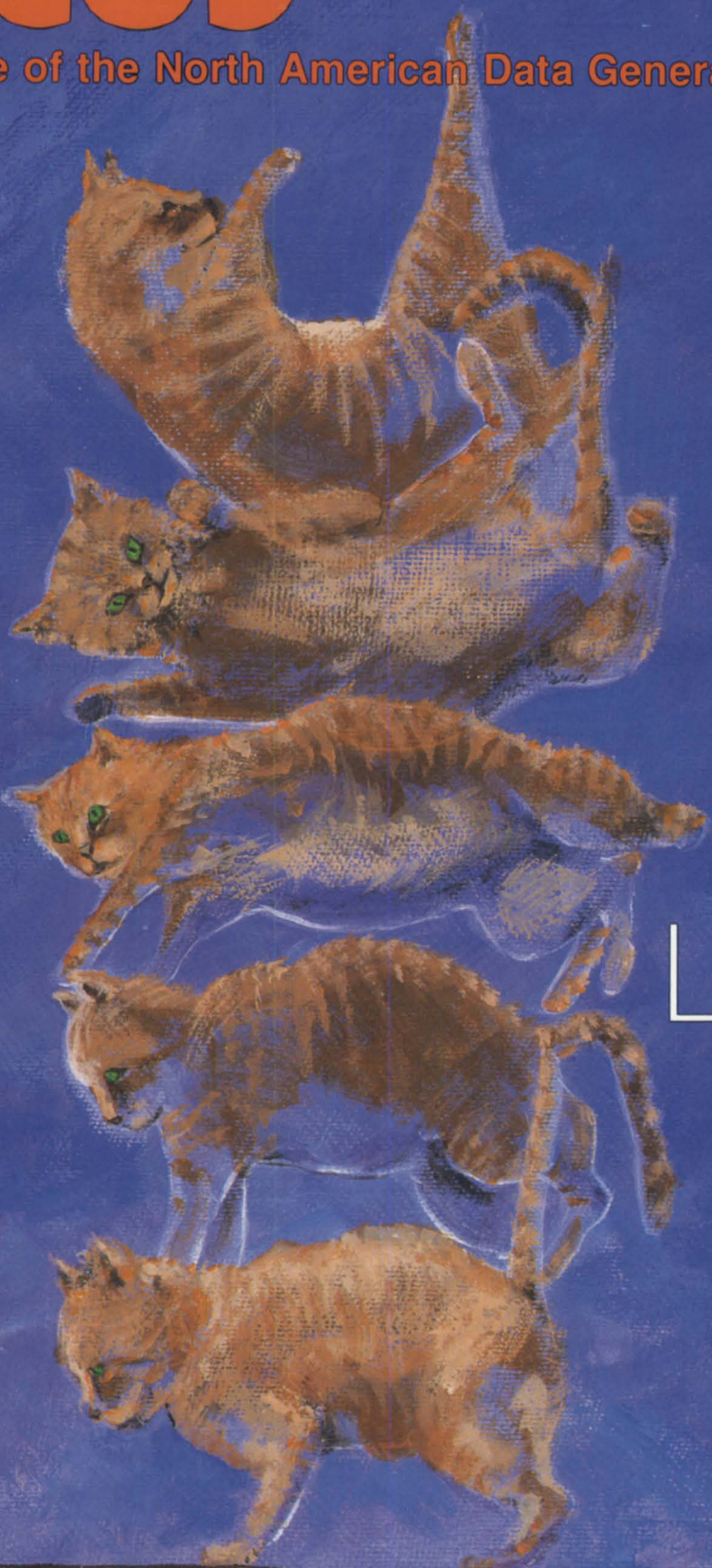
July 1988

FOCUS

The Magazine of the North American Data General Users Group



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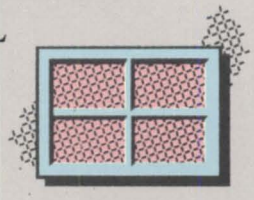

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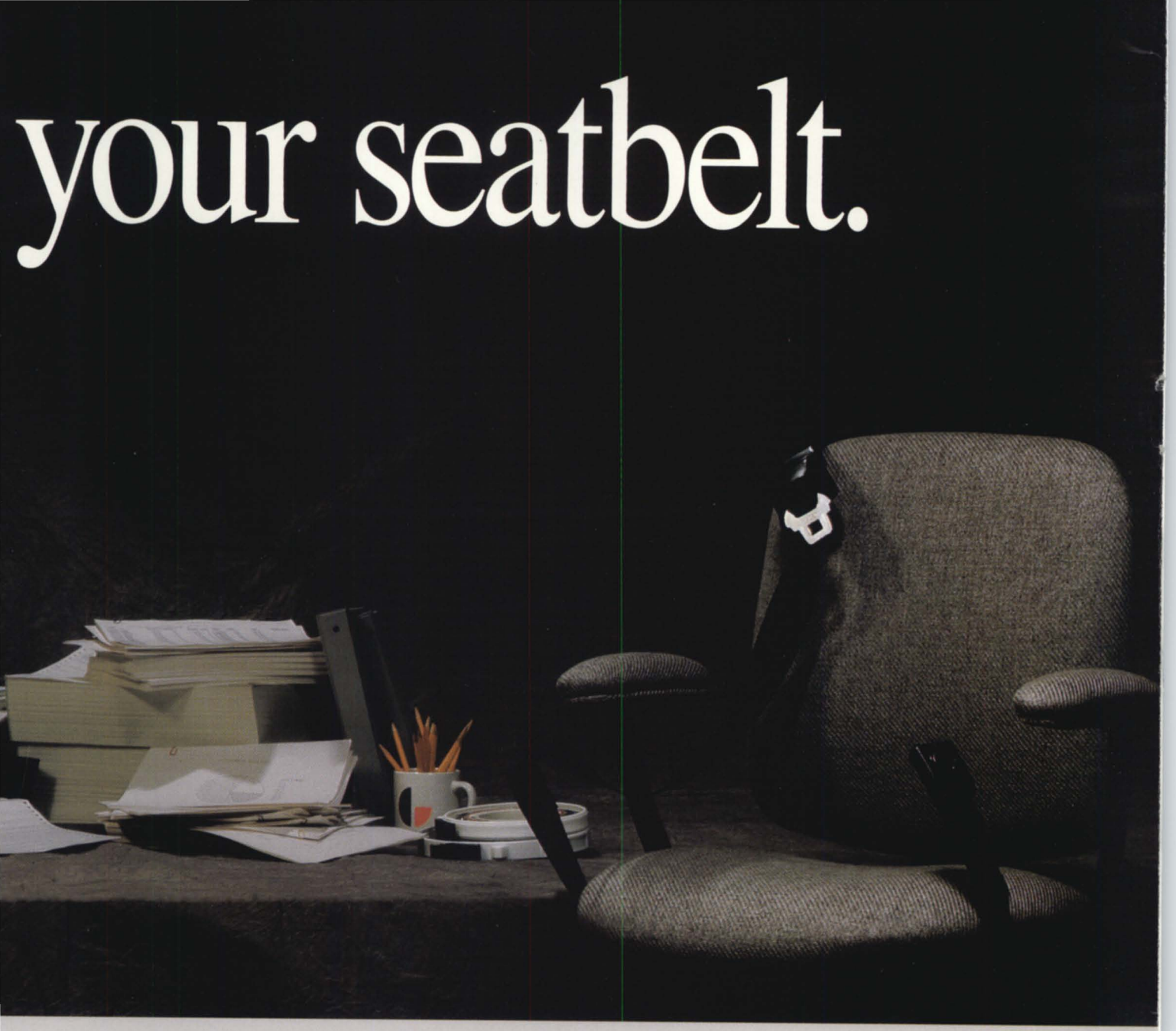

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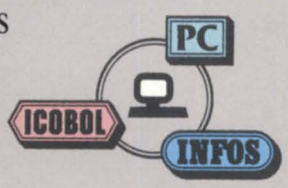

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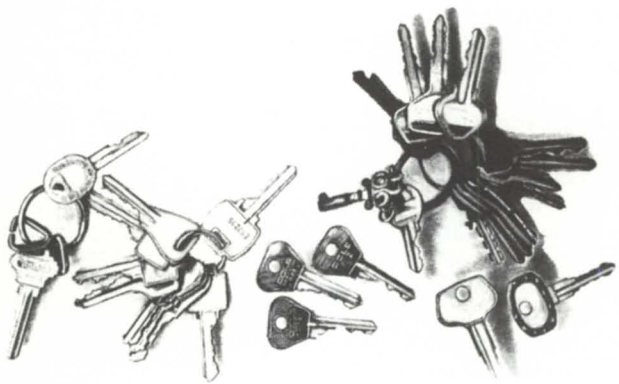

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The NADGUG conference is sooner than you think

by Joyce Carter
NADGUG president

Have you made your plans yet for NADGUG's 1988 conference? Better get going, because it's only a few weeks away. The 1988 conference will be in Philadelphia, the City of Brotherly Love, site of the signing of the Declaration of Independence, and home of the Liberty Bell.

Although the highlights of our conferences are always the many opportunities for learning and discussing, I hope you will try to spend some extra time in Philadelphia and visit a few of the many historical spots. Absorb the flavor and history of Philadelphia. The First and Second Continental Congresses met there, and it was the capital of the United States from 1790 to 1800. George Washington lived in Philadelphia during both his terms.

The 1988 NADGUG conference will be making history there also. We anticipate more attendees, more and better sessions, and a fuller exhibit hall than at any of the previous conferences. There will be giveaways, door prizes, and a lot of fun. Everyone will find sessions that fit their interests and their needs. The sessions are aimed specifically to management, technical, and end-user interests. If you have never attended a NADGUG conference, now is the time to take advantage of the learning situations, to meet other users, to learn what NADGUG is doing and be a part of it, and to see the exhibits.

It's fitting that NADGUG is meeting this year in the city where so much of our country's history, government, and culture was formed. This year, NADGUG is laying the foundation for some big changes of its own. But growth and change do not come easily, and NADGUG needs the support of the Data General user community in the forms of membership, attendance, and involvement so that we can provide more services to users and continue to provide communications between Data General and the users. This partnership is beneficial to all.

First of all, more regional interest groups are needed. You may live in an area where several other Data General installations are located, but without the help of a users group, you wouldn't know who they are, what size machines they use, or what applications they run. Also, if you attended local RIG meetings, you could meet other users who have the same problems and needs you do. Perhaps they can show you how to speed up response, control security, or back up your system. You can share information on a new rev, a particular 4GL product, or programming techniques. It's also nice to find out that your users aren't the only ones that think the system is down when they really forgot to put paper in the printer.

Focus is just one of the benefits made possible by NADGUG's growth. It is used to communicate ideas, products, and news to you. As we grow larger and stronger, the potential for NADGUG benefits increases also.

So get an early start on your reservations for Philly. The airlines have some good deals if the reservation is made far enough in advance. Also, to qualify for certain prizes, you must register early.

I am looking forward to meeting each of you. There will be a NADGUG/*Focus* booth in the exhibit hall where you will have a chance to meet and talk to the *Focus* staff and the NADGUG officers and directors. Please come by and let us know what you would like to see NADGUG become.

If you can't join us in Philadelphia, be sure to renew your membership. (If you aren't a member, join now and get your own copy of *Focus* delivered to your address.)

If there is no regional interest group in your area, talk to your DG representative or the new RIG/SIG coordinator about getting one started. If you would like to join, want to know where the closest RIG is situated, or wish to help start a new RIG, please call our new RIG/SIG coordinator, Cathlene Gentry, at 512/345-5316, or write to her c/o *Focus*. Δ

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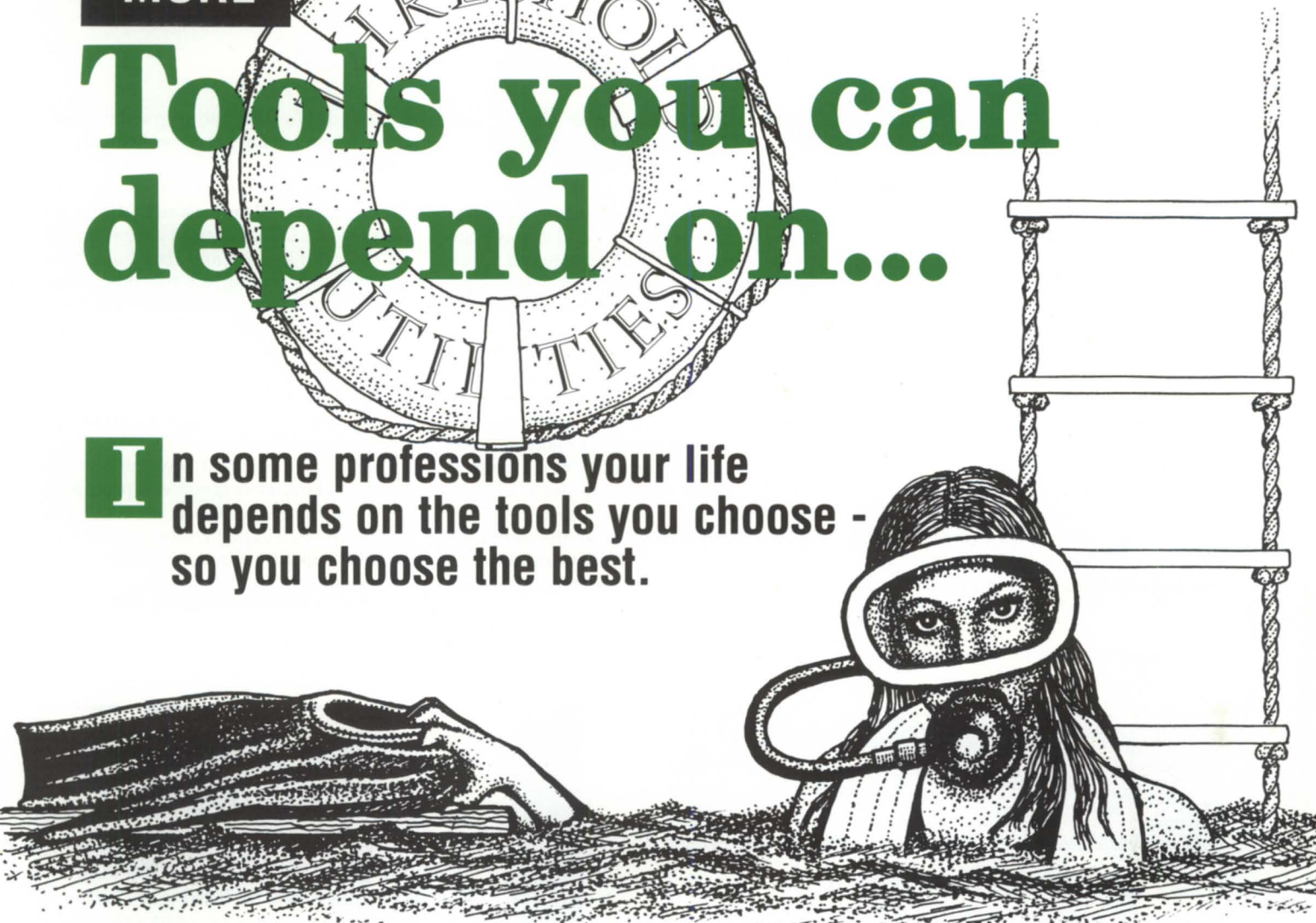

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United users group could provide needed discipline for Unix

It wasn't a complete surprise, but it sure got my attention. Since closing its Austin plant, Data General had been banished from the pages of the Austin newspaper, the *American Statesman*. In fact, about the only mention DG got during the last year was a footnote when the closed plant helped lure the Sematech semiconductor research consortium to Austin. But there it was on the front page of the business section for Saturday, May 21:

"**Lawyer seeks to unite computer user groups**. . . . Peter Marx, chief counsel for a group of customers of Data General Corp., said he plans to meet Monday with representatives of at least a dozen similar groups connected with computer firms, including International Business Corp., Digital Equipment Corp., and NCR Corp."

As I said, it wasn't a complete surprise—I had talked with Joyce Carter, our NADGUG president, the day before. At that point, she was still packing for her trip to Boston to meet with the heads of the other user groups. The meeting had been in the works for months, and it was clear the user groups had a lot to discuss. Joyce had told me that our counsel, Peter Marx, was hoping to get some press coverage for the meeting.

I don't know yet whether other news organizations picked up the press release. I hope so, but the good coverage it got in Austin might mean only that it was a slow day down at the *American Statesman*. On the other hand, the story has a certain populist flavor that could give it a much broader appeal. It quoted Marx: "You look at the articles written about the computer industry, and there is hardly any mention of users, and users are what it is all about. . . . There is no voice now for the users. There are some years of chaos ahead until this issue of a standard operating system is settled. It's time the users should be united." Isn't that what we've been saying all along?

Well, yes, but this seems to be on a different scale. All the reasons that brought users in the DG community together are still as valid as ever, and they have their counterparts among all the other user communities. But this may be something new. The fact that users are getting together, not only from the DG community, but also representing customers of IBM, DEC, Prime, Honeywell-Bull, Xerox, and Wang, suggests that something big is afoot.

That something big is Unix.

It didn't start out that way. Initially, the meeting of the users group was prompted by more mundane issues, especially an IRS ruling that single-vendor users groups wouldn't qualify for tax-exempt status. The Prime user group had carried the ball on that one, but NADGUG and others were staying in touch. The time seemed ripe for a "supergroup" to compare notes

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For more information about SIG/UX, contact:

- *John Huddleston, USDA Soil Conservation Service, P.O. Box 4611, Portland, OR 97208; 503/221-2843. Email: 503/221-3748; username SIG.UX, password NADGUG, mail wsfs.jh.*
- *Steve Knight, 101 Votey Blvd., University of Vermont, Burlington, VT 05405; 802/656-3099. Email: Knight@uvm.edu*

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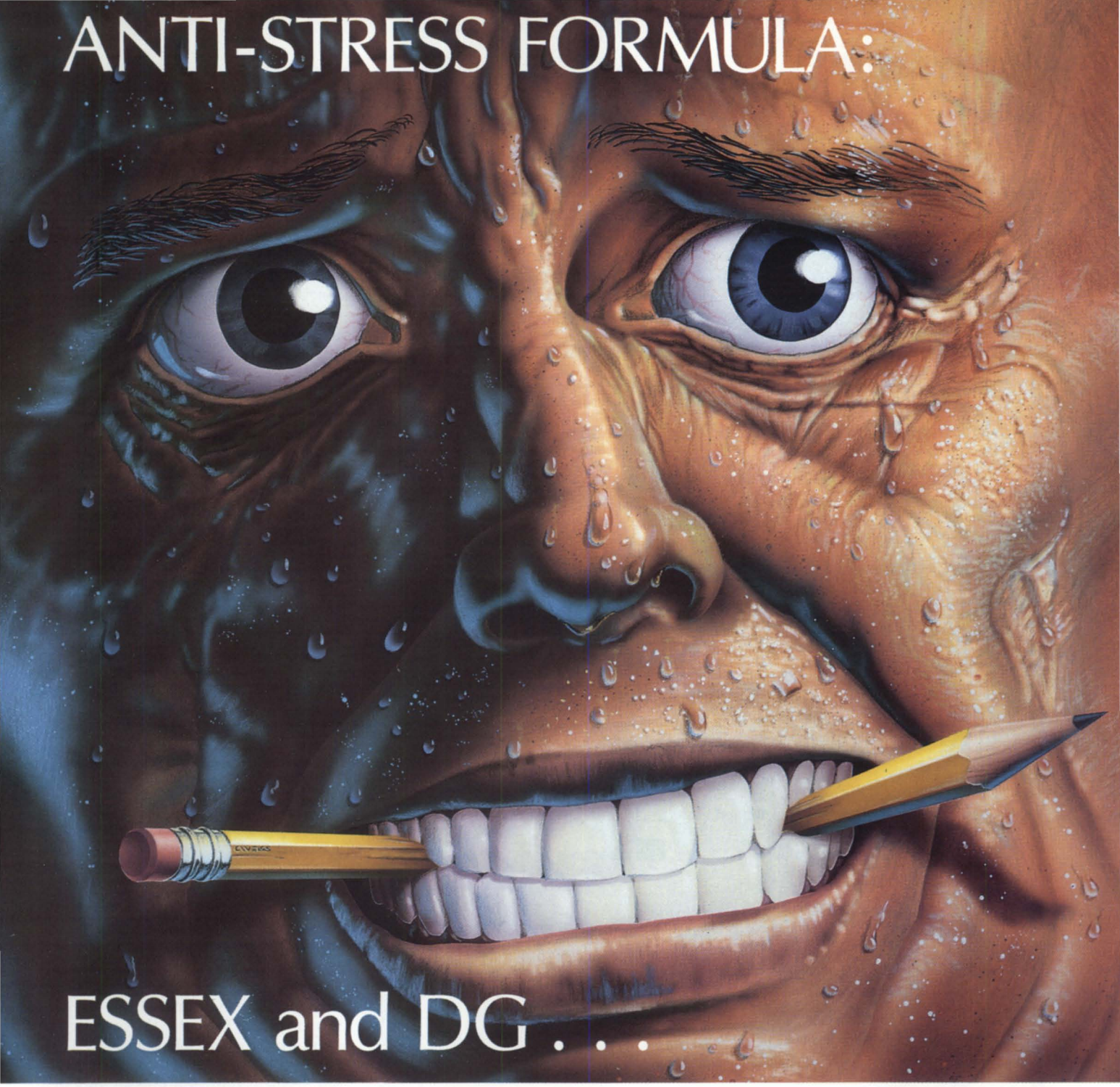

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on member benefits, administration, tax status, and other prosaic necessities. Peter Marx, who also serves as counsel for the Information Industry Association and chairman of the New England Computer Law Forum, suggested that NADGUG organize and host the meeting.

So it all got started nearly a year ago. What gives the supergroup more momentum now is the storm that is brewing for Unix and other industry standards.

Data General has made standards the The announcement last month that the company is embracing Unix as the operating system for its next generation of computers is a logical extension of that position, and didn't really surprise many observers. What did come as a surprise to many is that the Unix standard is far from standard.

That bit of intelligence hit the trade press with a thud when IBM, HP, DEC, Apollo, and a few others went public with their opposition to AT&T's hegemony over Unix. First, the group made a joint statement demanding that AT&T and its ally, Sun Microsystems, open up their discussions of future directions for Unix to other vendors. Not to do so, they argued, would violate the spirit of antitrust regulations and would give AT&T an unfair advantage in the burgeoning Unix market.

Perhaps the same argument could have been mounted against Microsoft when MS-DOS was gaining supremacy in the PC operating system wars. There is a crucial difference, however. MS-DOS, developed entirely by Microsoft, is uniform—obviously a desirable characteristic for a standard. Unix is not.

More than one *Focus* author has threatened to explain why not in an article with the working title, "The myth of Unix portability." The article is yet to be written, but it doesn't take long to grasp the gist of it. Unix has never had the benefit of a coordinated development effort such as that which stood behind AOS/VS. It was born out of wedlock, the bastard child of Bell Labs and the DEC PDP instruction set. A neglected child, it grew up among university hackers with nobody to teach it proper discipline and manners. Since then, a variety of foster parents have tried to civilize it, but many had to resort to genetic engineering to give it either the speed or the polish expected of a commercial operating system. The result is not a single Unix, but a whole family tree of "Unix-like" operating systems.

Meanwhile, IBM is threatening to announce its own Unix standard. That, *The Wall Street Journal* warns, could "reintroduce confusion into an area that seemed to be sorting itself out."

Vendors are likely to be preoccupied with their competitive position in the market for standard operating systems, which will be worth billions of dollars. The interests of users could easily be neglected, and they can't be addressed adequately within any single-vendor user group. Perhaps the needs of users are too diverse to be represented in a single organization. On the other hand, there's never been an issue like this before. At the very least, we in the DG community have a right to feel proud for providing the catalyst for the effort.—G.F. Δ

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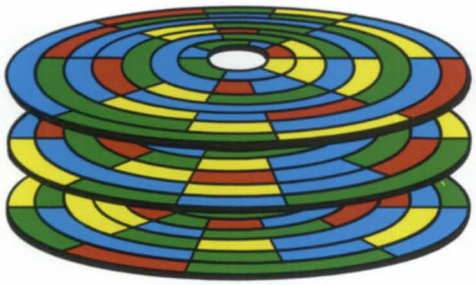

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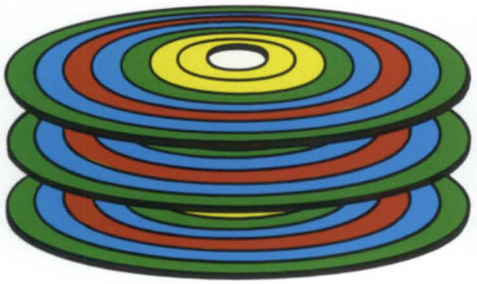

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Q. *Do you know which users have special user privileges?*

Q. *What information did you use to justify your last system upgrade?*

Q. *What percentage of your system resources is being used by each of your departments?*

Q. *How do you optimize the allocation of users across multiple CPUs?*

Q. *How do you track the resources used by one user for multiple projects?*

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Communications is theme for 1988 conference

Again in 1988, the NADGUG annual conference will emphasize a topic of pressing interest to the Data General community. Throughout the four-day conference scheduled for August 29 through September 1, presentation topics and exhibits will address communications issues and products. Speakers will be covering communications topics in each of the three "tracks" of presentations (end-user, technical, and management), because DG's shift in emphasis to communications affects *all* users.

The first official day of the conference, Tuesday, August 30, starts with a special general session following the keynote address. Colin Crook, Data General senior vice president of Communications Systems Group, and Joe Forgione, director of Communications Product Marketing, will set the mood for the ensuing three days with a presentation on Data General's communications strategy. Other topical presentations scheduled during the course of the week include:

- "Reducing Telecommunications Costs" by L.E. Staples of Data Race
- "Data General Unix Strategy" by Peter Griffiths of The Instruction Set and Anne Peter of Data General
- "PC Access to Information in a Multi-vendor Network" by Chris Zannetos of Data General
- "Overview of the DG/UX Kernel" by Andrew Huber of Data General
- "New Wiring Techniques for Data Communications" by Aldo Falossi of Cable Management System
- "Data General's Wide Area Intelligent Network Strategy" by Terry Prickett of Data General
- "MV/UX as a Cross-system Development Environment" by John Huddleston of the USDA Soil Conservation Service.

Those are just to name a few.

Of course, communications isn't just a topic. It's what you'll be doing with other NADGUG members and vendors and Data General people—communicating your ideas, expressing your concerns, and asking for opinions. There are the open forum, question-and-answer roundtables (CEO, System Managers, disaster recovery); the annual SIG meetings (this year including the formation of several new groups, e.g., Wordperfect and PerfSIG); the hospitality suites; the exhibit area cafe; the meet the editors of *Focus* session; and the NADGUG Executive Board meeting (held Sunday, August 28, it's open to officers, standing committee members, and RIG/SIG chairpersons). And this year for the first time, there will be a special executive panel that includes a discussion between DG senior management and the NADGUG Executive Advisory Council. And don't forget about the additional opportunities for learning in the all-day Educational Services seminars and OASIS-sponsored CEO workshop to be held on Monday, August 29.

In the evenings, you can relax from the business of the day by discovering some of the historical sights, art exhibits (the Rockwell gallery is nearby), seafood restaurants, and nightlife activities in Philadelphia. Newcomers should be impressed by the always lavish welcome reception sponsored by Data General at 6:30 p.m. on the first evening. Baseball fans will also have the chance to catch a game while in town—Philadelphia versus the San Francisco Giants.

These events all present the opportunity to discuss issues that are important to you and that will help you use your computer more effectively and easily. Watch for the August pre-conference issue of *Focus* for a more complete listing of the conference itinerary, so you can make your plans ahead of time. Remember that early registration packets are due by July 29 if you want to take advantage of the many offerings. Δ

RIG/SIG coordinator at work

May 5 and 6, the RIG/SIG Committee met with *Focus* and NADGUG staff members at the *Focus* headquarters in Austin, Texas, to draft and fine-tune the job description for the RIG/SIG coordinator, a new position that was proposed and approved at the spring board meeting in Philadelphia.

After plane schedule troubles were resolved, the entire group consisted of Dave Angulo, eastern division vice chair; Jan Grossman, western division vice chair; Paul Duck, RIG/SIG chairperson; Debra Bedrosian, NADGUG secretary; Barbara Hoogasian, NADGUG coordinator; Sharon Dennis, associate publisher of *Focus*; Greg Farman, editor/publisher of *Focus*; and Cathlene Gentry, the newly hired RIG/SIG coordinator.

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As RIG/SIG coordinator, Cathlene will develop, maintain, and publicize a list of speakers who are available to make presentations at interest group meetings. She will also develop and maintain a list of successful meeting topics and assist groups in setting their agendas, if needed. As a member of the RIG/SIG Committee, she will also participate in NADGUG Executive Board and RIG/SIG Committee meetings. The task of initiating and providing start-up support for new groups has also been transferred from the NADGUG staff to this position, based in Austin with the *Focus* staff. If you need any help in these areas, or if you have any special requests or projects that you need help with, feel free to contact Cathlene Gentry at 512/345-5316.

