November 1992

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The Magazine of the North American Data General Users Group

In Focus

A multitude of choices
Old dog, new tricks

Plus

Wasted disk space
RAID systems
The heart of the GUI

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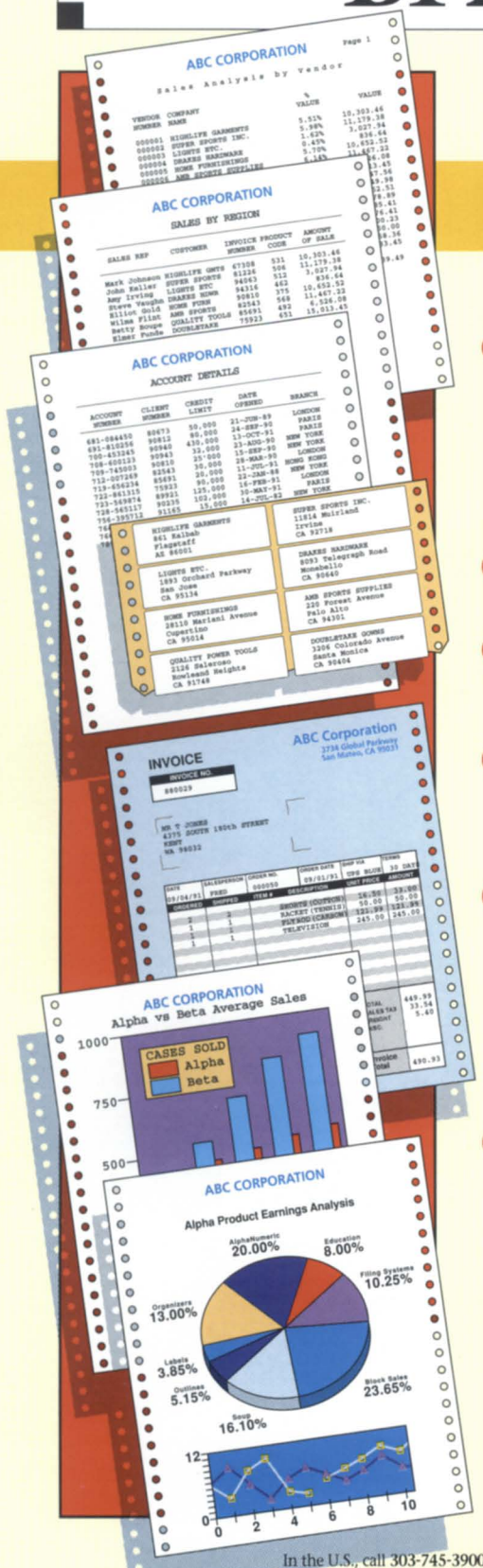

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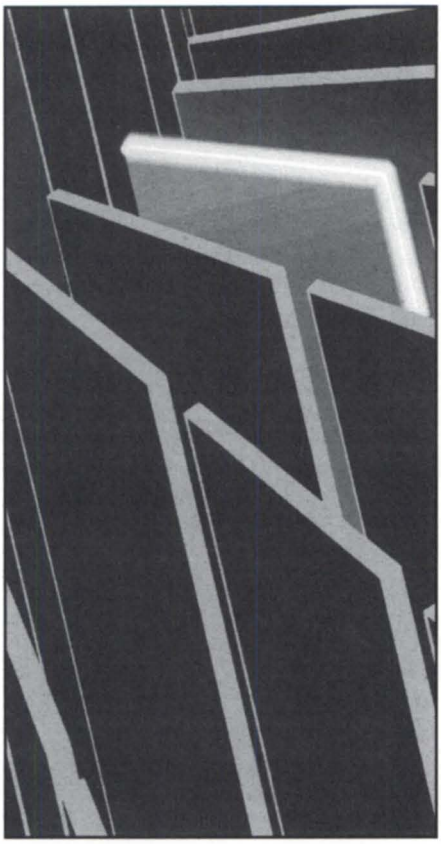

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Volume 8, Issue 11.

NORTH AMERICAN DATA GENERAL USERS GROUP

Dennis Doyle

Many positive things

Another busy year is coming to a close for me. Many positive things have happened for our group, and more will occur in the coming months. NADGUG's membership base is growing. Its budget and balance sheet are in the black. The software trouble report (STR) review process is well underway, the international aspects are increasing, and a few new people are stepping up to help run the organization. The goals I highlighted a year ago provided targets that were reachable through the efforts of many within NADGUG, as well as those at *Focus* and Data General.

I would like to thank Vice President Jan Grossman, Treasurer Steve Pounds, Secretary Tim Boyer, and Past President Frank Perry for all their work. The monthly phone meetings and resulting task assignments were significant this year. The quarterly board meetings also involved a substantial time commitment, and the ensuing workload added to it. Without this group of volunteers, it would have been impossible to move forward. Thanks again!

Working right next to the officers were our committee chairs: Calvin Durden (Audit), Chris Thorpe (Membership), Maggie Morris (Publications), and Bart Bates (RIG/SIG). There will be a change or two in this group in the coming year, and my hat is off to them for the help provided during the last 12 months.

Focus is running well in the capable hands of its editorial staff. The magazine has been a solid performer over the years, and its future looks bigger and brighter. Promised for the next year are a variety of interesting topics and presentations. We hope to see the advertising base grow as well. Thanks to Editor Doug Johnson and Publisher Greg Farman for helping get through a transition year!

The support I have received from our main Data General staff—Debra Bedrosian and Gerri Rebello—has been outstanding. They have helped NADGUG in many ways over many years, and I can't thank them enough for helping us grow.

And what is a DOK? It is Danieli & O'Keefe Associates of Sudbury, Massachusetts, a terrific association management firm that has been responsible for the annual conference for many years, and for the last year and a half for the day-to-day management of NADGUG itself. Their efforts have kept both major aspects of our group on a cash-positive growth path. Thanks to everyone within the firm for all they have done—in particular to account manager Michelle Dube. The many extra hours she has spent over the last year have been greatly appreciated by the board.

Many others have worked to keep NADGUG rolling this year, and for the previous 18 years. The organization's longevity and vitality reflect the skills and dedication of its membership base. To our current members, thanks for your time and support.

It is time for me to move on to Past President and the planning committee. I hope you all will join me in welcoming our new President, Jan Grossman, and Vice President Tim Boyer. It will be fun to watch them lead us through another growth year, culminating with NADGUG 93 in Atlanta, Georgia.

The next conference should be of Olympic proportions, highlighting our 20 years of members helping members. See you all there!

Dennis Doyle is NADGUG president.

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The Magazine of the North American Data General Users Group

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Help!

I am using TEX to access a host called XPEDITE. I need to "log" the messages sent by the host responding to my uploads. As it happens, when I run the routine from a terminal, everything works great. TEX captures the "log" file to disk exactly as I would expect. However, when I run the same routine using AOS/VS QBATCH, the TEX's log starts properly (at least one line of text from the host is captured), but the log seems to end where I begin my upload and nothing after that point is captured. Can anyone explain this?

A second problem—how can I hook up to GEIS (General Electric Information Service), which needs me to look like a VT100, with my MV and D210 terminals?

One last thing . . . as a non-dp-professional charged with MV system management, where can I go to get ad hoc advice on MV system problems?

Jim Rosenfield
SOMAC Supply Company
City of Commerce, California

Editor's note: *We relayed Mr. Rosenfield's letter to one of our Focus experts, Contributing Editor Tim Boyer at Denman Tire Corporation in Leavittsburg, Ohio, who provided the following reply:*

A three-part question. First, the TEX problem. I use the same utility to capture data from our bank every afternoon. Needless to say, rather than try to remember to run this daily, I use a batch file to automate the process. I've never had any difficulties with TEX logging the file. If I could take a look at the macro you use to run the batch file and your TEX command file, I might be able to be more helpful. One sweeping generalization: 90 percent of all the problems I've ever had with AOS/VS are because of ACL settings and searchlists.

Second question—the NADGUG tape, as well as Brian Johnson's bulletin board, has a copy of VT100KER, a VT100 emulator written by the same person that brought you TEX. It includes logging capabilities, but no file transfer capabilities.

Last question—I'd suggest logging onto one of the bulletin boards. The NADGUG bulletin board, at Rational Data Systems, can be reached at 415/499-7628, or Data General's DASH at 800/DASH-CSC. Both of these boards are frequented by users and Data General people, and we can usually get an answer to all but the most esoteric questions within a few days. For more in-depth training, *Focus* articles and the annual conference provide an excellent starting point for the non-DP user. Δ

Turkeys, turkeys, turkeys

by Doug Johnson
Focus editor

It should be noted here that we wanted to put turkeys on the cover of this issue—a wild riot of turkeys; feathered hordes of them; a legion of turkeys extending to the horizon. It being November with Thanksgiving approaching and all that, well, it *seemed* like a good idea.

There would need to be some kind of tie-in to computers (last March we had a St. Patrick's Day leprechaun sitting next to his end-of-the-rainbow pot of gold, and he was meeting his deadline using a notebook computer), so maybe one of the turkeys could be tapping on a Dasher. Or maybe there's a Pilgrim couple with an Aviion workstation running turkey inventory reports using a sophisticated relational data base system.

All kinds of crazy ideas pop up during staff meetings that produce the *Focus* covers you see each month. During just the past year there's been everything from 3-D trains popping out of computer screens to computer-generated map representations; programmers arguing over favorite languages; a rabbit scampering across a keyboard; a DG football team looking tough at the line of scrimmage; and Earth viewed from space on October's NADGUG conference issue.

Artwork comes from a variety of sources—commissioned artists, photos provided by Data General and others, and even mere clip art. Our budget isn't huge, so the art department people listed in the staffbox for 1992 (Casey Hunter, Pat McMurray, and Ann Soto) deserve much credit for imagination combined with efficiency.

The turkeys didn't make the November cover. Maybe next year. Instead, we started with a piece of clip art, tweaked and tuned it, adding dashes of color here and there, and now you see an eyecatching design that does suggest something about data bases.

NADGUG 92

Because the editorial cycle for an issue of *Focus* typically begins about two months before you the reader get your copy, I'm writing this November issue editor's note in late September. So I haven't been to the NADGUG 92 conference yet, and this will be (was) my first one. I'm sure I will have (had) a great time. See you (It was great seeing you) there. Δ

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

Who's on first?

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

Promises or products?

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

Future technology today

Wild Hare delivers advanced features such as windows, menus, hot keys and more. In leading-edge, object-oriented technology that makes them easy to use. Even with your current unmodified programs. Nobody else makes this much power so accessible.

Confusion or commitment?

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

Time is money. Yours.

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A multitude of choices

SYNOPSIS

Introduced just three years ago as Data General expanded into open systems, the Aviion has developed into a powerful platform for third-party data base products.

by Doug Johnson
Focus staff

If hardware ever manages to catch up with the demands placed on it by software, then data base systems will *really* take off and soar into the wild blue yonder. Or has it happened already?

Since its introduction in 1989 as Data General expanded into open systems, the Aviion has developed into a powerful platform on which to run data bases. And data base systems from third-party vendors have developed along with the Aviion in a relationship you might even call synergistic. Each helps to promote the other, and the total effect could be greater than the sum of the parts.

