access CEO at any time. We run Monitor without using up half the CPU time. The MV/9500 is billed as a 5 MIPS machine, and we believe it! It exceeds the performance of an MV/15000 mod 20 on several components of the :SYSMGR Benchmark Suite (see chart). If you are still struggling to make an MV/4000 carry too heavy a load, look into the MV/9500 upgrade option.Δ

Wendell C. Putney is Information Systems manager for Southern Optical Co. in Greensboro, North Carolina.

**Figure 1: SYSMGR benchmark suite results: (MV/4000 = 1.00)**

	INT.	AFPU.A	SYS.A	SPR.A
MV mod 10	2.47	2.00	2.51	2.56
MV mod 20	3.78	2.34	3.32	3.21
MV/9500	4.91	1.31*	3.65	3.64

\*This number reflects a timing problem in the floating point instructions used to run the benchmarks. Data General is actively investigating a solution to the problem and these results should not be taken as representative of the speed of many programs that use the floating point arithmetic. You can obtain a copy of the Benchmark Suite from the :SYSMGR bulletin board. See page 55.

# SAVED vs.



# SAFE



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lock prevents unauthorized removal of modules from the chassis.

Ideal for file backup, users can choose either 332MB or 662MB of storage per removable Winchester disk module. MIS managers in particular will benefit from the minimal space, power and cooling these subsystems require. Plus, add-on modules permit easy expansion for future data storage needs.

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Circle 15 on reader service card.

MIIS, MS/DOS, Xenix . . . oh well, you get the point. Cash in on the strengths. Use the network to bring in those strengths you require. I suspect there will soon be a massive "Network Operating System." NOS will be the true open system environment everyone wants. NOS will tie any system best suited to the operation you requested. The redirection performed by NOS will be completely

transparent to you. With NOS, you incorporate the strength and the flexibility of proprietary operating systems and the associated architecture without having to contort your business around a science project. Nor will you need the services of Rand McNally to locate the resource you require.

### Environment

Environmental issues are sometimes overlooked and then made to fit after the fact. Air conditioning must keep the baby cool. However, if you are leaving an M/600 and a room full of Zebra disks for an MV/9500 and a RAMS disk, your new system will require less cooling. This too can be a problem. If you have too much AC capacity, you can freeze your operators or freeze up your AC system. In either case, you've a problem on your hands.

How much space will the new system require? What kind of power will be required? When you replaced your ENIAC with the Compaq 386 Desk Pro, you might have noticed there was a bit of excess space remaining once the upgrade was completed. On the other hand, if your move is from a micro Nova to an MV/40000 HA, you are going to need a bit more power. A small nuclear plant just outside your computer room may be all that is required. Just make sure you have reasonable access to the new system and that the power is good, clean, and readily available.

By the way, if UPS only means packages and deliveries to you, then you need to see a power specialist. You might be cheating your users out of some very valuable system time. If your system goes down every time the local power company's supply is exceeded by demand, you are a candidate for an UPS system.

What will be your new staffing requirements? Will you be adding more shifts so backups and batch processing won't impact your prime time operation? You will need to consider how you will train the new staff members. How will you bring the existing staff up to speed on the new machine and the new procedures? Growing from a small shop to a larger one can become Excedrin headache number 13, unless you plan each step carefully. The issues that you don't know and are not aware of are the ones that increase the pain factor.

### Motives

What is the basis for this upgrade? I'm sure this is part of a well orchestrated, long-range plan that was well thought out. It isn't? Have you incorporated technological innovations as an integral part of your plan? You haven't? Oh.

I suggest you contact someone capable

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Randy Berndt, DG Review

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of doing a baseline study so you know your starting point. Those same people can assist you with capacity planning. Armed with your business plan and your capacity requirements, you can now set out to build the type of system to meet your needs. Future needs are as important as today's needs but are less easily defined. Don't wait for another crisis before you begin planning for expansion.

I have seen systems that evolved over time with little planning and they strongly resemble a modern art sculpture—there was a reason and a beauty somewhere, but I wasn't sure just what the artist was trying to tell me.

Allow for expansion. Your business plan is a dynamic document. So your system plan should likewise be dynamic. There may be some slow years ahead, so it's wise to proceed cautiously, but remember that you may also be wildly successful.

Examine your priorities. Why are you upgrading? More speed? Throughput? Expansion? To reduce maintenance costs? These are all valid reasons if they have been well thought out and carefully planned. Your customers, the system users, need to see a transparent conversion. If they must be impacted, make sure that it's with greater ease of system access, better response, and more user friendly applications. Too many applications are designed around the notion that the purpose of a program is what it does. Thus, the program has evolved into something that dictates needs to the business rather than the other way around. The general cause of this is migratory programmers and developers. There is no plan, so the program becomes the plan and its needs become the action items. "It has always been done that way" is the logic applied, and the tail starts to wag the dog.

Break the circle. Take the opportunity to turn this upgrade into something special. Research. Think. Consult. Plan. Then implement.  $\Delta$

*Don Thomas is president of National Software Technical Services, Inc. (NSTS), and Bill Means is vice president of Research and Development. Bill and Don have over 25 years experience with Data General equipment and software products.*

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### SYNOPSIS

*Purchasing previously owned Data General equipment is a viable alternative, despite how you feel about used cars.*

by Alan Rees  
Special to Focus

A long-held myth concerning used equipment sales is that a previously owned computer is similar to a used car—the purchaser buys someone else's problems.

This is not the case. Purchasing a previously owned computer is a black and white proposition—either it works, or it doesn't. Common usage problems associated with other types of used goods do not apply to computer equipment. Over time, a computer does not become any slower or faster, less efficient or more efficient, less powerful or more powerful. It is possible to acquire previously owned equipment, equal to its counterpart in quality and dependability, at a considerable cost savings.

#### Upgrading

About 80 to 90 percent of previously owned equipment purchasers are upgrading. The reasons are numerous. Upgrades can provide faster CPU speed, smaller and faster disk drives (with increased storage capacity), more memory, additional input/output controllers, and higher capacity storage mediums. Many companies need more video display terminals or additional multiplexors because of increased network usage, while others

want updated printers for better print quality and faster throughput.

Regardless of the need, key questions should be asked to determine whether an upgrade is necessary. Are response times on the company's computer system becoming slower? Are batch or monthly reports taking too much time to process and print? Are disk drives constantly at near capacity? Are backups beginning to take an inordinate amount of time? These are just a few questions that could indicate your need for an upgrade.

#### Where to start

Whether you are purchasing an initial piece of computer equipment, or are upgrading existing equipment, thorough research and a complete understanding of your company's needs are critical. It is important to ensure that the right equipment is obtained at a fair price and is covered with a good maintenance program and proper warranty, regardless of whether you purchase from the manufacturer or a third party.

Prior to searching for equipment, you should understand the different categories of previously owned equipment. As you investigate vendors, make sure that they share these same definitions.

Previously owned equipment is divided into four categories—refurbished, used, unused, and as-is. *Refurbished equipment* contains parts replaced with

new components, factory painting, and component revision upgrades. *Used equipment* is cleaned and tested, but may have slight cosmetic imperfections that do not affect functionality. *Unused equipment* is basically new, comes in a factory package, but is out of warranty. *As-is equipment* is often incomplete, non-working, or untested. Significant savings for as-is equipment may offset the lack of any warranty. Because these categories often overlap, the vendor and customer must establish each other's perceptions prior to the purchase.

#### Choosing a vendor

When choosing a vendor of previously owned equipment, reputation and customer satisfaction are crucial. Availability of service, parts, and maintenance agreements are a must. After all, the key to guaranteeing that previously owned equipment remains in good working order is proper maintenance. The buyer should request names of the vendor's customers who have purchased similar equipment and have similar application requirements. These customers can indicate the quality of the vendor's equipment, as well as the vendor's ability to provide support before and after the sale.

Another key in determining vendor competence is the ability to choose the proper equipment to meet your system requirements. Here, expertise in the Data



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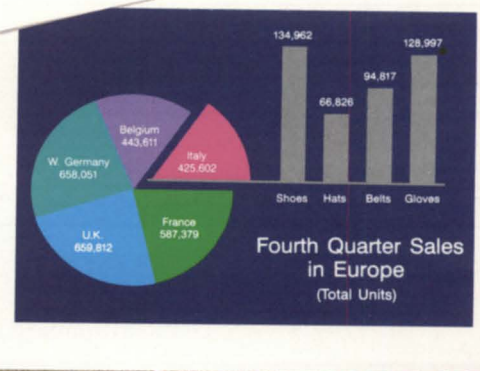
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EXPORT 2		IMPORT		EXPORT 3		IMPORT	
6189.00	4359.00	5399.00	4006.00	6661.00	1914		
893.00	1882.00	758.00	1757.00	863.00	725		
7943.00	11177.00	6216.00	10129.00	7485.00	5247.00		
402.00	529.00	430.00	329.00	836.00	292.00		
1810.00	1155.00	134.00	1003.00	4066.00	411.00		
5530.00		10607.00	5511.00	552.00	4313.00		
8217.00	1169	2702.00	911.00	15396.00	1910.00		
581.00		15124.00	3179.00	25124.00	256.00		
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			10960.00		9755.00		
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TO: Drug Application  
FROM: Lab 041B  
RE: Product #2298 Clin.  
Attached are the clinical trials results for FDA submission. We will have results for remaining test groups by Friday...two weeks of schedule!

```

(OUTPUT)
Command ****

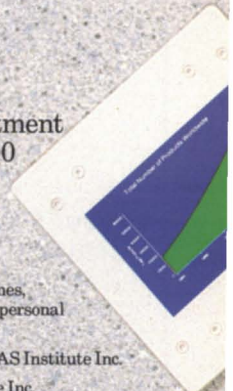
          Clinical Trials Data
          General Linear Model Procedure
          Repeated Measures Analysis of Variance
          Analysis of Variance of Contrast variables

          TIME N represents the Nth degree polynomial contrast for TIME

Contrast Variable: TIME 1

Source      DF      Type III SS      Mean Square      F Value      Pr > F
-----
WLAN        1      2.00902493      2.00902493      34.99      0.0001
DRUG        1      1.18089076      1.18089076      20.58      0.0009
DEPT        1      1.36172804      1.36172804      23.71      0.0006
-----
MEET
Command ****

PROC GLM uses the method of least squares to fit general linear models.
Among the statistical methods available in GLM are: regression, analysis
of variance, analysis of covariance, multivariate analysis of variance
and partial correlation. This procedure can be run interactively.
    
```



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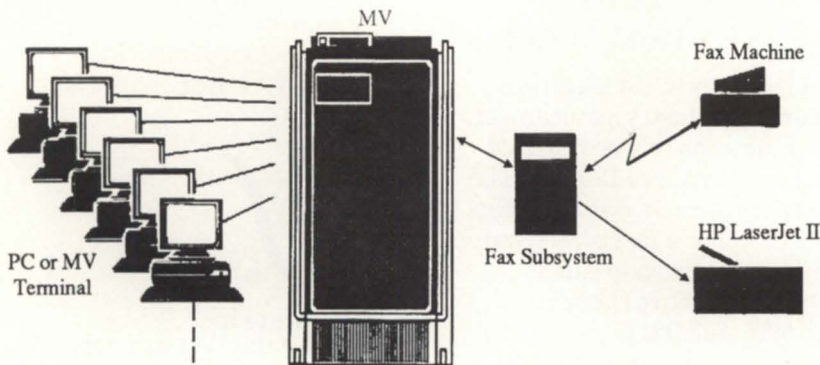
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General marketplace—both in hardware and software—is essential. Sometimes significant performance improvements are available through system software fine-tuning instead of buying. Weigh such expertise heavily when selecting vendors. It will help ensure that the vendor can provide proper future services for the lifetime of the equipment.

When purchasing a previously owned equipment upgrade from either DG or another resource, one of the buyer's main objectives is to receive honest, accurate advice. One recommendation is to obtain advice from other Data General users or suppliers of complementary goods or services such as software developers and compatible equipment manufacturers. Another source of information on equipment upgrades is trade publications. A Dun and Bradstreet report, bank references, and vendor references are also good starting points.

When qualifying a supplier for equipment upgrades, determine whether the correct technical information is provided. When you inquired about the upgrade, did you receive a prompt reply to your inquiry? Was the company organized enough to give you the proper information or suggestions? Did they truly answer your questions?

Although it may be difficult to make a personal visit to the supplier, such a visit to their production facility will give you a visual picture of the vendor's operation. If possible, the purchaser should view the vendor's inventory of equipment and parts, overall organization, cleanliness, staffing/activity level, and repair and refurbishment facilities. Because purchasing an equipment upgrade involves replacement of components, it is helpful to determine the scope of the vendor's inventory of parts. It is important to know that the vendor will be able to provide an extensive inventory of parts and components that may be needed for warranty repairs or to further upgrade the equipment in the future.

### Tying loose ends

An aspect to consider when purchasing an equipment upgrade is how to obtain a proper operating system license. A license can be purchased from Data General for the price difference between the old processor license and the new processor license.

