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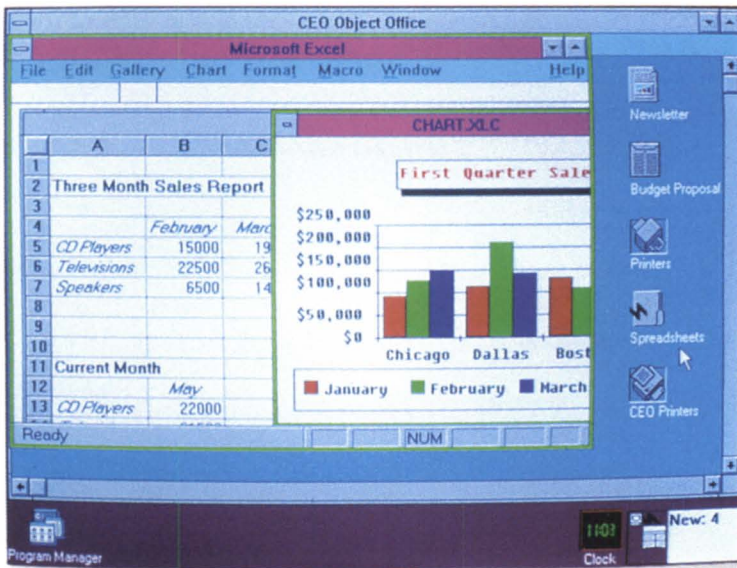
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# FOCUS

The Magazine of the North American Data General Users Group

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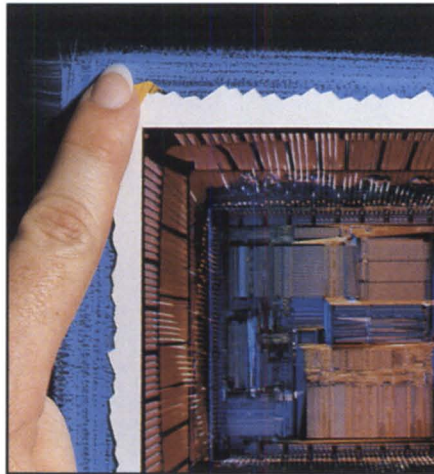
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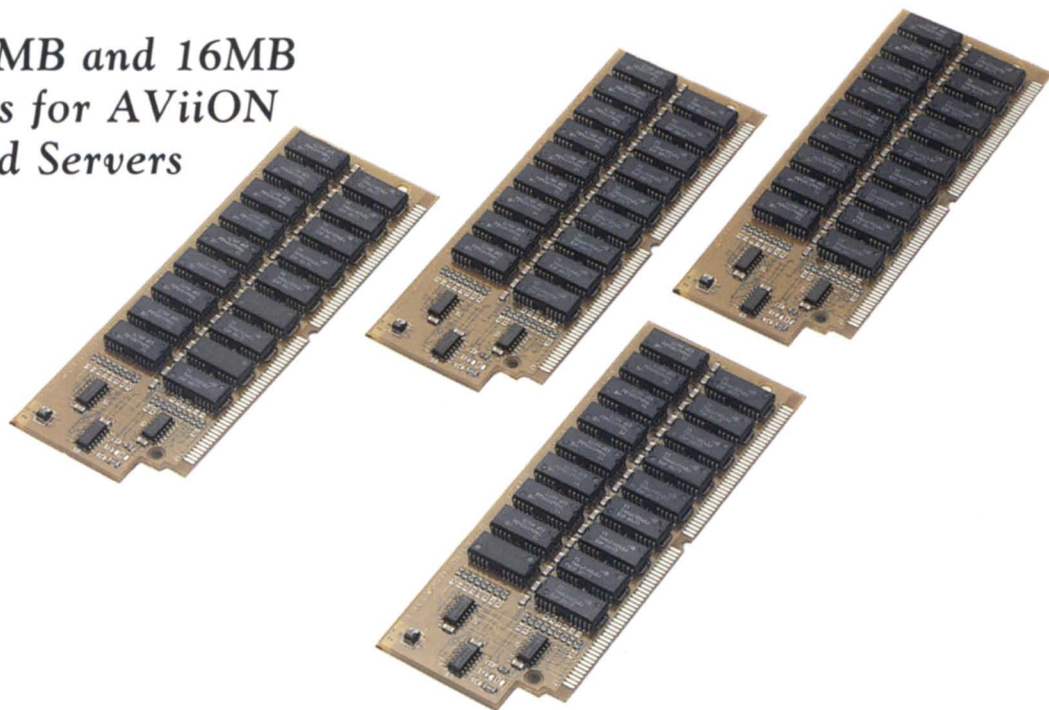
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## The days go by

Whew! It's been a busy month. Data General had a media blitz this July—by Data General standards, anyway. Both MV and Aviion systems were in the spotlight. The new Eclipse MVs and communications software went on a baseball roadshow, touring major league cities. Many lucky customers went to major league baseball games courtesy of Data General. The company announced a new notebook-sized PC, a slew of software products for the Aviion, an Aviion workstation, and three new Aviion servers.

Late in July, Data General released its third-quarter financial statements. DG showed a profit for the third quarter in a row. Revenues were roughly equivalent to those of the same period last year, but operating expenses were down significantly. The adjustments and consolidations of the last few years, painful as they were, appear to be working. A coworker noted that in the private sector companies can reduce employees and still produce at the same levels as before and make a profit. The need for profit forces efficiency. He lamented that those kinds of adjustments, which corporations go through regularly, just can't seem to be made by the U.S. government. But that's getting off the subject. A quick analysis of DG revenue is telling: Aviion sales increased and MV sales and support services decreased. Is Data General on the right track?

Before you answer, I recommend you read what DG Senior Vice President of Advanced Systems Development Tom West said in his opening remarks to one of the Aviion product announcements—that users want evolution, not revolution (page 8).

West's insight into what drives the market, and Data General's strategy to

provide a standards-compliant Unix platform, make a good introduction to this month's special feature, which appropriately is the Aviion. The Aviion is about two years old now, and we wanted to find out who is using it and how. We found Aviions in hospitals, law firms, and businesses. We talked to VARs, end-users, and system managers. They are using Aviions in a variety of ways, but a common factor is that all are impressed by the speed of the machines. We also spoke with the director of Aviion product marketing to find out DG's future plans for the Aviion.



September is always a significant month here at *Focus* magazine. This is our anniversary month, marking the beginning of our seventh year of publication. According to *Focus* Publisher Greg Farman, it all started in 1985. NADGUG leaders had faith in the project and lined up the support to make it happen. Our first issue coincided with the Boston conference.

Tim Boyer was not in that first issue, but he signed on shortly thereafter, and he's been a regular contributor ever since. This month's column marks his 50th article for *Focus*.

Another early believer in the project was Ann Soto. She is the artist responsible for many of the magazine covers and illustrations that you doubtlessly have admired over the years. Ann was one of the first *Focus* staffers. She recently launched a new venture—baby girl Elizabeth was born on July 24.

As *Focus* continues to evolve, we honor our old friends, and we welcome new readers who are just now entering the DG world via the Aviion. Now is a good time to show our appreciation to all those who over the years have helped make this publication what it is, and by doing so, supporting NADGUG. Thanks to you all. Δ

# FOCUS

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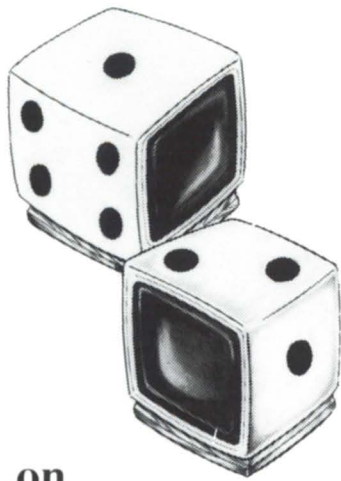


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## DG NEWS

# Three makes a trend

by Doug Johnson  
Focus staff

Growth in Aviion sales, previous belt-tightening measures, and the sale of its Japan subsidiary figured in the financial statement as Data General Corporation reported its third consecutive profitable quarter.

Net income was \$35.6 million for the third quarter of fiscal year 1991, compared to a net loss of \$21.4 million for the same period last year. Total revenues for the quarter ending June 29, 1991, were \$301.2 million, compared to \$302.4 million for the third quarter in 1990. Operating income was \$26.2 million, compared with an operating loss of \$18.7 million for the third quarter last year.

"We are pleased that our results have continued to improve despite the weak economy and the impact the strong dollar has had on overseas markets," said Ronald L. Skates, Data General's president and CEO.

According to Skates, "Revenues from our Aviion family of open systems again increased during the quarter." The greatest area of Aviion growth was in high-performance servers.

In its condensed consolidated statements of operations, DG showed significant reductions in costs and expenses. The total for 1991's third quarter was \$275 million, down from \$321.1 million for the same period a year ago.

Revenues for the nine-month period totaled \$933.3 million, up from \$907.9 million for the same period in 1990. Operating income for the nine-month period was \$63.4 million, compared with an operating loss of \$4.4 million in the prior year. The company's cash position increased by \$162.2 million to \$247 million as of the end of June.

Net income for the third quarter 1991 included a one-time gain of \$13 million from the previously announced sale of DG's Japanese subsidiary. Revenues from Japan were \$12 million lower than in the second quarter this year.

The company also announced during the third quarter that it had sold its Clayton, North Carolina, facility to Caterpillar, Inc., for \$5.2 million. The sale had no impact on third-quarter results but increased the company's cash balance.Δ

### Data General Corporation Condensed Consolidated Statements of Operations

(In millions except per share amounts)

	Quarter Ended		Nine Months Ended	
	June 29, 1991	June 30, 1990	June 29, 1991	June 30, 1990
Revenues:				
Product	\$198.2	\$196.0	\$605.3	\$587.9
Service	103.0	106.4	328.0	320.0
Total revenues	301.2	302.4	933.3	907.9
Costs and expenses:				
Cost of product revenues	97.3	109.0	308.7	313.3
Cost of service revenues	60.6	65.8	190.8	199.6
Research and development	25.1	35.9	76.2	106.1
Selling, general, and administrative	92.0	110.4	294.2	333.3
Total costs and expenses	275.0	321.1	869.9	952.3
Income (loss) from operations	26.2	(18.7)	63.4	(44.4)
Gain on sale of subsidiary	13.0	--	13.0	--
Interest income	2.2	1.1	4.6	5.3
Interest expense	2.8	2.6	8.9	7.7
Income (loss) before income taxes	38.6	(20.2)	72.1	(46.8)
Income tax provision	3.0	1.2	4.8	3.7
Net income (loss)	\$35.6	\$(21.4)	\$67.3	\$(50.5)
Net income (loss) per share	\$1.05	\$(.71)	\$2.10	\$(1.69)
Weighted average shares outstanding	33.8	30.2	32.1	29.9

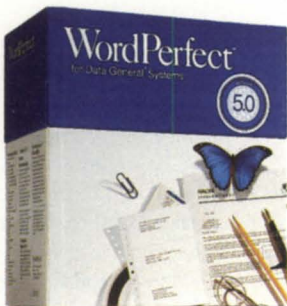


# 10

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# Revolution and standardization: what went wrong

*Editor's note: Following are remarks given by Tom West, senior vice president of Advanced Systems Development, at the Aviion communications/office systems announcement on July 16 in Westboro. Because not everyone can go to Westboro, and because we believe the thoughts that follow are important to all Data General customers, we received permission to reprint the speech here. For more information about DG's new Aviion products, see page 56.*

Over the past eight years, corporate America has installed 40 million PCs and Macs on the desktop in hopes of improving white collar productivity. This year, it's estimated that 10 million more will be added. Yet, over this same period of time, white collar productivity was falling by about one percent per year.

So what went wrong?

Maybe the issue was that personal productivity was our measurement system, but organizational productivity was really our goal. The corporate response was to install 1.5 million PC LANs of various flavors to allow for this organizational cooperation.

But, productivity continued to fall. Why?

Well, I think LANs typically replicate the organization chart—they connect members of a single department or a single discipline.

Unfortunately, task teams usually work across organizations, disciplines, and even geography. Teams come together to collaborate on a problem, or for the duration

of a project, then they disband, and different teams form to confront the next set of issues.

So bridges, routers, and specialized servers were added to the multiple LANs in an attempt to create the many group topologies that were required. And what started out simple, had now gotten very complex, and, the problem was still not solved.

Now as you would expect, different vendors have different views of all this. But what everyone seems to agree on—from Apple to DEC to IBM to Compaq—is that there is a problem, and the problem is that, although PCs are working for individuals, the desktop is not working for organizations.

What is a little surprising, however, is that the answer most of these companies are coming up with is usually a new operating system and a new chip. An even bigger standard . . . something like a revolution . . . and a new world order based upon the belief that someday everything will become simple, when we finally get it complex enough.

Well, as an engineer who has been trying to do these sorts of things for the last 20 years, I guess I understand where they are coming from. An engineer's natural reaction to a problem is to build a better mousetrap . . . preferably starting with a clean sheet of paper. Revolution and standardization is a vendor's idea of a perfect world.

But it's not clear that customers want

the confusion of yet another desktop standard, and a revolution, to add to their existing problems.

It seems to me that the lesson of the past 10 years shows that users want evolution . . . evolution through systems that integrate their current applications—from the desktop to the data center—in the short term . . . systems that provide a risk-free path to enterprise-wide, vendor-independent client/server computing in the longer term.

Evolution and integration is a user's idea of a perfect world. Nevertheless, there's a war on out there, and the battlefield seems to be the desktop.

Many years ago at Data General, for reasons of size as well as strategy, we decided it would be foolish to join the battle for desktop supremacy. Furthermore, we felt that users really shouldn't have to gamble on the outcome of these parochial vendor issues . . . that life could be a whole lot easier if a user could wait until the race was over before he had to place his bet.

So we took a somewhat different approach.

Three things seemed apparent in this context:

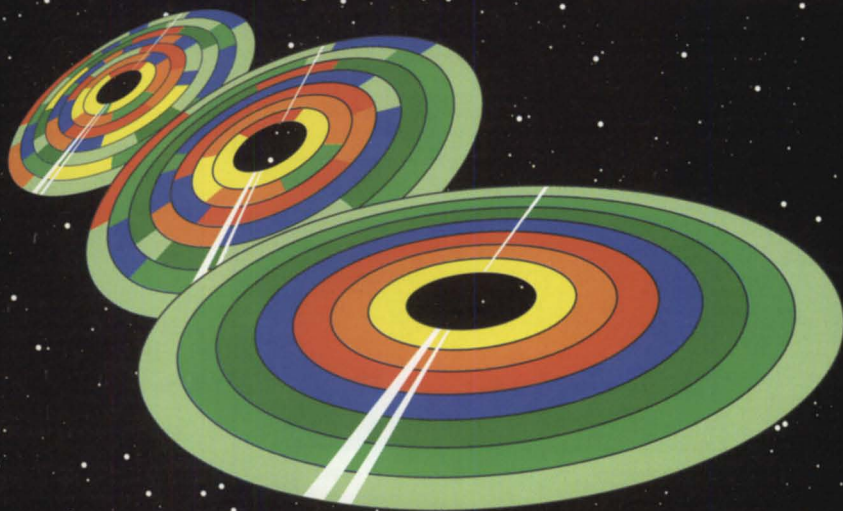
- Running your entire enterprise with a peer network of desktops probably won't happen in our lifetime . . .
- Enterprise-wide client/server computing, on the other hand, will happen—and in fact, it's here today . . .
- And, there will never be a single clear winner on the desktop because of many vendors' self-interests.

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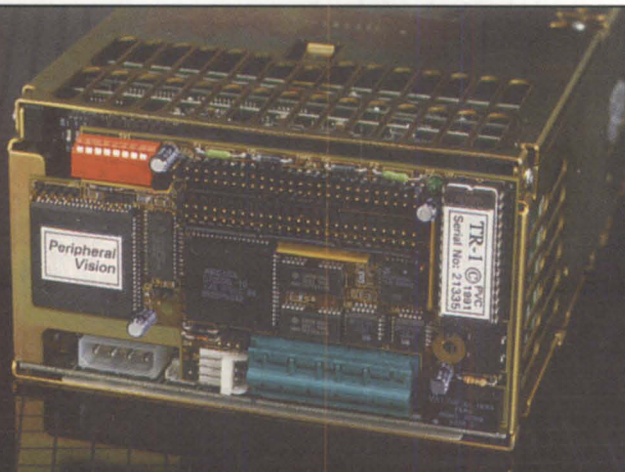


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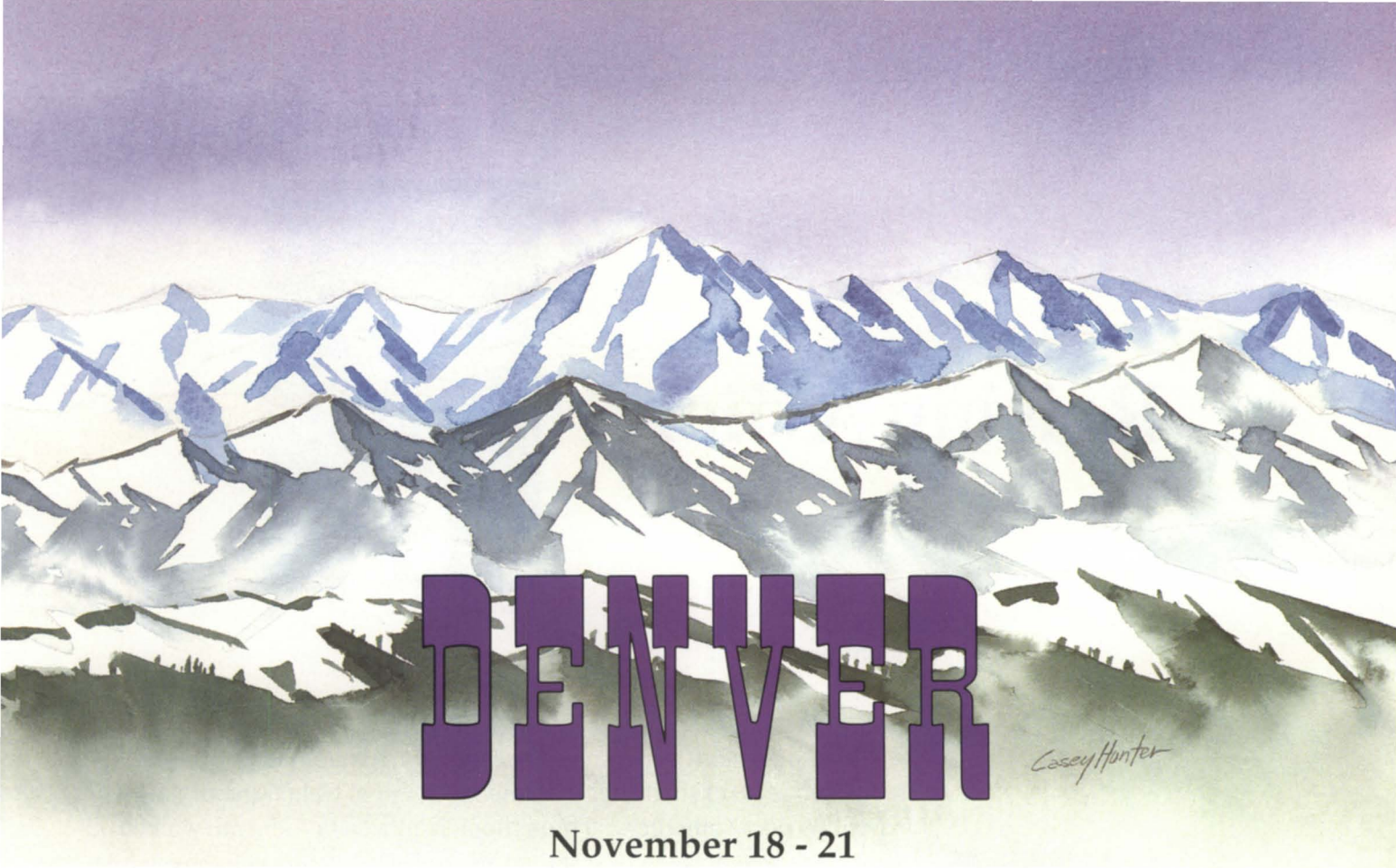
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And perhaps more important, they are secure in the knowledge that they will always be able to integrate their desktop of choice, whether it's a PC, a Mac, a terminal, or a Unix workstation today, or an ACE box of a Power PC a few years down the road.