There was some planning behind this. "When the whole concept of going into open systems was developed, one of the key elements that was viewed as an absolute necessity was to make this [Aviion] an outstanding platform for third-party data base products," says Jerry Paul, who heads up Data General's data base group.

Development built on the past. "Looking back to the proprietary minicomputers of the 1970s and 80s," says Paul, "what you had to have on those systems was, that was a really good Cobol, like ICobol, BBASIC, or one of the third-generation languages, because that was what everything got written in."

A look at the open Unix systems of the 90s, by contrast, shows developers working with fourth-generation languages (4GLs) and industry standard data bases, such as Oracle, Sybase, Informix, Ingres, Progress, Unify, or another of what has become many others. More than two dozen run on the Aviion now.

Making sense

Using third-party data base products on the Aviion makes sense, says Paul, "because while DG has a very robust file system, Unix historically does not have a robust file system. So people look to the data base vendors for that, on an industry-wide basis."

The Aviion's first years focused on things like symmetric multiprocessing, along with an industrial-strength operating system and a solid file system. And then there have been more recent technological announcements, like the HADA [high availability disk array], now called Clariion, and RAID technology (redundant arrays of inexpensive disks). An added dimension to the recently announced Clariion subsystem is a tape array. "Some of the data base vendors are looking for faster ways to back up these data bases," says Paul. "You start getting 24 GB or 30 GB into a chassis, and unless you have some way to back it up, there's a problem."

At Data General, says Paul, "we believe that the data base is the most important element, after the base hardware and operating system software. And what we've

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Data General and Oracle

Data General enjoyed the spotlight in the September/October issue of the *Integrator*, Oracle Corporation's company publication. Several articles looked at joint marketing between the two companies, DG's new disk array subsystems, and performance benchmarks with Aviion and Oracle 7.

Co-marketing between DG and Oracle, announced in early September, focuses on VAR channels. Oracle VARs and sytems integrators will be encouraged to use Data General hardware, and Oracle will seek to assist DG VARs in moving to open systems and Unix. Incentives will include free software porting services, product and operating system training, increased discounts, trade-in deals, and special lease programs.

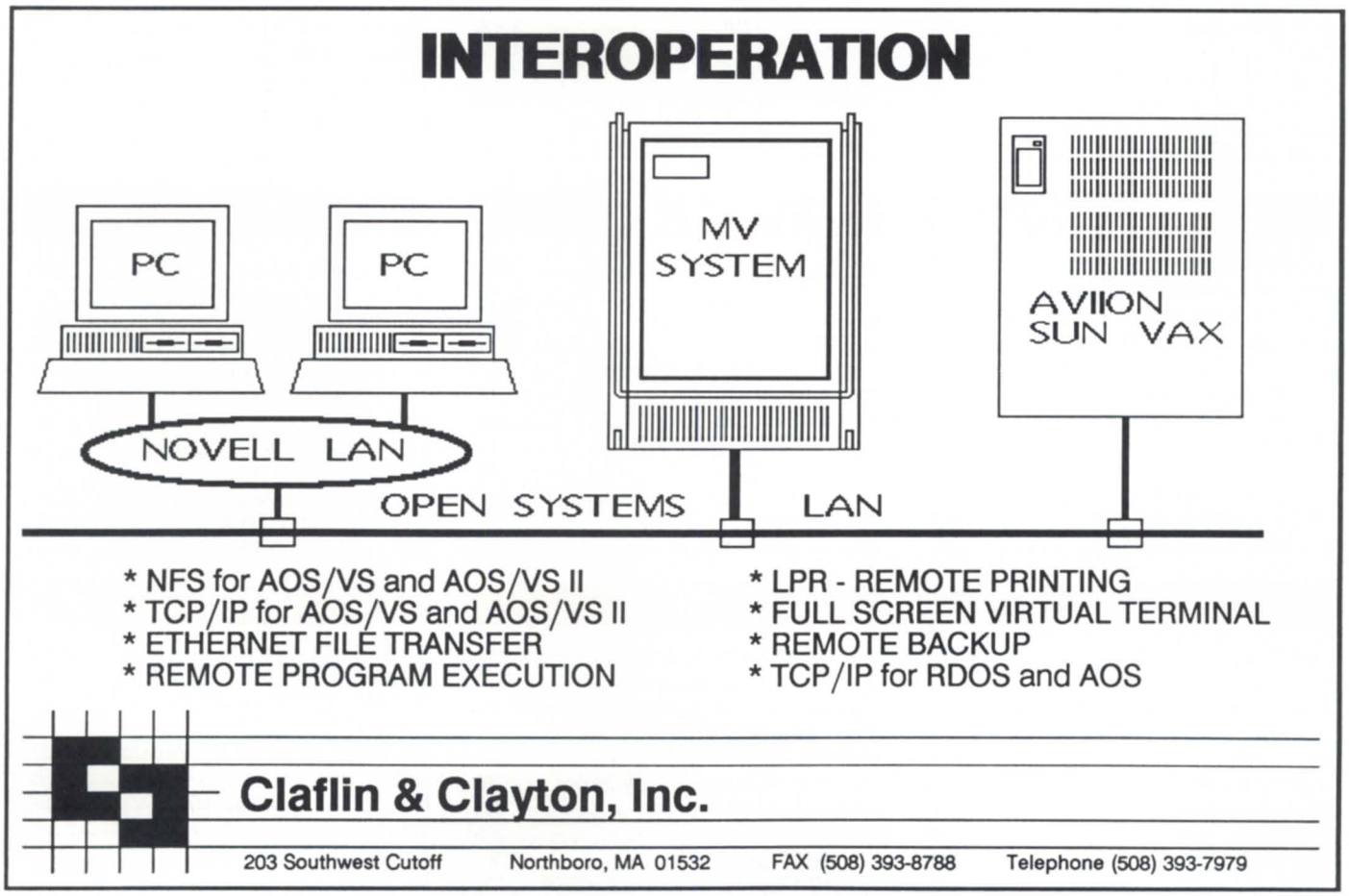
DG's Ronnie Todisco (Storage Systems Marketing) explained aspects of RAID technology (redundant arrays of inexpensive disks), highlighted new DG high availability disk array (HADA) subsystems, and detailed several companies using an Oracle-Aviion-HADA combination.

David Irwin, 88open/Data General development manager with Oracle, discussed the migration of proprietary data bases and applications to Oracle RDBMS and open systems, specifically covering data bases and applications implemented over DG's Infos II to Oracle on DG/UX and Aviion.

"Oracle 7 performance on DG Aviion," by Neal Maeyama and Robert McCormick, recounted the achievement last June of 100.85 transactions per second (tpsB) at a cost of $1,588 per tpsB with an Aviion 4625 running Oracle 7. The numbers indicate the best price and performance combination yet recorded with the Transaction Processing Performance Council (TPC).

Steve Baxter, DG's vice president of corporate marketing, spoke in an *Integrator* interview about the long-running relationship between DG and Oracle and emphasized the importance of VAR programs (which account for more than half of Data General's business).

Regarding the performance benchmarks, Baxter noted that "the next closest competitor was 63 percent more expensive on a price-performance basis. We think that's a fine testimony to not just the Aviion, but to the relationship of Data General and Oracle." Δ



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done in the last year is get all of the popular data bases running on the Avion."

"Because DG built its own data bases, like DG/SQL and Infos, we have a relationship with the data base vendors that is more than simply giving them money and having them do a port," says Paul.

The relationship with Oracle Corporation (see related article, page 8)) represents just one example in which DG is working closely with third-party data base product vendors.

"In addition, we're doing things with the other data base vendors," says Mark Prahl, DG's manager of data base marketing. "For example, we had Informix in doing joint plans with us recently to promote our products in existing and new markets in the coming fiscal year. And we have people from both organizations working together here and at Informix corporate, at Ingres corporate, Sybase, etc., in putting together joint business plans to not only ensure that all the products that we develop together get delivered to the base, but also that we continue to promote ourselves into new areas."

No change for change's sake

Those who have stayed with their MV systems won't have to change just to get something new, says Paul. "If users want to take advantage of advanced features, like Clariion and things like that, we're making it available on the MV."

There are two types of users, typically, says Paul. "Those running their existing applications, they're very happy with them, they're Infos, they're DG/SQL. They may have been written in Cobol with a file system. And those users would say, 'Why would I want to change?' That's an individual user decision. But we certainly wouldn't encourage them to move systems, because they're happy, they're meeting their business needs, as opposed to just changing something for the sake of change."

Then there are users who see a new application they want, but perhaps it's available only on Unix. "Well then, Avion's a wonderful choice for them," says Paul. "We've got a path for either user." Δ

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Old dog, new tricks

SYNOPSIS

The author outlines a data base system that will make the jump from an older MV platform to Informix on a RISC-based system. Part 1 of 2.

by John M. Huddleston
Special to Focus

Who says you can't teach an old dog new tricks? Last year we installed an Ethernet card onto a Data General MV/8000 II. The purpose was to expedite the transfer of source code and 4 GB of data from the DG to a RISC-based system (yet to be procured). This will assist us in transferring of all our present applications and data into one relational data base system.

We are currently designing the schema for the relational data base system. The details of this schema will be presented in a subsequent article. In this article, a custom-built data base will be presented that incorporates a sparse indexed data file system with multiply hashed station information records in a retrieval process.

The system was designed for a "one-time" data load. While retrieval is quick and efficient, the data update process is at best cumbersome. Site information update requires hours of CPU time and is not automated. There is a variety of output formats and applications available, but users cannot design their own applications, combine their own selected data, or reformat their own data for output. For these reasons, and because relational data base systems have become user friendly and functional, the entire system is being redesigned.

The Data General MV/8000 II was installed in 1984 with AOS/VS, 2 MB of memory, a Zebra 277 MB removable hard disk, one Argus 354 MB hard disk, one IAC-16, and one IAC-8 asynchronous communications board, two ISC synchronous communication boards, a floating-point processor, 16 Tektronix 4105 terminals, and one Dasher 211 terminal. In 1985, the DG was modified to increase disk space, memory, and asynchronous access. The 277 MB removable drive was replaced by three 592 MB hard disk drives and 6 MB of memory were added to the original 2 MB of main memory. Additional asynchronous boards, one IAC-16, and three IAC-8 boards were added to the system to boost the number of user ports to 64 (32 dial-up, 32 hardwired). Data General's MV/UX was added to run concurrently with AOS/VS.

Data base alternatives

In 1984, a project was begun to evaluate the various alternative commercial data bases and the corresponding report generation facilities. With the knowledge that the dataset would not change frequently and with the need of higher mathematical functions to produce statistical and probability analyses, a custom-designed data base was proposed. The proposed custom data base would unify and restructure all existing flat files into one related data base. The principle features of the data base include a data loading function, data access for the report and analysis routines, a data update process, and a site location update process.

A contract was initiated, and in 1985 work started on the design. MV/UX was and is an essential element in the development on the DG. The load and update commands would be executable from either the CLI or the MV/UX environment as one-line commands with arguments. The data access system, on the other hand, would include a complete parser query language for finding stations that had been loaded, and then executing specific preprogrammed functions to output data and analyses for selected stations.

