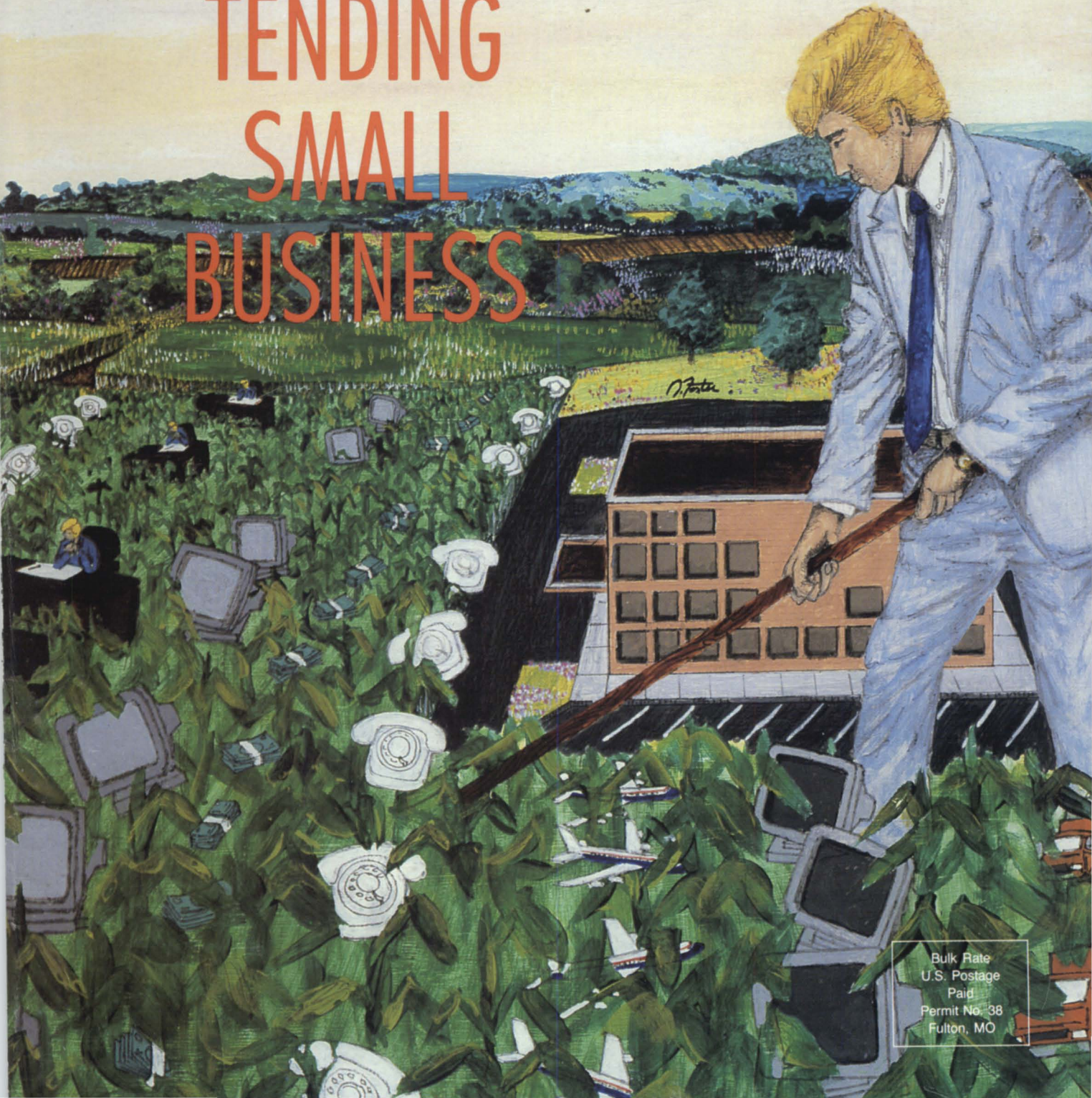


February 1989

# FOCUS

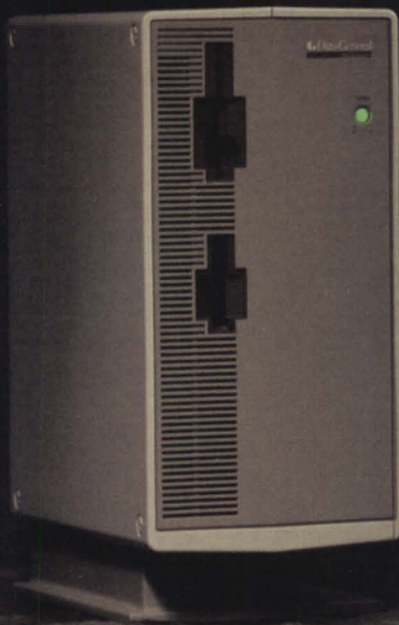
The Magazine of the North American Data General Users Group

## TENDING SMALL BUSINESS



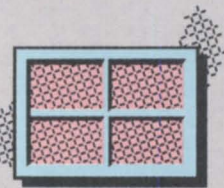
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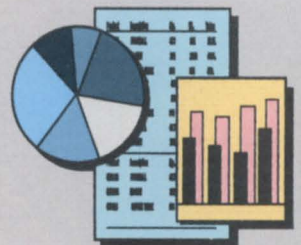
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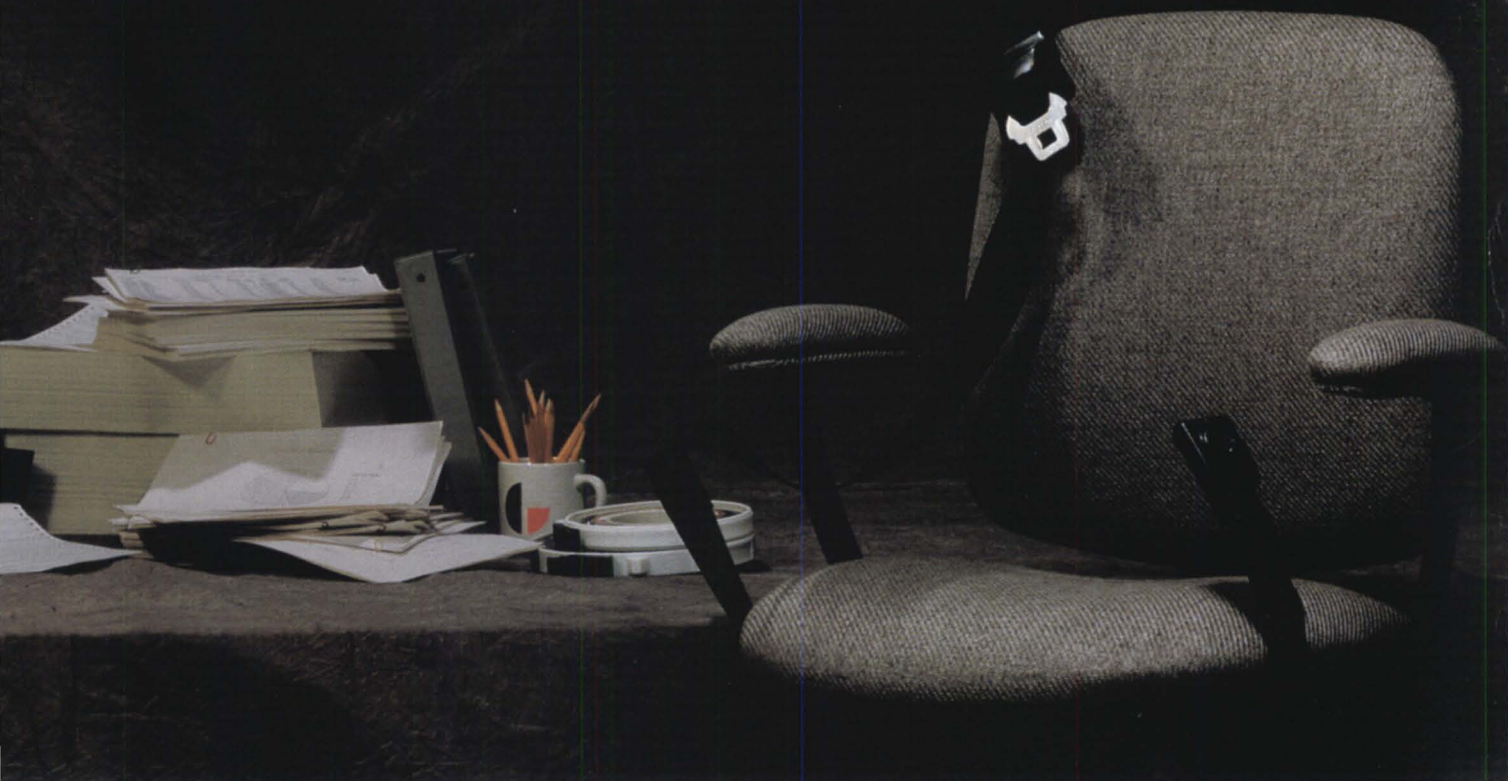
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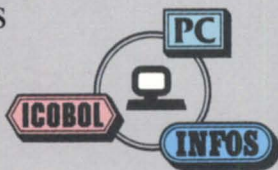
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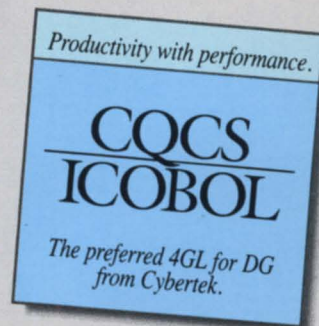
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# You say you want a resolution?

By Donald W. Clark  
NADGUG president



Computers and desktop publishing may have revolutionized the magazine industry, but we can't seem to get around the fact that the darn things still have to be printed and mailed. That takes time—a lot of time, in fact. To get this message into the

February issue, I have to take time out of a week that I'd planned to spend recovering from Christmas and preparing for the New Year.

So please bear with me while I make a few New Year's resolutions for NADGUG. Even though they may not reach you until Groundhog's Day, they were timely when I set out to write them.

**1. NADGUG resolves** to show the good people of New Orleans that Data General computer users know how to have a good time. We get two chances for this one, because we have two events scheduled there this year. First comes the spring meeting of the NADGUG Executive Board, which will take place March 9-10 at the New Orleans Hilton. Attending will be all NADGUG officers and committee chairs, along with representatives from recognized regional and special interest groups. Gauging from the past, there will be more than 40 of us gathering to conduct NADGUG's business and prepare for the annual meeting next fall. By no small coincidence, our annual meeting is scheduled for the same place next September 18-21. For both meetings there's a lot of work to be done, but we seem to always make time for fun.