Over the past decade, users typically looked to one of the big guys—IBM or DEC—if they wanted a low-risk vendor, a point that smaller companies like Data General had to concede. But ironically, in the confusing 90s, Data General, with its Aviion server strategy, may well represent a user's safest choice.      Δ



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# Raising Aviion



Steve Aucoin

by Robin Perry  
Focus staff

## SYNOPSIS

*A look back at the past two-and-a-half years, and an assessment of Data General's future plans for the Aviion.*

A strategy shift here, an organizational overhaul there . . . a tumultuous two years ensued after the announcement of Data General's RISC-based Aviion computers. Throughout it all, Data General walked a tightrope trying to keep its installed base of MV customers happy, while at the same time aggressively pursuing new markets for its Aviion. Aviion has yet to prove that it really is the Nova II—the Nova being Data General's first commercially successful computer, but it seems to win more admirers than detractors. This summer's big win was a multi-million dollar contract to outfit the U.S. Environmental Protection Agency (EPA) with servers and workstations. In the following interview, Steve Aucoin, manager of Aviion open systems marketing, looks back at the past two-and-a-half years, and looks ahead to DG's future plans for the Aviion.

**FOCUS:** Since the Aviion line was launched in the spring of 1989, what do you consider to be your biggest success?

**Aucoin:** I think that our biggest success was in March when we announced our high-end, highly available systems, the AV/7000 and AV/8000 products. I think it shows how we could take the lessons we learned in the proprietary side over the years—selling into the commercial environment, selling into the highly available environment, the large environment—and move that over to the open systems world.

Basically, we did a lot of the standard DG stuff, which was build a bigger,

faster box, more inexpensively than our competition. In addition to that, I think, quite candidly, that we caught a few people by surprise when we announced our high availability disk array, which is the first disk array shipping on large Unix systems.

I think when we couple that with the strides we've made in Unix . . . our Unix DG/UX is all based on standards so that it's easy to port to . . . when you put all that stuff together for the AV/7000 and AV/8000 announced in March, I think that shows how far we've gone in a short amount of time.

**FOCUS:** Is there anything you've done over the past two years that you would have done differently?

See page 15



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## The RISC gamble

by Robin Perry  
Focus staff

Motorola's 88000 chip isn't going away anytime soon. That's good news for Data General, which invested heavily in the 88000's RISC (reduced instruction set computing)-based technology by placing it at the heart of its Aviion systems.

On July 3, computer industry rivals IBM and Apple announced an agreement to build a new generation of workstations to be powered by a new chip from Motorola. The question immediately arose "Would Motorola continue its past level of support for the 88K?"

Motorola stressed its commitment in a statement issued the same day. "In the wake of this morning's announcement, I want to underscore Motorola's commitment to supporting systems vendors and their customers who have chosen the 88000 RISC MPU family," said Murray

Goldman, senior vice president and general manager of Motorola's Microprocessor and Memory Technologies Group.

Motorola is currently working on a new generation of the 88K, the 88110, which will be three times as fast as the 88000, said Nick Sturiale of Cunningham Communications, Inc. "It equals three [88000] chips on a single chip. It's a beast," he said. The 88110 is scheduled to be released during the second half of this year. Several support chips in development will further enhance the 88110's performance in high-end multiprocessor workstations or servers, according to Goldman.

Data General views the Apple/IBM accord as "another endorsement of RISC technology," said DG spokesperson Stephanie Bigusiak. If the Apple/IBM

workstation becomes a reality, "the demand for servers will increase. We'll continue to support all the industry standards."

The 88000 chip received further endorsement in June when Motorola won a contract to develop a new class of microchips that, when implemented fully, will be installed in more than six million Ford cars and trucks annually. The chip will be a special version of the 88000 designed to control Ford's Powertrain Electronics Controller. It will have the same engine and construction as the 88000 chip used in Aviions, said Sturiale. Although there will be no direct impact on the Aviion, "More software development tools [will be] built for the 88K. There will be more source code written for the 88K," he said. The Powertrain Electronics Controller is targeted for completion by the mid-1990s.Δ

Aviion open systems family servers and systems. Note: This chart does not include the AV/530 workstation or

	AV/3200	AV/4000	AV/4100	AV/4020	AV/4120	AV/5200	AV/5220	AV/5240
<b>Processor</b>	single	single	single	dual	dual	single	dual	quad
<b>MIPS</b>	19	19	23	38	46	29	58	117
<b>Clock Speed (MHz)</b>	16.7	16.7	20	16.7	20	25	25	25
<b>Memory (min/max)</b>	8/16	8/128	16/128	32/128	32/128	16/528	16/528	32/512
<b>VME Options</b>								
<b>Available slots</b>	1	2	2	2	2	9	9	8
<b>Form factor</b>	6U	6U	6U	6U	6U	6U/9U	6U/9U	6U/9U
<b>Packaging</b>	desktop	desktop	desktop	desktop	desktop	office	office	office
<b>Mass Storage</b>								
<b>Disk</b>								
<b>Max internal</b>	1.3 GB	1.3 GB	1.3 GB	1.3 GB	1.3 GB	3.3 GB	3.3 GB	3.3 GB
<b>Max supported</b>	1.3 GB	6.0 GB	6.0 GB	6.0 GB	6.0 GB	15 GB	15 GB	15 GB
<b>Tape</b>								
<b>Cartridge</b>	150 MB, 525 MB	2 GB, 150 MB 525 MB	2 GB, 150 MB 525 MB	2 GB, 150 MB 525 MB	2 GB, 150 MB 525 MB	2 GB, 150 MB 525 MB	2 GB, 150 MB 525 MB	2 GB, 150 MB 525 MB
<b>Reel to Reel (1600/6250)</b>	no	yes	yes	yes	yes	yes	yes	yes
<b>Communications</b>								
<b>Ethernet</b>	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	2 VME option	2 VME option	2 VME option
<b>Synchronous</b>	3 lines	3 lines	3 lines	3 lines	3 lines	4-24 lines	4-24 lines	4-24 lines
<b>Asynch</b>	2-18 lines	2-257 lines	2-257 lines	2-257 lines	2-257 lines	2-1020 lines	2-1020 lines	2-1020 lines
<b>Parallel</b>	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated
<b>UPS</b>								
<b>Backup time, Full load</b>								



**Aucoin:** I think if we would have done anything differently it probably would have been at the front end to more quickly find the right MV/Aviion balance within the company. I think there was some confusion [about whether] we were serious about MVs anymore. I think that's why you saw us put the Eclipse Business Unit together—to clearly show that we are still very focused on our proprietary world. That's why we moved Joel Schwartz, who was originally brought in to help recruit all the Aviion software, over to the Eclipse Business Unit. If anything, I think that's an area we could have improved on.

The other area that we're coming to grips with is that one of our key strengths was in office automation. What we learned on the proprietary side was that commercial is clearly a place that we can succeed. And we're doing that. That's what our announcements in March were helping to reinforce. I think in the upcoming months as we make some announcements in the office automation side, you'll see that we realize our office automation on the pro-

prietary side [CEO] was clearly a big win for us. We want to use a similar capability on the Aviion side.

**FOCUS:** Since you have decided to focus on Aviion servers, how has that affected the porting of software to your workstations?

**Aucoin:** When we originally started with the Aviion business, we clearly were trying to capitalize on our strengths in the proprietary and commercial world. A lot of focus had already been placed on recruiting the commercial ISV (independent software vendor) packages. For example, the 16 leading data bases all run on DG. And all run very well on DG.

In terms of recruiting software for the workstations, the funny part was, DG never really was going full bore into the technical marketplace, and competing with those straight technical workstations. A lot of it was a perception in the press that we had only workstations and we were recruiting only in that way. So we really

have not had a major effort in recruiting technical software. We had some technical software packages that we needed, but we weren't going out there trying to get every CAD/CAM package under the sun. It really didn't effect us in what we were recruiting. If anything, it helped clarify our position in the marketplace.

**FOCUS:** Are you going to have a performance monitor under Aviion similar to what is under AOS/VS and VS II?

**Aucoin:** That's an area that, as we get more and more into commercial users and larger and larger systems, we need to expand our offerings. Right now that's an area that's under consideration. I can't comment further because it's not an announced product.

In terms of performance information in general, one of the things to remember is that DG is focused clearly on being recognized as the premier supplier of open systems for commercial and business type applications, as such we feel that our bi-

**the AV/4100, AV/4600, and AV/5225/6225 servers announced on July 29. See page 56.**

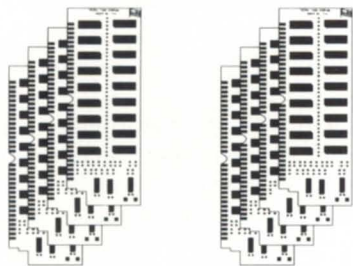
AV/6200	AV/6220	AV/6240	AV/6200-20	AV/6220-20	AV/6240-20	AV/7000	AV/8000	
single	dual	quad	single	dual	quad	quad	quad	<b>Processor</b>
29	58	117	29	58	117	117	117	<b>MIPS</b>
25	25	25	25	25	25	25	25	<b>Clock Speed (MHz)</b>
16/784	16/784	32/768	16/784	16/784	32/768	64/512	128/768	<b>Memory (min/max)</b>
9	9	8	19	19	18	8	18	<b>VME Options</b>
6U/9U	6U/9U	6U/9U	6U/9U	6U/9U	6U/9U	6U/9U	6U/9U	<b>Available slots</b>
rackmount	rackmount	rackmount	rackmount	rackmount	rackmount	office	rackmount	<b>Form factor</b>
								<b>Packaging</b>
none	none	none	none	none	none	3.3 GB	None	<b>Mass Storage</b>
60 GB	60 GB	60 GB	113 GB	113 GB	113 GB	4 GB RAID 5, 11 GB	48 GB RAID 5, 113 GB	<b>Disk</b>
								<b>Max internal</b>
								<b>Max supported</b>
2 GB, 150 MB	2 GB, 150 MB	2 GB, 150 MB	2 GB, 150 MB	2 GB, 150 MB	2 GB, 150 MB	2 GB, 150 MB	2 GB, 150 MB	<b>Tape</b>
525 MB	525 MB	525 MB	525 MB	525 MB	525 MB	525 MB	525 MB	<b>Cartridge</b>
yes	yes	yes	yes	yes	yes	yes	yes	<b>Reel to Reel</b>
								<b>(1600/6250)</b>
2 VME option	2 VME option	2 VME option	8 VME option	8 VME option	8 VME option	2 VME option	8 VME option	<b>Communications</b>
4-24 lines	4-24 lines	4-24 lines	4-48 lines	4-48 lines	4-48 lines	4-48 lines	4-48 lines	<b>Ethernet</b>
2-1275 lines	2-1275 lines	2-1275 lines	2-1275 lines	2-1275 lines	2-1275 lines	2-1020 lines	2-1275 lines	<b>Synchronous</b>
1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	1 integrated	<b>Asynch</b>
								<b>Parallel</b>
						3 KVA	10 KVA	<b>UPS</b>
						6 minutes	10 minutes	<b>Backup time,</b>
								<b>Full load</b>

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nary compatibility workstations are a very important part of that strategy; so that we can connect binary compatible workstations into our servers and enhance the performance of our servers.

For example, one of the things on the DIS II [USGS] bid was geographic information systems, which a lot of people view as a workstation deal. To a certain extent it wasn't, because they bought a lot of servers, and the servers all have workstations hanging off of them. So it really was a combination server and workstation deal. The reason we won that was because we had a good comprehensive strategy. Our solution had more than just workstations. A lot of our competitors had just workstations or just servers. We had a compatible line between each.

One of the other things that's clear is, if we were to go full bore into the pure technical marketplace, it would be a very difficult area to get into, because we have the likes of DEC and HP/Apollo and Sun into there very heavily. And all of a sudden IBM has been pitching into the marketplace as well. They're all out there slugging away. It is a very difficult market to be in. We feel much more comfortable being in the commercial area with workstations as part of our commercial sell. We've been successful in places like USGS DIS II. Even on our new high-end systems, AV/7000/8000s, we found there are people putting a variety of desktops, everything from X-terminals to PCs, to dumb terminals to our workstations, on these products. That's why having a full robust line, with a complete storage and communications line, is very helpful to us.

**FOCUS:** Everyone was pleased to see that Data General had two consecutive profitable quarters, but a majority of that revenue came from sales of the MV line. What's your strategy for increasing Aviion revenue?

**Aucoin:** I think one of the reasons the Eclipse line is staying strong, which obviously is in our best interest, is, again, based on things like the Eclipse Business Unit. That is clearly part of the intent that we had for the company. On the other side, as customers become more open to open systems, clearly we're trying to ride that trend for our growth. Towards that end we're continuing to make product announcements over the next several

months and into the future.

Another thing that we're doing is continuing to enhance our marketing programs area. We just hired a new director of Aviion marketing programs who is going to assist in enhancing and growing our marketing programs area, which in turn helps do everything from generate leads for our sales force to get our sales force more targeted toward what we should be selling, to help tie that all together with our high-end announcements.

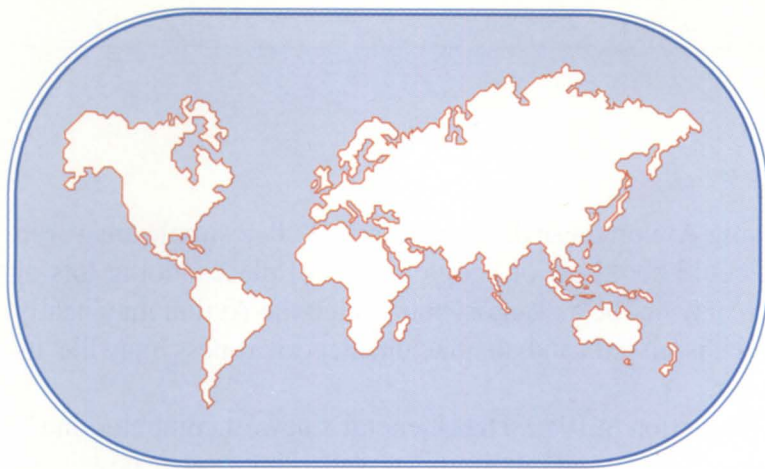
For example, after we announced our systems in March, we found that we had opened up some new sales targets that we had not been in before. We can start having new classes of competitors. We can better offload mainframe applications like Focus and other relational data bases (Oracle, Informix), or large analysis organizations like SAS—those types of mainframe applications which fit into the current economic climate. As companies are trying to downsize, and they realize that they have to continue to do certain functions, they're finding that automation is still extremely important to them. But they can't afford, for example, those extremely expensive mainframes. They can't afford to put an extra million into a mainframe to run more SAS applications and keep track of statistical analysis, as an example, as they try to compete in the world market. We can come in and offer a much less expensive alternative.

**FOCUS:** If someone reading this interview is considering buying either a new MV or a new Aviion, what would you tell them?

**Aucoin:** DG is clearly offering users a freedom of choice. I think for the customer that is truly interested and has applications on the proprietary side, we continue to enhance and are continued to be committed to our MV family. He can clearly continue on that path.

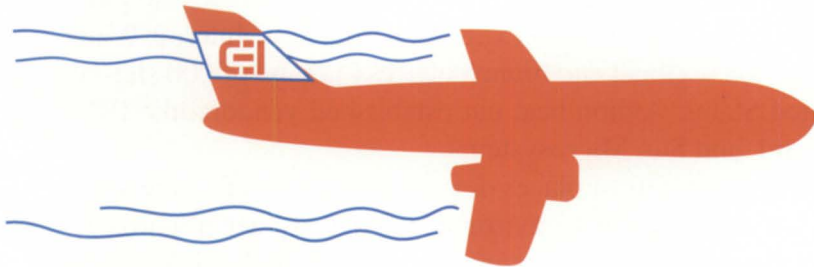
If he's interested in moving toward open systems, if there are things open systems can do for him, we can offer him a path there. We have interoperability between our systems. If, for example, he wants some applications that are available only on our open systems side, or only under Unix, that's an area we can do well on.