Another way to receive a license for an upgrade is with a "Form 500" transfer through a leasing company. This one-time transfer is a Data General form that includes an AOS/VS license and costs significantly less when packaged with a processor. Often, equipment brokers make the arrangements for purchase of this equipment directly from leasing companies. Operating licenses for equipment upgrades can also be purchased through value added resellers who provide software/hardware enhancements not available "off the shelf" or from the manufacturer.

One common concern when upgrading from one piece of equipment to the next is what to do with the computer currently in use. When a company is ready to find a buyer for its previously owned equipment, one option is to negotiate a trade-in with the supplier who is handling the system upgrade. After all, dealers are not only interested in selling equipment, but also in buying equipment for inventory. Growing companies that already use Data General products and that are in need of more powerful equipment are also a good market for used equipment.

After a vendor is selected, and payment is discussed, do *not* agree to prepay either in part or in full. Exceptions to this rule are either a solid relationship between the two organizations, three qualified references from the vendor, or a face-to-face agreement between the two. Although most vendors are reputable and will handle any problem that arises, some may make promises they can't keep.

Purchasing previously owned equipment can be a cost-effective alternative for many firms wanting to upgrade. The key to a successful purchase is to do your homework before the purchase is made so that the end result will add to your company's solutions, and not to its problems.  $\Delta$

*Alan Rees is president of NPA West, formerly NPA Systems of California, Inc., a provider of disaster recovery, third-party maintenance, and sales/service of new and previously owned equipment for the Data General marketplace. He has been involved in the computer industry for 16 years, including positions at ITEL Containers International, Electronic Data Systems, and Burroughs Corporation.*

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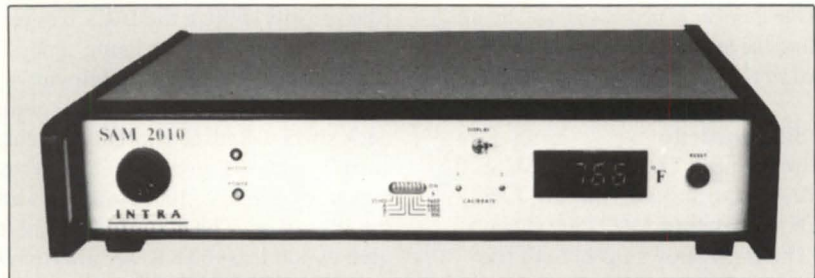
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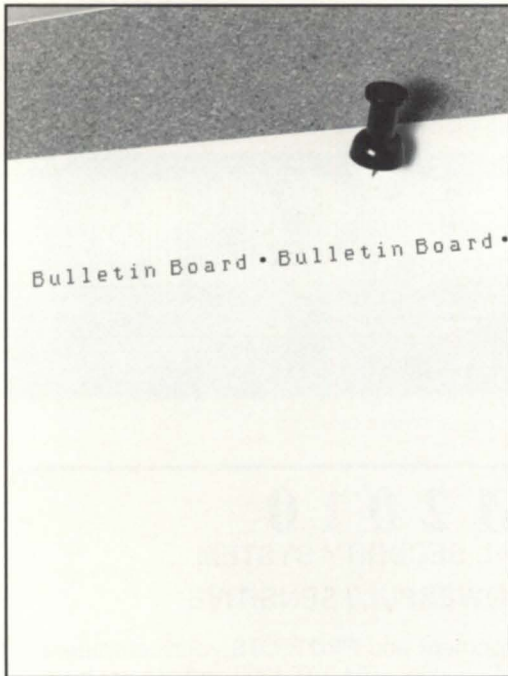
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# Bits and bytes from the bulletin board



on an average of once per day. Of course, when it crashes, everyone logged on dies. Is anyone else having trouble running a mixed bag of Unix on workstations and AOS/VS (classic) on DGs with Telnet as the primary tool for talk? Any solutions?

From: Richard Kouzes

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

From: Bill Benedetto

How high of a "high priority position in the chassis" do I need? We tried moving it above our MCA board, but we still had problems. I wonder if we are just asking too much of Telnetd?

We are running a Tektronix emulator on our Sun workstations. We use Telnet to log onto the DG and run software that normally drives a Tektronix 4115/4125. I don't fully agree that the Telnetd is seeing flaky characters and dying. Why should the Telnetd care what it is passing along the wire? It should just take the characters and push them out the door.

## Return of Telnetd

*Due to the number of new responses, we are reprinting the following question that first appeared in the July 1990 Focus—Editor.*

From: Bill Benedetto

We are running 7.60 on our MV/8000 and MV/20000, and are running 7.65 (all AOS/VS) on our MV/7800. They all crash. The error shows up in both the operator's console and the log file for either Telnetd or TCP/IP (I don't remember which, but I'm sure we've had errors posted to both files.) DG is supposedly looking at this problem with its highest priority. We told them we've had this problem for one to two years, and they were shocked we had waited this long.

Anyway, our Telnetd program crashes

From: Richard Kouzes

I just remember that we had to move [the priority] above the IACs. There is no reason that the data being sent should have any effect on Telnetd, unless the Tek41xx emulator is sending back special control sequences such as cntrl-T cntrl-V. I've done Tek stuff on a Sun from our MV/10000—it was slow, but it worked. The net should be able to give you at least 60 KB/sec and maybe as much as 250 KB/sec; it depends on the graphics software. Are you the only machines on the net or are there others? . . . You may want to try isolating your machines for tests if you are on a big net.

From: Bill Benedetto

Thanks for the response. I don't think that we tried moving the ethernet card

above the IACs. I believe we moved it up just a couple of slots. We still had problems.

Part of our problem is isolation. We have only found one occurrence that consistently crashes the Telnetd. This is when a user accidentally types out a binary file. And *this* is not even consistent.

From: Doug Rady

Telnetd: there is some magic finite limit on just how much you can shove through. [It] seems to be dependent on the particular "goings on" of each system and usage. [Have you] given any thought to AOS/VS II rev 2.00 with the kernel based TCP/IP-II? Rumors of upwards of 600 percent speed improvements . . . almost as robust as real Unix (BSD) Telnet.

From: Jim Dingman

. . . I think your Tek emulation is killing Telnetd. Ours runs fine until we do things like that.

From: Bill Benedetto

[Doug] We haven't considered going to VS II because we are going to DG/UX next year. My problem is what to do in the interim . . .

[Jim] We treat our Tek terminals as hardcopy devices. We just hand the stuff to the Tek terminal and let it do the drawing . . . Of course, we have the Telnetd in the middle handling all of the characters. And why should there be only an occasional problem? Why would this work for five days without any hitches and then blow up five times in two days straight? Perhaps it is the sign of the moon?

On a positive note, DG contacted us and said that they have "isolated the problem." They haven't fixed it, but they have acknowledged to us that there is a problem and that they know where it is. Δ

---

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

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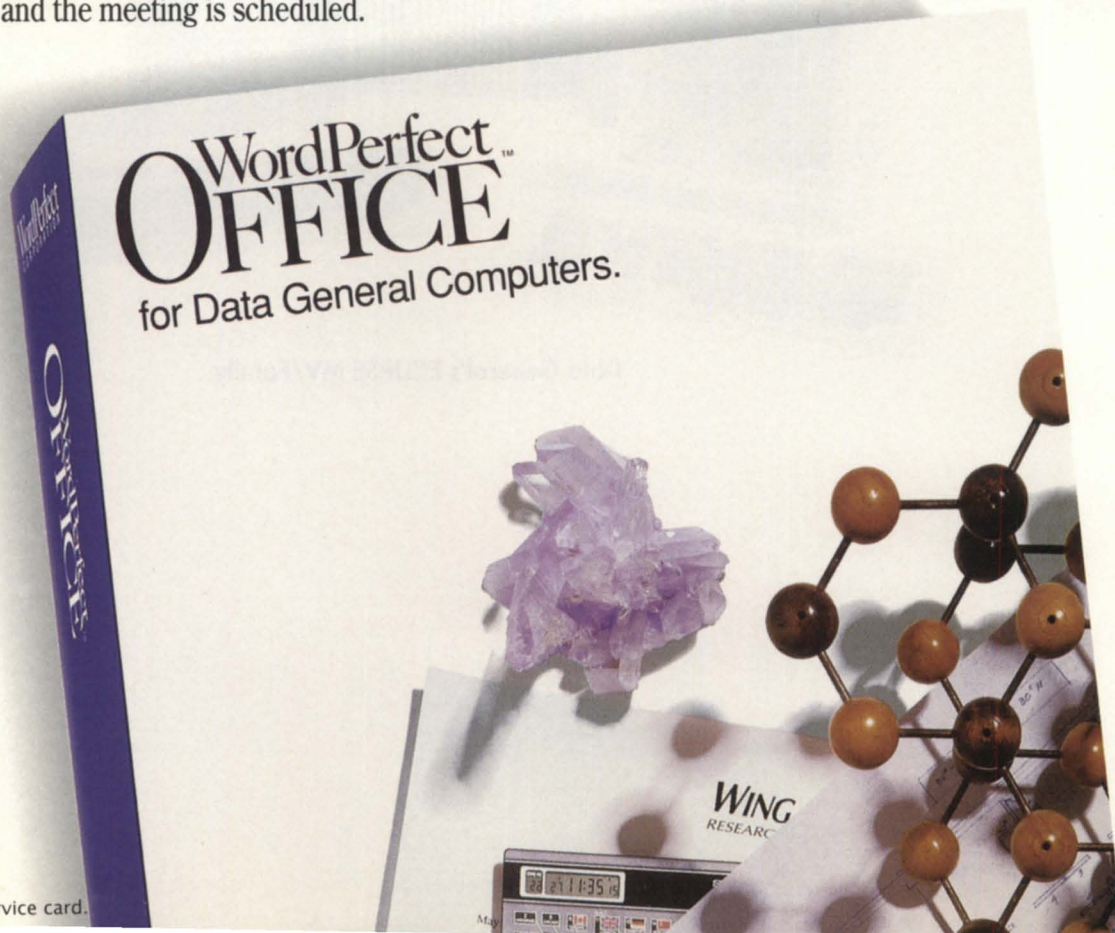
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September 1990

# FOCUS

*The Magazine of the North American Data General Users Group*

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What makes this year's NADGUG Conference even more significant is that two major Data General conferences are also taking place in Seattle at the same time — SOURCE 90, Data General's Reseller Conference, and the Data General Annual Sales Kickoff Meeting.

"United for the 90s" is the overall theme for these events. The programs for these conferences will take place in separate facilities. However, the NADGUG exhibit at the Washington State Convention and Trade Center will be the one place where all attendees can visit the Data General and third-party software exhibits. On Monday evening, attendees from all three groups will meet together in the Exhibit Area for a reception.

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**Turn page for details and registration information.**



# CONFERENCE REGISTRATION

NADGUG members may register for the full conference and receive three days of sessions, exhibits, and social events for only \$395 (non-members pay an additional \$50). An \$80 late fee is required of those registering after the September 21 deadline. Additional registration fees are required for the special workshops and Educational Services seminars on Monday.

Complete information on the conference, including travel discounts and registration are contained in the NADGUG 90 Registration Kit. If you have not received a kit, please call 1-800/877-4787 (within the US), or 1-512/345-5316 (outside the US) to request a kit, or complete and return the business reply card on the back cover.

## Agenda

Here's a quick look at the NADGUG 90 conference program. A selection of five different breakout sessions targeted to end-user, management, or technical audiences, are offered per time slot. A new feature this year is a special UNIX® track.