A new proposal from the committee was that the first day of the conference, traditionally a Monday, should be targeted for a RIG/SIG workshop designed to help people to organize and run a successful group. The workshop will stress how to promote membership, how to get the most from your NADGUG benefits, how to deal with Data General, and how to utilize the help offered by the RIG/SIG coordinator. There will also be suggestions for handling the financial side of a RIG or SIG, organizing the group's structure, and putting out a healthy newsletter.

In order to promote RIGs and SIGs, two-thirds of a page of RIG/SIG advertising will run in every issue of *Focus*, featuring a different group each month. The RIG/SIG chairperson allocates this space to various RIGs or SIGs based on their activity, cooperation, or need. Any group interested in participating in this offer should contact Paul Duck at 813/855-2615.

In addition, successful DG branches or value-added resellers will be pinpointed as potential areas to start new regional or special interest groups, and startups in these areas should begin soon.

■

No. Cal. FUDGE (Northern California Frequent Users of Data General Equipment) invites DG users in the San Francisco Bay area to a special roundtable on rev 3.0 of CEO, to be held on July 13. The meeting will begin at 6 p.m. with a no-host reception, and the roundtable begins at 7 p.m. The roundtable will include Steven Tyler (of Airco Solar Products), Mike Travis (of the U.S. Forest Service), and a yet-to-be-designated, technically oriented CEO expert from Data General. The meeting will be held in the Oakland Room of the Oakland Airport Hyatt. Admission is $5 at the door. Δ

Managing your programming staff

Not getting results? Maybe your staff doesn't know what you expect

by Steven Handlos
Special to Focus

There may be many reasons why a project misses deadline; some of them cannot be prevented. Improper management of the programming staff, however, can be prevented in all cases. Many people are promoted to management based on technical skills; that's what happened to me. I worked hard to become a good programmer and systems analyst. My projects were finished on time, and the programs worked. My problems didn't begin until I became a manager. Suddenly, projects weren't being completed on time, and I couldn't understand why.

One day, a flyer came across my desk describing a training seminar that would provide the answer. The flyer was for a five-day course in managing personnel. As I took the course, I applied the lessons to my job situation. I realized the mistakes I had been making, and I made plans to correct those mistakes when I returned to the job. I found that managing programmers requires more than technical programming skills. It requires a knowledge of people—what motivates them, and why they do the things they do.

I learned three simple rules for improving the performance of my programming staff.

1. Specify what you need.
2. Measure the results.
3. Take motivating action based on the results.

One of the simplest mistakes a manager of programmers can make is not being clear enough about what is expected. This was my biggest problem. Consider the case of Dan, my first assistant programmer, who eventually went on to become a data processing manager in a large data processing department. He was originally hired by our company's research department. Because of his interest and skills in data processing, he was transferred from research to data processing, where he worked on a variety of projects. I couldn't understand why the projects I assigned to him weren't being completed on time, until I learned the three simple rules listed above.

For starters, I hadn't specified his job accurately. I had assigned him one major task that I wanted completed by my time schedule. However, I also assigned him to provide miscellaneous services from time to time for other individuals in the division. His time was unstructured for providing these services. When I returned from class, I began to measure his time; instead of spending 10 percent of his time on miscellaneous projects as I had assumed, he was spending 40 percent. The additional 30 percent had a significant impact on the deadline of the projects that I had promised to the division manager. A perfectly good employee and programmer wasn't getting the job done because my job specifications were too broad for him to be able to focus on the most important projects.

> Extinction means giving *no response* to a behavior

This error was compounded by my lack of measurement of what he was doing. Instead of measuring what was being done, I was assuming that what I expected was being done—but my assumption was incorrect. Measurement provides the data needed to access and improve the situation.

To correct my problem, I sat down with each programmer and reviewed the specifications of their job assignment. In Dan's case, I made it clear that it was my fault he was spending so much time on miscellaneous projects: I had allowed him to do it. I did, however, ask him to reduce the time to the amount that I assumed, and he agreed. I met with each programmer on a weekly basis to reinforce this new method of management. We developed a weekly checklist of duties to be performed that fit within the project development time schedule. This list of duties was the specification. We met weekly to review their accomplishments. The degree to which those results had been obtained was my way of measuring their job performance. At the conclusion of each weekly meeting, we agreed on a new set of specifications for the following week.

You also have to follow up with the proper rewards for completing the job as specified. Be careful not to reward the failure to complete the specified task. Be alert for programmers who test to see whether you actually mean what you are saying. One of my programmers, Jim, did this. He came from another division as a novice, but it soon became apparent that he was one of the best programmers we had. One week, I gave him a list of specifications. At the following week's meeting, he hadn't completed any of the specified items; he had only excuses. I didn't get angry or shout. I simply gave him back the list and said, "This is your list for next week." When he got up to leave, he said, "You can bet I'll have these things completed next week." I had passed the consistency test, and from then on, he completed his projects on schedule.

Psychologists call this "behavior modification." In my situation, that was exactly what was needed. In a well-managed situation, modification isn't needed. Things are being done as they should be done. In a poorly managed situation, modification is necessary. If done properly, the modification shapes up the department to do the things that should be done, when they should be done. If the modification is necessary, it's because things aren't being done properly.

Let's examine three methods of motivation to change behavior:

1. rewards
2. punishments
3. extinction.

Rewards and punishments are familiar to everyone. If someone does something you like, you give them a favorable re-

sponse. If someone does something you dislike, you give them an unfavorable response. The favorable response is a reward. The unfavorable response is a punishment.

The third method of modifying behavior is less understood. Extinction means giving *no response* to a behavior. It is what I did to Jim when I returned to him the previous week's assignment. I didn't reward him, and I didn't punish him, but he knew I wasn't happy.

Reward and extinction work the best. Punishments rarely work unless a method of self-punishment can be established. If you frequently punish, then the behavior you desire will only be performed when you are present. Extinction works much better than punishment for individuals who feel rewarded when you give them any response at all. Once you have established a game plan, and the programmers on your staff begin to understand what you really want, rewards will be the best method for maintaining or modifying behavior. While punishment will only work while you are present, rewards will work at all times. Rewards are appropriate for long-term maintenance of correct behavior.

However, you must be certain that the reward you offer is appropriate for the person receiving it. A reward for one person may be like a punishment to another person. You should be careful to identify properly the reward necessary to motivate an individual programmer to achieve the desired behavior.

The time it takes to redirect your staff's efforts is less than you think. The weekly meetings demonstrate your commitment to your staff 's goals, yet they only require a few minutes. Once the system is in place, and everyone understands it, five minutes is adequate time to review progress and confirm next week's goals. It is a small price to pay for project completion on schedule.

Although you may meet with resistance when you begin to improve things, as I did with Jim, you must persist. Develop a style you feet comfortable using and stick with it. Once you demonstrate that what you are doing will benefit your programmers, they will gladly accept it. They will know exactly what is expected of them and what good things will happen when they do a good job.

If you sincerely want to do a good job, and you are sincerely interested in the people that work for you, then the use of these management techniques will improve the performance of your staff and will make your department a more pleasant place to work.

If you are a manager of programmers, and you feel a lack of control over your projects, you may need to improve your managerial skills. This article is only a brief summary of the topic. If you are interested in taking a management course, give me a call. Δ

Steven A. Handlos established Productivity Systems Development Corp. in 1983, and Datasafe Corp. in 1987. His companies' products include contract programming, a data entry program generator, disaster recovery services, and training. He can be reached at 2138 Ashley Phosphate Rd., Suite 206, Charleston, SC 29418; 803/553-6649.

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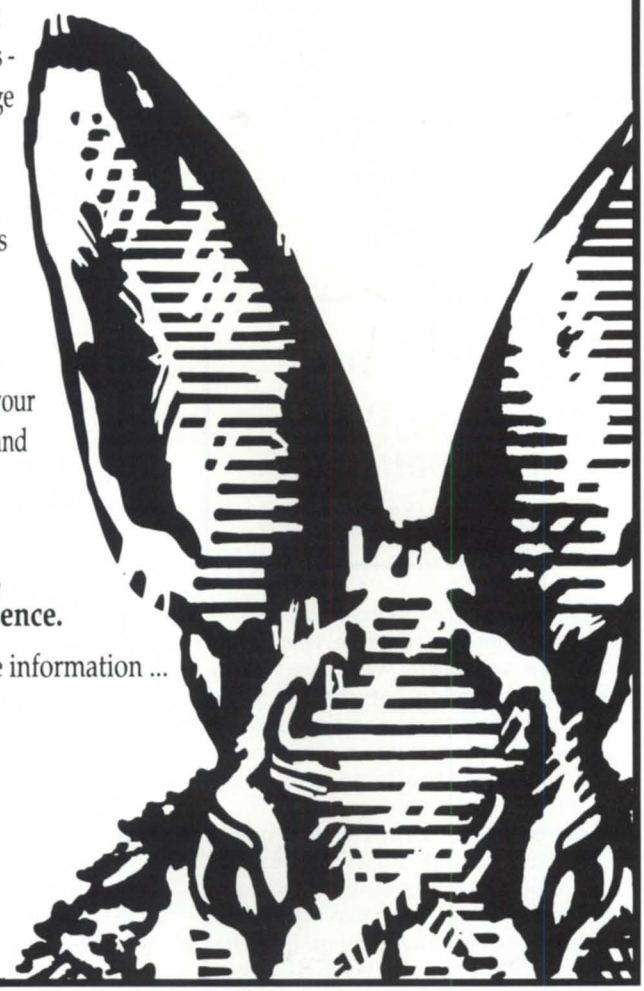

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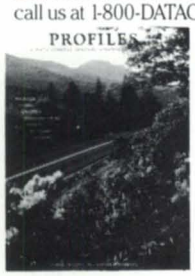

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Sorting it out

Wordperfect's sort/select feature can be very helpful—if you know how to use it

by Thane Perkins
Special to Focus

Wordperfect's sort feature brings a piece of the data base manager to the world of the word processor. It allows the Wordperfect user to turn a document into a collection of records that can be sorted alphabetically, numerically, or by a keyWord.

Take one company's "Weekly Best Report" (sometimes called the "Weekly Beast Report" by the secretaries). It pulls information from the weekly sales reports and arranges it in a variety of different ways. The report helps the sales manager keep track of the best salespeople in each area of sales.

At first, only one list of eight salespeople and their sales figures was needed, but as the company grew, and the sales staff burgeoned into many areas and numerous salespeople, the report grew in size and complexity. In addition, the sales manager likes to come up with new ways of arranging and rearranging the list. Figure 1 is an abbreviated version of this list. It demonstrates how the sales manager could begin to sort this information.

If you look at each line in Figure 1 as a separate record, and each column as a separate field within that record, you can visualize what I mean by turning a document into a data base. Using Wordperfect's sort feature, you can rearrange the way the records are ordered. You can generate a list of salespeople in any order you want: alphabetically, according to either the first or second name in the first column; numerically, according to sales of whatsits, thatsits, or total sales; or according to the sales area. However, the sort isn't restricted to sorting by the information in one column. For example, you can group the salespeople by area and total sales to produce the list in Figure 2.

This is an example of a line sort. Line sort assumes that each line is a record, and the information within each line is divided up into fields and words. A variety of Wordperfect functions (tabs, indents, hard and soft returns that indicate the end of a line, etc.) are used to separate records, fields, and words.

The paragraph sort is like a super line sort. Instead of viewing each line as a record, the paragraph sort groups several lines of text into one record. For example, if you grouped the salespeople by area and then wanted to list each group according to the whatsit sales of each area's top salespeople, you would use the paragraph sort. The result is shown in Figure 3.

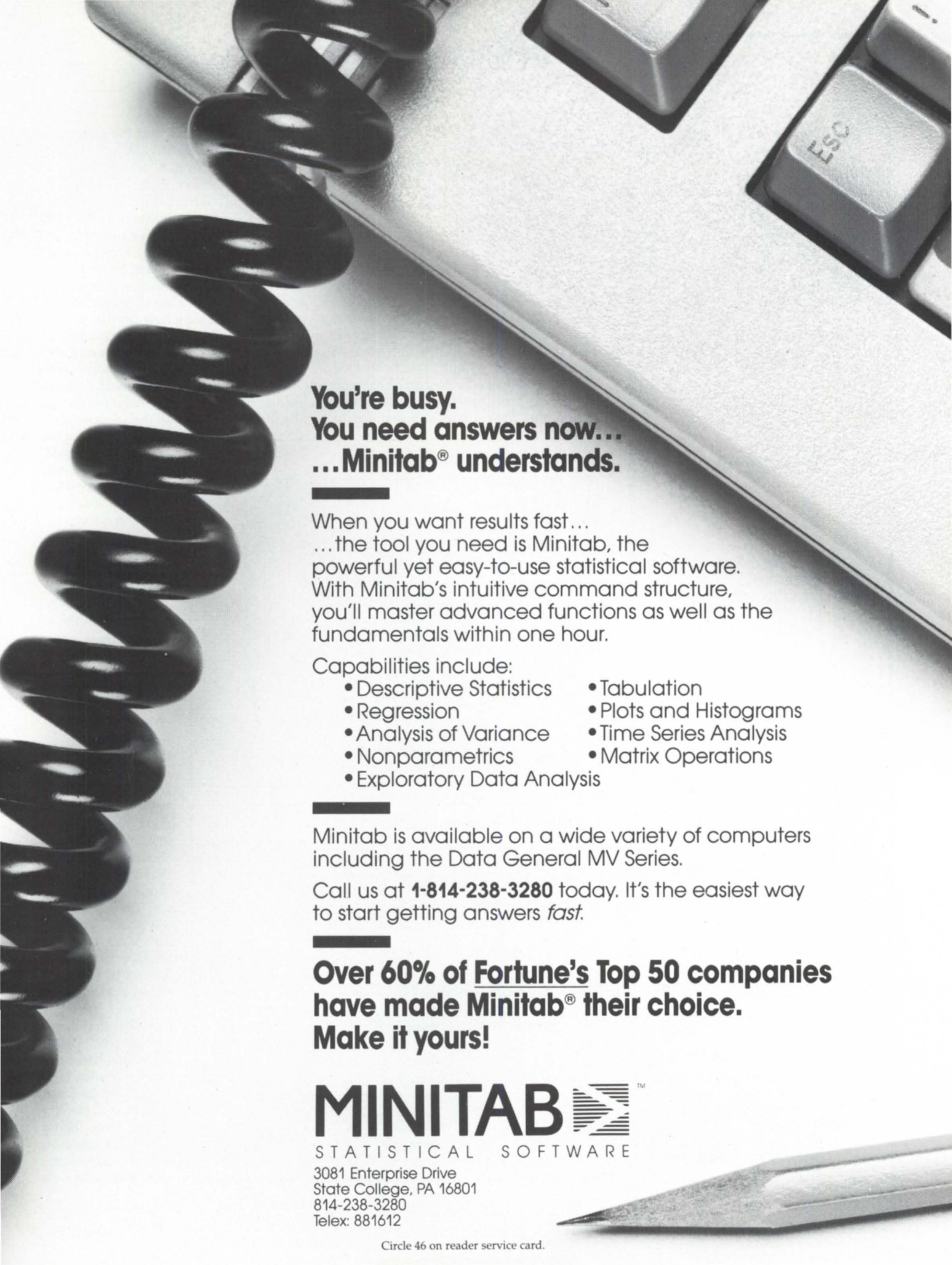
Because this type of sort allows each record to contain several lines of information, each record is divided into fields *and* lines that are in turn divided into words. This type of sort also uses the same Wordperfect functions to separate fields and words.

The third type of sort is the merge sort. This sort was designed to work with Wordperfect secondary merge documents, which often contain a large number of addresses, names, and numbers. A typical secondary merge document looks like this:

Holli Wood^R
66 Sunset Strip^R
Burbank^R
California^R
34789-2331^R
^E

Figure 1: Abbreviated "Weekly Best" report

Salesperson's name	Sales area	Whatsit sales	Thatsit sales	Total sales
Bob Wyer	Southwest	15	17	32
Otto Mobeal	Mid West	32	24	56
Sandi Aego	California	22	23	43
Hugh Stone	Texas	25	14	39
Minnie Soduh	Mid West	16	21	37
Ellie Noyes	Mid West	18	24	42
Sam Francisco	California	23	22	45
LeGrand Kenyon	Southwest	18	14	32
Alice Fortwurth	Texas	23	23	46
Sam Antonio	Texas	19	33	52
Al B. Kerkie	Southwest	12	16	28
Beverly Hills	California	23	19	42
Holli Wood	California	21	16	37



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As you can see, the document is already separated into fields and records. Fields are separated by the ^R code, and records are separated by the ^E code. The merge sort uses these as field and record separators, and continues to use the space to separate words within each field. One difference between the paragraph sort and merge sort is the order of field and lines; the paragraph sort has lines that are divided up into fields, and the merge sort has fields that can be divided up into lines.

People rarely need to alphabetize a secondary merge document of addresses. They usually want to find just those records in the document that have the same zip code, city, or state. For example, you may want to use the merge to create letters to be sent to salespeople in Texas. Instead of creating a new secondary merge document, you can use another sort feature, select, to generate a new document from an existing secondary merge document. After specifying the merge sort and defining which fields, lines, and words you want to use, the select optionwill find only those secondary merge records containing the addresses of all the salespeople in Texas. The select feature isn't restricted to the merge sort: you can select records in both the line and paragraph sorts. You are also given the option to select or to select *and* sort a document.

Figure 2: Sorted by area and sales total

Salesperson's name	Sales area	Whatsit sales	Thatsit sales	Total sales
Sam Antonio	Texas	19	33	52
Alice Fortwurth	Texas	23	23	46
Hugh Stone	Texas	25	14	39
LeGrand Kenyon	Southwest	18	14	32
Bob Wyer	Southwest	15	17	32
Al B. Kerkie	Southwest	12	16	28
Otto Mobeal	Mid West	32	24	56
Ellie Noyes	Mid West	18	24	42
Minnie Soduh	Mid West	16	21	37
Sam Francisco	California	23	22	45
Sandi Aego	California	22	23	43
Beverly Hills	California	23	19	42
Holli Wood	California	21	16	37

Figure 3: Using paragraph sort

Salesperson's name	Sales area	Whatsit sales	Thatsit sales	Total sales
Otto Mobeal	Mid West	32	24	56
Ellie Noyes	Mid West	18	24	42
Minnie Soduh	Mid West	16	21	37
Sandi Aego	California	22	23	43
Sam Francisco	California	23	22	45
Beverly Hills	California	23	19	42
Holli Wood	California	21	16	37
Sam Antonio	Texas	19	33	52
Alice Fortwurth	Texas	23	23	46
Hugh Stone	Texas	25	14	39
LeGrand Kenyon	Southwest	18	14	32
Bob Wyer	Southwest	15	17	32
Al B. Kerkie	Southwest	12	16	28

The global select function takes the select feature one step further. Instead of limiting the search to a particular word or number in a defined field, the global select will search for the existence of that word or number in any field or line.

One of the nice things about the sort feature is its ability to work with other Wordperfect features. If you wish to sort only part of a document, you can do a block sort. Use Wordperfect's block feature to block off the area you wish to sort, and start the sort. Text that incorporates the Wordperfect math features can be sorted as long as you keep the math definition at the top of the page being sorted. Turn math on at the top of the document and make sure

the math off code is only at the bottom. The sort feature can also be incorporated into a macro or merge macro.

Outlines created using Wordperfect's automatic paragraph numbering feature can be sorted (paragraph sort is best) and will correctly renumber themselves. However, in doing this, you must remember a new field is defined each time a tab or indent is used. For example:

1. No tab on this line—only one field
[TAB]A. One tab—text is in the second field.
[TAB][TAB]1.[INDENT] Two tabs and an indent mean that the text is in the fourth field.

(Many users incorrectly assume that if there is no text in front of or between tabs, no field is defined. Also note that automatic paragraph numbers aren't really numbers, because if you turn reveal codes on, you will see [Par#:Auto] rather than a number.)

Before doing any kind of sort or sort/select, save your document

You can do a little troubleshooting if the sort doesn't turn out as expected. Before doing any kind of sort or sort/select, *save your document*. If the sort doesn't work as planned, you can start over. If you find that the sort merely sent the first record to the bottom of the list, you didn't define the sort properly. Turn on reveal codes and look at the document. You may be sorting the wrong field or word. Check for two tabs next to each other, indents in unexpected places, or too many hard returns separating documents, etc. The more uniform you can make each record, the better your chances are for a good sort. Sometimes resetting the tabs and cleaning up the document is all you need to do. Δ

Thane Perkins is the testing specialist for Wordperfect Corp.'s Data General Division. He can be reached at 1555 N. Technology Way, Orem, UT 84057; 801/227-4455.

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Expect the unexpected

A disaster recovery plan could be your best insurance policy

by Rick Merten
Special to Focus

The fire alarm sounded, and all of us ran in panic from the building. Afterward, we stood outside, helplessly watching everything go up in flames and smoke—personnel records, current sales orders, engineering design documents, financial records, departmental files—everything. What a nightmare! Could we open our doors for business the next day?

The president of our company and I shared this recurring nightmare. Knowing that it could actually happen at any time, our management assigned me, the documentation supervisor, to devise a plan to protect and maintain critical corporate data and documents in the event of a disaster.

Archiving critical documents makes good "cents" for any firm—large, small, or medium. Zetaco didn't have any disaster recovery plan, but we had years of critical documents that needed to be protected. Our objectives were to develop a plan with realistic maximum protection, which we defined as:

1. staying within a limited budget plan
2. using an off-site facility
3. keeping the data in a retrievable state.

Some items I had to consider in order to develop a comprehensive disaster recovery plan were storage facilities, storage media, service bureaus, equipment, operating costs, the amount of material acceptable to be lost, and, most importantly, the recovery plan itself.

The question of acceptable data loss always appears to have an easy answer: none. However, sky-high costs and realistic planning make the 100 percent protection objective impractical.

As I researched this question, I found that the level of realistic loss tolerance varied in each department. For example, recovering financial records intact was far more important to our company than saving advertising artwork. I asked each department to realistically evaluate its documents with this question in mind: "Can we lose this data and continue to function?" (This was a perfect chance for us to purge useless files that had no archival value. After all, hadn't we just decided that it wouldn't matter much if we lost that file in a disaster?)

We charted all of the data and documents that were identified as critical, defining on what type of media they are currently kept, and how big or long they are so that we could begin to develop an archiving program. Zetaco had basically two categories of materials to be protected: computerized data and paper documents. Computerized media included magnetic tape and magnetic disks.

To accomplish our goal of realistic maximum protection within a limited budget, we developed a simple yet effective plan: as much critical data as possible is collected on the centralized data base, and weekly system disk backups are made onto magnetic tape and transported to our off-site storage facility. Any other critical computer data on isolated computers, such as our S/140 (dedicated to accounting) or the personal computers in the engineering lab, is also archived weekly onto the magnetic media available to that system. This practice limits our "worst case" loss of critical data to one week.

The critical paper documents posed the greatest archiving challenge, because there are so many! Given the wide range of sizes and types of paper used, along with the physical space requirements and aging factor, we decided to archive our paper on microfilm. Microfilm can capture various original sizes, greatly reduce storage space requirements, and show virtually no aging compared to paper. Microfilm comes in many styles; we chose to use only two, which also happen to be the two most typically used in engineering environments. We chose 16-mm and 35-mm roll film with 550 frames per roll, and a three-inch by five-inch aperture card with a single 35-mm frame mounted over the opening. Microfilm service bureaus are in most cities, and we found that their services are consistently good if they belong to the National Micrographics Association.

Our solution was to use the best of both worlds: roll microfilm for pure archival storage and convenient aperture cards for documents we need to access easily. We microfilmed all obsolete and inactive documents in sequential part number and revision level on roll film, which cost only two cents per frame. All other active documents and new documents were put on aperture cards, at 35 cents each. To offset the additional cost of aperture cards, we're having duplicates made, and will use those cards in place of the valuable original drawings. The duplicate aperture cards are more convenient, quicker to use, and can reduce wear and tear or destruction to the typically expensive originals. (See the article in the April 1988 issue of *Design Graphics World* for an interesting discussion on the value and usage of microfilm.) Also, documents reprinted from microfilm are accepted in legal proceedings.

Start-up costs to archive the past 10 years of engineering drawings, bills of materials, technical manuals, ECOs, and other engineering documentation at Zetaco came to $6,000. All current and new revisions will be on aperture cards, so we can use them in the department; our estimated use is slightly more than 7,000 cards, or about $2,500 worth of cards per year.

If the $2,500 per year sounds like at lot, as it did to several people here, balance it against an estimate of the value of the critical documents, including labor costs, technical history, product reliability, etc. Our guesstimate on the cost of redrawing everything was $1.4 million in labor time alone, assuming we could get something to draw from! For other areas, we could only guess the replacement cost, but it was substantially more than $2,500!

Using different styles of microfilm media usually requires different types of machines. We keep all working documents on aperture cards, so just one piece of

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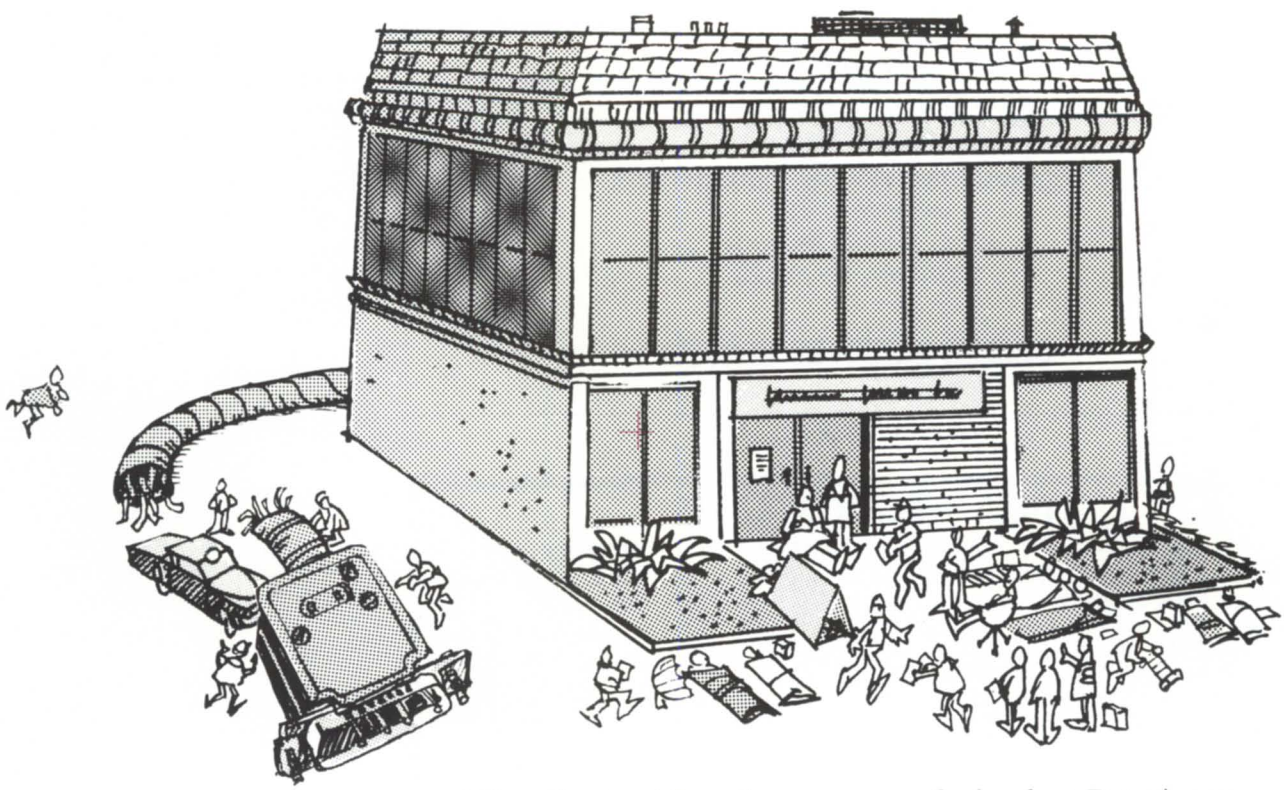

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equipment is required for operations. In the rare event the use of the roll film is needed, a service bureau has the equipment needed for viewing and/or reproducing the document.