**2. NADGUG resolves** to put on a friendlier face. People who have been part of the user group for years may not realize how big we've grown, and how overwhelming it all can seem to somebody who's new to the organization. As a group, we need to devote more attention to making NADGUG less formidable to newcomers. Each of us can help by putting a little effort into making them feel welcome.

**3. NADGUG resolves** to figure out a way to fit all the people who sit on the Executive Board into one room. This one has been creeping up on us for years. As I said above, we're expecting more than 40 people to show up for the spring meeting of the Executive Board. Actually, it could be a lot more. Each year we recognize new RIGs and SIGs, and each of them is entitled to send a representative. If they all actually did, we'd never find a table large enough to seat everybody. The potential for a population explosion has come up at the last few meetings. It's clear that we want as many as possible to participate, but if everybody who could come actually does, we'll have to come up with a quick solution. I think this will be the year.

**4. NADGUG resolves** to avoid parliamentary sleight of hand in our business meetings. (see #2.) It's not easy to get the members of a group as large as NADGUG all pointed the same way. In the past we adopted some procedures for decision making that made a lot of sense at the time, but we need to re-evaluate some of them now. This is a democratic organization, and it gets its vitality from the grass roots. We should never let our parliamentary procedures give people the impression that their voice doesn't matter, or that everything that matters has already been decided.

**5. NADGUG resolves** to recruit new leadership talent. We established a very good precedent a few years ago, that nobody should hold the same committee position for more than two years. That means that there will always be ways for new members to get involved and bring fresh ideas to the organization. Let me take a first step toward this resolution right now: **NADGUG wants you! Call me for details.**

**6. NADGUG resolves** to offer new services to members. Maybe you've already seen the flyer the *Focus* staff made up that lists 31 reasons for joining NADGUG. Those are 31 very good reasons. By this time next year, I hope there will be several more to add to the list.

Happy Groundhog's Day! Δ

# FOCUS

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## EDITOR'S NOTE

# In defense of dabblers

An old friend's surprise visit to the office the other day brought an unexpected insight. David Novy, who is an old friend to a lot of NADGUG members, was in Austin on business for 3M, his company. He stopped by the *Focus* office for a visit—actually, he called it a surprise inspection.

After a few minutes the subject turned to desktop publishing, a subject I thought I knew quite a lot about. For nearly a year now *Focus* has gotten most of its typesetting and design via our fleet of Macintoshes. We still do all the editorial work and most of the other office tasks on our MV/4000, but with the help of a little ingenuity and a few off-the-shelf products, the Macs have become an appreciated adjunct for the art department.

Within a few minutes David had torpedoed any complacency I felt about operating a state-of-the-art shop. Macintoshes are fine, he said, but an Amiga is much cheaper and has all of the software we would need for the work we do. Moreover, it supports color, and could produce film overlays directly, perhaps saving a few hundred dollars a month on color separations. Besides, the Amiga will soon support both MS-DOS and Unix, which would make it easier to integrate with our MV. He even went out and bought a copy of *Amiga World* to show me what he meant.

After closer inspection, I find that there are still a few missing pieces in the Amiga solution—but no more than there were in the Macintosh at the time we decided to go that route. The fact remains that if I had been as informed as David about desktop publishing, I probably would have considered the Amiga more seriously. Yet I'm an *editor/publisher*, while David is an MIS manager. So why did he know more than I did about this aspect of my job?

It turns out that 3M, and possibly a lot of other enlightened employers, expects professional people to spend a certain amount of their time dabbling. They probably use a different word, because "dabbling" carries negative connotations—it implies frittering away time on unproductive pursuits—playing rather than working. Dabbling is what David called it, though, and I think his word

goes to the heart of the matter: productive research is often as much play as work when the researcher approaches it with the right attitude.

This reminds me of a teacher I worked with once. His colleagues and students recognized him as one of the best. Over his blackboard was a 20-foot-wide mural of a B-29 on a bombing run. He loved to terrorize his students with unexpected questions. And whenever you asked how his day was going his response was the same: "It sure beats working."

A company takes a gamble when it encourages its professional employees to "dabble." It gambles that it took the right things into account when it hired its professionals in the first place—that in fact they are the types of people who are motivated by curiosity and able to find satisfaction from solving problems they encounter in their work.

From what I can see, the company doesn't need to worry very much about the problems its employees choose to dabble in. The problems may or may not have practical significance or an immediate payback, but dabbling encourages learning and insight, and knowledgeable employees make better problem solvers when the time comes.

The role of dabbling may have special meaning for small businesses. Statistics show that small businesses make a disproportionately large contribution in terms of new ideas and new jobs. Yet relatively few small businesses last. The pat answer for their high failure rate is that they lacked either management skills, or capital—probably both. I suspect there may be another lack, as well: time to dabble.

For people who launch a small business, work can easily become an obsession. There's so much to do, so much to learn just in the course of running the business day to day, that there's little time left for playing with new ideas. The challenge of running the business is wonderfully exciting at first, but it can wear thin over time. Meanwhile, the world moves ahead, the competition gets tougher, and new problems crop up. Unless there has been time for dabbling, the business may not be prepared to address new problems with current knowledge. Δ



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# News from NADGUG and its affiliates



by Cathlene Gentry  
RIG/SIG coordinator

Although it seems like NADGUG's fall executive board meeting just ended, it's already time to make plans for the spring meeting. All NADGUG officers and RIG/SIG leaders are encouraged to attend the meeting, which will be held at the Hilton in New Orleans, Louisiana, March 9-10. Any new regional or special interest groups who wish to petition for recognition should be prepared to do so at this

board meeting. A list of officers and activities to date must accompany a written request for recognition.

Remember that each recognized regional or special interest group *must* submit a status report to the executive board at the spring board meeting.



The Austin area start-up group held its second meeting on December 13 at the Uptown Enchilada Bar, located in downtown Austin. The meeting started at 6 p.m. with munchies and margaritas. After everyone had their fill, Jana Stein, senior system engineer with the Austin Data General office, gave an informative presentation on the new AOS/VS II file structure. She had recently attended a class on the new file structure and passed on her knowledge to the group. Jana used an overhead projector, and a quick wit to keep the presentation informative as well as entertaining.

Many new faces were present at the meeting, which is very encouraging. The group will meet again in February. Details about location and meeting topic are forthcoming. All DG users in the Austin area are encouraged come out and meet other users, and learn valuable information in a fun and relaxed atmosphere. For details about upcoming meetings or the group itself, you may contact me at 512/345-5316.



**OASIS (Office Automation Special Interest Subcommittee)** and the Atlanta Support Center are jointly sponsoring a customer support workshop for Data General users. The workshop will be held February 9-10 at the Hilton at Peachtree Corners in Atlanta, Georgia.

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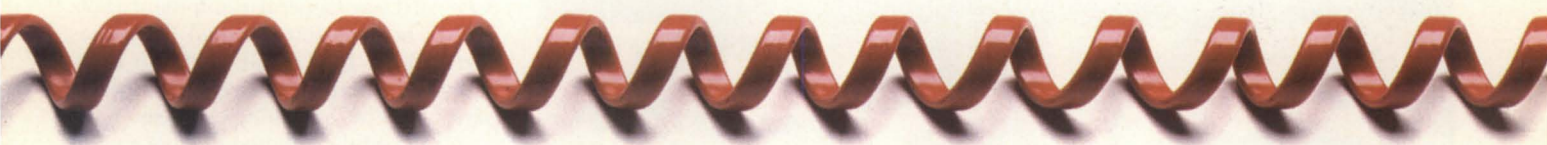
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The workshop is being held in conjunction with a class in "Applied CEO Office Management Concepts" at the Data General Educational Services Center in Atlanta, February 6, 7, and 8. For more information contact Charlene Kirian at 614/

476-1237, Bobbie Pressman at 312/948-1814, or Wes Thomas at 614/764-4361.



The Detroit regional interest group tried something new for its January meeting—an open house gathering with a buffet dinner. A general discussion of communications issues and products was given by Telenet representatives. The meeting was held at the Radisson Hotel,

Southfield, Michigan and the group picked up the dinner tab.

Meetings are usually held the third Tuesday of the month. Upcoming meeting dates are February 21, March 21, April 4, and May 16. DG users interested in attending any upcoming meetings should contact David Richardson at FX Coughlin, 27050 Wick Road, Taylor, MI 48180, 313/946-5850. Δ

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## L.A. Edge forgets computers at party

by Doug Reimer  
Vice President, L.A. Edge

On December 6, the Los Angeles End-users of Data General Equipment (L.A. EDGE) held its third annual Christmas party. In the L.A. EDGE tradition to be bigger and better each year, this year's party was a smashing success. One hundred people gathered to have a good time and to forget about computers.

The party started at 6 p.m. with cocktails sponsored by Catalina Computers. Calloway Vineyards presented five wines in a wonderful wine-tasting that was hosted by Verdugo Computers.

The evening's speaker was Olympic athlete Dwight Stones. Dwight is a three-time United States Olympic team athlete, winner of two Olympic bronze medals in the high jump, and a former high jump world record holder. He was a track and field announcer for NBC at the Seoul Olympics. Dwight and his wife Lynda were on hand for photographs with members and guests. The Polaroid pictures were signed by Dwight and given to each member.

The dinner started at 7:30 p.m. with Cornish game hen as the main course, accompanied by Calloway wines. Dwight gave an inspirational talk about his involvement in the Olympics and answered questions.

L.A. EDGE is the sponsor of the First Annual L.A. EDGE West Coast Super-mini Data General and DG Compatible Hardware Exhibit. The event will take place January 24 at the Rose Bowl's Brookside Country Club, in Pasadena, California. Admission to the exhibit area is free. Dinner afterwards is \$35 for non-paid L.A. EDGE members and member guests.