### MONDAY - OCTOBER 22

- Special Workshops & Seminars
- Exhibits Open
- Welcome Reception

### TUESDAY - OCTOBER 23

#### General Sessions:

- Special Keynote Address by Norman Weizer, Senior Consultant, Arthur D. Little
- Data General Keynote Address by Stephen Paul Baxter, Vice President of Corporate Marketing

#### Breakouts:

- WordPerfect Presents 5.0
- Detecting and Recovering from Computer Virus Attacks
- Practical 4th GL Implementation
- Protecting Your Computer: PCS Can Help
- DG/UX™ Streams

#### Breakouts:

- EDI and the 1990s: The Era of the Quick and the Dead
- The MV/Family's Forever
- Sorting Things Out - Techniques to Optimize Applications
- Planning for Future Growth
- Security Extensions to the Network File System

#### Breakouts:

- Solutions Through Systems Integration
- Optimizing INFOS® Files for Improved Performance
- Future Directions in CASE Technology
- Strategic Planning
- COBOL Under UNIX - Leapfrogging into the Future

#### Breakouts:

- A CEO Smorgasbord of Optional Products
- A Beginners Guide to System Performance
- AOS/VS II Terminal Connectivity: Now You Can Get There From Here
- Writing Portable INGRES Applications
- Fax Options Under Data General Computers
- Porting to DG/UX

### WEDNESDAY - OCTOBER 24

#### Breakouts:

- Wide Area Networking for the 90s
- AOS/VS II & UNIX Interoperability - A Technical Perspective
- Data General's Distributed Applications Architecture Strategy
- ECLIPSE® and AViiON™ Interoperability
- Practical Issues in Building Graphical User Interfaces for OSF/Motif

#### Breakouts:

- New Pathways: Creative Applications of Computer Conferencing and Groupware Solutions in US Industry
- Connecting for the Future - A Panel Discussion
- Optimizing Techniques for High Level Languages
- Tomorrow is Here
- Disk Mirroring in DG/UX

#### General Sessions:

- NADGUG Annual Business Meeting
- Data General Executive Panel

#### Breakouts:

- Bar Coding
- Recent Developments in AOS/VS II Architecture
- Distributed Processes - Managing an Information Center
- User Documentation
- NetWare® for AOS/VS and DG/UX
- Cocktail Reception & Banquet

### THURSDAY - OCTOBER 25

#### Breakouts:

- Remote Computing with Data General Systems
- Knowledge Bases and Databases: A Convergence of Technologies - A Divergence of Interests
- Managing Your Programming Staff
- Practical Issues of WAN-LAN Networking
- Parallelism in the DG/UX File System Design

#### Breakouts:

- Integrated Imaging on MV/Family Systems
- Communications in Heterogeneous Networks
- Trends in Database Technology
- Connecting Macintoshes to Data General Systems
- AViiON and MV/Family Systems as Application Platforms: A Technologist's View

#### Breakouts:

- Networking from AOS/VS to the World
- COBOL in the 1990s
- Disaster Recovery in the 90s
- Cost-Effective Contingency Planning
- Ginxu - Generally It's Not Exactly UNIX or Yet Another Silly Acronym

#### Roundtables:

- Office Automation
- COBOL
- Operating Systems



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# Porting alternatives

**SYNOPSIS**

*Cobol, BBasic, Infos II, and DG/SQL ports range from relatively easy to downright simple; but beware of porting a file management application to an RDBMS.*

by Mike Normile  
Special to Focus

*(Editor's note: This is the second in a two-part series on alternatives for connecting Eclipse MV and Unix systems.)*

Data General views porting an application from the Eclipse MV family to open

systems as an option, not a requirement. This article is designed to inform those who wish to investigate or pursue that option.

It is important that you understand the following about the suggestions listed in this article:

- They assume your goal is a straight

port. That is, no changes to, or expansion of the application's functionality will be made along with the port;

- There is a tremendous variety of software available on Data General's open systems, and it is quite possible that products other than those mentioned here will be the most appropriate for your particular situation;

- Figure 1 lists the products that Data General recommends when planning a port.

**Interactive Cobol, Business Basic**

Applications written in ICobol and BBasic will be the easiest to port, since both languages are being ported to Unix. With Interactive Cobol, program object files and data files have identical formats on Eclipse MV family and Unix systems, and may simply be copied from one to the other.

Business Basic data file formats are compatible across both platforms. Program files must be LISTed to ASCII, then copied, then ENTERed. In both cases, porting is necessary if calls to other languages or to AOS/Vs are employed. "Copying" can be done via magnetic tape or TCP/IP.

**Infos II**

As Figure 1 indicates, the data manager to which Infos II is ported depends on the Infos II application. When the application uses Infos II only as an ISAM file manager (single key or alternate key ISAM, or "simple DBAM"), the data manager may be a simple ISAM system such as Informix, C-ISAM, or the ISAMs that are bundled into Unix Cobols. This path should be chosen only if the ported application does not, and will not in the future, require recovery and availability features such as transaction rollback. This need is frequently proportional to the user count.

**Figure 1: Porting alternatives**

	<b>AOS/Vs PRODUCT</b>	<b>UNIX PRODUCT(S)</b>
<b>Languages</b>	Interactive Cobol Business Basic AOS/Vs Cobol AOS/Vs C, F77, PL/1, Pascal	Interactive Cobol Business Basic LPI or Micro Focus Cobol GNU or Green Hills C, LPI F77, PL/1, Pascal
<b>Data Management Products</b>	<p>INFOS II</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">                     ISAM or simple DBAM (Note 2) and low user count (Note 3)                 </div> <div style="border: 1px solid black; padding: 5px;">                     Complex DBAM (Note 2) or high user count                 </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">                     C-ISAM (Informix) or Any Cobol ISAM (Note 1) or Any RDBMS                 </div> <p>Any SQL-based RDBMS</p>
<b>DG/SQL</b>	With any 3GL With DG/Ingres	Any SQL-based RDBMS Standard Ingres
<b>Note 1:</b>	Interactive Cobol, Business Basic, and all of the Unix Cobols have ISAM data managers embedded within the language.	
<b>Note 2:</b>	"Simple DBAM" means Infos II DBAM used in a way that is logically equivalent to alternative key ISAM. The index structure has one "selector" level and one "record index" level. "Complex DBAM" means any other type of Infos II usage with two or more index levels.	
<b>Note 3:</b>	The exact dividing line between "low" and "high" user count will depend on your individual situation. The line will be at the user count where you believe that the fast recovery time offered by an RDBMS becomes necessary.	

Porting from Infos II ISAM to another ISAM is a straightforward translation. The program logic should not require modification. The language itself will require porting—for example, AOS/VS Cobol would be translated into LPI Cobol.

Figure 1 also indicates that a relational data base management system (RDBMS) implementing an SQL data manipulation language should be seriously considered for a number of applications. Since porting to an RDBMS is complex, it will be addressed separately.

The Infos II alternatives are independent of the language used in the application. Three-GL alternatives are included in Figure 1. Powerhouse and CQCS are the 4GLs most often used with Infos II. Both will be ported to the Aviion, and will support an ISAM system and an RDBMS.

## DG/SQL

Nine different vendors have committed to port their SQL-based RDBMS products to Aviion. Many of these vendors also have versions for 80386-based Unix systems, and most ports will be complete by the time this article appears.

As a result, porting a DG/SQL application to open systems will be relatively easy. The particular porting path a DG/SQL user follows depends primarily on the language products (either 3GL or 4GL) that are used in conjunction with DG/SQL.

Applications that use DG/SQL together with a 3GL can be ported to any of the nine Aviion SQLs. Porting the SQL statements will only require modifying the statements to account for differences in the SQL syntax of the various products. Since the ANSI SQL standard does not cover the data base OPEN command, for example, each implementation of OPEN is a bit different. No major change to the program logic should be needed.

## Porting to an RDBMS

The past few years have seen SQL-based relational data base management systems (RDBMS) dominate the data management market.

Users of file management systems are asking if the benefits of an RDBMS are worth the cost of porting an existing application, while many Infos II customers are considering RDBMS ports regardless of their open systems plans.

This section examines the issue of porting an existing file management (ISAM, Infos II) application to an RDBMS.

## What is different about an RDBMS?

RDBMS products are different from file management systems such as ISAM and Infos II in two fundamental ways: set-at-a-time data manipulation language (DML) and support for transactions.

• *Set-at-a-time data manipulation.* File managers allow an application program to manipulate a single record at a time. It can READ one record, UPDATE one record, DELETE one record, and so forth. RDBMS products let a program manipulate whole sets of records at a time.

• *Transactions.* A transaction is a group of data base or file manager commands that perform one logical unit of work. For

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example, the commands that deduct money from a savings account balance and add it to a checking account balance make up a single "transfer" transaction. With an RDBMS, a programmer must identify the start and end of a transaction using special commands. After a failure, an RDBMS will automatically "roll back," or undo partially completed transactions, greatly speeding recovery.

File managers do not support transactions. If there is a system or application failure, the data files may contain partially completed transactions. Recovery often requires reloading a backup copy of the files and reentering all transactions entered since the backup was done.

### The advantages of an RDBMS

Almost all RDBMS products offer sev-

eral major advantages over simple file managers such as Infos II:

- *Higher availability.* The transaction rollback feature of most RDBMSs can shorten recovery time from failures such as power outages from hours to minutes. Many RDBMS products are enhanced with additional availability features such as on-file back-up.

- *Productivity tools.* Most (but not all) 4GLs were designed to work exclusively with RDBMS products. Virtually all of the newer types of programmer productivity tools, such as CASE tools, are being designed for use with RDBMS products exclusively.

- *Cooperative processing.* This term refers to splitting an application into pieces that are run on separate processors. The next major wave of applications will be cooperative, and will utilize PCs and workstations and graphical user interfaces as user-friendly front end processors. The PC or workstation will transmit SQL or file system commands to a data base or file server system.

Whenever such applications access individual records (rather than entire files) an RDBMS will probably be required for good performance. Since a single SQL command can replace literally thousands of Infos II or ISAM commands, RDBMSs make much more efficient use of the network than file managers.

### Key facts about porting

The key facts that anyone contemplating a port from a file manager to an RDBMS should understand are these:

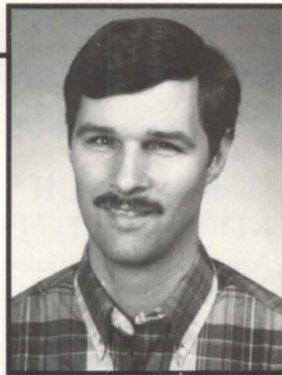
- "Quick and dirty" ports do not work
- There is no magic black box that automatically converts application code
- Porting to an RDBMS usually requires extensive redesign and reimplementations of the application
- Programmers without RDBMS experience will require retraining
- Modern development tools, such as RDBMS design tools, CASE tools, and 4GLs can help in the redesign and implementation of an application. However, they cannot totally automate such a job.

### Why porting to an RDBMS is difficult

The very features that give RDBMS advantages over Infos II and other file managers make porting an RDBMS difficult.

- The set-at-a-time power of SQL is the

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“ The wide variety of seminars, which provides something for just about anybody, covers anything from essential management skills to highly technical research. As a fairly new programmer analyst who is also interested in interpersonal skills, I found both the technical and management seminars to be useful and informative. As an AOS/VS user, I especially enjoyed the AOS/VS roundtable. It is the best forum I know for comparing notes and joining forces with other users of the same operating system.

At my first NADGUG conference, I made contact with members of Data General's documentation department to express a concern of mine about document accessibility. I have no doubt that personal contact went a long way toward resolving my problem in a most expedient manner.

You can make some valuable connections with vendors at the exhibits, too. You can save an incredible amount of phone calling and letter writing by doing "one-stop shopping" at the conference. Besides, if you are like me, you will probably discover vendors you wouldn't even have known to call. ”

— Dan Simpson, Programmer/Analyst  
General Instrument Corporation

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reason that "quick and dirty" conversions do not work. A quick one-for-one translation of ISAM or Infos II commands to SQL commands would force the SQL commands to manipulate only single records. This would be like using a tractor-trailer to haul a single bag of groceries. The resulting application might "work," but it would perform very poorly.

- Since file managers do not support transactions, applications that use them tend to be much less structured than RDBMS applications. These applications must be restructured in the porting process.

RDBMS applications must be designed and coded differently than file manager applications. This is why there are no "magic black boxes" to automatically port RDBMS applications. It also means that programmers who are inexperienced in RDBMS must be retrained and then given time to learn to use RDBMS effectively.

### The porting process

The general steps to be followed in porting from a file manager to an RDBMS are as follows:

- Plan ahead
- Design the data base. This is the most important step in implementing any application on an RDBMS, whether a port or a new application. There are several PC-based CASE tools that help users analyze their data requirements and design the data base
  - Redesign the application logic. The new design must be based on transactions and set-at-a-time data manipulation
  - Recode the application. You might also consider improving productivity by doing all or part of this recoding in a 4GL. Many users implement an entire application in 4GL, and then recode parts in 3GL as needed for performance
  - Move the data. This is the easiest part of the port, and there are utilities available to help. Present and Sort/Merge can both unload data from an Infos II file into a flat, sequential file. Most RDBMS products have utilities that can then load the data from the flat file into a data base.

### When a port is warranted

Folk wisdom holds "If it ain't broke, Mike Normile is the Information Management Product Manager in Data General's Corporate Marketing division.

don't fix it." Ports require planning and lots of time; folk wisdom might be the best guide for determining when porting makes sense.

The cases in which porting an existing application to an RDBMS are most advisable are when the application is growing in terms of user count and data base size, or when an application is coming due for extensive modifications or a complete

rewrite for reasons of age or changing application requirements.