So we really do offer the customer the choice. We don't want to force him to go one way or the other. △



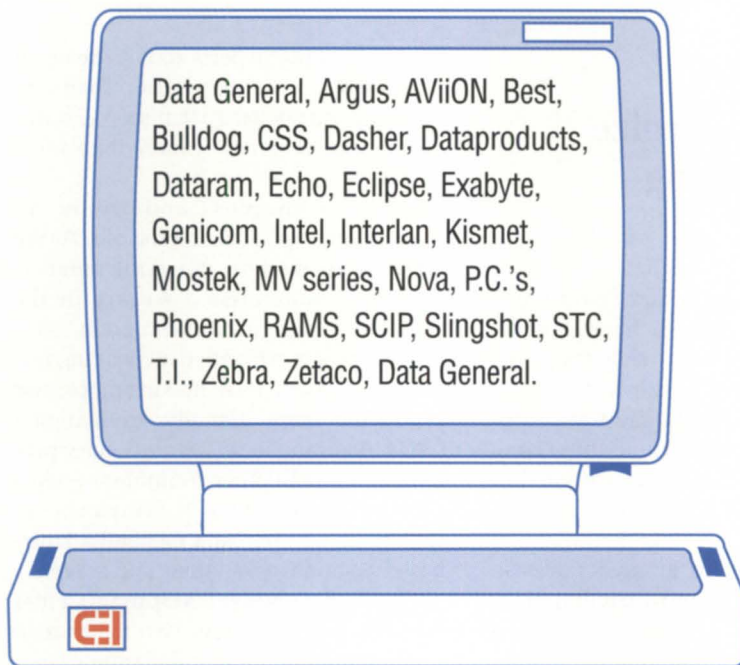
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# Aviion out there: different roles to play

by Doug Johnson  
Focus staff

## SYNOPSIS

*Finding its niche in the computer world for Data General's Aviion may be a matter of demonstrating its adaptability and just moving forward (quickly, of course).*

Who's using Aviion these days and how? Well, a simple answer to that question could be: "Lots of people in lots of places, doing lots of things." There may not be a category into which the Aviion may neatly be placed and dismissed, and in that uncategorical-ness may lie its ultimate success.

Since its introduction in 1989, Data General's newest computer line is demonstrating versatility and flexibility, as well as impressive power. So who *wouldn't* want blazing speed and solid price/performance?

In 1990, DG won a competitive government contract process to place some 6,000 of the new machines in U.S. Department of Interior Water Resources Division regional and branch offices—a total of 200 sites all over the United States. Aviion beat out established vendors like IBM, Hewlett-Packard, and Sun Microsystems.

Aviion is out there in lots of places doing things like medical records, laboratory information systems, environmental data, speedier word processing, or even complex digital mapmaking (see related article on this page). And according to the users and managers interviewed for the following profiles, it's doing it well.

## At the USGS, Aviions modernize the mapmaking process

What would 16th-century Spanish explorer Francisco Coronado have given to possess an accurate map while traipsing around the American Southwest?

"*Madre de Dios*, that Grand Canyon is deep," he could have exclaimed after consulting a contour chart. "Let us forget this Fabled City of Gold foolishness and go home."

Today, we take for granted the vast array of topological and cartographical reference materials produced and made available by the National Mapping Division of the U.S. Geological Survey.

"One of our old-line products is the USGS quad sheet that hunters, fishermen, and city and regional planners are familiar with and use," says Alan Turco, supervisory geographer with the USGS's Mid-Continent Mapping Center in Rolla, Missouri. No matter where you go in this country, you can get a map of the place.

But just as Coronado in his time would have liked even having one in the first

place, mapping experts today dream of producing accurate maps faster. Their City of Gold would be a map that's never out of date—or at least not for more than a few moments.

New techniques and tools in mapmaking are replacing the old. At the forefront are modern, powerful, number-crunching computers. "We are in the middle of a modernization program," says Turco, "where we anticipate leaving our old analog methods of making maps, and producing maps digitally, from digital data." Assisting in this evolutionary process, along with other computer systems already in place at the 410-employee installation, will be Data General's Unix-based Aviion workstations and servers.

The Mid-Continent Mapping Center office at Rolla is one of two major map producers for the National Mapping Division. Turco works in the Branch of Research, Technology, and Applications. In that branch, he says, "We have recently received nine Aviion 300 D workstations with a 6120 server, for research and development purposes, primarily."

These Aviion workstations were purchased by the USGS under a government contract, awarded to Data General in December 1989 by the Water Resources Division of the U.S. Department of Interior,

**Women & Infants Hospital of Rhode Island, Providence**

An MV/40000 serves as the workhorse computer system for this installation, the fifth-largest obstetrical hospital in the United States. The existing DG system handles administrative tasks such as patient admission and billing, medical records, and payroll for approximately 1,100 full-time and 500 part-time employees.

But it was another story entirely for the hospital's laboratory. "We had no system at all," says Bruce Reirden, vice president for information services. "We had completely manual recordkeeping in the laboratory before we bought the [Aviion] system."

As the laboratory's first computer, the Aviion was intended as a specific remedy for a specific problem. The machine itself is an Aviion model 6200, with 16 MB memory and 3 GB of disk  
*See Women & Infants, page 20*

**London Psychiatric Hospital, London, Ontario, Canada**

One of 10 psychiatric hospitals in Ontario, this location employs approximately 800 people and was running some 70 terminals on an MV/4000. The system simply was overburdened, according to Frances Fisher, systems operator.

"We've had the MV now for six years, and we're just ready to expand," she says. "The system was very slow, for the number of users we had." Particularly affected were Wordperfect users processing clinical records.

For the past several months the staff has been adjusting to an Aviion 5200 running 50 terminals and 20 printers.

"We use it in the business office, for all our financial programs," says Fisher. It handles the pharmacy department as well. "We use it in clinical records. We've got a data base of all our patients. We do  
*See London Psychiatric, page 20*

**Analytical Service Laboratories (ASL), Vancouver, British Columbia, Canada**

This environmental laboratory employs approximately 60 people and specializes in cleanup and impact studies, consulting for agencies and various governmental organizations, and dealing with chemistry, waste, and toxic chemicals.

According to Dale Shewchuck, analyst and system programmer, the Aviion was brought in this past summer to run a 4GL data base program called Informix. The company acquired an Aviion 5220 processor, 32 MB RAM and two 662 MB hard drives, running 22 terminals and 6 printers. There is also an Aviion 300 workstation.

As for new equipment acquisition,  
*See ASL, page 21*

that eventually will place several thousand Aviions throughout the country. The National Mapping Division has an option to buy from the USGS contract, says Turco. As of midsummer, the Rolla office had been using its nine R&D Aviions only for a couple of months, Turco adds.

USGS people in Rolla will put the Aviions to work on two main research tasks. One, the Modernization Products Generation Effort, involves developing and making maps from digital data. "Then we have another product that will be offered in a few years to come, which is called our Digital Line Graph-Enhanced (DLG-E)," Turco says. "We have a digital product now that's been out for a number of years, called the DLG. We're wanting to enhance this and add more features to it, and make it more compatible with geographic information systems that many of our users are using our digital data in."

The Rolla office has also received an Aviion 5200 series server for use in the Earth Science Information Center office (ESIC). That unit is slated for billing, inventory, and other administrative functions, but as of midsummer was not yet on-line.

The major training issue specific to the Aviion was learning Unix. "We have in the branch of Research, Technology, and

Applications some people who are quite well versed in Unix," says Turco. "We have some of our own in-house training as well. When we procured these nine [workstations] from Data General, we sent out people for Unix training and DG's specific user training."

Training was considered an important issue, Turco adds, because "we have a lot of mapmakers who have been involved in making maps for a number of years using old analog methods. There's a lot of training crossover that's going to have to occur." Federal government agencies are careful to stress that they do not endorse any particular computer system or company, but Turco says "we have looked very favorably at Unix workstations as having a lot of potential for us down the road for our mapping, our map production, and revision requirements."

Recently, the National Mapping Division has completed a new once-over mapping of the 48 contiguous United States—consisting of about 57,000 quad sheets (1:24,000 scale). "However, as you're well aware, maps get old rather quickly," says Turco. "So we are now in the middle of our revision program, where we'll be from here on out trying to keep our maps current."

The Aviion will be part of an increas-

ingly digital mapping environment, Turco says, "And we see that as a major effort well into the 21st century."

The goal someday could be an automated or largely computer-governed mapmaking process, but such capability is years away. Meanwhile, the computers remain welcome and powerful but ultimately limited tools.

"When we make maps from aerial photographs," Turco explains, "an awful lot of expertise sits in the human brain—in the cartographer or the cartographic technician who's reviewing that aerial photography, and taking things off of that and putting it onto what will be our chart." The future of mapmaking will "be an interactive process but, yes, we're getting an awful lot of help with computer mapping now, and [we] anticipate an awful lot more as we move more totally into an interactive environment. [But] putting a map source in at one end of a black box, punching a button, and getting a map out of the other end is quite some ways down the road."

If people today are able to take for granted the accurate and readily available maps of which Coronado could only have dreamed, it's because experts and technicians in the U.S. Geological Survey have done the foundational work and refined their tools along the way. Δ



erating system on the MV to Unix on the Aviiion involved substantial data transfer.

"The major thing was speed," she says. Even with something as mundane as spellchecking a document, there has been marked improvement. "Now it's just a blur," she says. In clinical records, "a report that took four hours maybe takes 15 minutes now to compile and print. The speed is phenomenal."

Other considerations in selecting the Aviiion included expandability and increased choices available through open systems. "We didn't want to be stuck with one software company," she says. "[Now] if there's a certain software that we like, we can go out and purchase it ourselves."



*ASL, continued from page 19*

"We started looking last fall," Shewchuck says, "and settled it out

with Data General early this spring, received the computers at the end of March, and have slowly been porting applications to the Aviiion." The company also uses AT&T 386s, and other computer equipment used mainly as instrument controllers. The Aviiion is intended to help ASL move ahead.

"The 386s have pretty much hit the wall, as far as performance [goes]," Shewchuck says. "We're building a large laboratory information management system, and it was stunted [because] anything we added to the system would degrade its performance." Other systems lacked the ability to grow as well as could the Aviiion for its price.

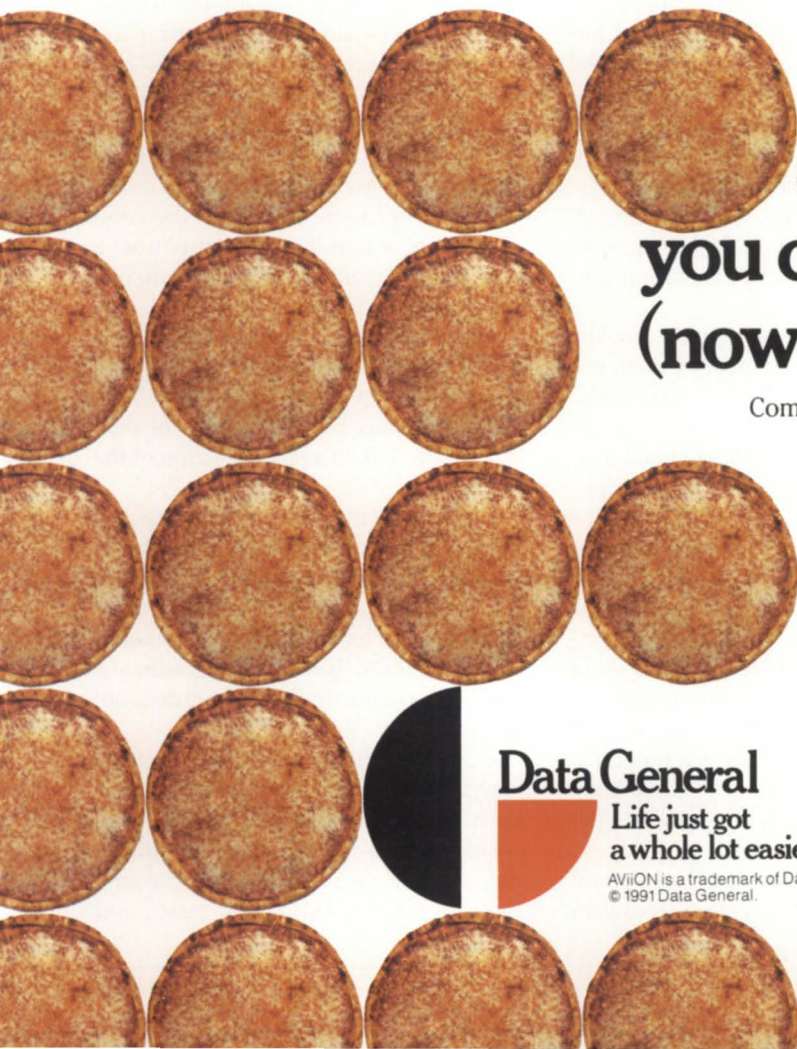
"We're running a fairly complicated, large data base to maintain the lab," Shewchuck says. "All the results, samples, everything that we deal with, and all the clients we deal with are kept in the data base. So, as a result, we were looking for a product that would give us high transactions per second at

a reasonable cost."

ASL's new Aviiion 5220 with a dual processor qualifies at about 50 MIPS, Shewchuck says, which "has helped us a lot." Performance is no longer an issue. "The analysts in the laboratory and the report writers, and everybody else involved can use it much more efficiently."

Acquiring an open system was important as well. "We're Unix because all of our data generally has to be in one place, and accessible by everybody," says Shewchuck. We want to stay as open as possible because we're dealing with so many different types of systems, controlling instrumentation, and everything."

Dramatically increased speed has been a plus. For most of the lab personnel, Shewchuck says, "what they want is something that's visible and something that works, efficiently, so they're not having to sit there five minutes while it does a screen refresh or something." △



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# The 4GL philosophy

by Jack Huber  
Special to Focus

## SYNOPSIS

*Not to sound evangelical about it, but using 4GLs to migrate software from the MV to the Aviion might just be a decision made in heaven.*

When Alpha Omega started developing software for the MV more than 10 years ago, Unix was just one entry in a menagerie of minicomputer operating systems. Who would have believed then that an operating system championed by AT&T and used mostly by engineers and college students could gain preeminence as an open systems standard?

Like lots of other folks, we ignored Unix-based systems for a long time. As a DG VAR, we were perfectly happy with our MV systems, and we concentrated on developing a nice range of vertical market applications for that platform.

We're still happy with those MVs, and so are many of our customers. But when DG got into the Unix world, our customers noticed. They started reading those articles about "open systems" and started demanding more choices for the future.

We were faced with two major problems to overcome. First, we would have to migrate our software to the new Aviion. Second, because some customers would not want to change systems, we would then have to support dual platforms into the foreseeable future.

## Migration strategies

We made our decision to support the Aviion in early 1990. At that time, our applications were written in either Cobol or Business Basic. We came up with three possible migration strategies: we could convert to all Cobol and get a Cobol compiler for the Aviion; we could rewrite everything in C for the Aviion (and possibly move the C version to the MV later); or we could use a fourth-generation language.

The first strategy we rejected quickly. We had no great fondness for Cobol. It is not a particularly productive or powerful language, and Cobol compilers on different platforms are just different enough to cause endless headaches. For example, the Cobol compiler on the MV contains verbs that exist in no other Cobol version, to support the DBAM structure. We could not have the same source code on both the MV and the Aviion.

We seriously considered the second strategy. C and Unix are inseparable to many minds, and there's no denying the power of C. Its portability is not perfect, but clever work with libraries could help. It would certainly be more portable than Cobol.

But on the other hand, C had several disadvantages for our situation. It requires

a great deal of expertise to use effectively. And projects in C are notoriously hard to pin down. We had heard the horror stories of the "three-month C rewrites" that took three years. That kind of performance would put us out of business.

The third solution (getting a 4GL) had its own set of good and bad points. Four-GLs are very productive, and the good ones are very portable. Literature from a 4GL company often paints a picture of a programmer's Utopia.

Our doubts could be summed up by a question: If 4GLs are so great, why doesn't everybody have them? They've been around awhile, but they have not penetrated more than a small fraction of the market.

We knew some of the typical reasons. Four-GLs have a reputation for being resource hogs. Since we would be upgrading existing customers, we could not afford that problem. Telling a customer to spend \$50,000 in hardware upgrades just to receive a new software version does not go over well.

Our other main concern about 4GLs was flexibility. Since our software systems are quite sophisticated, the language we used had to do more than just produce data entry screens. It had to handle anything that Cobol can do (at least), and



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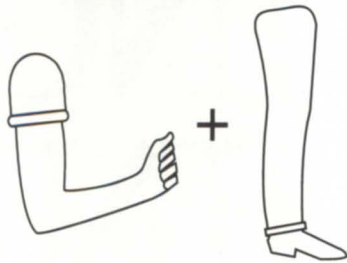
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## FOCUS ON: AViiON

most 4GLs do not offer that much depth. It's not uncommon for a 4GL shop to use Cobol or C for low-level routines that can't be written in the 4GL.

These two sticking points, plus some other minor issues, kept coming up as we looked at 4GLs. Finally, we settled on System Z, a product from Zortec, Inc., of Nashville, Tennessee.

Z has the standard 4GL features. It's a very productive environment, and it's extremely portable—even the compiled modules can run on both MV and Aviiion. It also has some major architectural differences from other 4GLs that answered our objections.

The designers of Z are performance fanatics. We were surprised to see that an application done in Z requires less memory and less disk space than an equivalent system done in Cobol. Response time was good even on an MV/2500.

That still left the issue of flexibility. That was settled by looking at some of the utilities that come with the language. With most 4GLs, the utilities are written in C because the 4GL itself is not powerful or flexible enough. Not so with System Z, where all the utilities are written in the Z language. (Zortec will even sell you the source code if you want to customize the utilities for your own use.)