Upcoming meeting topics include: February 28, EDI; March 28, Business and Analytical Tools (SAS); and April 25, Data General night. For more information contact Doug Reimer at 213/582-5203 or Bill Pearce at 213/618-9905. Δ

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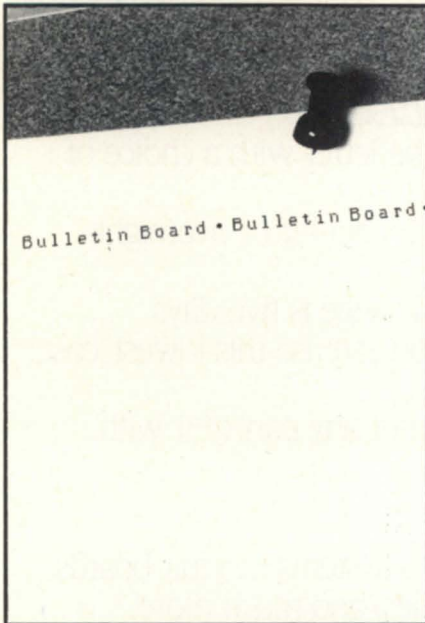
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**High density floppies on MV/2000s**

From: Russ Cordner

Could anyone please explain to me why I can't seem to format high density diskettes on an MV2000 with a low density format? The format completes okay but when I try to dump to them, I get physical unit failures. The lower density diskettes format perfectly. By the way, this is a hardware format problem I am having using ADEX. If anyone could supply some info it would be greatly appreciated.

From: Ron Ralston

Just as a comment . . . are you aware of the fact that MV/2s can only READ the 48 tpi format? They can both READ and WRITE 96 tpi diskettes. This may not have any bearing on your problem, but it would seem to imply that you aren't going to be able to DUMP to a floppy which uses the 48 tpi (360 KB) format.

From: Russ Cordner

I don't seem to have any trouble formatting 48 tpi diskettes for 40 tracks on the MV/2000. The problem occurs when I try

to format 96 tpi diskettes for 40 tracks on the MV/2000. As far as I know, the only difference between 48 tpi and 96 tpi diskettes is the quality of the media (96 tpi being better). If this really is the case, then I can't understand how the MV/2000 diskette drive can't handle a better quality diskette than it is used to. I would appreciate any thoughts you may have on the subject.

**Check digits**

From: Cliff Norris

I'm looking for COBOL source code for a sub-routine that can calculate check digits for three-digit or greater numbers. If you know of any please leave a message for me on the BBS.

**Support for CEO 2.2X**

From: Margrit Eade

Has DG stopped supporting CEO 2.2X yet? If not, when will support be dropped?

From: Ed Faits

I have some notes from NADGUG about that . . . "CEO 2.2X will be supported until March 1989" . . . from the CEO roundtable.

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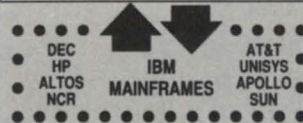
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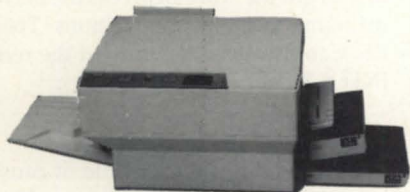
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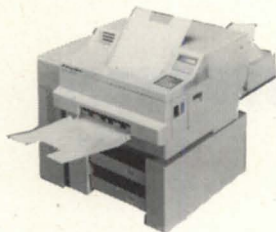
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Not sure who said it; I think it was Chris Stone from Data General.

From: Steven Tyler

According to DG, it had initially planned to support CEO 2.2X for six months from shipping date (April 1988). Last word I had was that support would be for one year, till April 1989. At that time they would re-examine and make another de-

termination as to how much longer, if any, it would be supported.

From: Mike Shumway

Just for your info, we just got 3.02 and it had 2.27 tacked onto the end of it. So, the support window might be extended if they are coming out with new 2.2x releases, although they only consist of 10-20 files . . . Who can tell?

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### Mac connections

From: Tom Scheiderich

Anyone know if there is any work being done to connect the Macintosh to DG similar to what has been done with DEC? I had heard that there was something being done a while ago, but haven't heard anything for months.

From: David Down

DG has started working on PCI for the Mac, but don't expect to see anything until late this year.

From: Tom Scheiderich

That's too bad. I was thinking about working on writing something myself but am just too busy. Oh well!

### Executing across Xodiac

From: Sam Pitts

I think the subject of executing and accessing programs and data across Xodiac has been briefly discussed. Please bear with me; how can I execute programs and access data (spreadsheets and spreadsheet programs) across the network without becoming a virtual terminal? When I tried links, I got the "cannot access the network in this manner." Any suggestions? Thanks. P.S. Can this be done without the remote INFOS agent, etc.?

From: David Down

If a program has a console, it must be local to the machine it is running on (@CON, @VCON, @TCON, @WCON . . .). If you only use @INPUT and @OUTPUT, they can be remote. A VCON doesn't need to belong to EXEC. You can dynamically assign one when you proc a program, and then connect to it with UVTA.

From: Sam Pitts

Thanks for the tips David. Could you give me examples on how to dynamically assign a VCON when you proc a program and connect it with UVTA?

From: David Down

I haven't done it in quite a while, but something like this should work: PROC/DEF/IOC=@VCON9 :NET:HOST:PROC and then X UVTA HOST PROG should connect you to the program you just PROC'ed. This assumes that your username/password matches and that you have the appropriate privileges. (May need to be /IOC=:NET:HOST:PER:VCON9—experiment if needed.)

**TELNETD & ANYPIDS**

From: Jan Bruun

I have just been installing AOS/VSTCP/IP on our MV/15000 model 20 and have been experiencing trouble with TELNETD. I'm running a system genned for more than 255 PIDs. The problem is that TELNETD aborts, leaving stray PIDs around when you execute an ANYPID program from a TCON. I have filed an STR on it, but until a new release appears I will be running a SMALL-PID system.

From: Michael Travis

I've seen this. The "stray PID" is stuck in the Agent waiting for a ?SIGNL from TELNETD that will never come.

From: Bill Benedetto

What really torques me off about TELNETD is that it is likely to go down at any old time it feels like. I can usually type ahead (we're talking at the operating system level, here) and get the stupid thing to go down. Doesn't anybody use this that types faster than a character every five seconds? It is a regular occurrence here for TELNETD to get terminal errors and take itself (and anyone using it at the time) down. ("Terminal" here means "serious," not D215 . . .) Has anyone out there had this stupid problem? I say stupid because we have it with such regularity, someone else must have seen it before . . . but there are no STRs listed in the monthly newsletters, so this must be a great product, right? But I wander from the original point . . . I have not seen it where we have stray PIDs out there. The only thing like this that I have seen is if we get stuck in an application and abort back to the workstation, that application will often be left running on the DG although the connection has been broken.

From: Michael Meissner

I try to avoid TELNETing into an AOS/VS system. It certainly is buggy—I have a program that sends out terminal ID strings, and does a timeout read, and I had to make it recognize when @CONSOLE is a @TCON, and print out a comment that TELNETD is too dumb for this program. . . . Sigh.

From: Bill Benedetto

Hooray! Someone in the free world who recognizes that the TELNETD on the AOS/VS has some problems (short-comings?). Is there nothing that we can do to resolve any of this or is it just the nature of the beast?

From: Michael Meissner

I know the TCP/IP development group is aware of the problem.

**RDOS 7.50**

From: Paul Foster

Is anyone running rev 7.50 RDOS with large disks such as 277 MBs or larger? We have discovered a bug in the file system that corrupts disks (among other things)

and are interested in talking with other 7.50 users. An STR has been submitted to DG reporting this bug but we have not yet received a reply.

From: Tom Scheiderich

I would be interested in hearing about this problem as we are just ready to go from 7.4 To 7.5 to allow us to use the larger disk (500+ MB). If there is indeed a prob-

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lem, I want to delay it. We can't afford that type of problem.

From: Tim Boyer

We were running twin Fuji 2333 (294 MB) with no problem, but had them gened as four Kismets. Is such a solution possible for you, or are you running real live DG disks?

From: Tom Scheiderich

I was planning on going to 7.5 specifically to use DG's 500+ MB disk. We currently use a 192 MB and are maxed out. The price difference between the 354 and the larger disk is not that much and with rev 7.5 we will be able to use the larger disk (7.4 won't handle it). So you said your only problem was not a bug but an incorrect sysgen?

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From: Tim Boyer

No, we were using Fuji disks and the Zetaco controller, so we split the disks down into four logical disks. Is the 500+ an Argus type? From what I remember about Argus disks and RDOS, you're going to be running slow, slow, slow! RDOS doesn't take advantage of the disk's intelligence (from what I remember—somebody else help me with this), and the Argus is inherently much slower than other disks (e.g., 3000 rpm spin time), so you might be better off going third-party.

**CEO pipe servers**

From: Jeff Campbell

If anyone gets ready to do a user migration from a CEO pipe server, be forewarned! It isn't gonna work. There is a patch that was just released to fix the problem. The patch is called 3.01\_ceo\_om\_vs\_patch\_pipe. With this patch installed, everything works just fine.

**Batch streams**

From: Tim Boyer

Possibly dumb AOS/VS question (I'm learning this thing on my own) . . . When I QBATC a file, QOUTPUT contains, at the top, the contents of my initial IPC file. In my case, this causes no harm—a DE-FACL command, etc. However, 99 percent of my users are logged directly to the ICOBOL logon screen. In their case, QOUTPUT contains the Logon screen, complete with control characters, etc. Apparently VS tries to execute this screen, because any batch stream started by one of the users contains a) the logon screen, b) a system panic message with accumulators, and c) an "unknown message code" message. It creates a .MDM file. Then it executes! What am I doing wrong, and how can I correct it?

From: Lon Culbertson

You can prevent CLI code from executing in batch by using [!equal, [!login], CONSOLE] . . . [!else] . . . [!end]. Is this what you need?

**Letters**

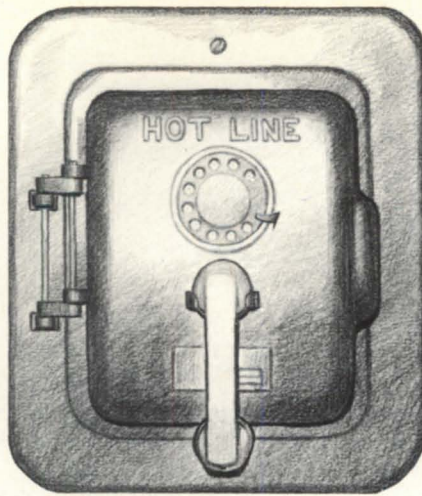
From: Jan Bruun

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From: Focus Editor:

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# CEO Decision Base evolves

## Features and functionality of rev 4 point to continued support

by Don Dewar  
Special to Focus

Data General recently announced a new revision of CEO Decision Base (CDB), a personal decision support tool that offers four components: spreadsheet, data table, chart, and report. One reason for the popularity of CDB is its integration with Data General's CEO office automation software, with its consistent menu driven interface. New features of CDB include a reporting component, additional functionality in existing components, and performance enhancements. Other more subtle changes add to the appeal of CDB.