The larger the application, the more likely that the advanced availability and recovery features of an RDBMS are required. "Reload last night's backup and reenter today's transactions" may be an acceptable recovery procedure for a 10-user system, but at larger user counts, this policy is unacceptable.  $\Delta$

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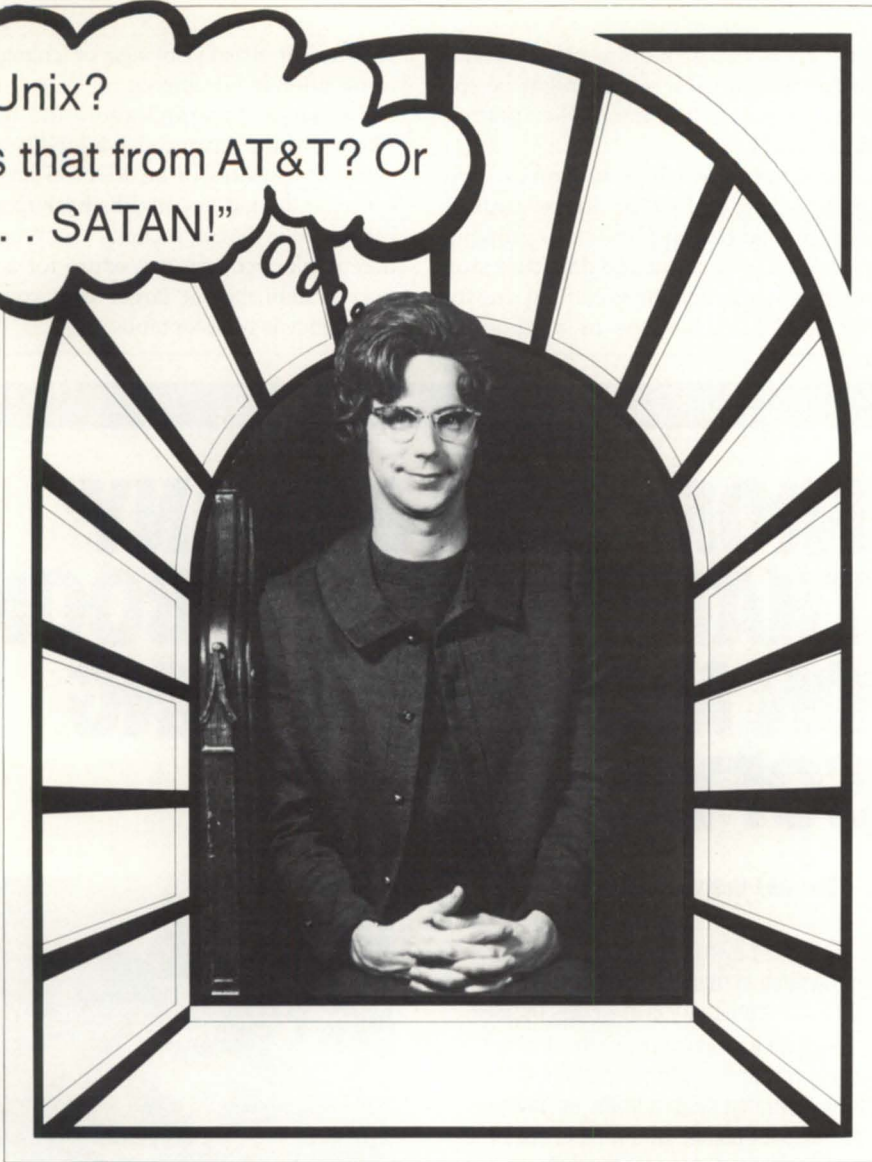
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"Unix?  
Is that from AT&T? Or  
... SATAN!"

Photo of Dana Carvey as the 'Church Lady' courtesy The Brillstein Company.



# I survived Unix

## SYNOPSIS

*Whether or not you think the Devil made DG do it, there's no denying Unix contains many commands and options that DOS has been waiting for.*

My next few articles will be about something near and dear to every MV users' heart—Unix.

After writing a column on Wild Hare's compiler (*Focus*, April 1990), I got a call from Data General asking if I'd like to review ICobol on the Aviion. I replied that I'd love to, except that a) I don't have an Aviion, and b) I've never even picked up a book on Unix, so I wouldn't know what to do with an Aviion if I had one. DG most generously shipped me a copy

of 386/ix Unix for my PC, and said that as soon as I got familiar with Unix, I could borrow an Aviion for a couple of weeks. The first article in the series, therefore, is the reaction of a total novice to Unix.

### First, the knee-jerk

For an industry that coasts on the leading edge of technology, computer people are a reactionary bunch. The operating system (compiler, word processing package, spreadsheet, etc.) that I'm using is

obviously vastly superior to anything else on the market. Is there anyone out there who doubts that AOS/VS is better than VMS? The single exception seems to be MS-DOS. In eight years of working with DOS, I have yet to meet anyone who likes it. Suggest that someone switch from DOS to Unix, however, and you get a reaction like that of the Church Lady on Saturday Night Live. "Unix? Is that from AT&T? Or ... SATAN!"

I've been playing with Interactive Systems' 386/ix Unix for a whole month, so now *I are an expert*. The bottom line is ... it's not that bad. In fact, I rather like it. And I like it a whole bunch better than DOS. Of course, there's a learning curve; there is with *any* operating system. It took me three months under AOS/VS to realize that I had my NL and CR keys swapped, and just last month I finally got my batch streams straightened out (I think). Unix seems to have a steeper learning curve than most of the operating systems that I've worked with. Paul Reiber from Carnegie Mellon says this is due partially because it is so huge, and partially because the manual reads like one large Quick Reference card.

So for this article, I'm going to take a quick look at Unix and what I like and don't like.

### Hacking away preconceptions

I'm sure my Unix preconceptions are similar to everyone else's—obscure commands, written by and for hackers, etc. The obscure commands objection is valid. But if you were a beginner, what would you think of an operating system that forced a command structure like this:

```
fi/after/tlm=[!date]/cpl=1/nhead/sort/l=backup  
#:+.CO
```

which is a line from one of my backup macros? Obscure, right? Of course, no one ever types this. They use the macro. Same thing in Unix. In Unix, however, you have even more flexibility than AOS/VS. On your MV, try creating a macro called DIR.CLI and executing it. It can't be done—not even by typing the complete name. In Unix, you can create a batch file (called a shell script), name it the same as a shell command, and have it call the shell command with no problems or infinite loops.

Unlike DOS batch files, shell scripts



don't have to have any particular extension or filename. Unix has a command, `chmod`, that gives execute and other permissions to a file, much like ACL. In fact, if you're consistently using a shell script, you can just put the commands into your `.login` script (the equivalent of `autoexec.bat`) and save a disk access each time you invoke it.

The Unix command line interpreter is called the shell. Think of it as `command.com`. Unlike DOS, which has one and only one CLI, Unix has at least three: the Bourne, C, and Korn shells. The Bourne shell was developed first, and contains the fewest commands. Berkeley then developed the C shell, which adds features such as CLI history. Then AT&T responded with the Korn shell. I've got enough problems with this article without learning *three* new CLIs, so I concentrated on the Bourne shell.

There are three obvious differences between the Unix command line and DOS. I want to make it clear that these are not necessarily criticisms, just differences. Unix has, after all, been around for a few more years than MS-DOS. If anything, DOS should be criticized for not doing things the Unix way!

The Unix directory structure is nearly identical to that of DOS, and most of the commands to manipulate that structure are the same or similar—`CD` to change directories, `MKDIR` to make a directory, `RMDIR` to remove an empty directory. The learning curve in this case consists of the different slash used. DOS uses the backslash (`\`), while Unix uses the slash (`/`). Since Unix has publishing priority, I suppose that means that DOS is doing it wrong, but this difference gave me more typing problems than all the rest combined.

Options in Unix are selected by the dash, instead of a slash. In Unix, `ls -F *.txt` lists all files with a `.txt` extension, while marking what type of file they are. This seemed to cause me no problems at all. In fact, I find that I prefer it. In DOS, I constantly type the wrong slash.

The next thing is what I consider a major annoyance. Unix treats upper and lower case as different characters. In the example above, typing `LS -F` returns "not found: LS". In `vi`, Unix's screen-oriented editor, many of the commands are different depending on the case. `F`, for instance, moves the cursor left to a specified char-

acter, while `f` moves it right. Getting into the ICobol runtime system consisted of many iterations of typing `ICX`, then `icx`, typing `c` and `mainmenu`, then `C` and `MAINMENU`, and so on. My CAPS LOCK key is beginning to show signs of wear. Switching the slash and backslash was confusing; differentiating the cases was downright annoying, and was the one feature I disliked most.

**The vichyssoise is on page 498**

And now to the CLI commands. This is where Unix really shines. It's got all of the commands and options that I wish DOS had, and more. I've heard Unix criticized for having too many switches and options. I'm sorry, but I don't buy this argument. It's like complaining at a restaurant that there are too many items on the menu. Unix commands have the op-

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tions that I've always wanted in DOS, but never got. If you don't want to remember all of the options, write yourself a macro that specifies the most useful ones.

DOS's "DIR" command accepts two switches: /w for a wide listing, or /p for a page pause. Unix's "ls" command has 22 options. You can list files alphabetically, by date, list hidden files, list what type of file it is, and so on. DIR pales in

comparison. In DOS, the TYPE command accepts no switches, and will display a single file. The Unix command for TYPE, "cat", accepts multiple inputs and wildcard characters. Typing Ccat file1file2" or "cat file\*" are both perfectly valid. You can also instruct cat to display non-printing characters as their control code equivalents.

The equivalent of DELETE is "rm", and

among other features it has two that DOS needs desperately, a confirm switch and a recursive switch. The confirm, "i", functions exactly like the AOS/VS DELETE /C. The recursive switch will remove all of the files *and subdirectories* from a directory. I'm sure I've wasted years of my time in DOS going down directory chains and deleting files so that I could remove a directory. Unix makes that unnecessary.

Then there are the Unix commands that have no DOS equivalents. Unix is full of commands that, in DOS, are usually accomplished by programs that I've paid way too much for. For example, "tail" prints the last lines of a file. This is a command that I wish AOS/VS had. How many times have you done a quick TYPE of a report, just to see the total line? Unix's "find" command operates as a super DIR. It'll search through directories and subdirectories for a file that matches the criteria that you're looking for. You can match by name, access time, creation time, size, and so on. This is especially helpful since, by the appearance of my system, Unix tends to have many more levels of subdirectories than most DOS systems. The ICobol log, for instance, is a file in directory /usr/opt/icobol\_1.51/run/log. The much maligned "grep", despite the silly name, turns out to be very useful. It'll search through files and report which ones contain characters that match a pattern. And like any operating system worthy of the name, Unix allows a link entry from one file to another with the "ln" command.

Unix even includes a full screen text editor, vi. I've been using Wordstar for too long to easily change editors, but I had no real problems editing programs with vi. Interestingly enough, this editor contains no commands for text formatting, line spacing, justification, and so on. Instead, these functions are supplied in separate programs, nroff and troff, which you run your text through after you're finished with vi. Another program, eqn, is a full-blown equation processor. You can feed it something like

$x \text{ over } r + y \text{ over } r$

and the printed result will be

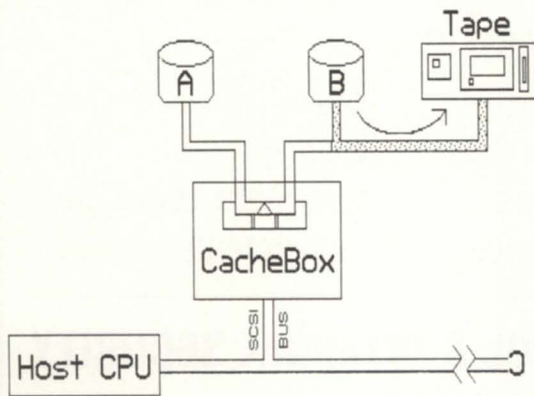
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misguided though they may be. I've got my PC partitioned into a 50 MB DOS disk and 50 MB Unix disk. One of my concerns with this series was getting files back and forth between the systems. The Unix program "dossette" takes care of this nicely. Type "dossette", and you're at the A> prompt. From there, you can change directories or drives, TYPE a file, move the file from Unix to DOS and vice versa. In other words, it looks much like the DOS environment, with DOS commands (except the slash is still backwards).

Of course, there are commands in Unix that simply have no place in DOS. For example, "who" lists the system users, and "mail" manipulates the mail system. Neither of these make sense on a single-user system. The "at" and "batch" commands work much the same way that batch does in AOS/VS. And to pop out of a background process, there's no need for a separate command like "proc/def...". Simply put the "&" character at the end of your command line, and Unix will fire up another process and run your command.

Another knock against Unix used to be the lack of available commercial software. That's becoming less and less true every day. As companies jump on the Unix bandwagon, it's becoming possible to buy anything for Unix that you can for DOS—from Wordperfect, to Lotus, to AutoCAD. And now that ICobol is available, millions of developers are going to be rushing their latest version of inventory control to the market... well, maybe not. But you can certainly migrate your own applications to Unix.

It's impossible to cover the intricacies of a full-blown operating system like Unix in 2,000 words. Imagine trying to write a four-page summary of AOS/VS! I hope I've given you a bit of the flavor of Unix. It may not be right for everyone. A single-user Unix system is kind of like a single user AOS/VS system—but it's a well-constructed operating system, and wasn't half as scary as I had imagined.

---

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---

It's got the built-in commands and switches that DOS should have, but doesn't. At this point, I'm actually looking forward to trying out ICobol and the Aviion.

#### Odds and ends dept.

Being the trusting soul that I am, I loaded up CLI32 as soon as I got it. I think I must be the only person in the

country who doesn't have a beta version of it, and I felt deprived for too long. So far, so good. The only macro changes I've had to make are in those macros where I was too lazy to spell out "priority". The new "privilege" command makes PRI illegal as an abbreviation.