The general format for the path to the data file is :ODB:ST:dataYY where 'ST' refers to the two-character state abbreviation; 'data' refers to the four-character datatype code; and 'YY' refers to the two-character state FIPS (Federal Information Processing Standard) code. Not all data would fit onto one 592 disk, so some filenames were links to other disks on the DG. These disks retain the same path structure.

Data base design

The data base system currently contains hydrometeorological data for monthly snow courses, stream gauges, reservoirs, precipitation, and a miscellaneous type as well as daily data from SNOTEL (SNOw TELemetry) sites, climatological stations, daily stream gauges, and daily reservoirs. All data are stored in a water year format, October 1 through September 30 of the following year. Each data file has a corresponding sparse index file that contains site byte location pointers to the data file. As originally established, there would be 14 directories (12 western states, Alaska, and Hawaii) with 18 files per directory. This design allowed for expansion of both the number of states (directories) and datatypes (2 files per datatype) without degrading performance.

All data loaded into the ODB existed in other federal data bases, both SCS and non-SCS. The design intent of the ODB was to put portions of the various data bases into a single data base for central accessing and then provide procedures to allow a user to select stations based on key attributes. These key attributes are defined as cross reference IDs and geographic location information for the stations to be loaded.

Each station found in the system is described by 12 key attributes. Once the

process of creating and editing attribute records has been completed, records are compressed into a C-structure format. A set of primary and secondary indices to the structure records are then created. The primary indices contain selected attribute information and a secondary index is created with a hashing sequence for quick station retrieval. Both of these indices, relating the retrieval keys to the stations, must be sorted. The operation takes several hours, but when complete allows for extremely fast retrieval.

Most users are primarily interested in data retrieval and report generation to address a specific problem. This is accomplished by invoking the query language that locates and retrieves stations matching key attributes, and outputs data corresponding to the selected station in predefined formats. Depending on retrieval key, a location process is started that uses various sets of location indices. Once the station list has been generated, the user then enters a command corresponding to a predefined application.

System redesign

In 1989, our program scope was broadened to encompass the entire United States. Now, instead of 14 state directories, we support 50 states and some Canadian provinces. Due to difficulties in a transition to this new system, the system was redesigned to bind to the data at execution time, and all applications were redesigned to go through a library of calls to reach the data and attribute files. Binding to the data at execution means that the program is not "hard-coded" into one set path to the data files. An argument is passed to the program to establish file paths and environment paramaters. The library provides one access path to the data and attribute files. While this increases the processing overhead of the program, it facilitates the transfer of applications to new data files structures, or as we will see next time, different relational data base schemas. Δ

John Huddleston is a computer engineer with the U.S. Soil Conservatcion Service in Portland, Oregon.

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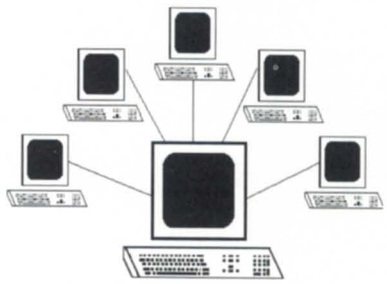

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Brian Johnson

Wasted SPACE

SYNOPSIS

This month BJ covers a couple of issues related to disk file organization, disk space consumption, and disk performance.

:DISK_SPACE

Recently I've been getting a lot of calls about the apparent discrepancy between the length of files and the actual number of disk blocks they consume, as evidenced by the output from the SPACE command on the directory where the files reside.

Four years ago I put a program called SAFE (Show Allocated File Elements) on the :SYSMGR BBS. SAFE displays a map of the data elements for a file showing which are allocated, which are sparse, and which are unnecessarily allocated. An unnecessarily allocated element is one whose contents is entirely nulls. SAFE uses the "read next allocated element" feature of the ?BLKIO system call to locate allocated elements and thereby infer sparse elements. Figure 1 shows the output from SAFE for LOAD_II.PR and DUMP_II.PR.

Sparse files are a major advantage that AOS/VS enjoys compared to other operating systems. The most commonly occurring sparse files under AOS/VS are .PRs, .STs, and INFOS DVLs. Most DG software programs that create sparse files are pretty good about avoiding writing a block whose contents is entirely nulls, but quite a few third-party software packages aren't nearly as diligent.

A couple of AOS/VS II users called recently to report an apparent anomaly with respect to disk space usage. The scenario usually involves dumping some large file structures to tape with DUMP_II and then reloading them with LOAD_II only to find that they take up a lot more space than they did before they were dumped.

Here's the experiment I used to determine if the callers were right:

I moved a copy of CLI16.PR to my home directory and ran SAFE on it. SAFE reported that only 80 of the 116 blocks occupied by CLI16.PR were allocated, and that no data elements were unnecessarily allocated. Then I dumped CLI16.PR to a disk file using DUMP_II and used LOAD_II/DELETE to reload it. Running SAFE again showed that LOAD_II had completely allocated all 116 blocks, increasing the actual disk consumption of the file by 31 percent.

Repeating the test on several other files with a range of element sizes produced mixed results. The net-net appears to be that LOAD_II sometimes fails to detect sparse data elements because its sparseness check is based on the value of the /BLOCKSIZE= switch, not on the element size of the file being loaded.

So, should you be concerned about wasted disk space when you have to reload files using LOAD_II? Until the problem is fixed, apparently so.

Is there any way to avoid or correct the problem? Well, sort of. Using CLI16's LOAD or MOVE, or CLI32's MOVE, but without the /BUFFERSIZE= option switch, most of the unnecessarily allocated elements will be deallocated. But not all of them; it depends on the file's element size and how it well it coincides with the default buffer size used by CLI16 and CLI32.

Of course you *could* write a utility program to read through files checking for unnecessarily allocated elements. If any are found the utility would have to copy the file to a temporary file, taking care to avoid copying null blocks, and then replace the original file with the temporary file. This is a moderately tricky piece of code because you will need to preserve all original file attributes (except for TLA and TLM, of course).

:ELEMENT_SIZES

Under AOS/VS you can specify the

Figure 1 - SAFE Output

```
Su) SAFE :+_II.PR

Analyzing :LOAD_II.PR
... ....     .  . ..                    |
 !. .    .. !.............................<EOF>
Each position corresponds to an element of 24 blocks. The file is
2712 blocks long, but only 1128 blocks are allocated (58% sparse).
Two elements (48 blocks, or 2%) are unnecessarily allocated.

Analyzing :DUMP_II.PR
..                    .... .  .  ..    |
    .  .          .. ... ..   ...................|
...<EOF>
Each position corresponds to an element of 32 blocks. The file is
4192 blocks long, but only 1344 blocks are allocated (68% sparse)
```

element size of a file when you create it, but the element size of the Random Index Blocks (RIBs) is fixed at one disk block.

Under AOS/VS II, when an LDU is formatted with Disk Jockey you can specify a nonstandard, two-stage data element size for the LDU and a nonstandard RIB element size. The default values match AOS/VS. Regardless of the values specified for the LDU, you can override any or all of the values when creating a file if you use the new AOS/VS II ?XCREATE system call in place of the generic ?CREATE system call.

Specifying element sizes that are appropriate to the file size is a universally accepted principle. Doing so minimizes the amount of CPU spent searching the system cache for RIBs and increases the probability of a cache hit, thereby raising the cache efficiency.

Over the past few years several prominent DG consultants have argued strongly in favor of AOS/VS II users making use of the split element size option, and/or non-standard RIB element sizes. Personally, I've never been convinced that the unnecessary complication warrants the trouble. Here's my reasoning.

There are three main goals associated with choosing element sizes for files that are frequently and randomly accessed. But before I get into them let me dismiss two large classes of files. The organization of files that are rarely accessed is clearly not important. The organization of files that are sequentially accessed is relatively unimportant too, because the same RIBs are accessed each time a data element is accessed, except every 128 data elements when the system has to make a transition to the next low level RIB.

The first element size related goal is to minimize the amount of disk space needed when the file is sparse. The smaller the element size, the greater the probability is that a given data element will be sparse.

The second goal is to minimize the amount of system cache activity required to access the data elements of the file. Each cache search requires that the system expend CPU time, and there is always the potential of a cache miss, which will require even more system CPU to do the logic required to read the disk. This goal usually implies that a file should have no more than a single index level.

The third goal is to minimize the amount of disk activity due to system cache misses. This goal is achieved by making sure that the total number of RIBs associated with frequently accessed open files can fit within the system cache with room to spare. The spare room is required in order to allow for transient blocks, which need to stay in the system cache only for short periods. An example of transient blocks are the directory blocks needed to do a command like FILESTATUS. During a FILESTATUS command with a template, a large percentage of the total number of blocks used by the directory

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will have to be accessed, usually more than once (/SORT doubles the number of accesses!). After the FILESTATUS command, the chance of most of the blocks being needed again in the near future is small, but by that time they may have already pushed a lot of active file RIB blocks out of the cache.

Of course, contiguous files are the optimum solution if infinite disk space is available; they don't require any cache searches at all. All of you with infinite disk space can stop reading at this point and spend the rest of the day making all your files contiguous. For the rest of you, contiguous files make sense only if: a) the file does not grow; and b) the file is not sparse. If the file does grow, there is the ever-present danger that progress will cease at 3 a.m. some Sunday morning with a message that "insufficient contiguous blocks are available" and you're gonna get a wakeup call. If the file is sparse you end up wasting disk space which would otherwise be usable for other files.

So, does the availability of split data element sizes or larger RIB element sizes do anything to help us accomplish our goals? Not really.

First of all, if the size of a file is fixed and we have no information about where in the file most of the accesses take place, then a split data element size has no advantage over a fixed data element size. I don't know about you, but I have no idea where most of the accesses take place in most of the files that I deal with.

Let's assume that we have a heavily accessed growing file, and let's take a look at three scenarios to see if we can possibly find something which helps us to achieve our goals.

Scenario #1: a small primary element size and a large secondary element size. Assuming that the file is initially created with an element size which results in a single level index, then this option minimizes the growth of random index levels once the file starts to grow, but at the expense of an increased probability of running out of contiguous blocks. A better strategy would have been to estimate how much the file would grow in, say, three months, and then specify the element size based on that file size and plan to rebuild the file every three months.

Scenario #2: a large primary element size and a small secondary element size. This option reduces the probability of running out of contiguous blocks once the file grows beyond its originally anticipated size. But it does it at the expense of increased system cache activity because the random index levels grow quickly once the secondary element size kicks in. The increased cache activity puts pressure on you to rebuild the file sooner than you might have, had the element size been uniform.

Scenario #3: a large RIB element size. On the face of it, this seems like a great solution for large files. After all, doubling the RIB element size from one to two cuts in half the element size needed to achieve a single random index level.

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The flaw in this logic is that now the random index block requires two system cache buffers, so half as many RIBs fit in the cache. If the maximum size of the system cache were not fixed, this might be a nifty idea. However, the maximum is currently fixed, so there is no net gain.

So, there doesn't seem to be any clear-cut winner. I've been waiting for a couple of years for someone to produce hard data showing a clear advantage for split element sizes and large RIB element sizes, but all I've seen so far are unsupported claims.

I don't know about you, but using default values when nonstandard values have no clear advantage seems to me like the way to go.