### New Reporting Component

The most noticeable change to CDB in this revision is the new reporting component. The reporting component allows data from the spreadsheet or data table to be formatted into a report. Just like the charting component, the reporting component allows default reports to be created quickly.

CDB reporting can create two types of default reports: column and line. Column reports are set up so that the data is organized in a columnar fashion (see Figure 1). Line reports are set up so that each piece of data is on a separate line (see Figure 2).

Another feature of CDB reporting is the ability to customize reports. This is done using a free-form report editor. The report editor allows text to be typed in just as it would be in a word processor. Data can be positioned and described

**Figure 1: A columnar report**

COMPANY	Q1	Q2	Q3	Q4	AVERAGE
Acme Ltd.	\$12.50	\$30.25	\$25.00	\$32.51	\$25.07
XYZZY Co.	10.20	12.25	15.50	20.22	14.54
ML&R	50.00	45.00	35.00	34.00	41.00
Don's	10.15	25.25	50.50	75.75	40.41

with the use of function keys. Menus help the user to better understand what is needed to complete the function.

The new CDB report component allows you to easily format data into a default report that can then be customized using a free-form editor.

### New Functionality

Revision 4.00 of CDB has new functionality in its spreadsheet and data table capabilities that make it more useful and flexible. The CDB spreadsheet has been enhanced in areas of business functions, string operations, and CEOwrite support, while the data table processor now has computed column options as well as CEOwrite support. The spreadsheet has a number of new business functions included as standard formulas. Among them are the following:

- CTERM—the number of compounding periods it will take for an investment earning a fixed interest rate per period to grow to a future value;
- DDB—the depreciation allowance of an asset over a specific period of time;
- RATE—the periodic interest needed for a present value of an investment to grow to a desired future value over the number of compounding periods in a given period of time;
- SLN—the straight line depreciation of a set for one period;
- TERM—the number of payment periods in the term of an ordinary annuity necessary to accumulate a future value, earning a periodic interest rate.

The spreadsheet has added concatenation, substring, and length functions for manipulating text strings and text cells. Previously, all that could be done with text was to enter it into a cell. Both spreadsheets and data tables can now be saved

as CEOwrite documents. This allows users who prefer CEOwrite to use it to edit their converted spreadsheet or data table. As a side note, earlier CDB revisions included CEOwrite compound support, meaning that spreadsheets and data tables could be included as a part of CEOwrite documents, but not saved as such.

The computed columns option allows a column to be specified with a formula that references data from another column (see Figure 3). This adds a whole new dimension to data tables. For example, I used this feature to augment data table string formatting to create more interesting reports.

### Performance Enhancements

Performance enhancements have been made throughout CDB in updates of revision 3 and in revision 4.00. The data table and charting components have re-

**Figure 2: A line report**

COMPANY	Acme Ltd.
Q1	\$12.50
Q2	30.25
Q3	25.00
Q4	32.51
Average	\$25.07
COMPANY	XYZZY CO.
Q1	\$10.20
Q2	12.25
Q3	15.50
Q4	20.22
Average	\$14.54
COMPANY	ML&R
Q1	\$50.00
Q2	45.00
Q3	35.00
Q4	34.00
Average	\$41.00
COMPANY	Don's
Q1	\$10.15
Q2	25.25
Q3	50.50
Q4	75.75
Average	\$40.41

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worked some of their file management to speed file access. The most significant performance enhancements, however, lie in the spreadsheet processor. Screen display is another area that has been improved in revision 4.00.

The spreadsheet has increased performance in many areas by making better and more efficient use of the virtual memory access afforded by AOS/VS. In the past, a chunk of the spreadsheet was kept in memory so it could write to and read from disk to get data when needed. This could be costly when recomputing. Now the entire spreadsheet is kept in memory and it lets AOS/VS page data in and out. Since the spreadsheet can now access that information faster, functions like recompute, sort, copy, move, and insert are executed more quickly (see Figure 4 for relative analysis versus other spreadsheet products).

Screen display is another area where significant improvements have been made. Scrolling within the data table and spreadsheet is visibly faster. One reason is that redundant characters are intercepted and not output to the screen. For

instance, if there is already a letter "A" in a position on the screen, another letter "A" will not be output there. In addition, the redrawing of overlaid menus is no longer the tedious effort it once was. In previous revisions of CDB, when you cancelled from a menu it would draw each overlaid menu until it finally got to the one on top. Now only the final screen image, with the menu on top, is drawn.

### Subtle Improvements

CDB has made subtle improvements in the following areas:

- the main pickone menu
- spreadsheet file structure
- disk storage.

The main pickone on spreadsheet and data table has been changed to include charting and reporting, making these functions more visible and easier to initiate.

**Figure 3: The computed column option**

COMPANY	Q1	Q2	Q3	Q4	Average*
Acme Ltd.	\$12.50	\$30.25	\$25.00	\$32.51	\$25.07
XYZZY Co.	10.20	12.25	15.50	20.22	14.54
ML&R	50.00	45.00	35.00	34.00	41.00
Don's	10.15	25.25	50.50	75.75	40.41

\*This column is the formula  $((Q1)+(Q2)+(Q3)+(Q4))/4$

The spreadsheet file structure is now more robust and the size of the spreadsheet file now reflects the amount of data in the spreadsheet. The more robust spreadsheet file means it is less likely that data will be lost or corrupted.

The new spreadsheet file structure only contains the actual data that is in the spreadsheet. Previous revisions of the spreadsheet saved information about cells that was deleted in the disk file. This revision saves only the data that actually exists. This tends to make the spreadsheet file smaller.

The physical memory size of the CDB

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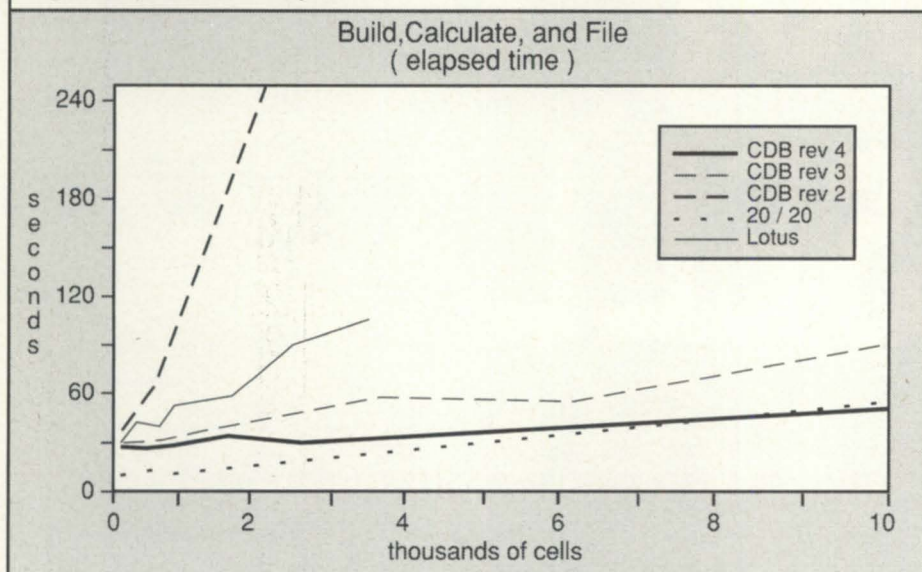


product has decreased. This was done by making some of the screen files smaller, but more notably by putting all the ex-

ecutable files in one large file. This will save disk space; I do caution that if you try to verify this fact by checking the size

of the CDB.PR, you may think it is huge. This is not really the case, however. The spreadsheet uses some large arrays to perform its virtual access. These arrays don't actually exist, but the size command counts them anyway.

**Figure 4: Performance comparison**



*In the above diagram, Lotus was running on IBM PC-AT 286. The other spreadsheets were running on a lightly loaded MV/10000.*

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*Don Dewar is a software engineer at Data General's headquarters in Westboro. He can be reached at 4400 Computer Drive, Westboro, MA 01580 or at 508/366-8911.*

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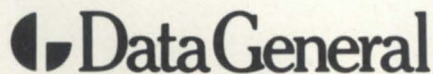
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# SOFT SELL

## Lansing's small businesses like DG performance — where are the salesmen?

by Michael E. Marotta  
Special to Focus

Every Data General user in Lansing, Michigan has the same story: They love their Nova, Eclipse or MV; they know their field engineers on a first name basis; they have never seen a sales person from Data General.

Several calls to the Data General sales office in Detroit reveal why these things are true. According to DG, the only money to be made in Lansing is in selling to the state government and the state is already committed to IBM, Honeywell, and Unisys. If you point out that there are a lot of small shops running IBM System 3X, you will be told that "those people don't want to buy from us."

### Common and unique

Lansing, Michigan is both common and unique, depending on which of several perspectives you choose. It is a Midwest town of about 200,000 people. Five or ten miles from the downtown business district, you may find corn, wheat, and beans growing on dozens of small farms. Lansing is the state capital. East Lansing is the home of Michigan State University with its 40,000 students, less than half of whom live on campus. Ransom E. Olds started an automobile factory here 80 years ago. After selling that one to GM, he opened another company in Lansing, Diamond REO Trucks. These three facets

of the economy (the state, MSU, and automotive) are easy to see. Less obvious are the hundreds of businesses that any town or small city must have.

German Automotive is owned by Leonhard Klimenko and Georg Moisenko. From the heyday of the VW Bug, they have expanded to service Porsches, Saabs, and other European cars. Ross McFarland runs their MP200 computer. They have had it for seven years. "We have a dinosaur here and we love it," he says.

The MP200 is used for accounts receivable and inventory. German Automotive keeps track of 250 clients with the receiv-

Speaker, Hines & Thomas, Inc., are commercial printers. They have owned their Eclipse 130 for eight years. Says Mark Burke, "It's a good running machine." The software came from Stewart Systems in Boston (now out of business). The system was designed for the printing industry and, according to Burke, it parallels closely what is done manually. The software for job costing, inventory, general ledger, accounts receivable, and accounts payable was written in assembler. How does he maintain that kind of code? "Very carefully!" he laughs.