So we became convinced that a 4GL could do the job, and we chose the third strategy. We installed the development system in November 1990.

### Getting started

It was now time to see if we had made the right choice. Our first migration project involved a package for durable goods distribution management. We had estimated that with either of the other two strategies, we would need to devote 10 man-years to the project from start to finish.

After consultations with Zortec, we decided to reduce the number of programmers in that first project by 70 percent. This had two benefits. After having managed the software development process for 12 years, we knew that the smaller a programming team could be, the better. And if the 4GL route should prove to be a mistake, we would have far fewer wasted resources.

It took that team three months to get out the beta release of the software, including training and ramp-up time. A month or so of polishing got us up to full release. We

were surprised at how fast we could turn out finished code. One programmer, using an application generator and then tweaking the resulting programs, turned out nine finished report programs in one day!

We also expect to save a lot in maintenance of the software. There are two ways a 4GL helps during maintenance. First, since there are far fewer lines of code to maintain (about one-tenth the number of lines Cobol would need), changes are easier and take less time. Second, we have avoided the problem of maintaining multiple versions of the software. *Exactly* the same code can be used on both the MV and the Aviiion. We are now running that first system on both machines, side by side. No differences whatsoever exist between the code on the two machines.

We normally use the Aviiion for development and do systems testing on the MV. This allows us to exploit the strengths of each machine. The Aviiion is an excellent development workstation. The MV has lots of terminals, so we can test things like record locking and file access from multiple users.

We have just finished our second software system written from scratch in System Z (for accounting and financial management), and we expect to finish a third system for job costing by the end of the year. We simply could not have met these schedules without using a 4GL.

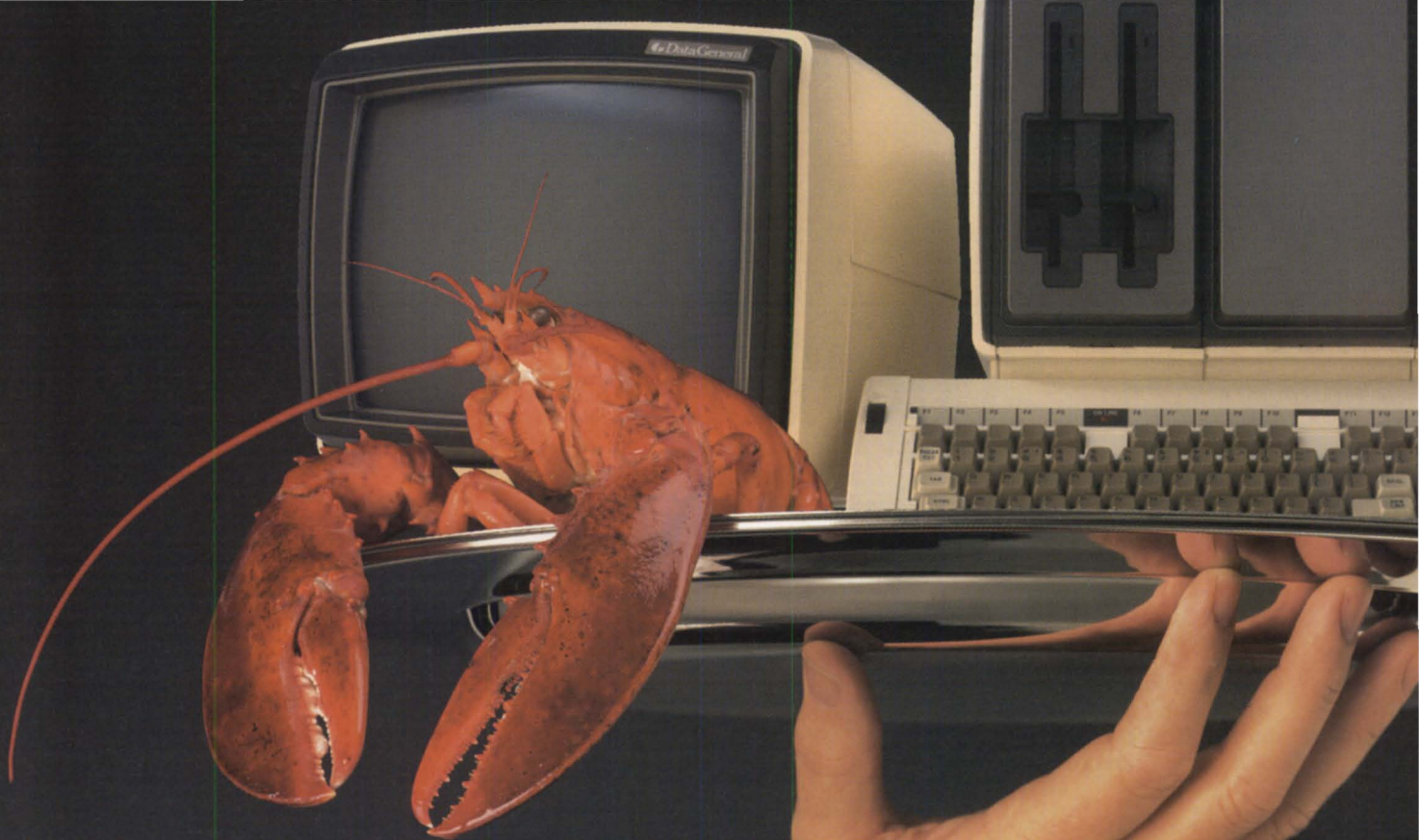
Our customers are pleased about some of the changes in the new systems. System Z builds in a querying system, for example. And the report generator I mentioned earlier can be used by customers to develop reports specific to their installation.

We don't want to sound evangelical, but we are definitely believers in the 4GL philosophy. Besides helping our programmers be much more productive, there is no easier way we know to get from the MV to the Aviiion. Δ

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*Jack Huber has worked more than 20 years in sales and marketing within the software, turn-key, and computer services industry. He is a vice president in sales and marketing with Alpha Omega Systems. He may be reached at 708/574-0700 or by writing to Alpha Omega Systems at 2021 Spring Road, Suite 220, Oak Brook, IL 60521.*

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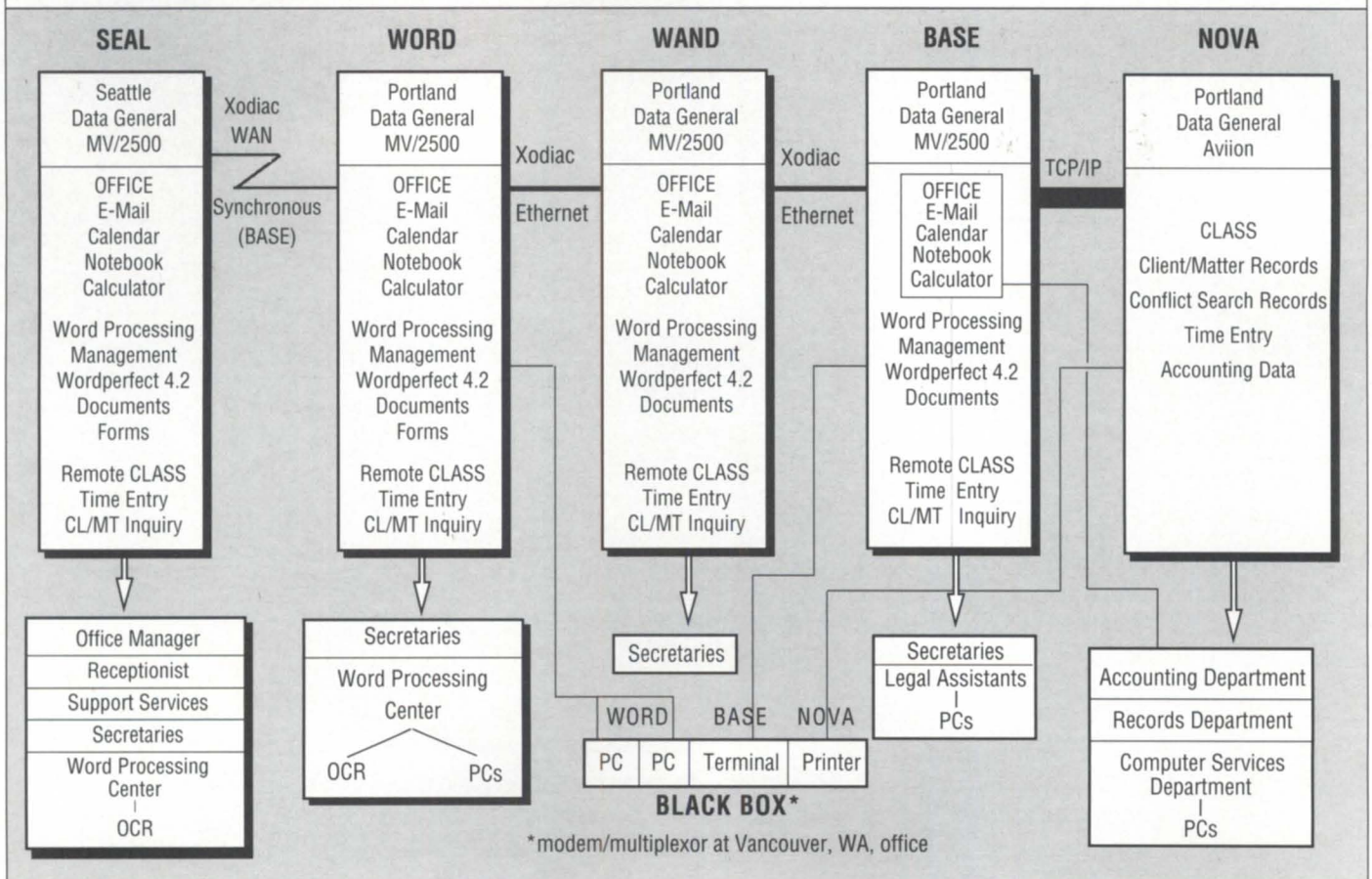
by Joel M. Lewis  
Special to Focus

**SYNOPSIS**

*Arriving late into the data processing age, an almost century old law firm makes up for lost time by automating with Avions.*

The four-office law firm of Schwabe, Williamson, & Wyatt will celebrate its 100th anniversary in 1992, but not until 1985 was office automation addressed. A new position appeared that year: data processing coordinator. There was one PC in the firm then—an IBM System/34 in the accounting department—and an IBM 5520 in the word processing center. Most secretaries still used electric typewriters.

**Figure 1: Schwabe, Williamson & Wyatt minicomputer system**



\*modem/multiplexor at Vancouver, WA, office

Today, an Aviion 6220 (AV) runs the full range of "back-office" law firm applications: client/matter records, conflict checking, time and billing, reporting and accounting.

The process resulting most recently in the AV has been evolutionary. One year was spent defining the ideal computer system and applications software, writing a request for proposal, searching for and selecting a vendor. Chosen by mid-1986 were Class, a product of what is now Softsolutions Legal System of Orem, Utah, and Wordperfect. These products run on DG's Eclipse MV line of minicomputers.

### Background

An MV/2000 and the newly announced MV/15000 model 8 were in place in mid-1987. The MV/15000 ran Wordperfect for secretaries and supported data processing applications. The MV/2000 replaced the IBM 5520, serving the seven-station word processing center and three secretaries.

An MV/15000 model 20 and two MV/2500s (upgraded MV/2000s) were in place in the Portland office in 1989. A third MV/2500 was installed in the Seattle, Washington, office and "Xodiac-ed." All were connected using ethernet, providing e-mail and firmwide document management.

### On to Aviion

We purchased the AV to increase computer resource capacity. The firm wished to add software modules, improve response time, extend available hours, and allow additional processing during prime hours.

The Aviion was installed in the third quarter of 1990, relieving the MV/15000's data processing load. The MV had supported 18 data processing users and 45 secretaries. The new AV, several local MVs, and one remote MV communicate using TCP/IP and Xodiac. In designating the network names (see diagram), we paid tribute to Data General's first big-selling computer model by calling the Aviion "Nova".

For several reasons, the AV won out over the MV in our case. Number one was potential processing power for dollars spent—more bang for the buck. Our software provider was anxious to do it, and saw Unix as the future platform. RISC technology offered speed improvements in such areas as text indexing.

### Successes and struggles

The Aviion system was installed originally with a single processor, DG/UX version 4.2, and the assurance that the AV processing power equaled that of the MV/15000, Model 20. We experienced real sluggishness when the system got busy during month-end processing. A mix of interactive users and batch processing or reporting slowed things to a crawl.

The mid-term scheduler was identified as a potential problem. The system seemed to spend more time trying to decide what to do than it did doing it. The problem was addressed in DG/UX release 4.31, but it did not do the trick. It is addressed again in DG/UX 5.4, which we are scheduled to install as soon as it is available.

In the meantime, the vendors cooperated and provided a second processor,

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

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upgrading the AV/6200 to a 6220. This more than did the trick! This solution appears to provide three times the processing power, partly because not so much scheduling is required. Another possibility is an engineering change that may have been implemented in the upgrade, utilizing a new memory cache chip.

Productivity and workflow efficiencies have been achieved. Clerical accounting

work has been reduced, allowing a reduction of one clerk. During that time the firm has grown 30 percent. At the same time, billing processing has improved; turnaround of prebills and bills has been reduced by several days.

Porting Class (originally written in BBasic) to the Aviion presented some interesting challenges. Transoft of England provided the interpreter, UBB. Our time

and billing information was stored in huge, sparse data bases on the MV, and there was no ready method of migrating those files to the Aviion because the logical empty space in the MV data bases translated to physical null space on the Aviion. Coming to our rescue, SLS wrote an "UNDUMP" utility, which extracted the data base information from a dump file format. Hence, we used DUMP II to compress the data on the Eclipse MV, TCP/IP to transfer it, and then "UNDUMP" to decompress the data bases on the Aviion.

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**O**ur time and billing information was stored in huge, sparse data bases on the MV, and there was no ready method of migrating those files to the Aviion

### The future

The firm is currently expanding office automation to attorneys. Objectives include moving to Wordperfect 5.x. We will choose between utilizing an Aviion 5220 as a word processing document server and incorporating NFS and TCP/IP to network attorney PCs with secretary terminals, or employing a standard LAN utilizing Novell Netware.

In the firm's corner of the PC world, dBase is used for some general-purpose data base applications and data manipulation for special administrative reports. When Class was running on the MV, we used Softerm to download files to a PC and massage them in dBase. When we installed Class on the AV, we used James River Group's Ice Ten to move files to the PC. When we read about Recital, a Unix version of dBase, we installed it on the AV. This kept us from downloading files. Very little of the PC version of the code had to be changed. One of the processes that took 10 hours of moving files and massaging on a 386 PC now takes us 2 hours of AV processing. Δ

*Joel Lewis has 23 years experience in systems and data processing. He is currently the computer services manager at Schwabe, Williamson & Wyatt, a Northwest regional legal services firm.*

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## WITH COBOL

```
IDENTIFICATION DIVISION.  
PROGRAM-ID. CALLDG.  
ENVIRONMENT DIVISION.  
SELECT ANIMALS  
  ORGANIZATION IS INDEXED  
  ACCESS IS DYNAMIC  
  KEY IS ANIMAL-TYPE  
  ASSIGN TO BEASTS.  
DATA DIVISION.  
FD ANIMALS  
  RECORD CONTAINS 16  
  CHARACTERS  
  DATA RECORD IS ANIMAL-REC.  
01 ANIMAL-REC.  
  03 ANIMAL-TYPE PIC X(8).  
  03 ANIMAL-NAME PIC X(8).  
PROCEDURE DIVISION  
START.  
  OPEN INPUT ANIMALS.  
  MOVE 'DOG' TO ANIMAL-TYPE.  
  READ ANIMALS INVALID KEY  
  DISPLAY 'BAD ANIMAL'  
  LINE 10 POS 1.  
CALL-SPOT.  
  DISPLAY 'HERE' LINE 10 POS 1.  
  DISPLAY ANIMAL-NAME HIGH  
  LINE 10 POS 16.  
  CLOSE ANIMALS.  
STOP RUN.
```

## WITH SYSTEM Z

Here, Spot.

### Is System Z 4GL COBOL?

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ZIP, a utility of System Z, allows you to develop queries, menus and reports with no programming knowledge. However, for the more experienced user, the source code generated by ZIP can be enhanced or modified for more complex applications.

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Programs developed with System Z are not dependent upon the hardware or operating system they were developed on. The executable code can be "copied" to other systems with no change or recompiling. For example, you might have a program developed under UNIX and then decide to install it on a DEC VAX under VMS or a PC under DOS. Graphics, function keys and other conventions previously accepted as "machine dependent" are portable.

### Performance + Productivity + Portability

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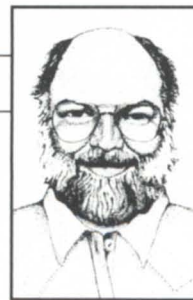
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# Items from the column spike

## SYNOPSIS

*There's lots of stuff to think about this month. BJ concludes that Infos 6.00 might best have been relegated to the wine cellar. On the other hand, AOS/VS 7.69 seems to be holding up well, but AOS/VS and AOS/VS II may be growing apart. Meanwhile, note the differences between CLI16 and the combination of CLI32 and DUMP\_II/LOAD\_II. And do not drive yourself nuts configuring that dial-in modem.*

### :WOE\_IS\_ME

This month I've got a couple of planes to catch shortly, a stack of real work on my desk, and I'm a week behind schedule on this column, so I'm going to continue popping small items off of the column spike again this month instead of tackling some big, complicated topic.

### :INFOS\_6.00

Infos 6.00 arrived here on June 10. Before unleashing it on the hapless users, I waited for the weekend and installed it with nobody around so I could make sure it worked OK before real users started to beat on it.

The first piece of bad news is that Infos 6.00 is no longer a plug-and-play product, as previous revisions were. There is a file containing a passel of global switches that are used to tell Infos at startup how much space to allocate in a gaggle of files that now take the place of the dear departed INFOS.VM file. The switches affect the maximum number of simultaneous users, files, locks, and a bunch of other things. A default version of the file is supplied with values that appear to be reasonable for a typical small system (like mine), except for one: /WIRE.

