

September 1989

# FOCUS

The Magazine of the North American Data General Users Group

## What's new in user interface?

*NewWave and object management*

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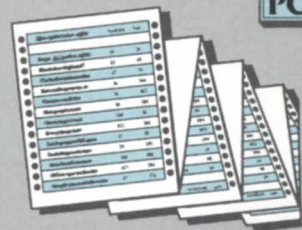
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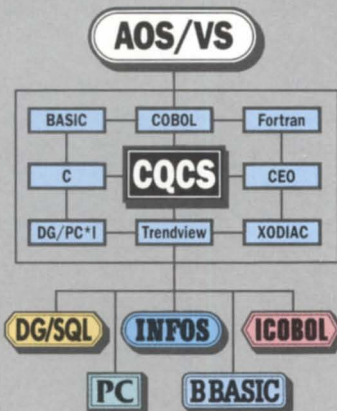


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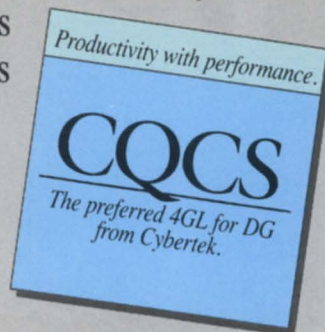
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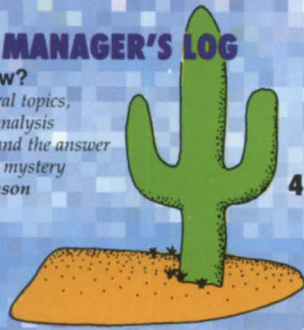
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Cover illustration by Eliz Soto

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# The time is here!

The time for our annual conference is fast upon us. As a veteran of several conferences, I already know how informative and helpful they can be—not only are there interesting and educational sessions and exhibits, but there's the added bonus of networking with the largest gathering of DG users ever.

You may have noticed that we've spent a lot of energy in the past few months trying to make you aware of the marvelous benefits of attending the conference. You should have seen advertisements and articles in *Focus*, and also received a registration package in the mail. This month, we're providing information that is suitable for both those who are already registered, and for those who haven't quite decided. If you are one of the undecideds, we hope the information on pages 66-74 will tip the scales in favor of your attendance. (If you know already that you are going to attend the conference, please pass this information along to someone who has not made up their mind.)

No matter how much we try to inform you, however, there are always questions that arise. I contacted NADGUG's membership coordinator at our Austin offices to find out what kinds of questions people are asking about the conference. I spoke to Kim Barrow, who is assuming the duties of the job while Membership Coordinator Suzanne Himes takes her maternity leave (Katarina Elizabeth was born

on July 24). Kim compiled the following list of commonly asked questions, and their answers:

*Do you have to be a member of NADGUG to attend the conference?*

No. But it is cheaper if you buy a membership.

*Are the Educational Services Seminars included in the conference registration?*

No. You must register separately for the seminars.

*What is this non-disclosure agreement on the back of the registration form and do I have to fill it out?*

The non-disclosure agreement is a standard form that participants in DG's Educational Services Seminars are required to sign. If you are not going to attend the seminars, you do *not* have to sign it.

*How can I get information about alternative lodging in New Orleans?*

Call the Greater New Orleans Tourist & Convention Commission, Inc., 504/566-5011.

*What social events are included in the registration fee?*

Social events included in the registration fee are the welcoming reception and dinner banquet. The post-conference tours are optional. In other words, you have to pay extra for the Honey Island swamp adventure! Δ

## LETTERS

### Invoice changes

I would like to clarify some comments I made in the June issue of *Focus* concerning service invoicing and contracts. The section I am referring to is on page 24, beginning with "Carter."

At the beginning of the statement, we talk about changes made in the software for our contract system. These changes have resulted in much more accurate invoices, which are referred to at the end of that section. However, the four changes talked about in the middle are not currently reflected in the customer invoices. Actually, these changes will be appearing in the December 1989 invoices, which will begin mailing to customers in mid-November. Specifically, these changes, or improvements are:

- Invoice calculations being made at the

model level rather than at the contract level

- Credits appearing on the invoice as soon as they are issued
- Summary statements at the beginning of each invoice
- Shorter and easier to understand invoices.

I hope that this will clear up any confusion that customers may have concerning their service invoices. Customers have been asking for these improvements and we are working to deliver them. We just want to make sure that they know when to expect them.

Thank you,  
Steven C. Carter  
Manager, Field Communications  
Data General  
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# Learn the RIG/SIG secrets

## Conference workshop will benefit your organization—and it's free

The **RIG/SIG Committee** has been working fast and furious to plan the first annual **RIG/SIG Workshop**, and it looks like it's really going to happen! The workshop is targeted to RIG/SIG leaders or representatives, but is open to anyone interested in starting a new group or getting more involved in their present group. There is no charge for attending this informative workshop, which is scheduled for Monday, September 18, from 1:30 to 5 p.m., at the New Orleans Hilton. A preliminary schedule of topics and speakers is provided below.

- 1:30—2:00 p.m. RIG/SIG accounting (Calvin Durden)
- 2:00—2:30 p.m. Newsletter creation (Greg Farman)
- 2:30—3:00 p.m. RIG meeting programs (Leryl Cash, Steve Kern)
- 3:00—3:15 p.m. Break
- 3:15—3:30 p.m. SIG workshops (Charlene Kirian)
- 3:30—4:00 p.m. Motivational techniques (to be announced)
- 4:00—5:00 p.m. Using RIG/SIG resources: (Cathlene Gentry, Bart Bates, DG representative to be announced)

RIG/SIG Committee members are very excited about the workshop and think the information will prove to be beneficial to all regional and special interest groups—no matter how big or small, how active or inactive. We'll see you there!

The **Educators SIG** encourages all members to attend the annual meeting at the NADGUG conference. The meeting will be held on Wednesday, September 20, at 5 p.m. To talk about details of this meeting of the minds, contact either **Jim McFarlane** of Alvin Community College, 713/331-6111, or **Ed Lindberg** of Western New England College, 413/782-3111.

The **Infos SIG** meeting at this year's conference will feature a presentation from two key DG Infos specialists: **Tony Coor**, project leader for Infos, and **Linus Hicks**, senior software engineer. Their talk will focus on performance issues of Infos 5.0 and plans for Infos in Unix. The meeting is scheduled for Tuesday, September 19, at 5 p.m. Any questions concerning the Infos SIG should be directed to **Jim Siegman** at 312/673-1700.

DG users interested in an **Office Publisher** special interest group will be glad to hear that an initial meeting will be held during the conference. **Carolyn Hunt** at ECC International is overseeing the start-up activities. Interested parties can call

Carolyn at 407/859-7410, ext. 2438.

The **Colorado DG Users Group (CODGUG)** held its July 27 meeting at the U.S. Air Force Academy in Colorado Springs. The session began with a brief business meeting and quickly moved on to the more exciting stuff. Members were briefed on the academy mission and shown how the academy uses its Data General computer. The group was offered a tour of the computer center and other academy facilities. The next meeting of CODGUG will be held on September 14. For more information about CODGUG, contact **Bruce Carey** at 303/755-6300.

The **Metropolitan New York Regional Interest Group (MNYRIG)** held a meeting on July 25 at the DG sales office in Saddle Brook, New Jersey. The meeting focused on AOS/VS 7.6x and system performance. The group holds quarterly meetings and encourages all New York and New Jersey DG users to attend. Details can be obtained from Steve Kern, 201/825-6400.

**DGUI (Data General Users of Indiana)** will discuss AOS/VS II at the next meeting, September 20. The November 15 meeting will address career opportunities in the Data General marketplace. People with suggestions for meeting topics or programs that may be interesting to the Data General Users of Indiana are asked to please submit their ideas to **Annette Kaub** at 317/573-2980.

Don't forget to submit your annual report to the **NADGUG Executive Board!** The deadline has been extended to August 31.

The **RIG/SIG Luncheon** will be held Tuesday, September 19, in the New Orleans Convention Center. The luncheon will be held from 11 a.m. to 1 p.m. The above-mentioned reports will be read at the luncheon by a representative from your group. If your group will not have a representative in attendance at the luncheon, please mail the report to me so that I can represent your group. △

---

*Cathlene Gentry is the RIG/SIG coordinator for NADGUG. She may be reached at Focus magazine, 4807 Spicewood Springs Rd., Suite 3150, Austin, TX. 78759; 1-800/877-4787, (1-800)USR-GRUP.*

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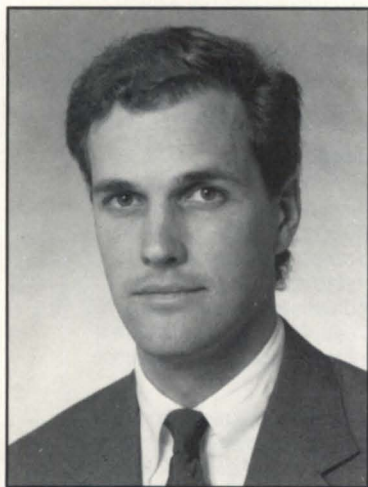
July 89: UBB ported to the DG AViON under DG/UX  
- another World First for Transoft!

SEE US AT  
NADGUG

# Object management and user interface

## SYNOPSIS

DG rushes to catch up with the current wave of technology by improving the look of the screen and tuning up the software.



Chris Stone

The new look, based on object management and NewWave, an environment developed by Hewlett Packard, will provide a single window, or view, into an organization's entire network of information and computing resources. Icons and pull-down windows will decorate our desktops. In addition to improving the outward appearance of our machines, the technology will allow users to concentrate on completing their tasks, rather than learning individual applications. The reasons for adopting object management and NewWave are discussed in this interview with Chris Stone, software group manager for Data General.

**Focus:** In April the Object Management Group, a new industry R&D consortium, named you as its first executive director. Why did you get the job? Will it take you away from your DG position as software group manager?

**Stone:** No, I still have both jobs. There are a couple of reasons for that. We believe—both DG as a company and the OMG as an industry group—that object management will be the preferred software platform of the 1990s. DG was one of the major forces pushing for the Object Management Group, both because we believe it's in our best interests, and because we believe it will improve the design of our software. I was named executive director because I'm with DG, and because I was the guy who had been doing most of the pushing.

The two jobs have me working in the same general area. DG has an architect-

## Group promotes "mix and match" applications

When the Object Management Group was formally announced in mid-April, it was a consortium of 10 international companies hoping to make systems and software from different manufacturers work together efficiently. By midsummer, the number of participating companies had nearly doubled, but the goal remained the same.

According to Chris Stone, the group's executive director, the OMG is working for the adoption of a "common worldwide object-oriented applications-integration environment that will allow users to mix and match independently developed applications across various operating systems." Specifically, the group expects to:

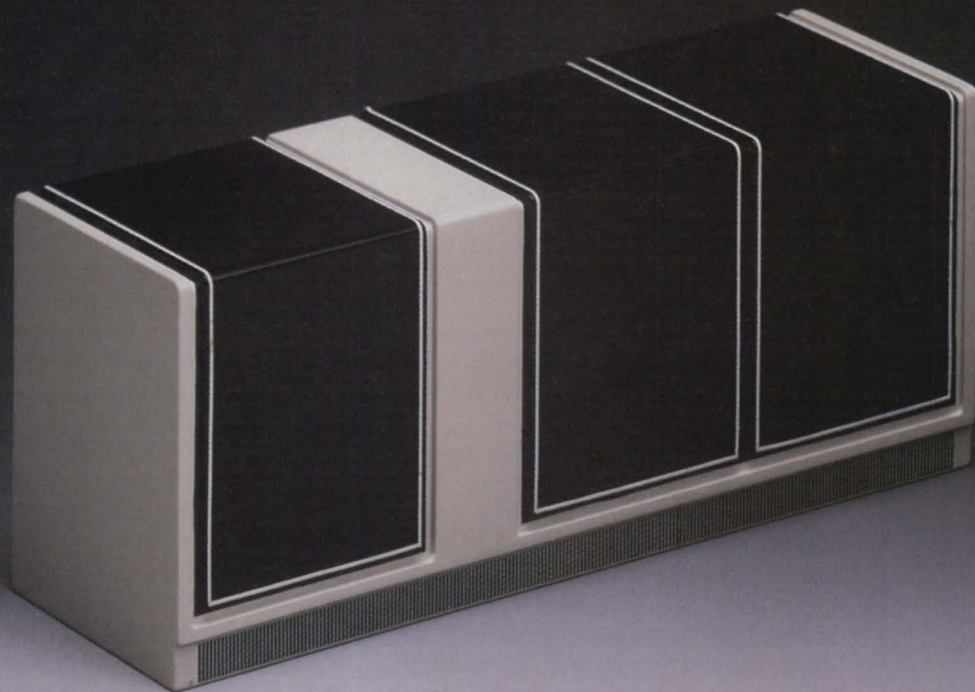
- promote an object-oriented environment based on appropriate industry standards
- promote a framework to guide independent development of compatible applications
- enable applications to be coordinated

across heterogenous networked systems in a multinational, multilingual environment

- adopt a core of commercial implementations of the framework and promote their market acceptance internationally
- influence the future development of these core products and technologies
- foster the development of tools and applications that conform to and extend this framework
- provide a mechanism for certifying compliance with the core technology
- adopt Hewlett-Packard's NewWave object management facility, independent of user interface, as a working example of this framework.

Membership fees for corporate members range from \$5,000 to \$50,000 depending on the size of the company. Associate (non-voting) memberships are available for individuals (\$500) or companies (\$1,000) that are not selling products for the object-oriented environment. △

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- g Seminars held for Federal Government only.
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## FOCUS ON: USER INTERFACE

ture we call DAA, for Distributed Applications Architecture, and a lot of the underlying technologies in DAA have to do with object management. Object management basically makes up the core, or the base set, of the software we're working on. In simple terms, let's say you're working on a new CEO-like product that supports DOS windows, Unix workstations, and Unix service over multiple LAN transports. How do you distribute all that? That's basically what object management is about.

I don't plan on wearing both hats forever—we're searching now for a full-time executive director.

**Focus:** What does object management mean? Can you give us some examples of what benefits it's supposed to have?

**Stone:** Most computer science people view object management as more language-oriented—a way to develop software based on modules rather than reading sequential instructions. That's certainly a big part of it, but using object-oriented software does a couple of other things for you as well. For one, it forces developers to think differently about how they design programs. For example, if you're designing a word processor, you're not being paid to design a filing system, a printing system, a mail system, and so on. If you went out and looked at Wordperfect or Lotus, or whatever else, you'd probably agree with me that they have pretty weak file systems and mail systems, because that isn't what they were doing.

However, you could develop those programs as "objects," that is, as intelligent pieces of information that can be plugged into each other. Then you could have an object management layer that everybody wrote to, and you'd solve the problem. Then my Wordperfect document and Lotus spreadsheet and Micrographics bar chart could actually be built as a single document, rather than as all this "cut and paste" nonsense.

That's the crux of it. Then you want to expand that across the network, so you're actually distributing the processing among groups of people. That's the advantage for users.

Writing to this model can also cut development time by 30 to 40 percent. When you develop pieces of code that are all

very similar, you can use the procedures over and over. You don't do that in today's application development. Look what Lotus has just gone through with rev 3: it took them three years to get it out, and now the thousands of applications that knew how to talk to Lotus rev 2 will all have to change. If everybody had written to an object layer, we wouldn't have that problem.

For a vendor like Data General, object management can help attract more applications developers, because it's a system that is usable across a variety of boxes and operating systems. And once you've built the core, you can add applications freely. We've always talked about how you can add your favorite application to CEO, but believe me, it was a nightmare doing it. With object management that goes away. And you can also cut your time to market dramatically.

In addition to all these practical advantages, DG is supporting object management because it puts us on the leading edge. In the same way that integrated office systems were the rage in 1982-84, we expect that distributed systems using this technology will be the next step. Plus, it's all designed independent of silicon—it doesn't have to run on the 88K; it can run on anybody's Unix.

**Focus:** Is this approach anything like the standards that Apple established for developing Macintosh applications, so that products from different vendors would have a common appearance and use the same general commands?

**Stone:** Yes. You could argue that the Mac is object-oriented. It is, in the sense that objects are on your screen and you can move them around, and when you click on a document it PROCs the application (which is completely opposite from the usual way of doing things). The difference is that the Macintosh is closed.

**Focus:** Is this all just a visionary's dream of the future, or is it something that could realistically be implemented with current technology and reasonable cooperation among vendors?

**Stone:** It's way beyond the visionary stage. The vision was a year and a half ago. We expect to have products in this area within six to eight months.

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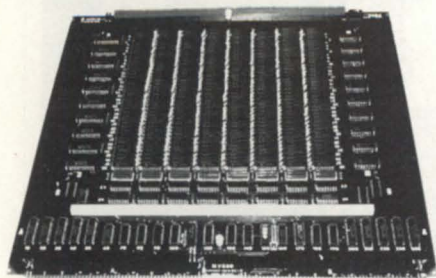
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**Focus:** What's been happening with the OMG since they named you as the executive director?

**Stone:** So far the group has been spending a lot of time drumming up new members. We started with 10 members and are now up to about 18; we're targeting to have 40 or 50 member companies by the end of the year. Right now we're adding about a member a week.

OMG is a corporation, and its board of directors has had a couple of meetings where we worked on structuring the technical committees so they can go off and select products to support. We've already chosen one product that we want to promote: it's a facility in Hewlett-Packard's NewWave called Object Management Facility. We expect to promote other object-oriented products in the area of network distribution, data bases, languages . . . things like that.

**Focus:** Looking down the list of members, I see American Airlines, Canon, and a few other companies I don't usually think of as part of the computer industry.

**Stone:** I wanted very much to have an international flavor, and the people who were starting OMG all agreed that we shouldn't form the group until we had some international representation. Canon was actually one of the first to come in. One of the major reasons is that they're developing a 16-bit, 2-byte Kanji version of NewWave, and they wanted to expand on that based on some of the work being done by other members of the Object Management Group. In addition, Canon has taken the lead in forming sort of a Japanese version of the OMG, so we will be working with companies like Toshiba, Matsushita, and Sanyo. Europe is also very progressive in this area. We're working with Philips and other European companies to make sure they're represented as well.

**Focus:** DG is already participating in several industry technical committees and research consortiums—notably 88Open and the Corporation for Open Systems—but the Object Management Group seems to be getting more attention than the others. Why is that?

**Stone:** Well, it is getting a lot of attention. It seems like every time I pick up a magazine somebody else is writing about it. I think the reason it's getting so much attention is that it has no political manifestation. We don't have the political battles like, "My Unix is better than yours." There aren't any network issues, because it's independent of the network. And there aren't any de facto standards to deal with because virtually nothing existed in this area. The group was formulated solely to promote a technology for the future. We believe that software designers and end users want to be able to mix and match information, and that this is the way to do it—and at the same time it can drastically reduce development costs. There's already a lot of substance behind this idea, but it won't happen without a lot more work and education.

**Focus:** But if there aren't any products to promote or axes to grind, what was the impetus for getting companies to participate?

**Stone:** Well, everybody likes to get on a bandwagon if they know they can help steer it. We started thinking about forming a group almost two years ago. When DG built CEO in 1979-80, there weren't a whole lot of companies doing that, and the difference was that you wanted to be very proprietary and not let anybody else know what you were working on. A couple of years ago we decided we wanted to build a similar product, particularly for the Unix and DOS client markets, but this time we wanted to be "open." That meant the first thing we had to do was find out what else was out there. With DG's support, I contacted Hewlett-Packard, because we knew they had been developing this product called NewWave. Prime Computer was also very involved from the beginning. I also hired a consultant to help scope out some of the people who might be working in this area. We got together in Boston a year and a half ago . . . HP, DG, Canon, and Prime were the first four, and then it grew from there.