:DISK_DATA_CACHE

Recently I've run into a lot of sites that have elected to use the AOS/VS II disk data caching without paying any attention to whether or not it's a net winner. There seems to be this mind-set that any cache is a Good Thing and should be used. The sad part is that most of these systems are experiencing serious CPU contention during large parts of the day, and if there's anything that disk data caching does for you, it consumes CPU.

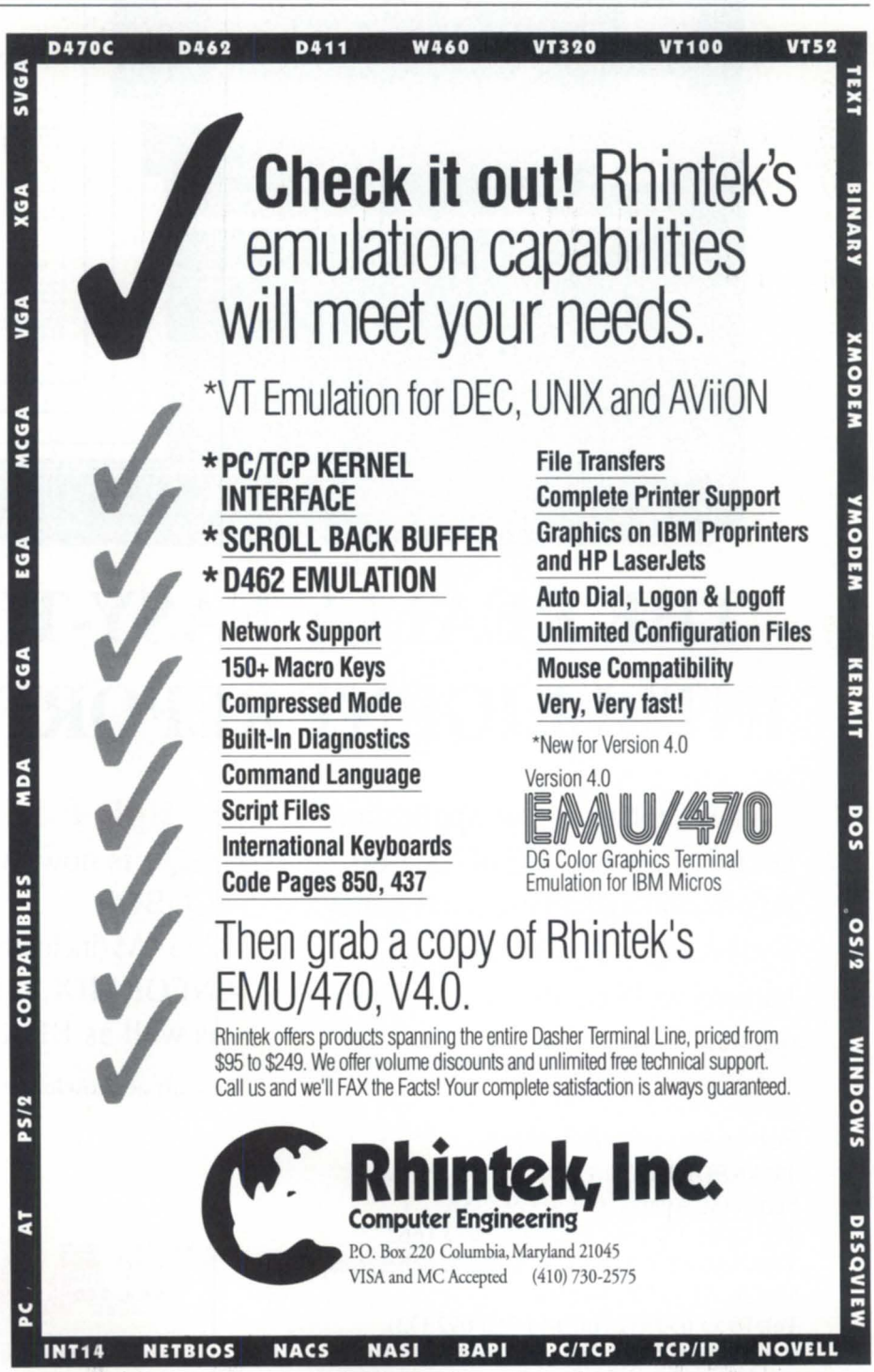
Even if you ignore the extra CPU, there's another drawback to the disk data cache: it lengthens the average disk access by virtue of the fact that it reads a lot more data during each access than what is actually being requested. It does this on the theory that you might be reading the file sequentially, or that you're reading it randomly but in clusters, and that you're next request will involve data in the vicinity of the previous request.

The guys at DG who designed the disk data cache went to great pains to measure the cost of the cache versus its benefit, and they haven't made any secret of their results. In general, if you can't achieve an overall cache efficiency of at least 30 percent, then the disk data cache is probably a net loser.

So what are the chances of achieving a net efficiency of 30 percent? It depends. During overnight batch when a handful of streams are running, it's very good. During the day on systems with low PID counts, it's also very good. On systems with high PID counts, or systems with large amounts of data being accessed, chances are pretty slim.

How about some real-life data? Recently I surveyed eight medium (100 to 200 PIDs) to large (more than 200 PIDs) MV systems. The highest overall cache efficiency I found was 19 percent. The lowest was 8 percent and the average was 14 percent. In other words, none of these systems should have been using disk data caching.

Does it make sense to just cache a single critical disk (the system disk comes to mind)? Yes, but only if you can sustain an overall efficiency of 30 percent. However, I've seen only a couple of systems where this was achievable, and they were all less than 200 PIDs.



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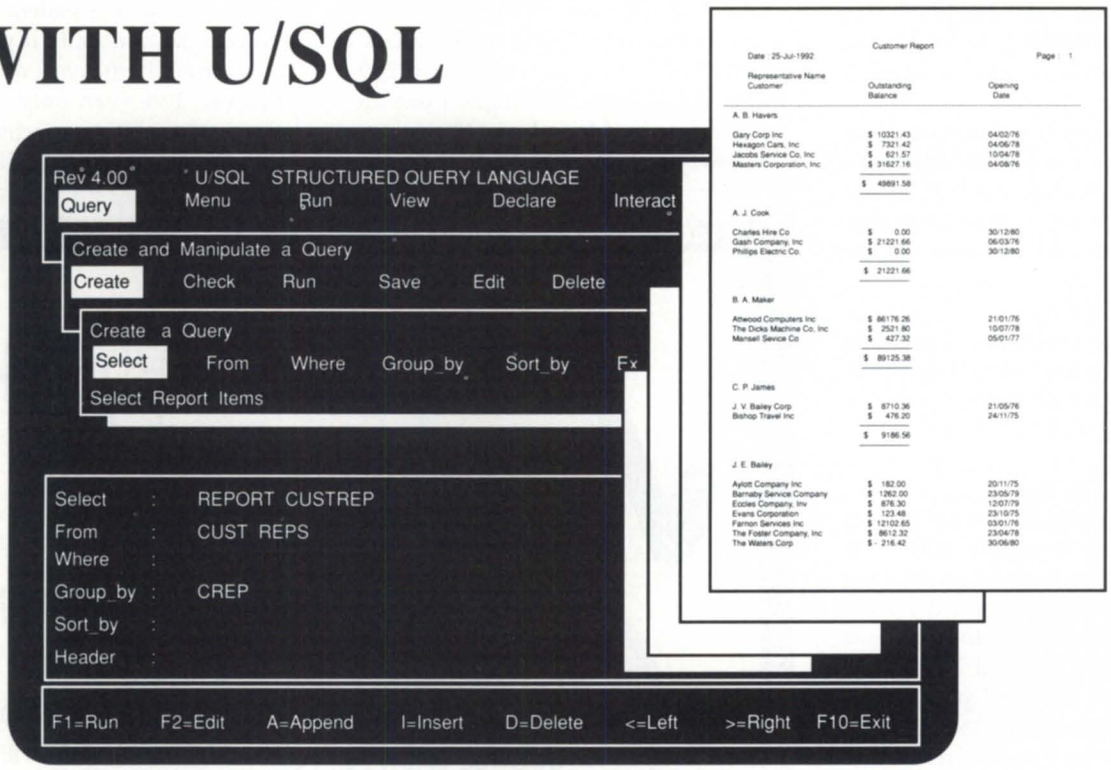

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Does it make sense to keep two operating systems around and reboot before and after the daytime work so that a cache-less system is used during the day, and a cached system is used at nights and on weekends for the batch work? Yes, but only if you can sustain an overall efficiency of 30 percent. I've seen quite a few systems where this made sense.

Moral: if you're using the disk data cache option and you have more than 200 PIDs, it's probably a net loser. If you're frequently experiencing CPU contention, then you should turn off the disk data cache option *even if you can achieve an overall efficiency of 30 percent.*

:TRADE_RAG_NONSENSE: REVISITED

I know I said last month that I was gonna give up reprinting nonsense from the trade rags, but there's one last item I just can't pass up.

If you believe the trade rags, then everybody involved with computers is outsourcing or downsizing or rightsizing or re-engineering their businesses to use RISC-based workstations running networked open systems with graphical interfaces, object-oriented programming, and client-server everything. Not the kind of thing to make a user of minicomputers running Cobol and Infos sleep well, eh? Well, consider this little item from the September 7 issue of *Information Age:*

"Some 33 percent of the companies recently surveyed by the accounting firm Deloitte & Touche say they're using client-server applications, but only 3 percent report using client-server computing for what they consider business-critical applications. The survey of 3,500 telecommunications and IS managers also revealed that 11 percent have outright rejected the use of the client-server approach. Among the reasons they cited are lack of expertise in the required skill sets; immature software and applications development tools; lack of sufficient network infrastructure and network management capabilities; cost; and a lack of support from vendors."

That, friends, is reality. The columns written by people who've never actually worked in a data processing department and the cover stories written by vendors of client-server products are clearly not reality. Δ

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David Novy

Breaking the unbreakable

SYNOPSIS

RAID systems are no longer technology toys, but serious tools for reducing downtime disk hardware failure to almost zero.

This month I discovered a new status symbol for the system management set—mirroring a file system on a RAID box. This is for those system managers who can never have too much redundancy when it comes to disk drives. RAID (redundant arrays of inexpensive disks) by itself supports a hardware mean time between failures (MTBF) in excess of 100 years.

When you use an extra drive to mirror a file system on the RAID, the MTBF probably can be measured in terms of ice ages (which occur about every 10,000 years). Of course if you have a status symbol, you must come up with a name for it. The name I like for such a system is RAID 5.1. That would indicate a RAID 5 system with a single mirrored drive backing up key disk partitions. RAID 5.1.1 would indicate a RAID 5 system with double-mirrored drives. Of course, you would use RAID 5.0 or RAID 5 for a RAID 5 system with no mirrored drives.

Seriously, you should give careful attention to disk drive redundancy. RAID systems are no longer technology toys, but serious tools for reducing downtime from disk hardware failure to almost zero. I have heard many system managers claim that their employers will not purchase a RAID system because the employer believes they are too expensive. At the same time, these very system managers claim that their employers have calculated that a day of downtime at the site costs $23,000, yet the employer still considers disk mirroring or RAID systems too expensive. I told one system manager to keep good records of system downtime. By next year, he will not have any difficulty in convincing his boss that disk redundancy is well worth the price.