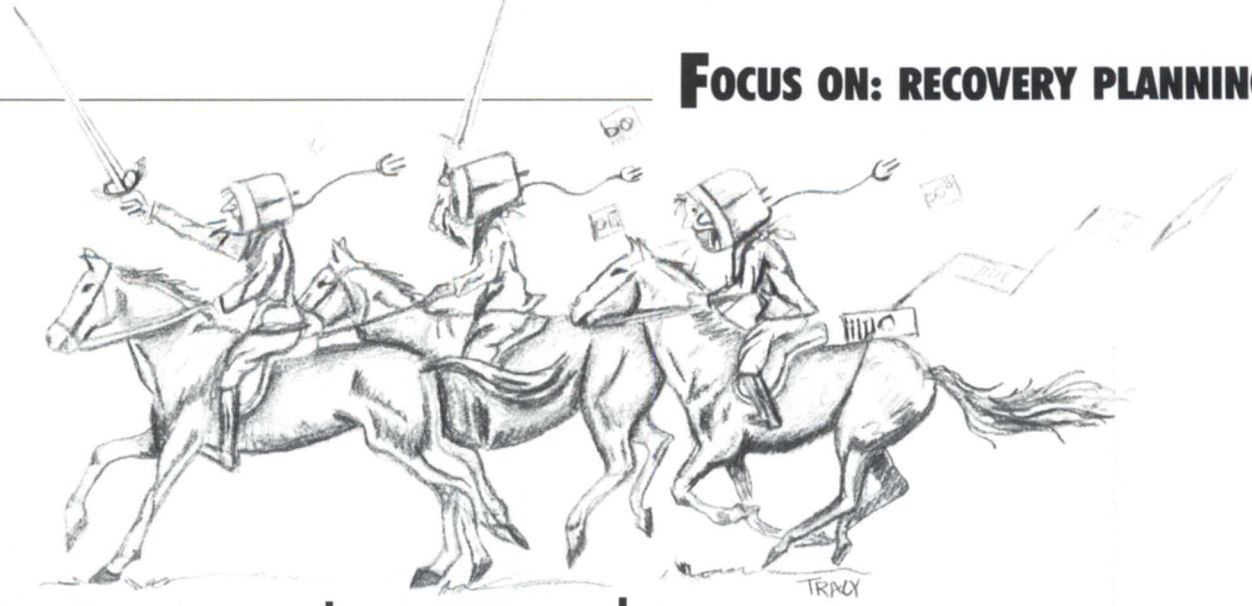
Several business record storage facilities in the Minneapolis/St. Paul area offer services, ranging from basic concrete to elaborate electronic vaults. We wanted one place that could store both types of backup media we would use (magnetic and microfilm). Our magnetic media was acceptable for storage, and relatively stable for archival storage if a few precautions were taken. We evaluated the facilities on the factors most important to us: an adequate level of security and suitable environmental controls to protect against unacceptable temperature and humidity fluctuations and magnetic disturbances. It was important to find a facility that had acceptable transporting techniques and reasonable access by our personnel.

Our recovery plan outlines where the archives are stored, who to contact, where to have duplicates made, and phone numbers of critical management staff, along with their immediate responsibilities during the rebuild period. Besides the copies of the recovery plan kept at the storage facility and in our Engineering Standards records, the officers of our firm and I keep a copy at home, so in the event of a major catastrophe, we can have it immediately available. If a minor disaster happens, the computer system backups can be loaded into the system, or the microfilm can be duplicated or blown back onto paper to replace a missing original.

One consideration we almost overlooked was an alternate facilities plan. Where would we do business if our building wasn't habitable for several weeks or months? Where were the most convenient DG service bureaus located in case we couldn't replace our MV/8000 right away? This key part of the plan was included in our written recovery plan, along with the information about documentation recovery.

We've been extremely lucky at Zetaco for more than a decade, because we haven't had to cope with so much as a wild sprinkler system that could have eliminated much of our design history. Now with our recovery plan in place, our president and I can both sleep easier, without fear of our luck running out and our daydreams turning into nightmares. Δ

Rick Merten is a documentation supervisor for Zetaco, 6850 Shady Oak Rd., Eden Prairie, MN 55344; 612/941-9480.



The computer cavalry

When disaster strikes, you'll wish they were there

Compiled by Joe Cannata
Special to Focus

"Here I come to save the day" are the lyrics to an old song about a mighty hero. Your disaster recovery company should be singing the same song if, for example, your operator typed)DEL/V # from root, and your backup tapes were unreadable. Or a loud banshee scream came from your disk drives, and you forgot backups that night. How else would you deal with a computer room filled with charred remains? You could let your fingers go walking, but under what headings would you look? Head crashes? Computer supplies? Superheros? Miracles?

The following is a directory of companies in the disaster recovery industry that can provide expert assistance, either before or after a disaster occurs. By no means is this a list of everyone, but it is targeted at firms dealing with Data General customers. With it, you should at least be better able to deal with any panic situations that may arise—or prevent a potentially damaging situation.

Consultants
Kenneth N. Myers
K. N. Myers & Co.
4 Penhurst Rd.
Pittsburgh, PA 15202
412/766-7919

John Nugent
Necessary Protection Services
545 Tyrol Ln.
Shakopee, MN 55379
612/445-3109

Don Smith
Smith & Co.
Box 287-L Scottsville Rd.
Floyds Knobs, IN 47119
812/923-8132

Disk recovery specialists
Mark Koffskey
Advanced Computer Technologies
2435 E. North St.
Suite 323
Greenville, SC 29615
803/292-5070

They specialize in providing recovery from head crashes and controller problems, reading smoke-damaged media, and reading bad tapes. AOS, AOS/VS, and RDOS are supported in the recovery process.

Pat Parker
Creative Synergy Corp.
2839 Paces Ferry Rd., #320
Atlanta, GA 30339
404/438-0033

They specialize in recovering disks and reading damaged media.

Phil Horvitz
General Data Systems
7621 Laurel Leaf Dr.
Potomac, MD 20854
301/299-3900

GDS specializes in benchmarking, tuning, and customizing AOS/VS, as well as disk recovery. They have the ability on an individual case basis to undelete, read crashed disks, access corrupted INFOS data bases where IVERIFY won't run, and read deleted files. Each recovery is different and not always 100 percent successful, but *any* recovered data reduces the loss.

Jerry Grubbs
Randomex
108 Cemetary St.
Norcross, GA 30071
404/448-1299
213/595-8301

Located both in Atlanta and the West Coast, Randomex can handle recovery of damaged media.

Contingency planning tools
Tari Schreider
Computer Planning Resources
P.O. Box 568
Glenwood Landing, NY 11547
516/754-7087

They offer a disaster recovery planning guide called *Contingency Planning Strategies/90* for DG MV series processors. It provides users with the knowledge to formulate their own plans from within. An updated version will be out soon.

Steve Handlos
Datasafe Corp.
2138 Ashley Phosphate Rd.
Suite 206
North Charleston, SC 29418
803/553-5847

Datasafe uses Computer Assurance Corp. (see hot sites below) as their hot site locations through a joint marketing agreement.

John R. Nugent
Necessary Protection Services
545 Tyrol Ln.
Shakopee, MN 55379
612/445-3109

Besides consulting, Mr. Nugent offers MARS, an on-line disaster recovery and

contingency planning tool.

Judy Browne
Profile Analysis Corp.
454 Main St.
P.O. Box 875
Ridgefield, CT 06877
203/431-8720

PAC offers RecoveryPAC, an automated planning tool. Through questionnaires, models, prototype plans, and Gantt charts, a recovery plan is built using an in-package data base. Also available is a risk analysis package called RiskPAC.

Hot sites
Dan Kilburn
Data Assurance Corp.
6551 S. Revere Pkwy.
Suite 130
Englewood, CO 80111
303/792-5544
800/654-1689

Data General
DG Field Engineering
50 Maple St.
Milford, MA 01757
800/325-3065
800/952-4300 (in Massachusetts)

Data Assurance (DAC) has recently signed an agreement with Data General to provide hot site/disaster recovery services called DG/Hot Site. Equipped with a broad range of DG hardware, Data Assurance offers planning and consulting services, start-up assistance, and controlled testing.

Mike Gallagher
Computer Assurance Corp.
3077 McCall Rd.
Suite 2
Atlanta, GA 30340
404/455-3993

Mike Collins
Computer Engineering Associates
3922 Vero Rd.
Baltimore, MD 21227
301/247-5244

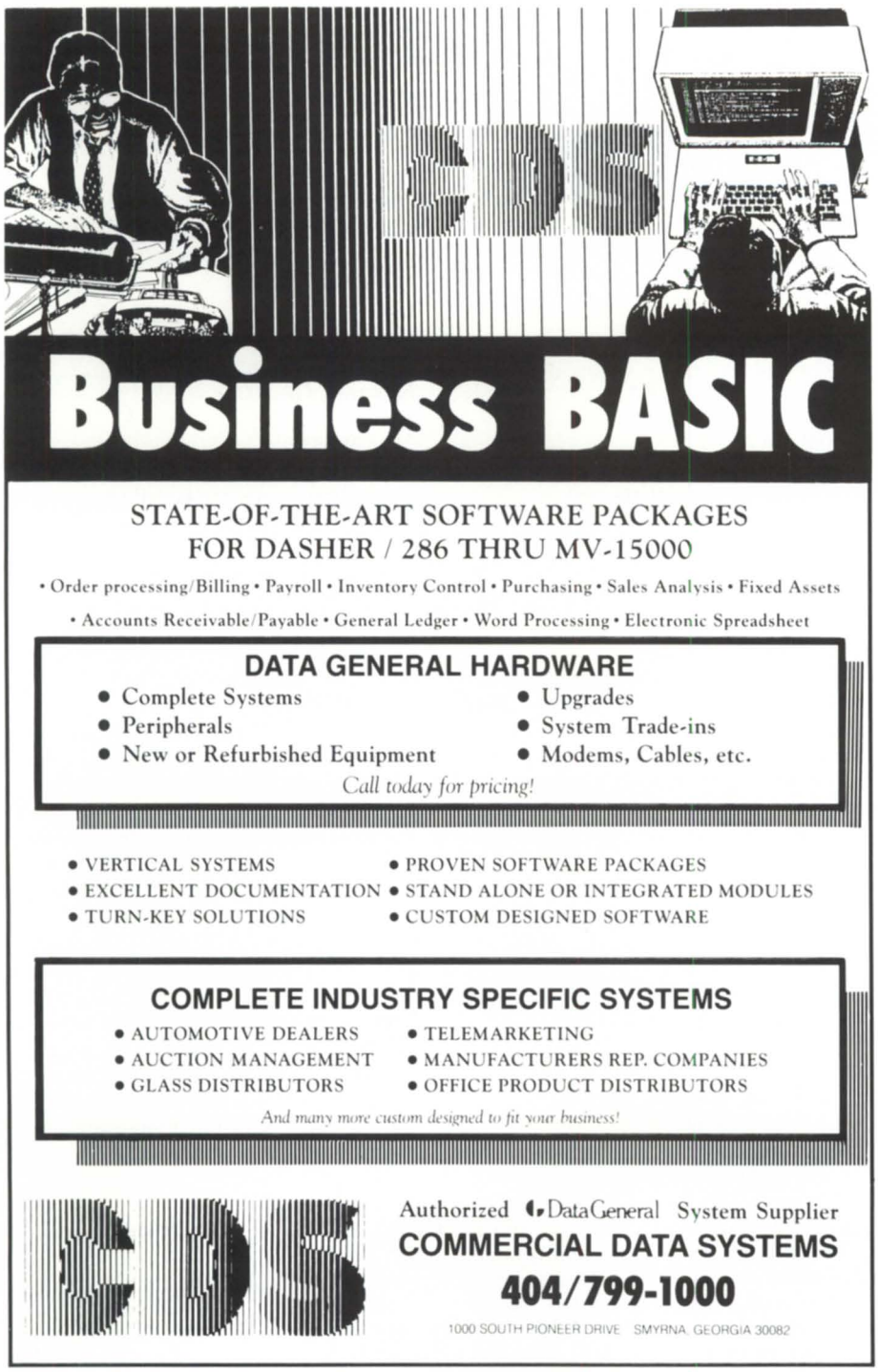
Jim Shapiro
Fast Track Systems
61 Broadway
New York, NY 10006
212/943-4555

Raphael Feldman
Sysgen Recovery Services
77 Air Park Dr.
Ronkonkoma, NY 11779
516/737-4300

Training and consulting
Data General Educational Services
2400 Computer Dr.
Westboro, MA 01580
617/366-2900

DG offers a two-day seminar (SM529) on disaster recovery planning. The seminar leader is also available to consult on planning needs as well. Δ

Disaster recovery is one of Joe Cannata's specialties. Contact him at Data General, 7927 Jones Branch Dr., McLean, VA 22102; 703/827-9666.



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Sneak preview

Big changes in rev 3 of CEO. Part III of III

by Paul Duck
Special to Focus

This is the last in a three-part series describing the extensive changes in the latest revision of CEO. This month, I will be covering new calendar features, utilities, CEOwrite, and changes to spell checking and archiving.

Calendar

Automatic holidays—Holidays that your CEO manager defines on your system now appear in the day, week, and month display of your calendars. Only users with CEO management privileges can insert, change, or delete a holiday.

Previously, the only purpose for defining holidays was to prevent you from scheduling meetings with other users on a holiday; you were still able to insert your own personal meetings, appointments, and other events on a calendar day defined as a holiday. With revision 3.0, you can insert events on days that are defined as holidays, but the calendar server will mark them as conflicts. You still can't schedule meetings with others on holidays.

Remote calendar access—Revision 3.0 enables you to give users on other systems access to your calendar. The other systems must also be using CEO rev 3.0, however. The calendar profile menu is where you specify which other users can have access to your calendar. To give access privileges to a remote user, type the person's username:hostname.

Scheduling from interrupt—You can now schedule meetings using the calendar option from the interrupt menu. Scheduling was previously available only if you chose the calendar option from the main menu.

Print calendar events—When you view or change a calendar event, the calendar event menu has a new option that allows you to print this event. If you print the event, the menu prompts you for a printer name and number of copies. Your printout will contain the event type, time, location, subject, and description.

No wait for scheduling—Rev 3.0 allows you to schedule a meeting in "the background," which means you can continue using your terminal instead of waiting while the scheduler attempts to schedule the meeting. The schedule meeting menu has a new prompt that asks, "Do you want this scheduling done in background?" If you answer yes, you must also fill out the scheduling supplement menu, which asks for further information regarding the meeting—for instance, whether you want mail confirmation from attendees. When the scheduler finds a compatible time for all attendees, you and all the other attendees you specified will receive a notification in your inboxes.

Scan several calendars—Scan several calendars is a new option (option 9) on the calendar menu. It allows you to look at the calendars of as many as four users at a time, provided those users have granted you access to their calendars. When you choose option 9 from the calendar menu, a menu prompts you for the usernames of the people whose calendars you want to see. Now that rev 3.0 offers remote calendar access, you can also type the name of a user on another system if you have access to that person's calendar, using the format username:hostname. The option to scan several calendars allows you to see only one day at a time; week or month displays are not available.

List processing

New merge document printing options—Rev 3.0 offers greater flexibility for printing selected pages when you merge text with list documents, print them, and edit their printing specifications. The new printing pages menu appears when you answer and press the NEWLINE key in response to the "print which pages:" prompt of the printing specifications menu. The printing pages menu offers three options for printing selected pages. Depending on your choice, the number you entered after the "print which pages:" prompt takes on different meanings.

Suppose you have a list document containing 10 addresses and a text document that is a form letter, and you enter the number 2 at the "print which pages:" prompt. Below is an explanation of how the CEO system would interpret the number 2, based on each of the options from the printing pages menu.

1. Printed pages—If you choose option 1, printed pages, the system would merge all addresses with the form letter, but only print one page—page 2—of the entire set of merged documents.

2. Page numbers—If you choose option 2, page numbers, the system would print the second page of each merged letter—one page for each of the records in the list document. In other words, for 10 records, your output would be the second pages of 10 letters.

3. Records—If you choose this option, the number you enter at the "print which pages:" prompt represents the number of an individual merged record. In this example, the system would merge the second address in the list document with the form letter, and print out the entire letter.

Suppress printing of merge symbols—When you print a list document or text document without merging, you can now tell the CEO system not to print the special symbols that surround merge fields and records. To print documents or records without merge symbols, answer "N" to the "print merge symbols?" question on the printing specifications menu.

New date and time format options

Rev 3.0 offers expanded options for displaying the date and time within CEO. Your personal language profile menu allows you to choose from the following date and time formats:

- Month, day, year, 12-hour clock:
Dec 31,87 1:30 PM
- Day, month, year, 24-hour clock:
31 Dec 87 13:30
- Day, month, year (numeric), 24-hour clock:
31.12.87 13:30
- Month, day, year (numeric), 24-hour clock:
12/31/87 13:30
- Year, month, day (numeric), 24-hour clock:
87/12/31 13:30

Enhanced spell checking

You can now press the SPELL function key from anywhere within CEO and get help. The spell menu prompts you for the word to check, then displays as many as eight words similar to the word you type. The cursor will go back to the "enter word to be verified" prompt, and you can continue entering words to check until you press CANCEL/EXIT.

You can now also scan the input areas of mail menus for spelling errors. Spell checking is available from the short message, forward a message, forward a filed message, reply to a message, mail a document,

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8387 256KB NOVA/4	450
8656 256KB ECLIPSE	375
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DESKTOP MOD 20 512KB	450
DESKTIP MOD 10 512KB	650

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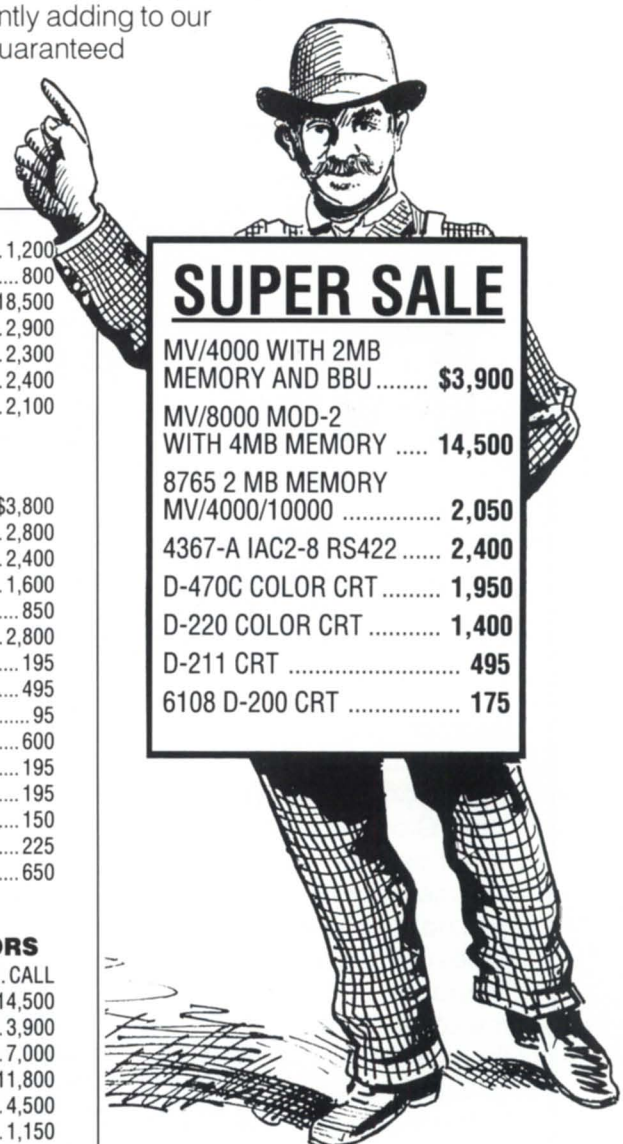

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mail a file, and mail a folder menus. When you press the SPELL function key while in these menus, you see the prompt "scan for misspelled words" (type "N" for spelling verification)." If you type "Y" for yes, the spelling checker will mark any misspelled words it finds in the input areas. If you answer "N," the spelling verification menu will appear, and you can enter a specific word to check.

Automatic archiving

CEO now has an automatic archiving utility that marks documents for archiving if you haven't worked with them after a specified time period. Documents marked for archiving will move to tape the next time your CEO manager runs the archiving utility, and you will no longer be able to view or work with them.

Your CEO manager decides the time interval for archiving documents when CEO revision 3.0 is brought up. So if, for example, the manager specifies an interval of three weeks, CEO will automatically mark for archiving any documents you haven't touched in the last three weeks.

By editing the user's system profile, the CEO manager can exempt certain users from automatic document archiving. The user's system profile menu also allows CEO managers to specify an individual interval for archiving if a user doesn't want to conform to the system-wide time period. See your CEO manager if you feel you should be exempt from archiving, or if you want an archiving interval different from the one defined for your system.

CEOwrite Word Processor

Revision 3.0 of CEO will introduce a new word processing option—the CEOwrite Word Processor. CEOwrite was originally developed to run under MS-DOS on a variety of personal computers and workstations. An adapted AOS/VS version of the original product runs under CEO.

CEOwrite will not replace the CEO Word Processor; however, significant enhancements (such as the ability to create compound documents) will be available only in CEOwrite. Other CEOwrite features include the ability to generate a table of contents, alternate character sets (including Greek and scientific), and a utility for generating and filling out forms.

You can specify in your filing profile menu whether you want to use CEOwrite or the original CEO Word Processor as your primary word processor. Then when you create a new document, the system automatically supplies the document type you specified (CWT for CEOwrite, or WRD for CEO Word Processing) at the "document type:" prompt of the define document summary menu. When you begin editing the new document, you will automatically be using the word processor that corresponds to the document type. You can override this automatic word processor choice by typing a new three-letter code in the "document type:" field.

When you edit an existing document, the word processor corresponding to that document's type starts automatically. If you want to change from one word processor to another, choose to edit the document from the documents menu. This will enable you to edit the document's summary. The "document type:" prompt of the edit document summary menu displays the document type as CWT or WRD. If you enter a new document type (thereby choosing a different word processor), the system converts the document while you

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wait, and the new word processor starts automatically when you edit the document's content.

The CEOwrite Word Processor has an extensive on-line help system available when you press the HELP function key.

Compound documents—This is a feature of the CEOwrite Word Processor that allows you to include graphics, spreadsheets, and data tables in word processing documents. You can create compound documents in either of two ways.

1. Create a new spreadsheet, data table, or graphic that is specific to your compound document. CEOwrite displays the spreadsheet, data table, or graphics component within the text of the compound document, preceded by a reference string. You can edit or view the component only from within the compound document. To do so, place your cursor on the reference string and press the COMPOUND DOCUMENT function key. When you are finished, press CANCEL/EXIT to continue working with the rest of the compound document.

2. Create a reference to a spreadsheet, data table, or graphic that exists in the CEO filing system. Within your compound document, a reference string will mark this component's existence, but its contents will not appear in the compound document until print time. You can view or edit the contents of the component by placing the cursor on the reference string and pressing the COMPOUND DOCUMENT function key. When you are finished editing the component, press CANCEL/EXIT to return to the compound document. You (and anyone else who has access to the component through the CEO filing system) can also view or edit this component from outside of the compound document. At print time, the compound document will show the most updated version of the component, including any changes made from either within or outside of the compound document.

If you want, your compound document can include only a portion of the information available in a spreadsheet, data table, or graphics component. This applies for both newly created or preexisting components. To specify the information you want to use, position the cursor on the reference string at the beginning of the component, press the COMMAND function key, and type characters. CEOwrite displays a menu that you can use to specify the information you want to include.

Summary

The only difference between CEO and CEO 3.0 is that it's much better than before, with many added features. Data General's development group should be congratulated for a job well done! The product as it stands today is ahead of the competition. If I could guess DG's plans for the future of this product, I'd say the fun is only beginning. Using ISDN in the future, we could soon be using Buck Rogers-type products. Δ

Paul Duck is the chairman of NADGUG's RIG/SIG Committee and a CEO guru for Orbi Inc., a vendor of MRP II-based manufacturing systems. Contact Paul c/o Orbi Inc., 14390 Carlson Circle, Tampa, FL 33626; 813/855-2615.

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Beyond Report

Getting more out of your syslog

by Tom Gutnick
Special to Focus

The syslog is a vital facility under the AOS and AOS/VS operating systems, yet many system managers don't fully understand or appreciate it. This article will delve into the syslog and answer some questions about it, such as the type of information that can be collected with syslog, how it can be used, and how data can be put into your own syslog.

First, some basics. Syslog is short for system log. It's a facility for tracking resource utilization, hardware conditions, and possibly security events on your system. Here are a few reasons why a system manager might find syslog data useful.

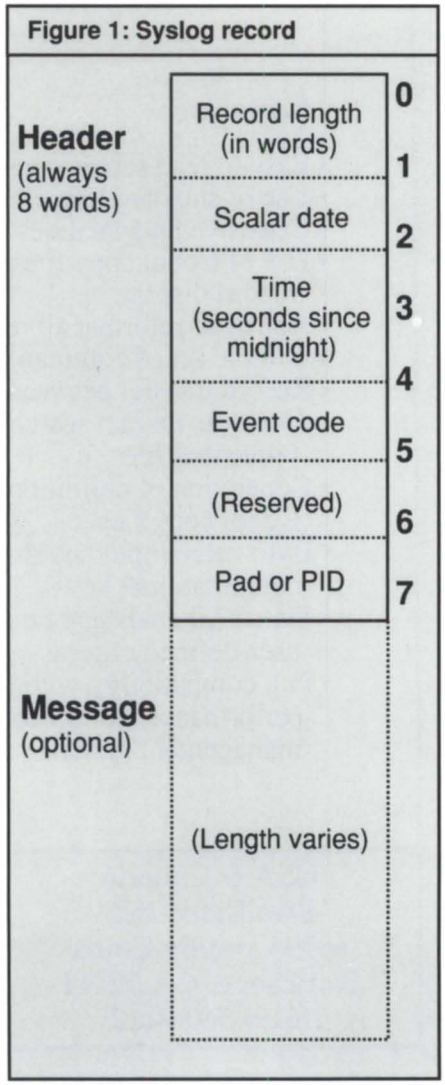
- Reviewing hardware logs allows you to anticipate hardware problems before they become disruptive.
- Information on resource utilization allows you to bill your users for their use of the system. Even if you don't want to bill them, you've got the information you need for capacity planning.
- Security information can alert you to attempted breaches of your system's security. (The syslog can be an extremely useful tool when performing security audits of AOS/VS systems.)

Here are the types of information that can be automatically collected with syslog:

- hardware events: device error, memory error. Under AOS/VS only, events reported by the SCP or DRP, including power fail or restore; AOS/VS panic or hang; microsequencer, cache, or bus parity errors; enable or disable of degraded mode, etc.
- what I term "minimal kernel" events: process termination, syslog turned on or off
- EXEC events: console connect time (generated when a user logs off), unit mount time (for tape mounts), privileged user logon, pages printed
- network events: the various communications packages have options for logging, including RMA, FTA, DG/SNA, XTS, and MTA
- locally defined events: your chance to customize the syslog
- security-related events: process management (creation, termination, ringload, chain), change in superprivilege mode; LDU initialized or released; user profile modified; unsuccessful log-on attempted; file created, opened, deleted, renamed, or unsuccessful open attempted. (These are available under AOS/VS rev 6 or later, but are not available under AOS.)

This list is not exhaustive—refer to appendix A of *AOS/VS System Concepts* (manual 93-335-1) or pages 9-23 through 9-30 of *How to Generate and Run AOS* (manual 93-217-6) for more information.

Figure 1: Syslog record



Where it goes

Under AOS, everything gets logged into a single file (by default, named :SYSLOG), provided that a SYSLOG/START command has been issued from PID 2.

AOS and AOS/VS used to handle the syslog in exactly the same way. Beginning in rev 6 of AOS/VS, however, there are actually two separate logs. The hardware events are always logged into a file called :ERROR_LOG. Although you can delete this file (but please don't until the field engineer has examined it), you can't turn this log off. Unless you have malfunctioning hardware, this file isn't likely to grow very large, and requires minimal manage-

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ment. The discretionary log is named :SYSLOG (you can call it something else by creating it with a CREATE/TYPE=LOG command and creating a link to it from :SYSLOG). SYSLOG/START is equivalent to SYSLOG/START/DETAIL=MINIMAL, which records the same events as under AOS. Specifying SYSLOG/START/DETAIL=FULL gets you this information, along with all the security events. (Under AOS/VS, the syslog can be controlled by PID 2, or by any process with system management privileges turned on.)

Full-detail syslog was created to meet the requirements of C2-level security (as defined by the National Computer Security Center). As such, every time a file is opened or closed, every time a file is renamed or its ACL changed, every time a user tries unsuccessfully to open a file or to log on—an event is generated. Needless to say, you pay a price for such a copious audit trail: increased processing by the operating system, increased disk I/O by the operating system, and increased disk storage requirements for the log file. How much of an increase? I'm leery of suggesting numbers because of the variations between systems; as the EPA says about cars, "Your mileage will vary." On the system in my office (which uses CEO office automation software heavily), a full-detail syslog file grows about 20 times as fast as our default syslog.

How to get at it

Now that you know what's in the syslog, how do you get information out? Included on your AOS or AOS/VS release tape is a utility called REPORT.PR. Report is a good basic utility. It will give you a summary of each user's resource utilization and of each device's error count. It can give you a detailed report for most types of events; you can even select specific users and time ranges for your reports. What Report can't do for you, however, is give you a report such as all connect time records, sorted first by username, then sorted chronologically, nor can it do correlations between different types of event records. For this, you need to write your own program—or at least convert the syslog data to a format that can be used by Present.