**Focus:** Why did the OMG decide to promote the Hewlett-Packard "NewWave" user interface?

**Stone:** It's not just the user interface, but

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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.
```

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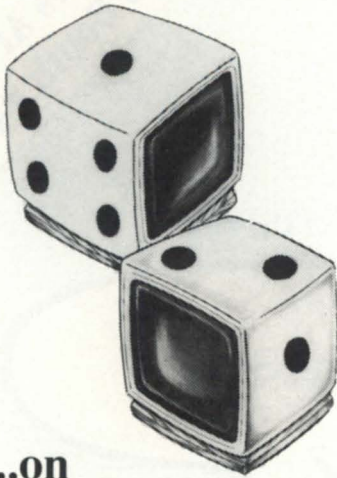
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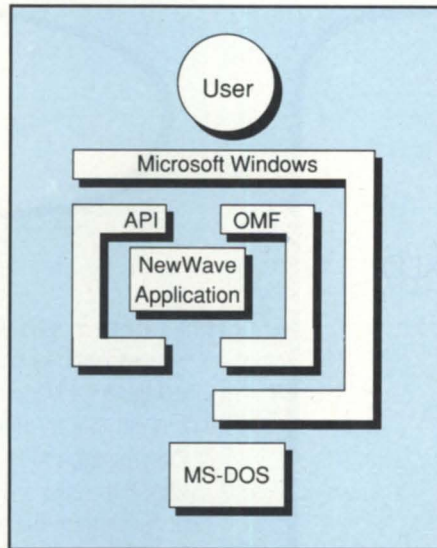
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## FOCUS ON: USER INTERFACE

that seems to be what everybody is thinking about. Aside from the pretty face, NewWave provides a lot of neat tools, particularly in the area of a task language, which they call Agent, and in the area of the Object Management Facility—the way they manage objects on the desktop.



Object management facility capabilities

**Focus:** When DG develops products to this standard, will they have the appearance of the NewWave user interface?

**Stone:** Yes.

**Focus:** Why is DG supporting NewWave instead of one of the other interfaces that is begging to be adopted?

**Stone:** Quite honestly, because NewWave has a better shot—a better probability of adoption than any of the others. Not only that, but NewWave doesn't require that everything start anew. It allows you to encapsulate existing applications. That's important, because the world won't suddenly be object-oriented next year. For many years to come we will have to co-exist with applications that were in use long before any of this came about.

**Focus:** Most good ideas have some kind of down side. For instance, does the flexibility you offer carry significant penalties in performance?

**Stone:** That's always been a myth about object management. A lot of people assume object management means big fat

pieces of code and poor performance. It's really just the opposite. The whole concept of developing with object management means that you break the code up into intelligent pieces and optimize the pieces. Then you use them appropriately. We don't see any performance issues other than the network bandwidth issue, and of course that's independent of object management.

**Focus:** Assuming that the OMG is successful, will these benefits be extended to both the MV family and the new Avion products?

**Stone:** Both. And we will *have* to be successful.

**Focus:** What else do you have to do other than sign up lots of vendors for the OMG, to really make object management catch on?

**Stone:** I believe it's already caught on. Unfortunately, there are some factions forming now. For instance, Microsoft is saying they plan to do it their own way. I have a feeling that's going to come back to bite them in the near future. We're talking to the other major vendors, and Microsoft is the only one that seems to think it's God's gift to the industry.

**Focus:** Do you think that the products and approaches that the OMG is working on will be adopted as de facto standards?

**Stone:** I think some of the technology we're working on, both in DG and in the OMG, will actually become de jure standards, because there's a lot of pressure from users and a lot of support from vendors to establish standards.

**Focus:** How will this fit with DG's traditional market presence?

**Stone:** We want to be known as a technology provider, but we're really emphasizing the distributed computing arena, which we believe will be one of the primary markets over the next couple of years. Office automation as we used to know it has pretty much changed. What we did with CEO back in the early 80s we expect to do again with a new set of products, all based on the object management model. Δ



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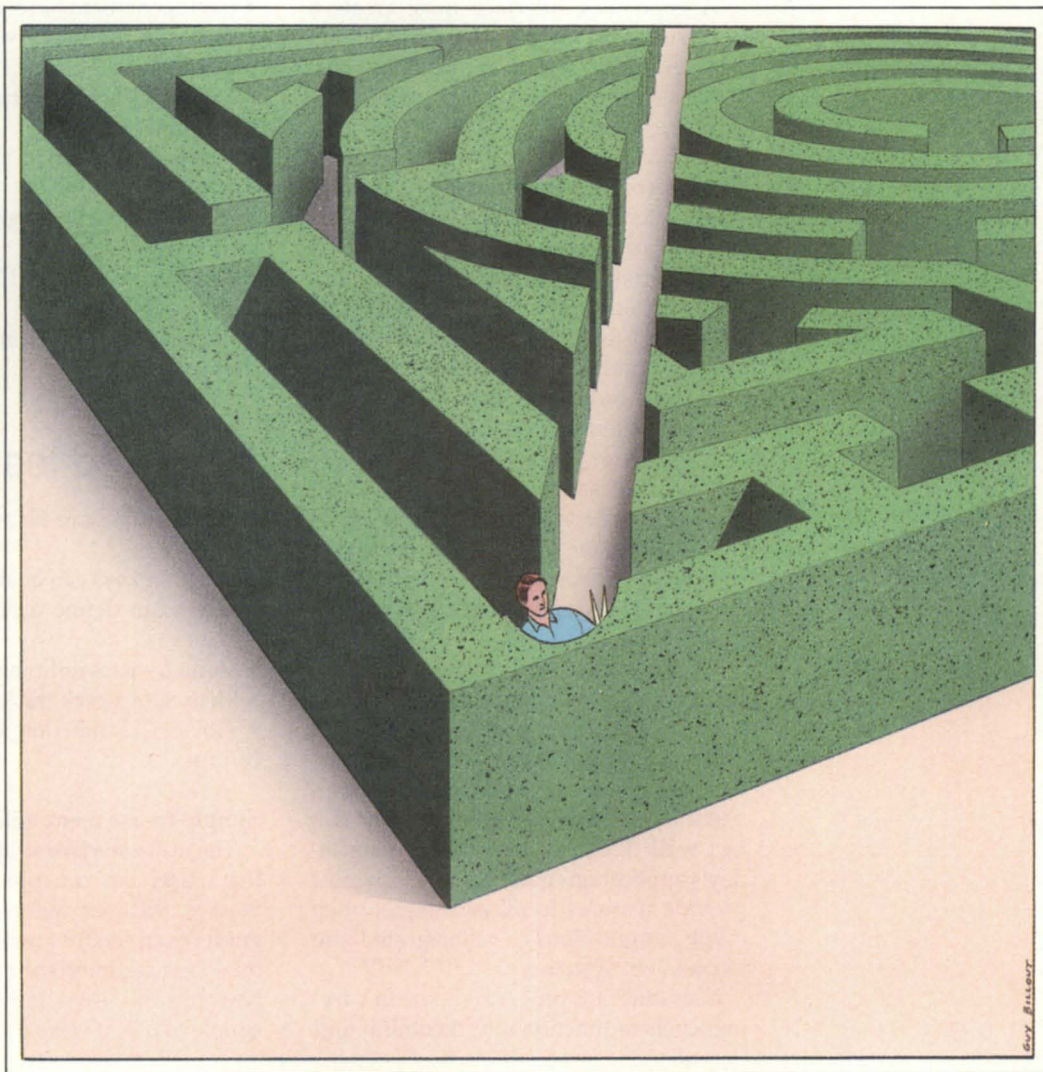
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# Getting the most out of user interface

by Daryl Hunt  
Special to Focus

## SYNOPSIS

*User interface programs vary in their degrees of functionality, flexibility, and ease of use. The author explains what to look for in a user-friendly system.*

Today's computer applications are difficult to use. Basic commands such as EXIT, SAVE, and HELP are inconsistent between applications and are located on different function keys (if they are accessible by function key at all). And each application has its own code for denoting start-up switches and arguments.

A good user interface must create a consistent and simple user environment for a group of unique applications. That is not a simple undertaking, but it is possible.

## My interest in user interfaces

My interest in user interfaces started a number of years ago. I was assigned a few programs to enhance and support. One was a user interface system. Later, I was asked to create a second user interface for another client. The first interface could not meet their needs. I now had two user interface systems to maintain.

A few years later, I was requested to design an "easy-to-use, consistent, and flexible" user interface. One requirement was to allow the user environment to be interactively changed to fit the needs of each client. The end result was a product called MenuOP.

## Features of a friendly user interface

I have learned the hard way that not all computer applications are "friendly." Fielding questions from users and managers of computer systems taught me that fact well. The user interface driving today's applications must be flexible. It must provide features to allow unique, often cryptic applications to be integrated into a consistent system.

User interface programs come in varying levels of functionality, flexibility, and

ease of use. One example is Data General's Command Line Interpreter (CLI). CLI may be efficient, but it is not simple to use or safe to use either. Not everyone has the time to learn enough CLI commands to perform day-to-day activities.

Several features are desirable in a user interface. These features may be divided into basic and advanced categories. They are described below.

## Basic features:

- Simple-to-use menu selections
- Help for all applications
- Intelligent menu screens
- Controls the user's working environment
- Controls the application's runtime environment
- Passes switches and arguments to applications
- Provides reports of application and user settings
- Requires no command line environment knowledge
- Keeps users from command line environment.

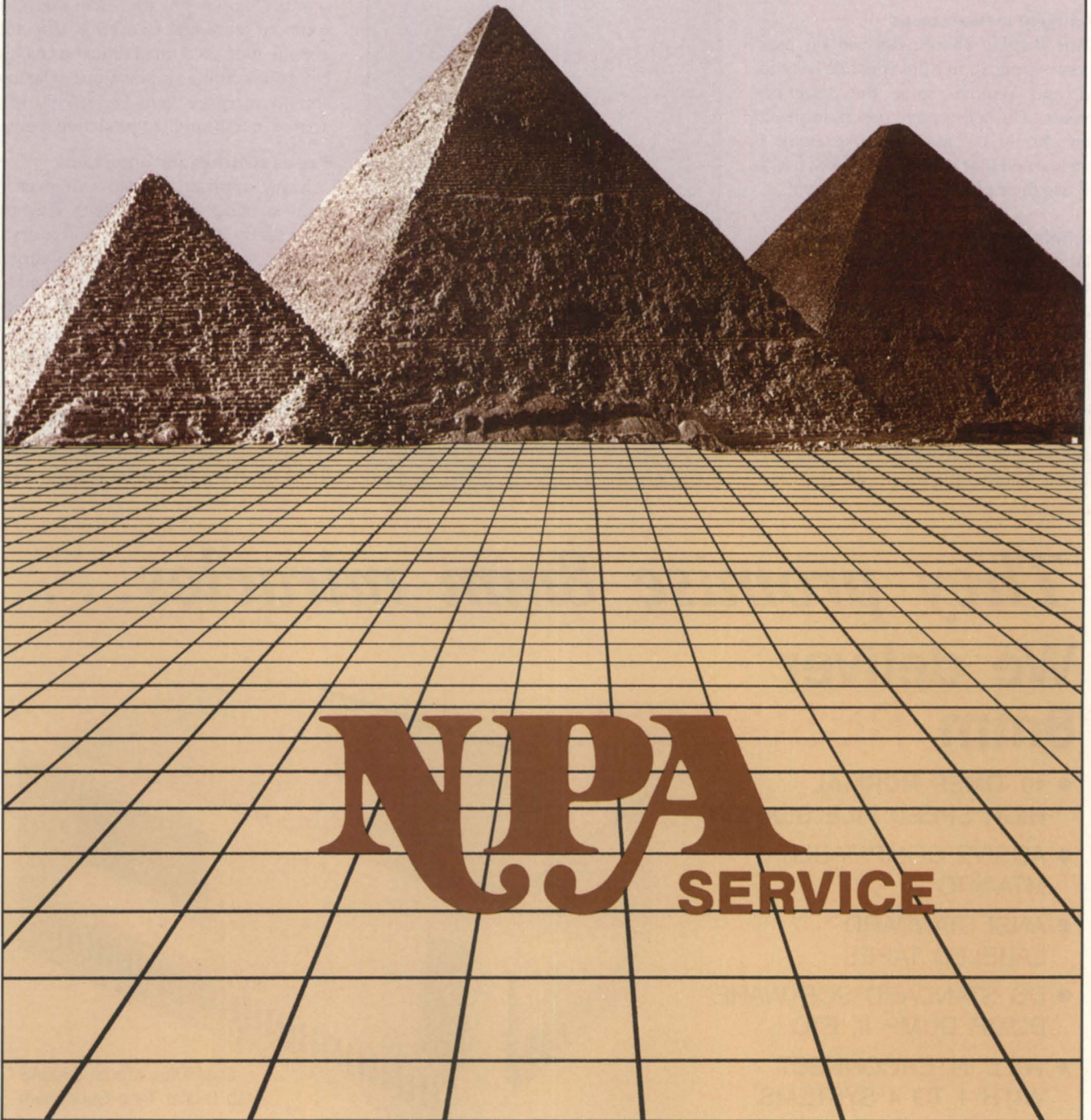
## Advanced features:

- Applications can be assigned to function keys
- Function keys can be rearranged
- Users can define a personal function key set
- Menu by-pass jumping
- Menu jump-back tracking
- Go to CLI function key with access control.

## Simple-to-use menu selections

The user interface should be so simple that a user can run applications and CLI macros without referencing a user's guide, even the first time. To accomplish this, the user interface must have all the basic features listed. If the interface is not simple to use, it is *not* useful!

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### Help for all applications

The ability to view help screens describing each application program or macro must be available. Help should be easy to update by the local manager.

### Intelligent menu screens

Title display should depend on user access. Application titles must be easy to add and remove from the selection screen(s). The help screens describing each entry should be one keystroke away. I have learned that if help is not easy, users will use their phone as a help system!

### Controls the working environment

Working environment settings may vary for each user: which applications to run, the arrangement of function keys, working directory, searchlist, CLI access, and switches/arguments to applications, just to name a few. The user interface must be able to define these values. It is also a plus to be able to define user defaults that are used unless specifically defined. Another big plus is the ability to

The help screens describing each entry should be one keystroke away. I have learned that if help is not easy, users will use their phone as a help system!

denote which values can be changed by the user.

### Controls the runtime environment

Application runtime environments often vary. System privileges (superuser, number of son process, etc.), and environment settings (working directory, generic files, etc.) must often be changed before executing applications. The user should never see them, because the manager should be able to predefine them.

### Passes switches and arguments

Many applications allow or even require switches and arguments. The notations used are often cryptic, and users are forced to remember them. The ability for a manager to predefine an application's parameters is a must. And of course, manager-defined help for available parameters should be at the touch of a key.

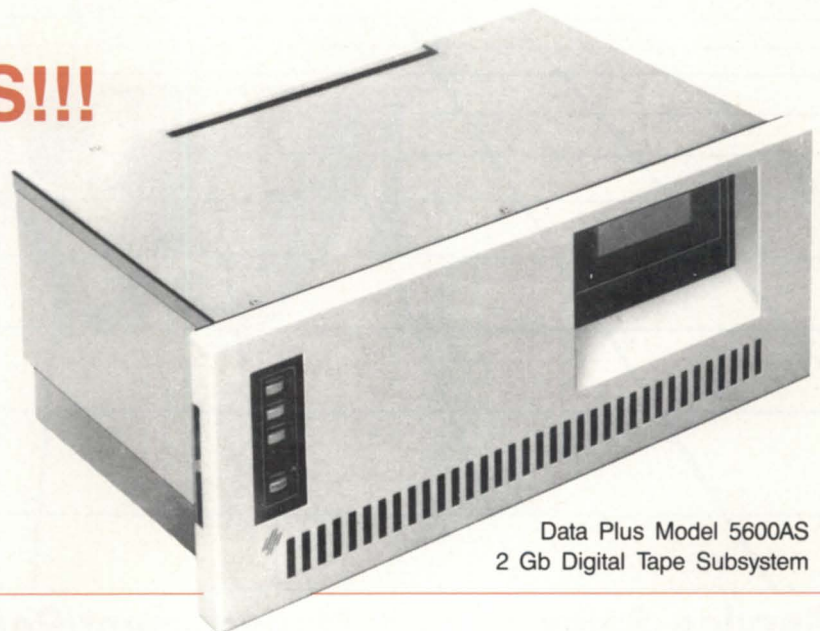
### Provide reports

Once a user interface system has been created, it is essential to be able to report on its structure. Information about which

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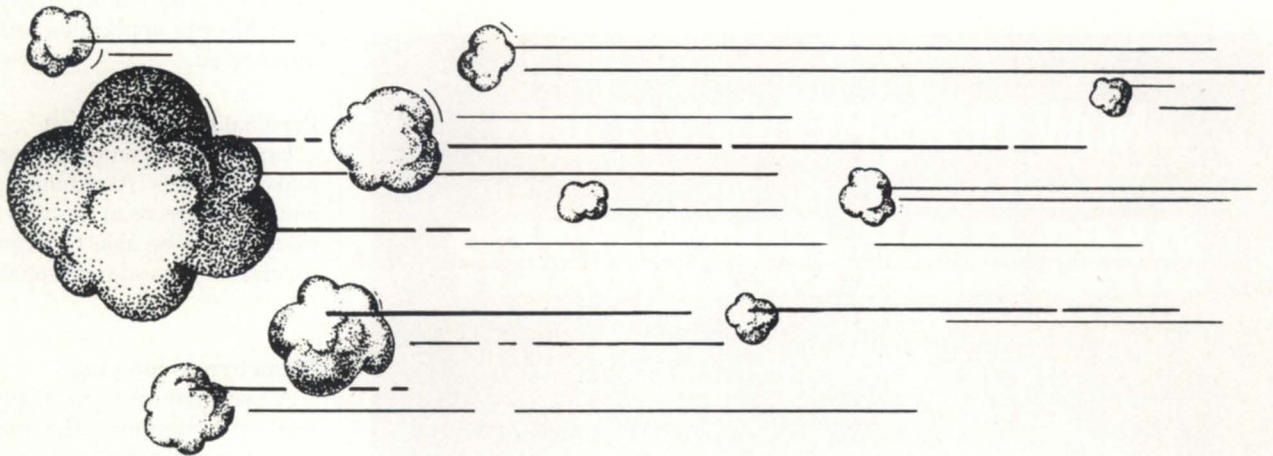
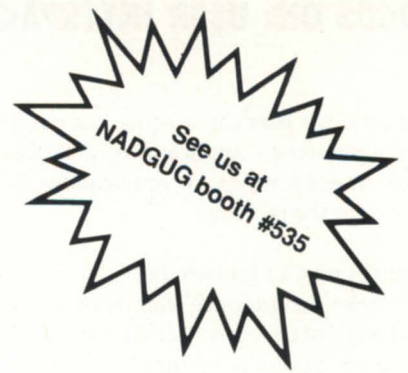


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applications a user can execute, the parameters passed to applications, and the environment settings for applications is helpful for the manager.

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### Keeps users from CLI

The CLI environment is a dangerous place for inexperienced or upset users. A user interface must have the power to restrict access to the CLI.

### Applications assigned

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are used by many people. It is nice to be able to assign these applications to a function key. This allows the application to execute from any menu screen by simply pressing a function key.

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The function key location of basic commands (like help and exit) varies between software packages. The ability to arrange the user interface function keys to match your favorite application will be much appreciated.

### Personal function key set

Experienced computer users like to make shortcuts. Assigning applications and menu screens to function keys is one example. To be able to define a set of function keys as your personal set is helpful.

### Menu bypass jumping

A user may need to display another menu of applications. The ability to jump directly to that menu and bypass the display of intervening menus is a timesaver for an experienced user. Ever been logged on via a modem and watched the screen refresh useless information over and over? Even at high transfer speeds, unnecessary displays become tedious.

### Menu jump-back tracking

You will want your user interface to remember where you have been and allow you to backtrack. Most users prefer one selection screen they can call home. They would like to be able to return home easily after displaying other selection screens. A feature to allow them to backtrack is just the key.

### Go to CLI function key

This key must have access restrictions. But it is a lifesaver for the manager, and some experienced computer users. There are just some times you must get to the CLI and you do not want to terminate the user interface. This key must work from any data entry point or it becomes annoying.  $\Delta$

*Daryl Hunt is a Senior Systems Programmer at Concept Automation, Inc. He can be reached at Concept Automation Inc., 1319 Moran Road, Sterling, Virginia 22170; 703/450-6000.*

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# Winning the shell game

**SYNOPSIS**

*Customize Wordperfect's shell menu for simple, error-free use of the CLI.*



by Kent Finkle  
Special to Focus

Data General's Command Line Interpreter (CLI) prompt can intimidate an inexperienced user, who may be baffled by the mysteries of files, directories, and searchlists. Even after CLI is mastered, typing errors and lapses of memory can lead to unexpected results. However, there is a quick and easy solution. Wordperfect's shell menu generator gives CLI a friendly interface, allowing the novice to execute any program easily, and the expert to condense a complex chore into a single keystroke. Your organization benefits from simple, error-free use of the CLI and lower costs for training and support.

To run a program from a shell menu, you merely press its letter. After the program finishes, the shell prompts you with "Press any key to continue . . ." When you press a key, the shell quickly returns you to the original menu. Anyone who helps inexperienced users run programs from the CLI will know how useful such an easy method could be. There are no

more typographical errors or forgotten commands, and long, repetitious combinations of keystrokes are compressed into a single letter.

**Menus for all**

A global shell menu can be set up in a few minutes as the default for all users on the system. Customized menus can be written to meet the special needs of individual users just as conveniently. If needs change, the shell allows you to modify a menu at any time. This feature lets you develop a custom menu as you work.

While the shell can shortcut your way to Wordperfect's word processor, spreadsheet, or other programs, it is much more versatile than that. A menu choice can also be a CLI macro or a vertical application program.

**Cost savings**

The town of North Andover, where I am the system manager, has cut its training costs significantly using custom shell menus. Rather than teaching each user the intricacies of the operating system, we simply write a menu, with entry to the user's frequent applications reduced to a single keystroke. This hides the complexities of the operating system from the users, and lets them get on with their work.

The command to run the shell menu system is "Shell" at the CLI. If you want to run the menu automatically when the user logs on, add the command "Shell" to the user's Setup.cli file. If you don't want the user to see the CLI prompt at all, just add the command "BYE" immediately after the command "Shell" in the Setup.cli. This will cause the user to be logged off after exiting the shell.

**Set-up menu**

To create a menu for a user, just log on under his or her username, and type the command "Shell/s" at CLI. The SETUP MENU appears. At the bottom of the screen, you will see:

1 Edit; 2 Header; 3 Add; 4 Del; 5 Move; 6 Change Ltr; 7 Submenu: (F7 = Exit).

Let's examine the SETUP MENU options one by one.

Edit (Option 1)

Edit lets you add a choice to the menu or change an existing choice.

Press "1."

The "Program Information" input form appears. At the "Menu Description" prompt, type the name of the program as you want it to appear on the menu. For example:

Program Information: "Wordperfect."

Shell prompts you with "Selection:." Let's say we want to run Wordperfect, set up to print at printer number 3. We want Wordperfect to load the document "Myfile" and run the macro "START-MACRO" when it loads. This can be accomplished through a CLI command.

Selection: "2"

The next prompt is "CLI command." Shell is waiting for us to enter the CLI command we want to execute when this menu choice is selected.

CLI command: WP/o=3/m=START MACRO MYFILE

Shell accepts the command and returns us to the "Program Information:" prompt.

Program Information: EXIT (Function key 7)

Shell returns to the SETUP MENU. The menu description we entered, "Wordperfect," is in the upper left-hand corner of the SETUP MENU, emphasized with a horizontal "highlight bar." Now we want to give our lone menu choice a letter. Press 6

Shell asks us to choose a letter from A to Z.

Enter new letter (DEL to delete): W

Shell adds a "W" in front of the menu selection "Wordperfect."

Of course, a menu should have more than one choice, so let's add another Wordperfect program to the menu.

Use the arrow keys to move the highlight bar underneath the "W—Wordperfect" entry.



Press 1

To add Mathplan to the menu, we repeat the steps above.

Menu Description: Mathplan

Selection: 2

CLI command: MP

Press EXIT (Function key 7)

At the Setup Menu, pick 6, for "Change Ltr"

Enter new letter (DEL to delete): M

Now we have two items in our menu.

#### Non-Wordperfect application

Let's imagine that we have a non-Wordperfect application program that we run frequently, called Payroll. Conveniently, the process of adding Payroll to the menu is similar. Use the highlight bar to point at the spot on the screen you have chosen for the Payroll menu entry. Type "1" for edit.

Menu Description: Payroll

Selection: 2

CLI command: XEQ PAYROLL

Press EXIT (Function key 7)

At the Setup Menu, pick 6, for "Change Ltr"

Enter new letter (DEL to delete): P

Now our menu includes:

W — Wordperfect

M — Mathplan

P — Payroll

#### CLI macro

Now, imagine that another application program, say DATABASE, requires a series of CLI commands before and after it runs, perhaps changing directories and otherwise modifying the CLI environment, and then restoring the original environment. To accommodate this, you can create a CLI macro with Data General's text editor SED, or with Wordperfect's PEDIT, and name it, for example, MYDATA.CLI. The steps needed to add the CLI macro MYDATA.CLI to the shell menu are similar to our previous examples.

Menu Description: Database

Selection: 2

CLI command: MYDATA

Press EXIT (Function key 7)

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At the Setup Menu, pick 6, for "Change Ltr"

Enter New Letter (DEL to delete): D

When the DATABASE menu choice is selected, shell will execute the macro MYDATA.CLI. When MYDATA.CLI finishes its business, you will see the familiar "Press any key to continue . . ." message. Press a key and the shell menu will return, ready for the next instruction.

### Instructions

To place comments, instructions, or other explanatory material on a menu, type the text after the "Program Information" prompt, choose 0 for "Selection," and press Exit (function key 7).

Menu Description: Press H for help

Selection: 0

Press EXIT (Function key 7)

### Help

You may want to offer a menu choice that provides help. Type the helpful text into SED or PEDIT. Either will create a text file containing the help instructions you wish to display. You could call this text file "MYHELP." Now simply add the choice to the menu as before.

Menu Description: Help

Selection: 2

CLI command: TYPE MYHELP

Press EXIT (Function key 7).

At the Setup Menu, pick 6, for "Change Ltr"

Enter new letter (DEL to delete): H

When the help choice is selected from the menu, the help text file "MYHELP" will be typed to the screen. Pressing a key at the prompt returns the user to the menu with one keystroke.

### Header (Option 2)

"Header" lets you modify the menu title to make it more personal for each user. For instance, if your user's name is Lee, you can make the title on the menu say "Lee's Menu."

Press 2 for header.

Options: 2 (Menu title)

Enter menu title: (Delete Wordperfect Library)

Enter menu title: Lee's Menu

Also, you can display the date, day of the

week, and time in various formats.

#### Add (Option 3)

"Add" allows you to insert a space for another choice into your menu. Place the highlight bar where you would like to create space. Press "3." The other menu choices will move aside to make room for the new choice.

#### Del (Option 4)

"Del" allows you to remove unwanted menu choices. To delete a choice simply point at it with the highlight bar, and press "4." Shell will delete the choice, and reposition the remaining choices to occupy any space left by the deleted choice.

#### Move (Option 5)

The Move command lets you arrange and rearrange the choices. Use the highlight bar to point to the choice you want to move. Press "5." From the list of letters displayed, choose the letter that corresponds to the new location. The choice is moved to the location selected.

#### Change Ltr (Option 6)

The Change Ltr command allows you to assign new letters to the choices on your menu. Use the highlight bar to point to the choice whose letter you want to change. When you select "6," shell prompts you for the new letter. Type the new letter and the letter of the menu choice is changed accordingly.

#### Submenu (Option 7)

If one menu doesn't give you enough room, the shell allows multiple menus. The Submenu command creates a system of submenus linked to a main menu. Even the submenus can themselves be linked to still more submenus, chained as deeply as you like.

#### The shell game

In short, if you want the ease, simplicity, and cost savings of running multiple programs from a standard interface, learn to use the shell. In this shell game, unlike its gambling counterpart, winning is always on the menu.  $\Delta$

*Kent Finkle is computer system manager for the town of North Andover, Massachusetts.*

## \*\*\*\*\* Attention Infos Users \*\*\*\*\*

The annual meeting of the Infos SIG will be held in conjunction with the North American Data General Users Group Conference, September 19, at 5 p.m. Both the NADGUG conference and the SIG meeting will be held at the New Orleans Convention Center.

**Featuring:** *Tony Coor — Infos Project Leader  
Linus Hicks — Senior Software Engineer  
Guy Sutton — Software Engineer*

**Topics include:** *Performance issues on 5.0 release  
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# Connectivity for the rest of us

**SYNOPSIS:**

*At last, Pacerlink provides DG users with terminal emulation and efficient transfer capability with the Macintosh.*

by Greg Farman  
Focus staff

Focus has devoted many pages this year to reviews of products that are supposed to help PCs find gainful employment as workstations connected to DG minicomputers. Having so many terminal emulation and file transfer products for the PC is sometimes confusing, but obviously the market supports the abundance of choices.

Compared to what's available for the PC, there has been a real dearth of products that do the same thing for Apple's

Macintosh. That's why DG's announcement last January of a new "strategic alliance" with Pacer Software caught our attention. We immediately called Pacer to say we wanted to get a review copy of its product for the DG market.

As is so often the case in this industry, things took a little longer than anybody could have guessed. Sometime in February, we received an impressive-looking package from Pacer, but the instructions all referred to loading the software on a VAX. A quick call confirmed that somebody in the shipping department had misunderstood our request; they had sent us their DEC product . . . and the DG version wouldn't be ready for another month or so. In late April another package arrived, but before we could unpack it, Pacer called to ask us to wait a week or so for a new set of diskettes. They had discovered some problems in the DG terminal emulation. Finally, the first week of May, we received a working version of the product.

It was worth the wait.

Not that this is a perfect product. I'll get to its shortcomings later in the review. However, it is a definite improvement on the methods we had been using to communicate between the art department's Macintoshes and our MV/4000. For the first time, we can actually give the Macs a second personality as fully functional DG terminals. More importantly, file transfers are now simple enough that even free-lance graphic art-

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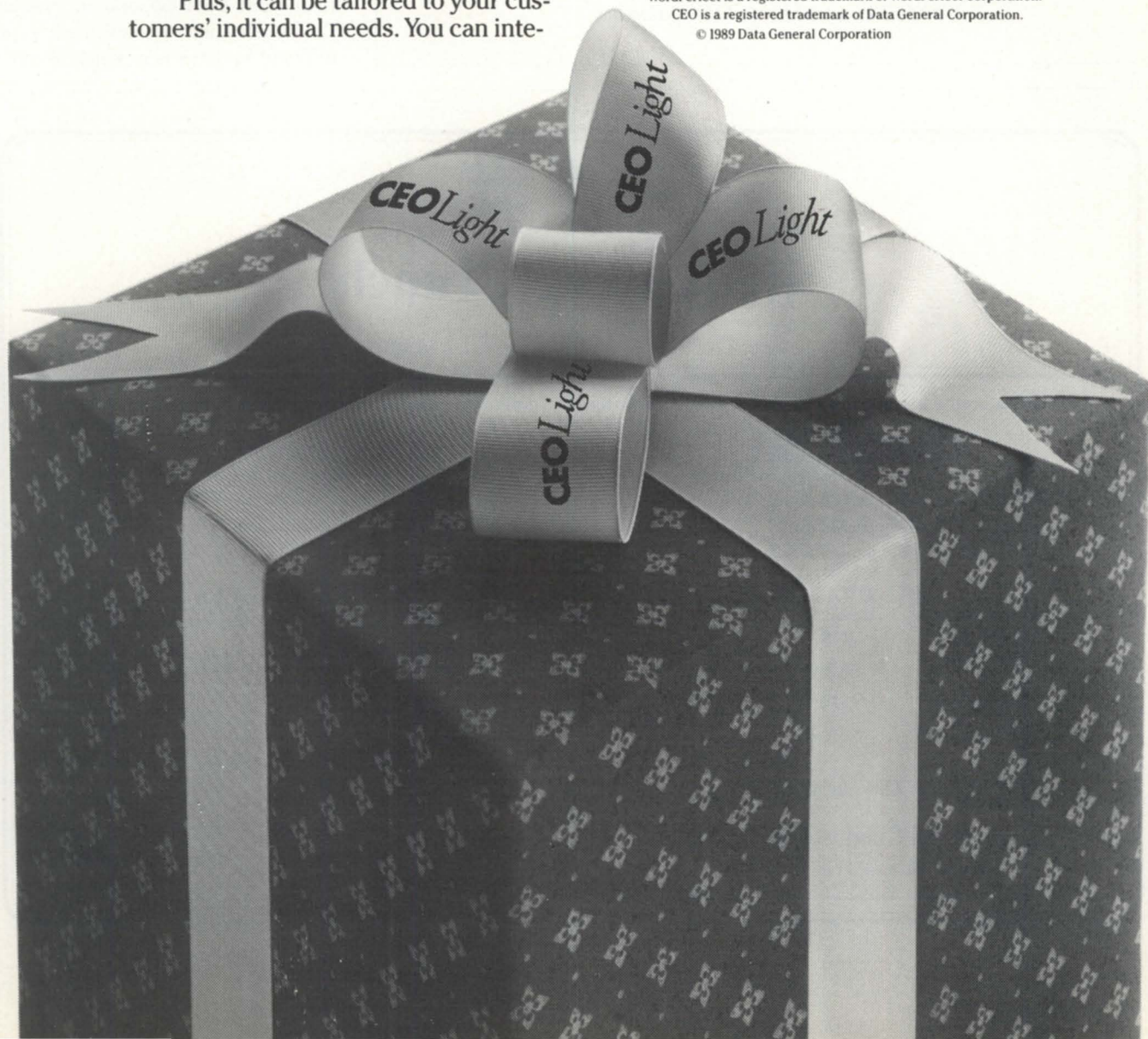
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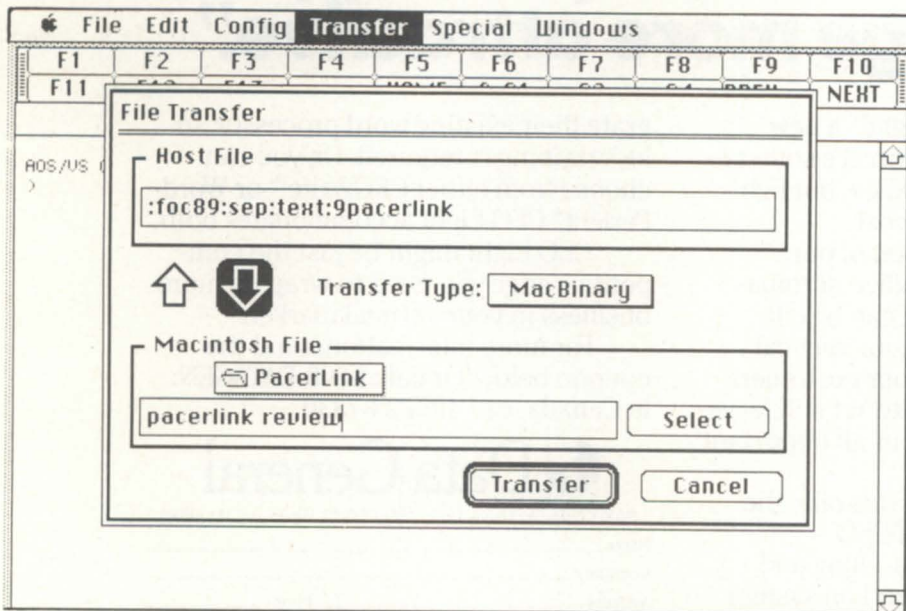
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*Pacer's "one-at-a-time" file transfer shows how to set names of files and direction of transfer. Note the bank of "softkeys" and CLI prompt behind the dialog box.*

ists couldn't mess them up.

Our review copy of Pacerlink arrived in a box about the size of a laptop computer. In it there were a 48-page Installation Guide, a 54-page Macintosh Users Guide, a reel of 1600 bpi tape, and two Macintosh diskettes.

The documentation was well-written and (mostly) accurate. I was surprised to find that only about two pages in the Installation Guide dealt specifically with Data General systems. The rest of the book tells how to install the emulation software on the workstations (it works on PCs and PS/2s, as well as the Macintosh), how to load the server software on the supported host systems (including not only DG, but also Prime, Stratus, VAX, and Unix or Ultrix hosts), and how to run the package on networks (Appletalk and ethernet are currently supported).

According to Peter Coppola at Pacer Software's development office (down the road from Data General in Westboro), Pacerlink's ability to work with so many different systems is a major benefit. I'll

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have to take his word for that part, because I was only able to test it on our MV/4000. However, it's easy to see that a site with a mixture of hosts and workstations would save a lot of frustration and training if it could use the same product, with the same commands and procedures, regardless of which host the workstation was connected to.

Having plowed through the relevant fractions of the Installation Guide, it was a simple matter to load the tape onto our MV/4000. By itself, however, this was not a very satisfying accomplishment, because it still didn't allow me to do any-

revenue from unauthorized copying of their emulation software, because they use a proprietary technique for file transfers, and do not support any of the readily available public domain protocols. Unless it is communicating with a licensed host, a workstation running the Pacerlink emulator can't do much except act as a dumb terminal.

Even so, it would be a better than aver-

age dumb terminal. Pacerlink emulates DG's Dasher D461 very well indeed. Mapping of function keys has been a problem for other Dasher emulators for the Macintosh, but Pacerlink seems to have gotten it right—provided you read all the instructions for how to set up the "soft keys."

Instead of using the clover or option keys to turn the Mac's numeric keys into

*The company doesn't bother to license its emulation software for the workstation end of the connection; users are free to make as many copies as they like*

thing. The host programs are designed to provide file transfer service, virtual disk service, and print spooling—which are background services that don't come into play until an emulator program running on a workstation calls them.

It's worth noting that these server programs running on the host are what Pacer Software considers its "value added." The company doesn't bother to license its emulation software for the workstation end of the connection; users are free to make as many copies as they like. The host programs, however, will restrict the number of concurrent sessions to whatever level the customer has paid for. Pacer Software doesn't expect to lose a lot of

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function keys, Pacerlink sets up a bank of soft keys on the Mac's screen. The user can then set these up any way that's convenient. Individual soft keys can thus act as function keys, or they can send the host a predefined text string, or they can even push to a new series of softkeys. It's a complicated system, but it seems to have solved a problem that other emulators didn't. We hadn't been able to use Macin-

toshes to run word processing or spreadsheet programs on the MV/4000 because the function keys never worked properly.

This brings up one of my criticisms of the product: only a few sets of predefined soft keys came with Pacerlink, and none of them were ones I use regularly. If you're a CEO user, you're in luck, because all the regular CEO functions are already mapped into a set of four templates.

However, there isn't a set that's simply labeled F1, F2, F3, etc. It took about an hour of customizing the soft keys to come up with a basic function key set that should have been provided by the vendor. When I asked Peter Coppola about this, he said Pacer would add the basic function keys soon. The development staff had only used Pacerlink with CEO, SED, and the CLI, so they hadn't known what other soft keys should be provided.

After logging on and putting the terminal emulation through its paces with several applications on the MV/4000, I was satisfied. I used it with Wordperfect, Planperfect, CEO, and our ICobol accounting package, finding no problems at all. The next obvious test was to try it out with file transfers.

The combination of a good terminal emulator integrated with servers on the host gives Pacerlink a very simple way to pass commands and information back and forth between the host and the workstations. Using typical Macintosh pull-down menus, dialog buttons, and the mouse pointer, Pacerlink avoids the complex procedural commands we used to use for initiating a file transfer.

This is file transfer "for the rest of us," as the Macintosh ads promised. It's as simple as pulling down a menu labeled "transfer" and then clicking on a few choices. If, for example, you want to download several files from the host, you select that option, then wait about 10 seconds for the emulator to call the server. Wait another few seconds and a list of the files and subdirectories in your working directory will scroll into place. Double-click on a subdirectory, and its contents will be displayed. Then click on the files you want to download, select the type of transfer (text, binary, or Macbinary), and select the target directory on the Macintosh. That's all there is to it.

All this convenience isn't free, of course. Figure 1 shows that there is a substantial trade-off in efficiency compared to the file transfer method we had been using. Using a small, quick, and rather unfriendly Xmodem program, we were able to transfer binary data at 5.79 Kbps, using only about 5.1 percent of the MV/4000's CPU capacity. Pacerlink was about a third slower, and used about twice as much CPU.

My file transfer tests also uncovered a few peculiarities: text files transferred

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about 20 percent faster than binary files, and uploads ran slightly faster than downloads. I called Peter Coppola to ask why, and he explained that Pacerlink was written entirely in C for portability, and has not been completely optimized after being ported to AOS/VS. The binary transfers are running somewhat slower than text transfers on the DG platform but this is a temporary problem—something about the protocol needing to filter out certain control sequences that might otherwise foul up some network devices.

**Figure 1: File transfer statistics**

	Pacerlink		Xmodem
	1st copy	2nd copy	1 or 2
<b>A</b>	23:20	24:40	14:40
<b>B</b>	3.55	3.36	5.79
<b>C</b>	11.7	10.8	5.1
<b>D</b>	29.0	15.0	34.0

- A** Downloading a file (min:sec)
- B** Effective transfer rate (Kbps)
- C** Average CPU consumption (%)
- D** Avg. idle CPU during transfer (%)

Transferring a 622,014 byte Wordperfect document from an MV/4000 to either one or two Macintosh Plus workstations. The MV/4000 was supporting its usual complement of office and accounting users during the tests.

He expects this to be fixed early next year, at which time the binary transfers would run at least as fast as text transfers. This would have brought the effective transfer rate for the Wordperfect file into the range of 4.5 to 5 Kbps.

Coppola added that some files would benefit from file compression routines built into the Pacerlink protocol. Whenever Pacerlink encounters the same character four or more times in a row, it compresses it. Text files with lots of spaces or binary files with lots of nulls would be the main beneficiaries.

Performance isn't everything, of course. It should be balanced against the convenience of an intuitive, user-friendly interface. Pacerlink also offers additional features that may tip the balance for some users, such as the ability to print host

files on Macintosh printers, or to spool Macintosh files to DG print queues.

One more feature deserves some discussion, even though it is not really a practical matter at this point: virtual disk service. With a separate utility—sort of a mini-emulator—you can mount a virtual disk on the MV for the workstations, then store and access programs and data kept there almost as if they were part of the

regular Macintosh desktop. I say "almost" because of the performance factor: with an asynchronous connection moving only 9600 bits per second, this kind of disk service wouldn't be practical for launching an application or accessing frequently-used data. However, when ethernet service is added to the DG platform (probably in 1990), this may well become a practical option. △

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# Text formatting shortcuts

by John Huddleston  
Special to Focus

**SYNOPSIS**  
*Nroff tool creates attractive output in Unix.*

Data General's MV machines running under AOS/VS have word processing programs, while machines running DG/UX do not. However, there is a way to reformat text in DG/UX. Although it isn't as efficient as CEO or Wordperfect, the text reformatter known as nroff can be used to take files created with an editor and reformat them. This article will show you how to set up a UX (either MV/UX or DG/UX) shell script to utilize nroff and other UX commands to create attractive output.

If you have created a text file but want to change the borders or move the paragraphs, you will have to edit each line to get approximately equal line lengths. If you let the nroff text processor reformat it, you will save time. Many people are hesitant to use nroff because there are many commands to learn. These commands begin with a period and must be placed in the first column of the line you wish to revise. Our approach will be to set up a UX shell script that will use two of these commands to do all the work.

## NR uses redirection

Before I begin, it may be helpful to explain what composes a UX shell script. A UX script is a series of lines containing program names or other UX script names that are in your PATH. Programs are source code files that have been compiled and linked into executable code on your

machine. Most output from a program goes to the standard output, also called "stdout," or the terminal screen. Redirection (>) allows you to put the output that would normally go to the screen into a file. Double redirection allows you to append information to the end of the file.

The nr script is shown in Figure 1. In its simplest usage, nr will take ASCII text and create left- and right-justified output. The nr script uses nroff, echo, cat, rm, and the if-then-else logic commands to work within the UX environment. If you do not specify a number of characters to indent each line, nr will automatically indent six spaces. If you do not want indentation, pass a 0 as the third argument.

**Figure 1: nr script**