And to prove that it really is a 32 bit process, XZZZY now returns "Twice as much happens!" △



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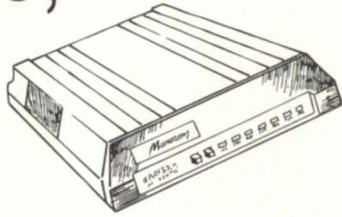
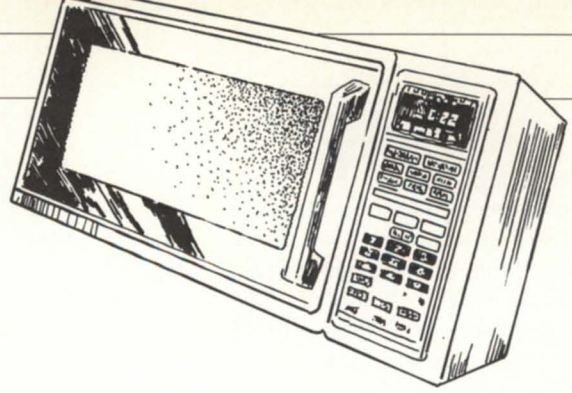
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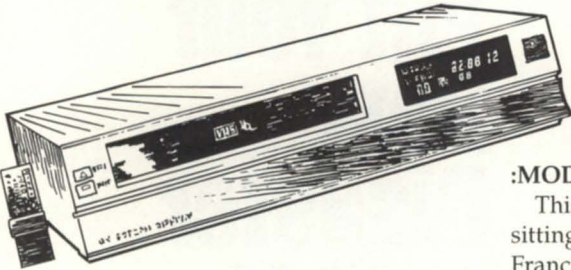
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# Standards,



# what standards?



"Everything should be made as simple as possible, but not simpler."

*Albert Einstein*

"When I die and go to Hell, my job will be to configure all of Satan's modems."

*BJ*

## SYNOPSIS

*Determining modem configurations can seem like a black art, but there's really no magic involved. You just need to know a few things about flow control, autobaud vs. fixed rate compression, dial-in setups, and the latest Microcom jargon. This information you won't find from DG Direct.*

### :MODEMS

This morning, while the airplane I was sitting on was lining up to land at San Francisco, I attempted to set my watch back to local time. It took me quite a while to do it because my watch has a user-hostile interface, no standard exists for the human-watch interface, and I'm not in the habit of carrying the manual for my watch around with me.

This problem is not limited to watches; it also applies to microwave ovens, VCRs, and most other home appliances.

For those of you who are naive enough to believe that the existence of standards can solve problems like this, I have just one thing to say: "Hayes compatibility."

Technically, Hayes compatibility is only a de-facto standard, and not a very good one at that. One of the most blatant violators of the standard is Hayes itself. But no standard is without violators. Take the RS-232C standard; few computers and terminals follow the spirit, not to mention the letter, of the standard.

Every time I'm confronted with a new modem, it seems like it takes hours just to figure out the additional commands the modem manufacturer added to support the particular quirks that someone felt compelled to add to the modem.

### :AX-

A company called Microcom, started by an ex-DG marketing guy, makes a line of modems that support another de-facto standard referred to as Microcom Networking Protocol (MNP). Microcom originally developed MNP in order to allow

modems to communicate in an error-free fashion, regardless of the phone circuit quality. Eventually, the standard was expanded to include data compression and asymmetric bandwidth allocation in order to achieve higher throughputs than the relatively narrow spectrum phone circuits are nominally capable of.

A little over a year ago, I noticed that DG Direct was selling Microcom modems. Also, I had purchased some Microcom modems through other channels on the assumption that the guys who developed MNP would probably do a better job of implementing it than other modem manufacturers.

Initially, I bought some Microcom AX2400c modems that support MNP Classes up to Class 4 (error free with data compression at Modem Port speeds up to 2400 baud and Serial Port speeds up to 9600 baud). Then I bought some AX9624c modems that support up to Class 6 (error free with data compression at Modem Port speeds up to 9600 baud and Serial Port speeds up to 19200 baud).

I originally started writing this column in January of 1989. Over the past year, I've tried several times without success to obtain a list of recommended settings from DG Direct. Apparently, when you buy a Microcom modem from them, you're on your own when it comes to setting it up properly.

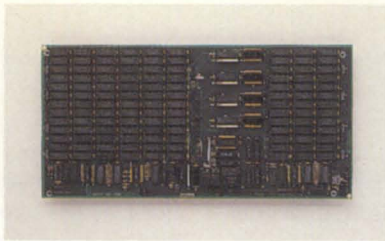
The purpose of this and my next few columns is to walk you through the results of countless hours of research, and show how to get the most out of these modems when using them with AOS [/VS [III]] systems.

The configuration is not yet sunk in concrete, so the details will undoubtedly evolve. I'll keep you apprised of my progress in the months to come. In the meantime, I'm going to start this project by laying the groundwork for the effort this month, then next month I'll describe the actual modem setup at both ends. If you can't wait until next month, you can obtain a pre-release of next month's column from the :SYSMGR BBS.

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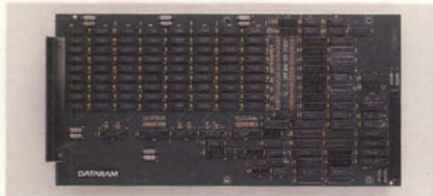
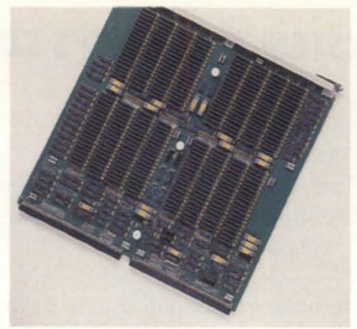
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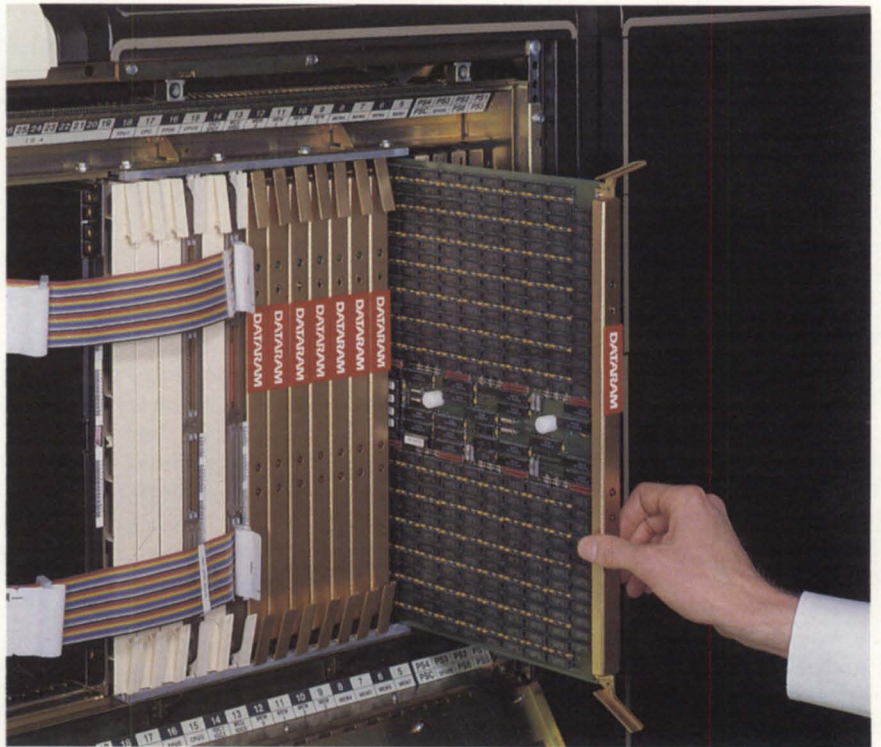
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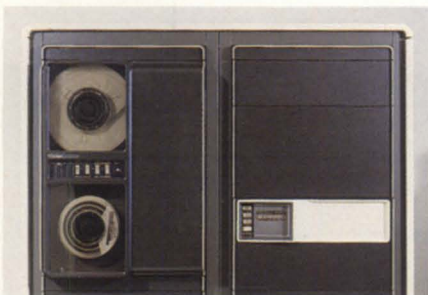
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## :GOALS

Here's the list of goals that I wrote up before starting to figure out how to connect and configure the modems:

1. The modems should adhere to the requirements of AOS/VS for session security. In other words, AOS/VS should be able to detect when a caller has hung up without logging off so that it can force a logoff and terminate the user process(es).
2. The modem should be able to talk to callers whose modems range from terminally stupid to smarter than the answering modem.
3. The setup should allow software to use DG's "old style" cursor addressing (i.e., "<20><col><row>"), without the chance of a column or row value of XON or XOFF being mishandled by the modem.
4. The caller should be able to use ^S and ^Q to pause/resume the display without data loss.
5. Cycling the power or hitting the RESET button on the rear of the modem should not require re-programming the modem options.
6. The modem should return to a known state when a call terminates.
7. The setup should allow callers to do true binary file transfers (e.g., Xmodem /Ymodem/Zmodem).
8. The modem should be easily convertible to dial-out usage.

## :JARGON

Before we leap into this, we need to get a little Microcom jargon under our belts.

Serial Port refers to the interface between the modem and the computer. The Serial Port is always in one of two states; command state or connect state.

Modem Port refers to the interface between the two modems via the phone line.

The AX modems support four connection modes: Normal, Direct, Reliable, and Auto-reliable. Normal and Direct connections do not use MNP and can range from 110 to 2400 baud. Reliable connections use MNP and can range from 110 to 9600 baud. Auto-reliable mode attempts to establish a Reliable connection first, and if that fails then it falls back to either a Normal or Direct connection. The other modes simply hang up the phone if they can't establish a matching connection.

Normal and Direct connections are both used to talk to non-MNP modems. A Di-

rect connection is used to talk to truly stupid modems so the Serial Port speed always changes to match the Modem Port speed. A Normal connection allows a slight enhancement over a Direct connection; the Serial Port can be fixed regardless of the Modem Port speed. To handle the speed mismatch, Direct mode allows

the two modems to exercise flow control between each other using XON/XOFF, albeit at the expense of data transparency, and allows Serial Port flow control using XON/XOFF or CTS/RTS.

## :FLOW\_CONTROL

During Normal and Reliable connec-

Figure 1: AX default settings

Default	Description
%A0	Disable auto-reliable fallback character
\A3	Set the MNP block size to 256 chars max
B1	Use the Bell 212A standard instead of V.22 at 1200 bps
%B9600	Set max Modem Port bps rate to 9600 bps
%C1	Enable data compression during reliable connections
&C0	CD always on
\C0	Do not buffer data during auto-reliable negotiation
%D0	Seconds to delay upon disconnect to give buffers time to flush [AX2400c only]
&D0	Ignore DTR transitions, DTR not needed for auto-answer
\D0	DSR and DTS always on
E1	Enable Serial Port echo in command mode
%E1	Enables the automatic retrain sequence (at 2400 bps only)
\E0	Do not echo Serial Port data during connect state
&G0	Disable guard tone
\G0	Disable Modem Port flow control during normal connections
\H0	Disable HP ENQ/ACK protocol
\I0	Disable the interface protocol
\J1	Enable Serial Port bps rate adjust
\K5	Send break to remote in sequence with data
&L0	Disable leased line
\L0	Initiate stream link
M1	Speaker on until carrier is detected
&M0	Operate as an asynchronous modem
\N1	Direct mode connections
Q0	Enable output of result codes
\Q0	Serial Port flow control disabled
\R1	Turn off the RI signal after call is answered
&S0	DSR always on [AX2400c only]
V1	Send long form result codes
\V0	Disable modified MNP result codes
X4	Report NO DIALTONE and BUSY when dialing, report CONNECT speed
\X0	Process XON/XOFF, but don't pass it on
%Z1	Disable echo suppressors if they turn on [AX9624c only]
S0=0	Do not answer incoming calls
S2=43	Escape code character
S3=13	Carriage return character
S4=10	Line feed character
S5=8	Back space character
S6=2	Seconds to wait before dialing
S7=30	Seconds to wait for carrier
S8=2	Seconds to pause for ',' dial string character
S9=6	Tenths of a second for carrier to produce CD
S10=30	Tenths of a second before carrier loss drops CD
S12=50	Fiftieths of a second quiet time before/after 3 escapes

Read-only registers and registers related to synchronous operation have been omitted from this list.

tions, Modem Port and Serial Port flow control are required in order to avoid data loss.

During Normal connections, Modem Port flow control is required to handle any difference between the Serial Port and Modem Port speeds. Each modem controls the flow by sending XON/XOFF characters to the other modem. Whether or not to use Modem Port flow control during Normal connections is controlled by the \G option. Obviously, XON/XOFF characters occurring in the data stream can confuse the modems by being mistaken for flow control requests from the other modem. As a result, if software flow control is used on the Serial Port at the calling end, then it is usually configured to react to XON/XOFF characters and swallow them. Reacting to XON/XOFF and passing them through as data is an option (\X), but this will confuse the Modem Port flow control for sure.