Although processing a syslog file is straightforward, there are a few details you need to be aware of. (Again, the information is well documented in the operating system manuals.) These are the issues:

- dynamic record format
- scalar date
- almost-scalar time
- compactness of security event records.

Figure 2: Processing a syslog file (algorithm in pseudo-code)

```
Init:
    Open log file: input, dynamic record format

Loop:
    Do until end-of-file
        Rec length := 16 (bytes)
        Read into header buffer
        If header.length > 8 (words)
            Rec length := (header.length - 8) * 2
            Read into message buffer
        Perform output processing
```

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Figure 3: Converting a scalar date ?CDAY system call

```
* System stores days elapsed since 31 Dec 1967
* Day of week = (scalar date) modulo 7
  (1 = Monday)

Input:
* AC0: scalar date
* AC1:  Reserved
* AC2: Reserved

Output:
* AC0: Day (1-31)
* AC1:  Month (1-12)
* AC2: Year - 1900
```

Dealing with the record format is the most important issue—if you can't read the data, everything else is irrelevant! Figure 1 shows that every syslog record contains an eight-word header, which may or may not be followed by a message (its length is always a multiple of eight words). The first two words contain the length (in words) of the total record (header plus message). That length is stored in binary (long int to you C hackers, .DWORD for assembler, INTEGER*4 for Fortran, PIC S9(9) COMP for COBOL, etc.), which means you can't get away with opening the file for variable-length format.

When I wrote my first program to pro-

Figure 4: Converting an almost-scalar time: ?CTOD system call

```
* SYSLOG stores double-word, seconds since midnight
* AOS/VS expects single-word, biseconds since midnight

* Divide syslog time by 2
   If syslog time is odd, add 1 second to converted result

Input:
* AC0: Scalar time
* AC1:  Reserved
* AC2: Reserved

Output:
* AC0: Seconds (0-59)
* AC1:  Minutes (0-59)
* AC2: Hour (0-23)
```

Figure 5: Processing security events (sample pseudo-code)

```
/* This code fragment shows some of the code that would be needed to display the username and
program name for any process issuing superuser commands or ?SUSER system calls. Much is,
necessarily, left to the imagination.
*/

1 Process-entry  occurs MAXPID times
   2     Program-name   character (?MXPN)
   2     User-name      character (?MXUN)

Process-loop:
   Perform Read-Syslog-Record.
   If Event-Code = ?L.PROC              /* New process created */
         Process-entry [Log-msg.New-PID].Program-name := Log-msg.Program-name
         Process-entry [Log-msg.New-PID].User-name := Log-msg.User-name
   Else if Event-Code = ?L.CHAIN        /* Chained to a new program */
         Process-entry [Log-hdr.PID].Program-name := Log-msg.Program-name
   Else if Event-Code = ?L.TERM         /* Process terminated */
         Process-entry [Log-msg.Target-PID].Program-name := " "
         Process-entry [Log-msg.Target-PID].User-name := " "
   Else if Event-Code = ?L.USR          /* Superuser mode */
         Display Log-hdr.PID
         Display Process-entry [Log-hdr.PID].Program-name
         Display Process-entry [Log-hdr.PID].User-name
   . . . etc.
```

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cess a syslog file, COBOL didn't support dynamic record formats (I'm showing my age here), and I had to process the file byte by byte. But things are much more sophisticated today: open the file for dynamic format input; read in 16 bytes (eight words); from the total record length, determine the length of the message; and read the message. Figure 2 shows the algorithm in pseudo-code. A very simple program might just read the header and message and then write them as a single record to a variable-length file that could then be processed by Present or your favorite report writer.

Note that the format of the header is fixed, but the format of the message depends on the type of record. Again, this is well documented in the manual.

Dates in the syslog (like dates stored in the AOS or AOS/VS file system) are stored in a scalar format: the number of days elapsed since December 31, 1967. Thus, day 1 was January 1, 1968, and I am writing this on day 7,313. How do you convert a scalar date to something easier to understand? AOS and AOS/VS provide a system call, ?CDAY. Figure 3 gives a summary; the full description is in the *AOS Programmer's Manual* (manual 93-120) and the *AOS/VS System Call Dictionary* (manual 93-241). (Don't be scared by accumulators—all the 32-bit languages have system call interfaces, so you don't have to drop down to assembler!) January 1, 1968, or scalar day 1, was a Monday. If you divide the scalar date by seven, the remainder gives you the day of the week (0 = Sunday, 1 = Monday, etc.).

Now, about that almost-scalar time. The standard AOS scalar time is the number of biseconds since midnight. (Why not seconds, instead? This way, the time fits into a 16-bit word. Did you ever notice that the creation time for a file or its time last modified or accessed never has an odd number of seconds?) Since we want the syslog to be as accurate as possible, we store the actual number of seconds since midnight (taking up two words). To convert the syslog time, divide by two to obtain the standard scalar time, then use the ?CTOD system call (see Figure 4).

Dealing with the record format is the most important issue—if you can't read the data, everything else is irrelevant

The only other thing that's slightly tricky is dealing with the security events (/DETAIL=FULL). As noted before, a full syslog file can get large rather quickly. It could have been even worse if they hadn't come up with a somewhat compacted format. If you look at the format of the messages (such as for superuser turned on, file opened, etc.), you won't see a username as part of the message. The only information to identify that record is the PID number stored in the header portion. So you'll need to set up a table in your program that stores the username (and possibly program name and process name) and is indexed by PID. When you get a process creation or chain record, enter the appropriate information into this table; when you get a record that you want to report on, index into the table to find that

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information. Figure 5 shows this in pseudo-code.

How to put more in it

Now you know how to get data out of the syslog, but how do you put data in? There are two ways. The CLI has a command, LOGEVENT, that allows a superuser to insert a text message into the syslog. For more flexibility, your program can use the ?LOGEV system call (which is what the CLI actually uses for you). (See Figure 6.) Using ?LOGEV, you can define any record format you want—text, binary, floating point, or a mixture. Just make sure you use event codes that are in the user-defined range. You'll create chaos if you use the same event codes already used by Data General.

Figure 6: Enter an event in the system log file: ?LOGEV

Input:
* AC0 Event code
* AC1 Byte length of message (maximum 496 bytes)
* AC2 Byte pointer to message

What kind of information would you put into the syslog? I used to run a program every night that reported the disk blocks used for each user's directory. I also modified the CX.CLI macro, so that when the operator mounted special forms in the printer, we logged the name of the form. This way, we could adjust our billing depending on which forms were used for each print job. I'm sure you can come up with some other ideas.

Almost done

I still haven't told you everything about syslogs (I gave a three-hour seminar on the subject at the NADGUG conference in 1987), but this article should be enough to get you started. If you come up with any exciting syslog applications, I'd be interested in hearing about them. Whether your concerns are capacity planning or security, there's a wealth of data sitting in your syslog waiting to be tapped. I hope I've given you the tools to begin to explore what syslog has to offer.

Tom Gutnick is the systems engineering consultant for Data General's mid-Atlantic region, where he specializes in AOS/VS performance and security issues. He can be reached at 703/827-9600. The information contained in this article represents the opinion of the author and is not the representation, warranty, or promise of Data General.

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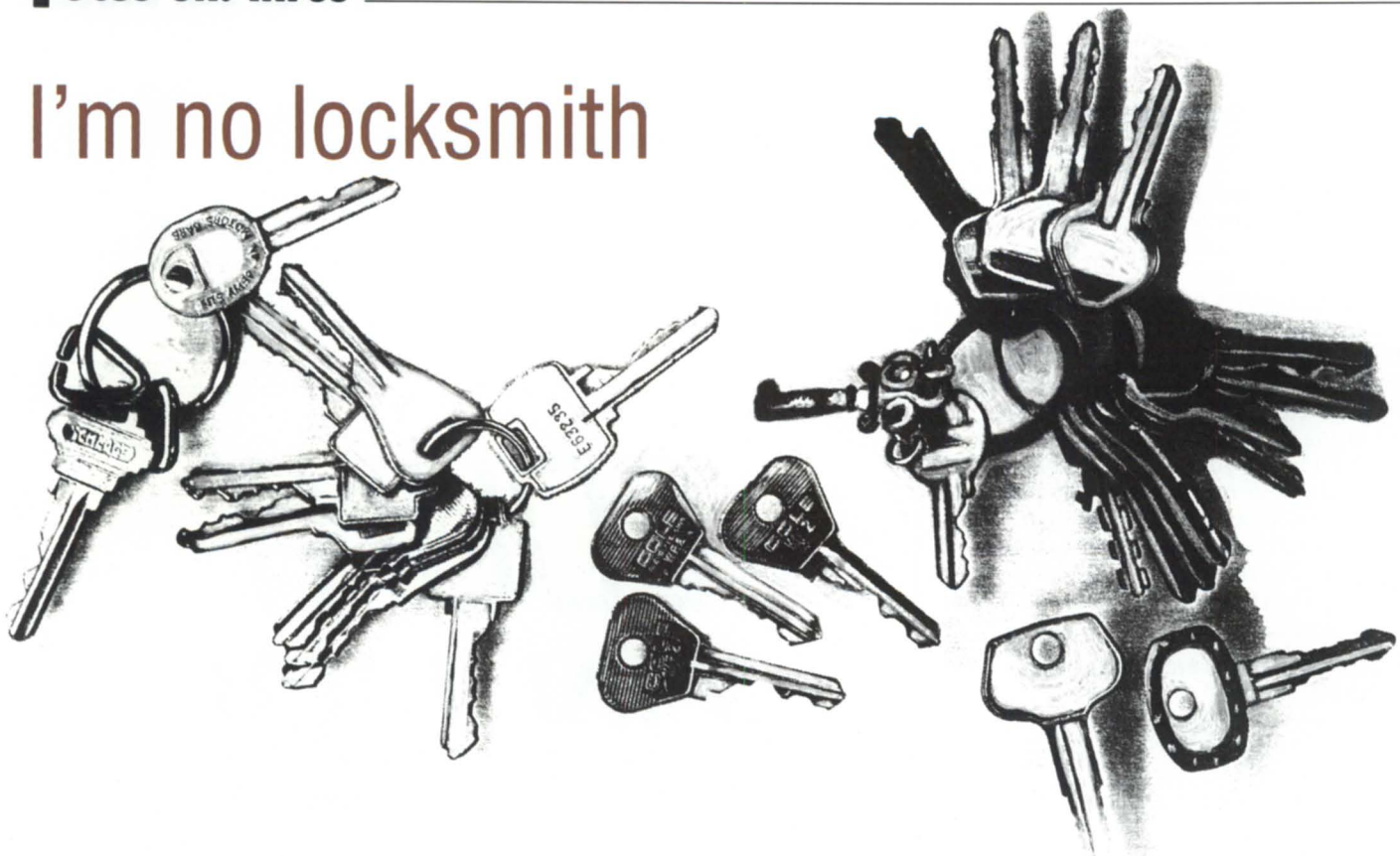

But here's a method to read directly to a duplicate key

by Steve Cohen
Special to Focus

Close counts in horseshoes, hand grenades, and INFOS_II. In the case of INFOS_II, this means that for keys with duplicates, a READ . . . KEYS ARE . . . will only point to the first key of a duplicate series. In order to get positioned to a particular occurrence of a duplicate key, the programmer has to save either the record or its feedback, then scan sequentially down the duplicate series, comparing each scanned record to the record or feedback until a match is found, or until the key value changes. This, of course, is a highly I/O-bound operation, which isn't a strong point for INFOS_II.

One alternative that would let you read directly to a duplicate key would be to concatenate an ordinal number to each duplicate key. This would make the key unique relative to the primary portion of that key. Unfortunately, you don't know which occurrence (or ordinal value) you want before you do a keyed read.

George Burns's article in the April 1988 issue of *Focus* underscored this problem: he resorted to hand coding the management of multiple occurrences of duplicate keys (page 41, program listing 155-DB-REC-ADD). Note that his code attaches an ordinal series to the key with duplicates in an attempt to abort the INFOS_II management of duplicate keys. This gets close to the desired result by setting the ordinal value to zero, then sequentially scanning (by incrementing the ordinal value followed by read approximates to account for skips in the numeric run) to locate the desired record.

Why is manual management better than automatic management? Have you ever had to delete a record when that record had other keys pointing to it? Have any of these other keys ever been a duplicate key? Have you ever used INFOS_II to scan sequentially down an occurrence of a duplicated key looking for a particular record? Maybe you believe that doing sequential scans is beneath the dignity of a full-featured data base system.

One feature in INFOS_II allows duplicate occurrences of a key to be automatically uniquely identified. It is described as the "occurrence number." As stated in the COBOL manual, page 7-92, third paragraph from the bottom: "You should set the occurrence number to the desired value for each key in the series." How do you know what value should be used for the desired occurrence?

You'll find several mentions of this occurrence number in the COBOL manual. Page 7-152, fifth paragraph from the bottom, mentions that the WRITE command will "update the occurrence number for the last key in the key statement . . ." (Off the subject, you should be sure to update the third paragraph from the bottom as directed in the COBOL release document for 3.20.)

On page 4-21, the "with duplicates clause" section discusses the use of the duplicate name key value "John Smith,"

Figure 1: Defining the partial record

```
SELECT FILE
   ASSIGN TO "DBFILE"
   ORGANIZATION IS INDEXED
   ACCESS IS DYNAMIC
   RECORD KEYS ARE
        SELECTOR-KEY
        RECORD-KEY
          WITH DUPLICATES
            OCCURRENCE IS OCCURRENCE.

FD FILE
   FEEDBACK IS FEED-BACK
   PARTIAL RECORD IS PARTIAL-RECORD
01 DATA-REC PIC(whatever).

WORKING STORAGE SECTION.
01 PARTIAL-RECORD.
   05 OCCURRENCE PIC 9(9) COMP.
```

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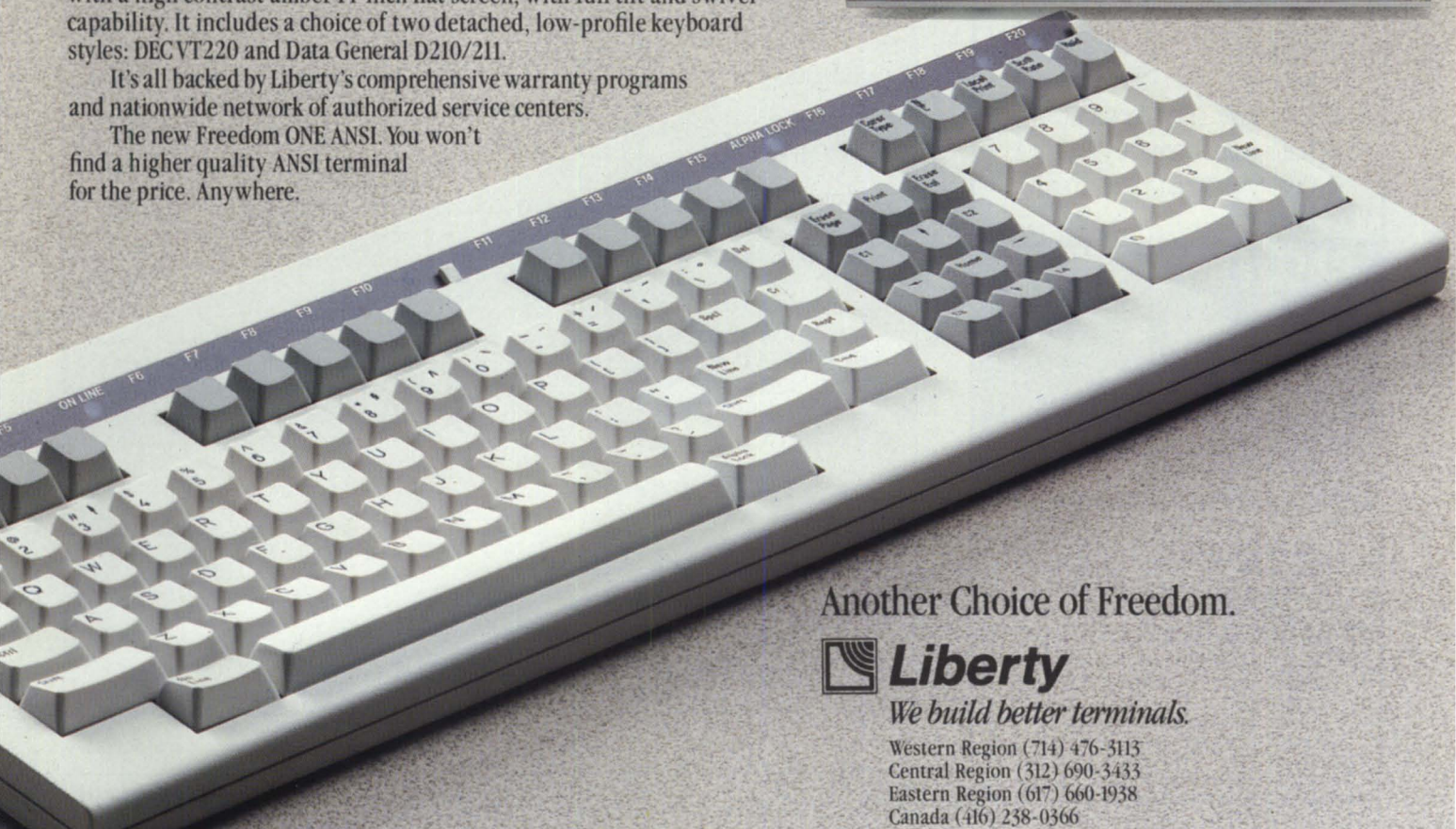

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each one of which refers to a separate record. It states that the use of the RETRIEVE KEY command (page 7-95) can be used to access the occurrence number of a duplicate key. Even though this section misleads the reader into thinking that the occurrence number is ordinal relative to the key (i.e., first occurrence of John Smith, second occurrence of John Smith, etc.), it discusses the fact that a duplicated key can be uniquely identified.

Using RETRIEVE KEY is a good way to obtain the occurrence number in the case where one is already current to a particular "John Smith" key. But what about learning the occurrence of a particular key before getting current to it? The command RETRIEVE . . . KEY KEYS ARE selector-key1;record-key1 . . . will simply access information about the first occurrence of a key value. This is also true for the READ command. Since the manual clearly states that "You should set the occurrence number for each key in the series," you're in a catch-22: to uniquely identify a duplicate key, you should set its occurrence prior to a read—but to access the value of the key's occurrence, you must already be current to it.

If you know the occurrence value of a duplicate key before doing a READ to it, then you can directly access that record without having to sequentially scan down all occurrences of a duplicated key. Thus, there is a need to store that value so that it's available before you do the read to a duplicate key.

This article grew out of my need to directly access duplicate keys while repairing a data base. It was taking an excessive amount of time to delete records, many of which had key inversions with duplicates. This data base has three key paths: FORM-NUM without duplicates, INVOICE-

Figure 2: Portion of loader program

```
PROCEDURE DIVISION.

DECLARATIVES.
MAS-REC-ERROR SECTION.
   USE AFTER STANDARD ERROR PROCEDURE ON OLD-REC.
DISPLAY-ERRORS.
   DISPLAY WHERE-IT-IS.
   DISPLAY "OLD-AR-STATUS       = " OLD-AR-STATUS.
   DISPLAY "OLD-AR-INFOS-STAT  = " OLD-AR-INFOS-STAT.
   STOP RUN.
END DECLARATIVES.

MAIN-PROCESSING SECTION.
INIT.
   OPEN INPUT SEQUENTIAL OLD-MAS-REC.
   OPEN I-O MAS-REC.

BEGIN BY READING THE OLD DB BY THE PRIMARY KEY (NO DUPLICATES)

   DISPLAY "READING ST_AR BY FORM"

   START OLD-MAS-REC KEY EQUAL FM-KEY.
   READ OLD-MAS-REC DOWN.
   PERFORM READ-WRITE UNTIL END-OF-FILE.
   PERFORM END-PGM.

READ-WRITE.

   READ OLD-MAS-REC NEXT INTO M-WORK-REC
        AT END MOVE "YES" TO EOF.
   IF NOT END-OF-FILE
        PERFORM WRITE-THE-KEYS.

WRITE-THE-KEYS.

WRITE THE RECORD INTO THE NEW DB USING THE NO DUPLICATES KEY
```

(continued)

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NUM with duplicates, and LAST-NAME with duplicates. The purge program processed the file by the FORM-NUM path looking for records that qualified to be deleted. Per qualified record, the program loaded the last name from the record into the name search key on the SELECT clause and did a READ RETAIN POSITION to that key. If the feedback of the record found was equal to the feedback of the desired record, a DELETE PHYSICAL with keys was done.

The feedback check is necessary because the NAME key is with duplicates, and the READ simply positions to the first occurrence of that name. If the feedback of the record found is different from the feedback of the desired record, a PERFORM FIND-CORRECT-NAME-RECORD UNTIL FEED-BACK-OF-NAME = FEED-BACK-OF-FORM paragraph is executed. If a key is found for which the feedback is equal to the record desired, it is deleted; otherwise, an error message is displayed and processing is continued. This same logic is used for the location and deletion of the INVOICE-NUM key inversion. After both of these keys are deleted, the FORM-NUM is deleted, which also physically deletes the record at that time. For this data base of 9,000 records with 3,000 to be deleted, the number of sequential scans caused the program to run more than four hours on a relatively empty machine (MV/6000, 4 MB memory, AOS/VS 6.04, COBOL 3.20, and INFOS_II 4.20, Argus 350 MB drive).

If, while positioned to a record via the FORM-NUM path, you take the LAST-NAME to do a read via the NAME path, INFOS_II will read the first occurrence of that name. If known, however, the actual occurrence number can be used to do a direct read to that name. There are four options for finding the actual occurrence number.

The first option is to store the occurrence number somewhere on the record, and update this field at the time the key inversion is written. Then, while current to a record by any path, occurrence numbers for the key inversions are there to MOVE into the occurrence number variables prior to a read to any key. However, this requires that space be made available in the record. It also means a lot of modification to existing programs to implement this technique.

The second option is to store the occurrence information off line, that is, create a second data base with just the occurrence information. Since each record in the example data base has a unique FORM-NUM, use that as the key to the new file with the occurrence fields as data. When positioned to any record, READ new-off-line-file KEYS ARE FORM-NUM to get the occurrence, and load that into the OCCURRENCE IS variable prior to the read via the name path. This technique also involves considerable effort to implement. Furthermore, it shouldn't be necessary to create a second data base to effectively utilize any other data base.

The third option is to concatenate the nonduplicate key FORM-NUM to each of the keys with duplicates. This allows a unique key value to be built from information already on the record while current to any path. But it also creates a lot of redundancy in the INFOS_II key files. Further-

Figure 2 : continued

```
    MOVE "WRITE   FORM" TO WHERE-IT-IS.
    MOVE AR-FORM-NM TO FORM-NUM.
    WRITE NEW-REC RETAIN POSITION FROM M-WORK-REC
        KEYS ARE FM-KEY, FORM-NUM.

NOW, WRITE THE TWO INVERSIONS FOR THE KEYS WITH DUPLICATES.
INFOS WILL AUTOMATICALLY UPDATE THE OCCURRENCE NUMBER.

EXAMPLE OF A CONDITIONAL INVERTED KEY OCCURRENCE (SOMETIMES
YOU WRITE IT, OTHER TIMES YOU DON'T). WHEN THE CONDITION IS THAT
NO KEY IS WRITTEN, ZERO OUT THE OCCURRENCE (WHICH IS LEFT FROM
THE PRIOR WRITE INVERTED TO THAT PATH).


    MOVE "WRITE   INVOICE INVERSION" TO WHERE-IT-IS.
    MOVE INVOICE-NUM TO INVNO.
    IF INVNO NOT EQUAL ZERO
        WRITE INVERTED NEW-REC RETAIN POSITION SUPPRESS DATA RECORD
            KEYS ARE DT-KEY, INVNO
    ELSE
        MOVE ZERO TO INV-OCC.

EXAMPLE OF AN UNCONDITIONAL INVERTED KEY OCCURRENCE

    MOVE CR-NAME TO L-NAME.
    MOVE "WRITE   NAME      INVERSION" TO WHERE-IT-IS.
    WRITE INVERTED NEW-REC RETAIN POSITION SUPPRESS DATA RECORD
        KEYS ARE NM-KEY, L-NAME.

NOW PLACE THE OCCURRENCES IN THE PARTIAL RECORD. NOTE THAT
NOTHING IS REQUIRED TO BE MOVED - SINCE THE WORKING-STORAGE
VARIABLE FOR THE OCCURRENCE NUMBERS ARE DATA ITEMS UNDER
THE GROUP ITEM WHICH DEFINES THE PARTIAL RECORD. THIS ALLOWS
INFOS TO UPDATE THE OCCURRENCE ON A WRITE INVERTED FOLLOWED
BY A REWRITE SUPPRESS DATA RECORD TO PLACE THAT OCCURRENCE
ON THE PARTIAL RECORD.

    MOVE "REWRITE PARTIAL RECORD" TO WHERE-IT-IS.
    REWRITE NEW-REC RETAIN POSITION SUPPRESS DATA RECORD
        KEYS ARE FM-KEY, FORM-NUM.

AT THIS POINT, EACH READ OF THE PRIMARY KEY (NON- DUPLICATE KEY
WITH THE PARTIAL RECORD) WILL ALSO PRE-LOAD THE OCCURRENCE
NUMBER OF THE DUPLICATE KEY INVERSIONS. ANY KEYED READ TO
THESE INVERTED KEYS WILL DIRECTLY GO TO THE KEY WHICH POINTS TO
THE RECORD JUST READ VIA THE PRIMARY KEY.

  END-PGM.
    CLOSE MAS-REC.
    STOP RUN.
```

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more, if the primary key is big, then processing keys can become a burden.

The fourth option, the subject of this article, is to store the occurrence number in a partial record attached to a key without duplicates (see Figure 1). Similar in design to option 2, this requires fewer changes per program, because the only change in logic is to ensure that there is a REWRITE...SUPPRESS DATA RECORD KEYS ARE FORM-NUM after all WRITES or DELETES to the key inversions. It also consumes less space, since the occurrence number can be made 4 bytes long if it is defined as PIC 9(9) COMP. It affects the processing of the nonduplicate key, since each read to it must also process the input of the partial record (except of course when used with SUPPRESS PARTIAL RECORD), but the overall gain in processing the duplicate keys greatly surpasses this loss.

By utilizing a simple naming convention in the WORKING STORAGE, SELECT clause, and FD clause, no procedure code is required to maintain the occurrence numbers. This is accomplished by defining the partial record as a group item in working storage; its data items are the variables used in the OCCURRENCE IS clause under the keys WITH DUPLICATES (see Figure 1). By doing this, INFOS_II updates the occurrence number directly in the partial record definition, which can be captured with a REWRITE SUPPRESS DATA RECORD. By choosing the key without duplicates to which to attach the partial record, you know in advance the occurrence of the key inversions with duplicates.

Our shop uses the COPY facility to define the SELECT and FD definitions, along with SMU Build to manage program compilations. With the SMU Find utility, we found all programs that needed to be rewritten to position WRITE INVERTED commands above a final REWRITE of the

Figure 3: Program outline to load with DUPLICATE-KEYED-DIRECT-READ

1. ICREATE target file identical to the source file.

2. Inquire target file to create your selector keys, linking the partial record to the level below the selector, which will be the path without duplicates.

3. Use the above program as a skeleton (minimum program) that does
   a. Read a record in the source file by the non-duplicate path
   b. Write that record in the target file
   c. Write the inversions to the target file for that record
   d. Rewrite that record in the target file suppressing data record
   e. Repeat until end of file.

4. If available, start a REQUEST-GROUP beginning a-b ending in d-e.

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partial record. Was it a lot of work? You bet, but we received a maximum return for the effort.

A portion of a data base loader program is included with this article (see Figures 2 and 3). This is the program that moved records from the old data base to the new one, where the partial records are updated with appropriate occurrence numbers.

Getting information about how to use occurrence numbers to directly read a multiple occurrence of a duplicate key was not a trivial matter. At Data General's RAC Center, the first-line person couldn't help with the use of duplicate keys. A subsequent discussion with Carolyn Knight and Sam Burel of the RAC Center gave me clues that the COBOL manual lacked an adequate discussion of how to use occurrence numbers for duplicate keys. These two people really are good, and I hope that they will be rewarded for their efforts. I got further assistance from Allen Kiesel of Stone Petroleum, Tom Duell of Eagle Software, and Jim Siegman of Datamark. These discussions confirmed that DG COBOL/INFOS_II programmers don't generally use occurrence numbers to directly read duplicate keys.