```
if [ $# -gt 1 ]
then
echo ".ll $2" > tmp$$
if [ $# -gt 2 ]
then
echo ".in $3" >> tmp$$
else
echo ".in 6" >> tmp$$
fi
cat $1 >> tmp$$
nroff tmp$$ > $1.nr
rm tmp$$
echo "$1.nr contains the output file"
else
echo "Usage: $0 input_file chars_per_line
<indent_col_width>"
fi
```

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The nroff filter will be used to reformat tmp\$\$, the input file, into a column of a length specified by \$2, the second argument. The ".ll" (line length) nroff command does this. If a third argument is included, it is combined with ".in," the nroff indent command. The form of the nr UX command looks like this:

```
nr input_file column_characters
```

<indent\_characters>

### Two-column output

A 33-character-wide column with a four-character indent can be combined to make two columns on one page. To create a two-column output, you must pad each line. The nroff with right justification will pad complete lines, but not lines at the end of paragraphs. To skip a line between

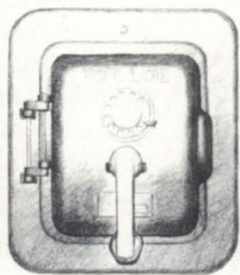
paragraphs, insert a line of blank spaces.

Once you have made sure that all lines in the text are padded to a constant length, you should split the file into multiple files of 66 lines each. The first and second file can be pasted together with the UX "paste" command. Repeat this procedure until all the split files have been pasted. Paste takes two input files and puts the combined output to the screen. Use redirection to capture the output to a file. Once the file is created, use double redirection with subsequent files to append the pasted text.

The files can be split into 66-line segments with an editor, or you can use the window shell script shown in Figure 2. For example, to copy and paste the first 264 lines of the nroff dfile "mytext," the window and paste commands would be:

```
window mytext.nr 1 66 > output1
window mytext.nr 67 132 > output2
paste output1 output2 > mytext.final
window mytext.nr 133 198 > output1
window mytext.nr 199 264 > output2
paste output1 output2 >> mytext.final
```

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**Figure 2: Window**

```
if [ $# -gt 2 ]
then
if [ -r "$1" ]
then
sed -n "$2,$3p" $1
else
echo "$1 is not a readable file"
fi
else
echo "Usage: $0 filename starting_no ending_no
fi
```

### Experiment

You can experiment with character length and indent numbers until you find the right combination. If you do not like right-justified text but you want all your lines approximately the same length, you can use nr to reformat the text, then use vi or ex to replace all multiple spaces with one space. The ex commands are shown in Figure 3.

**Figure 3: "ex" commands**

```
:1,$s/ */ /g
:1,$s/^ / /
```

Figure 4: Pad .c

```

/*
 * Programmed November, 1987
 * by J. Huddleston.
 *
 * This program will pad all lines
 * to the third argument length.
 */
#include <stdio.h>
#include <signal.h>
#define LF '\n'
int atoi();
/*
 * Make these global to
 * close them with interrupt().
 */
FILE *fi,*fo;
/*
 * called by signal()
 * used to trap CTRL-C CTRL-A
 */
int interrupt()
{
    fclose(fi);
    fputc(LF,fo);
    fclose(fo);
    exit(0);
}

main(argc,argv)
int argc;
char *argv[];
{
    char linebuf[bufsize], *p;
    long int charcnt, charlen;
    int ch, i;
    int (*istat)();
    if(argc < 3)
    {
        printf("Usage: %s infile outfile line_length\n",
        argv[0]);
        exit(0);
    }
    if((fi = fopen(argv[1],"r"))==NULL)
    {
        exit(0);
    }
    if((fo = fopen(argv[2],"w")) == NULL)
    {
        fclose(fi);
        exit(0);
    }
    charcnt = 0;
    /* third arg is line length */
    charlen = atoi(argv[3]);
    while(1)
    {
        istat = signal(SIGINT, SIG_IGN);
        if(istat != SIG_IGN) signal(SIGINT, interrupt);
        while( (ch = fgetc(fi)) != EOF && ch != LF)
            linebuf[charcnt++] = (char)ch;
        if(ch == EOF) break;
        linebuf[charcnt] = 0;
        p = &linebuf[0];
        while(*p != 0) fputc(*p++, fo);
        for(i = charcnt; i < charlen; i++)
            fputc(' ', fo);
        fputc(LF, fo);
        charcnt = 0;
    }
    fclose(fo);
    fclose(fi);
    exit(0);
}

```

You can also change the nr script echo system or devise a system of your own to automatically add your own nroff commands. More importantly, you may want to put some nroff commands into your text before processing to keep tables intact. You can do this by placing a ".nf" on the line before the table and a ".fi" at the end of the table.

I have written a pad command in C.

This program is shown in Figure 4. It will enable you to pad your lines in the original nroff file with one command rather than editing each line in vi or ex. Δ

*John Huddleston is vice president of NADGUG SIGUX. He may be reached at PO Box 4611, Portland, OR 97208.*

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## Bits and bytes from the bulletin board

### Xmodem for the DG/200

From: Peter Duncan

Does Xmodem exist for a DG/200 running under AOS?

From: David Down

The XMREC and XMSND routines in TEX work under AOS. They provide Xmodem checksum send and receive only (dial-in).

### Don't touch that switch

From: Mark Pagano

We recently had a problem on our MV/10000 where an operator accidentally hit the "power off" switch and knocked the system down. My initial thought was that the lock switch was off, but I found out that even with the lock on, the power

can be turned off. This is contrary to what is written in the manual "How to Generate and Run AOS/VS." Our Grumman FE called six sites that had standby MV/10000s, and the same thing had happened on those machines. So what's the deal? Bad documentation or bad hardware?

From: Bill Grzanich

My guess is bad documentation. Data-cover, Inc., in Pontiac, Michigan, sells little plastic covers for those switches. That was our solution.

### DUMPed on

From: Kevin Danzig

Help! We started using DUMP\_II when it came with 7.62 for some backup applications and have kept on using it after we back rev'd to 7.57. We are finding that many of our tapes can't be read. We get the error "incorrect labelled tape sequence

number." Anyone have any ideas?

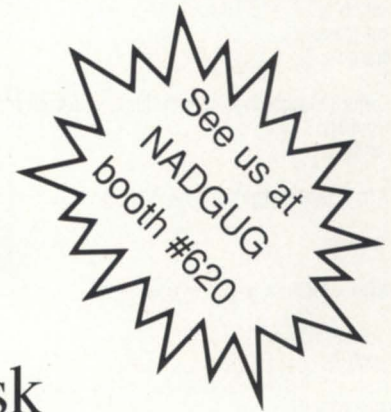
From: Rob Mougey

We used DUMP\_II while running at 7.60 and when we went to 7.64, it was discovered that the new LOAD\_II could not read tapes created by DUMP\_II. DG told us that DUMP\_II was a "provisional" program that was not supported and they recommended that we keep a copy of LOAD\_II on our system in order to read the tapes produced by DUMP\_II. It evidently is not compatible with any other DUMP/LOAD release.

From: John Keavy

You should be able to continue to use DUMP\_II from AOS/VS rev 7.62 after you rev back to 7.57. We use DUMP\_II and LOAD\_II rev 7.64 with AOS/VS 7.56 and it works fine. I have stopped using labeled tapes and now use multi-reel unlabeled tapes.

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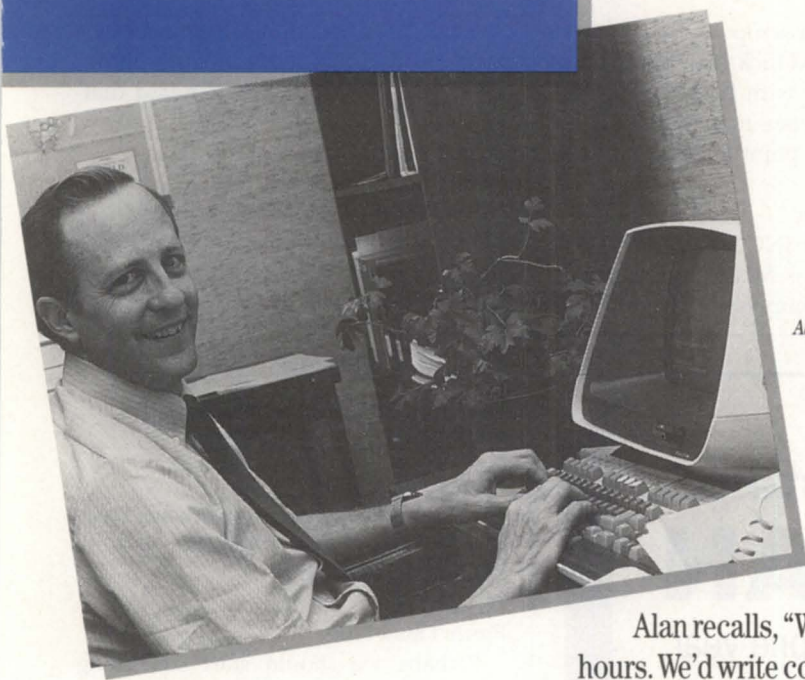
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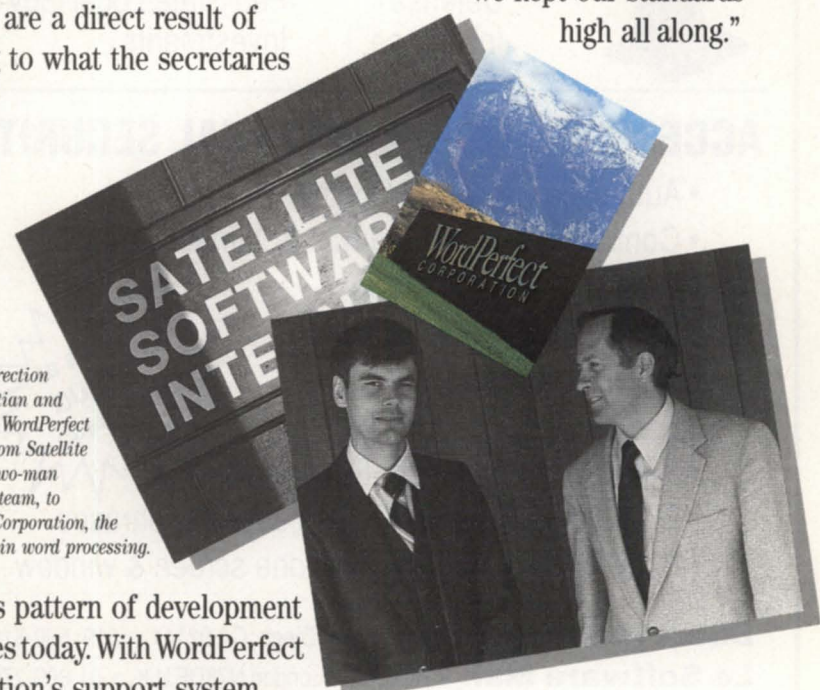
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## A mux is a mux

From: Kent Florian

Can anyone recommend a good 8-line mux and modem setup for a dedicated data line? We will be tying in some remote sites to our MV/7800 with IAC-16s, and I hate having to re-invent the wheel by doing a whole lot of research on these items. Thanks a whole bunch.

From: Walter Mosscrop

We've had good luck with the Micom-Box Type 2 Mux with both the internal and external (Fujitsu) modems. We use a 10-line model for point-to-point.

From: John Meyer

I am using an INCOMM turbo 4800 modem which has MNP 5 error correction and data compression. The cost is

around \$350 and the performance has been great. The data compression allows effective 9600 baud over standard dial-up lines.

From: Tom Scheiderich

I have been using Penril muxes and modems for about a year and a half. They work great and have more features than most of the other muxes we checked into.

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## Existential dilemma

From: Kevin Danzig

Is it just me, or did this BBS die?

From: Doug Kaye

Kevin, we're getting as many messages as ever. Also, lots of "lurkers" who are reading but not leaving.

From: Doug Rady

Perhaps we should start something controversial:

Debating the merits of AOS/VS...

Debating the merits (or lack of) of disk optimizers...

Debating the merits of Unix...

The foibles of the MV architecture...

Why VMS is such a nice OS even if it is bloated...

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What do you feel is the product with the louisiest support?

What year do you want the previously mentioned Christmas to occur in?

What is the *worst* software/hardware product that DG has ever committed? and many other burning issues.

## Frightening thought

From: Ted Barila

Does anybody out there have a LAN running under MV/UX?

From: Doug Kaye

We have LANs, and we have MV/UX, but the thought of putting them together is frightening!

## It's XYZZY

From: Andries Holtzhausen



Is there a secret but universal password for OP (something like XYZZY command in the CLI)? Our system gets hacked regardless of how many times I change OP's password.

From: Jeff Campbell

A couple of questions. Look and see if anybody has superuser. Does anybody have the change username option? Do you encrypt the OP password?

From: Tom Moore

If a user can gain access to the :UPD directory, they can find out any password. And, on another note, make sure OP does not have access to a modem (PREDITOR). There is a firm in San Diego called Datalynx that specializes in AOS/VS security.

From: John Huyghebaert

I have a C program that checks user profiles. It's not polished but it works. You may want to rename PREDITOR and move it someplace else. Good luck.

From: Stan Gula

In addition to the other suggestions, you should list *all* the users on your systems and their privileges, and audit them for changes. For example: get into PREDITOR. Turn off all irrelevant questions. Leave on modem/change user/superuser/superprocess/and anything else you're interested in. Then select the LIST command and answer + for username. PREDITOR will list all of those privileges for all users. You can either run this from a PC with text capture, or you can set up a command file for PREDITOR and do a proc/in=mycommandfile/out=mylistfile to run it.

You may find that you have more users than you expected. I have a couple of C programs that do basically the same thing—one of them also displays the time-last-logged-on, which is pretty useful too. If you're sure you know when the hacker logged in, you can also check the user report using the report.pr program to see who was logged on then. My guess is that someone is sharing a valid user id with an outsider.

From: Bob Shepard

When I was first hired here, we had someone tiptoeing through our ICobol

menu application systems. Perhaps I'm not in the same boat, because I'm the only one in the company with CLI access\*Q. And the OP console is LOCKed. I added a secondary password that was changed at 6 p.m. The users wouldn't know it until the next morning. (S)he really wasn't a threat. Just a nuisance. But this method might work on more serious hacking.

From: Andries Holtzhausen

Thanks for the suggestions. We have had all passwords changed and threatened our users with all sorts of nasty things. Since then the problem has not occurred again.

DG/One

From: Bob Shepard

Our salespeople will be getting DG/



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Ones for dialing up the MV/15000 here at home. I'm planning to download object code to the laptops and build a routine that transfers files between the mini and the laptop. I have the following questions: 1) Should I have the communications software submit the commands to the MV/15000 that will initiate the transfer/retrieval, or build an ICobol program to do the same. 2) How really compatible

is ICobol to an MS-DOS machine anyway?

From: John O'Keefe

To answer #2 first: compatibility between ICobols is near 100 percent, depending on which MS-DOS ICobol you're running. I've used both DG's and Wild Hare's Choice, and Choice wins soundly. It has routines to convert filenames (and

program names) from RDOS 10.2 to MS-DOS 8.3 automatically, so there is no coding change necessary. (That's a big deal if you're talking hundreds of programs.) DG just truncates. Also, Choice has some good extensions where you can call a routine to check which machine you're running on (Unix, DG, MS-DOS) and call to CLI (or shell, MS-DOS) with the proper syntax. I think DG's version does have slightly better performance though.

### Blocking PIDs

From: Rich Kolarik

This is an open question to anyone running or knowing AOS/VS. When you block a PID will the memory it was using be reallocated, or is the chunk of memory frozen with the PID? I had an experience yesterday where I had four PIDs running the same program and killing the system, so I tried to get one PID to have all the time by blocking the other PIDs. The result was that the PIDs left active were doing quite a bit of paging in and out. So I tried unblocking the other PIDs and setting their priority to a very high number. The unaltered PID finished a few minutes later. This brought up the question of whether the memory was reallocated or frozen with the PID. Any comments that anyone might have would be a help.

From: Walter Mosscrop

Rich, you say that the program was paging in and out. Do you mean that it was page faulting or was it being swapped in and out? If it was the former, and you use Infos, the page fault count is not entirely accurate—something about the way the file's pages are accessed causes them to be counted as faults (at least according to what I've seen and read). If I'm wrong on this, I'm sure that someone will correct me.

From: Kevin Danzig

It's very simple. If a PID is blocked and it's swappable, it can be sent out to disk. I don't believe that just blocking it will accomplish it. On BJ's BBS there is a routine called force swap that will SWAP everybody out who is swappable and blocked. I don't recall if the code was there, but if it is, you can see what forces the swap. Δ

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# Yes, they do windows

## SYNOPSIS

*Threshold's Screen Demon provides pull-down menus, pop-up windows, and a lot more.*

As I upgrade products that I've used on my PC, I can see a common thread emerging. Turbo Pascal, Wordstar, EMU—they're all converting to pull-down menus and pop-up windows. Obviously, this is the wave of the future, and the kind of interface that users (including myself) prefer. So what's an ICobol programmer to do?

Why, convert your programs to pull-down menus and pop-up windows, of course!

Screen Demon, from Threshold, allows you to do just that—and much more. In addition, it includes a mail facility, notepad, calculator, calendar, call CLI, print screen (to the system printer or a file), and global and local timeouts, all on your dumb D2xx monitor.

### Pop-up windows

I originally bought Screen Demon for the windowing. We had a simple, one-screen tire-costing system in place, and our controller wanted to include more information for each department. Since this would mean the entering of 12 to 20 lines per department, a separate screen would have to be built for each. Somehow, the thought of switching back and forth between 10 different screens just to enter one tire cost was enough to make me dizzy.

The key to Screen Demon's windowing capability is a monitor that contains an exact image of the current screen in memory at all times. When I want to pull a window up over the current screen, the code looks like this:

```

01 CALC-BOX-LINE          PIC 9(4) COMP VALUE 7.
01 CALC-BOX-COLUMN       PIC 9(4) COMP VALUE 18.
01 CALC-BOX-HEIGHT      PIC 9(4) COMP VALUE 16.
01 CALC-BOX-WIDTH       PIC 9(4) COMP VALUE 62.
01 CALC-BOX-LABEL       PIC X(30).

```

DRAW-BOX.