Using the /WIRE switch causes the Infos global server to become resident at priority 1 or 2, depending on the priority of the master console. Worse yet, the Release Notice argues repeatedly in favor of using /WIRE, and it is one of the default switches in the prototype switch option file provided on the Release Tape. Recommend-

ing blanket use of the /WIRE switch is extremely irresponsible, and the logic used in favor of it in the Release Notice is seriously flawed.

Use of the /WIRE switch has two potentially harmful side effects: it increases the memory consumption of the global server significantly, with the possibility of inducing premature memory contention; and it allows the global server to shut out all other users should it become CPU-bound for an extended period of time.

On a system where all users are using Infos, and all are using the same set of Infos data bases, the use of /WIRE has no effect other than to hasten the onset of memory contention. The problems arise either when memory contention sets in prematurely solely as a result of /WIRE, or when some number of non-Infos users are present and find themselves competing against Infos users who have the benefit of a high-priority server operating on their behalf. This latter condition probably applies to about 99.99 percent of the AOS/VS systems that use Infos.

For some unfathomable reason, the Infos II group also added a /WIRE switch to DDUMP/DLOAD. This is so that DDUMPs/DLOADs done during periods of memory contention will finish quicker, right? You've got to be kidding.

The Release Notice also indicates that Infos II 6.00 has forsaken the slower shared page I/O facility for the faster direct block I/O facility. As a side effect, this means that Infos no longer automatically enjoys the benefit of the Shared Page LRU pool.

You have to manage the pool contained within the global server yourself. That's great. Managing AOS/VS systems lately has become so easy and boring that I'm sure I'll have plenty of time to start monitoring and fiddling the Infos global server buffer size and restarting the server a couple of times a day before and after the overnight batch runs so I can take advantage of the memory rich environment at night. (Yes, Virginia, that was sarcasm.)

The Release Notice holds out the carrot of checkpoints completing "in as little as 1/10th the time," and the ability to perform multiple checkpoints simultaneously. As with the allegedly "FIXUP-less" AOS/VS II file system, it appears that the cost of this feature is additional overhead on each operation (as we'll see shortly). The net effect is that unless you're spending most of your time doing checkpoints, Infos 6.00 is apparently a net loser in terms of performance.

### :INFOS\_6.00:MEASUREMENTS

The Release Notice contained some ominous verbiage about increased memory requirements and vague references to performance improvements, so I decided to take the time to do a little more analysis than I would usually do on a new release.

Using the PERFWA program (described in my May '90 column and available on the :SYSMGR BBS as item PERFMGR:PERFWA) I analyzed the WorkingSetSizes of both the global server and a typical local server using the default startup option switches.



The growth in the size of the global server is significant; about a half-mega-byte if you fail to remove the /WIRE switch from the default startup switch file, or about 200 KB if you do remove it. The local server actually appears to have shrunk by about 16 KB, so with no /WIRE switch and more than about 13 Infos users, the overall memory consumption with Infos 6.00 might even be less than Infos 5.01. I didn't get a chance to check out this possible phenomenon. Here are the numbers:

### Unique WSS

Server	5.01	6.00	Change
Global, /WIRE:	302 kb	760 kb	+458 kb
Global:	302 kb	506 kb	+204kb
Local ring 4:	216 kb	200 kb	-16kb

Bear in mind that these numbers can change significantly, usually upward, when you increase the option values above the default values that DG supplies. And as we'll see shortly, the default values are nearly useless, even on a single-user system.

Next, I ran the benchmark described in my June '90 column (also available on the :SYSMGRBBS as item SMLOGS: SML9106X). The benchmark consists of using SORT to write 6,635 fixed-length 180-byte records to an empty Infos data base using 18 byte keys in random order. Then a second pass is made, again with SORT, to read the records back sequentially. After the initial abysmal results, I had occasion to discuss the tests with the Infos group, and they seemed surprised that I would try to run a benchmark with the default startup option values. At their request, I reran the benchmark several more times with ever-increasing values for the startup options until no improvement was noted in the benchmark times. This optimized run is the second set of Infos 6.00 values shown in the results.

Here are the benchmark CPU times:

### CPU Time

	5.01	6.00	Def/Opt
		Def/Opt	Change
Write (next):	133s	190s/174s	-43%/-31%
Read next:	72s	120s/107s	-67%/-49%

This is Really Bad News.

I don't know about you, but the prospect of watching all of our Infos batch jobs

run half to two-thirds longer curdles my milk. Even the possibility of speeded-up checkpoints doesn't make up for the speed decrease. We run batch immediately after the nightly backup and after turning off differential mode. This speeds up processing by eliminating unnecessary writes to the differential volumes and massive system cache activity due to the small element size of the differential volumes.

The only rationale I can postulate for what they've done to Infos II is that there was some other unpublished reason for doing whatever they did to slow it down. The most plausible reason for forsaking the LRU in favor of explicitly sized shared memory buffers is to accommodate some other operating system that doesn't have an LRU. Unix springs to mind, but you didn't hear it here.

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## :INFOS\_6.00:THUMBS\_DOWN

As far as I know, there are currently no products that require Infos 6.00 in order to run, so I'd recommend putting the Infos 6.00 tape down in the wine cellar with the other stuff that you hope will improve with age.

## :GOOD\_NEWS

On a more positive note, AOS/VS 7.69

continues to be exceptionally stable. Many of you should have received it by now via SSS, and I recommend that you go ahead and install it. Unlike Infos 6.00, it comes pre-aged.

XLPT.PR 7.69 has the same problems as its predecessors, so I've put an updated version of the unofficial BJ Inc. patches on the :SYSMGR BBS. However, there is one new problem that I haven't yet figured out

a way around. It seems that XLPT now outputs carriage control characters at the end of a line that is exactly CPL columns long, and is the last line on the page. This causes an extra blank page between each printed page. Stay tuned for a possible solution.

## :VS\_II:NEWS

On a less positive note, the number of disparities between AOS/VS and AOS/VS II seems to be growing, and making it somewhat more difficult to write some kinds of code to run on both systems. Generally, the problem areas tend to be in terms of file system differences and subtle system call differences.

An example of one difference that I just ran into last week is the way that "binary data-sensitive" I/O to consoles is handled. Under AOS/VS, setting both binary (?IBIN) and data-sensitive (?RTDS) in a ?READ packet resulted in the data stream being stored in the buffer with no massaging at all, not even stripping of the parity bits, and the input terminated upon encountering any of the delimiters specified at ?OPEN time. This particular mode of I/O is wonderful when writing code to deal with strange communications protocols. The one I'm working on this week is a variation of IBM BTAM 1050, and it uses hex DD as a delimiter. When I went to run the code under AOS/VS II, the delimiter was not detected properly until I added a piece of code to turn on the 8BT characteristic on the port. That took me a while to nail down. *Emptor.*

## :CLI\_NOTES

Shortly after AOS/VS 7.67 was released, everybody here climbed onto the CLI32 bandwagon and we haven't looked back since. However, now that 7.69 is out, one would think that we could assume that CLI32 has stabilized. If so, there are several fundamental (and quite annoying) differences between CLI16 and the combination of CLI32 and DUMP\_II/LOAD\_II that are worth noting because they are probably here to stay.

Note that I treat CLI32 and DUMP\_II/LOAD\_II as a unit. That's simply because CLI32 has no built-in DUMP/LOAD commands as CLI16 had.

As much as I hate to say it, if CLI16 were pulled from the AOS/VS release media today I would miss it. I still use CLI16 occasionally when confronted with one of

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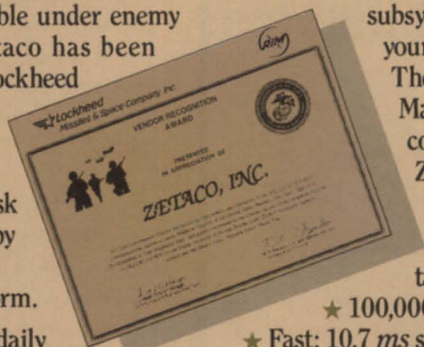
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CLI32/DUMP\_II/LOAD\_II's quirks. Here's a list of the situations where I do an XEQ :CLI16 before proceeding.

- CLI16's DUMP processes explicit file/pathnames on the command line in the order in which they occur. Occasionally, for cosmetic reasons, I prefer to create small DUMP tapes with the files in a particular order. Yes, I understand that this is

peculiar behavior on my part. Maybe someday I'll seek professional help for it.

- CLI16's DUMP command accepts huge numbers of arguments on the command line (many thousands of bytes). DUMP\_II has a very small limit that I run into frequently (a thousand bytes or so).
- CLI16's LOAD and MOVE commands

understand that when I specify a template argument that resolves to some deep pathnames, then any missing intermediate directories should be created as required to load the ultimate file. CLI32's MOVE and LOAD\_II don't always do this.

- CLI16's LOAD and MOVE commands don't complain when intermediate directories in the destination paths already exist. CLI32's MOVE and LOAD\_II issue annoying warnings.

- LOAD\_II/DUMP\_II buffer their output, as CLI16 does, but unlike CLI16 which detects ^C^A and responds by flushing the output buffer, LOAD\_II/DUMP\_II ignore ^C^A and ^C^B causing the buffer contents to be lost unavoidably. Too bad DG PL/I (the vehicle for CLI32/DUMP\_II/LOAD\_II) doesn't provide a nice default ^C^A handler the same way that DG C does.

- As I mentioned last month, how the /DELETE and /RECENT switches are handled differs significantly between CLI16 and CLI32/LOAD\_II. The most glaring difference is that file length is not used to break ties based on DCR/TCR during CLI32's MOVE and LOAD\_II. This means that aborted LOAD\_IIs and MOVES can result in partially loaded/moved files that will not be corrected by a subsequent LOAD\_II/R or MOVE/R. And because CLI32 and LOAD\_II ignore ^C^A and lose their output buffer on ^C^B, you can't even get a clue as to what file was being moved at the time of the abort so that you can manually delete it before resuming with a LOAD\_II/R or MOVE/R.

- I had hoped that the incredible CPU overhead incurred by CLI16 when processing large or recursive macros would be reduced by CLI32. If anything, CLI32 appears to consume even more CPU doing the same macros, in spite of the fact that it theoretically enjoys a built-in advantage by not having to do the thousands of no-op overlay loads that CLI16 had to do. I find that we are now writing program replacements for some of our more complex macros, or macros that process huge numbers of arguments.

Question: Why was /AUTOSIZE not the default for CLI32's FILESTATUS com-

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mand? Does somebody actually have software that expects the old output line format used by CLI16's FILESTATUS command? I doubt it.

## :DIAL\_IN\_MODEMS

Users with problems configuring dial-in modems properly on AOS/[VS[III]] keep cropping up on the NADGUG BBS and among my phone messages. It's a shame that so many system managers waste so much time on modem problems. Configuring them to work properly is quite simple as long as you know what the minimum requirements are. This is important: I haven't seen a modem yet that couldn't be configured to meet the minimum requirements using the following port characteristics (others not shown are assumed to be defaulted or turned off):

/605X/ON/ST/EB0/MOD/WRP

Note especially the lack of /IFC, /OFC, /HIFC, /HOFC, and /MRI.

The source of all the problems I've seen is that most modems are now delivered with default switch settings suitable for PCs. PCs and their software typically ride roughshod over the modem control signal standards established long before PCs crawled out of the ooze. They prefer for most or all of the modem control signals to be forced on rather than behave normally. That way they don't have to deal with them at all. I can't really blame the modem manufacturers too much. How would you rather have your technical support staff spending its time on the phone: hours with PC users, or minutes with users of real computers?

Simply stated, here's what DG operating systems expect of modems:

**DTR:** To the modem: the modem should not answer incoming calls if DTR is not on, and it should hang up on an active call if DTR drops.

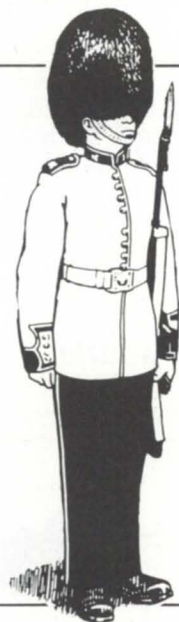
**CD:** From the modem: the modem should raise this signal when the carrier signal from the calling modem is detected, and drop it when carrier is lost (which may only be for a few seconds due to phone line noise, or permanently when the caller hangs up). Alternatively, you can get away with having CD track off-hook. This signal needs to go away when the call goes away, or you get the dreaded

"Logon/off in progress" message.

**DSR:** From the modem: this signal should either follow off-hook or follow CD (usually with a delay of some small number of milliseconds). This signal needs to go away when the call goes away, or you get the dreaded "Logon/logoff in progress" message. The timing of it with respect to CD is unimportant as long as it comes up with,

or shortly after, CD comes up and goes away with, or slightly after CD goes away.

**CTS:** From the modem: this signal indicates when the modem is safe to talk to, and typically either reflects RTS, or becomes active after CD and DSR at a point when the two modems have allowed time to synchronize their carriers and figure out how to minimize the phone line noise.



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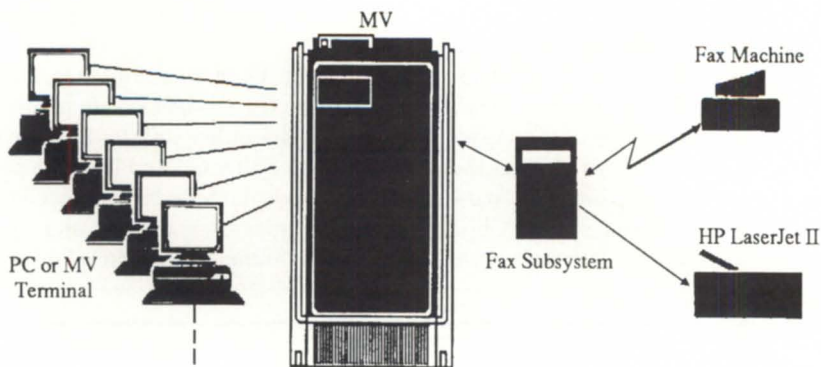
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### PRINTERS

4599 2000 LPM Band Printer .....	\$9,900
4364 600 LPM Band Printer .....	1,700
P600 Printronix 600 LPM Printer .....	1,700
6215 Dot Matrix Draft Quality, 250 CPS .....	790
B910 900 LPM Quietized .....	2,600

### COMMUNICATIONS AND CONTROLLERS

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4623 IAC 24 .....	\$5,400
4626 LAC 32 w/TCB .....	3,200
4532A LAN Controller .....	2,900
4370 IAC 16 .....	890
4560 LAC 12 .....	890

### DATA GENERAL COMPATIBLES

BMX 1 Controllers .....	\$950
BMX 3 Controllers .....	2,100
Fuji 2351 Eagles .....	750
Fuji 2361 Super Eagles (un-used) .....	1,800

Most DG multiplexors with modem control are constrained by their circuitry from sending any data until this signal is high. The operating system couldn't care less whether this signal is forced high all the time, or is active only when a call is active. The dreaded "Logon/off in progress" message is not related to this signal.

Setting your modem and port characteristics as I've just described, along with the /AUTOBAUD switch if the modem handles multiple speeds, will allow any modem to interact properly with AOSI/[VS(III)].

But you say that you've got a whiz-bang MNP Class 71 V83.2 bis screamer and you want to run in massively buffered mode at a fixed port speed of 56 kilobaud? Ah, that's a horse of a different color and would take a separate column for each manufacturer's modem. But the basic principles are still the same. My trusty Microcom MNP Class 6 9600 baud dial-in modems with fixed 19,200 baud port speeds are configured exactly as described above, except that CTS is used for outbound flow control (and no, I don't have /HOFC turned on for the port; IAC-8s support hardware output flow control by default).

The most commonly misused port characteristic is /MRI. This characteristic is needed only when your modem is incapable of auto-answer, and goes off-hook anytime DTR is asserted. Modems that stupid were quite common in the 1950s and 60s, but I haven't seen a non-auto-answer modem in 20 years, except for some on the bargain modem table at Crazy Ralph's emporiums of electronic junk down in Milpitas and Sunnyvale. I even saw an old DG 4K core memory board down there about six months ago. The price tag said \$50. I resisted the urge. Δ

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



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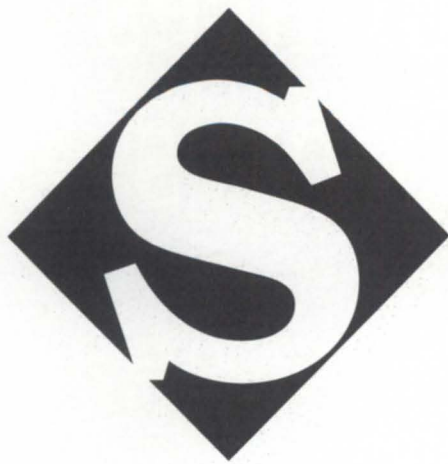
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# uper macros

## SYNOPSIS

*It's a bird, it's a plane . . . no, it's Wordperfect 5.0! Tackle those unwieldy big documents with this sleeker and more powerful than ever word processing tool. If your office lives by the printed word, you can't afford to be without it.*

by Kent Finkle  
Special to Focus

Version 5.0 elevates Wordperfect's word processor from merely a proficient document builder to a powerful, user-extendable document management system. If you aren't sure, take a moment to browse through the commands in the new macro language before you decide. 5.0's macro language is an opportunity for you to reach many document processing goals not possible with version 4.2. With the new macro language, you can write macros that

- assemble documents intelligently
- format documents automatically
- validate user input

and many, many other applications.

If any of you are hesitant to make the upgrade to 5.0, wait no longer. This version of Wordperfect is a totally different kind of product from 4.2. The earlier version allowed you to build documents. The new version allows you to build systems. There is no way I can do justice to the entire upgrade in one article. As an ex-

ample, I have already used the new language to 1) do table look-ups in external files, 2) write macros that process groups of documents by analyzing their contents, 3) bring consistency to a large (1 MB) data file, and 4) implement an unlimited undo feature. This is a powerful tool.