I believe this technique needs to be discussed by INFOS_II/COBOL programmers so that we can learn how to improve on this narrow limitation imposed on us by our data manager. (The DG INFOS_II and COBOL development programmers can define "narrow limitation" as follows: Keyed read to a duplicate key occurrence not utilizing the feedback of the current record as relative motion option, such as "READ file IMMEDIATE KEYS ARE . . .," or a READ file DIRECT KEYS ARE where a feedback value is used.) Δ

5. IRENAME the source file to an "archive name."

6. IRENAME the target file to the original source filename.

7. Modify all programs utilizing that data base to:
   a. Select sentence to include "OCCURRENCE IS" on "WITH DUPLICATES"
   b. FD sentence to include "PARTIAL RECORD IS"
   c. WORKING STORAGE to include a group item name used for "PARTIAL RECORD IS" and data items used for the "OCCURRENCE IS"

```
01 PARTIAL-RECORD-NAME.
    02 FIRST-OCCURRENCE-IS PIC (WHATEVER).
    02 SECOND-OCCURRENCE-IS PIC (WHATEVER).
```

   d. Modify PROCEDURE DIVISION code to ensure that any keyed output to inversions (WRITE INVERTED) are followed by a KEYED REWRITE DATA SUPPRESSED to that file using the no duplicates path.

Steve Cohen is a computer specialist-administration for Mississippi Cooperative Extension Services, P.O. Box 5446, Mississippi State, MS 39726; 601/325-3227.

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No weak lynx

Review: Infolynx offers INFOS emulation with improved performance

I've been playing around with someone else's software again. This time, the honors go to Infolynx, a relatively new package from Datalynx. This package has been available commercially for a couple years, but I first became aware of it at the NADGUG conference in Las Vegas last October.

Infolynx is a file management system that is a clone of INFOS II (please, don't read "clone" with any negative connotations). Like most second-generation clones, not only is it upwardly compatible with the original, but it also has a number of enhancements and features INFOS doesn't offer. I tend to shy away from software replacement packages, but in the recent past, I have found a number of them (of which B32 and ICHOST come to mind first) to be so vastly superior in performance compared to the originals that I must admit that they have earned their place in the DG world.

Infolynx appears to be well on the way to making its mark among products that give your DG system more "bang for the buck" than you thought it had. Although some users may feel that it already has proven itself, I'll hold out for another release or two to allow it to mature fully.

Many users will implement Infolynx simply as an INFOS II replacement. You remove ICALL.OB from your link command line and replace it with ILX_ICALL.OB. Instead of running the INFOS II process, you run ILX_SERVER. So far, all of the source codes I have tried have been completely compatible; not a single program has needed to be recompiled. I simply relinked the programs I wanted to test and ran them.

Infolynx has a second *modus operandi*, known commonly as native mode. Although using the native mode requires recoding your I/O statements, it also allows you to take advantage of all the enhancements over INFOS, instead of just the few built-in advantages available in INFOS emulation mode. Since my investigations were done using only the INFOS emulation, I won't be addressing those enhanced features at this time.

The installation

Installing Infolynx is simple: create a directory, load the dump file on the tape, modify the UP macro to execute INFOLYNX_UP, and modify the DOWN macro to shut down the server. Last but not least, modify your COBOL link macros to use ILX_ICALL.OB instead of ICALL32.OB from the INFOS directory.

The conversion

Here is the catch: conversion isn't simple, and can actually take a bit of work. Infolynx's proprietary data base structure is very different from that of INFOS II. A data base in its simplest form takes only a single file, where INFOS requires two control point directories, an index, a data volume, and UDAs on all file headers. This of course means that your data base must be reloaded before you can use it with Infolynx.

The conversion utility Infolynx provides can do much of the work for you, but it has one major drawback: it can't handle inverted records yet. As a result, this utility is only useful for single-key data bases, something that occurs rarely in the INFOS world. If you have one of these rare animals, then your conversion becomes as simple as a single CLI command. In my case, I had to use two programs, one to unload the INFOS data base into sequential files and another to load the data base up again. However, since any well-developed application will already have these utility programs for all of the data bases (you mean yours doesn't?), there should be few if any problems for a conversion.

This was a new release, and a few minor problems aren't unusual. The speed of the fixes were

The integration

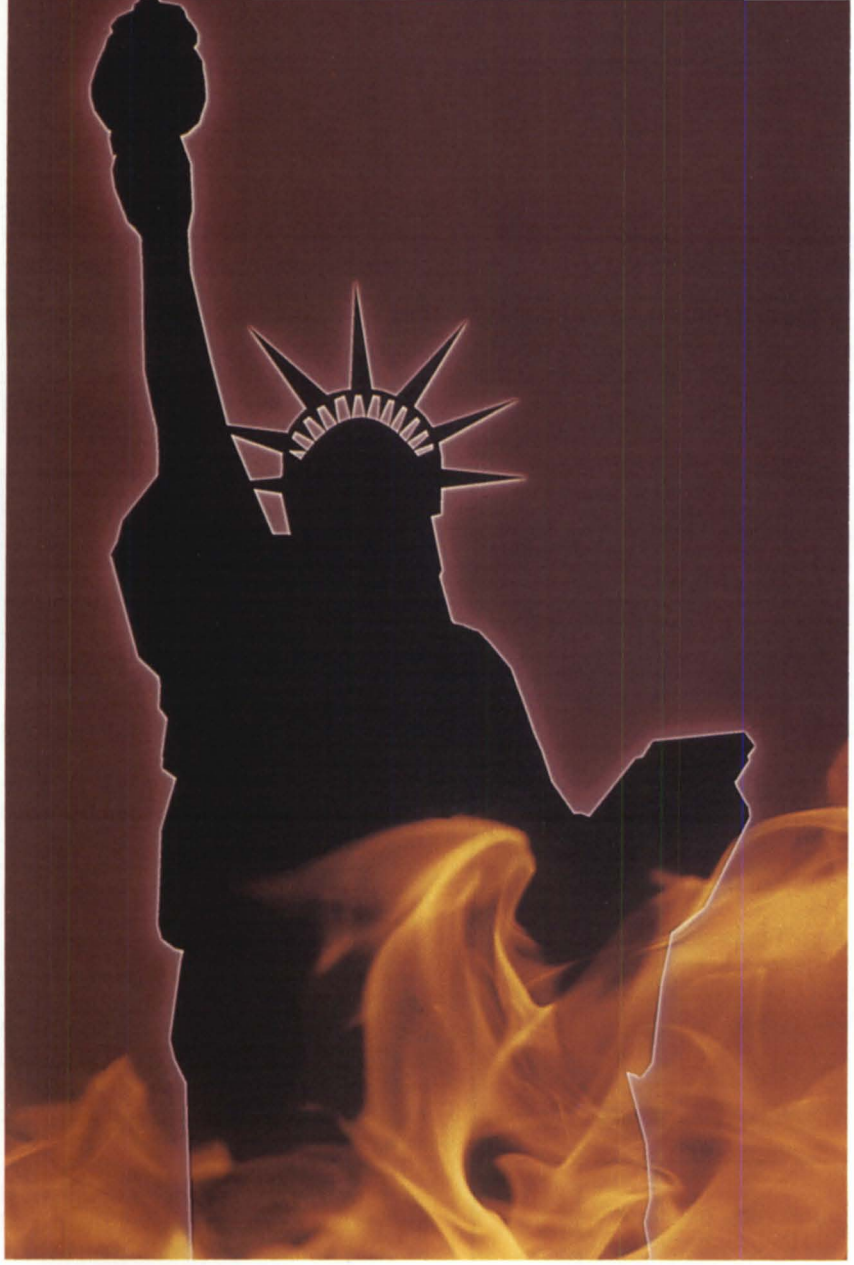
The integration of Infolynx in emulation mode is so complete that the execution of a program is normally unchanged. Once relinked, you can XEQ, PROC, or CHAIN to any program that uses Infolynx, as long as the server is running. If it isn't up and running, you will get file access error 91 in COBOL (or the appropriate code in other languages) when you try to open or access the files.

The testing

Now comes the fun. I had been presented with a brand-spanking-new release, and I had the dubious honor of being one of the first guinea pigs. Although the results of my testing showed some impressive results, I did encounter a few problems that caused me some concern—but after all, this was a new release, and a few minor problems aren't unusual. The speed

Figure 1: Program runtimes

Min:sec	INFOS II with record	Infolynx compression	Infolynx no compression
DB size	11,551,864	9,646,080	14,622,720
Program 1	52:52	33:08	34:30
Program 2	18:04	12:06	11:10
Program 3	5:48	3:20	2:26



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of the fixes were. Therefore, let me relate to you the three problems I found and what the product's creator, Pete Walsall, had to say about them.

The first came when I executed my file maintenance program. Every time I tried to access any record, I kept getting file access mode errors, indicating that it thought my main file was still closed. Running the program with the debugger proved that it indeed opened the file successfully. At this point, I contacted Mr. Walsall, who offered to dial into my system to take a look. Within the hour, he had determined that after I opened my master file, I went to see if an optional support file was available. It wasn't, and the program set a flag. Infolynx, however, had a bug that caused the channel number of the opened file to be replaced by the invalid channel number of the file that wasn't found. He had also patched the server program, and in only an hour or so, I was on my merry way. Imagine that—a lethal bug in a piece of software fixed on line within an hour. I know places where it takes longer than that to recompile a program. It felt great to be on the receiving end for a change.

> Imagine that—a lethal bug in a piece of software fixed on line within an hour

The next problem came when I ran the ILX_VERIFY program on a newly loaded data base. The utility reported three problems with the data base. However, these problems are false messages coming out of the verification utility. Since this was reported only a few days ago, there has been no word yet on the source of the problem. It is, however, known to be limited to fairly large files (mine is 10 MB and has 20,000 plus records). By the time you read this, the bug will have been isolated, and the fix will probably have been sent to all users.

The third problem I encountered was when my file maintenance program tried to delete a record. It deleted the record from the primary key path, but something happened on the alternate key path that made all my applications programs think that the record was locked. Thus, they all hung around waiting for the record to become unlocked. Again, Pete Walsall is aware of this, and the fix is available.

The features

I'll assume that if you have stayed with me this far, you are somewhat familiar with INFOS and know its abilities. The most obvious feature is the file structure. As I mentioned before, in the simplest form, an entire data base has both index and data blocks contained in the same disk file. The obvious advantages are simplicity of structure and ease of backup. Since there are no UDAs on the file and directory header (as in INFOS), you can use the standard system utilities such as DUMP_II/LOAD_II to back up your data base. Also, since there is only one file to open, only one system channel needs to be established. With INFOS, four channels

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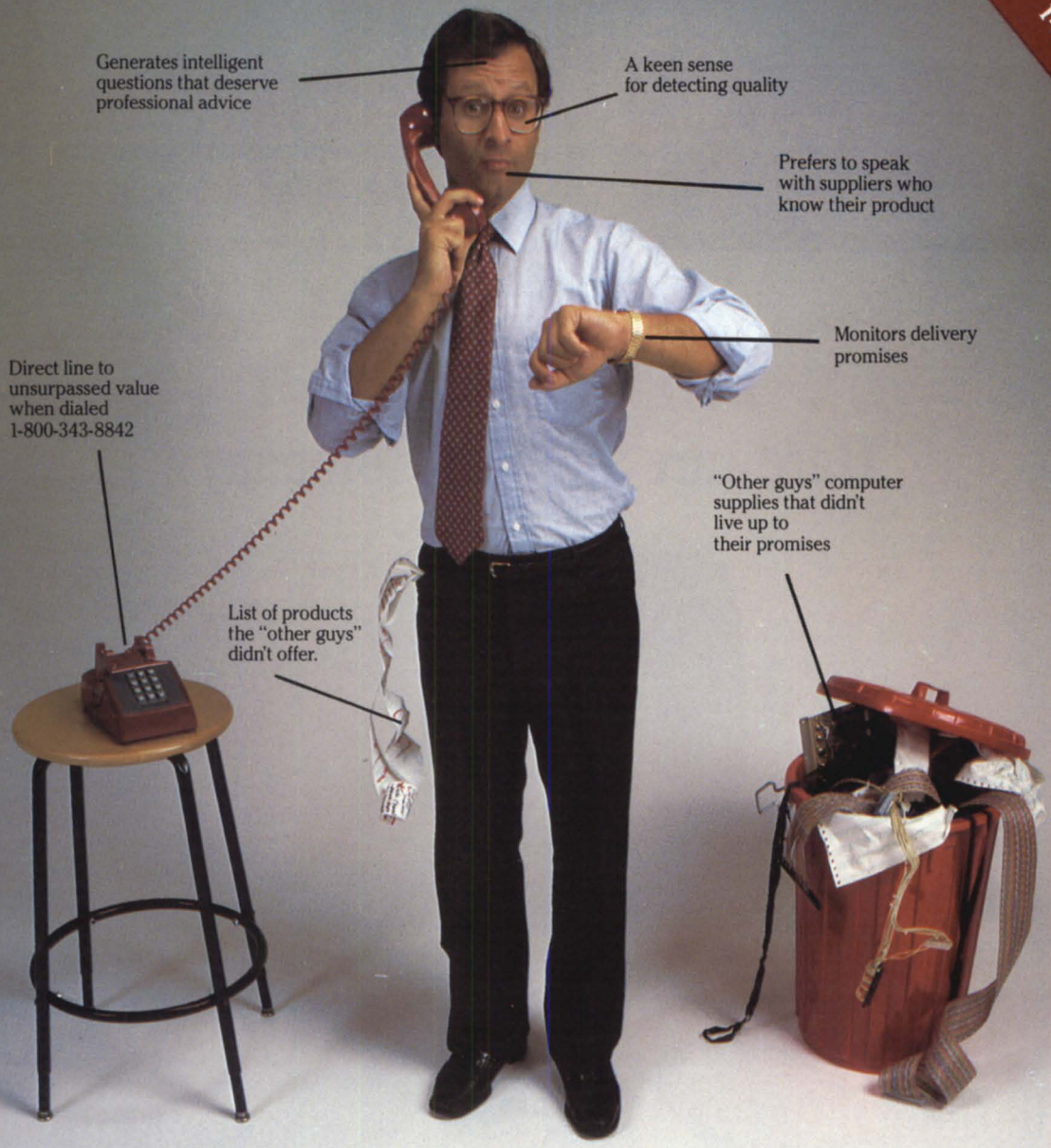

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are needed, two for the directories and two for the volumes under them. That alone cuts the time needed to open a file by about 75 percent.

Second is the partial record implementation. Although a different terminology is used, the partial records in INFOS are fixed and are always written by default. To avoid writing partial records in a data base, you must explicitly code it that way in your source program. Infolynx defaults to no partial records, and more importantly, partial records aren't fixed in length. Each partial record can be written with the length that best suits your needs. That alone would have saved several megabytes in disk space at one site I am currently working with.

Third is the Inquire utility. Although there are some differences in the way they operate, Infolynx checks all options for a particular command while entering it. INFOS's Inquire allows you to enter a command such as READ DOWN UP, whereas Infolynx will not allow it.

Fourth is the security - level codes on each subindex. This is ideal for a multiple-use data base with many different records from many departments. You could restrict the access on the customer account data to inquiry-only (for most terminals) but allow full access elsewhere in the data base. With INFOS, your only alternative is to use two separate data bases and set the ACLs accordingly.

There are many more enhancements, but let's skip a few and get to the most important one: speed. This is the number one reason many sites are using this product. It runs at least 25 to 50 percent faster than INFOS does.

The details

OK, let's talk about some cold, hard facts. Figure 1 shows the runtimes from the various programs I selected for testing. All of the programs are primarily I/O bound, with most of the I/O concentrated on the data base. My data base consists of a little more than 20,000 records of 274 bytes each. These records are inverted so that there are two key paths to each record.

The first program simply read sequential "flat" files from the disk and wrote the records into the data base. This program is used to reload the file during one phase of one of the recovery methods. Although its functionality at the simplest level could be duplicated with sort/merge, it also verifies the data records according to all of the rules in the file maintenance program. This way, no corrupted records would be reloaded into the data base.

Program 2 read the entire data base sequentially on the primary key and tallied the records. At the end, it produced a report that is about four to six pages long. Since nearly all of the elapsed runtime is spent in the read and process loop and less than 30 seconds are spent printing the report, the speed of Infolynx compared to INFOS should be obvious.

The third program was IVERIFY for INFOS, and ILX_VERIFY for Infolynx. Both ran on a terminal, both produced pages of statistics, only some of which were useful to me. Both programs run from a simple CLI command, though you have more options available with the Infolynx version.

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The results

Figure 1 speaks for itself. The tests were run on our MV/4000 without FPU and a 400 MB CDC disk unit with a Zetaco BMX controller. All of the tests have consistent results, showing that the Infolynx software outperforms INFOS by 30 percent or more. Furthermore, what few bugs I encountered were fixed rapidly and with total resolution, taking only a few days for the least critical problem. This product may allow many users to delay or cancel plans for a hardware upgrade, and as such, it's a product that deserves to be watched.

Another oops

The model number for the 2 MB memory board was incorrectly stated in my last column. It should have been 8765 instead of 8756.

Figure 2: TAIL.CLI

```
[!equal,%1%,]
   write You must supply a filename—abort.
[!else]
   push ; prompt pop
   delete/2=ignore   ?[!pid]tail.tmp
   create/2=error    ?[!pid]tail.tmp
   var0 [!udiv,[!size %1%],512]
   x :util:display/l=@null/first=[!var0]/last=[!var0]&
         %1% ?[!pid]tail.tmp
   type ?[!pid]tail.tmp
   delete ?[!pid]tail.tmp
   pop
[!end]
```

More mail

Recently, there was a fair amount of discussion on the RDS bulletin board about a utility called TAIL.PR that was similar to DISPLAY.PR except that it started at the end of a file. Mike Champagne sent in a CLI macro that will dump the last block of a disk file. With minor modifications, it could easily be adjusted to dump the last "N" blocks of a file. See Figure 2.

Paul Shatsoff of the NYS Office of Employee Relations asks: "Are you aware of an automatic log-off piece of software that will run on a DG MV/10000? Getting our users to log off is a real problem." I remember once I had the same problem with one user back when I was running AOS on a C/150. I set the /TO characteristic on that console port. Since the default timeout was two minutes, he got the message rather quickly. However, the best and cheapest solution that comes to mind was published in the December 1985 issue of *Focus*. The article was entitled "Watchdog" and included complete F77 source listings to terminate processes that fit the following criteria: it was below EXEC in the process tree, it was running on a terminal, it used less than a specified threshold amount of CPU during a time period (because CEO processes have background tasks to update the time and such), and the username isn't on the list of VIP users to be left alone. Δ

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

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Boyer's extracts

Lacking a sort verb, ICOBOL inspires shortcuts for extracting and compiling reports

We all have to do reports that require us to extract some type of information from a file, sort it, and print it out in a coherent manner. Since ICOBOL lacks a sort verb, however, the only way to do this is to read the file, write the selected records out to disk, and then read through the sorted file.

Problems tend to arise when you keep track of a particular transaction by date and then just want to print certain dates. As your file gets larger, the processing time increases drastically. Here are a few of the techniques we are using to speed up the file access.

We record downgraded tires by type and write them out to a file daily. Management wants a monthly report showing the downgrades in order by tire code, so the history file looks like Figure 1. Back in 1981, this was no problem. I simply entered the starting and ending dates and wrote a report program that looked like Figure 2.

Figure 1: The history file

```
FD DEFECT-FILE
        LABEL RECORDS ARE STANDARD.

01 DEFECT-RECORD.
        03 DEFECT-KEY.
              05 DEFECT-ITEM-NUMBER      PIC X(12).
              05 DEFECT-DATE.
                    07 DEFECT-YEAR       PIC 9(2).
                    07 DEFECT-MONTH      PIC 9(2).
                    07 DEFECT-DAY        PIC 9(2).
              05 DEFECT-TYPE             PIC X(8).
              05 DEFECT-PRESS-NUMBER     PIC X(8).
              05 DEFECT-TBM-NUMBER       PIC X(8).

        03 DEFECT-BLEMS                  PIC 9(8) COMP.
        03 DEFECT-SCRAP                  PIC 9(8) COMP.
   . . .
```

Figure 2: The simple approach

```
MOVE LOW-VALUES TO DEFECT-KEY.
START DEFECT-FILE KEY NOT < DEFECT-KEY.
IF DEFECT-FILE-STATUS = I-O-OK
   READ DEFECT-FILE NEXT RECORD,
   IF DEFECT-FILE-STATUS IS NOT = AT-END
        PERFORM PROCESS-DEFECT-FILE UNTIL
             DEFECT-FILE-STATUS = AT-END.

PROCESS-DEFECT-FILE SECTION.
CHECK-FOR-DATE.
   IF DEFECT-DATE < STARTING-DATE OR > ENDING-DATE
        GO TO READ-NEXT-DEFECT.

   PERFORM PRINT-INFO

READ-NEXT-DEFECT.
   READ DEFECT-FILE NEXT RECORD.
```

This would print the report in about 10 minutes. A funny thing happened, though. The defect file got larger and larger, and the report got slower and slower, until it was taking more than two hours to run. I either had to get rid of some of the history (and I *hate* getting rid of history) or rewrite it to run faster.

Since I already had the starting and ending dates, I figured I could get a big improvement if I had each DEFECT-ITEM-NUMBER. That way, I could just read through my item file and START the defect file exactly where I wanted, as shown in Figure 3. This would save reading through seven years of unwanted records.

Of course, this technique also depends on making sure that each DEFECT-ITEM-NUMBER has a valid corresponding ITEM-NUMBER. I do that by *never* deleting anything from my item file. I'll mark it as obsolete or discontinued instead, so that it won't show up on any reports. I don't know about your company, but mine always wants to know when we last shipped some obscure item that we haven't produced in years. I simply put an asterisk in front of the description of obsolete tires and do an INSPECT. Anything with a leading asterisk doesn't print out on our current parts list.

Back to our sort program. Instead of taking two hours to run, the rewritten program runs in less than one hour—better than twice as fast. But what do you do if you didn't keep all of the item numbers on hand, or if your item file is so big that the second method takes as long as the first? In that case, you have to get a little tricky.

Here's what I did. To start off, the procedure in Figure 4 begins at the first item and starting date and reads the file until the item number changes or the date is greater than the ending date. At that point, you have two possibilities: either you have just read the next item number, or you are still reading the current item number, but the date is greater than the ending date.

If you've run into the next item number, there's no problem—just move the starting date to DEFECT-DATE, do a START and READ, and keep going with the next item. If you haven't, you've got a bit of manipulating to do.

First, move HIGH-VALUES to the date, do a START GREATER, and read the next record. This will get you to your next item number. From there, proceed as before—move in the starting date, do a START and READ, etc. If your next record read has a date less than your starting date or greater than your ending date, you've read past the current item number and there were no applicable records for it, so go back up and try again. Otherwise, print it.

Let's walk through an example, using January 1, 1988, as our starting date and January 31 as our ending date. On the first read, both the DEFECT-ITEM-NUMBER and the SAVE-ITEM-NUMBER are at LOW-VALUES. The program then does a START and a READ to get to the first record, which looks like this:

```
TIRE-1  830112
```

Next, the starting date is moved to the date, and another read is done. The next record is this:

```
TIRE-3  870106
```

Since the date is out of the applicable range, you know that

there are no records in range for TIRE-1, so go back to the top and try again. But this time, DEFECT-ITEM-NUMBER doesn't equal SAVE-ITEM-NUMBER. Therefore, you just insert the starting date and do a START and READ. The next record read is this:

TIRE-3 880122

which is valid—so print it and start over again.

This way, except for a few reads, you're immediately getting to the data you want. In a big file, this can cut out literally thousands of reads and greatly improve performance. In this particular case, I cut 45 percent off of the runtime, as well as cut the program size down by not having the 1,024-byte item file in the program. In certain instances, such as when I'm using one history file to access another, I've cut more than 80 percent off of the runtime.

In case you're wondering why I'm checking for a file status of NOT "00" instead of just checking for an AT END condition, it's because of an ICOBOL peculiarity. If you are at the end of a file, and you do a START GREATER, the file status that you get back will *not* be an AT END (00); it will be a RECORD NOT FOUND (23). Just one more thing to make life interesting for us ICOBOL programmers!

Odds and Ends Department

The next article should be interesting—if I ever get time to write it. If all goes well, the next column will be written on an MV/8000 model II, instead of an S/140, and I should have all kinds of

Figure 3: Starting at a specific item

```
MOVE LOW-VALUES TO ITEM-NUMBER.
START INVENTORY-ITEM-FILE KEY NOT < INVENTORY-ITEM-KEY.
IF INVENTORY-ITEM-FILE-STATUS = I-O-OK
   READ INVENTORY-ITEM-FILE NEXT RECORD,
   IF INVENTORY-ITEM-FILE-STATUS NOT = AT-END
        PERFORM SELECT-DEFECT UNTIL
        INVENTORY-ITEM-FILE-STATUS = AT-END.

SELECT-DEFECT.
   MOVE LOW-VALUES TO DEFECT-KEY.
   MOVE ITEM-NUMBER TO DEFECT-ITEM-NUMBER.
   MOVE STARTING-DATE TO DEFECT-DATE.
   START DEFECT-FILE KEY NOT < DEFECT-KEY.
        IF DEFECT-FILE-STATUS = I-O-OK
             READ DEFECT-FILE NEXT RECORD,
                  IF DEFECT-FILE-STATUS IS NOT = AT-END
                  PERFORM PROCESS-DEFECT-FILE UNTIL
                       DEFECT-FILE-STATUS = AT-END OR
                       DEFECT-ITEM-NUMBER > ITEM-NUMBER OR
                       DEFECT-DATE > ENDING-DATE.

PROCESS-DEFECT-FILE.
   PERFORM PRINT-INFO.

   READ DEFECT-FILE NEXT RECORD.
```

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Figure 4: Getting trickier

```
    MOVE LOW-VALUES TO DEFECT-KEY, SAVE-ITEM-NUMBER.
    PERFORM SELECT-DEFECT UNTIL
        DEFECT-FILE-STATUS NOT = "00".

SELECT-DEFECT.
    MOVE LOW-VALUES TO DEFECT-TYPE.
    IF DEFECT-ITEM-NUMBER = SAVE-ITEM-NUMBER
        MOVE HIGH-VALUES TO DEFECT-DATE,
        START DEFECT-FILE KEY > DEFECT-KEY,
        IF DEFECT-FILE-STATUS = I-O-OK
            READ DEFECT-FILE NEXT RECORD,
            IF DEFECT-FILE-STATUS NOT = AT-END
                MOVE STARTING-DATE TO DEFECT-DATE,
                START DEFECT-FILE NOT < DEFECT-KEY,
            ELSE NEXT SENTENCE,
        ELSE NEXT SENTENCE,
    ELSE MOVE STARTING-DATE TO DEFECT-DATE,
        START DEFECT-FILE KEY NOT < DEFECT-KEY.

    IF DEFECT-FILE-STATUS = I-O-OK
        READ DEFECT-FILE NEXT RECORD,
        IF DEFECT-FILE-STATUS NOT = AT-END
            IF DEFECT-DATE < STARTING-DATE OR > ENDING-DATE
                GO TO SELECT-DEFECT,
            ELSE MOVE DEFECT-ITEM-NUMBER TO SAVE-ITEM-
                    NUMBER,
                PERFORM PROCESS-DEFECT-FILE UNTIL
                DEFECT-ITEM-NUMBER NOT = SAVE-ITEM-NUMBER
                    OR
                DEFECT-DATE > ENDING-DATE OR
                DEFECT-FILE-STATUS = AT-END.

PROCESS-DEFECT-FILE.
    PERFORM PRINT-INFO.

    READ DEFECT-FILE NEXT RECORD.
```

interesting stories about the changeover. It will also mean that I'll be able to take advantage of all of the nice features of VS ICOBOL. That should be good for a column or two.

Unfortunately, this may also be a portent of doom for all of you AOS/VS and MV users. Mind you, I can't *prove* this, but it seems like every time I change processors, disk drives, or operating systems, DG immediately discontinues what I've switched to. I call this being on the trailing edge of technology. I hope it doesn't hold true in this case, but don't be surprised if DG announces a 64-bit Unix machine next month! Δ

Tim Boyer is EDP Manager at Denman Tire Corp. 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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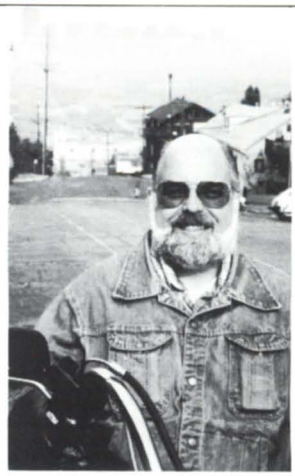

Drawing a blank

Configuring a printer isn't always black and white

:LPTSIG:REVISITED

In the March 1986 issue of *Focus*, I recounted the minutes of an informal meeting of the short-lived AOS[/VS] printer SIG (it lasted less than one hour). The SIG came together spontaneously after a dinner at the NADGUG conference in 1985 when a group of attendees approached me with questions about how to configure third-party printers to work properly as spooled devices.