The Eclipse 130 runs under AOS and

Repeating that he "can't speak highly enough about Data General service," McFarland explains that the floppy drive is temperamental and each time it fails, DG swaps it out quickly.

ables software. They maintain 12,000 items in inventory. German Automotive bought the turnkey system from a company that has since gone out of business. They chose the MP200 because the system was "expandable." Now the machine is obsolete.

McFarland can't say enough about the good service from Data General. "We're so impressed by the field technicians that we would buy a DG desktop," he states. He finds the service contract reasonably priced. Repeating that he "can't speak highly enough about Data General service," McFarland explains that the floppy drive is temperamental and each time it fails, DG swaps it out quickly.

supports two terminals. Data is stored on a 20 MB hard drive, configured as two 10 MB logical units. The 130 is in a competitive environment since Speaker, Hines & Thomas also owns an IBM PC for scheduling. In addition, estimating is done on three Commodore C128 personal computers.

### The competitive edge

In Lansing, the state is not the only government. The city of East Lansing runs four DG machines: three MV/2000s and a desktop 20. There are 48 townships in Lansing's tri-county region. Delhi Township ran a Nova 4X/16 for six years until the cost of service exceeded the price of a

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If you've considered buying WordPerfect 5.0 for the IBM PC, rest assured that WordPerfect documents created on Data General machines can be retrieved into 5.0 format on the PC. Likewise, files created with 5.0 for the PC can be saved in 4.2 format and then retrieved on the Data General. (Features new to 5.0 will not transfer to 4.2.)

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For more information on programs or marketing, contact the Data General Products Division at WordPerfect Corporation.

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new computer. They acquired an MV/2000.

Jim Felton is the assessor and computer manager for Delhi Township. He had "no complaints whatsoever" with the old Nova. "It never gave us any problems, but it cost too much to maintain." Maintenance was \$800 a month on the Nova; Delhi Township now pays \$140 a month for the MV2000.

They have seven terminals, two printers (a 300 lines-per-minute and an Okidata dot matrix) supported by a 160 MB disk. Of the 10 users, Felton says that three are "novices." He has four "experienced" users, two "experts," and one "guru" (Felton himself, of course). The programs come from First Computer of Ann Arbor, a company that specializes in creating software for local governments.

As the township assessor, Felton is very aware of being in a competitive situation. "We are a bedroom community of 20,000 for GM, the state, and MSU." He agrees that people can choose to live elsewhere in the Lansing area, and that his computer system helps maintain a desirable infrastructure for his neighbors. The township has a \$4 million budget that includes operation of a wastewater treatment works, separate from the general fund of \$2.5 million. This puts them squarely in the range for a successful small business.

They use the MV/2000 for payroll, sewer fees, taxes, appraisals, purchase orders, claims, and voter registration.

Purchase orders present a special challenge because they have a mandate to buy locally. They have many small vendors and this translates into a lot of processing since vouchers and invoices are consolidated for payment.

The process for collecting sewer bills is actually like a retail Point of Sale (POS) system. The terminal to the MV/2000 acts as a cash register. Residents bring in their bills and pay them on the spot with cash or a check.

Overall, of the 34 Data General sites in the Lansing area, there are six MV machines and eight Eclipses. The rest are all Novas. Delhi Township has one of the MVs. The other is an MV/4000 running CEO for E.F. Hutton's East Lansing office. Unfortunately, when Shearson-Lehman acquired E. F. Hutton, it made a corporate decision to move all operations into IBM mainframe environments.

#### When to get a minicomputer

Data General's lack of a market position in central Michigan is not caused entirely by the myopia of the Detroit sales office. First and foremost, Data General



manufactures minicomputers. We need to consider what that means.

You can buy an IBM PC/XT clone for about \$1,000. It will come with a monochrome monitor and two 360 KB floppy drives. For another \$1,000 you can have an AT clone with a color monitor and a 20 MB hard drive. This means that a small business can computerize in stages, acquiring one or two machines at a time over several years. When the time comes to move up to a local area network, the job can be done for less than \$5,000.

The question that needs to be answered is this: At what point does it become effective to take a long-range view and buy a minicomputer now, instead of slowly adding PC capability? The question is complicated further when you consider that Apple Macintoshes are about twice as expensive (and twice as powerful) as IBM-PC/XT/AT clones while the Atari and Commodore machines are about 25 percent cheaper (and more powerful) than the Intel 80xxx computers. Of course, the hardware is nothing without software. Many more companies create systems for IBM, Apple, Atari, or Commodore hardware than for Data General environments.

Furthermore, Data General training is hard to come by. Like Hewlett-Packard and Digital Equipment Corporation, Data General does not provide training in Lansing; you have to go to Detroit. However, you can learn spreadsheets, database management, word processing, and desktop publishing in an IBM-PC or Macintosh environment at several places in town.

There are many other factors that come into play. Color monitors are state-of-the-art. How many DG sites have color monitors? People have quirky reasons for preferring one spreadsheet over another. How many spreadsheets run on MV machines?

When a small business makes a decision to acquire or upgrade computers, these facts tend to point away from Data General.

This is too bad, too. No one can touch DG when it comes to hardware performance and reliability. DG field service is unsurpassed. A PC-based local area network configuration requires an investment in hardware and software between \$10,000 and \$50,000. Data General needs to ask itself if it can make a profit in that market. △

*Michael E. Marotta is a systems analyst with a decade of experience on Data General and other equipment. He specializes in creating user manuals.*

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# Does DG value small businesses?

## One single-CPU site manager doesn't think so

by Randall Berndt  
Special to Focus

The first draft of this article was much more negative than the one you are reading. I was pretty mad at DG, and wanted the people there to know it. Since then, I have spoken with other users, and I realized some of the anger was caused by the way DG presented news of recent policy changes to its customers. My concerns would remain no matter how the issue was presented, but handling the communication better would have helped me understand why DG took the steps it did.

Several events have caused me concern about my long-term commitment to remaining a DG customer: 1) the change in policy concerning SPSA and SSS for AOS/VS, 2) the decision concerning re-licensing (and the repaying of license fees) for enhancements to software, and 3) the STRs filed on CEO Rev 3, concerning programs aborting because they could not find a hostname.

### SPSA and SSS for AOS/VS

I recently received a form letter from Frank Kenney, of DG, explaining several changes made to DG's Software Subscription Services. The letter describes the new "Right-To-Copy" option for SSS, and gives descriptions of the *price savings* (emphasis mine) to be obtained by this change. However, the next-to-last paragraph of this letter is, to me, the most important. It explains the fact that SSS for AOS/VS and

DG/UX will no longer be available unless at least one CPU has an SPSA agreement for DG/UX. This means that a company like mine, which has only one CPU, is forced to switch to SPSA, or to rev-lock its system. This seems to be an example of an emphasis at DG on the short-term view. DG is offering a discount for the first year of SPSA. Sure there is a discount on the first year, but what about all the other years? If I don't want the product anyway, why should I be happy that only the second and following years will cost me more than I want to spend?

Past experience with DG has convinced

A company like mine, which has only one CPU, is forced to switch to SPSA, or to rev-lock its system

me that the switch to "SPSA first CPU/SSS following CPUs" for VS will be followed by a switch for the remainder of the software products. The re-licensing of enhancements to software, specifically the CEO Rev 3/CEOwrite mess, is a good example of this "try one, then do them all" attitude.

The price savings section of the letter describes the cost savings for an MV/2000 shop with CEO and ICObol on SSS. The cost would be reduced from \$1,065 per year to \$746 per year. This analysis, however, skips the costs of switching to SPSA for VS. Since those figures were not included, I can only estimate from past

experience that since SSS has usually been slightly more than half the cost of SPSA, once the SPSA costs are factored in, the MV/2000 user would be facing a net *increase* in cost, not a decrease.

### Re-licensing enhanced products

I recently learned from conversations with some DG people that DG is standing by its decision to consider AOS/VS II (otherwise known as VS Rev 8) a separate product and to charge current customers a re-licensing fee to obtain the product.

DG has said that the previous revisions of products will remain "fully-supported." I think there will be some disagreement as to the meaning of this phrase. From all appearances, once you decide not to upgrade on a core product, you will quickly find yourself unable to take advantage of enhancements to other products, since those products will only work with fully upgraded systems. XTS seems to be an example of this. In my view, those who remain at a previous revision will not be in "full-support" mode, but rather "bug-fix" mode on the core product and will find themselves rev-locked to older, less-featured revs of other products.

While I agree that DG has the right to set its software policies as it sees fit, I also believe that it has an obligation to honor its past commitments. I paid SPSA fees for two years, and am paying SSS fees now, because DG presented SPSA/SSS as a way for customers to obtain the most recent revisions of software in a manageable, budgetable fashion. At the end of the game, DG is trying to change the rules. I have been paying these fees all along, and have been waiting for the new revisions. Then, after DG has accepted the fees, they turn around and tell me I must re-license the new revisions. Had they sent Rev 8 out,

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## FOCUS ON: SMALL BUSINESS



and then said "This is the last major revision to be included in SPSA/SSS," I could make the decision to remain on SPSA/SSS or to wait and re-license the next major revision. I would then be in the position of having received what I believe I paid for.

This same situation occurred with CEO Rev 3/CEOWrite. While I was an SPSA

Since Data General  
is removing a  
significant portion  
of the value from  
SPSA/SSS by  
removing the access  
to new revisions,  
it would seem only  
reasonable that  
DG should lower  
the cost for all  
SPSA/SSS  
customers

customer, I sent in quite a few enhancement requests for word processing, as did many other SPSA/SSS customers. Rev 3 of CEO was released but the enhancements were done to CEOWrite. CEO Word was declared a dead product (no future enhancements), and yet all those SPSA/SSS customers of CEO (which included the word processing function) will have to license CEOWrite (and pay the license fee) to obtain the enhancements they paid SPSA/SSS fees to receive. There is something wrong with that scenario. DG's argument was that we had paid for CEO Word, and that we were not entitled to CEOWrite because it is a separate product. What I believed when I sent those checks to DG, was that I was providing funds for ongoing development by DG of new revisions of the CEO system, including the word processing function, whatever its name.

There is another aspect to this problem. Since Data General is removing a significant portion of the value from SPSA/SSS by removing the access to new revisions, it would seem only reasonable that DG should lower the cost for all SPSA/SSS customers. Instead, through a combination of forcing SPSA on single CPU sites, and adjusting costs based on processor

size, the cost of SPSA/SSS is going to be higher for a lot of customers.