However, a new macro command called {NEST} is representative of the kind of functionality now available. In this article, I would like to give an example of how the {NEST} command

- simplifies programming
- increases the capability of your macros
- makes your macros easier to read and maintain.

## The new command

The {NEST} command allows the macro programmer to execute one macro from inside another. The syntax is:

```
{NEST}filename~
```

where "filename" is the name of the macro we want to execute. A sample use of the {NEST} command might be:

```
{NEST}BoldOneLine~
```

The "BoldOneLine" macro here would convert one line of a document to bold-face. What is new about this is that the nested macro can be executed from within another macro, like so:

```
{UP}
{NEST}BoldOneLine~
{DOWN}
```

The macro carries out the {UP} command, executes all the commands in the external "BoldOneLine" macro, and then proceeds



to the {DOWN} command. You can see how powerful this is. Use of the {NEST} command will make your macros more readable and more reusable. You will be able to tackle more ambitious macro programming projects because you will be able to use the time-honored tactic of divide and conquer.

**More readable macros**

C, to pick on that popular language for a moment, has been called a "write-only" language (meaning that while it is possible to write programs in C, you can't read them afterwards) because of code that looks like this:

```
1) cflag = (((c) & 0x80) == 0);
```

What the heck does that do? (Answers at the end of the article, for those keeping score.)

As you can probably imagine, this was too hard for the majority of computer users. So, enterprising software companies created "macro" languages for their products. The macro languages were supposed to be "Everyman's" (or Woman's) programming language.

And they were easier... to write, that is. Reading them is another story. Surprisingly, since most macro languages are simply collections of recorded keystrokes, they are even harder to read than C. Consider this line from a Lotus 1-2-3 macro:

```
2) /wgdp60~{esc 5}
```

I wouldn't care to plow through a few hundred lines that looked like that. As a result, macros earned the reputation of readability about equal to hieroglyphics without the Rosetta Stone. Wordperfect's previous macro language, while slightly more readable than many others, was still perplexing even on a good day. Consider this Wordperfect macro:

```
3) {Date/Outline}36{Enter}1
```

It is pretty apparent that something involving dates or outlines is happening—but what is it?

Until recently, the only thing you could do as a Wordperfect macro programmer was heavily comment your work, like this:

```
{COMMENT}This comment explains the next line~
```

```
{Date/Outline}36{Enter}1
```

However, "nesting" now provides macro writers with an attractive alternative. With nesting, rather than writing:

```
{COMMENT}Converts line to uppercase from anywhere on line~
{Home}{Home}{Left}{Block}
{Home}{Home}{Right}{Switch}1
```

now you can now create a macro called UpperCaseLine and nest it, this way:

```
{NEST}UpperCaseLine~
```

This is much easier to read.

**How to add the {NEST} command to a macro**

The best way to show you how this

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works is to try it out. Let's build a macro that will create a "Title"—it will bold, underline, uppercase, and center the current day of the week.

To do this in a readable fashion, we need a library of "nestable" macros. Create the first one this way. Load up Wordperfect 5.0, type a line of text so we have something for target practice, and kick-start the macro recorder (Control-

F10). The "Macro Def" lamp is lit in the lower left corner of the screen to let you know that this call is being recorded. (For those of you who used to bang away at the old Wordperfect 4.2 macro recorder, this new one doesn't blink at you. Who needed that pressure, anyway?) Hang the name "BoldLine" on it and describe it as "bolds entire line from anywhere on line." The keystrokes are:

{Home}{Home}{Left}{Block}  
{Home}{Home}{Right}{Bold}

Pull the plug on the macro recorder (Control-F10). That's one. Now we need a macro that underlines one line. Turn the macro recorder on again:

Macro Define (Control F10)

Name the macro "UnderlineLine". The keystrokes are:

{Home}{Home}{Left}{Block}  
{Home}{Home}{Right}{Underline}

Flip off the macro recorder again.

Macro Define (Control F10)

Now for a macro that converts a line to uppercase. Wait a second. We have one that does that, called UppercaseOneLine.

Now we can nest these macros from another macro. Flip on the macro recorder one more time and define a macro called:

\* TestNest

and describe it as:

\* Check out nesting macros.

Don't record any keystrokes; just flip off the recorder:

Macro Define (Control F10)

Then turn it back on again:

Macro Define (Control F10)

Again, choose the name TestNest. Since TestNest already exists, Wordperfect will ask if you want to replace or edit.

Choose:

\* Edit

Now you are in the brand new macro editor. As an aside, don't you wish we had this editor years ago? I know I do. The macro editor is a great environment for this kind of work, as you will see. It doesn't print yet, but I'm sure Wordperfect is busily working on adding that feature as you read this.

Press Shift-C2 for the new scrolling pop-

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## Reason #2

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up command list. It is very slick. Use the arrow keys to highlight {NEST}file~ and hit NEWLINE. Repeat this four more times. You can also just press the letter "N" and the highlight bar will jump down to {NEST}. Your macro should look like this:

```
{NEST}
{NEST}
{NEST}
{NEST}
{NEST}
```

Now to call the macros we wrote, just set the name of each macro to the right of the word {NEST}, with a tilde ("~") at the end of each line.

```
{NEST} InsertDay~
{NEST} BoldLine~
{NEST} Underline_Line~
{NEST} UpperCaseLine~
{NEST} CenterLine~
```

Press Exit (F7) to save the macro.

To execute the macro:

```
* Macro (Control Shift F10)
* TestNest (NEWLINE)
```

Wordperfect will insert the current day of the week in your document, bold it, underline it, change it to uppercase, and center it, all in one blow.

### Reusability

Beyond readability, there is the benefit of reusability. Never reinvent the wheel, as the saying goes. If you have solved a similar problem before, the {NEST} command allows you simply to insert the same solution into later macros. Now that we have written our "UpperCaseLine" macro, we can use it in any of our future macros by simply {NEST}ing it. One macro writer can even write a library of useful macros for others less experienced in the craft. The details of how the {NEST}ed macro works are not as important as the fact that it works.

### Divide and conquer

Wordperfect's new macro language extensions are just the incentive we need to tackle bigger projects than we have in the past. Large projects can quickly grow unwieldy, but {NEST} gives us an answer

to that, too. We divide and conquer. We split up a sizable problem into several smaller subproblems that are easier to handle. If any of these subproblems is still too large, we split it up in turn into still smaller subproblems. Afterwards, we write macros to solve each of the subproblems. The macro we end up with should be relatively small, with many {NESTS} to the macros that solve the subproblems. The main macro might look like this:

```
* {NEST}GetClientInfo~
* {NEST}AssembleContract~
* {NEST}PrintDocuments~
* {NEST}UpdateFiles~
```

Each of these nested macros could contain scores or hundreds of lines.

### Conclusion

Now, with {NEST}, you can have powerful Wordperfect 5.0 macros that you will still understand months or years later. With the rest of the macro language, you can take your office automation system into the 1990s. If your organization lives by the printed word, you cannot afford to be without it. Δ

### Answers

1) cflag = (((c) & 0x80) == 0);

I think it checks to see if a character is on the ASCII list or not. Better ask a C programmer, though.

2) /wgdp60~(esc 5)

Changes the default page length on the printer to 60 lines. Who knew?

3) {Date/Outline}36{Enter}1

Inserts the current day of the week into the document. Create a macro called "InsertDay" and rewrite the line this way:

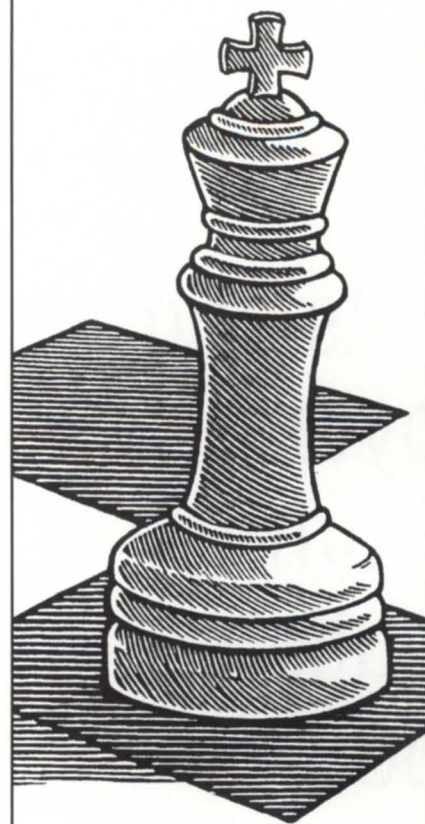
```
{NEST}InsertDay~
```

Δ

---

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

---



# Your move

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# Bits and bytes from the bulletin board

## The mysterious CEO\_PLF

From: Arlene Blouch

Upon looking over my CEO disk (I have to clean it up now and then), I found a huge text file named CEO\_PLF. This file has control characters in it and can't be typed, but a DISPLAY of the file looks like leftover information from printing documents. I find no reference to its existence in any CEO manual. My old 2.10 internals notes say nothing. In fact, the only place I see it is on a directory structure figure called "Printing System Files" in the SM221 System Manager training manual, but it makes no reference as to what it is or what it is used for. Is this a deletable file? Will it be recreated the next time QMA starts?

From: Bob Heindel Jr.

The CEO\_PLF file in :CEO\_FILES is the file that contains the definition of print layouts defined in the print layouts option on the utilities menu. You might review the print layouts you have currently defined, but if you delete the file, the next time you attempt to access CEO, it will complain saying that the file has not been converted (from a

2.2x format, I am assuming). I would suggest deleting any that are not being used from the print layouts menu.

From: Arlene Blouch

It was taking up 245 MB. All my other CEO systems were about 15,000 bytes. What I did was look in the :UTIL:CEO\_DIR and found an "empty" file. I renamed my huge file, then moved the empty one in, set the ACL, and restarted CEO. It is now working fine. I let it go on the new file for about one week, and there have been no problems reported by my users. The interesting thing about the PLF file that became large is that it is the only system that started out on rev 3.12. All my other CEO systems were installed since 1.21.

## Oracle PC integration

From: Richard Timmons

To all DG/PC programmers who have dealt with Oracle data bases: Help! I am faced with a perplexing problem and am seeking advice.

I was recently placed on the support team for a PC integrated data base system using Oracle. This is our first PC application. It was handed to us from a contracting firm, so the initial installation and documentation had already been established. Problem: when running Oracle during a weekly run, the error message "out of space" appeared. Further investigation led us to believe that the system partition needed additional space.

The Oracle defaults were used initially (version 5), placing the Oracle data base files in the system partition in the /dbs subdirectory. We, being new to Oracle processing, thought (erroneously) that our second course of action should be to increase the system partition. We did so by creating a DOS file with the CCF utility. Problem is that we were in a different directory when doing so, and supplied only the file name, not a full path name (for illustration purposes let's say the XYZ directory, filename NEWFILE), i.e., CCF NEWFILE 3000 CONTIG. . . then . . . ALTER PARTITION SYSTEM ADD FILE NEWFILE. . .

The problem is that every time we have to call the Oracle data base, we must be in the XYZ directory or else we get a "DATABASE DOES NOT EXIST

OR CANNOT BE FOUND" error message. Question: Why did we not have to always be in the /dbs directory before the system alteration, and why do we have to be in the same directory of the newly created file for Oracle to find the data base now?

Question: Would altering the path statements in the config.ora or the autoexec.bat file help? Or perhaps would altering the partition again, but being in the /dbs directory and supplying the full pathname of the newly created file place us back on the right track? The only other alternative we see is to export the whole thing and start all over again to rebuild the thing. We even tried that, but the export function doesn't seem to work at our remote location, as when we execute the export function from DOS, all we receive back is the DOS prompt.

From: Lon Culbertson

Just move the newly created file into the subdirectory that contains the rest of the data base files. Alternately, you can log on to Oracle as SYS and manually change the FILES table. However, if you decide to do this, the names/paths *must* be correct, or your data base will refuse to come up, and you will have to restore from a backup.

## ICobol keys

From: Jim Bageant

Why can't you use a binary number (COMP-4) as a key for an indexed file in ICobol? The manual says keys *must* be alphanumeric and sure enough, it doesn't work right with the binary key on an indexed file. If I start the file and do a read, it reads the first record. All read nexts that follow all return that same first record. Where does it screw up? I would guess that the search through the key tree is just straight compares.

From: Bob Butler

I haven't looked into this, but my guess would be that it is not actually using the key field but an internal representation of the value with the leading bytes being nulls. If I remember correctly, I got around a similar problem by using a re-defines on the COMP field with a PIC X field of the appropriate length. I used the alpha field as the key,

but the numeric field within the code logic.

From: Tim Boyer

Yes, the key must be alpha. As I recall, this was the first problem I ran into in ICobol. But this works:

01 THE-KEY.

05 REALLY-THE-KEY PIC 9(6)  
COMP.

THE-KEY is alphanumeric in this instance, and should work fine as a key. Just don't move SPACES to THE-KEY before your START statement—use LOW-VALUES instead.

## CEO Object Office

From: Arlene Blouch

Is there anyone out there running CEO Object Office using a PC as the LAN host and Novell Netware 386 and connected to an MV host under Synoptics twisted pair network (or equivalent)? Our DG salesrep says it can

be done, but I would feel more comfortable about it if I had a real person that has done it to talk to. Any insight would be appreciated.

From: Dell Setzer

Arlene, we here at RDS ported the Netware protocol stacks to AOS/VS for COO, so we know a bit about that end of things. You should have no problems with running via Synoptics twisted pair, as the interface that the MV sees is identical to ethernet. You'll probably use a regular old ethernet controller on the MV (ILC or LLC, depending on the MV you have), and things will work from there.

From: Arlene Blouch

Thanks for the information. I currently have an ILC on my MV hosts that I am using for XTS II. In the near future I will be adding TCP/IP on that network link as well. Can I use Netware on the same ILC, or must it be dedicated? Isn't it amazing how it all just

keeps getting more complex? Since I'm the one that has to make it work, I generally don't take everything sales people tell me as gospel.

From: Dell Setzer

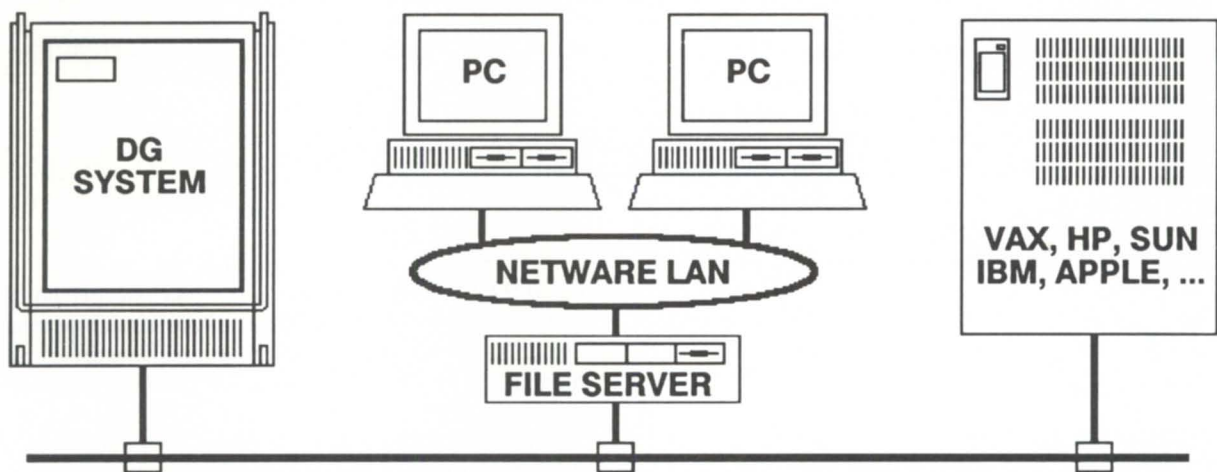
Arlene, currently the Netware transports on AOS/VS won't share the controller with XTS, etc. There is some thought of providing that in a future rev, but we really don't know if or when that will be. Since the Netware transports actually contain most of XTS already, it wouldn't be terribly difficult to have them share a controller—that's probably mostly a marketing decision, though. Your sales rep may well know more about that than us! 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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# Emulating AOS/VS sorts

## SYNOPSIS

*Are you confused about how to convert existing AOS/VS sort programs to DG/UX? Here's a mini-tutorial that makes it easier to do DG/UX sorts, and you won't have to worry about leading or trailing blanks.*

I had the need recently to convert a set of sorting programs from AOS/VS to DG/UX. The conversion taught me that it is possible to write DG/UX sorting programs that emulate AOS/VS SORT/MERGE sorts, but it is not a trivial matter to do so.

I discovered three major differences between AOS/VS sorts and DG/UX sorts:

1) A DG/UX sort requires that all sort records be terminated by a line feed (Octal ASCII 12). AOS/VS sorts can be fixed length if all the records are the same length, data sensitive if each record ends with a data-sensitive delimiter (default or user-defined), or variable length if each record contains a header consistent with the AOS/VS variable-length record format (including the record length).

2) A DG/UX restricted sort key is field dependent by default. However, an AOS/VS restricted sort uses the first character of the sort record as a reference point for the sort keys.

3) DG/UX does a complete sort, but AOS/VS sorts only to the level requested by the user key. As an example, if one has a 20-byte sort record but uses only a 10-byte restricted sort key, DG/UX will complete the sort of any lines still considered equal on the basis of the entire line, with all characters considered significant. An AOS/VS file under similar circumstances, however, will be sorted only through the first 10 characters.