Creating a disk mirror on a DG/UX system is very simple. First you should thoroughly read the disk management procedures section in the "Managing the DG/UX System" manual (DG part number 093-701088-01). Then I would recommend doing a special backup of any file systems you want to mirror. This special backup is recommended because it is possible to create a mirror that upon reboot will try to synchronize itself by copying an empty file system from one part of the mirror over the live data that used to reside on the other part of the mirror. I know one system manager who did create a mirrored disk in this manner. A disk mirroring procedure that should have

taken five minutes to complete turned into an all-night marathon because he incorrectly created a disk mirror that ended up wiping out the root and *usr* partitions on his key file server. It took him six hours to recover the information from his baseline and incremental backup tapes.

I will leave it up to the reader who wishes to do disk mirroring to read the manual, do the precautionary backups, and practice creating disk mirrors. I do not wish to take the responsibility of perhaps giving out incorrect information and then having someone blame me for wiping out a key disk. However, I do have some tips for those system managers who wish to work with disk mirroring:

Disk mirroring greatly increases disk reliability. Creating a disk mirror using DG/UX is well documented and easy to do

1) System mirroring is best done using standalone diskman. A system manager is less likely to create a mirror in an improper order. When creating the mirror, the first file system to add to the mirror is the live data partition. Then any backup partitions should be added. After the mirror is created, you should be sure to synchronize the mirror before rebooting. Standalone diskman can be invoked either from the DG/UX release tape or from the /usr:/stand disk partition. (See the "Managing the DG/UX System" manual for details.)

2) If you wish to mirror the "root" partition, then the boot mirror must be called "root" or you will not be able to have unattended system startup or panic recovery. In order to create a mirror named "root," you must rename the original "root" file system to something besides "root." The only way I found to do this is to delete the "root" logical disk partition and then create a new file partition using a different name that occupies the same disk space as the disk partition previously called "root." Under no circumstances should you create a new DG/UX file system on the renamed partition or the live data on the former "root" partition will be erased. As any experienced system manager will notice, this delete/create logical disk maneuver applied to a root file system is dangerous. Therefore, I strongly recommend backing up the root file system before attempting this procedure.

3) You should realize that even though you have a "root" disk mirror, you cannot boot from the "root" mirror. You can boot only from one of the "root" mirror pieces. As an example, the boot command from the SCM level is similar to: "b sd(cisc(0) root:/dgux". However, if the root mirror consists of two pieces—*roota* and *rootb*—then one correct boot command would be "b sd(cisc(0),0) roota:/dgux". The other would be "b sd(cisc(1),0) rootb:/dgux".

4) Even though you have a root partition consisting of two parts, you may not be able to boot from both of the parts. I once created a root mirror that consisted of logical disk partitions created from "sd(cisc(0),0)" and "sd(cisc(D),4)". I could boot from the "sd(cisc(0),0)" logical mirror partition. However, every time I tried to boot from the "sd(cisc(D),4)" logical mirror partition, I received an error.

In conclusion, disk mirroring greatly increases disk reliability. Creating a disk mirror using DG/UX is well documented and easy to do. Just remember to thoroughly read the manual before you proceed, and make sure your backups are in order. Δ

David Novy is a technical computer 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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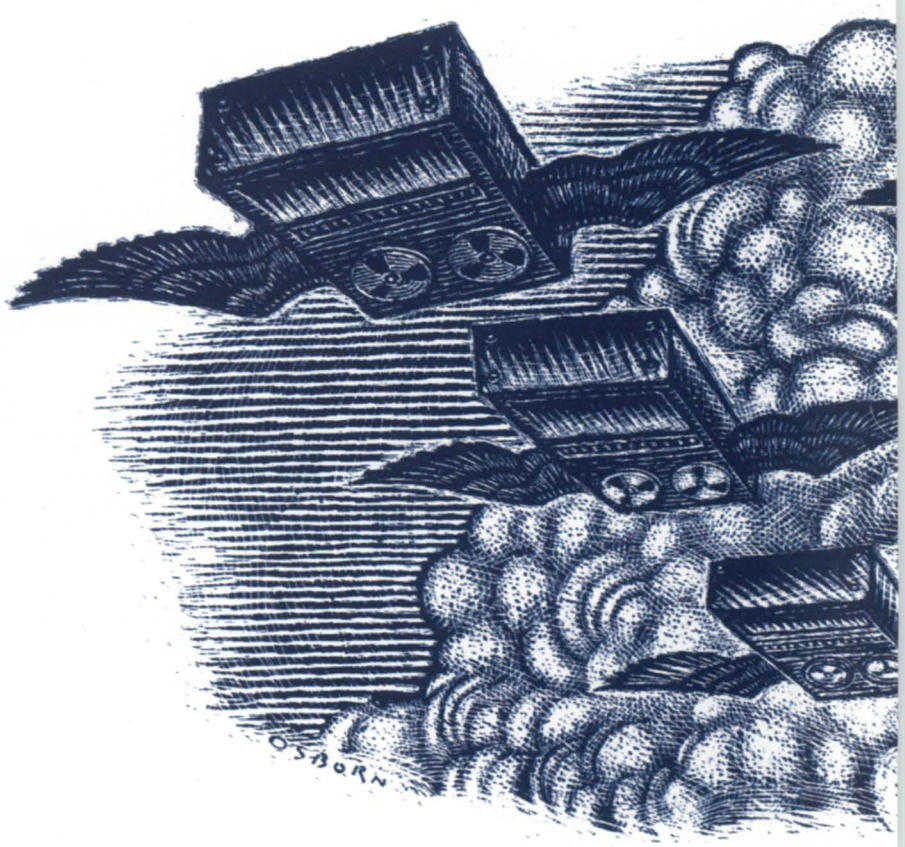

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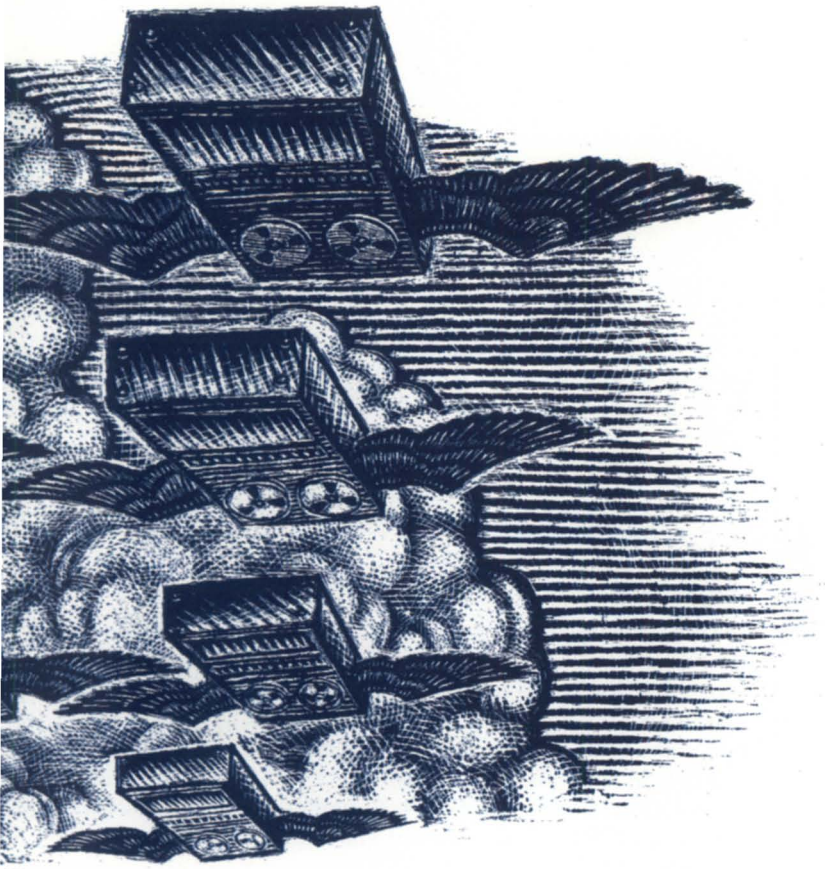

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The heart of the GUI

SYNOPSIS
The author begins a demonstration of some helpful X-Windows utilities. First of two parts.

by Pete Szaban
Special to Focus

The X-Windows system is at the heart of the Data General Aviion graphical user interface (GUI). The X port for Aviion includes several quite helpful utility programs. I hope to show off a few of these utilities, and mix in a little X flavor and terminology. You are encouraged to experiment. The exercises in this article have been performed successfully on an Aviion workstation running DG/UX 4.32, with X-Windows system revision X11R4. Most material should be directly transportable to other vendors' X workstations.

X exists as three types: server programs, client programs, and window manager programs. Server programs run in the background. They manage their respective keyboards, pointers (mouse), and video displays in response to requests coming over the network. Network requests come from programs called *clients*.

Client programs usually are application programs with which the user interacts (examples include word processors and spreadsheets). Window manager programs are special client programs that communicate with both server and client programs. Window managers give "look and feel" characteristics to X. Window manager programs interpret and pass along user requests to the server for window management, rearrangement, and resizing operations.

A common starting point

The remainder of this article outlines several exercises demonstrating some utilities and features included with X. All exercises assume use of a windowing environment with a shell window available to accept keyboard commands. X may be configured in a variety of ways. But this variety "feature" actually works against us here, because environment modifications make it difficult to give a set of instructions that will always yield a shell window.

Depending on system configuration, the windowing environment may (or may not) start automatically at login time. If X does *not* start automatically, one way to start it manually is to log in and enter the following Unix shell commands:

```
/bin/csh
set path = ($PATH /usr/bin/X11)
xstart
```

When X starts up, an X server, window manager, and one or more client programs usually start automatically under the direction of several script files. By default on the Aviion, these script files invoke the Motif window manager, a clock window, and a Unix shell window. A shell window is a rectangular workspace running one of the Unix shell command-line interpreter programs. These programs typically display a percent sign or dollar sign prompt. If a shell window appears, you have successfully reached the starting point. If there are no shell windows available, and the Motif window manager is running, a new shell window may be started as follows:

- Move the pointer over the background (root) window
- Hold the left mouse button down; a pop-up menu will appear
- While holding the left button, move the pointer over "New Window" and release the left button.

At this point, I assume that readers can log in, and get to the point where a shell window is open. If you can't get to a shell window, your best option might be to check with someone on your computer support staff.

Manually starting client programs

When X starts, several client programs may be invoked automatically. Client programs may be started manually from a shell window by keying in the client program name. Try starting a clock. Move the pointer into a shell window (an operation known as "focusing"), and enter the following command:

xclock &

If the shell window fails to echo keystrokes, make sure the pointer is inside that window. The X server uses the pointer position to determine which client window receives keystrokes.

A new clock window should have appeared on the display. The name of the clock client program is *xclock*. An ampersand (&) character was appended to the command so the clock would start as a background process. Notice that the shell window is prompting for another command. If the ampersand was omitted, the *xclock* client would still start, but the shell window would be frozen until the clock program finished. In general, to startn X client, simply key in the name of the client. To start the client as a background process, append an ampersand.