During a conversation with a DG employee prior to the AOS/VS II announcement, he used a phrase that stuck in my mind. He said that DG had "gotten away with it" on CEOWrite, and that he expected the policy to remain in force and expand in scope. That prediction, unfortunately, has come true.

### CEO rev 3 and the hostname problem

I read with great interest the STR history on CEO rev 3. Several programs had to be patched because they would abort when they could not find a hostname. For those of you to whom the term hostname is unfamiliar, let me explain. When you generate a network, each computer in the network is assigned a unique name to identify it. This is the hostname. When you run a CPU that is not networked, it is impossible to generate a hostname.

What astounds me is that DG Quality Control evidently did not test the CEO product on a non-network machine, even once. That seems to indicate that customers who only own one CPU are not considered valuable enough to include in the beta test group.

### The upgrade decision

It is apparent to me that DG's attitude displays a lack of concern for the small, single-CPU sites. To the argument that these sites should be served by VARs, I can only respond that I bought my machine directly from DG, not from a VAR, and DG expended a lot of effort at the time of the sale to convince me that it wanted me as a customer.

I had planned on upgrading my MV/4000 to an MV/15000 Model 8 in a couple of years, but that plan is now in serious trouble. I am investigating a PC-network to completely replace the DG system when the MV/4000 is fully amortized. I don't want to get rid of my MV. I love the things I can do with VS, and the machine runs well, but the corporate attitude I think I see makes it difficult for me to consider DG as a long-term partner. I realize that the loss of one 15/8 sale would not make a major difference in DG's financial status, but then again, maybe others out there are facing the same painful decisions I faced, and are also re-thinking their purchasing decisions. Δ

*Randall Berndt is Data Processing Manager for the American Urological Association, Office of Education, and NADGUG Software Librarian. He has worked with DG systems since 1977.*



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# DG wants small business customers

Software Business Unit manager affirms company's commitment to all of its customers

*One piece of fallout from DG's recent policy changes with respect to software versioning and support is the suspicion, which has been voiced by a number of users at smaller installations, that Data General no longer cares about their business. Focus decided to put the question directly to Frank Kenney, the manager of DG's Software Business Unit.*

**Focus:** Some of our readers say they feel that Data General is losing interest in small business customers. They believe that DG is concentrating on major accounts, and leaving sales to smaller customers to the VAR channel. Is their perception accurate?

**Kenney:** No, not at all. Data General wants to keep all of its existing customers, regardless of how big they are, as well as acquire new customers. I don't think anything in our policies or procedures would point to any other conclusion, and I certainly don't think our software restructuring would either. The overriding purpose behind the changes in our software support policies was to increase the level of support by offering users the choice of staying with the earlier version of AOS/VS. This is something we never offered before, and it's probably something that is especially attractive to smaller sites.

**Focus:** But some smaller customers believe that the restructured policy regarding Software Subscription for AOS/VS discriminates against them. Now at least one CPU at each site has to have an SPSA agreement, which is more expensive. They say this will force single-CPU sites to either pay more for software support, or rev-lock their system. Do you think the new policy discriminates against smaller customers?

**Kenney:** No, I don't. In fact, just the opposite. The primary reason for the changes was to increase Data General's level of support for the product, and at

the same time provide the customer a choice of whether they want to upgrade to a new version of the software, and if they chose to go to a new version, to do it in their own time frame. Typically the smaller users don't have the support capabilities of larger customers, and they probably need the increased level of support. In the case of AOS/VS, it is required to have SPSA, but that increase in cost, which I don't think is a great deal, allows us to provide the necessary level of support.

**Focus:** Will this policy be extended to other software products?

**Kenney:** We have no intentions of removing SSS and requiring SPSA for other products. We offer SSS for all the other products, and the Support Plus requirement for AOS/VS was because of the sophisticated nature of AOS/VS and the support costs we have to incur because of that.

**Focus:** What about software support for customers who bought their system through a VAR? Will they have to pay subsequent license fees, rather than taking advantage of the VAR's right to copy? If so, won't that make it expensive for the



customer and/or VAR to keep their systems at current revision levels?

**Kenney:** Remember, our licensing policies are the same as they were before the restructuring. What has changed is the support policy. If we have a support transaction with a VAR and the VAR wishes to keep his customers updated, he can do that via the right to copy option under Support Plus (another name for the same thing is Additional System coverage). Now, what the VAR chooses to charge his customers for keeping them up to rev is purely up to the VAR. The other case is when the support transaction is between the end user and Data General, but the same rule applies.

**Focus:** Well, let's take a situation where a customer bought multiple systems from a VAR, and was paying for support through the VAR. If the VAR pays the upgrade fee for AOS/VS II, can he then use the right to copy option to upgrade his customers?

**Kenney:** Again, you have to separate the licensing from the support. The customer can still license his software through the VAR by means of subsequent licenses. Then he has the choice of support: does he want it, and who is he going to get it from? If he gets it through the VAR, the VAR will have his own support agreements with Data General. When a new revision of AOS/VS comes out, the VAR will be entitled to it under his SPSA. If the VAR also has Additional System coverage, he could update his customers with that. The Additional System coverage costs 10 percent of the E class SSS price, so in this case it would be \$160. COBOL is \$47, Sort/Merge is \$33, CEO is \$260.

Quite frankly, this is a confusing area, and people are having trouble understanding the changes in the policies. We're not trying to hide or misrepresent the program. We want to do everything we can to help people understand it, and then address any issues they have after that. If a VAR customer is having trouble figuring out their support options, we'd encourage them to talk it over with their VAR. If it still doesn't make sense, they could take it up with system engineering in their area.

**Focus:** The introduction of AOS/VS II caused quite a stir, especially among smaller customers. They seem to feel that

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- EDI — February 28, 1989
- Business & Analytical tools (SAS) — March 28, 1989
- Data General night — April 25, 1989

L.A. EDGE meetings are held at the Brookside Country Club, in Pasadena, California. For more information contact Doug Reimer at 213/582-5203 or Bill Pearce at 213/618-9905.

**Late Flash: January 24, 1989 is the First Annual L.A. EDGE West Coast Supermini Data General and DG Compatible Hardware Exhibit. Admission to the exhibits is free! Due to the Focus mailing schedule, you may receive this issue before the show takes place. If you do, be sure to attend!**

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DG is not providing what they expected from their SPSA/SSS agreements. They say they paid for SPSA/SSS in order to get the most recent revisions of software in a manageable, budgetable fashion. They expected to receive AOS/VS rev 8 automatically, and they say DG's decision to treat it as a new product with a separate license fee amounts to changing the rules at the end of the game. Did you expect that kind of reaction?

**Kenney:** Any time you change a policy that's been institutionalized over the past 20 years, you're going to have varying degrees of acceptance of that change. Because we have a new policy with respect to versions of software, we have a new communication problem. As new versions and revisions are planned, both our customer base and Data General will get better at asking questions like, "Is it going to be a new release or a new version? What's the expected cost?"

Specifically on that AOS/VS I to AOS/VS II change, I'm surprised that small system users would react negatively to that. AOS/VS II is going to require a substantial increase in the system capacity and a great deal of systems engineering work to install. If we hadn't offered people the choice of staying right where they are with Data General continuing to support them—which is a big change, because we never used to do that—then these people would have had to upgrade their systems whether they wanted to or not in order to get continued support from Data General. Many people, both large users and single CPU sites, had indicated to us that that was not what they wanted to do. Or even if they did want to take advantage of the New File System in the future, they didn't want to be forced to do it right now.

They wanted us to prove to them that we would support AOS/VS I. In that context, we've actually staffed up a separate group just to do the maintenance. Over the past year a number of STRs have been answered with, "Fixed in the next rev." Now we have to demonstrate to people that we are going to fix those problems in AOS/VS I. In fact, we have two revisions already planned. One is in January and another in June or July. We're actively supporting AOS/VS I with fixes, and we're committed to that.

**Focus:** The DG Users Group in London has staunchly advocated the idea of providing continued support for older revs of AOS/VS, so they certainly appre-



ciate the idea of offering users a choice of staying with AOS/VS. Yet they're very upset about having to buy a new license for AOS/VS II. In fact, their group is making a blanket recommendation against upgrading to AOS/VS II. Do you have any kind of a response for that?

**Kenney:** I think one of our major goals with this restructuring is to meet this group's requirement that we continue to support older versions. That gives them the choice of whether or not to go to AOS/VS II. We have special discount programs to soften the impact of the license fee. It's then primarily a technical decision: they have to weigh the benefits of the new version against the cost of getting the new license, just as they would for any other purchase.

**Focus:** Returning to the concerns of some small business users, is DG testing its software for single-CPU sites? CEO rev 3.0, for example, passed quality assurance despite a problem that would have been spotted quickly during testing on a small system. It would abort if it couldn't find a hostname—but unless the CPU was part of a network, it was impossible to generate a hostname.

**Kenney:** The testing process, in terms of the number and type and characteristics of the environment, is almost unlimited. We do both single and network testing on products like CEO. My information is that the specific hostname issue that you refer to was just flat out a bug that was not discovered in the process. It doesn't in any way mean that the process is nonexistent or inadequate. This problem has been fixed in CEO rev 3.02, which is currently shipping.

**Focus:** Some smaller customers say they are exploring PC networks as an alternative to their DG systems. How serious do you consider the competition from PCs?