The following is an example of an AOS/VS sort program that adds a line feed to a fixed-length AOS/VS file so that it can be sorted by DG/UX sort:

```
X/M      SORT/C=@INPUT/0
INPUT FILE IS "INFILE.SRT", RECS ARE 37 CHARS.
OUTPUT FILE IS "OUTFILE.SRT", RECS ARE 38 CHARS.
INSERT "<012>"AFTER LAST.
COPY.
END.
)
```

The following is a copy of OUTFILE.SRT:

```
CONTACT      3M13      01100005609
PUBLIC.JQ    DCLHP01    00100457680
EVAN.JJQ     DCLHP02    00100457680
EVAN.JJ      DCLHP02    00100457680
```

```
EVAN.JJ      DCLHP01    00100457680
EVAN.JJQ     DCLHP01    00100457680
LEON.VJ      HTCHP01    00100009600
CAD          3M13      00100004141
CAD          3M13      00100000367
```

One should notice that this file contains three fields. Fields are important in Unix sorts, but they are not important in AOS/VS. For example, if one wanted to sort this file using the third field as the first sort key, and then the second field as the second sort key in AOS/VS SORT/MERGE, one could use the following program:

```
X/M      SORT/C=@INPUT/0
INPUT FILE IS "OUTFILE.SRT", RECS ARE DATA SENSITIVE
UPTO 39 CHARS.
OUTPUT FILE IS "OUTFILE1.SRT", RECS ARE DATA SENSITIVE
UPTO 39 CHARS.
KEY 27/37.
KEY 17/26.
SORT.
END.
)
```

OUTFILE.SRT is the same as INFILE.SRT, except it has a line feed on the end of each line. But the addition of the line feed changes OUTFILE.SRT from fixed length to data sensitive, and the sort file must be modified because of this change. Please understand that in the AOS/VS world, INFILE.SRT needs no modification. OUTFILE.SRT was created to show the effect of handling an AOS/VS sort file in the same manner as DG/UX.

Notice that the sort keys for the AOS/VS sort are referenced to the first character of the sort record, and that they are not based on fields. The output of the above-mentioned AOS/VS restricted-key sort is OUTFILE1.SRT.

```
CAD          3M13      00100000367
CAD          3M13      00100004141
LEON.VJ      HTCHP01    00100009600
EVAN.JJQ     DCLHP01    00100457680
EVAN.JJ      DCLHP01    00100457680
PUBLIC.JQ    DCLHP01    00100457680
EVAN.JJ      DCLHP02    00100457680
```

EVAN.JJQ	DCLHP02	00100457680
CONTACT	3M13	01100005609

Observe that OUTFILE.SRT is sorted by the equivalent of the third data field, followed by the second data field. But the first data field has not been completely sorted. (Compare EVAN.JJ and EVAN.JJQ)

Now, if one wanted to use the standard DG/UX sort command to sort properly outfile.srt, one would use the following command:

```
sort -b -o outfile1.srt +2n -3 +1 -2 outfile.srt
```

One would get the following output file:

CAD	3M13	00100000367
CAD	3M13	00100004141
LEON.VJ	HTCHP01	00100009600
EVAN.JJ	DCLHP01	00100457680
EVAN.JJQ	DCLHP01	00100457680
PUBLIC.JQ	DCLHP01	00100457680
EVAN.JJ	DCLHP02	00100457680
EVAN.JJQ	DCLHP02	00100457680
CONTACT	3M13	01100005609

Notice that this outfile is fully sorted, even though only the second and third fields were specified as sort keys.

An explanation of some of the options used by DG/UX sort is appropriate at this time. DG/UX sort options fall into three categories: those that alter the general behavior of the sort, those that describe the ordering to be used, and those that define the sort keys to be used.

In the DG/UX sort listed above, the *o* option specifies that the output file is to be *outfile1.srt*. The *b* option indicates that leading blanks are to be ignored when determining the starting and ending positions for a restricted key sort. The "+" followed by "-" describes conditions for the two restricted sort keys. The *n* option attached to the first restricted sort key specifies that this key is to be ordered numerically—that is, by numeric order rather than by character value. The default order, for example, places 1342 before 3 because the first character of 1342 (1) comes before the character 3 in the collating sequence. For numeric sorting to work, the numeric string must come first in the line, or more generally in the sort field. A numeric string consists of optional initial blanks, which are ignored, an optional minus sign, and zero or more digits, which may include a decimal point. The *-n* option cannot correctly sort exponential numbers such as 1.52E10.

The use of the *b* option is critical. If the DG/UX sort program did not use the *b* option, it would appear as follows:

```
sort -o outfile1.srt +2n -3 +1 -2 outfile.srt
```

The output of this file is:

CAD	3M13	00100000367
CAD	3M13	00100004141
LEON.VJ	HTCHP01	00100009600
EVAN.JJ	DCLHP01	00100457680
EVAN.JJ	DCLHP02	00100457680

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EVAN.JJQ	DCLHP01	00100457680
EVAN.JJQ	DCLHP02	00100457680
PUBLIC.JQ	DCLHP01	00100457680
CONTACT	3M13	01100005609

With the *b* option missing, DG/UX performs a character value sort on the second field and evaluates leading blanks. The second field of the second line, as far as DG/UX is concerned is " 3M13". The second field of the third line is " HTCHP01". In an ASCII collating sequence blanks come before alphabetic and numeric characters.

An explanation of the standard method of specifying restricted sort keys is appropriate at this time. The restricted sort notation is *+pos1 [-pos2]*. This means that the comparison should start at *pos1* and end at *pos2*. If *pos2* is missing, then the sort key continues to the end of the line. *Pos1* and *pos2* are numbers of the form *m.n*, which can be followed by optional flags. The notation *+m.n* means that the sort is to start at character *n+1* in field *m+1*. Thus *+2.3* means that the sort starts at the fourth character of the third field. Another way to express this is to say *+2.3* means skip two fields and three characters. If the sort is to begin at the beginning of a field, the *.n* portion can be omitted. Similarly, the notation *-m.n* means to continue sorting through the *n*th character following the *m*th field. The field separator is included in the character count. Omitting the *.n* position is the same as using *-m.0*, which means end at the last character of field. Multiple sort

keys are allowed.

In the example sort, *+2n -3 +1 -2* means the first sort key starts on the beginning of the third field (skip two fields) and continues to the end of the third field. (The *n* option on this key means that it is to be a numeric sort.) If this sort cannot resolve all conflicts by means of the first key, then the secondary key begins at the start of the second field and continues the sort to the end of the second field. If DG/UX still has unresolved conflicts, then it will sort on the entire record with all characters considered significant. DG/UX will perform this final sort without being programmed to do so.

If you are confused at this point, do not worry. Understanding how DG/UX sorts by means of fields can come only through practice. In the meantime, there is a way to make a DG/UX sort look like an AOS/VS sort. Using this method, the DG/UX example sort looks as follows:

```
sort -o outfile1.srt +0.26n -0.37 +0.16 -0.26 outfile.srt
```

The output of this sort program is:

CAD	3M13	00100000367
CAD	3M13	00100004141
LEON.VJ	HTCHP01	00100009600
EVAN.JJ	DCLHP01	00100457680
EVAN.JJQ	DCLHP01	00100457680

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PUBLIC.JQ	DCLHP01	00100457680
EVAN.JJ	DCLHP02	00100457680
EVAN.JJQ	DCLHP02	00100457680
CONTACT	3M13	01100005609

This sort line means that the first sort key starts at the 27th character from the beginning of the file and continues to the 37th character. This sort key is a numeric sort. The second sort key begins at the 17th character from the beginning of the sort record and continues through the 26th character. The input file is *outfile.srt*. The output file is *outfile1.srt*.

### Key advantages

This method of doing DG/UX sorts has two major advantages compared to the method of performing sorts described in the DG/UX documentation:

- 1) One will not have to worry about the effects of leading or trailing blank spaces on the sort key.
- 2) It is much easier to convert existing AOS/VS sort programs to DG/UX if this format is used. The sort keys will transfer directly as long as one remembers that the beginning of a DG/UX sort key is one position less than that used in AOS/VS.

I hope this mini-tutorial has helped you to understand better

how to convert existing AOS/VS sort programs to DG/UX. DG/UX sort has several additional option switches that add a tremendous amount of flexibility to DG/UX sorting capability. If one wants to understand better how to sort in DG/UX, then one should read the manual pages thoroughly and write practice programs. The important thing to remember is that AOS/VS sort programs can be converted readily to DG/UX if one remembers the following:

- 1) Base sort keys upon position relative to the start of the sort record, instead of trying to base sort keys upon fields.
- 2) Remember that all DG/UX sorts expect all sort records, including the last record, to be terminated with a line feed. If the final newline character is missing, DG/UX sort will append onto the output, issue a message, and continue.
- 3) DG/UX will resolve all unresolved sort conflicts after using the restrictive sort keys by doing a final sort on the basis of the entire line, with all characters considered significant. AOS/VS will sort only until the keys are exhausted.  $\Delta$

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

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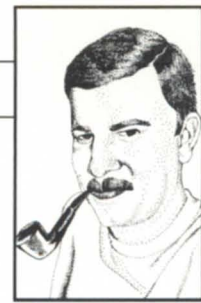
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# Painless Windows

## SYNOPSIS

*Why have the pain of two or three terminals on your desk when you can use Multiview Windows? The latest product from Digital Dynamics lets you run up to eight windows on a single MV screen, and has a host of other useful features.*

Did you ever wish you had two or three terminals sitting on your desk, just so you could accomplish different tasks on different tubes? Well, here I am, sitting in front of a single terminal, editing a program in one window while testing a program in another and running a compile in a third. No, I'm not running X Windows on an Aviiion—I'm running Multiview Windows on an MV/8000.

Multiview Windows (MVW) is the latest product from Digital Dynamics, Inc. (DDI), the people who brought you D:Drive. They made the observation that AOS/VS is a very robust multitasking operating system that most of us limit to running only one program at a time. Sure, there are hardware solutions to this—I've got two COM lines on my PC, and an IAC line hooked to each one. But there are times that this won't work. For instance, I'm using Microsoft Windows right now, which realistically requires a mouse. But the particular emulator I'm using only recognizes COM1 and 2, and a mouse can only be put onto those ports, so I'm stuck with one line. Unless, of course, there is a software solution.

MVW allows you to have up to eight separate windows on each terminal, so—as I'm writing this—I can hot key back to my emulator, check on that dump I'm

doing in one window, view the results of a compile in another, and edit a program in a third. This, I could get used to! Let's see . . . eight windows per COM port, two COM ports on this machine . . . maybe I don't miss RDOS all that much after all.

To begin MVW execution, a global manager must be brought up on PID 2. Although it is not strictly necessary, it's a good idea to then set up frequent users using the CONFIG utility. CONFIG asks for console number or user name, maximum number of windows for the user, terminal type, whether or not users can change their own profiles, directory to start in, and program to start when the window comes up. The terminal type has a Beehive ATL and D200 as predefined terminal types, and room for up to 13 other types. Defining your own terminal type is simple, requiring the answer to eight cursor positioning questions.

The startup program will, alas, only allow a .PR file to be chosen. Instead of giving my startup as :UDD:TIM:STARTUP.CLI, I have to specify :CLI32.PR and then invoke my startup macro as each window pops up. This isn't a big deal, but is a matter of end-user convenience. MVW preserves the user's searchlist and DEFACL, so system security shouldn't be compromised, but al-

lowing a macro as the initial startup program would greatly add to the program's flexibility.

Once you're set up, typing X :MVW:MVW will bring up the window manager. From there, you have a number of options. Hitting return will bring up window number 1, or typing a ^C^W sequence allows access to the MVW options.

## ZAP, and other options

The ^C^W (or ^C^C—the two are interchangeable) sequence is the master command to access all of the options available under MV Windows. There are a dozen or so of these including, as any good program should, the help screen. The commands range from the obvious—choosing which window you want to use—to automatically bringing up the next active window, and unique options like Host and Guest. ^C^W C captures all of the screen output to a file, while ^C^W Q does a screen QPRINT. The combination of these allows me to have the equivalent of a hardcopy terminal on my master console, just by running MV Windows.

Best of all, you can exclude your users from access to commands. When setting up a users' profile, the ZAP command will ask you which letters to exclude. Typing 'E' won't let that particular user do a ^C^W E to exit MVW. 'D' won't allow him to change initial directories, and so on through the entire command structure. In this way, you can control your end users.

The most interesting command is the ^C^W L (Link) command. Link will set up host and guest screens. As the Host of a session, you must enter a number given to you by a prospective Guest, which seems like a very nice security feature. After this number is entered, up to 26 screens can echo the output from a master screen. You can be a Host in one window and a Guest in another, or a Host and a Guest in the same window, or any number of other mind-boggling combinations. I can see

some great training possibilities with this option.

New to revision 1.15 is the ^C^W X sequence. This sequence won't let MVW terminate if there are active programs running in a window. This was on my "must have" list before getting the new revision—I forgot where I was and corrupted a file by canceling MVW. In fact, it's possible to disable the ^C^W E (terminate unconditionally) by using the ZAP command, something I recommend wholeheartedly.

One annoyance is the redisplay when you switch between windows. The manual states that the last 24 lines are automatically redisplayed on the screen. I counted once, and got 150 lines appearing after doing certain functions—not a fatal error, but rather distracting. Once, while in an ICobol program, I typed a little too far ahead, and entered several bad codes and got back the accompanying annoying beeps. Grating enough, but each time I popped back into this particular window, the entire sequence repeated itself!

I understand that DDI is working with Threshold to bring the Screen Demon windowing techniques to MV Windows. That would be a beneficial partnership, and would bring true screen image redisplay to MVW, rather than the somewhat simplistic "redisplay the last 24 lines" technique. In the meantime, users of version 1.11 and above can have their application programs handle the redisplay, or Screen Demon can take care of the refresh. Users of DDI's terminal emulator, MVTerm, don't have this particular problem—MVTerm handles screen redispays from the PC side of things.

Programs running under MVW run, on the whole, exactly the same as they would normally. The only difference I've noticed is that some programs I previously couldn't ^C^B out of—CRTEDIT or PED, for example—I now can under MVW. I'm not sure if this is a flaw or not. In my case, I think it's an advantage; I'm the only person around with CLI access. Everyone else in the place is CHAINED to the ICobol runtime, so they are simply logged off. It

may cause security problems at another installation. If so, the handy ZAP command (mentioned above) can also disable the ^C^A and ^C^B commands.

**Natural aptitude**

Of course, nothing is perfect, and I did run into a few problems. Contrary to popular belief, I really don't *try* to break these programs when I get them. I don't have to try, I've got a natural aptitude. For instance, while switching between windows I hit a "0" instead of a "1". It halted execution with a "User Trap Validity" error, and dumped me back into the CLI.

Although I had no problems running most programs, there were some that just did not work right. BJ's WHERE utility failed when I tried to redisplay the screen. DISCO bombs out when I go for the help screen. PED gives a traceback when returning from the menu screen. It looks like screen messages are a common denominator here, and certainly MVW must be doing something strange with the @CONSOLE file. None of these errors look to be

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insurmountable, and I'm sure the people at Digital Dynamics will be able to fix the problem, but I'd still recommend getting a demo tape and trying *your* application first.

MV Windows comes with its own terminal emulator, MVTerm. I will confess to not spending too much time with this, because it doesn't support my CLI32 editing keys, and I am spoiled enough that I no longer work with any operating system that doesn't. A new version of MVTerm is expected out soon, and I'm sure this deficiency will be rectified, and I'll take a look at it then.

In general, I liked MV Windows. There are still some rough edges that need to be taken care of, though. I tend to pay attention to the finishing touches in a program—usually, the program itself works, and it's the bells and whistles that tell you how much time has gone into development. There's a notice in the manual, for instance—capitalized, boldface, and surrounded by asterisks—that says that the MV Windows manager must be started

from PID 2. Wouldn't it have been easier and surer to put a [!nequal,[!pid],2]] line in the macro? And terminal types—apparently, the default is for a Beehive ATL, and you must explicitly change the CONFIG to be a D200. Now, I'm not sure of the Beehive-to-D200 ratio out there in MV land, but I suspect it would be more prudent to switch these.

On the other hand, there were plenty of nice features that I wouldn't have thought of. The CONFIG utility, for instance, can password-protect itself. I'd have probably been lazy enough to rely on ACLs. This is

a pleasant addition, and much more secure. And the host and guest features are an unexpected bonus—I have the feeling that some hotshot programmer put those features in just because he *could*.

Multiview Windows ran 99 percent of the software that I use on a daily basis without a hitch, and I found the convenience of being able to run, say, a compile in one screen, an application in a second, and an edit in a third *greatly* outweighed the inconvenience of losing my DISCO help screen. This is definitely a program worth looking at. When the console problems get licked—and I'm sure they will be—I'll be an absolute enthusiast. Until then, buy Multiview Windows—but before you do, try the demo version on the software you use most often.  $\Delta$

## Vendor information

Multiview Windows is available from Digital Dynamics, Inc., 3055 Plymouth Road, Ann Arbor, MI, 48105, 213/995-2400. A five-user MV license (regardless of MV class) costs \$849. Additional licenses for groups of five cost \$299 per group.  $\Delta$

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

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# A complete listing of the NADGUG software library

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

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

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

**C compiler** • Shareware product from Benchmark Products. Subset of ANSI standard C. Shareware version has a few features disabled, but is otherwise functional. 935 blocks.

**CRTEEDIT** • 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** • Selected *Focus* magazine articles including a SYSLOG filtering program, a

macro to copy to two tape drives at once, a Cobol screen generator, and a collection of articles by John Grant. 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.

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

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

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

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

**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.

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

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

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

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

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

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

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

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

Thanks to Brian Johnson and :WFFCA, the library is now able to provide 1,200 ft. copies to AOS/VS rev 6 users. Thanks to Kevin Danzig for duplicating MV/2000 tapes. For information regarding non-standard library distribution, call 1-800/932-6663.

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.

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## ON-LINE HELP

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

**NADGUG address:**  
 c/o Danieli & O'Keefe Associates, Inc.  
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**FAX:** 508/443-4715

**FOCUS Magazine address:**  
 c/o Turnkey Publishing, Inc.  
 Livingston Building, Suite 250  
 3420 Executive Center Dr.  
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##### Membership, RIGs, SIGs

NADGUG staff ..... **800/932-6663**  
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## *The latest products for DG systems*

# New Aviion systems top benchmarks

Westboro—Extending its reach into the open systems market, Data General introduces four new Aviion systems that have been rated tops in TPC-B and AIM benchmarks: the new mid-range Aviion 4600 RISC server, the Aviion 530 RISC workstation, the Aviion 4100 entry-level RISC server, and the new high-performance Aviion 5225/6225 RISC server. These systems feature single-dual processor configurations supported by DG/UX 5.4, which provides symmetric multiprocessing.