```

MOVE "STOCK PREPARATION" TO CALC-BOX-LABEL.
CALL "SD_NEW_WINDOW"
  USING CALC-BOX-LINE, CALC-BOX-COLUMN,
  CALC-BOX-HEIGHT, CALC-BOX-WIDTH,CALC-BOX-LABEL.

```

This draws a box 62 characters wide by 16 characters high at line 7, column 16, writes a heading at the top, and blanks out the interior. I then do all of my displays within the enclosed box. When I'm through, I call "SD\_REMOVE\_WINDOW" and the window disappears. The monitor still has a copy of the original screen, which is then redisplayed. I do this with each department, popping up the windows over the main screen each time, and the result is a screen that is clean, easy to follow, and easy to write.

### Pull-down menus

The above-mentioned controller also wanted to track our credit memos more closely, in order to find out why we were issuing so many. He wanted a sub-code for each type of occurrence—shipping error, returned goods, pricing error, etc. I could have taken up two or three lines at the bottom of the screen and displayed the choices, but a pull-down menu is easier to implement—and much easier to use. The code looks like so:

```

01 MENU-PACKET.
  03 MENU-LINE          PIC 9(4) COMP VALUE 7.
  03 MENU-COLUMN       PIC 9(4) COMP VALUE 50.
  03 DEFAULT-ITEM     PIC 9(4) COMP VALUE 1.
  03 SELECTED-ITEM    PIC 9(4) COMP.
  03 SELECTED-STRING.
    05 SELECTED-LETTER PIC X(1).
    05 FILLER          PIC X(29).
  03 MENU-ITEMS-STRING.
    05 FILLER          PIC X(15) VALUE "Shipping Error!".
    05 FILLER          PIC X(14) VALUE "Pricing Error!".
    05 FILLER          PIC X(15) VALUE "Goods Returned!".
    05 FILLER          PIC X(21) VALUE "Invoice Cancellation!".
    05 FILLER          PIC X(14) VALUE "Other Credit! ".

```

A call to "SD\_POP\_UP\_MENU" brings up a box with each of the choices in it. The user can make a choice by typing the first letter of the item, or by using the space bar, or the arrows. This highlights the particular item, and hitting NEW LINE returns the item to the menu packet. SELECTED-ITEM contains the number of the selection, and SELECTED-STRING the text. Since I made each of the possible selections start with a different letter, I can capture the first letter of the string and place it into my

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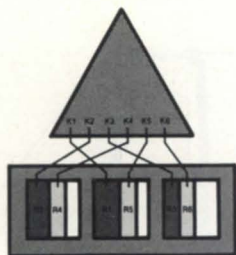
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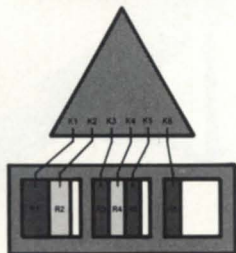
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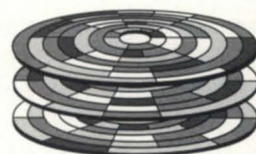


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CREDIT-SUB-TYPE data item. After NEW LINE is hit, the box disappears, and processing can continue.

## Hot keys

You can also assign a "hot key" to call a particular program. Screen Demon's main menu is such a program, and pressing F10 pops up a short menu of built-in routines, such as send/check mail, calculator, notepad, and screen print. In addition to these, you can assign any key to pull up a program of your own (or reassign the defaults—I've changed the F10 to control-F10 for the Screen Demon main menu). In my case, I frequently had to interrupt what I was doing and get into PRINTMGR to check the spool queue. Not any more—pressing ctrl-F9 gets me into PRINTMGR, and hitting escape brings me back to what I was doing.

Anything can be brought up by using a hot key— assembler programs, ICobol programs, any .PR, or even the CLI. By using hot keys instead of calls, you can all but eliminate the annoyance of interruptions. You'll still get interrupted, but you won't have to get out of the program you're executing.

## Other goodies

New with this release of Screen Demon are global and local timeouts, and a program called SD\_SPY.

Global timeouts are set in the Screen Demon configuration file. If a program has been waiting for an input for more than a

certain number of seconds (which you set in the file), a warning message is flashed on the screen. One minute later, the files are gently closed and the user is logged off. I've got my global value set to a half hour. If no one has typed anything in that period of time, it usually means that they've gone home for the day and forgot to log off.

Local timeouts, as the name implies, are program-specific. As such, they're more limited—but I find them more useful, because I can tailor them to a specific occurrence.

One of the more maddening occasions around here is when someone gets into the item file change/inquire program, brings up a tire, and leaves it on the screen with an "ANYCHANGE? \_" blinking at the bottom of the screen. This means that any program trying to read this record WITH LOCK (an inventory or invoice posting program, for example) is going to hang up until this item is cleared off the screen. If the perpetrator has gone to lunch—well, you get the idea.

With local timeouts, all I have to do is set the TIMEOUT-INTERVAL to the number of seconds that I want to wait, and do the following:

```
PERFORM ANY-CHANGE.
IF ESCAPE-CODE = ESCAPE-KEY OR
ESCAPE-CODE = 99 OR
ANY-CHANGE-ANSWER = "N"
GO TO ANY-CHANGE-SCREEN-2-EXIT.
```



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## ANY-CHANGE.

DISPLAY ANY-CHANGE-SCREEN.

CALL "SD\_SET\_ACCEPT\_TIMEOUT" USING TIMEOUT-INTERVAL.

ACCEPT ANY-CHANGE-SCREEN.

ACCEPT ESCAPE-CODE FROM ESCAPE KEY.

If nothing is input before TIMEOUT-INTERVAL number of seconds, the ACCEPT statement is skipped over and a value of 99 is returned to ESCAPE-CODE. I've then got control back and can do anything I want, which in this case is a graceful exit from the program.

What are you going to do until this code is added to your programs? That's where SD-SPY comes in. In RDOS, there is a #T system call that allows you to observe which programs are running on which terminals. There is also a program PC counter that, with a little practice, you can use to determine if anyone is actually *doing* anything in that program, or if the program is just sitting there. Unfortunately, there was nothing similar in VS—until now.

SD\_SPY's screen shows the console number, program status, logging status, PID, username, and current program name. The program status indicates whether a program is running or waiting for input. Thus, you don't have to keep watching a counter—SPY tells you if the program is just sitting there.

By itself, this is information that I and a lot of other people have wanted since moving from RDOS (it always seems to be in

"will be considered in future revision" limbo). But SD\_SPY goes a heck of a lot further.

On the bottom of the screen is a list of options for each particular terminal. The first, and most interesting, is "View," which does exactly what it sounds like. From your terminal you can view a dynamic display of whatever another ICobol user is running! This will enable you to quickly track down what a user is doing. It also has an immense potential for abuse, so be sure your ACLs are set correctly.

Another option is logging. You can set the program to log the activity on a particular terminal or group of terminals, and play it back later. If you've ever needed to know exactly what a person was typing that blew out a program, here's how to find out. Finally, you can terminate an ICobol process from this screen.

I'm coming to the end of this article and I haven't begun to touch upon some of the applications that Screen Demon can be used for. At the risk of running out of space, I'll toss in my favorite.

Those of you running CEO know how handy a mail facility is. Those of you who aren't (like me) can't imagine how much inter-office phone time it will save. We are now using Screen Demon's mail feature constantly.

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"To:" field or type "@ALL" to send to everyone. The message can be made urgent, and an acknowledgement can be requested.

On the receiving end, a blinking "Mail" appears in the upper right-hand corner of the screen, unless the sender specified "Urgent"—in which case it pops up immediately. Pressing Shift-F12 allows you to read the message, and an acknowledgement is then sent if requested by the sender.

This has saved us literally hours of running down people by phone, or walking to their office and putting a Post-It note on their screen. But what makes it even handier is the ability to use it as a CALL.

Most shops have operations that can't be run until some other operation has been performed. Inventory can't be run until billings are finished, an accounts receivable aging can't be processed until cash has been posted, and so on. We always depended on communications between employees, but those frequently break down—"I finished billings two hours ago. I thought I told you." Not with the mail function. The code looks like this:

```
77 RECIPIENT PIC X(20) VALUE "ALICE".
77 MESSAGE-TEXT PIC X(60) VALUE "CASH IS POSTED—GO AHEAD AND
RUN THE AGING".
77 URGENT-FLAG PIC X(1) VALUE "N".
77 ACKNOWLEDGEMENT-FLAG PIC X(1) VALUE "Y".
```

Then, when the person entering cash is finished, the program

does the following:

```
CALL "SD_SEND_MAIL" USING RECIPIENT,
MESSAGE-TEXT, URGENT-FLAG,
ACKNOWLEDGMENT-FLAG.
```

and the message pops up on Alice's screen.

Threshold has done a great job of furnishing a multitude of useful routines at a very reasonable price. They've been constantly enhancing them—the new version includes, along with SD\_SPY and the timeouts, a dozen or so new calls. This is a set of utilities that every ICobol user should have. Δ

**Figure 1: Vendor information**

Threshold, Inc.  
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Screen Demon rev 2.0 is priced at \$950.

*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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# Why so slow?

## SYNOPSIS

*BJ tackles several topics, including an analysis of AOS/VS II and the answer to last month's mystery.*

## MYSTERY\_SOLVED

If you spent much more time on last month's unsolved mystery than it took to read about it, then please accept my apology. It turns out that the solution to the mystery involved a piece of information about the benchmark and about my client's operating system that was not explicitly stated in my description of the problem. The reason that I didn't tell you about that piece of information is because I didn't realize that it was significant until the cause of the mystery was identified.

The cause of the anomalous behavior of the MV/10000 was due to a simple characteristic of both the benchmark and my client's operating system: neither attempted to segregate instructions and data into separate memory pages. When writing programs to run under AOS/VS, this segregation is something that's either done for you automatically by compilers, or, in the case of assembly language, it's so common to specify separate partitions for instructions and data that few programmers ever give it a second thought.

When the data cache on the MV/10000 detects a store, it notifies the instruction

cache of the address involved in case the store involves self-modifying code (a rare, but not impossible occurrence). If the area being modified in the data cache corresponds to an area that's also in the instruction cache, instruction caching is turned off for that area until the offending area is displaced by other areas of instructions that have no corresponding data cache activity. In the worst case, this might involve displacing 4 KB worth of instructions (i.e., the size of the instruction cache) before the instruction cache

becomes fully effective again. That explains why the benchmark didn't run fast until it was relocated to address 4000 octal (4 KB) and run.

Things are also complicated by the fact that the instruction/data cache logic takes some shortcuts by assuming that code and data will generally be segregated into separate pages. For DG operating systems, that's a good assumption that streamlines the cache implementation significantly.

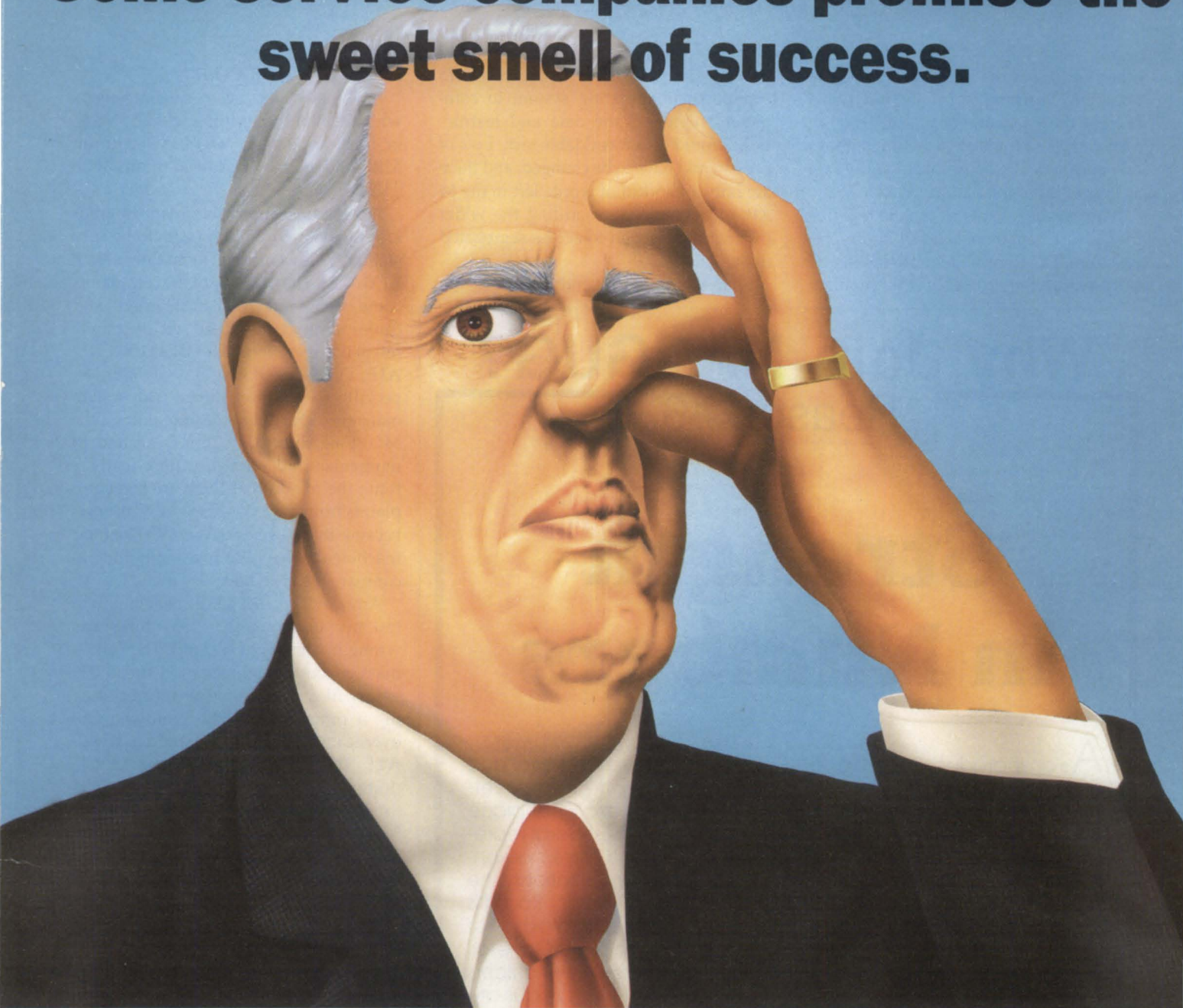
I'm still not too clear on some of the

**Figure 1: I/O required by AOS/VS and AOS/VS II**

AOS/VS I:				
Step	Elapsed	Access	BlksR	BlksW
Create	01:30	3700	9	3700
Dump	00:44	1000	11	1000
Delete	00:07	27	15	33
AOS/VS II:				
Step	Elapsed	Access	BlksR	BlksW
Create	02:22	4100	330	3800
Dump	01:42	1000	12	1000
Delete	01:56 (!)	3500 (!)	13	4100 (!)

Disclaimers: CPU time consumed by the CLIs running the benchmark were nearly identical (including the DUMP command), and so have not been listed. The disk results have been rounded to two digits of significance to discourage over-analysis.

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other addresses that triggered the cache back into working normally, but that's because the explanation had to go through a few levels of translation before it got to me, and now it's being translated again as I write this explanation.

If any reader wants to pursue this further, please contact me and I'll try to prevail upon DG to provide more details.

Knowing the cause of the problem

proved to be little help to my client. To change their operating system to completely segregate the data and instructions would be a formidable task. Lots of code would have to be changed, and there are only a handful of words left in the 64 KB address space for adding the wider instructions needed to access segregated data.

So much for happy endings.

## :VS\_II:AT\_WHAT\_COST?

I'm finally starting to run into users who are either upgrading to AOS/VS II, or have bought an MV/40000 with an MRC and are thereby forced to run AOS/VS II.

A common complaint from the upgraders is that AOS/VS II appears to be substantially slower doing some things than AOS/VS I. The majority of the complaints come from non MV/40000 users and center around the speed of directory-intensive operations (FILESTATUS, CREATE, DELETE, OPEN, and CLOSE); especially the sorts of things that system managers spend a lot of time doing, like MOVEing directory subtrees around to reorganize and rebalance disk loads. I think the reason that there are less complaints from the MV/40000 MRC users is because they never ran AOS/VS I on their machines so they don't have anything to compare the speed to.

Anyway, I created a little benchmark to test my suspicion that something was wrong in directory I/O land. The benchmark creates a subdirectory, creates 1,000 empty files within the subdirectory (using a program so as to avoid the CLI overhead involved in expanding "CREATE PROG(<0..9><0..9><0..9>).PR"), dumps the subdirectory and its contents to @NULL (forcing a ?GNFN, ?FSTAT, ?GACL, ?GOPEN, and ?GCLOSE per file), and then deletes the subdirectory. In between each step, a single cycle batch DISCO ( XEQ DISCO / BATCH / CYCLE=1 / LISTFILE=FOO) is used to capture the disk statistics, and a RUNTIME captures the elapsed and CPU times.

Figure 1 shows the results from running the benchmark on two dead-idle MV/4000 systems using the same make and model of disk and using 1,024 cache buffers.

The cause of the slowness in AOS/VS II is obvious; about 10 percent more disk accesses are required to create the 1,000 files, mostly in the form of extra reads, and about 10,000 percent (a factor of 100!) more accesses are required to delete the 1,000 files. The dump results are a bit disconcerting; the disk activity is similar, but the elapsed times differ by over a factor of two. The only explanation is that the CPU consumed by the New File System in the process of opening and closing 1,000 files is significantly more than it

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was under the Old File System. The CPUTIME utility bears this out.

I spoke to someone at DG about these results and was told something along the lines of "That's part of the cost of not having to run FIXUP before re-booting."

Ok, so let's see if I've got this straight now. We increase the number of disk accesses required for *every* create and delete so that we don't have to spend 20 minutes running FIXUP every six months after a crash in the case where ESD fails?

For stable revisions of AOS/VS running on stable hardware configurations with clean power, that sounds like a lousy trade-off. Maybe the solution is for DG to make AOS/VS II a little less reliable so that it crashes more often.

The sad part is that the increased availability and lower cost of high MIPS rating processors will have little effect on the additional I/O load; an MV/40000 quad-CPU system waits just as long for a disk I/O as a poor little MV/4000 with only a single CPU.

#### :VS\_II:FOOTNOTE

In case you're wondering if cranking up the File Information Table (FIT) element size on VS II disks helps the problem described above, the answer is no; it actually increases the I/O. Also, cranking up the FIT element size to 32 blocks instead of the default actually caused me to get an insufficient contiguous blocks error message on a disk that was only 80 percent full. This wasn't a fluke because I've heard the same complaint from several VS II sites. So much for all of you who are fond of running your disks 90 percent full. Better start saving up for one of those nifty new 2.2 GB 8mm cartridge tape units; it looks like you'll need either that or a disk reorganization utility to recover contiguous space if this problem turns out to be chronic.

#### :DISCO:MRC

It now appears that DISCO will not be modified to display any device statistics for disks that are connected via the new MRC option. According to a source inside DG, if you want to see what your MRC-based disk units are doing, you'll have to purchase a license for DG's AOS/VS Performance Monitor rev 5.10 or later to get at the statistics. Obviously, I'm not exactly a disinterested third party when it comes to performance monitoring tools,

but this seems to me to be pretty tacky. If you agree, then I suggest you provide DG's marketing department with a little negative feedback.

As soon as I can figure out how to access the statistics for MRC-based disk units, I'll publish the information (if it's publishable without violating any licenses) and hopefully somebody out there will make a DISCO alternative and sub-

mit it to the NADGUG tape librarian.

#### :DISCO:QUEUE\_LENGTH

Sometime around the release of AOS/VS 7.64, the formula used by DISCO to compute average queue length was changed. A partial explanation of the change finally showed up in the AOS/VS 7.65 update notice. A lot of people noticed that queue lengths that used to show



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up as 0.xx were showing up as 1.yy with the new version of DISCO. So what's the real difference?

Well, before we examine how the method was changed, let's talk a little bit about which per-unit disk statistics are recorded by AOS/VS and how you can get at them.

For some reason, which I won't speculate on, the system call for obtaining the disk statistics is undocumented. But it's not that difficult to figure out if you know how to use DEBUG to watch over DISCO's shoulder. The system call is ?DVSTT (DeVice STaTistics) and it returns the following information recorded since the unit was last opened or initialized (the abbreviations shown match those used by the update notice, then I added the missing ones):

- Qm: Maximum queue length ever seen
- A: Number of accesses (i.e., "arrivals")
- Ab: Number of arrivals that found the disk unit busy handling a previous request
- Ac: Number of arrivals that found the disk controller busy handling a request to a different unit on the same controller
- Qa: Total queue length seen by all arrivals
- C: Number of cylinders traversed
- Br: Number of blocks read
- Bw: Number of blocks written
- Ti: Number of seconds that the disk has been idle
- Ta: Number of seconds that the disk has been active.

Here are the columns displayed by DISCO and the formulas used to determine their values.

# of Reqs	A
% of Total	$A/(A1+A2+...An)$
% of Busy	$Ab/A$
% of Intf	$Ac/A$
Avg Queue	old: $Qa/A$ new: $(A + Qa Ab/2)/A$
Max Queue	Qm
Avg Seek	$C/A$
Blocks Read	Br
Blocks Written	Bw
% of Util	$Ta/(Ta + Ti)$
Avg Serv Time	$Ta/A$
Avg Resp Time	
old: (Avg Serv Time) * (1 + AvgQueue)	
new: (Avg Serv Time) * (Avg Queue)	

Until this latest change, DISCO's Avg Queue was simply computed as  $Qa$  divided by  $A$ . Then dividing  $Ta$  by  $A$  gave Avg Serv Time, after which Avg Resp Time was computed as:

$$\text{Avg Resp Time} = (\text{Avg Serv Time}) * (1.00 + \text{Avg Queue})$$

Translated to English, the last formula

says that the average time required to access a disk unit, including the time spent waiting in line, is the average time it takes to perform the access itself, plus the time it takes for an average-length queue of previous requests to be serviced. Using real numbers, if the average disk access time is 20 ms, and the average queue length is 0.5, then the total time required for a "typical" access would be 20 ms +

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10 ms, or 30 ms total.

So under the old scheme, Avg Queue had the sense of "the average no. of requests that an average new arrival would find already either waiting in line, or being serviced by the unit."

In any application of queuing theory to real life, there are bound to be some discrepancies that creep in. In this case, the validity of measuring only A and Qa, and

then using their ratio to compute Avg Queue, assumes that the disk and the requestors are behaving according to the assumptions made by the theory (too numerous to mention here). Clearly, that's not always the case. Let me give you an example.

Suppose a system spends the evening running a single large batch job that reads a transaction file and applies the transac-

tions to a big data base. The batch job does a million disk accesses, but the "Percent of Busy" (Qb/A) is zero because the batch job does its I/O serially (read the transaction file record, read the data base record, update the record, re-write the updated data base record). Then during the day, an on-line application involving multiple data base users takes over and generates another million requests, with an actual average queue length of 0.5 (which will get recorded by AOS/VS as a Qa value of 500,000). The queue length computed and displayed using the old scheme will be a misleadingly low value of 0.25 (500,000/2,000,000) instead of 0.50 (an error of 100 percent). However, because of the "1.00 +" term in the computation for Avg Resp Time, the Avg Resp Time would be less affected: 25 ms computed vs. 30 ms actual (an error of only 20 percent).

The new formula for Avg Queue is:

$$\text{Avg Queue} = (A + Qa \text{ Ab}/2) / A$$

Applying a little high school algebra to this gives a more useful version:

$$\text{Avg Queue} = 1.00 + Qa/A \text{ Ab}/2/A$$

From this version, it's obvious that the only differences between the old and new scheme are a) the new scheme already includes the 1.00 for the current request, and b) the new scheme adjusts the Avg Queue downward by deducting Ab/2/A. The first change is simply cosmetic, albeit confusing. The second change is a little strange; what exactly is Ab/2/A anyway, and what are we accomplishing by deducting it from the Avg Queue length as computed the old way?

Well, it would appear that the higher

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**Figure 2: Typical DISCO Avg Resp Time values for a 20 ms disk**

Busy%	Old	New	Change
0	20.0	20.0	( 0%)
10	22.2	21.2	( -4%)
20	25.0	23.0	( -7%)
30	28.6	25.6	(-10%)
40	33.4	29.4	(-11%)
50	40.0	35.0	(-12%)
60	50.0	44.0	(-11%)
70	66.7	59.6	(-10%)
80	100.0	92.0	( -7%)
90	200.0	191.0	( -4%)



the percentage of arrivals that find the unit busy (i.e., Percent of Busy), the more the raw Avg Queue length ( $Qa/A$ ) will be adjusted downward ( $-Ab/2/A$ ). In other words, the computed value for Avg Resp Time will be slightly lower (i.e., better) using the new scheme than it was using the old scheme.

I threw together a little program to demonstrate the effect of the two different schemes for computing Avg Queue on the Avg Resp Time values. The output is shown in Figure 2. As you can see, the worst-case difference is only about 12 percent occurring at around 50 percent busy. At more reasonable busy percentages (i.e., 25-35 percent) the difference is much less.

It would appear that the main effect of the new scheme is the confusion caused by switching the base displayed value of Avg Queue from 0.0 to 1.0 this late in the life of DISCO for no particularly compelling reason.

#### :7.65\_BJS\_PATS

All of BJ's Unofficial Patches for AOS/VS have been updated for AOS/VS 7.65 and are available on the :SYSMGR BBS.

#### :INFOS\_II:5.00:UPDATE

Infos II 5.00 now retains old copies of its .VM and .OUTPUT files each time the global server is restarted. In at least one client's case, this resulted in system disk space problems because he takes his Infos global server down during backups to ensure that no Infos files are open (he uses DUMP\_II instead of DDUMP).

The solution was to install a copy of the JANITOR program which I described in my October, '88, column. The JANITOR package is still available on the :SYSMGR BBS.

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#### :NAWLINS

The NADGUG Conference '89 is scheduled for late this month in Nawlins, Looseyanna, and there's still time to make plans to attend. Rumor has it there are still a few deluxe sheds left at Bayou Betty's Swamp Lodge.

Time is running short for you to submit your entry in the UPDATE.CLI Memorial Trophy contest for the best source code

example of how to needlessly squander copious quantities of CPU cycles. Send in your source code, or call for further details.

Things are on schedule for the 44th Annual Sleaze Tour in Nawlins, but preliminary scouting reports have identified only a handful of candidate sleazatoriums. Be there or be square. Look for date/time info to be posted on the conference message board. △

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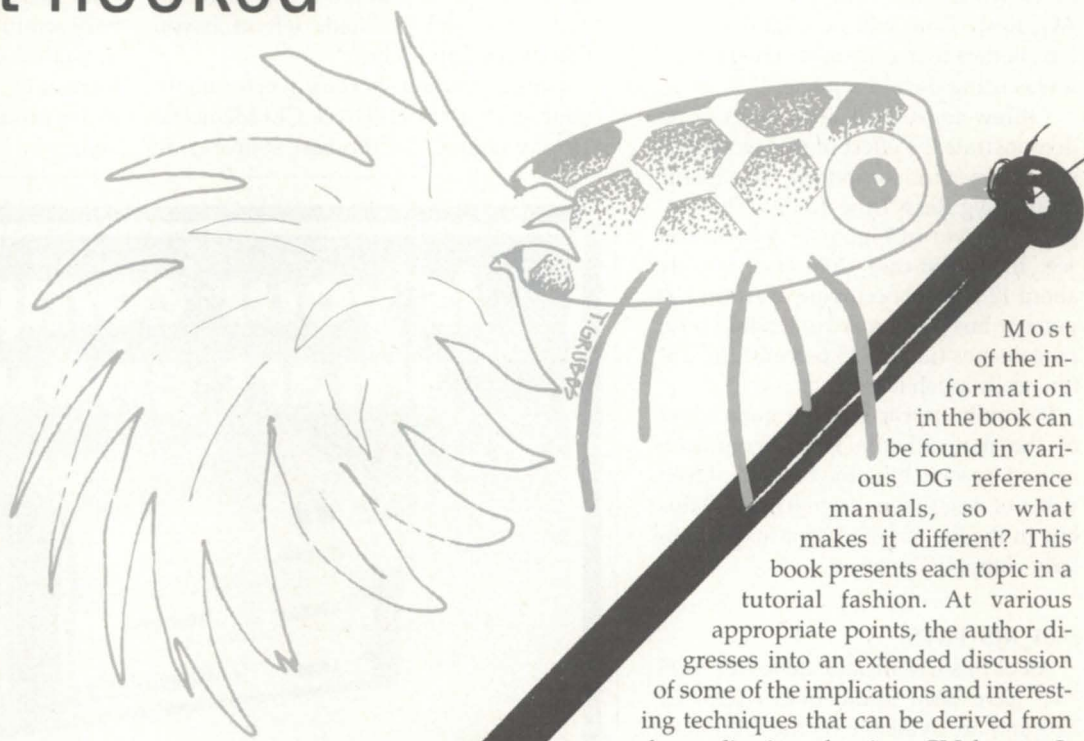
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**SYNOPSIS**  
The art of writing CLI macros is described in a new book from Shalless Software.

**T**here is a new book on the market that I have had the pleasure of reading. The title is *?!#, Hook-Bang-Crunch—Programming the CLI* (by Greg Shalless, Shalless Software). Even the most experienced CLI user will gain something from this book. I even learned something from the title, not having heard “#” referred to as “crunch.”

This is not a reference manual. It is a manual on technique and, to some extent, style. It does not replace the CLI user manual—it builds on it. A person with no knowledge of the CLI might be able to follow this book, but it is intended

for those who have at least a minimal working knowledge of the CLI.

Although I have not finished reading it from cover to cover, I read several chapters and at least skimmed all the others so that I could include them in this review. I am impressed. This is, without a doubt, the most extensive collection of tips and techniques on the CLI ever published in a single volume. Furthermore, the range of topics covered was incredibly comprehensive, and even more pleasing was that so far I have not found a single error. Credit goes to the editorial staff as well as the author for their commitment to accuracy and testing the sample macros. I even received revised pages due to a change in EXEC 7.62 that caused one of the macros to fail. (It worked under 7.57, which is the revision that everything in the book was tested with.)

Most of the information in the book can be found in various DG reference manuals, so what makes it different? This book presents each topic in a tutorial fashion. At various appropriate points, the author digresses into an extended discussion of some of the implications and interesting techniques that can be derived from the application of a given CLI feature. It is this that differentiates *?!#* from the reference manuals. Programming techniques and the underlying rules that make them work are the core of this book. As a result, I feel it has earned a place with any DG CLI user. It should be required reading for anyone dealing with the CLI on a daily basis.

### How complete is *?!#*?

The book consists of 30 chapters on 30 different topics, each of which would make a good lesson in a CLI course. The entire manual could easily be used by an in-house instructor as a syllabus.

Six of the first seven chapters are a review of CLI syntax. Although they duplicate information contained in the AOS/VS CLI user manual, they also serve to introduce the reader to the author's way of thinking. These chapters could be skipped by the experienced CLI user without harm, but I would recommend at least skimming the examples as a refresher. For example, in the argument list expansion `%m-n,r%`, I had forgotten about the optional “r” to allow you to skip over arguments. Even the author concedes that he can not think of a use for it that could

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not be just as easily handled in another fashion.

The rest of the first 16 chapters also have information that can be found in the manuals, but it is here that the discussions begin in earnest. For example, Chapter 10 has a thorough discussion of [!read]. (If you have a good memory, you may recall how my October 1985 column "[!READ] and System [in]Security" generated an incredible fallout of mail and discussion on [!read]. As a result of this loophole into the CLI, the /S switch was added to [!read]. This seemed to close the loophole, but a few weeks later I found out how to defeat the new switch. I kept mum about this technique since the solution would have greatly impacted system performance, the CLI, and security in general. The "secret" has been included in this book. Also, so has the best and only fail-safe solution.)

The second half of the book presents CLI features, commands, and pseudomacros in greater detail. There is thorough discussion on the differences of [!FILENAME] and [!PATHNAME]. One chapter is dedicated to the use of /I and /M in macros. This detailed presentation and explanation of both common and advanced techniques can improve anyone's CLI abilities.

### Shortcomings?

In our industry, it is generally fairly easy to find a list of shortcomings in a product and to construct a wish list of what you'd like to see. It wasn't so easy to do in this case. The few things I would change in this work are all of such a minor nature they hardly bear mentioning.

This manual is complete in my eyes, although it does leave room for a sequel. In Appendix A, the author touches on using SPEED and its macro language to perform data manipulations for which the CLI is not well suited. That topic could easily turn into another manual. Likewise with the discussion on SORT

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/MERGE in Appendix B. The most interesting section of the manual is the fifth appendix, X, which contains CLI macros, SPEED macros, and the SORT/MERGE commands used to build the fourth appendix, I, which is the index for the book. It is a complex application of many of the more advanced techniques presented in the manual, and it shows the raw power that is available to the CLI programmer.

**@tape, a.k.a. :PER:TAPE**

Many of you system managers out there are as fond as I am of creating logical device names. A logical device name is a link in the :PER directory to the actual device. For example, nearly all of our clients have @SYSPRINTER linked to @LPB, @LPD, @LPJ0, or @CONxx, depending on their hardware configurations. All of our macros (UP\_DPRINTER

.CLI, FORMS.CLI, etc.) refer to @SYS-PRINTER, and the same macro works on all systems. Another link that exists nearly universally on our systems is @TAPE. It points to @MTB0, @MTC0, @MTD0, @MTJ0, or @MTJ10, as is appropriate.

I have always been aware that you could not "DELETE @TAPE" successfully. You would have to either DELETE :PER:TAPE or DELETE [!PATH @TAPE] to make the link go away. This leads to an interesting restriction on several of the DUMP utilities. Apparently, they open the input file with the delete and create flag set in the system call. Since they want to ignore delete errors (after all, the dump file is not supposed to exist), there is no problem if a non-deletable pathname such as @TAPE is used. However, you can not open a tape unit with the create option set. When you dump to @TAPE, it works fine. When you use [!PATH @TAPE], it resolves to :PER:TAPE, which can not be used by the DUMP utilities. This is probably not a genuine bug, just an interesting phenomenon with the way CLI and/or the agent expand the "@" directory prefix.

**Did I C U FCU?**

I was turned on to a neat feature of printer spoolers recently. When you create a forms definition in the :UTIL:FORMS directory (using FCU of course), the information and form parameters are stored in the UDA of the filename. I thought this was because the 40 or 50 bytes needed for a forms definition would be more efficiently stored as a UDA, where it would consume much less disk than the 2,048 byte minimum file element required for a data file (512 byte under 7.64 and later).

As it turns out, there is another reason for this, or maybe this feature was a side benefit of the disk efficiency question. You can put a forms definition on any file on the system. This provides a means to add forms control to reports coming out of languages that do not allow forms specs. When XLPT processes a file, it checks to see if there is a UDA associated with the file. If so, it checks to see if it is a valid forms description. Then it uses that forms description as an override to the description currently being used for the spooler. When the report is completed, the original FCU definition is reloaded.

The F77QPR.CLI macro, adapted from the original by Randy Berndt (NADGUG

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tape librarian) shows how to use this feature. It accepts an argument that is the filename of a report using "Fortran Carriage Control" (which looks suspiciously like the IBM carriage control standards of DOS and OS). The macro starts by creat-

ing a temporary file to hold the commands for the FCU utility. Next, it sends a job to the batch stream that will run F77PRINT on the F77 report to convert it to a data-sensitive text file. It then runs FCU, using the temporary input file to add the forms definition to the report. After that, it deletes the work file and QPRINTs the finished report file. In this particular case, the report is printed on default forms with

an override of line 3 for the top of the page and line 65 for the bottom. For those of you who do not have the luxury (or should I say curse?) of writing reports with Fortran, you can skip the F77PRINT step and simply PROC FCU. Since the FCU run would normally take only a few seconds, I would remove the QBATCh as well. This simplified version is shown in figure 1. Δ

**Figure 1: F77QPR.CLI**