**Kenney:** Users are faced with more and more options. It's going to require a lot more analysis to determine what the optimum set-up is to solve their specific problems. It's better for them to have so many choices, because they can get a more satisfactory technical and economic answer to their problems. As standards are emerging, Data General is responding with products, and we expect to continue to provide viable solutions. Δ

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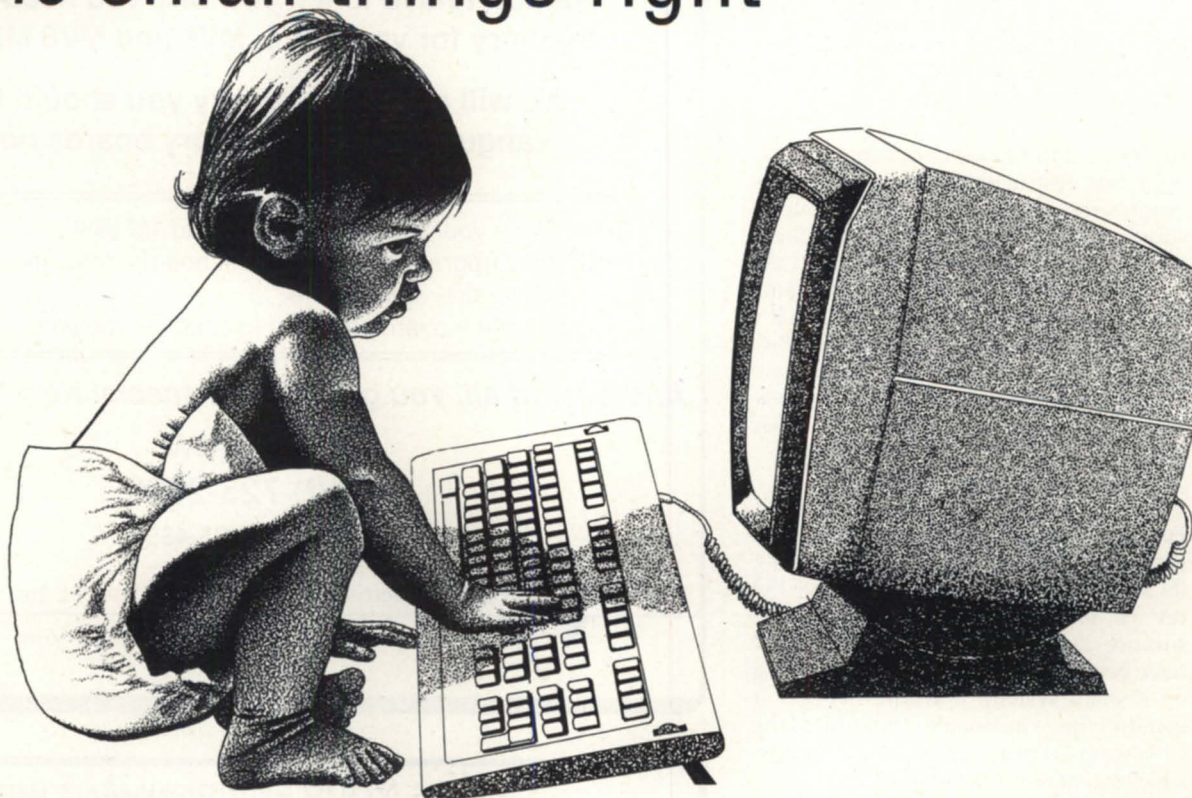


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# Get the small things right



## Developing software for small businesses takes care

by Kim L. Medlin and Doleen Wilbur  
Special to Focus

Today, most businesses—including small businesses—depend on computers and computer software to perform a broad range of tasks. Those tasks may include:

- maintaining account information
- processing daily business activities
- projecting business trends
- designing new products
- processing words
- communicating with other computer environments.

All of these types of applications are run in both personal computer and mainframe environments.

Small businesses, in particular, demand a lot from each software application. Be it financial, manufacturing, engineering, or word processing, the small business user

expects software to:

- meet the current needs of the business
- be easy to use without lengthy training
- be fully documented
- be developed with future growth of the business in mind.

### Specify the application

At Data General's Software Products and Services Division (SPSD), software development is a full-time business. To develop a packaged software product or custom software application, the first step is always to specify what the application will do. This step is critical to the success of the application and to the budget of a small business.

Most small businesses will initially search for an "off the shelf" software package, rather than buying a custom program, because of the cost savings. But when a company's specific software needs cannot be found in a standard package, then custom software is a viable solution.

Small businesses want applications to be installed and operational in the shortest possible time. Despite the time pressures, the developer can't afford to be lured into cutting corners on the design side of the project. To develop a successful software application, it is always es-

sential to get it right at the drawing board before programming begins.

The application specification process has far-reaching consequences for the eventual success of the project. For example, consider how your estimates of the cost of the development effort would be affected by an incomplete specification. The more complete your design is, the more accurate your estimates will be. Remember also that small business clients are especially sensitive to cost issues—and especially likely to be upset by unanticipated costs. An accurate estimate can provide them with essential information for modifying the specification if need be.

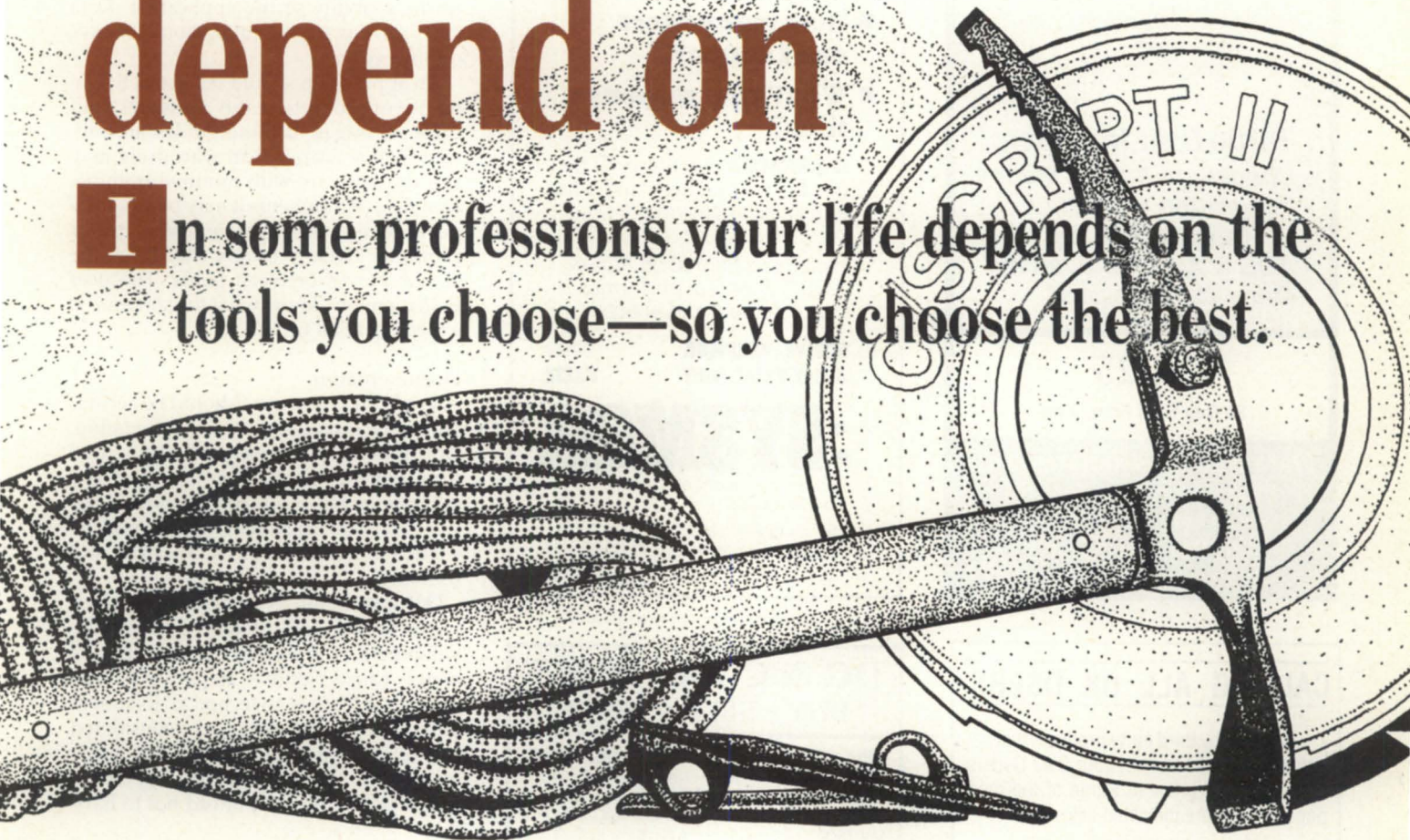
### Ease of use

During the design and development of an application, the ease-of-use factor is an important consideration. Small business users may not have the time for extensive training. By keeping the application's operation simple, you may make it possible for the user to literally "log on and go."

Menu options should be logically grouped, much like a table of contents, so the user can find them easily. An application should flow logically from the beginning to the end.

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Screen design is important to the human aspect of the application. In much the same way that the use of white space lends to the readability of a printed page, a well-designed screen layout contributes to the usability of the application. Data entry screens, in particular, should be easy on the eyes.

An application should be instructive in its use of prompts, status messages, and error messages. If these guides are presented in a clear, logical way, users may run the software with minimal training. In some environments it may be advantageous to reserve a separate screen line for prompts. These prompts change as the cursor moves between fields. The user will, therefore, know what the software is expecting at all times.

### Documentation

Application software should be accompanied by thorough user documentation. Documentation serves as a learning tool for the novice application user and as a quick-reference guide for the more experienced user. Documentation should be written with an emphasis on clarity and usability.

Documentation is critical for a small business that does its own software development. The loss of a key employee could cause serious negative consequences if there is no technical documentation. (Documentation can be considered a type of insurance. You may not really need it until the unexpected happens, at which point you can't afford not to have it.)

### Develop with growth in mind

One thing that is certain in a small business environment is change. Software needs will increase as the business grows; application software should be designed and developed with that in mind. Moreover, program maintenance and enhancements are easily handled when program code is well documented and adheres to tried-and-tested standards.

Successfully developed application software provides a foundation for the growth of the business as well as the application. △

*Kim L. Medlin is Software Project Manager for the Commercial Software Development Group of Data General's Software Products and Services Division (SPSD). Doleen Wilbur heads the Technical Writing Group of SPSPD. They can be reached at Data General, 3617 Parkway Lane in Norcross, Georgia 30092; (404)448-6072.*

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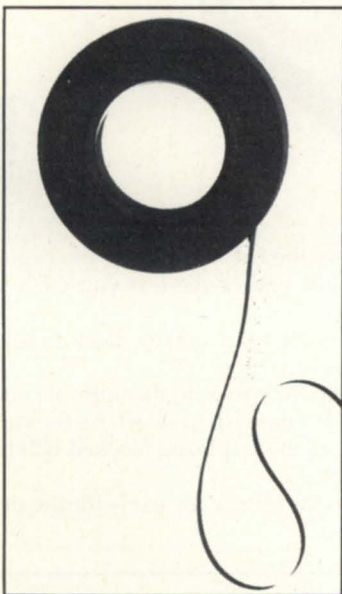
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or call 713/665-7500. (MV/2000 and MV/1400 users should send one tape cartridge.) Software contributions should be sent to the same address. Be sure to include your membership number.