During Reliable connections, Modem Port flow control is required both to handle Serial Port/Modem Port speed differences, and to handle re-transmissions done to recover from errors caused by phone line noise. Modem Port flow control is accomplished using a bit in the MNP packet header, so XON/XOFF characters occurring in the data stream can't confuse the modems.

Serial Port flow control is used during both Normal and Reliable connections to avoid overrunning buffers within the modem. Two kinds of Serial Port flow control are available; software (XON/XOFF) and hardware (CTS/RTS). In addition, the flow control can either be uni-directional (generated by the modem), or bi-directional (both generated and recognized by the modem).

At the AOS/VS end, the only possible flow control schemes are uni-directional software flow control, and either uni- or bi-directional hardware flow control. Bi-directional software flow control cannot be used because XOFF characters (part of the DG cursor addressing sequences) sent toward the modem would freeze the incoming data stream until an XON occurred, which might be never.

Obviously, the ideal situation would be to use hardware flow control. However, IACs and older DG multiplexors restrict changes in the CTS signal to the period between the beginning of the character stop bit and the beginning of the

next start bit; an interval as small as 52 microseconds at 19200 baud. Dropping CTS at any other time scrambles the data. So the question is, do the AX modems comply with this restriction? Few modems and statistical multiplexors can comply because they handle CTS/RTS in their on-board microprocessors instead of in hardware.

I configured the AXs for hardware flow control, hooked them up with a full 8-wire cable (pins 2 through 8 and pin 20), and tested them to see if they comply. Lo and behold, they do. That probably explains why DG Direct sells Microcom's modems instead of somebody else's.

So, based on the successful CTS/RTS test, we elected to use hardware flow control for the modem at the AOS/VS end. Whether or not to use uni- or bi-directional flow control is not so obvious. DG recently added the /HOFC and /HIFC characteristics to AOS/VS to support hardware flow control. This was a bit of a puzzle to me, since I already knew that IACs handled output flow control in hardware. In fact, both /HOFC and /HIFC were off during the successful test I just mentioned. Why add a /HOFC switch if hardware output flow control can't be turned off?

The current AOS/VS documentation and the CLI.TPC.CHARACTERISTICS help file are woefully inadequate when it comes to describing how the /HOFC and /HIFC characteristics operate. My suspicion is that these two switches were added to cover some newer multiplexors that handle hardware flow control in software. However, it may also be true that using /HIFC on an IAC will change IACRS' behavior when its buffer is overflowing from emitting a bell character to dropping RTS. That would make bi-directional hardware flow control useful for avoiding input data overruns into the IAC during high speed file transfers.

I haven't had a chance to test this theory out yet, but I will as soon as I get a chance. In the meantime, I've elected to use uni-directional hardware flow control for the Serial Port at the IAC end.

### :AUTOBAUD\_VS\_FIXED

In order for compression to be effective during reliable connections, the Serial Port baud rate should be set higher than the highest possible Modem Port baud rate. Unfortunately, this precludes any callers

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from using direct connections because the logic for auto-reliable mode is to fall back to a normal connection if the Serial Port speed is fixed. However, compression is too big a thing to give up, especially for callers on the AX2400c's, so we've elected to let the stupid modem callers suffer a little data loss occasionally. This is an area that's still undergoing field trials to determine the frequency of data loss. So far,

it doesn't seem so bad.

Reliable callers at 4800 baud or higher should not expect blinding throughput differences due to compression. Our experience shows that IACs are rarely able to drive a line faster than about 13000 baud. Most PC terminal emulators start flow controlling heavy input around 9600 baud (4800 baud for Blast!) depending on the PC's clock speed. Uploading files to

AOS/VS using Blast (or CEO Connection) at speeds higher than 2400 baud produces negative throughput rates due to massive overruns on the IAC end, unless you crank Blast's acknowledgement window down from three to one. Cranking the window down to one effectively converts Blast to a half-duplex protocol with a throughput similar to Kermit and Xmodem (i.e., lousy).

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### :SETUP:DIAL\_IN:HARD

The AX2400c and AX9624c each have two sets of DIP switches; ten at the front and eight at the rear. I've always found that the best strategy for programmable modems is to set any hardware configuration switches to the factory default settings, or as close to that as possible. In the case of both AXs, the factory default settings are to have all the front and rear switches set to the up position. Unfortunately, this puts the modems in SX mode, Microcom's proprietary alternative to Hayes' AT mode. Because I don't have any software that knows how to use SX mode, I set front switch 2 down to select AT mode instead.

Note that the default settings result in the modem restoring the state stored in its internal memory (stored using &W) after power-up, reset, or whenever DTR drops. (AOS/VS drops DTR at the conclusion of each call.)

### :SETUP:DIAL\_IN:SOFT

For some reason, all modem manuals group the option command descriptions in seemingly random order, instead of in alphabetical order. The Microcom manuals are no different, although they do include an alphabetical listing cross-referenced by page number. This makes checking the default value for any command a three-stage process; find the alphabetical listing itself, look up the page number of the full command description, and turn to the page number. My first order of business was to produce a crib sheet showing all of the commands and their default values in alphabetical order by letter, ignoring the ampersands, backslashes, and percent signs. If you don't do this, you'll spend most of your time paging through the manual. My crib sheet is shown in Figure 1 (page 40).

The second order of business was to write a little utility program to send setup strings to the Modem Port and display



the reply. Without this program, sending commands to the modem would either have to be done blind using WRITE /L=@CONx commands, or it would have to be done manually using a program like TEX, so you can see the result codes. Both of these methods have a serious disadvantage; if the port is hung because CTS is missing, then the only way out is to abort (^C^A in the case of a WRITE, TERMINATE in the case of TEX). Worse yet, either method of extricating yourself produces an IAC failure on AOS/VS 7.65 due to a bug in IACRS.

My utility program is called CONSTR (CONsole STRing). Its command line looks like this:

```
) CONSTR @CONx 4 AT&F&W(15) ATZ(15)
```

The first argument is the port. The second argument is the timeout value in seconds. The Microcom modems react to most commands in one second, or less, but some commands like &W and Z take two or three seconds. The third and subsequent arguments are the strings to send to the port. The program logic is to send the string and then report any responses from the port until the timeout expires with no characters received. The logic then repeats for each subsequent string. All writes to the port have a two-second timeout to detect hung ports.

One of the nice things about the Microcom modems is that they are capable of reporting their current settings. \S reports all letter commands and %R reports all the Sn values. At 9600 baud, TEX was unable to keep up with the report text without experiencing input data overruns, but CONSTR handles reports at 19200 baud quite nicely. Also, CONSTR supports a /L[=path] switch, so the current settings can easily be listed to a file for documentation purposes using this

*BJ is the President of B.J. Inc., a San Francisco based consultancy specializing in system auditing, system management, and performance analysis. :SYSMGR is a division of B.J. Inc. BJ can be reached at 109 Minna St., Suite 215, San Francisco, CA 94105, 415/550-1444 (voice) or 415/550-1072 (fax). The :SYSMGR bulletin board number is 415/391-6531 (300/1200/2400 with optional MNP class 4, CHAR/605X/CHARLEN=8 /PARITY=NONE/AUTOBAUD) or 415/550-1454 (voice).*

command:

```
) CONSTR @CONx 4 AT\S(15) (15) (15) (15)&
&)AT%R(15)
```

The three CRs are needed because the modem reports the current settings in four groups with "HIT ANY KEY TO CONTINUE" after the first three groups.

:TO\_BE\_CONTINUED

Next month, I'll start on the actual modem setup strings for both ends, the modified Blast MODEMS.SCR file, the Blast .SU format, the Pereline modem command strings, and how to easily switch the modems at the AOS/VS end back and forth between dial-in and dial-out use. In the meantime, you can download a copy of CONSTR from the BBS and start playing with it. Δ

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## DISCOVERIES by Jim Siegman

# Sort/merge quirk

### SYNOPSIS

Warning: A possible bug leads to data destruction

**SORT/MERGE** (both 3.30 and 3.40) has an interesting problem. I assume it is a bug, but I'm curious why the problem exists in the first place. Consider the following input file definitions of a **SORT/MERGE** command file:

Example 1:  
Input file is "@data"  
Records are 151 characters  
Blocks are 23,405 characters.

Example 2:  
Input file is "TAPE\_FILE:1"  
Records are 151 characters  
Blocks are 23,405 characters.

Both of these **SORT/MERGE** command files were executed with the same input tape and a CLI macro containing the following code:

```
MOUNT/DIR=[!dir] tape_file  
DATAFILE TAPE_FILE:1  
SORT/C=SORT_COMMAND
```

Example 2 worked perfectly, but Example 1 was a different story. The most dangerous aspect of the problem is that Example 1 ran to completion as if there were no problems—but there were two major ones. First, **SORT/MERGE** only claimed to find about 57,000 of the over 97,000 records on the tape. Second, none of the output records were valid input records; all of them had been shifted. I did not investigate to see if they were all shifted the same number of bytes. It was irrelevant because the data was destroyed.

I suspect that the problem has some-

thing to do with the odd block size. The CLI copy command can not write tapes with odd block sizes. When I tried to copy the disk output to tape using **/OMTR=23405**, I found that the tape was written with 23,406 bytes in each block. It's possible that the hardware can not write the odd block size, and that high-level utilities such as Cobol and **SORT/MERGE** ignore the last byte in the block, while low-level utilities (**CLI COPY** and **DISPLAY**) can't make this adjustment.

An STR (software trouble report) has been filed on this problem.

### Vacation time

I've been writing the Discoveries column for *Focus* magazine since the magazine's inception in 1985. At first, the column was a question-and-answer format, and lately I've expounded on my own experiences and theories. Rather than rehashing what I've already written, I've decided to take a short vacation from the pages of *Focus*. When I come back in a few months, I'd like to return the column to something closer to its original question-and-answer style. An easy way to submit your questions is to fill out the reader response card labelled "It's your turn to talk!" which is located near the front of this magazine. In the meantime, I'll be researching new topics. Have a great summer! △

---

*Jim Siegman is a contributing editor to Focus and treasurer of the Chicago Area Data General Users Group. Send comments or questions to 548 Walnut, Elmhurst, IL 60126.*

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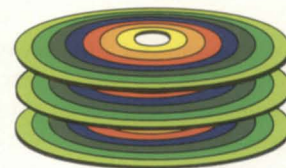
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# D O W N Sizing

## SYNOPSIS

*Upgrading may be the easy way out, but is it inevitable? Looking at the problem from a different angle, there are ways to postpone an upgrade. For starters, move word processing and other CPU-intensive work off of the MV.*

It's not that I'm always contrary, but I'd like to offer another perspective on this month's *Focus* emphasis on upgrading. I want to get your juices flowing, joggle those gray cells, and get you to look at the big picture.

### The upgrade scenario

So your computer is running out of steam. There are all sorts of things you can do. First, you can have Data General or an independent consultant guide you through a performance audit. In either case, you can throw money at the problem by going the "bigger and faster" route.

The fact is, MVs, like all proprietary architectures, offer less bang for the buck (fewer user MIPS per dollar) than many alternatives such as PCs and Unix-based systems. So, in the perspective of "Upgrades," let's take a look at one alternative to upgrading: PC integration.

### Hey, you! Yes, you!

You probably have responsibility for an MV family computer in an organization that is not, itself, a computer company, and as the needs of your organization grow, you need more computing power. Let's face it—if your organization

doesn't need more computing power as time goes on, you'll be looking for a new job. Without growth, you're bored and overpaid. If you like your job, you're probably thinking of ways in which you can do more for your organization. And that "more" is going to take "more" MIPS.

So what to do? The conservative (easy) way out is to trade in your old earth-tone box for a new MV/9500. (Gee, they really do look like AS/400s, don't they?) You get a new toy and the company saves on maintenance. That's good all around, but should you really stop there? It depends on how progressive you are.

If you take the civil service approach, you *will* stop there. After all, you've replaced your computer with one that is better, faster, and cheaper. Not bad for this fiscal year, eh? In the meantime, however, your more progressive counterparts are passing you by. This is the time to stop and ask: "Where are we going?"

Consider some of the more common applications on DG minis, and explore what you might do with these applications rather than simply throwing money at the problem.

### Word processing

This is the classic example. If you do

nothing else in your next upgrade cycle, get word processing off your minicomputer. My first choice would be Wordperfect for MS-DOS, preferably the LAN version. But even if you choose some other WP software, just make sure it's PC-based. Many users have found that simply moving word processing off the minicomputer breathes life into their old systems, and they have been able to postpone upgrades for years.

### Spreadsheets

Almost as dramatic as migrating your word processing, moving spreadsheets to workstations can free up tremendous minicomputer resources. PC-based spreadsheet programs such as Microsoft's Excel are superior to anything you'll find on a minicomputer, and although an 80286 may take longer to recalculate a spreadsheet than does an MV/40000, you can certainly recalculate the spreadsheets of 20 users on 20 PCs much faster than you can on a single time-shared MV.