```
[!nequal,%1%,,]
create/m %1%.TMP
C
%1%
132
<blank line>
<blank line>
3
65
<blank line>
<blank line>
B
)
qbatch/m
x f77print/type=fcc/recfm=ds/l=%1%.TXT %1%
proc/def/block/out/con/inp=%1%.TMP fcu
delete %1%.TMP
qprint %1%.TXT
bye
)
[!end]
[!nequal,%2%,,]
%0% %2-%
[!end]

FCUQPR.CLI

[!nequal,%1%,,]
create/m %1%.TMP
C
%1%
132
<blank line>
<blank line>
3
65
<blank line>
<blank line>
B
)
proc/def/block/out/con/inp=%1%.TMP fcu
delete %1%.TMP
qprint %1%
[!end]
[!nequal,%2%,,]
%0% %2-%
[!end]
```

*Jim Siegman is a contributing editor to Focus, chair of the NADGUG Audit Committee, and treasurer of the Chicago Area Data General Users Group. Send comments or questions to him c/o Datamark Corp., 3700 W. Devon, Suite E, Lincolnwood, IL 60659; 312/673-1700.*

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MV/2000 and MV/1400 users should send one **formatted, error-free** tape cartridge. Software contributions should be sent to the same address. Be sure to include your membership number. (Special thanks to Kevin Danzig for help with preparing the MV/2000 cartridges.) Allow 4-6 weeks for delivery.

People with AOS/VS rev 6 should send a 2,400-foot tape and specifically request DUMP\_II instead of the usual compressed version. The decompression program is rev 7 specific.

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.

## **Big Brother**

Automatic log-off program written in Fortran 77. Donated by the U.S. Forest Service. 181 blocks.

## **B.J.'s BBS contributions**

This addition to the library consists of about 20 items, including various programs, documentation, and macros. Some of the more interesting items include the :SYSMGR benchmark suite, a continuous incremental backup, a clean-up file maintenance program, a program to find strings in files, and a type-backward program. 5,749 blocks.

## **Black Jack**

Kim Medlin of Data General presented this at the Las Vegas conference. 15,079 blocks.

## **CRTEDIT**

This is the old RDOS screen editor ported over to VS. 51 blocks.

## **DBCHECK**

This program checks the open status of an INFOS file and examines the check-pointing status of a file. 230 blocks.

## **DUMpload**

DUMpload is a Macintosh program

to dump and load AOS/VS-compatible dumps on a Macintosh. 140 blocks.

## **ERP**

A process-termination program developed by NASA and modified by Manville. In Fortran 77. 338 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. 459 blocks.

## **FTNCVT**

This is a Fortran 5 to Fortran 77 translator. 287 blocks.

## **Games**

Games is a collection from various places. A new version of Conquest has been added as of April '89. 19,516 blocks.

## **Glossary**

Glossary is a program from John Grant that builds a list of words used in a document and shows where they are used. 416 blocks.

## **IMSLUTIL**

This is a collection of CLI macros, Cobol routines, and assembly routines callable from Cobol. By IMSL of Houston. 6,154 blocks.

## **JAG\_UTIL**

JAG\_UTIL consists of several programs: Filecount, Userspace, Scan, and Laminate. 1,501 blocks.

## **Kermit**

Kermit is a file-transfer protocol developed at Columbia University. Uses 9,328 blocks.

## **Logout**

Another auto log-out system. 246 blocks.

## **Look**

Look is used to view text files. It allows you to move forward and backward in a file. This program was donated by Data General. 438 blocks.

## **Macros**

This is a collection of macros from various sources. 452 blocks.

## **MENUDIR**

This is an initial user menu that can chain to other applications. It features a

password-control system. From the Fed SIG. 492 blocks.

## **Misc Kerm**

An expanded version of AOS Kerm, this now includes other versions of Kermit including DG/One Kermit. 6,298 blocks.

## **Notify and Prior**

Two contributions from Concept Automation. Notify tells you when a process has terminated. Prior lists the priorities of processes. 273 blocks.

## **QHelp**

QHelp is a tree-structured help facility. 2,277 blocks.

## **RDOS Kermit**

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

## **SKLSCRN**

This is the Cobol standard entry screen featured in George Burns' article that appeared in the April 1988 issue of *Focus*. 385 blocks.

## **Softrans**

This is a file-transfer protocol written in Fortran 77. It's used to communicate with proprietary PC communications packages. 496 blocks.

## **Spell**

Can check the spelling of a word or spell-check a document. Submitted by Richard Kouzes. 5,163 blocks.

## **SWITCHES**

SWITCHES is the GET.SWITCHES routine from John Grant's column in *Focus*. 1,297 blocks.

## **TEX**

Version 2.26a is now available. TEX (Terminal Emulator with Xmodem) is a terminal-emulation program written by David Down. He has recently revised the TEX software to include a command language. TEX is being distributed as shareware. At the end of 30 days, either remove it from your system or send the author a \$45 fee. 495 blocks.

## **VT100KER**

VT100KER is the VT100 emulator from John Grant. 1,135 blocks.

## **Xfer**

Xfer is a tape-conversion utility. 653 blocks. Δ

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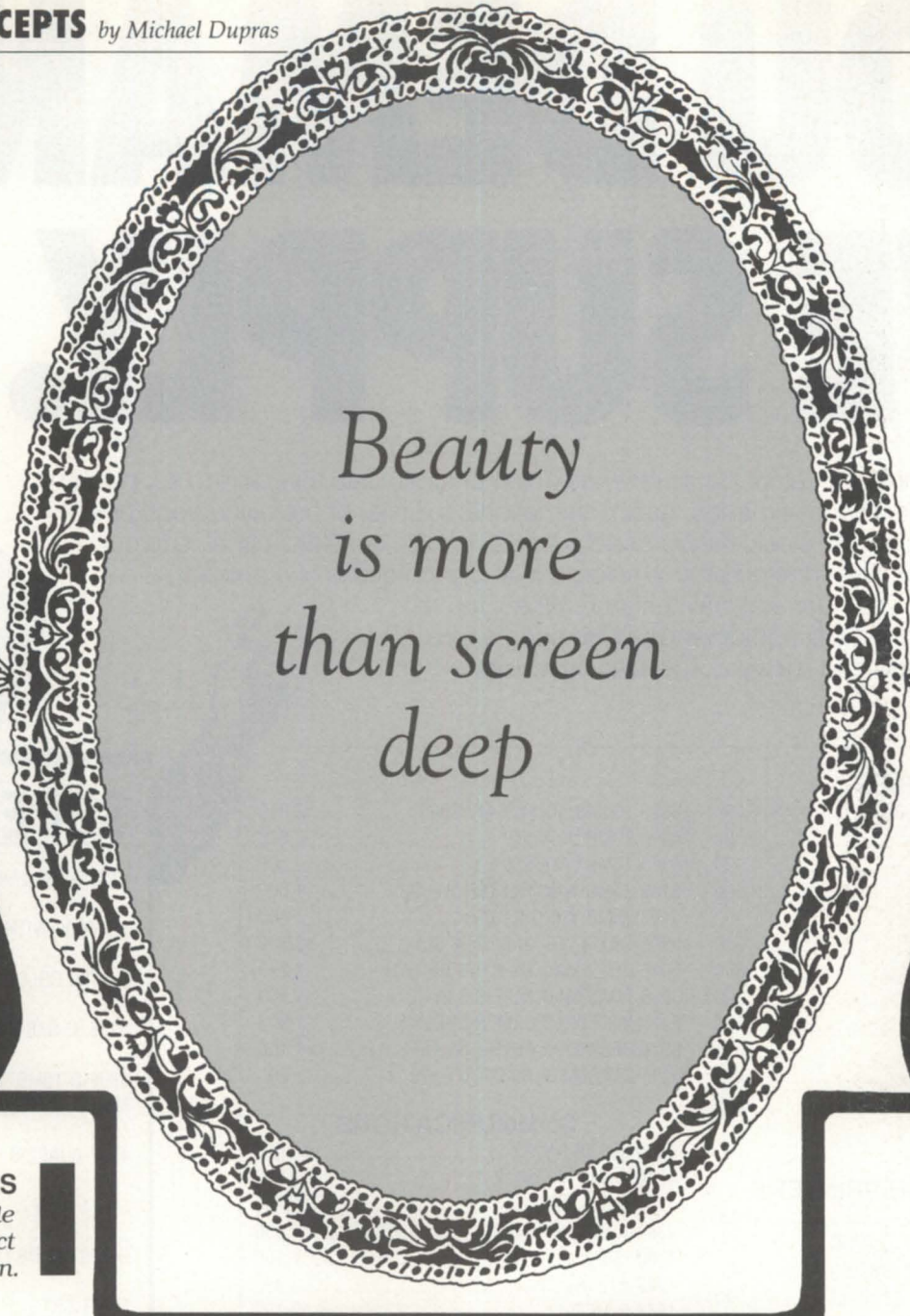
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#### SYNOPSIS

What happens inside a program can affect the user's perception.

#### Theory

Some of the other articles in this issue discuss graphics, screen layouts, etc., that the user sees and feels. What goes on inside the program can also have an effect on what the user perceives about the program. Consider, for a moment, a program that is doing whatever you want your program to do. The user interface could be as simple as XEQ FOO.pr SWITCHes or TERM PIDx. This is the minimal user interface, a base from which a program can be extended a long way.

#### Practice

You are already familiar with programs

that use IPC files to change their characteristics. Examples are EXEC (and its sons), XODIAC, and CEO\_OP. These programs accept commands from an interprocess communications file to start, enable, disable, terminate cleanly, or change configuration characteristics, to name a few. This ability is in fact a user interface. You can add it to your programs without much difficulty. Have your program create an IPC file on startup. Listen for incoming IPC messages and process them.

#### Creating the IPC file

At this point, some information is re-

quired regarding the nature of the program. Is the program to have only one copy of itself running on the system, or will there be more than one process of it invoked at any one time? EXEC and NETOP are examples of the single invocation per system type, while CEO\_CP is an example of a multiple invocation. Why is the distinction critical, you may ask? The answer is found when we begin to create the IPC file. Where do we create the file?

In the case of a global server, like EXEC and NETOP, the IPC file must be in a place that can be found easily by other programs. :PER is a good choice, for



several reasons. :PER exists on every system, it is cleaned out on every invocation of the operating system, and there is only one such directory per system.

In the case of CEO\_CP, and other "local" processes, the IPC file must be in a unique place, or have a unique name. Both of these techniques help prevent messages from going to the wrong process. CEO\_CP uses the user's :UDD:[!USERNAME] directory to place the IPC file. This makes it easy for CEO\_CP's son processes to find the IPC file. CEO\_CP also uses the unique name technique by building the IPC file name out of a base string, with the PID number of the CEO\_CP process in the middle of it. This prevents CEO\_CP processes with the same username from being confused when messages are passed between a particular process and its sons. Using one or both of these methods should be considered when designing your program.

#### IPC listening and processing

You already know how to create a task,

*Knowing that  
most of the  
keyboards on  
our terminals  
are finger-  
followers, not  
mind-readers,  
some errors  
can be  
expected*

and why it might be advantageous to do so. The IPC listener task waits for messages to come in. Knowing that most of the keyboards on our terminals are finger-followers, not mind-readers, some errors can be expected. Therefore, it is wise for the messages to be tested for validity, syntax, sequence, or other errors that could cause your program to behave in ways that you would be ashamed of. Processing of the message does not stop here.

It is obvious that a command means something to a program, and that a certain routine should be called to implement the requested action. This could be done by the task that is listening for the messages, or by a task that is written to handle the job. When the handling of the job will take longer than the shortest interval at which another message could come in, you can use the listener task to directly perform the action. When the action involves longer delays, it might be advisable to start or notify another task that will do the work, so that the listener

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task can go on about its job of listening. (Programs are like people—it is frustrating to try to talk to someone who is too busy to hear what you are saying.)

## Deferred processing

The act of deferring the processing of a unit of work within a program, as described above, affects the perceived user interface. The reality of this perception is that it now makes it possible to give the program several things to work on, without having to wait for completion of the previous directive before issuance of another. To the user, it appears that the program is quicker.

To implement this deferred processing, you can use queues, stacks, lists, or other methods. Put a structure, packet, command number, or even the original message, on the queue and send a signal to the task that will perform the work. To send the message, use the ?XMT/?REC, ?SIGNL calls (or their variants), or another IPC message.

With the ability to have several

“worker” tasks, your program may be doing more than one thing at a time, and the users’ perception of the program will probably improve.

## Timing

Sometimes it is desirable to have an active or working queue of things for a task to do, as seen above. If the task that works on the queue is doing some serious manipulation of that queue, it might not be desirable for another task to be mucking about with the same structures. In this case, it is simple to have a “new event queue.” Onto the end of this list, new commands or operations are added. I am currently using this where I have a timer task that is responsible for waiting for the shortest delay of a list of directives. It waits for the required time, then performs some action, such as sending a message to a mailbox. (Once all of NOW’s actions are performed, the rest of the queue entries are scanned and/or updated.) Before processing this working list of “things to do,” this task checks

another queue to see if any operations should be performed on the working queue. This allows new events to be scheduled, and for existing events to be changed or removed from the queue without encroaching upon the integrity of the working queue.

## Wrap-up

With a regular heartbeat from the timer, deferred processing, and timeout checks from the timer, the program starts to get a little more intelligent in its operation. The way in which the internals of the program were implemented are not the last word on dealing with users, but I hope that this look at user interface from the inside out helps with your programs. Δ

*Michael Dupras is senior consultant for the Software Products and Services Division of DG Canada. He may be reached at Data General, 1827 Woodward Dr., Ottawa, Ontario, Canada K2C 0P9.*

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6166-X D410 Monitor with keyboard	400
6169-X D211 Monitor with keyboard	225
6391-X D214 Monitor with keyboard	300
6392-X D215 Monitor with keyboard	325
6393-X D411 Monitor with keyboard	365
6394-X D461 Monitor with keyboard (new)	565
Note: Add \$45.00 per unit for Amber Screen.	
6284 D220 Color Monitor w/keyboard	625

## Tapes:

6021 800 BPI new style	\$ 400
6026 800/1600 BPI Blue, non FCC	1,200
6026 800/1600 BPI Brown, FCC compliant	2,500
6125 1600 BPI Streamer, FCC compliant	500
6299 1600/6250 BPI Rack mount	15,500
6300 1600/6250 BPI Meter cabinet	15,800
6311 15MB cartridge MV4 DC/7800DC	900

## Memories:

MV20000, All sizes	
MV15000, All sizes	
MV10000, 2Mb	
MV10000, 4Mb	
MV10000, 8Mb	
MV8000, 2Mb	
MV8000, 256Kb	
MV4000, 2Mb	
MV4000, 4Mb	
MV4000, 8Mb	

Specials	
D 411 Terminal	\$365
D 211 Terminal	\$275

## International Computing Systems

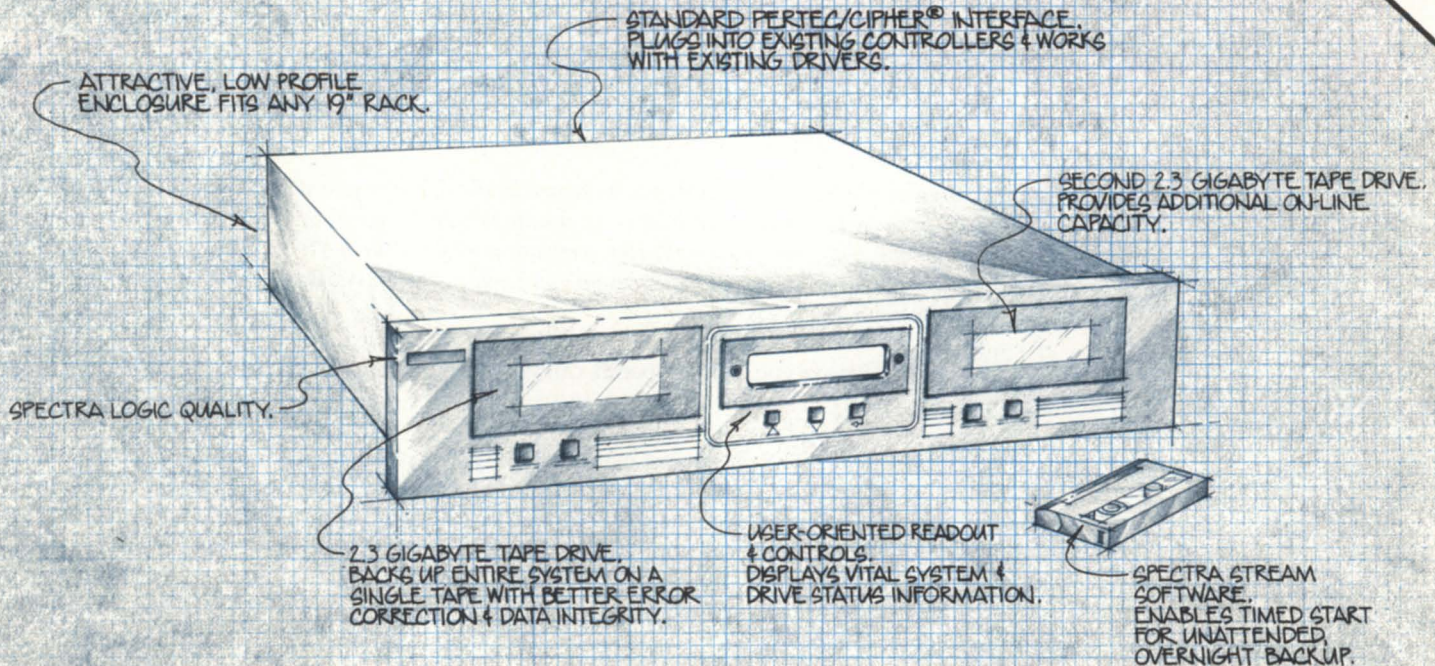
P.O. Box 343 • Hopkins, MN 55343  
**(612) 935-8112**  
 FAX 612/935-2580



# Concept

**SPECTRA TAPE**  
FOR DATA GENERAL & COMPATIBLE COMPUTERS

us at NADGUG '89  
Booth # 435



## Reality

**A complete line of Pertec/Cipher® compatible, high performance, maximum capacity tape backup subsystems — good enough to be called Spectra!**

For ten years, Data General users have trusted Spectra Logic disk and tape controllers for performance, reliability and innovation.

The reputation continues with Spectra Tape: a tape subsystem capable of backing up over two gigabytes on a single 8mm cartridge — at speeds up to 15 megabytes per Minute! Spectra Stream software, included with every Spectra Tape, provides timed start for unattended, overnight backup.

Spectra Tape is designed to save more than time. Its 3 1/2"

profile saves precious rack space; inexpensive, compact 8mm data cartridges save on storage requirements and its ease of operation and comprehensive LCD status window save headaches. And Spectra Tape saves money by connecting directly onto any existing Pertec/Cipher® compatible tape controller.

Onboard Error Correction Code (ECC), automatic data verification and helical scan recording ensure data integrity.

Spectra Tape includes operation software and is available with one or two 2.3 gigabyte tape drives.

It's backed by Spectra. It carries Spectra's one year manufacturer's warranty. It's good enough to be called Spectra.

**Call or write for complete information.**

# SPECTRA LOGIC

A Division of Western Automation

**Spectra Logic Sales:**

1700 North 55th Street Δ Boulder, CO 80301

Call (303) 449-7759 Δ FAX (303) 939-8844

Spectra Stream, Spectra Tape, Spectra Logic and Western Automation are trademarks of Western Automation Laboratories, Inc.

Circle 63 on reader service card.

# CONFERENCE

## preview

### SYNOPSIS

All you need to know about where to go, what to do, and how to say it.

The keynote speech at the NADGUG conference in New Orleans will be presented by Patricia Seybold, president of the Office Computing Group, Inc. Seybold is a consultant with 12 years' experience specializing in office computing and information systems design. Her company publishes four monthly research reports. She also appears regularly as a featured speaker at industry and user group meetings. We asked Seybold to give us a preview of her conference speech.

**Focus:** Without giving away your whole speech, can you give us a hint about what you will be speaking about at the conference?

**Seybold:** Basically the thrust of the subject matter will be object orientation, local area network topologies, and distributed network computing. I will spend most of my time talking about what object-oriented technology is, more from the standpoint of the end-user, the application developer, and the application environment, rather than from the standpoint of object-oriented programming languages.

**Focus:** The theme of the conference is "Emerging Technologies: Changing the Challenge." How will your speech address this theme?

**Seybold:** Mostly what I'll be talking about is the fact that computer programs will be written in a very different manner. They will be written in much smaller self-contained modules that will enable the end-user or the business analyst to begin to put together, in almost a Lego-set fashion, their own business

## Cajun dictionary

### Banquette

(*ban-ket*)—a French word meaning bench, and what the natives call a sidewalk. That goes back to when the first city sidewalks were made of wood with a slightly raised edge on the street side to help protect the ladies' skirts from the mud and the mire.

### Bayou

(*bye-yoo*)—an Indian word meaning creek. South Louisiana has a whole network of bayous.

### Beignet

(*bane-yea*)—a pastry which is a cross between a cruller and a doughnut without the hole, a square-shaped confection served hot and liberally sprinkled with powdered sugar.

### Cafe Au Lait

(*caf-ay oh-lay*)—French, meaning literally, coffee with milk. It is a half-and-half blend of strong chicory coffee and hot milk.

### Cajun

(*kay-jun*)—Slang for Acadians, the French-speaking people who came to South Louisiana from Canada.