Is it possible that somebody at DG has the distinction between logical and physical page size confused? Yep

At that time, I described a series of rules that should have been able to make any printer work properly with XLPT. Since that time, however, I've run into several situations where I just couldn't seem to get a particular printer to work with AOS[/VS] XLPT. But each time it happened, getting the printer to work wasn't the main business at hand, so I put off researching the problem until I could do a thorough job of it.

Well, last month, I spent a considerable amount of time getting my HP Laserjet series II printer to work with Wordperfect 4.2 (more about that in a future column). In the process, I discovered a couple of significant problems with the way that both XLPT and PMGR handle standard and nonstandard serial devices. By the time I finished researching the problem, I had an explanation for every bizarre problem I had encountered while configuring printers over the past few years.

Most of the problems started a few years back, somewhere around AOS/VS rev 4.00—although one of them appears to have been there since AOS rev 1.00. In retrospect, I can't explain why I didn't start having problems sooner.

Anyway, rather that just give you a summary of the tricks required to make any printer work, I'm going to give you a narrative of how they came about—just to make things more memorable for you.

Those of you who (1) are nontechnical, (2) can't wait, or (3) don't care, can just skip to the end of the column where the tricks are summarized in a :COOKBOOK section. The rest of you get a short trip through some XLPT and PMGR internals.

In order to simplify this discussion, I'm going to refer to the AGENT-LPMGR-PMGR-<ALPHA,CPI,IAC,IOP>RS team that actually does the I/O as "PMGR." The component that does the actual work isn't important for this discussion. I'm also going to restrict the discussion to "normal" text file printing; i.e., QPRINT options /BINARY/MAPPER=/PASSTHRU/8BIT aren't in effect for the job.

:XLPT_INNARDS

XLPT takes no action based on the specific characteristics of the device it's writing to, other than determining whether it's a data channel printer, a PMGR device, or "other" ("other" applies to anything else, like disk files, mag tapes, or @NULL) for the purposes of VFU simulation and determining the type of I/O to use. When you think about it, not taking the specific device characteristics into account makes sense: XLPT shouldn't know the specifics of the device; that's PMGR's job.

In order for XLPT to simulate a VFU, handle line truncation/folding, number pages, specify starting/ending pages, enforce page limiting, and report pages printed to syslog, it needs to keep track of the current page, line, and column numbers at all times. To do that, XLPT needs to know the *logical* page size. The logical page size is specified using the CX CPL and CX LPP commands (CX is shorthand for CONTROL @EXEC).

It's not enough simply to know the logical page size of the printer; XLPT must also know which characters cause paper motion, and what kind of motion they cause. By Divine Dispensation (i.e., it's hard coded), XLPT assumes the following.

- CR causes printing to occur and does not move the paper. The next character sent to the printer will replace or strike over (XLPT doesn't care which) the character in column 1.
- LF causes printing to occur and advances the paper to the next line. The next character sent to the printer will get printed in column 1 (i.e., LF implies LF + CR).
- FF causes printing to occur and advances the paper to the top of the next physical page. The next character sent to the printer will get printed in column 1

(i.e., FF implies FF + CR).

The assumed behavior for FF caused me to check the HP laser manual, and sure enough, I discovered that the default mode is CR = CR, LF = LF, and FF = FF. As a result, I amended my spooler binary cleanup file for the HP to include an <ESC>&k2G command to specify CR = CR, LF = LF + CR, and FF = FF + CR. Then I changed the default port characteristic to turn /NAS off. It's worth noting at this point that there is no available end-of-line termination option for the HP laser that matches what AOS/VS expects for devices with NAS turned on (CR = CR, LF = LF, FF = FF + CR).

For each line XLPT prepares for printing, it performs the following logic.

- Control characters whose effect on the page, line, and column counters is unknown are discarded.
- Trailing blanks are discarded.
- Horizontal tab simulation only takes place if a forms file has been specified (via CX FORMS or CX DEFAULTFORMS) that does not specify a tab table.
- Characters that would be printed beyond the last column are discarded unless the job specified /FOLDLONGLINES, in which case a LF is inserted after the character in column CPL.
- If the current line will be the first line on the logical page, three LFs are written first to act as skip-over-perf.
- If the current line will be the last line on the logical page, and the terminator is a LF, then XLPT replaces the terminator with FF.

That last item is important; it ensures that in case XLPT's logical page length is less than the device's physical page length, the LF terminator will not take the printer to the top of the next physical page.

In summary, XLPT always writes output lines so the last printable character doesn't occur beyond column CPL, and the terminator is always either a CR, LF, or FF.

:PMGR_INNARDS

Whenever a line of text is written to a port, PMGR edits the line according to the current characteristics. While it's editing the line, it scrupulously keeps track of the

Figure 1:
Disabling the ?SCHR command in XLPT

```
;BJ's unofficial XLPT.PR patch for all AOS/VS
;revs
;
;This patch should be applied after you apply
;any regular DG patch files for XLPT.PR.
;For example:
;
;  ) XEQ PATCH/I/T=:UTIL:XLPT.PR/P=
;        BJS_XLPT.PR_PAT
;
;Unofficial patch no. 1: Disable the ?SCHR
;command which XLPT uses to change the CPL
;and LPP values for serial ports.  Instead, you
;should use the CHARACTERISTICS/DEFAULT/
;CPL=m/LPP=n command to set the PHYSICAL
;page size of the printer and use the CONTROL
;@EXEC CPL and LPP commands to set the
;LOGICAL page size of the printer.
;
%PROGRAM
SCHR+3      [MOV# 0 0 SNR]      [NOP]
;
;End of patches
```

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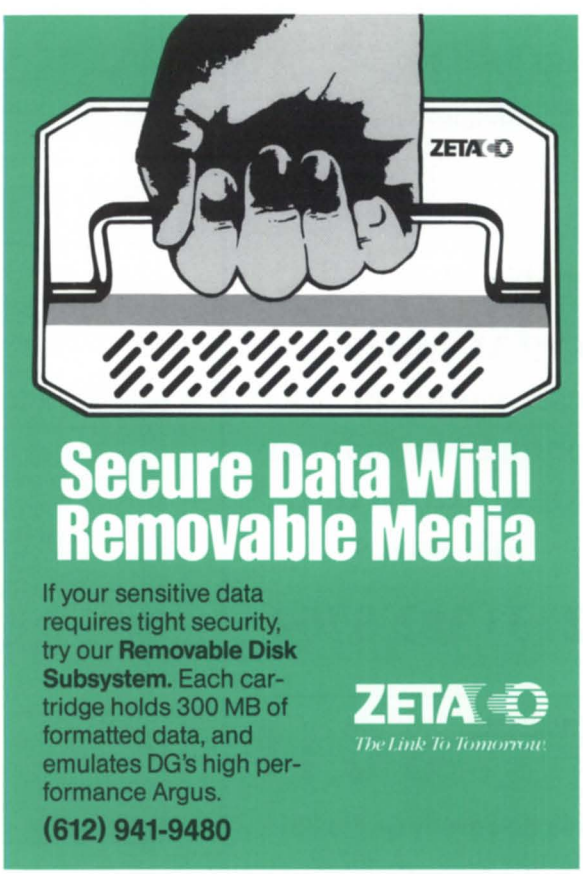

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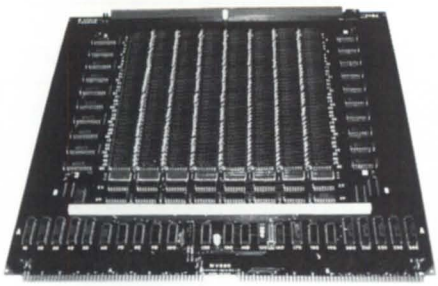

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current page, line, and column numbers for each character that will be sent to the printer.

The initial line editing consists of handling the EOL, ST, and UCO characteristics. After that, any remaining control

Figure 2: How XLPT/PMGR converts line terminators

Line ends with	NAS state	WRP state	last non-blank < CPL		last non-blank >= CPL	
			lineno≠LPP	lineno=LPP	lineno≠LPP	lineno=LPP
LF	off	off	LF	FF[1]	LF	LF[2] FF
	off	on	LF	FF[1]	none	FF
	on	off	CR LF	FF[1]	CR LF CR[3]	CR[4]LF[2]FF
	on	on	CR LF	FF[1]	CR	FF
CR	off	off	CR	CR[3]	LF CR	LF[2]CR[4]
	off	on	CR	CR[3]	CR	CR[3]
	on	off	CR	CR[3]	CR LF CR[3]	CR[3]LF[2]CR[4]
	on	on	CR	CR[3]	CR	CR[4]
FF	off	off	FF	FF	LF[5]FF	LF[2]FF
	off	on	FF	FF	FF	FF
	on	off	FF	FF	CR LF[6]FF	CR[4]LF[2]FF
	on	on	FF	FF	FF	FF

The LFs that are underlined are the problem characters. Note that all configurations where /WRP is off will produce an extra blank page when the last line on the page is exactly CPL columns long. Until this problem is fixed, it is impossible to properly configure a printer with /OFF/WRP!

1 From this, it's clear that XLPT/PMGR assumes that FF also returns the printhead to column 1 (i.e., FF implies FF+CR).
2 Error: This LF will advance the printer to physical line 1 on the next page, then the next FF will skip to the following page, resulting in an unwanted blank page.
3 This CR is redundant, but it's innocuous.
4 This CR is redundant, because FF implies FF+CR, but it's innocuous.
5 This LF is redundant, but it's innocuous.
6 This CR LF is redundant, but it's innocuous.

characters are discarded, other than the terminator, whose effect on the column and line counters is unknown.

Before finally writing the line to the port, PMGR may adjust the line terminator, depending on the length of the line, the value of the terminator character, and the WRP characteristic. To get a feel for how this works, let's take a look at writing a line on a terminal that uses LF instead of CR-LF when it moves to column 1 on the next row (typical of ANSI terminals or near-ANSI terminals like DG terminals).

Case 1: If the WRP characteristic is on, and the text is exactly CPL columns long, PMGR should remove the terminator, because the output of a character in column CPL will cause the terminal to wrap.

Case 2: If the WRP characteristic is on, and the text is longer than CPL columns, PMGR should take no special action, because the terminal itself will wrap the excess text onto the next row.

Case 3: If the WRP characteristic is off, and the text is exactly CPL columns long, PMGR should leave the terminator alone.

Case 4: If the WRP characteristic is off, and the text is longer than CPL columns, PMGR should insert a LF after the CPLth character.

Seems straightforward, doesn't it? It was. But now let's add some complications and see what happens.

What if the terminal uses non-ANSI standard line terminators? Simply replacing all LFs, including those inserted in case 4, with CR-LF should work.

What if the terminator is a CR or FF instead of a LF? No problem: the terminator should be used as is, and the page, line, and columns counters should be updated accordingly. So far, so good?

:PROBLEM_1

The first problem is subtle: PMGR assumes that a device with the /WRP characteristic wraps when a character is deposited in column CPL. This assumption is based on the behavior of drum and band printers with single-line print buffers that were popular when AOS was first designed. They would dump their buffer and reset their column counter to 1 as soon as a character was placed in the last buffer position (hence, the assumption that FF implies FF + CR).

Unfortunately, many newer printers (like the HP laser I was configuring) use a different wrapping scheme. They don't wrap until they receive a character that would require printing *beyond* the right margin. In other words, if the printer is 80 columns wide, and the line is 80 columns

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long, wrapping will only occur if the 81st character is not a CR, NL, or FF.

Well, that's not much of a problem. Why don't we just turn/WRP off for the device? I did, but I experienced problems whenever the last line on a page was exactly CPL columns wide: I got an extra blank page.

First, I assumed that I had the/NAS switch set incorrectly (it was off because of the problems with FF described earlier). So I changed the default /NAS port characteristic back to on and changed the HP back to its default of CR = CR, LF = LF, and FF = FF. Not having FF = FF + CR didn't worry me, because I knew that the next thing after an FF is always the three LFs used to produce the three-line skip-over-perf, and they would return the HP column counter to column 1. However, the printer still produced an extra page when the last line was exactly CPL columns wide. Rats!

Frustration was setting in. After all, I'm supposed to have all the answers, right?

Next, I tried turning on /WRP and setting the CPL to the physical right margin plus 1 (81 in this case), so that wrapping would never occur if I stuck to lines that were CPL minus 1 (80) or fewer columns wide. This time, there was limited success; no more extra blank page when the last line was 80 columns wide, but the hammer test patterns on the splash page (which are CPL, not CPL minus 1 columns wide) were missing the blank line that should have followed them. Not exactly a major disaster, but very tacky. And I hate tacky. Sleazy, yes. Tacky, no.

Then an idea struck me: how about setting the port CPL (physical) to 81 and the XLPT CPL (logical) to 80? That should solve the problem, right? Wrong. Same problem. It was just as if XLPT was using the logical CPL and LPP to set the physical CPL and LPP of the port.

:PROBLEM_2

In order to find out if XLPT was in fact erroneously setting the CPL and LPP values for the port, I patched XLPT to turn on system call logging and then started a queue against a new serial port and printed one job. Examination of the LOGCALLS output showed a ?SCHR system call in a routine called SCHR.

Is it possible that somebody at DG has the distinction between logical and physical page size confused? Yep.

My next step was to submit an STR and wait for the solution from DG, right? Half right. I submitted the STR and then immediately identified a patch to disable the ?SCHR command in XLPT. The patch is shown in Figure 1. I installed it, and all my problems disappeared, as long as I set XLPT's CPL to the physical page width and the port's CPL to the physical page width plus 1.

:NAGGING_CONCERN

Now that I had a solution to the /WRP problem, I started to go back over my original solution (/OFF/WRP) to find out where I went wrong. I couldn't come up with any explanation other than the possibility that there was a bug in the PMGR logic for handling /WRP. So I set up some test files with all the possible combinations of line length, terminators, and last line on the page. Then, to make abso-

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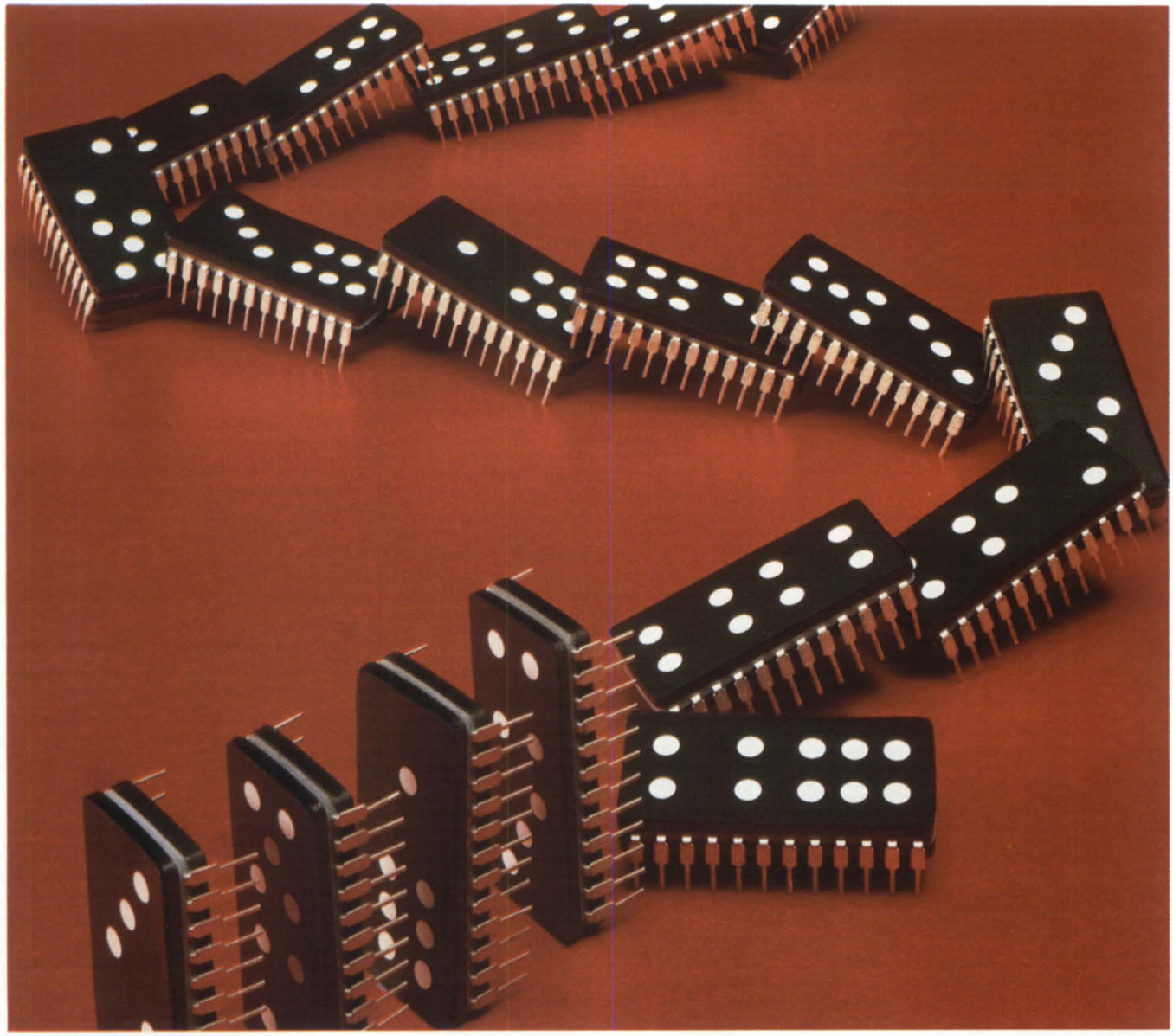

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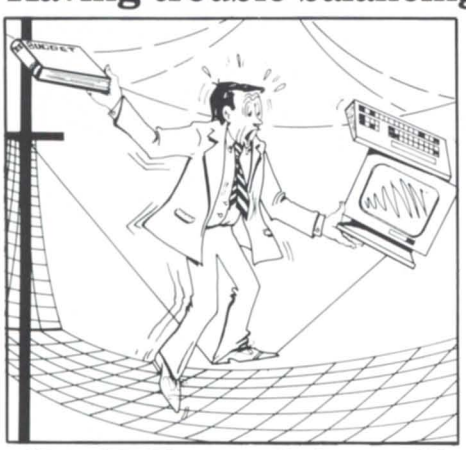

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lutely sure my results would be valid, I hooked up my trusty DG/One to a serial port to act as the printer. Then I fired up a terminal emulator package on the DG/One that was capable of displaying all incoming characters and capturing them to a disk file untouched. The results are summarized in Figure 2.

Lo and behold, PMGR mishandles any last line that is CPL columns wide (port CPL, not XLPT CPL, now that we've patched XLPT) if the port has /WRP turned on. PMGR inserts a LF when it shouldn't, causing the FF that follows to produce a blank page.

Luckily, the STR hadn't been mailed yet, so I ripped it open, amended it, and put it back in the outbox.

:RETROSPECTIVE

Looking back, I was puzzled when DG added the /NL switch on the CX START spooler command. I wondered why such a switch was needed when you could simply specify/NAS on the port. It was probably added by somebody who was going gray trying to get a printer configured to work properly and wasn't aware of the XLPT/PMGR problems.

:COOKBOOK

In order to make your serial printer work properly, you have to have /WRP turned on for the port, regardless of whether the printer wraps or not. This will not change until a rev of PMGR is released that handles /WRP correctly.

If your printer either doesn't wrap, or it wraps for the character *after* column CPL instead of *at* CPL (like most PC printers), then you must set the port CPL value to the physical printer width plus 1 (e.g., 81 for an 80-column printer, 133 for a 132-column printer, or 137 for a 136-column printer).

Finally, apply the XLPT patch shown in Figure 1.

No AOS research has been done, but one or both of the same problems may apply. Call me if you want to help research it. Δ

Copyright © 1988 by B.J. Inc. All rights reserved. *Brian Johnson is the president of B.J. Inc., a San Francisco-based consultancy specializing in system auditing, system management, and performance analysis. He can be reached at 109 Minna St., Suite 215, San Francisco, CA 94105; 415/550-1444, telex 296544.*

Shortcuts

Navigational aids to help you cruise through your directories

Since the subject of my last few columns has been assembly language, I thought I'd lighten up a bit this month (actually I am a bit burned out) and talk about some of the macros I use to navigate around my disk. Although they are simple, and many of you may have similar macros, perhaps they will be useful to someone getting started with AOS[/VS].

Directories

If you've ever played Adventure or Zork, you probably noticed that you don't always end up where you started if you move in one direction and then retrace your steps. Although this isn't usually the case with the CLI, sometimes it seems like it if you don't keep track of where you are. Since there are many ways of moving back and forth between directories (see Figure 1), it would be useful to have some navigational aids. But first, let's clarify a few terms.

The initial working directory (IWD) is the directory in which the current process was started, either by EXEC or you (PROCESS, XEQ). When you log on, the initial process is usually CLI.PR, and the IWD is usually :UDD:username, i.e., :UDD:GRANT. When you move into a (sub)directory and start up another program, the current directory becomes the IWD of that new program (unless you use PROCESS/DIRECTORY=name to specify another directory). To illustrate this, go into any subdirectory, start up SED, and use CLI or ctrl-F7 to start up a son of SED) process (I hope your privileges allow you two or three sons; if not, complain to your system manager). Now, either stay there or go into yet another directory (it doesn't matter) and issue a DIR/I command. Check your current directory with DIR. You will not be in :UDD:username; instead, you will be in the directory you were in when you started SED. It is the initial working directory of both SED and the current CLI, and remains a part of those processes. This redefinition of the IWD can be useful, as you will see later.

The previous directory is the directory at the previous [!LEVEL]. If you are still at level 0, it has no meaning, but if you PUSH and change directories, it is the name of the directory in which you were located before you PUSHed. It can be referenced by several CLI commands:

```
) DIRECTORY/P
) SEARCHLIST/P
) VAR3/P
```

as well as by several pseudo-macros:

```
) WRITE [!DIRECTORY/P]
) WRITE [!SEARCHLIST/P]
) WRITE [!VAR3/P]
```

The prompt

Many users (both novice and expert) set the PROMPT to issue one or two CLI commands to remind them of their environment:

```
) PROMPT DIRECTORY SEARCHLIST
```

Figure 1: Several ways to change directories

```
) DIR XXX            - go to subdirectory XXX

) DIR/I              - go to initial working directory
) DIR [!DIR/I]       - same as DIR/I
) DIR/I YYY          - go to the initial working directory and then down to
                       subdirectory YYY
) DIR [!DIR/I,YYY]   - same as DIR/I YYY

) DIR ^^             - go 2 levels up
) DIR ^^ZZZ          - go 2 levels up and then down to subdirectory ZZZ
) DIR/P              - go to directory at previous [!LEVEL] without POPping
) DIR [!DIR/P]       - same as DIR/P

) POP                - go to directory at previous [!LEVEL]
```

Figure 2: FDIR.CLI

```
comment—FDIR.CLI
[!equal,%1%,]
   write Arg 1 must be a directory name or template
[!else]
   push
   prompt pop
   directory/1=error/2=error [!filenames,+%1%+]
   string  [!asc,211,211,211,211,211,224]Directory[!asc,225]:[!asc,240][!efilename,[!directory]]
   prompt string
   TYPE/1=ignore/2=ignore NOTE
[!end]
```

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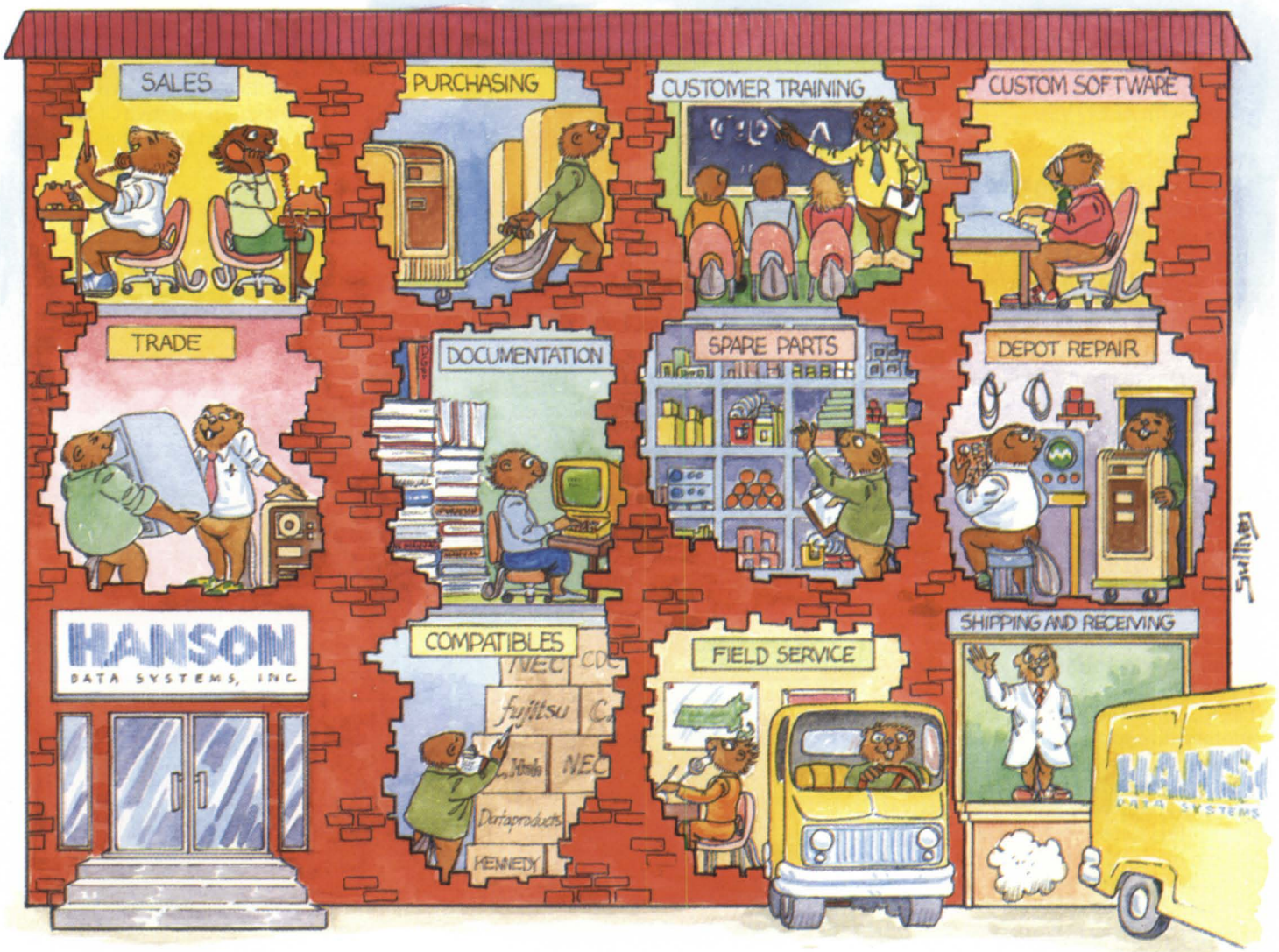

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A maximum of eight commands can be specified with PROMPT. This is more than sufficient, but it's rather limiting, because none of the commands can be specified with arguments or switches (admittedly a difficult parsing task). A more useful and generalized prompt facility would allow a CLI macro to be specified. Sigh, maybe someday.

FDIR.CLI

When I move around between directories, I want to be (1) able to return to the previous directory easily, (2) reminded of the current directory, and (3) able to use a template to specify the directory name. The first item can be handled easily by PUSHing first and then POPping to return. I can use PROMPT DIRECTORY to be reminded of the current directory, but it's rather messy: the name appears in my field of view and mixes with my CLI commands and the responses. Finally, I like to use long descriptive filenames and directory names. It might slow my system down a bit, but it sure is easy to find something when you want it. On the other hand, I don't want to enter 31-character directory names each time I use the DIRECTORY command.

> *I prefer lonnnnnngggg descriptive filenames for all of my application programs*

The FDIR.CLI macro (see Figure 2) accomplishes all of these tasks (you can name the macro anything you like; the "F" is for fast or fancy). All you need is a unique template or name to select your directory. If more than one name matches the supplied template, or if the name isn't a directory, then the /1=ERROR/2=ERROR switches ensure that the macro will fail, and PROMPT POP ensures that nothing has changed. On the other hand, if the DIRECTORY command succeeds, we have PUSHed and changed directories and can easily return to the starting point with POP. The prompt then changes from POP to STRING. While in the directory, the directory name appears on the right side of the screen, nicely underscored and out of the way of all of the action on the left side of the screen. If you would like to have a message appear on the screen every time you enter the directory (i.e., a reminder, warning, or list of things to do), then you can create a file called NOTE in the directory, and FDIR will TYPE it for you (if it exists). An alternative would be to have FDIR execute a macro called NOTE.CLI.

If you have the following directories and filenames at the current level:

```
TEST_DIRECTORY.DIR
FOO.PR
MY_NEW_PROGRAM.DIR
PROGRAM_MANUALS.DIR
```

then the following FDIR commands will succeed:

```
) FDIR EC—TEST_DIRECTORY.DIR
) FDIR NEW—MY_NEW_PROGRAM.DIR
) FDIR MAN—PROGRAM_MANUALS.DIR
```


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but these will fail:

```
) FDIR DIR—+DIR+ matches three names
) FDIR FOO—FOO.PR is not a directory
) FDIR PROG—matches two directories
```

COPY or MOVE or . . . ?