### Electronic mail

The motivations for moving e-mail off the mini are not as compelling as for word processing or spreadsheets. E-mail is not CPU-intensive. Rather, it is the connectivity and cost issues that must be considered.

With the announcement of Data General's X.400 capabilities, access to the rest of the world via CEO is becoming a reality, but at what cost? Not all of us have the budgets for these high-end solutions. Nor do we necessarily have the need for international or multivendor connectivity, at least not right away. Take a look at e-mail and other office automation products in the PC arena. Not only do some of them offer spectacular features, but the high volume of sales and fierce competition among a dozen or so vendors really keeps those prices down. Oh, by the way, X.400 connectivity is available in the PC world, too.

### Those vertical applications

Now comes the hard part. What about all those programs that you bought or wrote that are worth hundreds of thousands of dollars to your company? Here, the answer isn't quite so obvious, and your investment in mini-based software may well justify your keeping and even

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upgrading your system. But think ahead. Shouldn't you be considering some platform-independent options such as Oracle for your data bases, or even moving your development to highly portable programming languages to protect not only your investment in software, but also your ability to switch vendors to best suit your future needs?

Pay close attention to developments in this area in the months to come. For example, if your applications are currently written in ICobol, you probably know they can easily be ported to PCs. Products like Choice! from Wild Hare, and Ighost from Envyr offer the ability to move those applications to a variety of platforms. In fact, both of these products will (by the time you read this) allow you to share mini-based data between programs running on the minis and (via a LAN) programs on a PC workstation.

If you're developing new applications, look into portable tools such as the remote procedure call mechanisms provided as part of the Aviion's Software

Development Kit (SDK) for Portable Network.

And please don't forget my favorite equalizer: the local area network. Not without problems of their own, LANs do, however, offer you the best framework for developing a truly distributed computing environment—one in which you really can assign each computing task to the platform that offers the best mix of computational power and cost. You'll need a LAN in order to move your word processing to PCs, for example. Only then can you continue to share documents among your users as you do today.

### Why upgrade?

There are still valid reasons for upgrading your system. The obvious ones include the need for more disk space and support for additional users. Beyond those "technical" considerations are other valid reasons including reduced maintenance costs, and the all-too-real economics of your investment in existing applications.

Another of my favorite reasons for staying with minicomputers is field service. Whether your local support is good or bad, the fact is, you can pick up your phone and get help. If you are supporting offices in multiple cities, you can call a single company for that support. This is still rare in the world of PCs, and I would be willing to guess that many of you wouldn't want to go without the level of support you currently get from your minicomputer vendor. The "bigness" that makes our mini vendors seem like dinosaurs, is exactly what allows them to offer nationwide service.

In summary, don't skip that upgrade just because Doug said so, but please give it some thought. Look into the alternatives that may not only save you money, but will also offer you freedom of choice down the road.  $\Delta$

*Doug Kaye is president of Rational Data Systems, Inc., and can be reached at 1050 Northgate Drive, San Rafael, CA 94903; 415/499-3354.*

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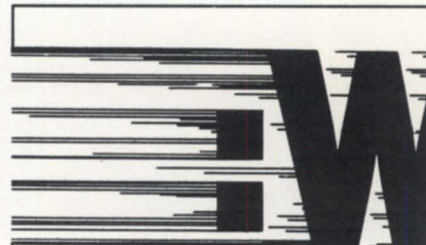
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## A complete listing of the NADGUG software library

### Thank You!

There are several people who deserve thanks for helping with the library. They are:

**Andy and David Uzick**, of N-E Thing Supply, for hosting the library and putting up with the messy stacks of tapes and envelopes.

**Kevin Danzig**, of the Danzig Corporation, for doing the MV/2000 duplications and putting up with having to format some of the tapes.

**Don McAfoose**, the Houston DG SE Manager, and all the Houston SEs, who help duplicate 130 MB tapes on their machine, and don't mind me playing Mahjong on the Aviiion while I wait (even if I do crash X-windows once in a while).

**Brian Johnson**, of B.J. Inc., for the use of his WFFCA program in the library, and for generally writing useful software.

—Randy Berndt

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

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

**B.J.'s BBS contributions** • About 20 items, including various programs, documentation, and macros. Some of the more interesting items include the :SYSMGR benchmark suite, a continuous incremental backup, a clean-up file maintenance program, a program to find strings in files, and a type-backward program. 6,761 blocks.

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

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

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

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

**FILEMNGR** • With this new version, you can move, copy, delete, view, and perform several other options faster. This is distributed as shareware. If you try it and continue to use it, you are requested to pay a registration fee. From Kim Geiger. 654 blocks.

**Focus** • Focus magazine articles. 1,774 blocks.

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

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

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

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

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

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

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

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

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

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

**MS-DOS** • A VS program that lets you read and write MS-DOS diskettes on an MV system with a 5.25-inch floppy disk drive. 984 blocks.

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

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

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

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

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

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

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

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

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MV/2000 and MV/1400 users should send one formatted, error-free tape cartridge. Software contributions should be sent to the same address. Be sure to include your membership number. Allow 4-6 weeks for delivery. To leave a question regarding non-standard library distribution, call 713/988-5342.

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

# A dashing family



Westboro—Data General Corporation announced two new IBM AT-compatible personal computers, the Dasher 386-25k, and the Dasher 286-12j.

The new Dasher 386-25k is a high-performance system using the Intel 80386 25 Mhz processor. The system supports both MS-DOS and Unix for a list price of \$4,995. The configuration consists of 4 MB of memory and a 100-MB hard disk.

The Dasher 386-25k can be configured as a LAN server, a multi-user Unix system, or as a high-end 386 workstation. Memory can be expanded to 16 MB, and the system includes 32 KB cache memory, Super VGA graphics controller on the

system board, LIM (Lotus-Intel-Microsoft) 4.0 software support, and other standard features such as a 3.5-inch or 5.25-inch diskette drive, two serial ports, and one parallel port.

The new Dasher 286-12j is a compact system that uses the Intel 80286 12.5 Mhz processor, and runs MS-DOS. A base configuration including 1 MB of main memory, two diskette drives, and a 40-MB hard disk, is priced at \$2,375.

The Dasher 286 contains 1 MB wait-state memory (expandable to 4 MB), a 40 MB hard disk, 3.5 and 5.25-inch disk drives, VGA graphics controller, LIM 4.0, two serial ports, one parallel port, and three 16-bit expansion slots. Though expandable to the capacity of many full-size PCs, the base is only 3.75-inches high, with a 16.1 by 15.5-inch footprint.

Both new Dasher products are accompanied by DG's PC "On-Site Select" one-year warranty.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4072.

Circle 58 on reader service card.

The new Dasher/386-25k (rear) supports both MS-DOS and Unix operating systems for a base price of \$4,995, including 4 MB of memory and a 100-MB hard disk. The Dasher/286-12j (front), a compact, IBM-compatible system that runs MS-DOS, includes 1 MB of memory, two diskette drives, and a 40-MB hard disk, for a price of \$2,375.

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MV15000 Model 20 8MB	.....	SAVE \$
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MV8000 Model 9300	.....	950
MV7800 4MB 16 slot chassis	.....	3,900
MV7800XP 8MB	.....	9,500
MV4000 2MB	.....	1,100
MV4000DC 2MB, 120MB, floppy	.....	2,250
MV2000 Enhanced 4MB 160 MB disk	.....	5,200
MPT100 Dual floppy	.....	350
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S-140 256KB Floating point	.....	1,500
Desktop 10 Floppy, 15MB disk	.....	875
Desktop 20 Floppy, 15MB disk	.....	1,295
Desktop 30 Floppy, 15MB disk	.....	1,495
S-120 256K 16 slot	.....	550
S-280 2MB	.....	900

**Processor Options:**

8997 Expansion chassis MV15, 20	.....	\$6,600
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8749 Battery backup for MV10000	.....	1,100
8746-B Battery backup for 8762	.....	
EXP Chassis	.....	900
8704 Floating point unit MV8000	.....	500

4543-B MCP1 8 Async 2 Sync DCH Ptr	.....	1,900
4463-ZT USAM-4	.....	275
4380 ISC-2 (Synch)	.....	600
4372-A TCB-16	.....	350
4371-C TCB-8 for expansion	.....	455
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4367 IAC-8 RS232, 20MA Modem Cnt	.....	1,500
4608 10 Port term. serv	.....	2,800

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6491 322MB for MV2500 or CSS	.....	3,150
6554 662MB for MV2500 or CSS	.....	6,150
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6593 CSS Subsystem with 622MB Disk	.....	12,800
6593-A CSS Chassis w/622 MB Disk	.....	8,200
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6392-X D215 Monitor with keyboard	.....	235
6393-X D411 Monitor with keyboard	.....	275
6394-X D461 Monitor with keyboard	.....	375
6500 D216 Monitor w/Keyboard	.....	385

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MV15000, All sizes	
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MV10000, 4Mb	
MV10000, 8Mb	
MV8000, 2Mb	
MV8000, 256Kb	
MV4000, 2Mb	
MV4000, 4Mb	
MV4000, 8Mb	



Circle 32 on reader service card.



## VS II can opt for Diskopt

Salt Lake City, UT—DMS Systems, Inc. announces the immediate availability of an AOS/VS II version of its Disk Optimizer and Management Utility (Diskopt).

Diskopt is a utility for managing disk resources on MV systems. It monitors disk performance, disk structure, and file placement. According to DMS, disk optimization improves system performance by making files contiguous on the disk and placing frequently accessed files together. The Diskopt disk tuning feature adjusts element sizes of files, eliminating index levels.

The VS II revision is available free to Diskopt customers with a current software subscription. For a limited time, Diskopt for VS II is available for \$500 to customers with a proof-of-purchase of a competing disk optimizer.

*DMS Systems, Inc., 1111 Brickyard Road, Salt Lake City, UT 84106; 801/484-3333.*

Circle 59 on reader service card.

## Aviion abounds

Westboro—Data General introduced four new members of its Aviion family: the AV 3200 server, the AV 200 workstation, and the AV 4100 and AV 4120 multi-user workstations.

The AV 3200 entry-level server has 8 MB of memory, a 332 MB disk, a 150 MB quarter-inch-cartridge (QIC) tape drive, and is priced at \$12,995. The 17-MIPS AV 200 workstation is priced at \$5,950, or \$350/MIPS, 40 percent less than some competitors.

The AV 3200 and AV 200 are available with up to 16 MB of memory, and support industry-standard SCSI devices. The AV 3200 supports 18 asynchronous lines, the AV 200, two integrated asynchronous lines and a 20-inch monochrome monitor designed to reduce eyestrain. Data Gen-

eral says the two systems are ideal for software development, desktop publishing, and commercial applications.

The AV 4100 and the AV 4120 are faster performing members of the AV family. The AV 4100 uses a 20-MHz Motorola 88100 chip performing at 20 Dhrystone MIPS. The AV 4120 uses two of the same chips performing at double the speed, 40 Dhrystone MIPS. The base systems include 8 MB of memory, a 332 MB disk, a 150 MB tape drive, a two-slot, industry-standard VME chassis, and an integrated ethernet controller for low-cost LAN connection.

In other Aviion related news, DG unveiled the 332 MB, 5.25-inch half-height Winchester disk, its lowest cost-per-mega-byte storage system for Aviion systems. The new drive, priced at \$4,950, features formatted, error checking/correcting (EEC) protected storage, a 14-millisecond average seek time, and 8.33-millisecond average rotational latency.