### Chicory

(*chick-ory*)—An herb, the roots of which are dried, roasted, ground, and used to flavor coffee.

### Crawfish

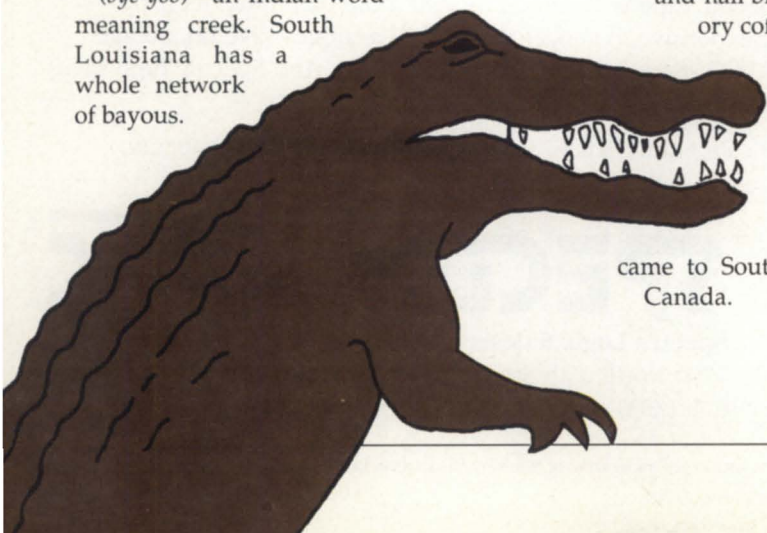
—sometimes spelled crayfish, but always pronounced *craw-fish*, these little critters resemble toy lobsters and turn up in an astonishing variety of local dishes.

### Creole

(*cree-ole*)—Refers to the first settlers of the region, as well as to a culture, a cuisine, a style of architecture, and to produce indigenous to this area.

### Dixie

—The local favorite and only beer produced in the area. The brewery is located on Tulane Avenue, and is open to the public for tours. (The word "Dixie" originated in New Orleans before the War Between the States. Because of the strong French influence in the city, paper cur-



applications. The real technical challenge that we face over the next two years is to allow this to happen in a way that will work—that this object-oriented technology will not just be something that happens within a workstation, but will actually happen with those different modules distributed across the network.

(For example) I might be working with one little piece of a project. On my workstation it looks like everything is right here, in terms of the series of steps I'm going through and the application I'm running or designing. But in point of fact, the "Lego set" that I'm using to put all these pieces together to design my application is going to be distributed not only on the workstations and servers on my network, but also on workstations that may be from different vendors and other operating systems.

**Focus:** Who will benefit from this technology, and how?

**Seybold:** The pay-off from this kind of technology is that in the 1990s the end-users, business analysts, even business executives, will be able to design their own applications. That's important because there aren't enough programmers in the world to do the amount of applications that we need as we get more and more specialized on how we

*(Seybold, continued on page 74)*

## What to do in New Orleans

by Seemee Ali  
Focus staff

Once, New Orleans was not much more than a convention center for mosquitoes. To ensure the profitability of this swampy real estate, French officials released 88 women from Parisian jails to marry the intrepid settlers and populate the land. Testifying to the success of unorthodox policy decisions, the city is now the third largest port in the world, and arguably the most decadent place in the United States.

The city is a tourist's mecca not only because of its colorful history (Napoleon Bonaparte even made detailed plans to spend his exile in New Orleans), but also because of its colorful present. The unofficial city motto is "Laissez le bon temps roulet" (let the good times roll), and entertainment, whether it's jazz, or food, or browsing for antiques, is taken very seriously here. New Orleans' history is notably absent the puritan tradition of other American cities, and this, combined with its heavy European influences—in architecture, and

food, and dialect—makes for a tremendously cosmopolitan setting.

On the riverfront, not far from the Hilton, stands the renovated Jackson

Brewery with its more than 125 shops and restaurants, riverside promenade, and sight-seeing terraces. It marks the outer periphery of the Vieux Carre, the French Quarter, which is permeated not only by the sounds of Preservation Hall's jazz, and the smells of beignets and muffuletta, but also by the dark black magic of voodoo specialty shops. A warning: these are the real thing, and not for the faint of heart; if you're in the market for newt's eyes and bat's wings, these are the places to find them.

For those whose taste runs to the more harmless, the St. Charles streetcar (which runs a circular route, with

*(New Orleans, continued on page 74)*

rency was printed on one side in French, the other in English. A ten dollar note was printed on the French side with the word "Dix" and became known as "Dixies." New Orleans was the first Dixieland.)

### Dressed

—An adjective applied here to food (not individuals), meaning "serve with the works." It generally refers to sandwiches "dressed" with mayonnaise, lettuce, and tomato.

### Etoufee

*(ay-too-fay)*—A succulent tomato-based sauce. Crawfish etoufee and shrimp etoufee are wonderful local delicacies.

### Gumbo

—Another dish indigenous to New Orleans, a thick soup prepared with beef, seafood, countless spices, and lots of rice.

### Jambalaya

*(jum-bo-lie-ya)*—New Orleans chefs "sweep up the kitchen" and toss a kitchenfull of ingredients into the pot—yellow rice, sausage, seafood, vegetables, and, of course, spices.

### Lagniappe

*(lan-yap)*—French for "bonus," the "little something extra" that your trip may bring. Fourteen oysters for the price of twelve, or eight postcards for the price of six.

### New Orleans

—The correct pronunciation of the city is almost unprintable. The locals say "Nawlines," "N'awlins," "NyOrlyuns," or "N'yawlyuns." Never "New Or-leens."

### Parish

—In any other state, a county. One of

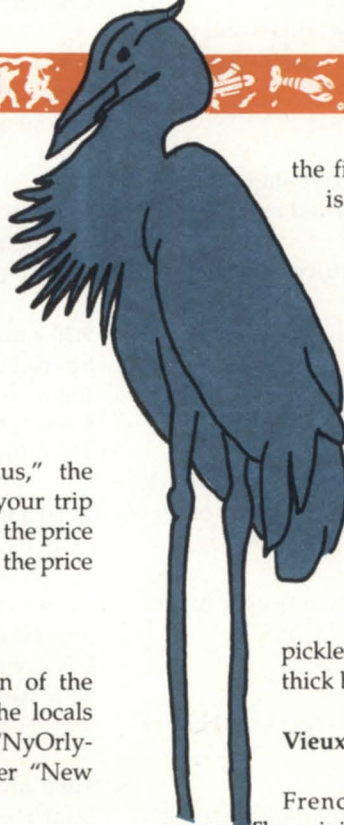
the first things any Louisiana school child learns is that this state is the only one in the country that has parishes instead of counties.

### Muffuletta

—An extravaganza of a sandwich. Italian sausage and meats and mustard and pickles, piled high on great thick buns.

### Vieux Carre

*(Vieu-ka-ray)*—French, meaning old square. The original city of New Orleans, now the French Quarter. Δ



# NADGUG Conference '89 schedule

(Registration, sessions, seminars, and exhibits at the New Orleans Convention Center. Social functions at the Hilton.)



## SUNDAY, September 17, 1989

**9:00 a.m.—5:00 p.m.**

NADGUG Executive Board meeting at Hilton (open to officers, standing committee chairs, and RIG/SIG chairs)

**4:00 p.m.—8:00 p.m.**

Educational Services seminars registration



## MONDAY, September 18, 1989

**8:15 a.m.—9:15 a.m.**

Educational Services seminars and office automation workshop registration desks open

**9:30 a.m.—12:30 p.m.**

Educational Services morning seminars (requires separate fees and registration)

OASIS-sponsored office automation workshop

**12:30 p.m.—1:30 p.m.**

Lunch break

**12:30 p.m.—6:00 p.m.**

Conference registration desk open (pick up your materials if preregistered, or register on site.)

Exhibits and exhibit area cafe open (opening ceremonies at 12:30 p.m.)

**1:30 p.m.—5:00 p.m.**

Workshop for RIG/SIG chairs (at Hilton)

**1:30 p.m.—4:30 p.m.**

Educational Services afternoon seminars

**1:30 p.m.—5:00 p.m.**

OASIS-sponsored office automation workshop (continued from morning)

**5:30 p.m.—6:30 p.m.**

First-timers orientation (at Hilton)

**7:30 p.m.—9:00 p.m.**

Welcome reception (at Hilton, ticket required)



## TUESDAY, September 19, 1989

**7:30 a.m.—9:00 a.m.**

Speaker orientation breakfast (for Tuesday presenters)

**8:00 a.m.—6:00 p.m.**

Conference registration open

**8:30 a.m.—3:00 p.m.**

Guest hospitality suite open (at Hilton, special guest orientation from 9:00—9:30 a.m.)

**9:00 a.m.—9:30 a.m.**

Complimentary coffee break (at Convention Center)

**9:30 a.m.—10:30 a.m.**

**Special general session**

Keynote address

Patricia B. Seybold, president and CEO of The Office Computing Group

**10:00 a.m.—6:00 p.m.**

Exhibits and exhibit area cafe open

**10:30 a.m.—11:00 a.m.**

**Special general session**

DG keynote address

Tom West, senior vice president of Systems Development Division

**11:00 a.m.—1:00 p.m.**

Lunch break

**11:30 a.m.—1:00 p.m.**

Luncheon for RIG/SIG chairpersons (at Convention Center)

**1:00 p.m.—1:45 p.m.**

**End-user**

CEO Roundtable (double session)

Chair: Charlene Kirian, Computer Training, and Roberta Pressman, Deutsche Credit

**Technical**

"Industry-Standard Benchmark for an Industry-Standard World: Comparing Performance of Unix Systems"

Tom Morgan, Data General

"A Survey of File and Document Compression Utilities of AOS and AOS/VS"

Brian Johnson, Brian Johnson Inc.

**Management**

"Developing An Access Security System for AOS/VS Installations"

Peter Walsall, DataLynx

"DG/INGRES Phase II"

Kathleen Springer, Data General

**1:45 p.m.—2:00 p.m.**

Short break

**2:00 p.m.—2:45 p.m.**

**End-user**

CEO Roundtable (continued)

**Technical**

"Porting to DG/UX"

Donna Boyce/Russ Clark, Data General

"X.25 and Data General"

Robert Machlin, amNET

**Management**

"System Administration in a Diskless Environment"

Stephen Daniel/Mike Mossman, Data General

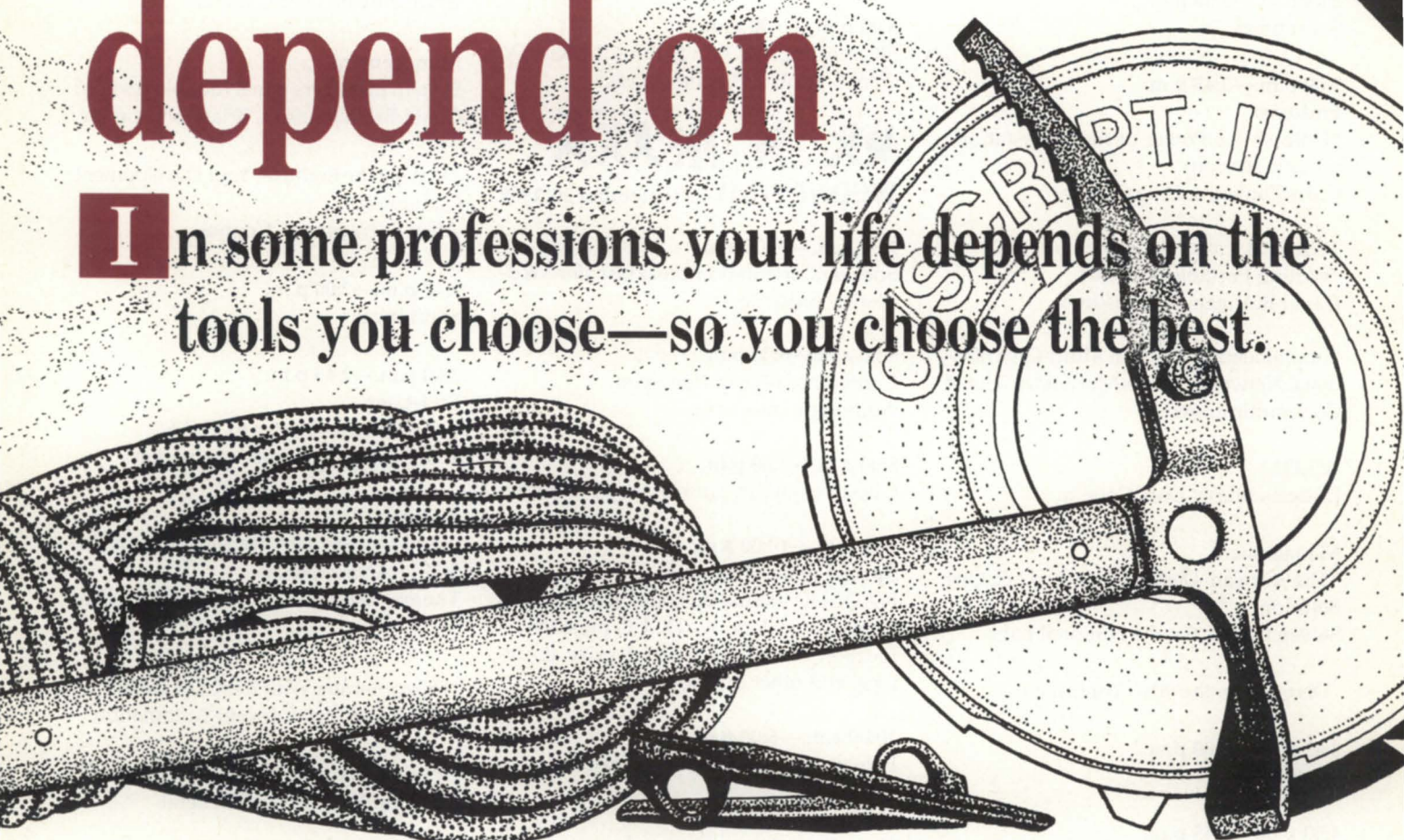
"Worms, Viruses, and Time Bombs: Coping with Current Trends in Computer Hacking"

Tom Gutnick, Data General

# Tools you can depend on

See us at  
NADGUG booth 334

**I**n some professions your life depends on the tools you choose—so you choose the best.



- **C/SCRIPT** - COBOL application development system.
- **Screen Demon** - Pop-up windows for DG terminals. Hot-key calculator, CLI, print screen, and more. Works with existing COBOL programs.
- **ICHOST** - Single and multi-terminal ICOBOL interpreters for MS-DOS systems. Up to 33 users. Fastest product of its kind.
- **Scream** - Fast file Transfers over ASYNC lines.
- **DG Dump/DG Load** - Create and load DG-compatible dump files on your MS-DOS or Unix system.
- **ICOBOL to RM/COBOL Translator** - Translates ICOBOL source code to RM/COBOL.
- **ICIO** - Access ICOBOL data files from a 32-bit program.

For more information

(205) 821-0075

## Threshold, Inc.

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Circle 69 on reader service card.

C/SCRIPT is a registered trademark of Threshold, Inc.

"Disasters in the 90s" (double session)  
James Shapiro, Fast Track Systems, Joe Cannata, Data General, and representatives from Comdisco.

**2:45 p.m.—3:00 p.m.**  
Short break

**3:00 p.m.—3:45 p.m.**  
**End-user**  
"Unleash the Power of the Workstation" (double session)  
Chris Zannetos, Data General

**Technical**  
"Writing Portable C Code"  
David Bultman, SAS Institute

"Implementing X.400 in Multi-Organizational Networks" Miles Morimoto, Telenet Communications

"CLI32"  
Douglas Bilton, Data General

**Management**  
"The Software Design Balancing Act: One Solution"  
Steven Chaba, Sandia National Labs

"Disasters in the 90s" (continued)

**3:45 p.m.—4:00 p.m.**  
Short break

**4:00 p.m.—4:45 p.m.**  
AOS/VS SIG meeting

**End-user**  
"Unleash the Power of the Workstation" (continued)

"Desktop Publishing on the PC and the MV"  
Guy Pribyl and Tracy Powell, WordPerfect

**Technical**  
"DG/UX Rev 4 Performance Monitoring and Tuning"  
Walter Fraser, Data General

"Comparative Network Performance X.25 vs OSI vs TCP/IP"  
Scott Hinckley, Data General

ICobol Roundtable  
Chair: Dennis Doyle, Software Alliance

**Management**  
"Software Development Contracts—Cutting Up the Copyright Ownership Pie"  
John Land, Spensley Horn Jubas and Lubitz

**5:00 p.m.—6:00 p.m.**  
SIG meetings: AOS/VS, Infos II, SIG/UX, OASIS, ICobol, Business Basic



**WEDNESDAY—September 20, 1989**

**7:30 a.m.—9:00 a.m.**  
Speakers orientation breakfast (for Wednesday presenters)

**8:00 a.m.—6:00 p.m.**  
Conference registration open  
Audiotape sales open

**8:00 a.m.—3:00 p.m.**  
Guest hospitality suite open (at Hilton)

**9:00 a.m.—10:00 a.m.**  
**Special general session**  
NADGUG annual business meeting  
Chair: Don Clark, NADGUG president  
Election of officers, special prize drawings, and other business

**10:00 a.m.—5:00 p.m.**  
Exhibits and exhibit area cafe open

**10:00 a.m.—10:30 a.m.**  
Complimentary coffee break

**10:30 a.m.—11:30 a.m.**  
**Special general session**  
Executive discussions  
Interactive discussion between Data General senior management and the NADGUG Advisory Committee

**11:30 a.m.—1:00 p.m.**  
Lunch break

**1:00 p.m.—1:45 p.m.**  
**End-user**  
"Training Using In-House Staff"  
Carl Switzer/Gail Crawford, Northern Illinois University

**Technical**  
"The Operational Data Base in the Centralized Forecast System"  
John Huddleston, USDA Soil Conservation

"CEO Light: A Technical Comparison with CEO"  
Casey Sayre, Data General

"IBM SNA Communications in DG/UX"  
Bruce Stovall, Data General

**Management**  
System managers panel (double session)  
Chair: Brian Johnson, Brian Johnson Inc.

"Making the End-user Your Development Champion"  
Allen Stjernegaard, Cognos

**1:45 p.m.—2:00 p.m.**  
Short break

**2:00 p.m.—2:45 p.m.**  
**End-User**  
"Text Searches Under AOS/VS"  
Tom Bishop, Concept Automation

**Technical**  
"Mini-to-Mini File Transfers Using the SOFTRANS Protocol"  
Thomas Doyle, Fremont Sanitation District

"Programming With the CEO Toolkit"  
Russell Cordner, Concept Automation

"X Windows and Graphics on the 88000"  
Durward Rogers, Data General

**Management**  
System managers panel (continued)

"A Multiple Entry Point CASE Architecture"  
Allan Hendrickson, Cognos

**2:45 p.m.—3:00 p.m.**  
Short break

**3:00 p.m.—3:45 p.m.**  
**End-User**  
"Data Base Publishing"  
Soto Flouris, Intercon Associates

**Technical**  
"Using the MRC Under AOS/VS II"  
Philip Schwartz and Mark Wilding, Data General

"Case Study: Two Years of Performance Monitoring/Usage Forecasting"

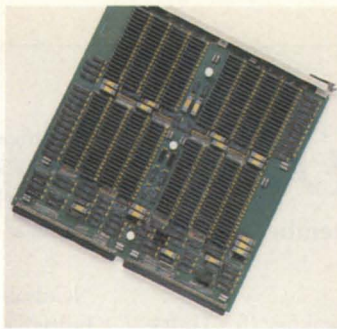


## Memory Boards for MV/15000, MV/20000 Computers

Dataram DR-1520 memory comes in 8, 16 or 32MB board capacities. The add-in memory uses 1Mb RAM technology to upgrade processor performance, and does not affect DG service arrangements. Boards are user installable, have Enable/Disable switch and LED indicators.

**Dataram Corp. Phone 1-800-822-0071 (NJ 609-799-0071).**

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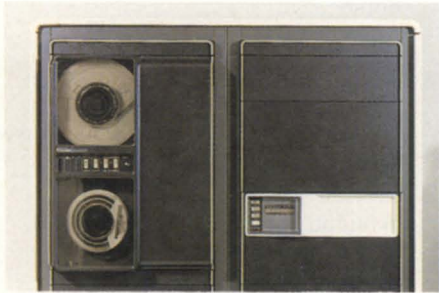
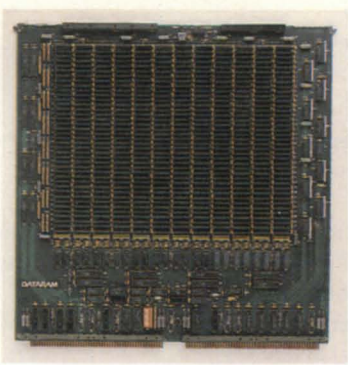


## Now up to 16MB Total Memory for MV/6000, MV/8000, MV/8000 II

Cost-effective DR-6080 memory boards improve response time, add power for more users, applications. Expand to full 16MB capacity with 4MB, 8MB, or 12MB boards, trade up to higher capacity. Full lifetime warranty.

**Dataram Corp. Phone 1-800-822-0071 (NJ 609-799-0071).**

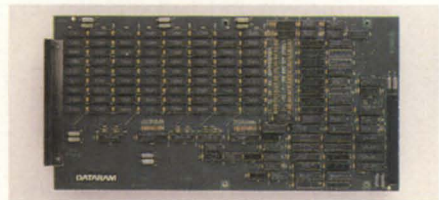
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## Main Memory Upgrade for MV/4000 and MV/10000

DR-280 series memory offers a choice of 2, 4 or 8 MB of main memory per board. The DR-280 operates with highest reliability DRAM technology and can be installed in minutes — without hardware or software changes. **Dataram Corp. Phone 1-800-822-0071 (NJ 609-799-0071).**

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## Lifetime Warranty on Memory for MV/1400, MV/2000, DS/7500

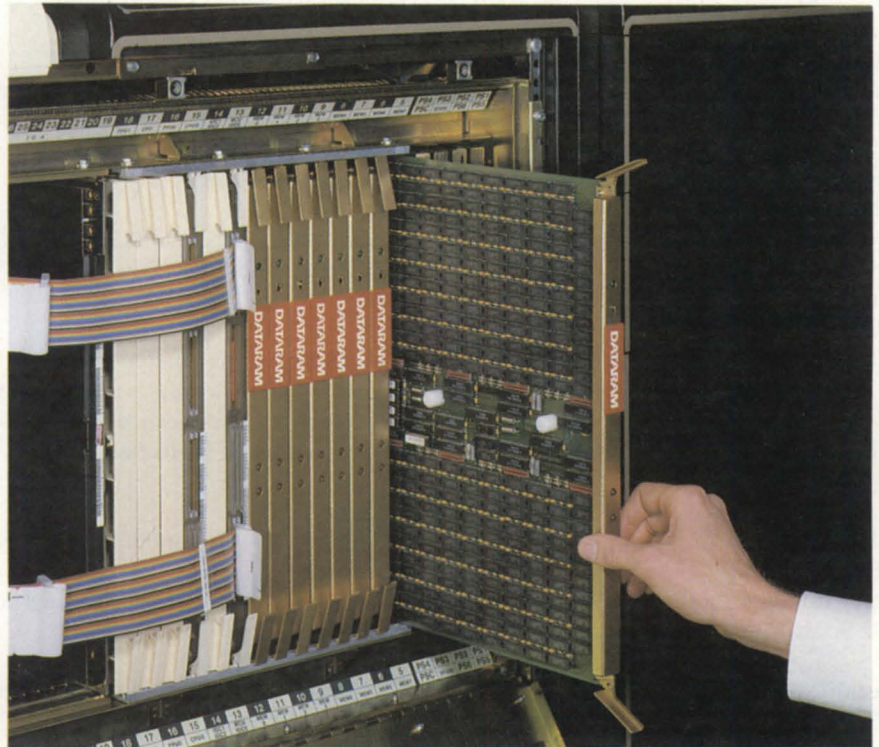
High-reliability 1Mb DRAM technology on 4MB and 8MB boards brings low-cost boost to processor performance. Dataram DR-1420 memories plug directly into all three processors, do not affect DG service arrangements. **Dataram Corp. Phone 1-800-822-0071 (NJ 609-799-0071).**

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## Up to 16MB Extra Main Memory for MV/2500 Series

Dataram's DR-2500 memory boards, available in 8MB and 16MB capacities to improve processor speed and power, are fully compatible with hardware and software for DG's MV/2500. The plug-in memory needs no maintenance, has a lifetime warranty, and is available on a 30-day trial basis. **Dataram Corp. Phone 1-800-822-0071 (NJ 609-799-0071).**

Circle 28 on reader service card.



# Memory is power.

## Plug more speed, users, functions into your DG with reliable Dataram memory

No matter which DG computer you own, Dataram has memory to fill it. Totally DG compatible. Designed and built maintenance-free, to keep costs down. Backed by a lifetime warranty that delivers spares overnight — and pays the shipping!

Dataram add-in memory is the efficient path to maximum performance. With up to 32MB on a single board, it can overcome system restrictions on your MV/1000, your MV/2000, or

any DG in between, for more speed or users, or for expanded applications without sacrificing speed.

Buy just what you need now. When you need more power, trade in your Dataram board for a generous credit on a larger one. Or try a Dataram board for 30 days, no obligation. Find out how much more computer your DG can be — and how little it can cost. Call for details on Dataram memory for Data General.

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# DATARAM

P.O. Box 7528, Princeton, NJ 08543-7528 • 1-800-822-0071 (NJ 609-799-0071)

See us at NADGUG booth #612

Kenneth Ramme, Rochester Gas and Electric

"Troubleshooting and Monitoring Extended Heterogeneous Local Area Networks: An OSI-Based Strategy"  
Gerard Puoplo and Geoffrey Mamlet, Data General

### Management

"Software Measurement and Evaluation"  
David Kephart, Illinois State University

"Cabling Systems for Tomorrow's Local Area Networks"  
Aldo Falossi, Cable Management Systems

3:45 p.m.—4:00 p.m.  
Short break

4:00 p.m.—4:45 p.m.  
End-user