Now let's make use of the redefinition of the initial working directory. Suppose you want to copy a file from one directory to another. The first thing you might think of is COPY:

```
) COPY XXX.DIR:FOO FOO—from here to there
) COPY FOO XXX.DIR:FOO—from there to here
) COPY ZZZ.DIR:FOO ABC.DIR:FOO—from there to there.
```

All of these COPY examples have two things in common: (1) you can't use filename templates and (2) the commands are tedious to enter (even if you use < > parentheses). The MOVE command is better, and it accomplishes the same thing as COPY, since it makes a copy and really doesn't move the file(s). (Note: a file that has a user data area [(UDA)] can't be copied, so use MOVE instead.) MOVE allows you to use templates for the file(s) to be moved; however, you still can't use a template for the directory, and you can't MOVE a file from another directory to the current directory (there to here). This means that you have to go there and move the files back to your original directory, which can be awkward. However, a trick and a simple macro can allow you to MOVE or COPY files, and you *never* have to specify a directory name, and you can *always* use a template for the files to be moved! If that didn't sink in, reread the last sentence to appreciate just how nice it is.

Figure 3: MOVE

```
comment—MOVEI.CLI
move/v/buffersize=8192%0/% [!directory/i] %1-%

comment—MOVEP.CLI
move/v/buffersize=8192%0/% [!directory/p] %1-%
```

First, create a MOVEI.CLI and MOVEP.CLI macro (see Figure 3). I hard coded the /V switch, because I don't see the point in using the MOVE command without confirmation. The /BUFFERSIZE=8192 switch isn't necessary, but it also seems like a good idea. Now, to MOVE files (+.F77, for example) from directory SOURCE to directory DESTINATION, you can use either MOVEP.CLI:

```
) DIR DESTINATION
) PUSH
) DIR ^SOURCE
) MOVEP +.F77—[!DIR/P] is 'DESTINATION'
) POP
```

or you can use MOVEI.CLI:

```
) DIR DESTINATION
) X CLI
) DIR ^SOURCE
) MOVEI +.F77—[!DIR/I] is 'DESTINATION'
) BYE
```

In both cases, you end up back in DESTINATION with the required files. Slick, huh? In practice, I rarely use MOVEP.CLI,

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menuOP

```
Jan 28, 1988          Main Menu          5:56:29 PM
0)...about menuOP (tutorial)
1) CEO (Data General's CEO)
2) Library (WordPerfect's Shell)
3) File Crypt (data encryption)
4) PIPELINE (async mail delivery)
                                    Option Id: 0
(F11=Exit /Cancel)    (SF1=Help)
```

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because I can never be sure of the current value of [!DIRECTORY/P] without issuing a WRITE [!DIR/P] or PREVIOUS command first. The uncertainty is caused by my continual use of my FDIR.CLI macro to move around in my directories. Each time it is used, it PUSHes to a higher [!LEVEL] and changes directories. With MOVEI.CLI, I can go anywhere using any macros I want without disturbing the value of [!DIR/I]. I can retrace my steps with multiple POP commands, or I can use an UNWIND.CLI macro that recursively POPs until level 0:

```
comment—UNWIND.CLI
pop/1=error/2=error/l=@null
%0%
```

The MOVEI.CLI macro is also useful when editing source files. If I am in SED (or SPEED), I can start up a son of SED) CLI process that has the current directory as the initial working directory. Then I can go anywhere on the disk and MOVE files back to that directory with MOVEI.CLI. I never have to return home manually, because a simple BYE to the CLI returns me to SED, where I can issue the APPEND FROM command to read in the copy of the file that now resides in the current directory.

Figure 4: FSED.CLI

```
comment—FSED.CLI
[!equal,%1%,]
   write %0\% requires a directory name or template
[!else]
   push; prompt pop
   string %1%\+.ed\+.sc\+.s2\+.tm\+.ob\+.pr\+.dir
   [!equal,([!file,[!string]]),( )]
         write no files match [!string]
   [!else]
         write files are: [!filenames,[!string]]
         x SED%0/% ([!file,[!string]])
   [!end]
   pop
[!end]
```

More shortcuts

FDIR.CLI allows you to use long, meaningful names for directories, without requiring you to enter those names in full. The technique can be extended to other CLI commands as well. Suppose you are working on program THIS_IS_MY_NEW_PROGRAM.PR in a directory. In addition to the +.F77 source files, there may be MAKE_THIS_IS_MY_NEW_PROGRAM. CLI (compile and link) and LINK_THIS_IS_MY_NEW_PROGRAM.CLI (link only) macros. Why such long names? Well, in the event that you get run over by a truck, and the program needs to be rebuilt, it will be obvious to your colleagues which macros are required to rebuild the program. The macros of course will contain not only all of the required switches and arguments, but comments as well. Although these macro names are self-documenting, they are far too long to enter during the program development cycle.

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All you need is a MAKE.CLI and LINK.CLI macro (in your :UTIL or :MACROS directory):

```
macro MAKE.CLI:
([!filenames,MAKE_+.CLI])%0/% %1-%

macro LINK.CLI:
([!filenames,LINK_+.CLI])%0/% %1-%
```

Then, no matter what the name of the MAKE_+.CLI or LINK_+.CLI file is, all you have to enter is MAKE or LINK. Of course, this assumes that there is only one MAKE+.CLI or LINK+.CLI macro in the current directory. This isn't a restriction, since each directory should really only contain the files (source, macros, documentation, etc.) for a single program.

A more general macro called CLI.CLI will invoke every +.CLI macro in the current directory:

```
macro CLI.CLI:
([!filenames,+.CLI])%0/% %1-%
```

I prefer lonnnnnngggg descriptive filenames for all of my application programs. Short names can be very confusing, especially if there are a few hundred applications on the system. If the names are long, then the users can do a FILESTATUS on the directory in which they reside to get a list of all of the +.PR files. With long filenames, it is then relatively easy to select the required program to execute. On the other hand, during the compile-link-test cycle, I certainly don't want to say XEQ THIS_IS_MY_NEW_PROGRAM every time I test it. The XPR.CLI macro takes care of that too, executing every +.PR file in the current directory (usually just one .PR file):

```
macro XPR.CLI:
X ([!FILENAMES,+.PR])%0/% %1-%
```

FSED.CLI

Finally, here's another useful macro in which templates can be used instead of the complete filename. Don't you wish SED or SPEED would accept filename templates, so you could use:

```
) SED +.F77
```

instead of:

```
) SED ([!FILE,+.F77])
```

Such a feature would consume less system resources and speed up the editing task, because only one PROCESS is created. The SED command BYE YES CONTINUE isn't good enough, because each filename must be entered manually, and templates still can't be used. Most users on our system rarely use the standard SED.CLI macro, preferring FSED.CLI (see Figure 4) instead. It accepts a filename template for two reasons: either there are multiple files to edit, or more commonly, the template is simply a convenient (lazy) way of specifying a single file (as in FDIR.CLI). Note that FSED also excludes various uneditable files. Δ

John A. Grant is a geophysicist with the Geological Survey of Canada, where he manages the Exploration Geophysics Subdivision's MV/4000. He may be contacted at 601 Booth St., Room 591, Ottawa, Ontario K1A 0E8; 613/992-1082.

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Elegant Present-ations

Advanced Present techniques to help you—no ifs about it

I was pleased with the number of responses from readers about the "Present Perfect" article in the March 1988 issue of *Focus*. Apparently, quite a few Present users are interested in using the product more effectively, and many of you want to know more about the advanced techniques I mentioned. By popular demand, I'll share a few of those goodies that help present your data more elegantly.

Used creatively, the Present syntax can support valuable advanced reporting techniques. This article describes three Present macros that will (1) produce multi-year, smooth graphs, (2) select one or all records from a single macro, and (3) invent a Present "if" statement. The data source used for these macros is a data table created from CEO's Decision Base, shown in Figure 1.

Figure 1: Decision Base data table

	Year	Month	Day	Amt	Code	Flag
1	86	2	1	100	A	Y
2	86	6	9	530	B	Y
3	86	11	1	1,060	B	N
4	86	12	31	1,295	B	N
5	87	1	1	1,300	C	N
6	87	1	30	1,395	X	N
7	87	9	15	2,150	A	N
8	88	1	4	2,610	B	N

Multi-year, smooth graph

An attractive, easy-to-understand format for displaying data is the time-line graph in which numerical data is plotted in relation to elapsed time. To produce such a graph, many people would try an approach similar to the following:

```
PLOT SUM(AMT) VS FILE_DATE SMOOTH
COMPUTE FILE_DATE = (YEAR * 10000) +
    (MONTH * 100) + DAY
```

This COMPUTE statement stores the

Figure 2: Independent axis with single-variable name

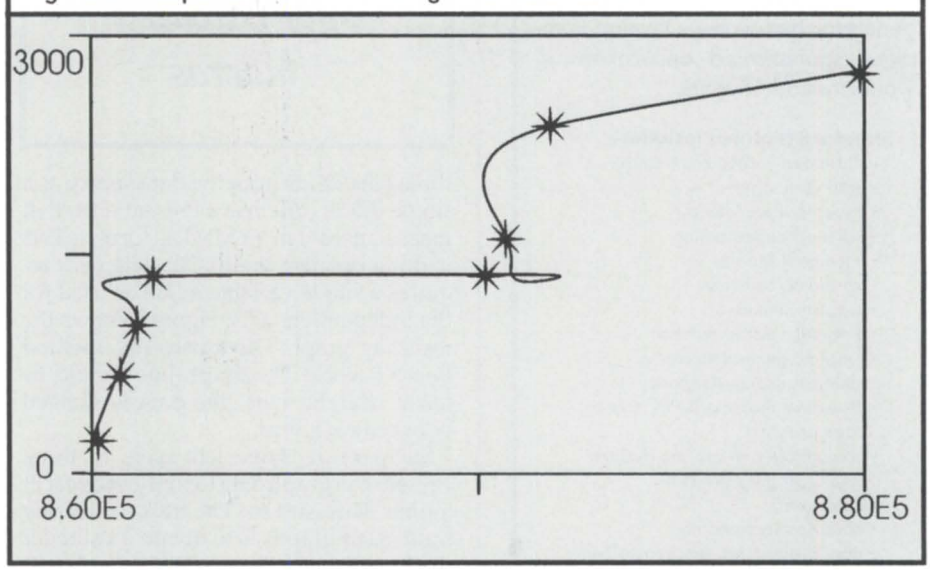
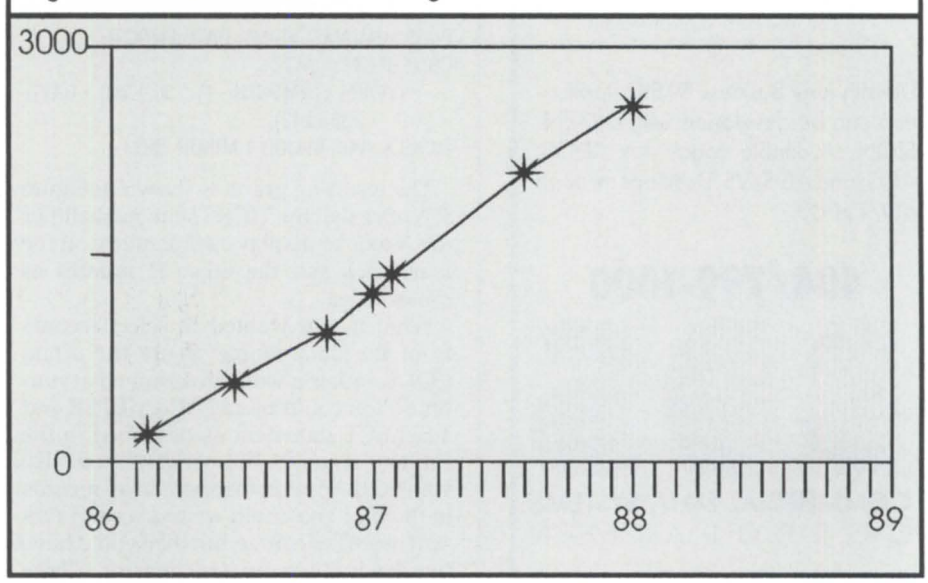


Figure 3: Three fields stored as single ditem



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The Present "if" statement exists after all! You don't have to wish for a future revision to allow you to write these sophisticated macros

three date fields from the data source as a single ditem (ditem is a Present term that means "field") in YYMMDD format. This is done because the PLOT statement requires a single variable name be used for the independent axis. Figure 2 shows the resulting graph. Obviously, this method doesn't work! The graph line should be fairly straight; here, the data is skewed between each year.

Such results have led users to think Present can graph data for only one year at a time. This isn't so. The trick to creating multi-year graphs is to obtain a value for the X-axis that will separate December 31 and January 1 by one plotting point. The COMPUTE statement in the following macro does just that:

```
PLOT SUM(AMT) VS MY_DATE SMOOTH
COMPUTE MY_DATE =
      (YEAR + ((((MONTH - 1) * 30.4368) + DAY))
            /365.242)
TICKS X_AXIS MAJOR 1 MINOR .0833
```

The resulting graph is shown in Figure 3. Notice that the TICKS statement allows the X-axis to display each January on the major tick and the other 11 months as minor ticks.

What if you wanted to select records from the data source where the ditem CODE equals a value determined at runtime? You could use a PARAMETER and a SELECT statement as described in the Present manual. But what if you also wanted the option to report on all records in the file? You could write a second Present macro, of course, but then you'd have two basically redundant macros. These capabilities can be combined into one Present macro as follows:

```
PARAMETER
      @I_CODE DISPLAY "Select what code value
            (NL for all):"
      LITERAL LENGTH 3 DEFAULT " "
COMPUTE COMP_CODE = SUBSTR(@I_CODE,1,1)
SELECT (CODE = @I_CODE) OR (COMP_CODE
      = "  ")
REPORT CODE AMT
```

This macro prompts you with "Select what code value (NL for all):" You can then either enter the desired code value or just press NEWLINE to select all records. Also, notice the COMPUTE statement above. A good rule of thumb to follow whenever you create an alphanumeric field with a COMPUTE statement is to use the SUBSTR function, so you have control of the length of the computed field. This macro's capability can be highly useful. You can now choose whether to view one fiscal quarter or the entire year, one department or the entire company, one employee or the entire staff . . . . You get the idea. You can also do the same trick for numeric fields. Using MONTH as the selection field, here is the macro to select on one or all years:

```
PARAMETER
      @I_YEAR DISPLAY "Select YEAR (NL for
            all):"
      LITERAL LENGTH 2 PREFIX "0" DEFAULT " "
COMPUTE COMP_YEAR = @I_YEAR
SELECT (YEAR = @I_YEAR) OR (COMP_YEAR =
      0)
REPORT YEAR MONTH DAY AMT
```

If statement

And now for the infamous Present "if" statement. You say you can't find the "if" statement in the Present manual? Don't look any further: it isn't there. Can Present perform an "if" statement functionality? Does a wild bear walk in the woods? The following pseudo-code describes the "if" statement functionality that will be emulated with Present.

```
      READ THE-FILE FIRST.
ANOTHER-ITERATION.
      IF FLAG = "Y"
            ADD AMT TO TOTAL-Y
      ELSE
            ADD AMT TO TOTAL-N.
      READ THE-FILE NEXT.
      IF END-OF-FILE
            DISPLAY "SUM(Y)=" TOTAL-Y
                  " SUM(N)=" TOTAL-N
            STOP RUN
```

```
ELSE
   GO TO ANOTHER-ITERATION.
```

The Present macro used to accomplish this task is concise:

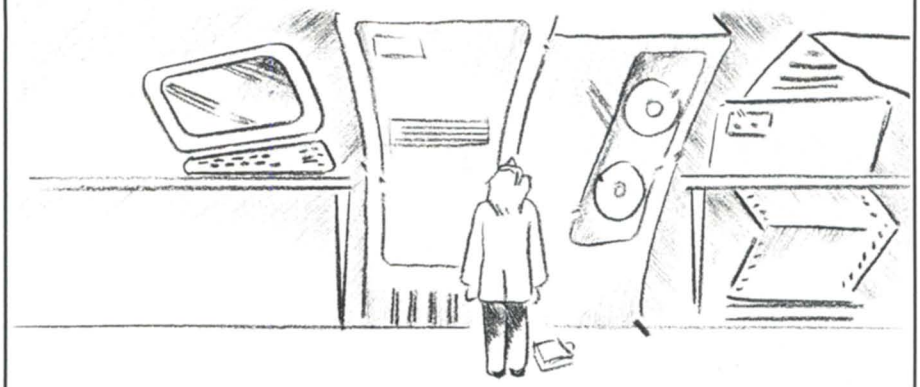
```
COMPUTE Y_MULT =
ABS(INDEX("0",CHAR(INDEX("Y",FLAG)))-1)
COMPUTE N_MULT =
ABS(INDEX("0",CHAR(INDEX("N",FLAG)))-1)
COMPUTE Y_AMT  = AMT * Y_MULT
COMPUTE N_AMT  = AMT * N_MULT
TOTAL "SUM(Y)=" SUM(Y_AMT) PIC Z(9)
"SUM(N)=" SUM(N_AMT) PIC Z(9)
```

To understand how this macro works, look at the first record of the data source. Notice the FLAG = "Y." Now work your way through the COMPUTE statements in the macro. Remember, every Present COMPUTE statement actually appends a field to the end of each record of the projection file. When FLAG = "Y," Y_MULT will have the value of 1, and N_MULT will have the value of 0. Therefore, Y_AMT will have the value of AMT, and N_AMT will be equal to 0. The converse is true when FLAG = "N." Y_AMT will equal 0, and N_AMT will have the value of AMT. Therefore, the sum of all Y_AMTs will provide the total of all AMT fields when FLAG = "Y," and SUM(N_AMT) will be the total of all AMTs that have the value of "N."

Even if you don't understand the mechanics of the above COMPUTE statements, at least you know that this functionality is available. You can modify the statements to fit your requirements.The fundamentals remain the same.

So the Present "if" statement exists after all! You don't have to wish for a future revision to allow you to write these sophisticated macros. I know from experience that all the techniques explained here are valuable. Similar macros are currently being used in live applications from coast to coast. I'd like to thank supreme Present guru Tim Redmond, who helped devise some of these techniques. If you can think of other Present challenges, just drop me a line. If I can't figure out a way to do it, I'll call Tim. If Tim can't figure it out, well, there are always future revisions. Δ

Kim L. Medlin heads special projects for the Commercial Software Development Group of Data General's Software Products and Services Division. He can be reached at Data General, 3617 Parkway Ln., Norcross, GA 30092; 404/448-6072 ext. 2007.



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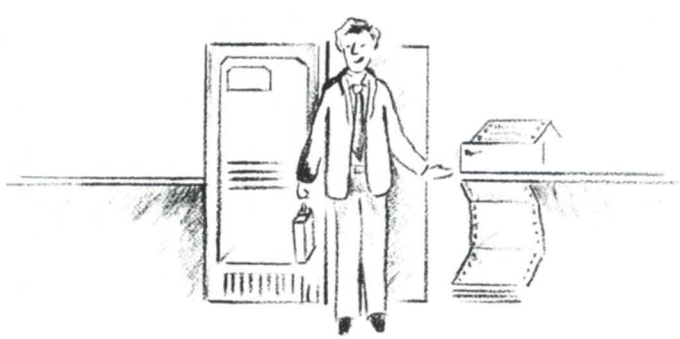

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Start simple

A no-sweat introduction to the benefits of PC-to-DG integration

Have you been thinking about PC integration but been turned off by the high cost and complexity? Are LAN-based products overkill for your needs? Instead of talking about glamorous high-tech solutions, I'm going to spend the next few columns discussing a variety of low-cost approaches to PC-to-DG integration.

Local area networks are expensive and sometimes complex. A LAN salesperson will gladly supply all sorts of facts and figures to demonstrate the potential gains in productivity, life cycle, cost of ownership, and return on investment, but you know darn well, you'll eventually be asked for a check.

While most of the recent high-visibility PC-integration products are based on local area network technologies, there are simpler and less expensive ways to get started. The one technology available to all DG minicomputer users is the asynchronous serial interface, or just "asynch." Your CRT terminals are connected to your minicomputer by asynch, for example. While 9600 baud (or even 19,200) is far from Ethernet's 10 million baud (bits per second), not every application needs the high speed of a local area network.

Let's examine a class of applications for which asynch technology is totally adequate, and then let's find products available to implement those applications.

Figure 1: Asynch resources

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ZSTEM (D100/D200/D400)
KEA Systems
2150 W. Broadway
Suite 412
Vancouver, B.C.
Canada V6K 4L9
604/732-7411

Smarterm 400 (D400)
Persoft
465 Science Dr.
Madison, WI 53711
608/273-6000

Softerm (D200/D410 and others)
Softronics
7899 Lexington Dr.
Suite 210
Colorado Springs, CO 80918
303/593-9540

Commercial file transfer products

MATE
Concept Automation
1319 Moran Rd.
Sterling, VA 22170
703/450-6000

Blast
Communications Research Group
5615 Corporate Blvd.
Baton Rouge, LA 70808
504/923-0888

Bulletin boards

:SYSMGR (TEX, Kermit)
415/391-6531
1200 baud

RDS/NADGUG (TEX)
415/924-3652
300 to 9600 baud

Terminal emulation

The most obvious use of asynch technology in PC integration is the terminal emulator. It's no surprise that you can use a PC or PC-compatible as a DG terminal, and while this may not seem very fancy, emulation is the first step toward a more sophisticated philosophy of PC integration. If nothing else, you should never buy another CRT terminal if you can help it. For only a few dollars more, you can have an MS-DOS workstation that can double as a terminal with substantially more capabilities for the future .

Terminal emulators cost between $50 and $250, so no matter which one you choose, it won't cost you much. However, there are major differences among the products. For example, if you need to emulate a D470 color terminal, Emu from Rhintek is the only one to consider. Need one that can be instantly activated via a hot key? Check out RDS's Popterm.

Evaluation of emulators is worthy of an entire column, and Tim Boyer has already covered many of the popular emulators in his "Inside ICOBOL" column in the February 1987 issue. However, some of these products have changed since then, and either Tim or I will bring you up to date in the near future. A list of many popular emulators appears in Figure 1.

File transfer

Now you've made the first step. Those PCs are serving double duty as CRT terminals, and you still haven't spent a dime on newfangled hardware. What's next?

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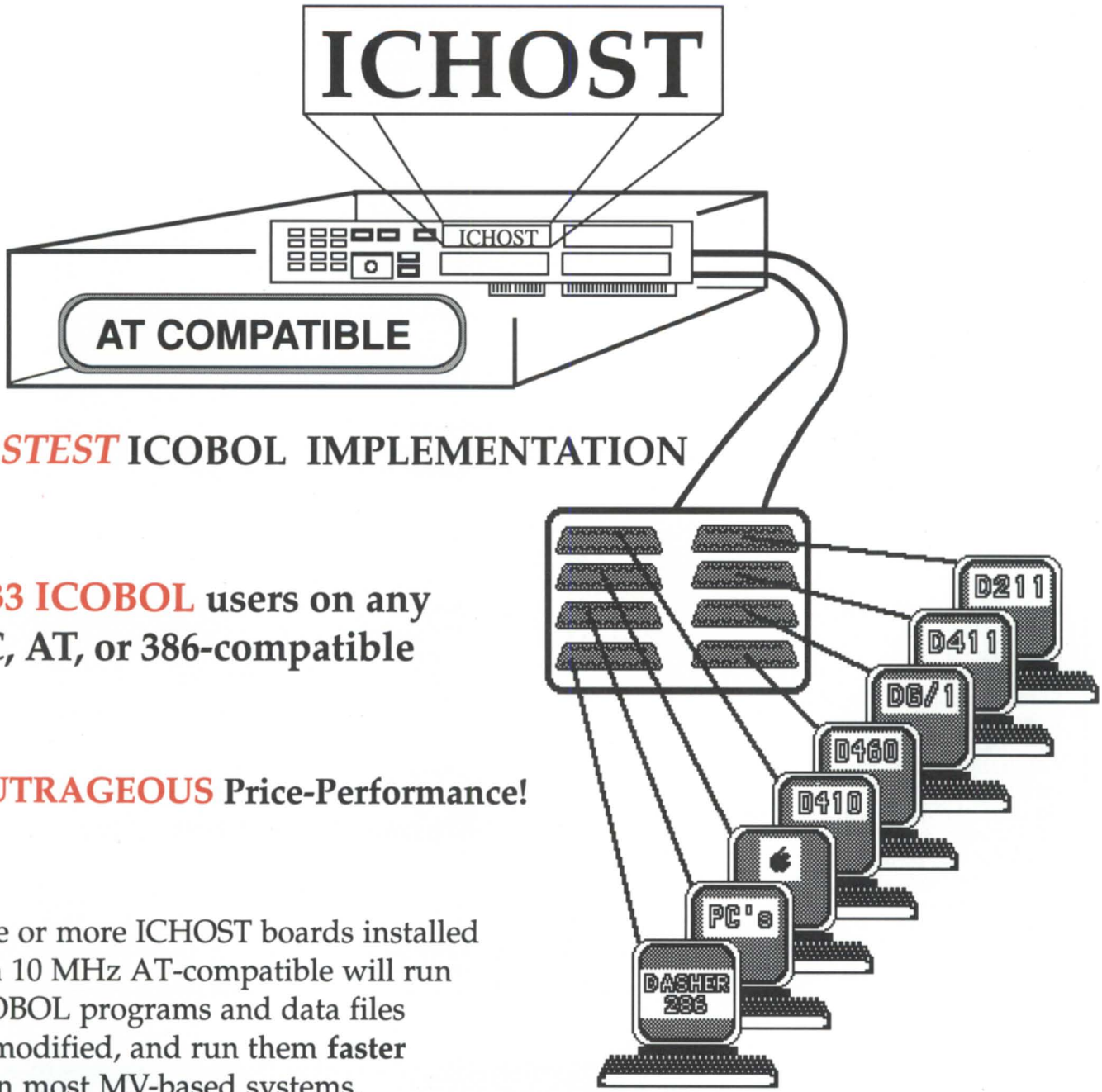

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Long Beach, CA 90808
(213) 425-2836

OR

Threshold, Inc.
165 East Magnolia
Auburn, AL 36830
(205) 821-0075

Circle 43 on reader service card.

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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 **415/924-3652**
OIS (to get an OIS ID and password, contact a DG field engineering telemarketing representative) **800/325-3065**
In Massachusetts **800/952-4300**
In Canada **416/823-7830**

NADGUG membership, address changes
NADGUG staff **617/898-4067**

Editorial questions, comments, article suggestions
Greg Farman or Carolyn Kelly (please send product announcement to the address listed below) **512/345-5316**

Information about advertising in FOCUS
Sharon Dennis **512/345-5316**

Back issues of FOCUS
Turnkey Publishing staff **512/345-5316**

Addresses:

NADGUG staff
c/o Data General Corporation, MS C-228
3400 Computer Drive, Westboro, MA 01580

FOCUS Magazine
c/o Turnkey Publishing, Stillhouse Canyon Office Park, 4807 Spicewood Springs Road, Suite 3150, Austin, Texas 78759

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To get more information about products and services that were advertised or listed in the Product Spotlight section of this month's **Focus**, just circle the appropriate reader service numbers. Use the adjacent Advertiser Index and Editorial Index for easy reference. Detach and mail today for fast, free information!

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1	13	25	37	49	61	73	85	97	109	121	133
2	14	26	38	50	62	74	86	98	110	122	134
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July 1988

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3	15	27	39	51	63	75	87	99	111	123	135
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9	21	33	45	57	69	81	93	105	117	129	141
10	22	34	46	58	70	82	94	106	118	130	142
11	23	35	47	59	71	83	95	107	119	131	143
12	24	36	48	60	72	84	96	108	120	132	144

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By now ***Conference '88*** *registration packet should be in your hands. If you can't find it, or have other questions, contact the NADGUG staff at 617/898-4078.*

Where Great Ideas Begin

Conference 88

"The single most valuable benefit is the contacts—the association with other users who work in similar environments."

— *Leryl Cash*
Chicago Area Date General
Users Group Member
National Can Corporation

To find out about the regional interest group in your area or a special interest group for your particular interest, circle reader service #62 in this issue. For further information on the Chicago Area Data General Users Group, contact Art Lewandowski at 312/530-5351.

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Circle 51 on reader service card.