Stopping X clients

Most clients allow some orderly way to perform an exit. Unfortunately, *xclock* is not one of these. One way to stop client programs that provide no normal exit path is with another client, named *xkill*. Stop the new *xclock* program by moving the pointer inside a shell window, and entering the following command:

xkill

A set of instructions will be displayed. By default, the mouse

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buttons are numbered 1, 2, and 3, reading left to right. Mouse button 1 is on the left, button 2 is in the middle, and button 3 is on the right. Position the pointer over the clock window. Make certain the pointer is over the clock window, or the wrong client may be killed. Momentarily press mouse button 1, then release it without moving the mouse (an operation known as "clicking"). The *xclock* window will disappear, and a server disconnect message will appear in the shell window.

In general, use the *xkill* client with some caution, as it is not the preferred way to terminate client programs. The *xkill* client tells the X server to break the communications connection with a particular client. This could cause some clients to do nasty things, like leaving buffers unflushed, files locked, or worse.

The *xman* client

Most information for this article came indirectly from hacking through the on-line system manual (help files). A client program named *xman* provides an intuitive interface to the system manual. This client can also be started from a shell window. Focus (move) the pointer inside a shell window and enter the *xman* client name, followed by an ampersand:

```
xman &
```

A small window entitled "Manual Browser" will appear with three menu options (called button widgets). Click mouse button 1 on the "Manual Page" option, by positioning the mouse over the words "Manual Page," and momentarily pressing, then releasing mouse button 1. A larger window will appear, explaining how to use *xman*. This window's left-side border contains a tall, thin rectangular scroll bar widget that you use to scroll through the help text.

To use an X scrollbar widget, focus the pointer anywhere inside the scrollbar widget. The pointer becomes a double-ended vertical arrow. Scroll forward by clicking mouse button 1. Scroll back by clicking mouse button 3. To skim through the text, hold down mouse button 2, and slowly move the pointer up and down the length of the scrollbar widget.

After reading the help screen, position the pointer over the "Sections" widget at the top of the window. Hold down mouse button 1—a pulldown menu will appear. Do not release the mouse button or the menu will disappear. The pulldown menu can be redisplayed by again positioning the pointer over the "Sections" widget, and holding down button 1. The sections menu displays the categories of help files available. Generate an alphabetically sorted list of user commands by moving the pointer over the option entitled "(1) User Commands," then releasing the mouse button.

Scroll through the list using the scroll bar gadget in the left window border. As you scroll through the commands. notice that programs related to X are followed by a capital X sur-

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rounded by parentheses. Locate the *xclock* entry. Click mouse button 1 over the word "xclock" to display help about the *xclock* client. The *xman* client is a tool for finding out more about X clients as well as Unix commands.

Remove the large help window by positioning the pointer over the "Options" button near the top of the window. Press and hold down mouse button 1. When the options menu appears, move the pointer over the "Remove This Manpage" option, then release the mouse button. This leaves the small "Manual Browser" window up for future use. The manual browser window was designed to be left on-screen at all times as a desktop help dictionary.

The *xload* client

Another client sometimes useful to leave running is *xload*, which displays a scrolling graph reflecting system load. Enter the following shell command to start *xload*.

```
xload &
```

The *xload* client can be killed with *xkill*. Leave *xload* running, however, so that a history of system load can be viewed periodically while proceeding through the remaining examples.

The *xedit* client

The most underrated X client, in my opinion, is *xedit*. It is a simple text editor, which probably could have saved many people from having to learn the cryptic command set of the *vi* editor, had they only known of *xedit*'s existence. For small, simple tasks, *xedit* provides an intuitive way to edit text files. Start *xedit* with the following shell command:

```
xedit &
```

The *xedit* window consists of three parts: a command menu at the top, a small message window just below it, and an edit window at the bottom. To enter text, move the pointer into the large edit window at the bottom, and start typing. The edit window is actually an X text widget. Text widgets provide a consistent, client-independent way to manipulate text, just as scrollbar widgets provide a consistent, client-independent way to scroll through text in a window.

Type a few lines of text into the edit window. Notice that the cursor can be repositioned using the arrow keys (several *emacs* commands are also supported by text widgets). The mouse can also be used to move the edit cursor to a desired position as follows:

- Move the pointer to the desired position inside the edit window text
- Click mouse button 1, and the edit cursor will move to the location of the pointer.

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Copy and paste

Most windows allow copy-and-paste edit operations. The *xedit* editor window is no exception. Copy and paste is a powerful feature that allows users to select a range of text, and insert (paste) a copy of that text in the same or a different window. Try a copy-and-paste operation on the text you entered in the *xedit* window:

- Move the pointer somewhere near the beginning of the text you typed into the *xedit* window (the pointer will look like an I-beam).
- Press and hold down mouse button 1; while still holding down mouse button 1, move the pointer partway through the text; the text will be highlighted to show the selected region.
- Release mouse button 1 after selecting about half of the text; the selected text will remain highlighted.
- Paste (insert) the selected text somewhere in the edit window, by moving the pointer to the desired location, and clicking mouse button 2.

Notice that the copied text will be pasted again each time you click the second mouse button. Copy and paste can also copy text to and from other windows. You may want to experiment a bit before proceeding.

To save the contents of the *xedit* buffer into a file, specify a file name and click on the "Save" button widget as follows:

- Move the pointer into the xedit command window (the top window), to the right of the "Load" button widget, and key in a filename.
- Move the pointer over the button widget named "Save," and click button 1; the message window will announce that the file has been saved.

Exit the *xedit* client by clicking mouse button 1 on the "Quit" button widget. The next time the file needs to be edited, the shell command *xedit xxx &* can be entered, where *xxx* corresponds to the name of the file to edit. Δ

Editor's note: Part 2 of this article will explore further X-Windows topics: xcalc *client and command line options, the* xterm *client, specifying color from the command line, and geometry, font, and display specifications.*

Pete Szaban is a technical programmer at Western New England College in Springfield, Massachusetts. He may be reached at 413/782-1239.

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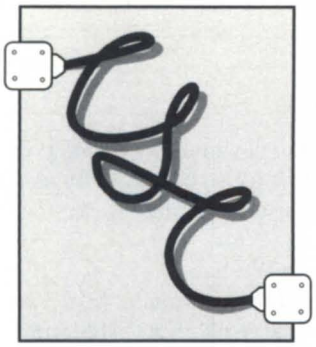


DASH items

SYNOPSIS

Notices and queries found posted on the DASH (Direct Access to Support Help) bulletin board.

Category: DG/UX

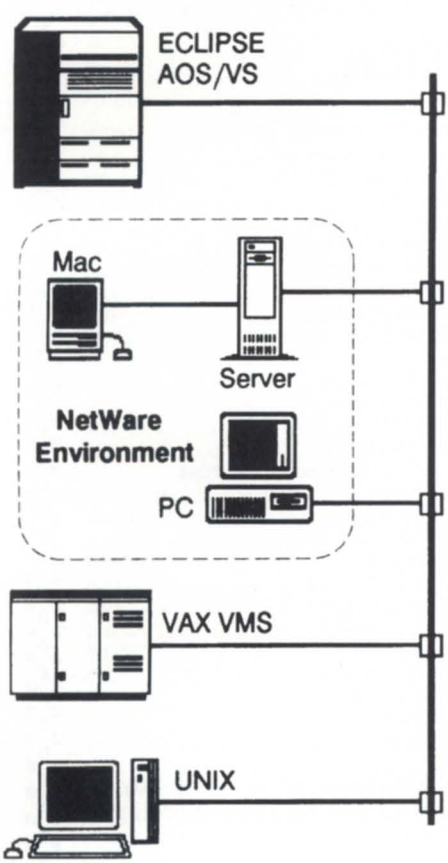
Author: Michael Keck
Subject: **who command vs. ps command**

When I issued a "who -u" command to see who was currently logged on our system (DG/UX 5.4 on an Aviion 5220), I saw that a user, "jack", was currently logged in on *tty11;* it returned a PID and an IDLE time of .05. I am confused because I was issuing the *who* command from tty11 and I was logged in as root. When I issued the command "ps -ef", the user "jack" was not logged in.

I am wondering why "jack" was logged in according to *who* and not *ps*. Also, what does the idle time indicate?

Reply by: Varoujan Vosguian

My guess is that the guy who wrote "who" was not talking much with the guy who wrote "ps" (or vice versa). Basically, the *who* command gets its information from */etc/utmp* for user logins and */etc/wtmp* for accounting. These files are updated by "init" and also used by "write" and "login". The IDLE time is the amount of time since last activity; a "." means some activity occurred within the minute. Basically, it tells you if the user is working or out for a coffee break; "old" means no activity in the last 24 hours. The "ps" command gets its information from the running kernel and files "/etc/Passwd" and "/etc/ps_data". As documented, "Things can change while *ps* is running, so the image is only an approximation." Also, *ps* is not restricted to the local node. I have seen confusion similar to what you described when two users had different loginnames but the same user ID (this can be done by manually editing file "/etc/passwd)"; *who* and *ps* gave different outputs.



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Reply by: Tom Barron

I've also seen situations in which *who* showed entries for users who had been logged in the day before but were not at the time I ran *who*. Apparently "/etc/utmp" isn't kept up to date as well as it should be sometimes.

Author: Susan Spaeth
Subject: ***cu* command**

After connection from an Aviion 5225 to an NCR Tower 700, we are trying

```
~%take /usr/acct/corp/test /usr/acct/corp/test
```

which results in displaying the info to the test screen. The command :

```
~%take /usr/acct/corp/test>/usr/acct/corp/test2
```

creates a file test2 on the Tower, but not on the 5225.

How are we to transfer files from the Tower to the Aviion 5225?
The command *~%put* takes files from the 5225 and places on Tower fine.

Reply by: Ephraim Nussbaum

I have two comments:
1) The syntax of the *take* command does not use the redirection symbol ">". You simply give the output file name, or leave it off to use the same name as the input and copy to your current directory.

2) I also am having trouble with the *take* command, and I'm going Aviion to Aviion. The *put* command works fine, but I've only gotten *take* to work once or twice. I've been meaning to report it.

What happens is the file displays on the screen, for some reason, and then gives me an error message when ended.

Reply by: Elliott Lavy

The problem you're describing (Aviion to Aviion) could be related to editread. If you have a data-trap mode on your terminal, look to see if there are extra characters after the CR-NL; *%take* depends on a tilde (~) immediately after the newline. Try turning off editread. It may also be solved by using a different term definition.

Author: Tom Westfall
Subject: ***crontab* question**

Is it possible (with an AV 4120 running DG/UX 5.4) to set a *crontab* entry or write a script that would down the system each night and then reboot it? It appears to me that if you do not down the system periodically, it starts to slow down. I spoke with someone I met at a conference who was running ULTRIX on a DEC who was able to do exactly that. Thanks.

Reply by: Elliott Lavy

DG/UX 5.4 does have a *reboot(1m)* command. Personally, I'd be afraid to use it in a *crontab* entry, since the current *cron* has a bug that causes it to rerun things at the wrong time. But why do you think the machine will slow down if not rebooted for some time?

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Reply by: DG Customer Support

Try init 0. The "/etc/rc0.d" script kills everything and does a halt.