The mid-range Aviion 4600 is priced starting at \$19,995 configured with 32 MB of memory, 525 MB QIC tape, and 332 MB 5.25-inch SCSI disk. It uses the 33 MHz Motorola 88100 processor and delivers 39-78 MIPS with 225-350 AIM III user loads (AIM is a trademark of AIM Technology of Santa Clara, California). Targeted at commercial markets such as retail distribution, manufacturing, and healthcare, as well as federal, state, and local government, the Aviion 4600 server supports commercial data base applications running industry standard relational DBMS environments like Informix and Oracle. The Aviion 4600, running

Informix-Online 4.0, delivers TPC-B throughput of up to 58 tps-B at a cost of \$2,450 per transaction per second.

The Aviion 530 workstation provides CPU performance of up to 78 MIPS as well as an improved I/O subsystem and graphics. The base system is priced at \$13,500 and includes 16 MB ECC memory and 32 KB internal cache. The Aviion 530 also has the ability to add various graphics options such as 8- or 24-bit graphics and a 24-bit Z-buffer.

Originally priced at \$21,390, the entry-level Aviion 4100 server is now \$9,995. It includes 16 MB of memory, 332 MB of disk, and a 150 MB QIC tape.

The Aviion 5225/6225 servers, priced at \$43,500 with 64 MB of memory, 1 GB SCSI disk, and a 525 MB QIC tape, provide an AIM III maximum user load of 414 users.

Data General has also announced a licensing agreement with Unix System Laboratories (USL) to offer the Tuxedo System Transaction Manager, Release 4.2, and its workstation extension on the Aviion product line. The Tuxedo System Transaction Manager, known as System/T, is a software product that provides a framework for building on-line transaction processing (OLTP) applications on Unix System V operating systems.

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

Circle 56 on reader service card.

## Connecting and sharing with Aviion

Westboro—Data General's new standards-based communications products promise the capability to share business applications across a wide range of desktops and networks. Customers using

Aviion servers will have more choices in connecting to applications on Digital, Apple, and IBM computer systems.

DG's announcement comprises two key communication areas: products that connect PC LANs (local area networks) to Aviion servers, and products that connect Aviion servers to other systems such as Digital's VAX or IBM mainframes.

Industry-standard PC LANs to Aviion servers:

- Based on AT&T LAN Manager/X and Microsoft LAN Manager technology, LAN Manager for Aviion Systems (LM/AV) connects DOS and OS/2 desktops to Data General Aviion and Eclipse MV family servers.
- OpenMAC for Aviion Systems provides application integration of Aviion servers with the Apple Macintosh environment. OpenMAC allows Aviion connections to Macintosh desktops over ethernet, Appletalk, or token ring, expanding the range of LAN alternatives.
- A new revision of Netware for Aviion systems gives users a choice between ethernet or token ring.  
Aviion servers to other systems:
- DNI (DECnet Interface) for Aviion systems allows DG Aviion servers to communicate with DEC's VAX servers over DECnet. Aviion customers can mail messages, transfer files, and access VAX-based applications.
- SNA Token Ring for Aviion systems connects Aviion servers over Token Ring LANs to IBM products such as an IBM AS/400 or an IBM 9370. Aviion users can transfer files, access IBM-based applications, and write cooperative programs. DG also introduces its 802.5 token ring controller board, the VEM Token Ring Controller (VTRC).
- X.400 for Aviion systems enables Aviion users to transfer mail to X.400 users on other computing systems.

- TCP/IP for Aviion and for Eclipse MV family servers, a new revision, supports token ring.
- Data General's network management architecture, based on the industry standard simple network management protocol (SNMP), allows an Aviion or MV server to be managed by an SNMP-based network management application. Eynode from Digital Analysis Corporation, which runs on Aviion systems, is such an application. Customers can now purchase Eynode from DG, while DG's new SNMP software is bundled with TCP/IP.

Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4083.

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Uniplex, offers a multiuser, multitasking solution for integrated office automation applications, and allows access to applications and services from a variety of popular desktops.

Aviion Office Information Systems includes four base products: AV Office, AV Office DOS, AV Office Windows, and AV Object Office. Three optional modules are also available: AV Office DocConvert, AV Office Dataline, and AV Office Dictionaries.

Designed for use with character-based terminals, AV Office includes document processing, an RDBMS, group communications, time manager, personal productivity tools, and presentation graphics.

AV Office DOS operates in either a standalone or an integrated MS-DOS PC environment, enabling the use of popular DOS applications such as Lotus 1-2-3 and Wordperfect within the Unix environment.

AV Office Windows is office automation software for X-terminals and Unix workstations. Compatible with OSF/Mo-

tif and the X-Window System, AV Office Windows allows all functions to be accessed through a graphical user interface (GUI). Users may access several applications simultaneously and switch easily between windows on the screen using icons and a mouse device.

AV Object Office, formerly known as Open Systems Office/pc.DAA, was announced in February. Based on Microsoft's Windows 3.0 and Hewlett-Packard Newwave 3.0, it unites Aviion Unix systems-based servers and PCs across Netware LANs.

AV Office DocConvert provides document conversion for Uniplex and Wordperfect. Additional document conversion facilities give end users document conversion capabilities to and from a wide range of systems including: Multimate, Word Marc and Microsoft Word for PCs, Macintosh computers, and Windows.

AV Office Datalink, fully SQL compatible, allows users to access and use the information stored in popular data bases such as Oracle, Informix, and Ingres. AV

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Office Dictionaries provides users with 11 foreign-language dictionaries.

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*Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4293.*

Circle 58 on reader service card.

## Guardian for DG/UX

San Diego, CA—Datalynx, Inc., announces a version of its Guardian security software system for Data General's Aviiion systems. The Unix Guardian provides system managers with a complete profile and access control system for enhancing the security of DG/UX machines.

Included among its features are control over the frequency of password changes, password generation and validation, time windows to control when a user is allowed access, listing consoles that are not valid for login, and automatic profile expiration.

System managers are also allowed to control the number and types of logins that can occur on the system by use of login groups. The software, which includes a full screen editor for building user profiles, also provides a range of user and access reports.

Unix Guardian is priced from \$800 to \$1,400 based upon the maximum number of concurrent users it will support. Demonstration tapes are available at no charge.

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

Circle 62 on reader service card.

## New avenues for MV

Westboro—AOS/VS II TCP/IP 1.10 and OpenMAC for MV/Systems broaden the MV family's client/server product set and strengthen the MV's ability to function as a server platform in multivendor environments.

OpenMAC for MV family systems enables Apple Macintosh computers to be integrated into the MV environment. The first Macintosh connectivity product sold and supported by Data General, OpenMAC for the MV allows Macintosh computers to act as MV terminals, en-

ables MVs to act as Macintosh print or file servers, and allows MVs to support the Apple Data Access Language (DAL), thus facilitating data transfer between the two systems.

AOS/VS II TCP/IP 1.10 provides enhancements to the MV family's current TCP/IP offering. These enhancements include support for a simple network management protocol (SNMP) agent, as well as support for Token Ring and X.25 connectivity. This improved TCP/IP offering makes it possible for MV systems to be managed by any network manager compliant with the SNMP standard, to operate over IEEE 802.5 token ring local area networks (LANs), and to extend IP routing over existing X.25 wide area networks (WANs).

*Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4288.*

Circle 59 on reader service card.

## Major upgrade for EMU/470

Columbia, MD—Rhitek, Inc. announces an upgrade to its EMU/470 color graphics terminal emulator. Version 3.2 includes such features as enhanced macro-definable keys, improved networking support, expanded command language, and increased speed and usability.

The EMU/470 now has more than 140 macro-definable keys plus automatic dialing, logon, and logoff functions. Each macro key can contain an unlimited amount of text, commands, and control codes providing complete control over the operations of the terminal emulator.

EMU/470 provides complete and exact emulation of all the top-of-the-line Data General Dasher terminals, including the D461 and D411, as well as the D470C. Terminal capabilities include compressed mode, colors, mouse support, and printer support.

Among the Dasher features handled are: protected characters, European keyboards and character sets, graphics printing, a 135-column compressed mode, and mouse support.

EMU/470, licensed for a single system, is not copy protected, allowing convenient backup or hard-disk installation. Free, unlimited product support is provided for registered users. Version 3.2 is

priced at \$249. Current license holders may update to the new version for a \$35 fee, which includes the new manual.

*Rhitek, Inc., P.O. Box 220, Columbia, MD 21045-0220; 301/730-2575.*

Circle 63 on reader service card.

## Get up and Walkabout

Westboro—Now is the time to bring all laptop users up to the latest 386SX-16 technology. The PC Business Unit is offering a deal to owners of all older laptop models (DG and third-party): trade it in for a Walkabout/SX and receive a trade-in credit in addition to a 45-percent discount on a wide range of options.

The Walkabout/SX is a 16-MHz computer based on the 386SX processor. Each system comes standard with a 1.44 MB diskette, 2 MB of expandable memory, and a choice of either a 40 MB or 120 MB hard drive. The modular power system with a slide-in battery pack and AC adaptor allows users to convert from a laptop computer to a desktop workstation utilizing such features as a color VGA monitor and SCSI interfaces.

Net promotional prices (regular price minus trade-in) for the Walkabout UDG140 are \$2,295 and \$2,575 for the UDG1120.

*Data General Corporation, 4400 Computer Drive, Westboro, MA 01580; 508/366-8911.*

Circle 60 on reader service card.

## Apple to Dasher with mxConnect

Mount Carmel, CT—A new product that allows Apple Macintosh computers access to Data General host systems is available from Cambridge Computer Corporation.

MxConnect, which emulates the Dasher D100/D200/D400 series asynchronous display terminals, can access the host system via asynchronous (RS-232 and RS-422), TCP/IP, X.25, or any communications toolbox protocol.

Features of mxConnect include: script processing; user-programmable and selectable command keys; color attribute mapping; print spooling to any printer; print redirection; support for Apple Events; an application program interface;

support for Data General graphics commands, including all color requirements; copy/paste information between host sessions and Macintosh documents; and Balloon Help, which provides on-line assistance to the most common functions.

MxConnect's scripting capabilities allow users to build a Macintosh front end for Data General host applications. All of mxConnect's functions—including setting communications parameters, operating a modem, selecting the terminal type, logging on to a host, performing a file transfer, playing back any prerecorded sound, or quitting the application—are accessible via the Cambridge Script Processor.

*Cambridge Computer Corporation, 80 Mt. Sanford Road, Mount Carmel, CT 06518; 203/288-6004.*

Circle 55 on reader service card.

## Buy a new notebook

Westboro—Data General added a new notebook personal computer to its prod-

uct line. The Walkabout/320 notebook is a small, lightweight, 80386SX-based computer for professionals requiring the performance of a desktop computer when on the road.

The Walkabout/320 notebook provides power and performance from the 20 MHz Intel 80386SX processor in an 8.5-inch by 11-inch by 1.8-inch package weighing less than six pounds (with battery pack). Features include 2 MB memory (expandable to 6 MB), a 40 MB or 60 MB hard disk, an internal 1.44 MB 3.5-inch floppy diskette drive, an RS-232 serial port, and a parallel interface. Interfaces are provided for a modem, external numeric keypad, PS/2 mouse connector, and an external monitor.

A removable, rechargeable Nicad battery provides a minimum of three hours of full operation, with power-saving features built in. A universal, autosensing AC adapter included as standard equipment and an optional backup battery pack are offered to meet additional power requirements.

Other options include a soft carrying case, external "accounting-style" numeric keypad, memory upgrade kits, and an internal 2400-bps modem with 4800-bps send-fax capability. An 80387SX math coprocessor is also available.

The Walkabout/320 includes a large, high-contrast VGA display with wide viewing angles, full-function keyboard, and a suite of pre-installed software, such as MS-DOS 4.01, Battery Watch, and Laplink, as well as power management software, a disk cache utility, the expanded memory manager, display utilities, a password utility, and system utilities.

The Walkabout/320 offers a full one-year warranty. Data General list prices start at \$3,695 for the 40 MB version and \$3,995 for the 60 MB version. Discounts for volume purchases are available to both VARs and end users.

*Data General Corporation, 3400 Computer Drive, Westboro, MA 01580; 508/898-4288.Δ*

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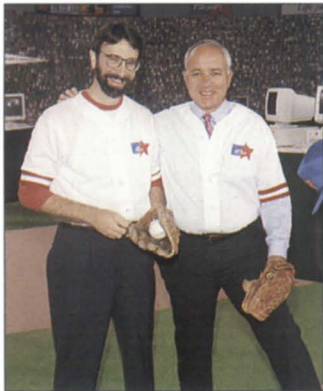
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## Data Specific

### Here comes the pitch



Director of Eclipse Marketing Dave Ellenberger and DG President Ron Skates don DG baseball uniforms.

Baseball was the theme of **Data General's** pitch for its new Eclipse MV products, the MV/5600 DC, the MV/9300, the MV/9600, and communications systems. In selected cities that are home to major league baseball franchises, Data General set up mock playing fields in a hotel lobby. Customers "stepped up to the plate," rounded the bases, and viewed an Eclipse demonstration at each base. After rounding all the bases, customers were given tickets to attend that evening's major league baseball game. The "Baseball Tour", held from July 11 to August 6, traveled to New York, Atlanta, Boston, Los Angeles, Chicago, and Washington, D.C.

### Two for two

Data General's DG/UX operating system received **POSIX and X/Open Portability Guide 3** certification in June. The approval opens up new markets for Data General as it can now sell to U.S. federal and commercial customers who require such certification. Data General joins only three other information systems vendors to receive the first set of POSIX certifica-

tions from the **National Institute of Standards and Technology (NIST)**. Any source code written to the POSIX standard now runs on the DG/UX 4.32 operating system. DG is seeking POSIX certification for its DG/UX 5.4 for the Aviion.

### It's a hit

Data General won a multi-million dollar award from the **Environmental Protection Agency** to provide more than 600 Aviionservers and workstations. The EPA gave procurement authority of \$100 million for the contract. The Aviion systems will be used as geographical information systems in a nationwide EPA network running Arc/Info from **Environmental Systems Research Institute** of Redlands, California. Under the eight-year contract, Data General will be responsible for training, software support, maintenance, and consulting services.

### Long throw

**Acucobol, Inc.**, developer of the Acucobol-85 Cobol compiler, opened a United Kingdom subsidiary to serve England, Scotland, Wales, and Ireland. The managing director of **Acucobol UK, Ltd.** is **Martin Cooper**. Offices are located at Victoria Buildings, Silver Street, Bury, BL9 0EU, U.K.

### Safe!

**Data General Chile S.A.** is the newest authorized sales and support representative for Guardian, the profile and access control system for AOS/VS and DG/UX systems from **Datalynx, Inc.** Data General Chile, located in Santiago, can be reached at +56-2-231-4629.

### News flash

The CEA Newsroom System is the official newsroom system of **Electronic Media's** RTNDA News television program. RTNDA News is a series of programs covering the 1991 RTNDA conference that are broadcast to convention ho-

tel rooms and distributed by satellite to TV and radio newsrooms across the country. **CEA (Computer Engineering Associates)** is a DG VAR (value-added reseller) headquartered in Baltimore.

### Alan Parisse to speak at NADGUG 91



Alan Parisse

Choosing a speaker to appeal to an audience as varied as that gathering at the Colorado Convention Center in November is quite a challenge. Data General and NADGUG conference planners agree that **Alan Parisse** is the one for the job.

Parisse, with more than 20 years of experience in sales and management, is a sought-after business speaker and author of "The Great Salesperson" and "Power Marketing: The 101 Best Strategies for Financial Professionals." He'll get the conference off to a quick start with a joint keynote address to NADGUG members, DG VARs (value-added resellers), and DG marketing and engineering specialists, on Monday, November 18.

Finding a speaker to interest everyone in this diverse group was a priority, said George Waggoner, Data General industry marketing consultant. The speech will be "relevant to all of his audience," said Waggoner. "The value of this combo meeting is lost if every aspect isn't given proper attention."

The title of Parisse's presentation is "Prospering through the Cycles." He will discuss the inevitability of cycles in business, careers, and life, and show how to deal with them—with a special emphasis on bouncing back after tough times. Parisse says that nothing worthwhile is easy or quick in coming: "Success is not a sprint, it's a marathon."

The NADGUG 91 conference will be held November 18-21 in Denver, Colorado. For more information, call 800/932-6663 or 508/443-3330 outside the U.S. Δ

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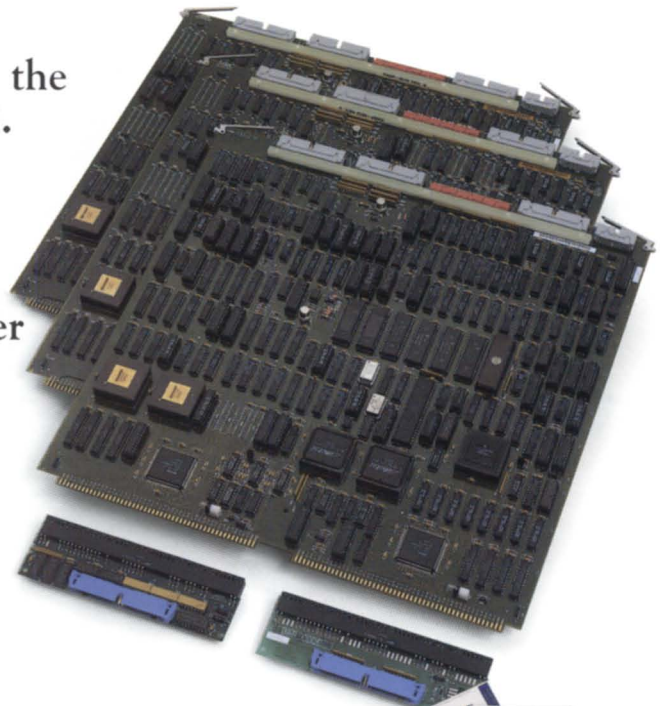
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