Most terminal emulators support a rudimentary form of file transfer called "text capture." As data is sent from the minicomputer to the terminal (or PC, in this case), the data is displayed on the screen and simultaneously written to an MS-DOS disk file. Similarly, "file transmit" features allow the PC user to create a text file off line, then send the file to the remote system as if the user was typing at a very high speed. While text capture and file transmission are very handy, these facilities are limited: you can't send or receive anything other than text files. Binary data, such as programs or spreadsheets, cannot realistically be transferred in this way. In addition, text capture and file transmission don't provide any error-checking or correction capabilities. If you capture a text file and drop a character or two, you'll still be able to read the text, but if even one bit in a program is transferred incorrectly, the program is useless—perhaps even dangerous. For this reason, the next step in asynch PC integration is reliable file transfer.

I think you can now find an implementation of XMODEM, YMODEM, or Kermit for any computer with a file worth transferring

Things happen sooner (and faster) in the world of PCs than in the minicomputer world. PC-based bulletin board systems (BBS) have become commonplace in the past six or seven years because of the availability of shareware or public domain software that can be downloaded via modem. Obviously, a reliable protocol is required to upload and download these programs, and the XMODEM and Kermit families of protocols are now common in the PC world. Brian Johnson wrote a good column describing the differences between many of the asynch protocols in his "System Manager's Log" in the December 1987 issue of *Focus*. B.J. has implemented XMODEM, YMODEM (an XMODEM derivative), and Kermit on his :SYSMGR bulletin board. The :SYSMGR BBS has the following available for download: Phil Julian's AOS/VS implementation of Kermit, David Down's TEX (a popular combination of emulation and XMODEM), and XMODEM and Kermit for MS-DOS.

In researching this column, I heard a lot of praise for David's TEX, especially as a replacement for DG's DG/Gate product. And the price is right too: TEX is licensed as shareware for only $45. TEX is also available to be downloaded from the RDS/NADGUG BBS. Of course, there's a catch: you'll need a transfer program in order to transfer the transfer programs. There are two ways to do this: David has developed an XMODEM bootstrap program that allows you to download the full TEX program, or you can get the entire package on the NADGUG software library tape from Randy Berndt (details on page 78).

MATE is a new product on the market from Concept Automation. I haven't had a chance to study it in any detail, but it appears to be roughly equivalent to TEX, i.e., it's an AOS/VS program that supports pass-through emulation and XMODEM file transfers. If you want more information, you can call them at 703/450-6000.

Blast, from Communications Research Group, is the best known commercial asynch file transfer utility for DG users, but its protocols are proprietary; you can only talk to other computers running Blast. However, the Blast protocols are also used by Data General as a component part of their DG/Gate and CEO Connection products. Although Blast used to have the advantage of running on a wide variety of computers, I think you can now find an implementation of XMODEM, YMODEM, or Kermit for any computer with a file worth transferring.

The next step

This month, I've covered the first two levels of PC integration: terminal emulation and simple file transfer. Next month, I'll discuss more highly integrated asynch-based file transfer products, such as CEO Connection and PC/Remote. Δ

Doug Kaye is president of Rational Data Systems, 5725 Paradise Dr., Corte Madera, CA 94925; 415/924-0840.

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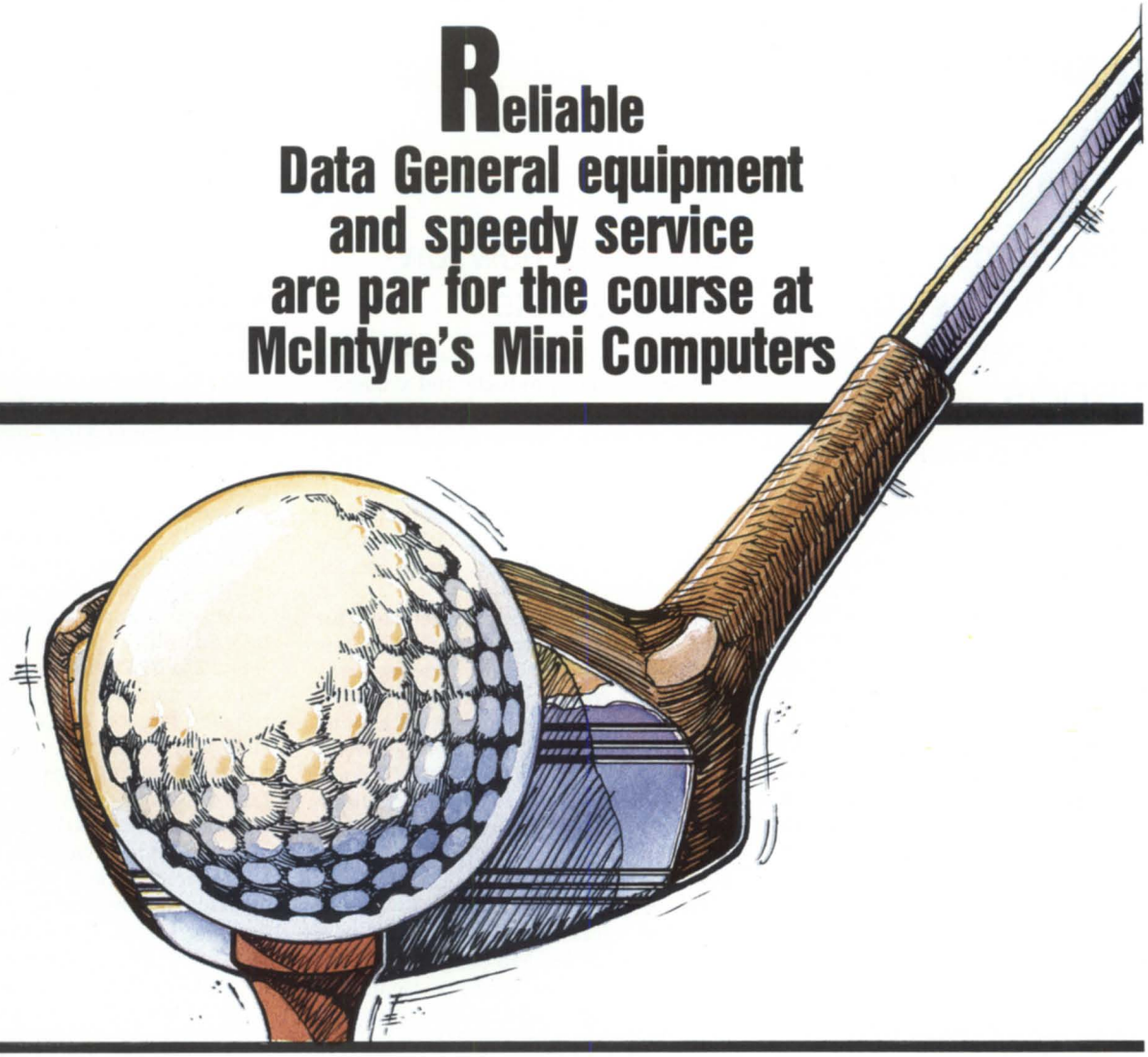

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Circle 41 on reader service card.

DG introduces new 16-bit system and new rev of DG/RDOS

Westboro—Data General has announced the new DG/500 computer, a 16-bit, entry-level, multiuser system housed in a PC-style chassis that can be removed for a system upgrade or maintenance. The new system reduces configured system costs by up to 30 percent for many DG/RDOS users. Pricing for the DG/500 starts at $4,995, for a base system that includes a single integrated system board with a micro Eclipse CPU, 512 KB RAM, 10 asynchronous ports, and a parrallel printer port. Other base system features include a 20 MB Winchester disk, single 5¼-inch 368 KB diskette drive, DG/RDOS operating system right-to-use, system microcode, and a one-year hardware warranty.

Additionally, DG announced the latest revision of its Real-time Disk Operating System, DG/RDOS 2.2. The DG/500 is fully supported by the latest revision of DG's RDOS 2.2, ensuring software compatibility for most Desktop Generation DG/RDOS applications. DG/RDOS is also supported on the MV/1400 DC and MV/2000 DC systems.

The 16-bit micro Eclipse CPU has a cycle time of 380 nanoseconds, and the system bus can transfer data at a rate of 5 MB per second. Options available include the following:

- a single expansion memory board with either .5 MB, 1 MB, or 1.5 MB for a maximum of 2 MB of parity-checked RAM
- an eight-port expansion asynchronous controller
- as many as four internal mass storage devices supported: a second 368 KB diskette drive or a 21 MB cartridge tape drive and controller, and a range of Winchester disks with a maximum system capacity of up to 160 MB.

A system with a single 368 KB diskette, 44 MB disk, 21 MB cartridge tape, and 1 MB memory sells for $8,500. A DG/500 with a 368 KB diskette, 160 MB disk, 21 MB cartridge tape, 2 MB memory, and 18 asynchronous lines sells for $16,100. A one-year, mail-in warranty service is offered. Δ

Circle 71 on reader service card.

DG offers new low-end products

Westboro—Data General has announced a range of new products and enhancements for the 32-bit MV series computers. These announcements include a free-standing disk and tape unit, a 130 MB standalone cartridge tape drive, expanded asynchronous connection capabilities for the MV/1400 DC and MV/2000 DC, and an 8 MB expansion memory board for the MV/1400 DC.

The **Combined Storage Subsystem for Departmental Computers** (CSS/DC) is designed for low-end MV series systems using DG's AOS/VS operating system. It consists of a freestanding pedestal cabinet that combines a 234 MB, 5¼-inch Winchester disk drive, and a 130 MB read-after-write, streaming/start-stop cartridge tape drive. The CSS/DC can accommodate a maximum of four peripherals, and is also available with the 130 MB tape drive.

The CSS/DC increases the MV/1400 DC's total disk capacity to 1.1 GB (with four disk drives) or 862 MB (with three disks and a 130 MB tape). This increase in disk and backup tape capacity, in conjunction with the increase of the MV/1400 DC's memory maximum to 12 MB, enhances its role as a file server in a large department.

Since the CSS/DC mass storage peripherals are shared with the previously announced Combined Storage Subsystem designed for the mid-range to high-end MV computers, common mass storage components are extended across the MV product line.

Also announced was a standalone version of the **130 MB cartridge tape drive**. The 130 MB, .5-inch cartridge tape drive subsystem now spans the MV product line from the MV/1400 DC to the MV/20000. The subsystem features a cartridge tape drive housed in a freestanding tabletop module.

DG also announced expanded asynchronous connection capabilities for the MV/1400 DC and the MV/2000 DC, and additional memory for the MV/1400 DC. These enhancements allow users to configure low-end systems for higher user counts. The same **12-line (RS232/RS422) intelligent asynchronous controller** available for the MV/2000 DC can be configured on the MV/1400 DC. This allows for a 50 percent increase (from 8 to 12) in the number of terminals that may be connected. In addition, the distributed intelligence of the asynchronous controller allows greater throughput in applications such as data acquisition. The **8 MB expansion memory** option board increases maximum memory to 12 MB for the MV/1400 DC, allowing the system to handle larger and more complex applications, such as those making heavy use of communications.

A new local bus **32-line asynchronous controller** for asynchronous serial devices is available for the MV/2000 DC as a single half-height option board. The single 7-inch by 15-inch board provides 33 percent more connections than two 7-inch by 15-inch boards did previously.

The **234 MB Winchester disk** has a 30 ms average seek time, and a maximum transfer rate of 1.5 MB per second in streaming mode. The 130 MB, high-performance cartridge tape drive has a sustained data transfer rate of 98 KB per second (on MV/1400 DC and MV/2000 DC systems) and provides six times the storage capacity of the 21 MB drive previously available on low-end systems.

The price of the Combined Storage Subsystem/DC configurations begins at $11,000. The standalone 130 MB tape drive is priced at $5,500. The price of the add-on, 234 MB Winchester disk is $7,200. The 32-line asynchronous card is $6,000, and the 12-line asynchronous card is $2,250. The 8 MB expansion memory is $5,500.

The disk/tape Combined Storage Subsystem/DC and the 130 MB standalone tape drive are available 30 days after receipt of order. All mass storage devices include a one-year warranty, as does the 32-line asynchronous controller and all MV/1400 DC and MV/2000 DC expansion memory. Δ

Circle 72 on reader service card.

Le Software Man announces rev 1.60

London—Le Software Man has announced revision 1.60 of The Ultimate, its program development and testing package for INFOS environments. The Ultimate is a fully screen-oriented, record copy files-based, and function key-driven replacement for Data General's Inquire, Query, and Sort/Merge products; it also incorporates some features of Present. This new revision doesn't have the limitations of previous revisions, and has a number of new features:

- All types of INFOS files can now be handled, including those containing al-

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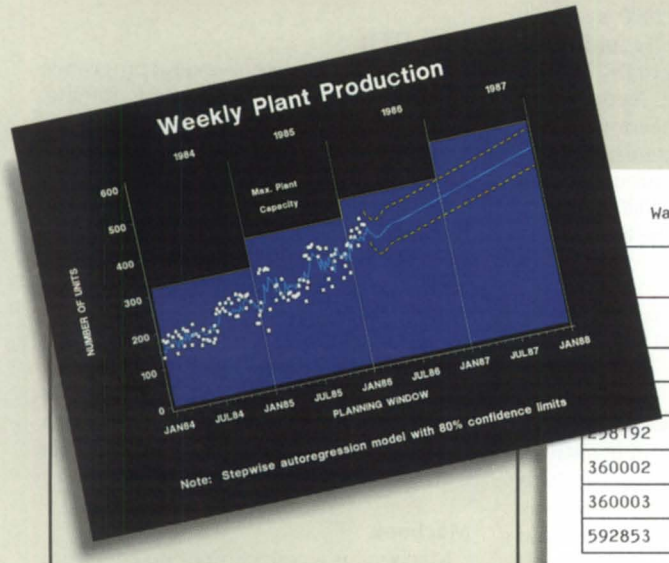

Warehouse Inventory Report - 16JAN87

	Quantity on Hand	Quantity on Order	Projected Reorder Date
	123980	10000	THU, FEB 12, 87
	89450	5000	FRI, FEB 20, 87
258192	20110	1000	MON, MAR 30, 87
360002	8585	0	TUE, FEB 10, 87
360003	15985	500	TUE, FEB 10, 87
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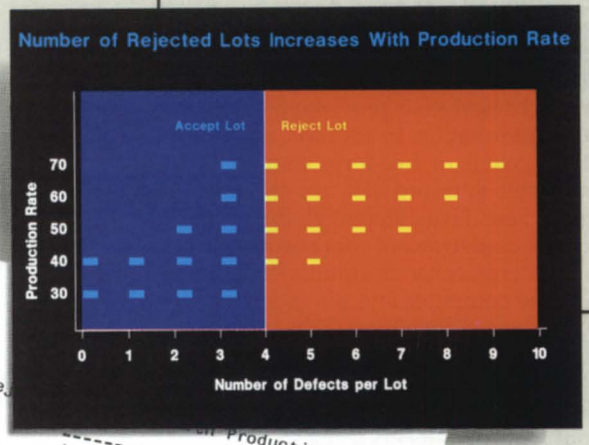

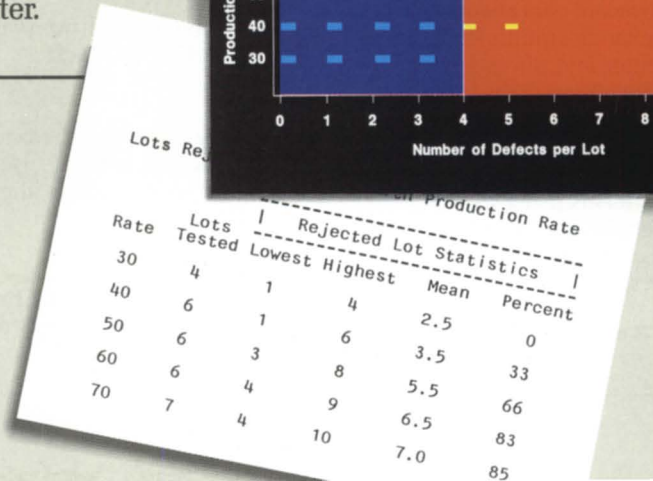
Lots Re... Production Rate

Rate	Lots Tested	Rejected Lot Statistics			
		Lowest	Highest	Mean	Percent
30	4	1	4	2.5	0
40	6	1	6	3.5	33
50	6	3	8	5.5	66
60	6	4	9	6.5	83
70	7	4	10	7.0	85

* Computer Intelligence, January 1986.

The SAS System runs on these minicomputers: Digital Equipment Corp. VAX™ 8xxx and 11/7xx series under VMS,™ and MicroVAX II™ under MicroVMS™; Prime Computer, Inc. Prime 50 series under PRIMOS®; and Data General Corp. ECLIPSE® MV series under AOS/VS. The SAS System also runs on IBM 370/30xx/43xx and compatible machines under OS, CMS, DOS/VSE, SSX, and ICCF; IBM XT/370 and AT/370 under VM/PC; and IBM PC XT and PC AT under PC DOS. Not all products are available for all operating systems.

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ternate keys or keys with computational fields.

• The ability to extract INFOS records to a flat file is now included, along with the facility to build in conditions using the copy file facility, and create and edit extract control records using the copy file facility.

• Rev 1.60 now can produce statistics about a subindex, such as the total number of records in a subindex, the number of records satisfying a particular set of conditions, and the number of logical deletions, etc.

• The procedure for converting COBOL copy files to Present definition files has been automated.

• The command function key is more widely available.

• The Ultimate is now available with the Infolynx data base system.

A six-weeks trial tape is available on request.

Le Software Man, P.O. Box 545, London N7 8DF, England; 1/609-4494. Datalynx, 6659 Convoy Ct., San Diego, CA 92111; 619/560-8112. Δ

Circle 73 on reader service card.

Master Software offers collector's item

Indianapolis, IN—Master Software Corporation has released Masterpiece, a new software package that runs on Data General minicomputers for museum collections management. Masterpiece automates the museum's inventory system and manages routine museum functions such as accessioning, deaccessioning, exhibit planning, conservation, incoming and outgoing loans, and research.

Masterpiece uses a combination of coded and uncoded data fields to ensure consistency while still being flexible. More than 70 predefined data fields systematically record descriptive, provenance, and location information. In addition, as many as five screens of free-form comments are available to record data not provided for elsewhere. Five different kinds of screens can be used to record data about an object.

Masterpiece handles multiple collections on one computer and offers security for confidential data through the use of passwords.

Masterpiece also features a forms generator that allows users to design and lay out their own forms using the data they want in the format they want.

Master Software Corp., 8604 Allisonville Rd., Suite 309, Indianapolis, IN 46250; 317/842-7020. Δ

Circle 74 on reader service card.

A complete listing of the NADGUG software library

NADGUG librarian Randy Berndt is now able to make the software library available to users of MV/2000 systems. Previously, MV/2000 tapes couldn't be serviced, but Kevin Danzig of the Danzig Corporation in Northvale, New Jersey, has volunteered to handle the conversions. All NADGUG members interested in receiving the NADGUG software collection, including those using MV/2000 systems, should send a 1,200-foot tape to:

Randy Berndt
American Urological Association
6750 West Loop South, #900
Bellaire, Texas 77401

or call 713/665-7500. Software contributions should be sent to the same address.

Please include a self-addressed return envelope with sufficient return postage. In compliance with postal regulations, do not date the postage, because the tape will not be returned to you on that date. If you send it at the end of the month, please have the postage read for the following month.

AOSKERM
This is an AOS version of Kermit written in Fortran. Uses 487 blocks.

DBCHECK
This program checks the open status of an INFOS file and examines the checkpointing status of a file. Uses 230 blocks.

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

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

Games
Games is a collection from various places. Enjoy. Uses 19,293 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. Uses 416 blocks.

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

JAG_UTIL
JAG_UTIL consists of several programs: Filecount, Userspace, Scan, and Laminate. John Grant has reserved some rights on his stuff, so check the documentation for specifics. Uses 1,501 blocks.

Kermit
Kermit is a file transfer protocol developed at Columbia University. Uses 9,328 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. Uses 438 blocks.

Macbook
Macbook is a collection of macros from the Colorado users group. Uses 342 blocks.

MENUDIR
This is an initial user menu that can chain to other applications. It features a password control system. From the Fed SIG. Uses 492 blocks.

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

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

SWITCHES
SWITCHES is the GET.SWITCHES routine from John Grant. Uses 1,297 blocks.

TEX
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. Uses 495 blocks.

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

Xfer
Xfer is a tape conversion utility. Δ

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Genuine Parts Company has already placed a $3.2 million order for the new 16-bit DG/500 (announced in this issue). Genuine Parts, which has headquarters in Atlanta, is a distributor of automotive parts to NAPA (National Automotive Parts Association) stores nationwide. Genuine Parts is migrating its Total Automotive Management System (TAMS) to the DG/500. TAMS is based on Data General hardware and proprietary applications software developed by Genuine Parts. The new TAMS system will be used by NAPA stores to automate invoice and inventory orders.

■

Thomas Business Systems, a computer brokerage firm, is offering free service by opening its computer system to any person or company wishing to buy or sell new or used computer hardware. Every item that a TBS broker finds is entered on the computer, including listings from end-users, faxes from brokers, advertisements from computer trade papers, and many items in stock. The data base contains assorted manufacturers' computer parts, totaling more than 13,600 items for sale. All that is needed is a PC or compatible with a modem. For more information, call Phil Thomas at 407/392-2005.

■

Data General has entered a joint marketing agreement with O.D. Systems, a software systems house based in the U.K., for manufacturing and distributing software. Data General will sell three software packages for the computer-integrated manufacturing marketplace: Mancos, for MRP II and shop-floor control (including Fincos II for associated financial requirements; Express, for distribution and order entry; and Sofie, for process planning). O.D. Systems has more than 100 customers throughout Europe, Australia, and Africa.

■

Grumman Systems Support Corporation, a third-party computer maintenance company, has recently installed a consolidated computer system for dispatch and inventory. The new system is connected by leased lines and terminals to Grumman's district facilities. For dispatching, the system logs customer calls and follows each service call from dispatching an engineer to ordering of parts and closing the call.

■

In addition, Grumman and Sysgen Recovery Services are finalizing a joint marketing agreement in which Grumman will market Sysgen's disaster recovery planning and hot site services to its current base of Data General customers. In turn, Sysgen will market Grumman's computer maintenance services.

■

Data General Educational Services is offering a new seminar to help users learn the AOS/VS New File System. The seminar, called "AOS/VS NEW File System Conversion SM530," will teach data processing managers, system managers, systems analysts, or system programmers about the NFS, as well as how to convert smoothly to the new system.

SM530 will be held at various times during the summer in Atlanta, Boston, Chicago, Los Angeles, and Washington, D.C. The four-day seminar costs $1,350. For additional information, call 617/366-2900.

■

Data General has announced the phase out of semiconductor operations at its Sunnyvale, California, plant. This change in operations, which should be complete by the end of 1988, will eliminate 150 jobs. DG will purchase all semiconductor parts in the future from independent manufacturers. However, the company will continue to invest in engineering resources for VLSI implementations of its products. The CMOS Development Center based in Sunnyvale will now report to the Systems Development Division in Westboro.

■

Data General is back on track—the race track, that is. Once again, DG will sponsor the Tyrrell Racing Organization's participation in the 1988 Formula One racing car season. The Grand Prix season includes 16 races, which started in mid-April with the Brazilian Grand Prix in Rio. Other races will be held in San Marino, Monaco, Mexico, Canada, the U.S. (Detroit), France, Britain, Germany, Hungary, Belgium, Italy, Portugal, Spain, Japan, and Australia. This year, Team Tyrrell will use a Tyrrell-Ford 017 car, which uses a Cosworth engine. The car will sport Data General's corporate colors, as well as Cortaulds, R.J. Reynolds Tobacco, and Cavendish Finance. Drivers this year are Jonathan Palmer, 1987 champion for normally aspirated cars, and Julian Bailey.

The team uses Data General DS/7540 workstations for car designs, MV/2000s located in Paris to perform simulations and analysis of designs, and DG/Ones to monitor the cars' performance during test runs.

■

Data General has opened a new 100,000-square-foot facility in Thailand for the manufacturing of cables and harnesses and the assembling and testing of peripherals and PCs. According to Edson de Castro in a speech given at the dedication of the plant in Thailand, the decision to locate there was based on the availability of workers and the support given by the Thai government.

■

Data General's second-quarter financial report shows a net income of $17.2 million, or $.57 per share. These figures include an extraordinary tax credit of $2.4 million, or $.08 per share. In comparison, this time last year, DG reported a net loss of $42.6 million, or $1.59 per share, including an extraordinary loss of $18.2 million, or $.68 per share.

Revenues for the second quarter, which ended March 26, were $349.7 million, compared with revenues of $315.2 million for the second quarter last year. This is an increase of 10.9 percent.

Operating income for the quarter was $20.1 million, or 5.7 percent of revenues, compared with an operating loss of $9.0 million for the second quarter last year.

During the second quarter of 1988, DG realized a gain of $5.9 million before taxes as a result of the sale of the facility in Austin.

■

Extended Product Suppliers has signed an agreement with Dataram Corporation to distribute Dataram's DG-compatible memory products in the Netherlands, specifically the Dataram DR280 for the MV/4000 and MV/10000, the DR7800 for the MV/7800, and the DR1520 for the MV/15000 and MV/20000.

■

Data General will be licensing Intercon Associates' Office/Publisher software to DG customers and will market the product through DG's North American sales force. Since early spring, Data General has taken responsiblility for making sure the software is installed and running according to specifications. DG will provide first-line user support. Data General computer users can now receive the same assistance with Office/Publisher software as with any other DG product. The Office/Publisher software works with Data General's CEO software. Δ

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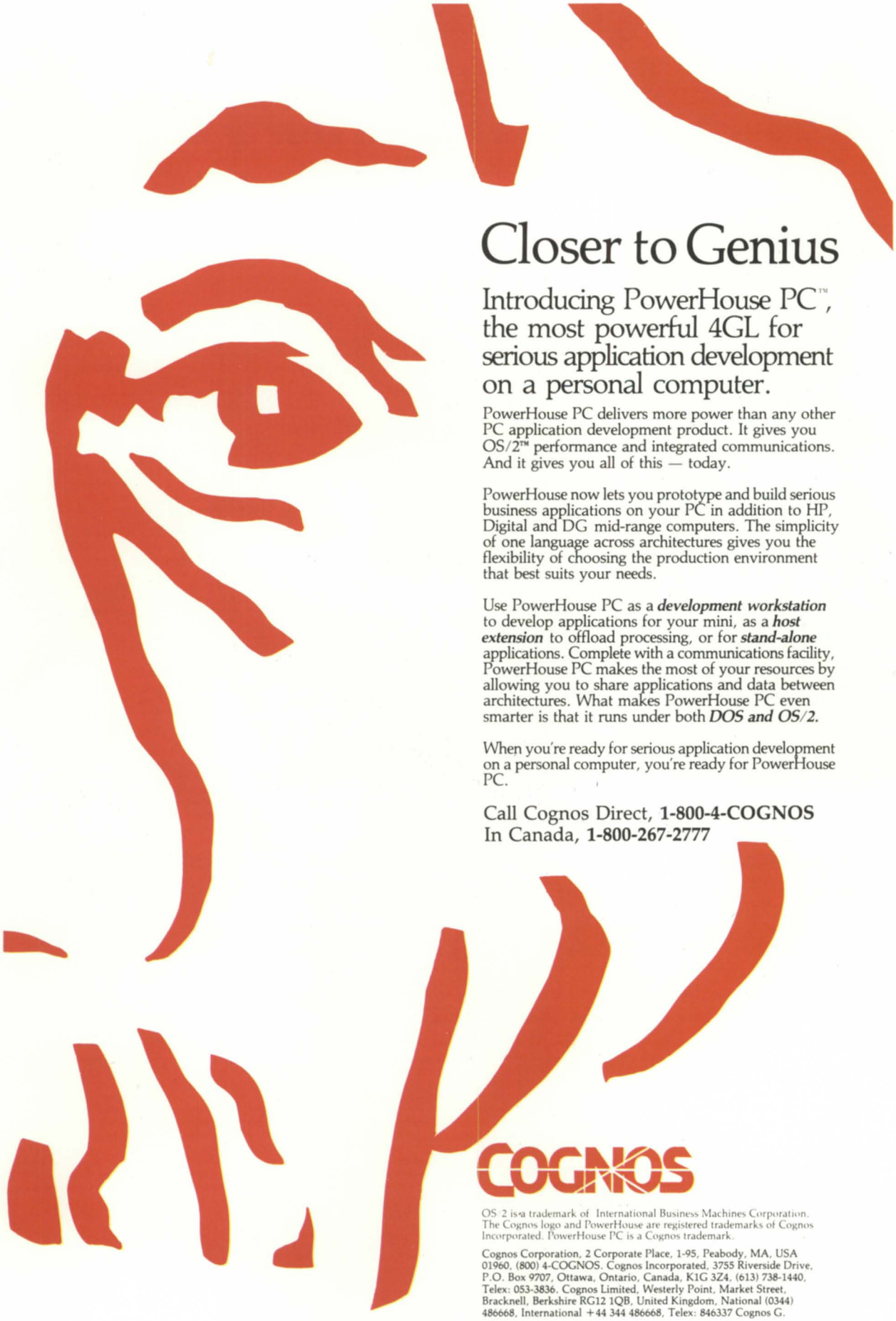

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