Reply by: Tom Westfall

The system seems to slow down after long periods of time without a reboot. I'm not sure why. My local DG systems engineer told me to reboot at least once a week. The "/etc/rc0.d" script that was mentioned sounds like it stops the machine, but does not restart it. Is that the case? And could you explain the *crontab* bug a little? I have been running many processes nightly, and do not seem to be having any problems.

Reply by: DASH Development

I have just received a reply from the Development folks regarding the documented *cron* bug. (The one where it reruns jobs if it doesn't have anything to do). The work-around is to add the following entry to your *crontab:*

*0 * * * * date >/dev/console*

This is evidently enough to keep *cron* happy.

The reboot command has worked for me every time I've used it. Personally, I don't think I'd try to automate the roboot. I'm sure Murphy would tell you that it's a bad idea. (There you are, working at an odd hour to:

1) Beat that deadline;
2) Do something when you've got the machine all to yourself;
3) Fix that elusive bug you've been working on all week; or
4) All of the above, when . . .

SURPRISE! The system reboots . . . . Δ

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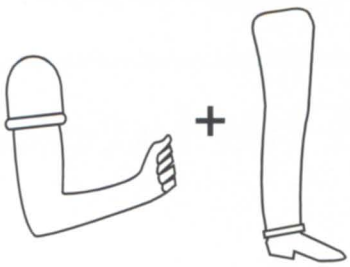

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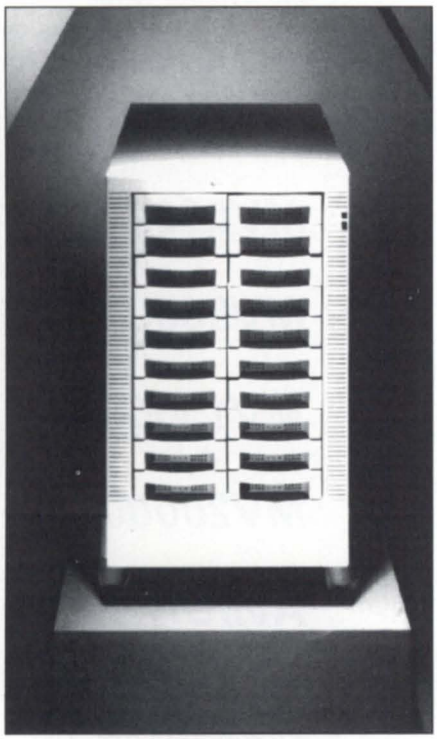

Clariion is a storage solution offering up to 24 GB of capacity within a footprint of 2.7 square feet

DG trumpets Clariion storage systems

Westboro—In a move to expand its open systems customer base, Data General announced low-cost, high-performance Clariion disk and tape arrays compatible with IBM, Sun Microsystems, Hewlett-Packard, Unisys, and ICL, as well as Aviion platforms. Clariion is Data General's new name for its HADA II open storage systems for Unix systems-based servers.

Clariion disk arrays offer storage capacity of 2.5 GB to 24 GB in a footprint of 2.7 square feet, and contain up to 20 3.5-inch SCSI-2 disk drives (500 MB or 1.2 GB). The use of commodity drives ensures low cost. RAID technology reads and writes data to multiple drives in parallel for much higher rates of data transfer than traditional storage.

To provide protection against data loss, Clariion arrays constantly self-monitor subsystem components and feature automatic recovery in the event of component failure. If an individual disk drive fails, RAID technology ensures the data are still available to the user. The power supply, fans, storage control processors, and drives can all be replaced-under-power by customers, eliminating downtime.

To complement the Clariion disk arrays, Data General also introduced the Clariion tape array. This deskside system contains five 3.5-inch 4 mm DAT tape drives and a storage control processor to deliver fail-safe back-up storage. Each of the 4 mm DAT tapes can store up to 5 GB of compressed data. The system can transfer data at up to 6 GB/hour, and the use of a parity drive ensures that a backup operation will complete even if a tape or drive fails.

Prices for the Clariion disk array family start at $28,000 for an entry 2.5 GB system, $46,000 for an entry 6 GB system, with add-on 2.5 GB stripes priced at $34,000. The Clariion Tape Array is priced at less than $30,000 and will ship in the spring of 1993. Volume shipments for Sun and IBM systems will begin this month. HP, Unisys, and ICL will ship in early 1993.

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

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Cobol graphics AV

San Diego, CA—Acucobol is shipping Acuview, an integrated business graphics package for Cobol. Acuview allows developers to incorporate variations of five categories of graphs, including line, pie, bar, word, and table charts into their Acucobol-85 applications.

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of more than 100 standard chart designs and create custom charts. Pricing for Acuview for the Aviion ranges from $1,440 to $6,933.

Acucobol, Inc., 7950 Silverton Ave., Suite 201, San Diego, CA 92126; 619/689-7220.

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ICobol makeover with Harestylist

Boulder, CO—New from Wild Hare Computer systems, Inc., is Harestylist, a RAD (rapid applications development) tool that adds named-object windows and pop-up and pull-down menus to ICobol applications. According to Wild Hare, Hairstylist is the only tool on the market that provides object-oriented capabilities to ICobol programs, giving existing applications a PC look and feel.

Hairstylist is terminal, operating system, and hardware independent, and requires no changes to existing application code. Hairstylist allows the programmer to interactively create user displays and menus for use on any system that supports Wild Hare's Choice! runtime system, from PCs to mainframes. It controls window and menu objects, including size, color, contents, border, shadow, and title, and can test run these objects to ensure they operate as desired, reducing development time and costs. User mouse support and other PC-like features are included.

Wild Hare Computer Systems, Inc., P.O. Box 3581, Boulder, CO 80307-3581; 303/442-0324.

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Terminal pickup and repair

Fremont, CA—Guardian Computer Support, Inc., an on-site computer maintenance and disaster recovery organization, now offers nationwide repair service for 200 different brands of video display terminals, including Data General.

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Guardian Computer Support, Inc., 43062 Christy St., Fremont, CA 94538; 800/752-8733.

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Fast file access

Newport News, VA—The new fast file access option on Contemporary Cybernetics Group's CY-8500 8 mm tape drive allows Unix users access to any file on the tape in less than two minutes.

The CY-8500 can store between 5 GB and 25 GB on one tape at speeds up to 90 MB per minute. Its liquid crystal display shows command under execution, transfer rate, compression ratio, tape remaining, and ECC rate.

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Spatial modeler AV

Atlanta, GA—Erdas, Inc., announced the Spatial Modeler module, a versatile add-on component to the Erdas Imagine 8.0.1 geoprocessing package. The product is scheduled for release on Data General's Aviion 300 and 400 series of workstations by the end of 1992.

The Spatial Modeler module is a new visualization tool for spectral and spatial analyses on any type of data. Access traditional GIS (geographical information systems) functions and image-processing capabilities from a single dialog box for one-step processing, or use the Model Maker for creating graphical models. More complex modeling outside of the graphical user interface may be accomplished using the Spatial Modeler Language.

Model Maker is a graphical editor exclusive to Erdas. With its palette of tools, users can "draw" their own customized models or edit the library of predefined models that accompany Imagine. Available input includes raster layers, tables, matrices, and scalars.

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GIS modeling is used for applications ranging from urban planning and site selection, to mineral exploration and resource management.

Model Maker provides tools for querying multiple input files. Users can perform Boolean operations for "if . . . then" and "either . . . or" type analyses, and can access mathematical, statistical, exponential, and trigonometric functions.

Erdas, Inc., 2801 Buford Highway NE, Suite 300, Atlanta, GA 30329-2137; 404/248-9000.

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Data encryption MV

Newport News, VA—Contemporary Cybernetics Group added data encryption to its line of storage systems with the CY-2000-S, a 1 GB optical disk drive that utilizes encoded card keys to control access to sensitive data.

Users can still read and write standard 650 MB and 1 GB disks, and high level card holders can still write non-encrypted disks for easy data exchange.

The CY-2000-S provides gigabyte capacity, transfer rates of 1.5 MB per second, and a 35 ms average seek time.

Data encryption is also now available on Contemporary Cybernetic Group's CY-8200 and CY-8500 8mm tape subsystems which store between 2.5 and 25 GB.

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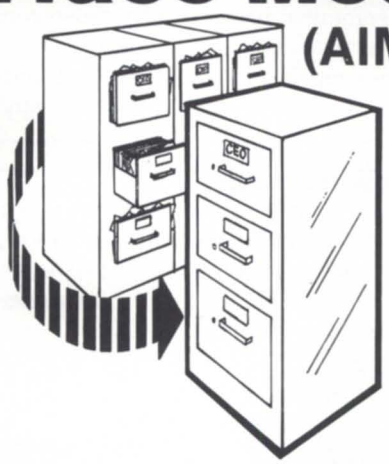

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Less disk thrashing

El Segundo, CA—The Megaram-Supra solid-state disk from Imperial Technology is designed for use in harsh environments where rotating, magnetic drives cannot perform reliably.

It features a 20 MB per second bandwidth, multiporting, a 1/8-ms access time, error detection and correction, built-in battery backup, and internal diagnostics. Two interface options are available.

Imperial Technology, Inc., 2305 Utah Ave., El Segundo, CA 90245; 310/536-0018.

Circle 61 on reader service card.

Alpha Windows manager

Plano, TX—Facet Term for Alpha Windows, from Structured Software Solutions, Inc., provides window manager support for Alpha Window terminals, a new generation of character-based terminals that incorporate a window-style user interface. As the window manager for an Aviion server, for example, Facet Term will enable users to open, close, move, resize, and stack multiple windows running various Unix applications on Alpha Windows terminals.

Structured Software Solutions, Inc., 4031 W. Plano Parkway, Suite 205, Plano, TX 75093; 214/985-9901

Circle 63 on reader service card.

New presort software

La Crosse, WI—Postware Presort and Postware Presort Plus, new offerings from Postalsoft, Inc., automatically presort mailing addresses, following the most recent postal rates and automation regulations. Both programs help high-volume mailers prepare completely packaged and trayed or sacked mailings. In addition, they produce facsimiles of U.S. Postal Service-required reports, and generate a mail sort listing. The Postware Presort Plus package includes standard features of Postware Presort and a number of specialty functions. Postware also released Postware ACE (Address Correction and Encoding) and Postware ACE Plus, two computer mail processing software programs that standardize and correct addresses and assign postal information such as 5-digit ZIP codes. Postalsoft programs run on a variety of platforms, including Data General Aviion computer systems.

Postalsoft, Inc., 4439 Mormon Coulee Rd., La Crosse, WI 54601-8231; 608/788-8700. Δ

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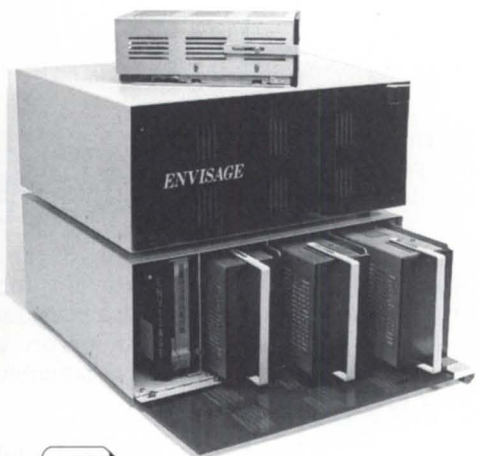

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Bits and bytes

DG/UX ICobol

From: Arlene Blouch

We are beginners in the world of ICobol under Unix, and a note in the manual has us puzzled. We are running 1.70 (current revision) on an AV 7000. For color settings within ICobol, the manual states, "you are working with code revision 9 or greater." What does that mean? We have tried making the changes, recompiling, etc., with no effect. Any ideas would be greatly appreciated. Thanks.