All above products are available 30 days after receipt of order. Data General is of-

# QUESTION?

### FEATURE COMPARISONS OF 2.3GB - 8MM TAPE BACKUP UNITS

	DATA PLUS	DATA GENERAL	MEGA TAPE	CONTEMPORARY CYBERNETICS
List Price	8900	13995	8950	9995
Price Includes Controller	YES	YES	YES	YES
Rack Mountable	YES	NO	YES	YES
Tabletop Enclosure	YES	YES	YES	YES
Automatic CPU Sharing	YES	NO	Manual	NO
Number of Shared CPU's	6	0	2	0
Supports ANSI Labeled Tapes	YES	NO	YES	NO
Runs DG DMTRLI	YES	NO	NO	NO
Runs all Revs AOS/VS & VSII	YES	NO	YES	NO

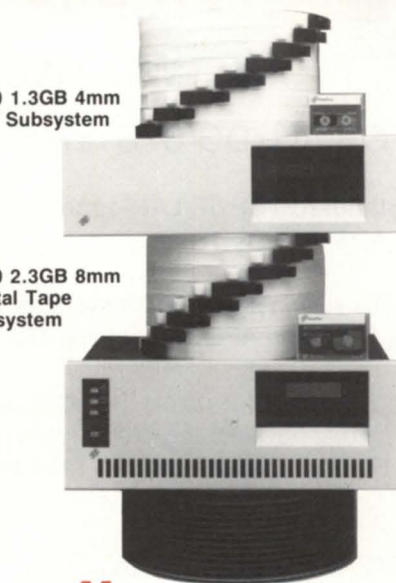
### FEATURE COMPARISONS OF 1.3GB - 4MM TAPE BACKUP UNITS

	DATA PLUS	DATA GENERAL	MEGA TAPE	CONTEMPORARY CYBERNETICS
List Price	7600	Not Available	Not Available	Not Available
Price Includes Controller	YES	Not Available	Not Available	Not Available
Rack Mountable	YES	Not Available	Not Available	Not Available
Tabletop Enclosure	YES	Not Available	Not Available	Not Available
Automatic CPU Sharing	YES	Not Available	Not Available	Not Available
Number of Shared CPU's	3	Not Available	Not Available	Not Available
Supports ANSI Labeled Tapes	YES	Not Available	Not Available	Not Available
Runs DG DMTRLI	YES	Not Available	Not Available	Not Available
Runs all Revs AOS/VS & VSII	YES	Not Available	Not Available	Not Available

# ANSWER!

**5300 1.3GB 4mm DAT Subsystem**

**5600 2.3GB 8mm Digital Tape Subsystem**

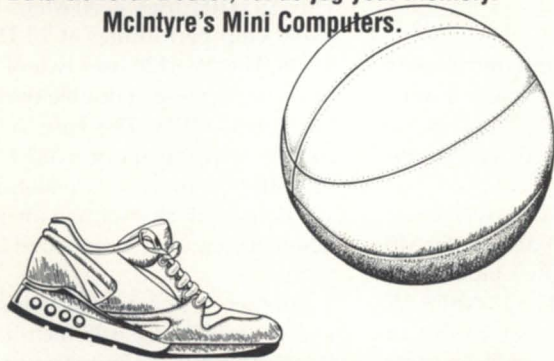


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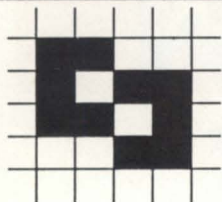
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## **ETHERNET TCP/IP NETWORKING**

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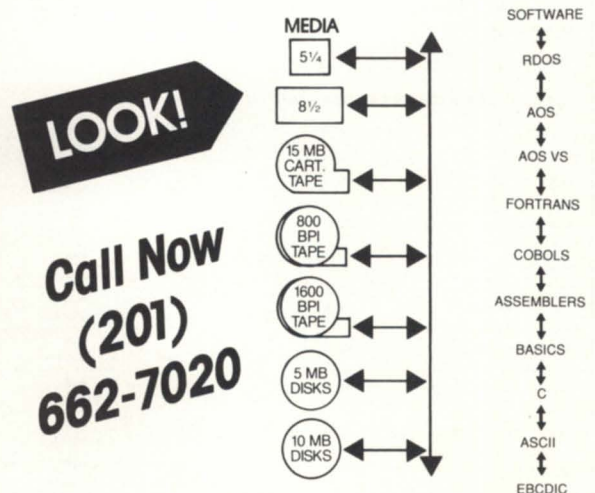
- ◆ Industry Standard TCP/IP LAN connections for AOS/VS, AOS, and RDOS systems.
- ◆ Connects DG systems to non-DG systems such as VAX, IBM, SUN, and APOLLO running TCP/IP.
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Telephone: 508-393-7979  
Fax: 508-393-8788

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Circle 31 on reader service card.

fering a special leasing program for the AV 200 and AV 3200 systems. Leases are available in 36, 48, or 60 months. Customers can lease an AV 200 for as little as \$102/per week or the AV 3200 for \$146/per week with no money down. The program expires September 30, 1990.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4072.

Circle 60 on reader service card.

## New monitor, disk, and discounts from DG

Westboro—Data General announced a new VGA color monitor, a 200-MB 3.5-inch half-height disk, and a price reduction on the Dasher 386-25 PC.

The new model 6628 14-inch monitor has a .31mm dot-pitch rating and superior clarity. Included with each unit is a compact built-in tilt/swivel stand and a universal convenience power cord. Priced at \$645, the monitor is available for immediate delivery.

The new 200 MB 3.5-inch half-height disk, model 6664, has a 16ms average access time, 1.5 MB per second potential transfer rate, and a 64 KB look-ahead buffer. The disk also runs on DG's Dasher 386sx-16, raising the disk capacity to 400 MB. Model 6664 is priced at \$1,695.

Moreover, DG announces a 13 percent price reduction in its 386-25 personal computer, bringing the list price down to \$6,995.

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

Circle 61 on reader service card.

## Infos II and you

Westboro—Data General announces upcoming seminars on Infos II revision 6. The comprehensive lectures and hands-on lab sessions will provide specific information needed in tailoring Infos II to your own environment.

The dates and locations are: August 7-9 in Los Angeles, August 20-22 in Washington D.C., and October 2-4 in Chicago. Infos II rev 6 will be available later this summer.

Infos II rev 6 seminar, New Performance Options (SM206), will teach you how

to utilize your system resources, especially with the scalability features of rev 6. The seminars will discuss how to monitor and optimize Infos II on systems including distributed environments.

Data General Educational Services, 4400 Computer Drive, Westboro, MA 01580; 1-800/876-3433.

Circle 62 on reader service card.

## Guardian angel

San Diego, CA—Datalynx, Inc. announces revision 2.30 of Guardian, the profile and access control system for Data General AOS/VS and AOS/VS II systems.

Version 2.30 contains a number of enhancements including the ability to: inactivate profiles that have been unused for

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093_0002	50191	Crunched	66%	17099	16-Sept-88	2:01 p	01C9
BILLING.LOG	532000	Crunched	94%	36087	31-May-89	11:41 p	3E91
EMPLOYMENT.AGR aka EMPLOYME_00	5793	Crunched	45%	3221	18-Jan-89	3:55 p	1D1C
<b>TOTAL</b>	<b>3</b>	<b>587984</b>	<b>(91%)</b>	<b>56407</b>			

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

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Focus

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## ON-LINE HELP

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

#### NADGUG

##### Membership, address changes

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

##### Information on RIGs or SIGs

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

##### Electronic bulletin board

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

#### NADGUG staff and Focus Magazine address:

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Stillhouse Canyon Office Park  
4807 Spicewood Springs Road  
Suite 3150  
Austin, TX 78759

#### FOCUS Magazine

512/345-5316

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

Information about advertising .....Michelle Sentenne

FOCUS back issues .....Turnkey Publishing staff

a specified period of time, separately control the number of batch and interactive logins for any user-defined profile group, and generate a report of all profiles ordered by the password expiration date. Foreign language support is available on request.

Initial license pricing for Guardian on most processors is \$950. Subsequent licenses run \$700.

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

Circle 63 on reader service card.

## Version 7.0 of DB/C Databus

Oak Brook, IL—Subject, Wills, & Company released version 7.0 of its DB/C Databus language compiler, which includes new operations for advanced programming techniques.

DB/C Databus compiles Databus pro-

grams for a number of computer systems including MS-DOS based personal computers, many Unix systems, and Data General MVs.

DB/C Databus is a third-generation computer language created for business-oriented applications. The DB/C system includes the Databus language, a compiler, a run-time facility, and 16 utilities. Prices start at \$295 for a single-user MS-DOS standalone PC and range up to \$6,495 for unlimited CPUs or servers at a single site. One year of support and maintenance is included.

*Subject, Wills & Company, 800 Enterprise Drive, Oak Brook, IL 60521; 708/572-0240.*

Circle 64 on reader service card.

## Security for 8mm backups

Newport News, VA—Contemporary Cybernetics Group announces an 8mm tape backup subsystem with data encryp-

tion security control for sensitive information. Data access is controlled by card key, so even security sensitive sites can take advantage of the 8mm standard, compatible with MVs and other DG mini-computers.

With CY-8200-S subsystems, backups cannot be performed without a Data Access Card. Only authorized users with a uniquely encrypted Access Card can read the data.

Also announced is a data compression feature increasing CY-8200-S storage from 2.5 GB at 15 MB/minute to 10 GB at 60 MB/minute.

The CY-8200-S includes a two-line, 40 column drive status display and is available with all models and interfaces offered by Contemporary Cybernetics Group for the digital helical scan 8mm tape drive.

*Contemporary Cybernetics Group, Rock Landing Corporate Center, 11846 Rock Landing, Newport News, VA 23606; 804/873-0900.*

Circle 65 on reader service card. △

## CLASSIFIED ADS

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:SYSMGR BBS specializes in file transfer of RDOS and AOS[VS] DUMP files - no messaging facilities. XMODEM, YMODEM, and KERMIT supported. 415/391-6531 (one line), 2400 baud (Vadic 3447), 8 data bits, 1 start/stop bit or 415/550-1454 (voice). System is MV/4000, terminal mode is CHAR/605X.

NADGUG members who are planning to attend the 1990 Conference are eligible for discount air fare to Seattle. The discounts are up to 50 percent off of regular coach fares without the usual restrictions, or an additional 5 percent on most discounted airfares, with restrictions. The discounted airfares are non-refundable, require a Saturday overnight stay, and advance purchase. For more information, contact **Data General Corporate Travel**, and identify yourself as being with the North American Data General Users Group. Within the U.S., call 1-800/343-1284 (outside Massachusetts). Outside U.S. or in Massachusetts, call 508/366-8911, ext. 1000.



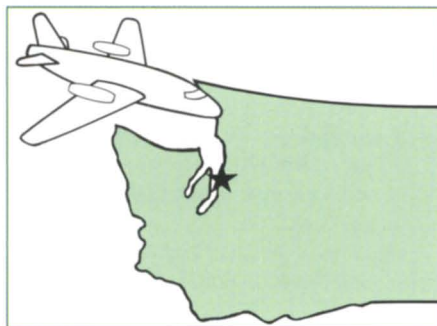
Will Data General have a profitable third quarter? Signs point in that direction. Market watchers noted that Data General stock has been building momentum. In an early June rally, DG stock went up 11.5 percent, to 12 1/8. According to the Dow Jones Professional Investor report, market analysts raised their ratings on the stock after meeting with Data General executives.



Data General and **Postalsoft, Inc.** signed a value-added reseller agreement. Wisconsin-based Postalsoft provides the Postware Mailing System, a mail processing software for large volume mailers. The system includes address correction and encoding, presort by class, and duplicate detection. The first module will be ported to the Aviion by the end of August. There are no plans to port Postware to the MV, according to **Susan Ring**, a Postalsoft spokesperson.



**C.R. Smolin, Inc.** was accepted into Data General's Independent Software Vendor (ISV) program, a cooperative marketing relationship between Data General and a select group of software vendors. C.R.



Smolin, Inc. developed and markets E-Z-MRP, the Material Requirements Planning System, and related modules, all designed for production and inventory control of small and medium-sized manufacturing firms. The products are available on Aviion, Dasher, and DG /One computers.



Another company that has signed on with DG's ISV program is **Threshold, Inc.** of Auburn, Alabama. Under the agreement, Threshold will port a version of its Screen Demon pop-up window and screen management package to the Aviion family of computers. Screen Demon is already available on MV machines. The first version released for Aviion will provide support for DG/ICobol, with other languages to follow.



Do they take requests? . . . **Wordperfect Corporation** in Orem, UT uses disc jockeys on its telephone hold lines in Customer Support. If you call in to one of Wordperfect's 22 toll-free lines for technical help, and are put on hold, a "hold-jockey" will play music, run WPCorp commercials, discuss scheduled release dates, and provide up-to-the minute traffic reports that explain the average hold times for each customer support group.



Progress has been reported in several legal battles between DG and computer maintenance organizations over the use

of DG's MV/ADEX diagnostic software. DG holds that maintenance organizations have infringed upon DG's copyrights of MV/ADEX; maintenance organizations claim that DG is attempting to monopolize the service market for DG equipment. The following companies have entered the fight: **Granada Computer Services LTD.**, **Grumman Systems Support Corporation**, **Computer Products and Repair (CPR)**, and **Service and Training, Inc. (STI)**. Status of these cases follows.

DG's case with Granada is settled with Granada acknowledging DG's valid copyright and ceasing to use or copy MV/ADEX. DG versus Grumman and STI continue. DG has been awarded preliminary injunctions in both cases, meaning the maintenance companies must suspend their use of MV/ADEX during a discovery stage in which they gather more evidence. However, in a press release, STI claims, "A major victory was won by STI when the Court said that it was inclined to accept STI's definition of the relevant market which consists of those customers that own or use Data General computers." The case with CPR is progressing slowly due to a move from California to Boston, and has had no ruling.

**Jim Dunlap**, Data General corporate spokesperson, relates that "Having won the case against Granada and having been awarded preliminary injunctions against Grumman and STI, we [Data General] are confident that we shall prevail in the current copyright infringement cases involving DG's MV/ADEX diagnostic software."



**Dataram Corporation**, maker of memory and peripheral products for Data General and other equipment, opened an Eastern regional sales office in the Philadelphia suburb of Horsham. The office gives Dataram a central location from which to coordinate the activities of its Eastern seaboard district offices, and to explore sales in the Greater Philadelphia area, which contains the Route 202 corridor, also known as "Silicon Valley East.Δ

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