"Computers in Sales and Marketing"  
Carl Gropper/Steve Haber, Profidex

Cybertek SIG meeting  
PERFSIG meeting  
WordPerfect SIG meeting

### Management

"Being On Top"  
Steve Handlos, Productivity Systems, and Liz Straus, Stewart Associates

### Technical

"Relational Directions for Data General"  
John Farnsworth, Data General

5:00 p.m.—5:45 p.m.  
Educational SIG meeting

### End-user

"Advanced User Interfaces and Office Systems"  
Bruce Evans, Data General

### Technical

"Solving Application Performance Problems—Four Steps in Tuning an Application System"  
Andy Wilkes, Data General

Federal SIG meeting  
Lions Gate SIG meeting  
Law Enforcement SIG meeting

7:00 p.m.

Cocktail Reception and Banquet (at Hilton)



## THURSDAY, September 21, 1989

7:30 a.m.—9:00 a.m.

Speakers orientation breakfast (for Thursday presenters)

8:00 a.m.—10:00 a.m.

Conference registration open  
Educational Services registration open

8:00 a.m.—noon

Guest hospitality suite open (at Hilton)  
Audiotape sales open

9:00 a.m.—9:45 a.m.

### End-user

"Using WordPerfect with CEO"  
Guy Pribyl and Tracy Powell, WordPerfect

"A SAS-based Information Subsystem"

Leonard Bruckman and Eileen Ramakrishnan, Connecticut Department of Environmental Protection

### Technical

"ICobol 1.50—An Ambitious Step Forward"  
Gerry Manning, Gerry Manning and Associates

":SYSMGR Benchmark Suite for AOS/VS—An Update"  
Brian Johnson, Brian Johnson Inc.

"Bridging AOS/VS and DG/UX"  
Thomas McMillan and Ivan Liss, Radford University, and Lawrence Laramay, Data General

### Management

"Modems, Multiplexers and ISDN—The Evolving Network"  
Robert Balsamo, Paradyne

9:45 a.m.—10:15 a.m.

Complimentary coffee break

10:15 a.m.—11:00 a.m.

### End-user

"Hypermedia: A Revolution in Document Organization, Access, and Viewing"  
Jerry Goguen, Data General

"Statistical Quality Control"

Paul Bachteal, SAS Institute

### Technical

AOS/VS Roundtable (double session)  
Chair: Ed Lindberg, Western New England College

"ICobol—Increased Markets and Portability"

Bruce Ray and Linda Ven Dryes, Wild Hare

"Three-Dimensional Performance Solutions"

Allen Hopper, Data General

### Management

"If Artificial Intelligence is the Answer, What is the Question?"  
(double session)  
Yehudah Freundlich, Data General

11:00 a.m.—11:15 a.m.

Short Break

11:15 a.m.—noon

### End-user

"Effective Presentations Using Graphics"  
Diane Olson, SAS Institute

"Developing a Graduate Level Course in Operations Planning and Control Utilizing 'IMPCON' on Data General"  
Gail Turgeon and Lance Heiko, Bryant College.

### Technical

AOS/VS Roundtable (continued)

"Systems Analysis Prerequisites for CASE"  
Michael Grottola, Vantage Software

"Generic Peripheral Cache Systems"  
Clyde Sparks, Delphi Data

### Management

"What's New in PC Integration"  
Douglas Kaye and Peter Wiggins, Rational Data

"If Artificial Intelligence is the Answer, What is the Question?" (continued)

Noon—1:00 p.m.

Lunch break

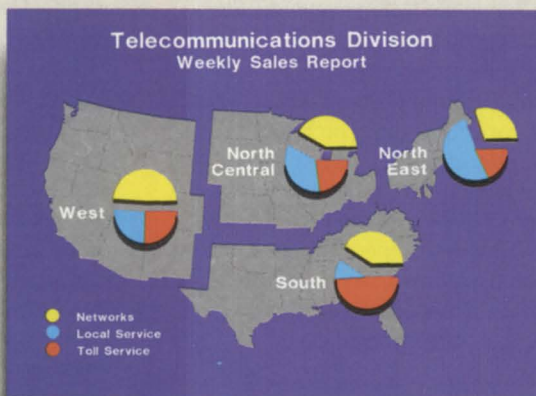
1:00 p.m.—4:00 p.m.

Educational Services Seminars (requires separate fee and registration)  $\Delta$

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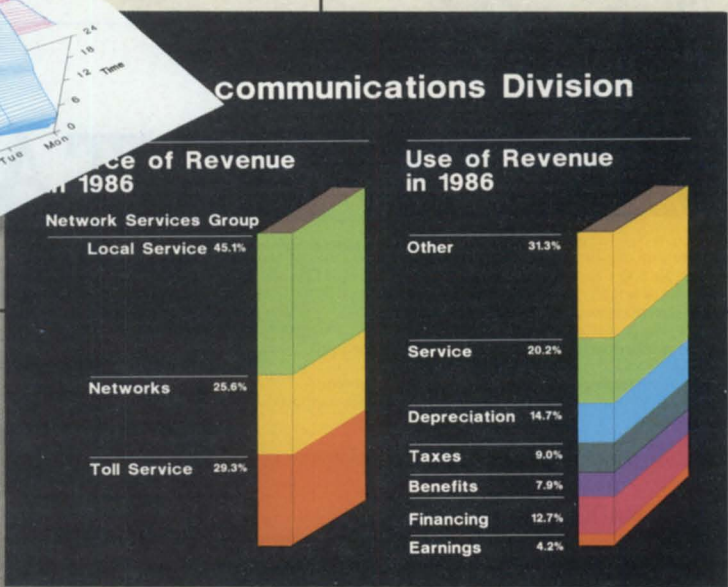
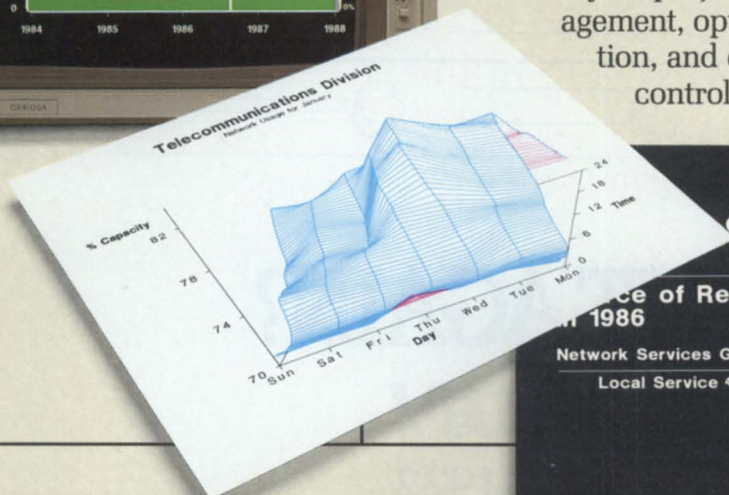
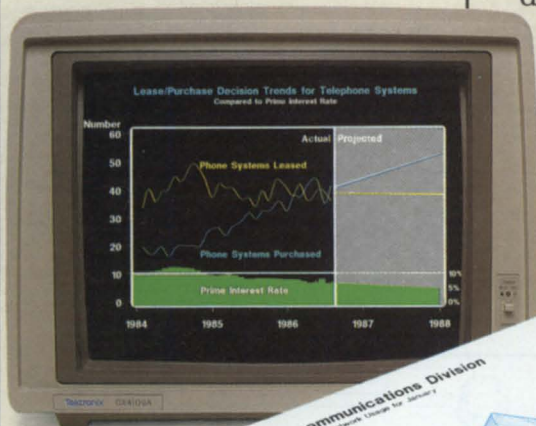
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*(Seybold continued from page 67)*

run our businesses and as we track our customers and customize our products.

Point number two is the collaborative nature of the way you'll be doing the work. In the time-sharing model, certainly with PCs networked together, and even in the minicomputer/time-sharing model, when you have multiple people on the same system trying to communicate, you do it asynchronously. You do it by sending something through electronic mail and then the other person looks at it and comments back. Once we move to this next distributed network computing architecture, you will be able to see in real time everything that's happening all at once, if you want to. You will have links to all the different things going on and your screen will be updated as things come in. That's just a very different way of operating and it's something that's hard to put a dollar value on. My own hunch is that once we start experiencing it, there won't be any turning back. And, we will need these new architectures to do it.

**Focus:** Do you believe that Data General is heading in the right direction with its strategy of distributed applications architecture?

**Seybold:** Yes, definitely. We share a lot of the same views about how application design will be done in the future, how important it is to do it in a heterogenous manner, and how important it is to be a standard-setter in this arena so that the whole industry can move on. Δ



*(New Orleans, continued from page 67)*

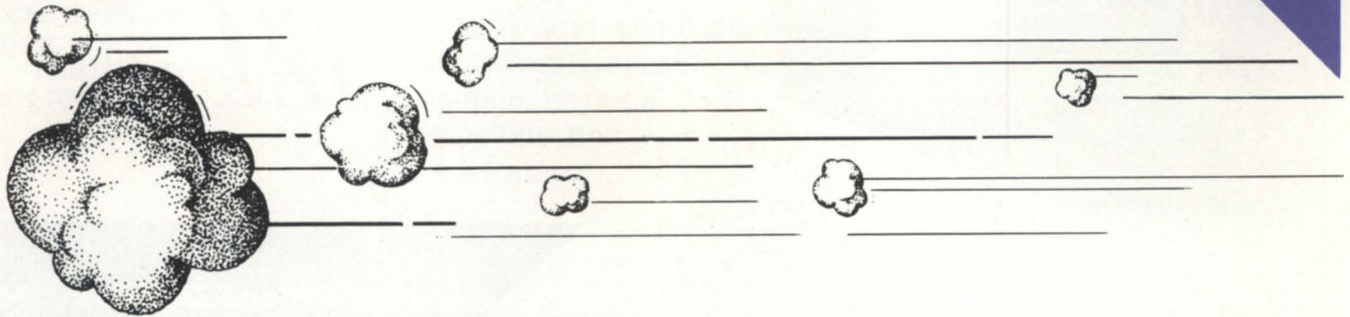
stops marked along the way) provides a 60-cent tour of the garden district—beautiful and big Victorian homes that continue to exude the prosperity New Orleans once enjoyed. Tulane University and the 400-acre Audubon Park are also near this area, as is Magazine Street and its string of antique shops. Desire, the streetcar immortalized by Tennessee Williams, is retired to the French Quarter (it can be seen there at the old U.S. mint), and has a new incarnation as a modern bus that mainly serves the projects of the same name.

During the conference, several tours are available for guests. On Tuesday morning, September 19, "New Orleans A La Carte" wheels through the city, in and out of the French Quarter and Lake Pontchartrain, and in the afternoon, a tour of the Garden District is offered. On Wednesday, a \$46 tour offers a glimpse of the Old South, with visits to several historic plantation homes still maintained as private residences by New Orleans natives. After the conference, tour groups will travel to Baton Rouge, the capital of New Orleans, and to Honey Island Swamp to see wildlife in the bayou.

Scores of artists, from Degas to Louis Armstrong, have been inspired by New Orleans. The city is beguiling, and whether on a guided tour, or alone, it begs to be experienced.

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# I/O I/O it's off to work I go

**SYNOPSIS**

*Reduce Cobol/Infos I/O errors with combined in-line file status checking and a general purpose error routine.*

by Jay Anderson  
Special to Focus

Much of the work done by a Cobol program is input/output. Since I/O is such a large part of what a Cobol program does, it is important that some consideration be given to what happens when an I/O error occurs.

This article demonstrates how the declaratives section, the file status variable, and the Infos status variable are used to gain more control over Cobol/Infos I/O errors. It features in-line file status checking in conjunction with a general purpose error routine. Combining these techniques produces a powerful generic methodology for coding Infos file handling in a Cobol program.

**Handling I/O exception conditions**

The Cobol manual states that there are four facilities available for I/O error checking:

- The AT END statement
- The INVALID KEY statement
- Declaratives
- Infos status and file status data items

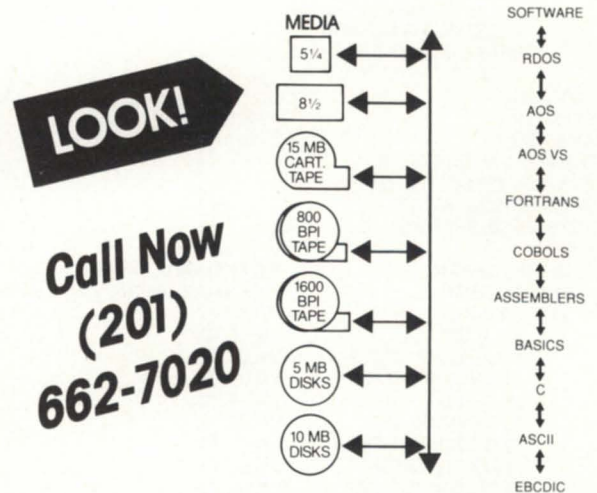
Cobol programmers are familiar with the AT END and the INVALID KEY statements. These are sufficient for controlling program flow, but sometimes lack finesse when a serious I/O error occurs. The Cobol solution in this case is to abort with a screen full of "CALL TRACEBACK, FP=,PC= and ERROR" messages. This treatment can be a little disconcerting for user and programmer alike. A better solution is to use the file status, Infos status, and declaratives facilities.

The Cobol file status data item is a two-character alphanumeric data item that is specified in a file's SELECT clause. It contains a status code that Cobol returns when an I/O statement is executed. These file status codes can be used to control the flow of a program. File status is most useful when combined with the declaratives facility.

The Infos status data item contains the exception codes from Infos or the operating system after an I/O statement. Its use is similar to the Cobol file status variable. It is important to notice that the codes returned by the Infos status variable are represented as octal numbers. These codes are available in the system error message file.

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Declarative procedures occur in a separate subdivision at the beginning of the procedure division. Cobol invokes the declarative procedures when an I/O error occurs, according to the rules provided by Cobol. After executing the declaratives code, control passes to the statement following the I/O statement. This opens the door to a world of possibilities. The rest of this article will discuss one of those possibilities.

### A general purpose Infos error routine

A general purpose Infos error routine should have certain minimum characteristics. Its main objective should be to report that an error has occurred. A second should be to provide enough information about the error so that some plan of action can be formulated. There are some other secondary characteristics. It should work on-line as well as in batch. It should leave an audit trail that does not rely on the actions of a user. It should be well-behaved in that it gives the user a chance to read the screen. Figure 1 is the listing of a Cobol program that incorporates just such an error handling routine.

### What the program does

The program makes use of a file status variable called FILE-STATUS and an Infos status variable INFOS-STATUS. These have been strategically placed inside an error line that is used in the error handling code. In addition, the FILE-STATUS variable has been coded with possible values defined by Cobol using 88 level variables. These 88 level items are used to control the program flow after I/O statements. The declarative section allows all of this to work because, after the declarative code is executed, control passes to the statement after the I/O statement. Not much happens in the declarative procedure. In this example, the filename of the file causing the error is simply moved to the error line.

In the procedure division, the first line is a call to subroutine WHO. Subroutine WHO gives the program its powers of discernment. When the variables WHO-PID, WHO-CON, and WHO-USER are filled, another set of 88 level variables can be used to determine if the program is at a console or running in a batch stream. This is evident in the routine 9999-ERROR. If the program is running with a console, the screen section is used to display the error lines and get a response. In batch, a normal DISPLAY verb is used to write the error lines to the standard output file.

### What about Infos?

If an error occurs, control is transferred to the 9999-ERROR routine. The call to subroutine PPKEY (Figure 2) is the next obvious order of business. To understand PPKEY, some background information is needed.

A Cobol program and Infos communicate through software structures called packets and tables. The Infos manual describes volume definition packets (VDPs), file definition packets (FDPs), processing packets (PPs) and key description packets (KDPs). Although beyond the scope of this article and well hidden from the Cobol programmer, the packets are available to the Cobol

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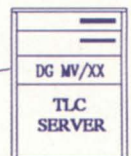
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Figure 1: Input-output section

INPUT-OUTPUT SECTION.

FILE-CONTROL.

SELECT ANINFOSFILE

ASSIGN INDEX TO 'ANINFOSFILE'  
 ASSIGN DATA TO 'ANINFOSFILE.DB'  
 ORGANIZATION IS INDEXED  
 ACCESS MODE IS DYNAMIC  
 RECORD KEYS ARE SELECT-ANINFOSFILE  
 ANINFOSFILE-KEY  
 FILE STATUS IS FILE-STATUS  
 INFOS STATUS IS INFOS-STATUS.

DATA DIVISION.

FILE SECTION.

FD ANINFOSFILE

FEEDBACK IS ANINFOSFILEFB.

01 ANINFOSFILEREK PIC X(80).

WORKING-STORAGE SECTION.

\*\*COPYBOOK CBERROR.WS

01 ELINE-1.

05 ERR-FILE-NAME PIC X(10) VALUE SPACES.  
 05 ERR-DUMMY PIC X VALUE SPACES.  
 05 FILE-STATUS PIC X(2).  
 88 I-O-OK VALUE '00'.  
 88 DUPLICATE-ADDED VALUE '02'.  
 88 DUPLICATE-READ VALUE '02'.  
 88 AT-END VALUE '10'.  
 88 DUPLICATE-KEY VALUE '22'.  
 88 RECORD-NOT-FOUND VALUE '23'.  
 88 KEY-TOO-LARGE VALUE '24'.  
 88 HARDWARE-ERROR VALUE '30'.  
 88 OPEN-ERROR VALUE '91'.  
 88 MODE-ERROR VALUE '92'.  
 88 RECORD-LOCKED VALUE '94'.  
 05 FILLER PIC X VALUE SPACE.

05 INFOS-STATUS.

10 ISTATDIGIT OCCURS 11 INDEXED BY DIGITNDX  
 PIC 99 COMP.  
 PIC X VALUE SPACE.  
 05 FILLER PIC X VALUE SPACE.  
 05 ERR-USER-MSG PIC X(74).

01 ELINE-2.

05 ERR-MESS PIC X(80).

01 ERR-KEYS.

05 ERR-KLINE OCCURS 6 INDEXED BY ERRNDX.  
 10 ERR-KEY-LN PIC S99 COMP.  
 10 ERR-KEY PIC X(79).  
 PIC X(255).

01 HEX255

01 HEXLN

01 ERRWRD

01 ASCIIZERO

01 RA-DIX

01 WHO-PID

01 WHO-CON.

05 WHO-CON1 PIC X.  
 88 RUNNING-CONSOLE VALUE 'C' V'.  
 88 RUNNING-BATCH VALUE 'S' B'.  
 05 FILLER PIC X(31) VALUE SPACES.  
 PIC X(32) VALUE SPACES.

01 WHO-USER

\*\*END COPYBOOK CBERROR.WS

01 ANINFOSFILEFB

01 SELECT-ANINFOSFILE

01 ANINFOSFILEREK.WS.

05 ANINFOSFILE-KEY.  
 10 ANINFOSFILE-NUMBER PIC 9(6).  
 05 ANINFOSFILE-DATA.  
 10 ANINFOSFILE-DATA PIC X(74).

SCREEN SECTION.

\*\*COPYBOOK CBERROR.SS

01 SCR-ERR-LINE.

05 SCR-BLANK-23 LINE 23 BLANK LINE.  
 05 LINE 23 COL 01 PIC X(80) FROM ELINE-1.  
 05 SCR-ERR-MSG.  
 10 LINE 24 BLANK LINE PIC X(50) FROM ERR-MESS.  
 10 LINE 24 COL 51 'ENTER / TO CONTINUE'.  
 10 LINE 24 COL 79 PIC X TO ERR-DUMMY.

\*\*END COPYBOOK CBERROR.SS

PROCEDURE DIVISION.

DECLARATIVES.

AN-INFOSFILE SECTION.

USE AFTER ERROR PROCEDURE ON ANINFOSFILE.  
 MOVE 'ANINFOSFILE' TO ERR-FILE-NAME.

END DECLARATIVES.

MAIN SECTION.

0010-CONTROL.

\*\*COPYBOOK WHO.PL

CALL 'WHO' USING WHO-PID WHO-CON WHO-USER.

\*\*END COPYBOOK WHO.PL

OPEN I-O ANINFOSFILE.

IF I-O-OK

NEXT SENTENCE

ELSE MOVE 'OPEN' TO ERR-USER-MSG

PERFORM 9999-ERROR.

READ ANINFOSFILE SUPPRESS DATA KEY IS SELECT-ANINFOSFILE.

IF I-O-OK

NEXT SENTENCE

ELSE MOVE 'SELECTOR MISSING' TO ERR-USER-MSG

PERFORM 9999-ERROR.

CLOSE ANINFOSFILE.

STOP RUN.

0010-EXIT. EXIT.

\*\*COPYBOOK CBERROR.PL

9999-ERROR.

\*\*\*\*\*

\* CALL PPKEY WILL ONLY WORK IF THERE HAS BEEN NO COBOL I-O

\* AFTER AN INFOS CALL

\*\*\*\*\*

MOVE ZERO TO

ERR-KEY-LN (1) ERR-KEY-LN (2) ERR-KEY-LN (3)

ERR-KEY-LN (4) ERR-KEY-LN (5) ERR-KEY-LN (6).

CALL 'PPKEY' USING ERR-KEYS.

PERFORM 9999-10-OCTAL-TO-DECIMAL.

IF ERRWRD = ZERO

MOVE 'NO ERROR OCCURRED ....' TO ERR-MESS

ELSE CALL 'ERMSG' USING ERRWRD ERR-MESS ERRWRD.

IF RUNNING-CONSOLE

MOVE '' TO ERR-DUMMY

PERFORM 9999-05-ACCEPTER UNTIL ERR-DUMMY = '/'

ELSE DISPLAY ELINE-1

DISPLAY ELINE-2.

MOVE ELINE-1 TO HEX255.

MOVE 80 TO HEXLN.

CALL 'HEXTODISK' USING HEXLN HEX255.

MOVE ELINE-2 TO HEX255.

MOVE 80 TO HEXLN.

CALL 'HEXTODISK' USING HEXLN HEX255.

PERFORM 9999-30-HEXKEYS VARYING ERRNDX FROM 1 BY 1

UNTIL ERRNDX > 6.

STOP RUN 'ABORT'.

9999-05-ACCEPTER.

DISPLAY SCR-ERR-LINE.

ACCEPT SCR-ERR-LINE.

9999-10-OCTAL-TO-DECIMAL.

MOVE 0 TO ERRWRD.

PERFORM 9999-20-DIGIT VARYING DIGITNDX FROM 1 BY 1 UNTIL

DIGITNDX > 11.

9999-20-DIGIT.

COMPUTE ERRWRD = (RA-DIX \* ERRWRD) +

(ISTATDIGIT (DIGITNDX) - ASCIIZERO).

9999-30-HEXKEYS.

IF ERR-KEY-LN (ERRNDX) = ZERO

SET ERRNDX TO 6

ELSE MOVE ERR-KEY-LN (ERRNDX) TO HEXLN

MOVE ERR-KEY (ERRNDX) TO HEX255

CALL 'HEXTODISK' USING HEXLN HEX255.

\*\*END COPYBOOK CBERROR.PL



# Having key data available for inspection can be an extremely powerful debugging tool

program. PPKEY uses the KDPs of Infos to track down the last keys used by the Cobol program. These keys are moved into the ERR-KEYS table defined in working storage. This magic requires no additional coding in the body of the program. This version of PPKEY will handle up to six keys, which should be adequate for most Infos structures. A warning should be issued here! The external PPTR belongs to Cobol. The routine works for now, but a different compiler revision could change the variable name PPTR.

It may not be obvious from the example given (Figure 3), but having key data available for inspection can be an extremely powerful debugging tool.

After the call to PPKEY, the error routine makes use of the Infos file status variable. Since the octal Infos status code is available and Infos messages are in the system file ERMES, why not get the actual message text? This can be accomplished by converting the octal code to its binary equivalent and making a call to subroutine ERMMSG.

The paragraph 9999-10-OCTAL-TO-DECIMAL handles the octal/binary conversion. The routine takes advantage of the fact that a character can be viewed as a binary number. Subtracting the binary value for "0" from the binary value for any other digit yields that digit's value in binary. This is true because "0"

Figure 2: PPKEY