From: Ephraim Nussbaum

I can't help you with color problems, since we only have monochrome screens ourselves. However, code revision 9 is simply the revision of ICobol 1.70.

From: Arlene Blouch

Thanks for the answer—I thought I was losing it. But that puts another kink in it since it doesn't work as documented and we are running 1.70.

From: Tim Boyer

ICobol has added features in various revisions that may or may not work with a particular platform/operating system. The easy way to avoid an incompatibility is by telling the compiler not to generate particular opcodes. I forget the switch settings, but there should be a switch on the compiler command line to set a particular code revision (e.g., icobol -R8 logon). If you're running 1.70 on DG/UX, you shouldn't have to worry about it—that platform should run any code generated by the compiler.

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RJE80

From: Olav Torvund

We use RJE80 with Sync modems PTP using 3780 for both binary and ASCII file transfer. Both ends proc up GSMGR and RJE80, then dial up. We can send files either way.

The files are mostly sent from a head office out to nine different sites. Is there a way with GSMGR and RJE80 that the operator can dial up and receive files from the main office without an operator being present at the main office?

From: Joseph Edens

This will be one-sided, since I only see what happens on our end. Every day we send a file via RJE80 and at the completion, receive a file back. We don't care what they call the file, because we call it whatever we want. The way we do it is:

```
CONTROL RJE80 START
DEL/1=I/2=I <filename>
CONTROL RJE80 LIST <filename>
```

Whenever something comes back to us, it is stored in <filename>.This works for ASCII files, but I wouldn't make any guarantees on binary files, since we haven't tried that yet. Hopefully, this will be of some help.

From: Olav Torvund

Thanks for the info. What you have is similar to ours. Do you know if a file is returned automatically without operator issuing a CONTROL RJE80 SEND <FILE> at the other end? If it is automatic, I would like to know what the macro looks like at the other end.

From: Joseph Edens

I would think that it could be checked with a CLI macro to see if the file was received OK and then send the file back via the "CONTROL RJE80 SEND <filename>. 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. No fees other than telephone charges.

A complete listing of the NADGUG software library

compiled by Tim Boyer

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MACROS • Contains miscellaneous submissions: MACBOOK. 508 blocks.

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

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

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

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

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

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

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

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

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

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

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Data Specific

Clariion call

At press conferences in New York and Paris during September, **Data General Corporation** announced its new Clariion Business Unit and unveiled the first members of the Clariion family of open storage systems.

Based on the latest RAID (redundant arrays of inexpensive disks) storage technology, the new Clariion systems were demonstrated working with Unix-based systems from IBM, Sun, Hewlett-Packard, Unisys, and ICL. Clariion systems for Aviion, formerly named HADA II, were first announced in July. DG's new business unit will be headed by **J. Thomas West.**

The Clariion family includes a new disk array capable of storing up to 24 GB while remaining small enough to fit under a desk. There is also a new tape array. Volume shipments of Clariion disk array systems begin this month.

Up to 20 disk drives reside in a 2.7-square-foot cabinet. Prices start at $28,000 for an entry 2.5 GB system, $46,000 for an entry 6 GB system, with add-on 2.5 GB stripes priced at $20,000 and add-on 6 GB stripes priced at $34,000.

The Clariion tape array, a companion product to the disk array, uses 4 mm DAT drives and an intelligent RAID array controller to provide up to 20 GB of redundant backup storage.

Z interface

Zortec, Inc., of Nashville, Tennessee and **Dimension Software Systems** of Dallas, Texas, have signed a strategic alliance. Under the agreement, Zortec's fourth-generation rapid application development (RAD) toolset, System Z, will utilize Dimension's middleware technology to interface with the latest versions of relational data base products, including Oracle, Informix, Sybase, and Teradata.

Applications written in System Z will be able to take advantage of data that may already be resident in corporate data bases, while programmers can develop applications that can simultaneously access relational data bases and files from several different vendors and platforms.

"We view this as an important step in our continuing commitment to provide the development tools needed for open systems client/server architectures and the rapidly emerging enterprise software industry," said **David L. Condra,** president and CEO of Zortec.

Spinoff

Hiperstor of Portsmouth, New Hampshire, formerly a subsidiary of **Clearpoint Research Corporation,** will spin off from its parent company and function independently.

Hiperstor will assume full responsibility for the sales, marketing, manufacturing, and future product enhancement of its existing DGMS-SC family of SCSI-based storage subsystems for Data General systems.

"Being an independent organization will allow us to concentrate on our areas of expertise," said president **Bill Mathrani.**

Hopping

Independent ICobol developer **Wild Hare Computer Systems, Inc.,** of Boulder, Colorado, has moved to a new location and nearly doubled the size of its office space.

"Our company's current growth rate mirrors our deep commitment to the ICobol marketplace, and our desire to continue to develop products that enhance DG users' Cobol applications," said **Phil Goodwin,** Wild Hare's manager. The company's mailing address remains the same, but the new street address is: 6595 Odell Place, Boulder, CO 80301; 303/443-0324.

Next: NeXT

All the other computer companies seem to be teaming up these days, so why not? **Data General** will begin sell-

ing workstations made by **Next Computer, Inc.**, along with its own Unix-based Aviion family.

DG spokesman **Jim Dunlap** told United Press International that Next machines will complement existing DG products, rather than replace them.

Said UPI: "The Aviion servers became hot sellers for Data General in its return to profitability in 1991 after years of losses. But continuing declines in sales of the company's traditional minicomputers [the Eclipse/MV family] have dragged Data General back into losses."

Telecommunications

A national service agreement with Data General will provide on-site end user service to **Teleprocessing Products** of Simi Valley, California. DG will service and support Teleprocessing Products' data communications equipment and systems, including digital data termination CSU/DSUs, switched digital CSU/DSUs, high-speed synchronous line drivers, T1 multiplexors, and digital network enhancement equipment. Teleprocessing Products' customers range from small companies to *Fortune* 500 organizations.

An Italian connection

Acucobol, Inc., of San Diego, California, announced the opening of Acucobol Italia s.r.l. Headquartered in Piacenza, Italy, the new enterprise will be the sales and technical support office for Acucobol-based products in Italy, including Acucobol-85, Acu4GL, and Acuview.

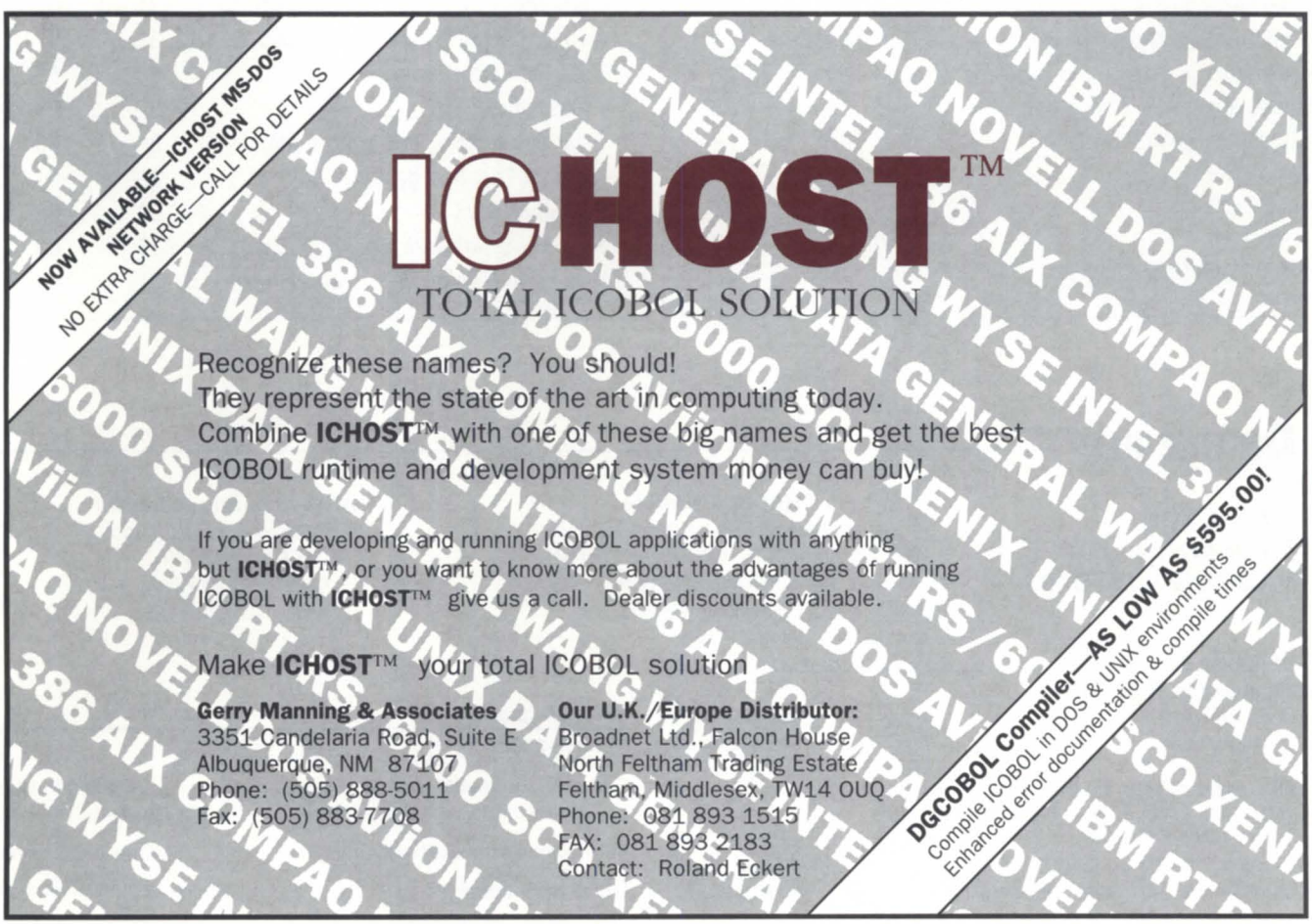
Curacao client

Fiserv, Inc., of Brookfield, Wisconsin, announced that the leading credit union in Curacao, Netherlands Antilles—the **Cooperatieve Spaar en Krediet Vereniging Ambtenaren ACU**—will install the Fiserv Galaxy 2000 Credit Union System for its in-house data procesing. The credit union, which represents the first international credit union site for Fiserv, chose the Galaxy 2000 system to help it accommodate growth, develop new products, and compete effectively with the island's banks.

The $17 million credit union, whose name in English means the Civil Servants Credit Union, provides services to 5,700 government civil service employees.

By the end of this summer, membership will swell to 10,000 when employees from all other government corporations will be permitted to join. The expanded membership rolls will represent more than 10 percent of the island's work force.

The Fiserv Galaxy 2000 system will run on the Data General MV/7800 XB minicomputer, which will replace a homegrown data processing system. Δ



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