```

.TITLEPPKEY
.ENT PPKEY
;+++++
; This routine uses the INFOS parameters in PARAU32.SR
; X/S MASM%0/%/L=%1% LS/O=%1% PARAU32.SR/PASS1 %-%
; PPTR is found in module COBREAD in a COBOL program.
; It contains an address to the last INFOS processing packet used.
.EXTL PPTR
;PURPOSE: Track down the keys used in the last INFOS call and
; move them to a common area within the COBOL program. This area ; can then be
written out to disk.
;----- ANDERSON -----87/10/13
;CALLING SEQUENCE:
; CALL "PPKEY" USING COMMON-AREA.
;+++++

.NRELO ; UNSHARED
; PARAMETER TABLE

CA = -12. ;BP to common area
;01 COMMON-AREA.
; 05 ALINE PIC X(80) OCCURS 6.
;CONST

ACO = 0
AC1 = 1
AC2 = 2
AC3 = 3
MXKYS = 6. ;Maximum key packets.. Set by COBOL routine
MXKLN = 79. ;Maximum key length set by COBOL routine
;Declare storage for 1 byte more.

;VARS
SAPACK :.DWORD 0 ;Save packet address
NOKEYS :.DWORD 0 ;Save number of keys
SACA :.DWORD 0 ;Save BP to common area
.NREL 1 ; Shared code

PPKEY: WSAVS 0 ;Save all
LWLDA AC2,CA,AC3 ;Get BP to common area
LWSTA AC2,SACA ;Save for later
LWLDA AC2,PPTR ;Get processing packet address
WSEQ AC2,AC2 ;Is it zero?
WBR CONIN1 ;No
WBR DONE ;Yes

CONIN1:
LNLDA AC1,?TYPE.W,AC2 ;Get the packet type
WSNEI ?PPVS.AC1 ;Is it a processing packet?
WBR PROK ;Yes
WBR DONE ;No

PROK:
WLSHI 1,AC2 ;Get a BP to packet

WADDI ?PKPN.B,AC2 ;Get BP to number of key packets
WLDB AC2,ACO ;Get the actual number
WSGTI MXKYS,ACO ;Is the number > max
WBR GTMXK ;No
NLDAI MXKYS,ACO ;Yes..Make it the max

GTMXK:
LWSTA AC0,NOKEYS ;Save it
;Get the PP address back again
LWLDA AC2,PPTR ;Got it
WADDI ?PPVS.L,AC2 ;Packets are contiguous
NLDAI ?KDPVS.L,ACO ;Get value of key packet length
WSUB AC0,AC2 ;Prepare for loop (- packet length)
LWSTA AC2,SAPACK ;Save this ;Loop for all key packets

LOOP:
LWLDA AC2,SAPACK ;Get the current packet
WADDI ?KDPVS.L,AC2 ;Point to next
LWSTA AC2,SAPACK ;Save for next time through
LWLDA AC3,?KKYP.D,AC2 ;Get BP to key
WLSHI 1,AC2 ;Get a BP
WADDI ?KYLN.B,AC2 ;to the key length
WLDB AC2,ACO ;Get the length

;If zero length key I'm finished
WSEQ AC0,ACO ;Is it?
WBR CONTIN ;No..Continue
WBR DONE ;Yes..Done

CONTIN:
;Is the length too long to handle?
WSGTI MXKLN,ACO ;Is it?
WBR GTMXL ;No
NLDAI MXKLN,ACO ;Yes..Make it the max

GTMXL:
WMOV AC0,AC1 ;Ditto 0 -> 1
LWLDA AC2,SACA ;BP from COBOL
WSTB AC2,ACO ;Save length as first byte of key
WINC AC2,AC2 ;Point past
WCMV ;Move key to common
;Set for next
LWLDA AC2,SACA ;Get it
WADDI MXKLN+1,AC2 ;Bump to next
LWSTA AC2,SACA ;Put it back
LWDSZ NOKEYS ;Skip on no more keys
WBR LOOP ;Loop it

DONE:
LDAFP AC3 ;Restore Frame
WRTN ;Return to COBOL
.END ;This is the very last line.

```



# The latest products for DG systems

## DG offers 5.25-inch tape and disk storage devices

Westboro—Adding to its mid-range open architecture storage systems, Data General has introduced two new mass storage products for the Eclipse and Aviion systems. A 662 MB 5.25-inch disk drive providing twice the storage capacity of comparable IBM and DEC models doubles the maximum internal storage capacity of deskside MV/family and Aviion systems and workstations, and a 5.25-inch cartridge tape subsystem also increases storage capacity, from the current 130 MB maximum to two GB per cartridge.

Priced under \$17 per megabyte, the new Winchester disk drive (Model 6554) features 662 MB of formatted, error-checking/correcting (ECC) protected storage, a 16-millisecond average seek time, and an 8.33 average rotational latency. It provides from 1.2 GB to 1.8 GB of internal high-performance storage, with prices starting at \$10,900.

The new tape subsystem (Model 6590) is DG's first cartridge tape drive to incorporate helical-scan technology (used in video tape machines to compact large amounts of data into small areas), and features read-after-write verification and on-board ECC storage. Prices begin at \$7,800.

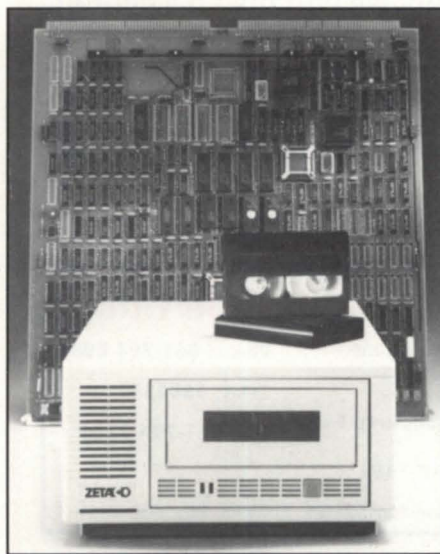
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## New tape storage products from Zetaco

Minneapolis, MN—Zetaco, a DG VAR and designer of DG-compatible peripherals, has three new products that utilize helical scan technology for tape backup.

The SKT-2300 tape cartridge can store



Zetaco's SKT-300 helical scan tape subsystem.

up to 2 GB of data. It is ready to plug-and-play with no modification to DG hardware or software using the DG MTJ driver. The SKT-2300 is available in a 9-inch x 12-inch enclosure. It is priced at \$10,995.

The SKM disk/tape subsystem is a high performance data storage and retrieval system made up of magnetic disk drives and a helical scan disk drive, providing 330 to 1,803 MB of high-speed data storage and 2 GB of cartridge tape backup. SKM subsystems are compatible with DG's DPJ and MTJ software drivers, which are designed to accommodate high-performance disk and high-speed cartridge tape.

Configurations offer flexibility to the customer of starting with a tape-only or disk-only unit, then adding drives as needed. Base configuration begins at \$11,495.

Zetaco also announced the availability of the SCZ-4 tape controller for OEMs and system integrators. The SCZ-4 interfaces the Exabyte Model 8200 helical scan tape drive to Data General's MV series minicomputers to provide high-speed, high-capacity backup of data stored on magnetic disks.

The SCZ-4 is compatible with DG's MTJ

software driver, including full use of DG utilities and smooth integration. List price for the SCZ-4 controller, including cables, software support tape, and user manual, is \$4,995.

*Zetaco, 6850 Shady Oak Rd., Eden Prairie, Minnesota 55344; 612/941-9480.* Δ

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## Tool Kit links DG with Motorola and Intel

Westboro—Data General and OASYS Inc. announced the OASYS Cross Development software Tool Kit for the DG Aviion and Dasher/386 product families, which will enable programmers and software engineers to use DG systems as low-cost development platforms for Intel and Motorola microprocessors.

The Tool Kit consists of Green Hill's C, Fortran, and Pascal optimizing compilers as well as OASYS' macro-assembler/linker, librarian, multi-window debugger, and simulator. It runs on any Binary Compatibility Standard-compliant Motorola 88000-based system and can be used to initiate, manage, test, and simulate applications on the Aviion and Dasher/386 products for downloading into Motorola or Intel 386-based environments.

Prices start at \$2,000 and are available 30 days after receipt of order.

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Circle 82 on reader service card

## New software provides legal data base

Fort Collins, CO—Legal Textbase, a new 3CI, Inc., product compatible with DG's AOS/VS superminicomputers, offers a textual data base that can be applied to litigation support, conflict of interest, case management, document storage and retrieval, and other special-purpose legal questions. The software integrates Wordperfect shell and library functions so that Legal Textbase can be accessed from Wordperfect, and vice versa. Data can also be transferred between the two systems.

*3CI, Inc., 2057 Vermont Dr., Fort Collins, CO 80525; 303/223-2722.* Δ

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## 3CI releases new version of InFoCen

Fort Collins, CO—DG users of InFoCen should be receiving version 8.2 of 3CI, Inc.'s, information management system. The new release includes improved variable length text handling, a user-friendly menu system, expanded macro module capabilities, and enhanced virtual view processing. In addition, the add, change, select, retrieve, sort, tally, reverse, virtual, and lock server functions have been optimized for more efficient performance.

InFoCen 8.2 runs from \$10,000 to \$120,000 depending on machine class.

3CI, Inc., 2057 Vermont Dr., Fort Collins, CO 80525; 303/223-2722. Δ

Circle 87 on reader service card

## CA and 5V present new methods for data analysis

Los Angeles, CA—Correspondence Analysis (CA) and 5V, offered by BMDP Statistical Software, introduced new analytical methods for DG's MV series. CA converts data from a two-dimensional table into a graphical display. Widely used in Europe, but unavailable in the United States until now, CA generates plots that group together rows and columns of data that share similar profiles.

5V provides state-of-the-art techniques for analyzing repeated data, in which each subject is observed more than once at several points in time, or under varying conditions. The 5V program has the ability to analyze incomplete data, and can provide a number of built-in choices to specify how the repeated measures relate to one another.

Both programs are part of BMDP's latest statistical software package, which also includes improvements in existing features, such as greater control over the format of data listings, new options for case and frequency weights, and the ability to "stack" variables.

BMDP Statistical Software, 1440 Sepulveda Blvd., Los Angeles, CA 90025; 213/479-7799. Δ

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- SQLSkel (DG/SQL Program Skeletons for use with C/SCRIPT II plus DBAM)

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- Third Party Peripheral and Memory Products
- SAM 2010 Environmental Monitor

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- C/SCRIPT II plus DBAM (COBOL Program Generator)
- WordPerfect (Office Automation Products)
- OFFICE/Publisher (Desktop Publishing)

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## Smarterm 470 emulates DG graphics and terminals on PCs

Madison, WI—Persoft Inc.'s new software package, Smarterm 470, enables personal computers to emulate DG D470 color graphics, D461, D460, and D450 monochrome graphics, and most Dasher text terminals. In addition, Smarterm 470 provides extended mapping, with greater flexibility and control over attribute colors. Using extensive macro language, the software allows a single keystroke to replace multiple keystroke operations like host log-on and file transfers. Users can also run other PC applications in the foreground while file transfers, host program calculations, or printing operations occur in the background.

Smarterm 470 requires an IBM PC or compatible DOS version 2.1 or higher, and an EGA or VGA graphics board for graphics emulation. For graphics, the program

uses 512K of memory, though less is required for text terminal emulation. It is available through Softsel, Micro D, value added resellers, and retail outlets. An introductory price of \$295 is offered through 1989; afterwards Smarterm 470 will cost \$345. Users of Smarterm 400 may purchase upgrades for \$99 through 1989.

*Persoft, Inc. UW Research Park, 465 Science Dr., Madison, WI 53711; 608/273-6000.*

Circle 84 on reader service card

## Signal offers removable disk storage system

Acton, MA—Removable high-capacity, high-performance disk drives, designed for normal and rugged environments, are now available for DG computers through Signal Computer Products, Inc. The system (Model RS/380) consists

of a two-drive rack-mountable enclosure with two 380 MB high-performance disk drives, each encased in a canister with an easy plug-in/pull-out feature.

*SIGNAL Computer Products, Inc. 411 Massachusetts Av., Acton, MA 01720; 508/263-6125.*

Circle 85 on reader service card

## Wordperfect Office 2.0 replaces Wordperfect Library 1.1

Orem, UT—WordPerfect Office 2.0 is now available for DG's AOS/VS operating system. The new product includes calculator, macro editor, program editor, and notebook programs in addition to calendar and mail. These functions can be integrated with other Wordperfect or non-Wordperfect products in one shell

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menu. Users can leave programs loaded in memory and switch to other programs with one keystroke, leaving several programs active at once. The shell contains macros to execute commands within any shell program, and a "clipboard" that acts as a temporary holding area to move text from one program to another.

WordPerfect Office prices range from \$1800 to \$14,000, depending on the CPU.

Updates are being shipped free of charge to customers who subscribe to WPCorp's Software Subscription Service for Wordperfect Library. WP Corp will continue supporting Wordperfect Library 1.1 until further notice.

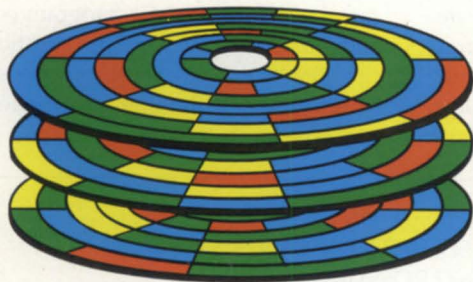
*Wordperfect Corp., 1555 N. Technology Way, Orem, UT 84057; 801/222-4100. Δ*

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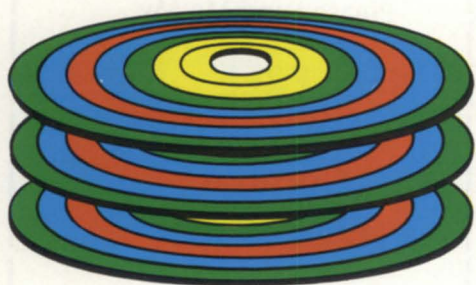
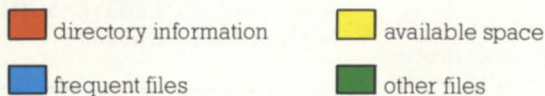
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See us at NADGUG booth #446



**EAGLE**  
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## 5600AS tape delivers compact storage

Torrance, CA—DataPlus announced the availability of a new DTS 5600AS Digital Tape Storage backup subsystem that delivers 2.3 GB of tape backup storage on a single pocket-sized 8mm tape cartridge. Highly compact, the system comes packaged in a 7-inch high, 19-inch rack-mountable enclosure, and has been designed to provide total transparency to Data General AOS/VS running on all models of Eclipse/MV computer systems. It performs in the same fashion as a standard MTA/MTC tape subsystem, and has switch-selectable device codes 22 and 62 on board. Up to four systems can share the same tape drive without any manual switching.

*DataPlus, 2750 Oregon Court, M-3, Torrance, CA 90503; 213/618-2090. Δ*

Circle 83 on reader service card

## Squeeze play: ARC program compresses files up to 90 percent

Germantown, MD—Data Bank Associates is distributing the ARC program for Data General computers using AOS/VS operating systems. The ARC program was developed under an exclusive contract with System Enhancement Associates of Wayne, New Jersey, the developers of ARC for PCs.

ARC automatically generates unique PC filenames for the archive library while permitting use of standard DG filename templates. Unlimited numbers of users can simultaneously extract or run programs from a common ARC library.

ARC is useful for organizations that need to transfer files between PCs and a DG. In tests at the Federal Aviation Administration, ARC demonstrated data compression of 40 to 90 percent without adversely affecting other operations.

The ARC program for DG computers lists for \$850 per single CPU system, \$1,275 for dual CPU system, and \$1,500 for systems that have three or more CPUs.

*Data Bank Associates, 20010 Century Blvd., Suite 104, Germantown, MD 20874-1118; 301/540-5562. Δ*

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*There's a \$75 late fee for registrations received after August 19, and the New Orleans Hilton can't guarantee reservations after this date. So... don't be late! If you need more information, contact the NADGUG staff at 1-800-USR-GRUP (512/345-5316 outside U.S.)*

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## ON-LINE HELP *Who to call for answers about NADGUG and FOCUS*

**NADGUG's electronic bulletin boards**  
 (300 or 1200 baud modem)  
 Rational Data Systems .....**415/499-7628**  
 OIS (to get an OIS ID and password, contact a DG field engineering telemarketing representative) .....**800/325-3065**  
 In Massachusetts .....**800/952-4300**  
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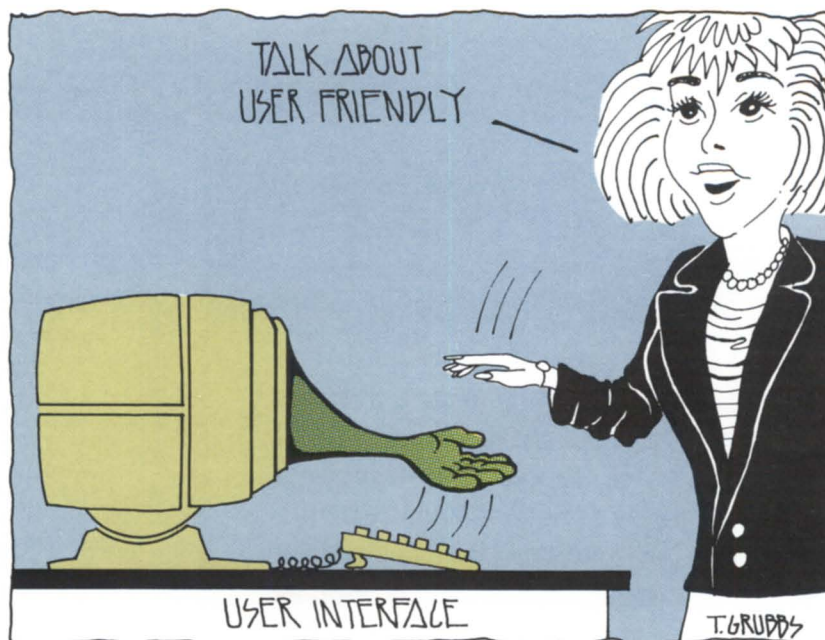
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Fifteen leading software developers have agreed to port their products to the Aviiion family of RISC-based Unix workstations. The agreements include five data base/fourth generation language software manufacturers: **Oracle Corp.**, **Cybertek Software, Inc.**, **Informix Software, Inc.**, **Progress Software Corp.**, and **Relational Technology, Inc.**

Other companies will offer office automation, statistics, accounting, manufacturing, and other software tools and graphics. They include: **Access Technology, Inc.**, **Applied Logic Systems, Inc.**, **Franz, Inc.**, **MCBA**, **Micro Focus Ltd.**, **Nova Graphics International Corp.**, **PRIOR Data Sciences Ltd.**, **Quality Software Products**, **Southwind Software, Inc.**, and **Wolfram Research, Inc.**

**News from 88Open.** The **88Open Software Initiative** announced that 11 new independent software vendors have committed to developing applications and compatible software across the range of 88000-based RISC computer systems, including the Aviiion machines from Data General.

The new software vendors include **Quadratron Systems, Inc.**, **Accelr8 Technology Corporation**, **Quality Software Products**, **Statware, Inc.**, **IXI Ltd.**, **KI Research, Inc.**, **Ryan McFarland Corp.**, **Tadpole Technology**, **Unipress Software**, **Rowley Associates**, and **Olympus Software.**

The 88open Software Initiative audits the compliance tests for a software port and issues a trademark seal to compliant software free of charge. Its goal is to accelerate compatible software development for the Motorola 88000 RISC computer architecture.

The 88open Initiative has also opened a **Silicon Valley Technical Center** in San

Jose, California, where tools and procedures will be developed to certify hardware and software compatibility for the 88000 RISC chip.

**More RISC news.** Motorola's 88000 RISC chip received a lot of favorable press recently after **Unisys Corporation** announced that the chip will power a major new product line for the Unisys Network Computing Group. The 88000 now powers more RISC systems than any other chip on the market.

The list of equipment that Data General will service under contract has greatly expanded under the company's new Compatible Products Program. DG service contract customers who have non-DG equipment connected to their DG system may now include that equipment within their service agreement.

Former DG executive **Frank Keaney** has been named vice president of sales for **EMC Corp.** Keaney, who was with DG for 10 years, most recently served as vice president of tactical marketing for DG. In his newly created position at EMC, Keaney will be responsible for sales of the company's main memory and disk products for midrange computers.

The official facsimile service for the NADGUG conference in New Orleans will be provided by **Concept Automation, Inc.** CAI will install at least two Fax peripherals on a DG system in their booth. Staff

members will assist attendees who wish to send or receive Fax messages during the show. There will no charge to conference attendees for this service. CAI hopes that every attendee will drop by and send a Fax to their home office to prove they were at the show!

Data General reported a net loss for its third quarter ended June 24 of \$23.1 million, or \$.79 a share, compared to net income of \$592,000, or \$.02 per share, for its third quarter last year.

Revenues for the third quarter were \$306.1 million, compared with revenues of \$330 million for the third quarter last year. Operating loss for the quarter was \$28.7 million, compared with operating income of \$3 million for the third quarter last year. Net loss for the first three quarters of 1989 was \$35.7 million, or \$1.22 per share. For the same period last year, the company reported net income of \$34.3 million, or \$1.16 per share.

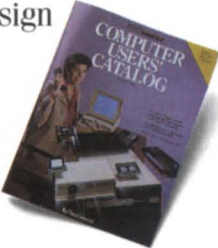
Chief Operating Officer **Ron Skates** attributed the losses to soft demand in the United States and an unfavorable exchange rate in overseas transactions. The company is cautious about the near-term outlook, he said, but is optimistic about long-term prospects, due in part to the success of the MV/40000 and early enthusiasm for the Aviiion family of operating systems.

The third quarter results include a gain of \$6.3 million before taxes resulting from the sale of a wafer fabrication facility in Sunnyvale, California. The plant was sold to **Rohm U.S.A. Ltd.**, a semiconductor manufacturer. The equipment in the plant was sold to **Exar Corp.** The combined plant and equipment sale totalled \$18.5 million. DG closed the Sunnyvale plant last December as part of an effort to improve earnings. Δ

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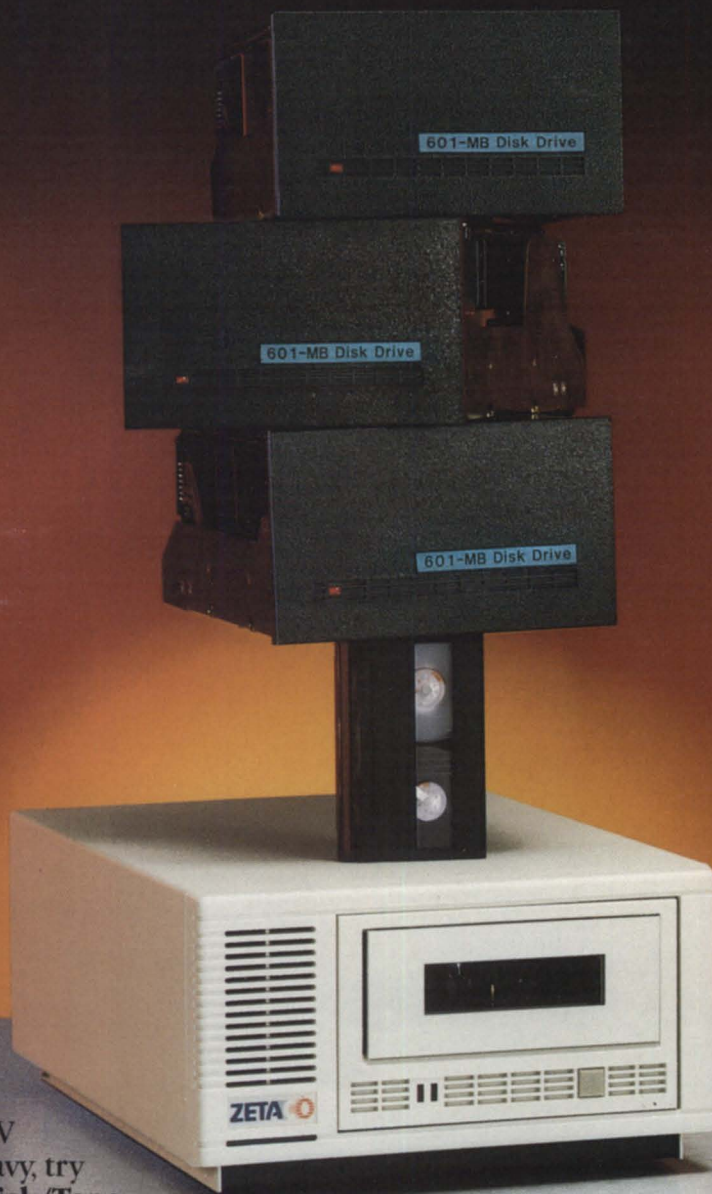
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California Office: 714/582-1026,  
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\*In lab tests on an MV/7800, SKM tape sustained streaming performance at 246 KB/sec data transfer rate, backing up a 100-MB sequential file from SKM high-performance disks in just 7.5 minutes.

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