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

Please include a self-addressed envelope with sufficient return postage. In compliance with postal regulations, do not date the postage, 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.

### Big Brother

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

### B.J.'s BBS contributions

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

### CRTEDIT

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

### DBCHECK

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

### DUMpload

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

### ERP

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

### FILEMGR

With this new version, you can move, copy, delete, view, and perform several other options faster. This is distributed as shareware. If you try it and continue to use it, you are requested to pay a registration fee. From Kim Geiger. 459 blocks.

### FTNCVT

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

### Games

Games is a collection from various places. Enjoy. 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. 416 blocks.

### IMSLUTIL

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

### JAG\_UTIL

JAG\_UTIL consists of several programs:

Filecount, Userspace, Scan, and Laminate. 1,501 blocks.

### Kermit

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

### Logout

Another auto log-out system. 246 blocks.

### Look

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

### Macbook

This is a collection of macros from the Colorado users group. 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. 492 blocks.

### Misc Kerm

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

### QHelp

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

### SKLSCRN

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

### Softrans

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

### SWITCHES

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

### TEX 2.25

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

### VT100KER

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

### Xfer

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

# A chip off the WordPerfect block



Educated use of this valuable tool increases productivity

by Steven L. Weitzel  
Special to Focus

WordPerfect's Block feature is simple to use and fast. It allows users to execute

specific features on selected portions of text. For example, the user may: print a single paragraph rather than the entire document, run a macro only on a select number of lines of text, identify specific words in the document to be underlined or changed to bold, or cause the Search feature to be limited to a select number of paragraphs.

Four basic steps are used in implementing Block:

1) Move the cursor to either the beginning or the end of the text you wish to define.

2) Press the function key Block to turn Block on.

3) Move the cursor to the opposite end of the text you wish to select. As the cursor moves, the text being blocked will be highlighted.

4) Select a feature for use with the defined text.

Figure 1: Executing Functions with Block

Function	Key	Description	Function	Key	Description
Bold	F6	Prints block darker.	Move	CNTL-F4	
Block Protect	SHFT-CNTL-F8	Protects block from a soft page break.	Append		Adds block to the end of a disk file.
Center	SHFT-F6	Centers block between left and right margins.	Copy		Copies block to another file.
Define Macro	CNTL-F10	Macros may be defined while in block.	Cut		Removes block from the document.
Delete	DEL	Deletes block.	Cut/Copy Column		Moves or removes a column of text that has been defined by tabs, tab aligns, indents, or hard returns.
Delete Right	C1	Deletes block.			Prints block.
Flush Right	SHFT-CNTL-F6	Aligns block against right margin.	Print	SHFT-F7	Searches block for the given item and replaces as instructed.
Go To	SHFT-CNTL-F11	Moves cursor while in block.	Replace	SHFT-CNTL-F2	Displays reveal codes screen. Rewrites block.
Mark Text	SHFT-CNTL-F5				Saves block to a file.
Index		Marks block for inclusion in an index.	Reveal Codes	SHFT-CNTL-F3	Searches block for given item.
List		Marks block for inclusion in a list.	Rewrite	CNTL-F3	Checks spelling for block.
Redline		Block will be printed with vertical bar in the left column.	Save	F10	Converts block to superscript or subscript.
Strikeout		Block will be printed with dash through each character.	Search	F2	Underlines block.
Table of Contents		Marks block for inclusion in a table of contents.	Spell	CNTL-F2	Converts block to upper or lowercase.
Table of Authorities		Marks block for inclusion in a table of authorities.	Super/Subscript	SHFT-F1	
			Underline	F8	
			Upper/Lowercase	SHFT-F3	

When the Block key is pressed a "Block on" message will begin blinking on the status line. This message indicates that you are now ready to define a block. [Block] is also placed in the Reveal Codes screen at the position where Block was turned on.

There are many ways of moving the cursor to the opposite end of the text being blocked. These include all of the standard cursor movements available during normal editing:

- The right and left arrow keys highlight one character at a time as you move the cursor right or left. The (Shift-Right Arrow) or (Shift-Left Arrow) combinations cause all text to be highlighted between the current cursor position and the beginning of the preceding or following word. The up and down arrows cause all characters from the original cursor position to the destination position on the next line to be highlighted.

- The HOME key followed by a left or right arrow key will highlight all text from the current cursor position to the beginning or end of the current line. The HOME key followed by the up or down arrow will highlight all text from the current cursor position to the top or bottom of the screen. Pressing HOME twice followed by an up or down arrow key will highlight all text from the current cursor position to the beginning or end of the document.

- The BREAK/ESC key highlights a specified number of characters in a line, number of lines, or number of pages. This is done by pressing BREAK/ESC followed by a number and then selecting the direction key you wish to repeat.

- The Screen Up (C2) and Screen Down (C4) keys (located on the numeric keypad) will highlight from the current cursor position to the first or last line on the current screen.

- The Page Up (SHFT F11) and Page Down (F11) keys will highlight from the current cursor position to the top of the previous page or bottom of the current page.

- Go To (SHFT-CTRL F11) will highlight from the current cursor position to: a specific character or page, the top or bottom of the current page, a different column, or an original cursor position. Pressing Go To followed by any non-numeric character will cause the system to search from the current cursor position to the end of the document for that character. If the user types an upper case letter then only upper case letters will be searched. If a lower case letter is typed then both upper and lower case letters

are searched. If the character is found then all text between those two positions will be highlighted. If the character pressed is a number then all text between the current cursor position and the page specified by that number will be highlighted. Go To followed by an up or down arrow will highlight all text from the current cursor position to the top or bottom of the current page or column.

When Go To is pressed twice the cursor will return to its position prior to using one of the following features: BREAK/ESC, Go To, HOME and arrow keys, Page Up and Down, Replace, Screen Up and Down, and Search. As an example, if the cursor was at the top of a multi-page document and a Search was performed and the item in question was found on the last page of the document, the cursor could be returned to its previous position at the top of the document by pressing Go To (SHFT-CTRL F11) twice. This could have many different uses when blocking text. As an example, if you highlight text using the HOME and arrow key combinations and then find that you have made a mistake, you could take away the highlight by pressing Go To twice.

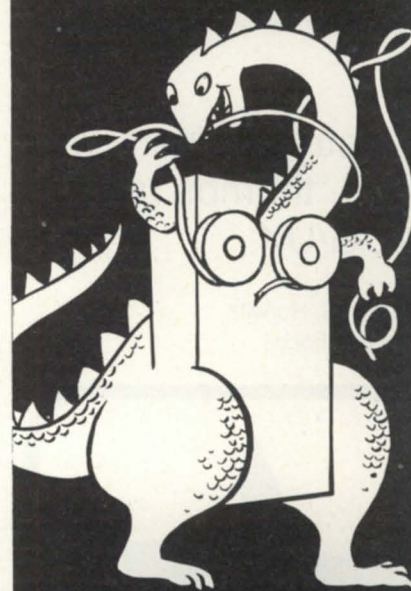
Go To is also useful when your text is in columns. The Go To key followed by a left or right arrow key will cause all of the text from the current cursor position in a column, to the destination cursor position in the next column, to be highlighted. Pressing Go To followed by the HOME and the left or right arrow keys causes all text from the current position to the first or last column of a page to be highlighted.

Once the text is highlighted, the user may select one of the many WordPerfect features. The feature selected will only perform its functions on the text highlighted by Block. The features available with Block are listed in the table on page 38. You will notice that the options on some of the feature menus will change while Block is activated.

Perhaps the greatest benefit of using the Block feature is the increased productivity it allows. Think of the time saved by having the ability to convert an entire page of text to uppercase in a few keystrokes rather than retyping it, search for a word through just three pages of a document rather than all 56 pages, or underline a sentence in a few keystrokes rather than retyping it. These are just a few examples of the possibilities. You will find Block to be an invaluable tool that you will not want to be without.  $\Delta$

*Steven L. Weitzel is a programmer in the Data General division of WordPerfect.*

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# Scoring DG's Unix strategy

## Industry analyst gives "thumbs up" to DG/UX

by Judith S. Hurwitz  
Special to Focus



As the Editor in Chief of *Patricia Seybold's Unix in the Office*, the author recently took a close look at DG/UX rev 4 and DG's overall Unix strategy. This article is based on a review that appeared originally in the November 1988 issue.

There has been a rapid acceleration of the movement towards Unix over the last year. With the Europeans, Japanese, and the United States federal government so strongly behind Unix and standards, most vendors are developing a standards-based product strategy. Because competition will become even more intense over the next several years, it is wise for Data General to strive to present a strong and impressive Unix strategy as quickly as possible.

Data General has done a creditable job with the design and implementation of DG/UX version 4. It adheres to industry standards while innovating in some key areas that are geared to the commercialization of Unix. These innovations are most notable in the areas of I/O and support

for symmetric multiprocessing. Kernel redesign has made the operating system base modular and more efficient.

**Support for symmetric multiprocessing** is very nicely designed and should offer technical advantages for Data General over other competitors in the marketplace. The key strengths include:

- The virtual processor model that effectively controls the use of CPU resources.
- Process management through the use of short-term and medium-term schedulers. This two-level facility significantly adds to the commercial effectiveness of DG's approach to symmetric multiprocessing.

Figure 1: Third party applications with DG/UX rev 4.0

<u>Product</u>	<u>Revision</u>	<u>Vendor</u>
UNIFY	4.0	Unify Corp.
ACCELL IDS	1.3	Unify Corp.
RM/COBOL 74	2.1a	Data General
BBx Progression/2	1.0	Basis Corp.
UNIBOL	1.0	Data General
WordMarc Composer	36.09.08	Data General
WordMarc Author	36.09.08	Data General
LinkMarc	86.09.0C6	Data General
20/20 Spreadsheet	2.2	Access Technology
IMAGEN Printing Software	2.3	Imagen Corp.
Q-Office	1.95	Quadratron Systems
Xroff	296.03	Image Network
DG/UX BLAST	7.45	Data General
Synchrony	3.50	Sceptre Corp.
Softerm PC	2.10	Softronic, Inc.
PC-NFS	3.00	Sun Microsystems
JAM	3.15	JYACC
Formaker	3.15	JYACC
preVue	2.0	PC Murphy Industries

These third party software products have been successfully tested for operation under DG/UX 4.0.

Absence of a product from this list does not mean that the application will not run, but rather that it has not been tested by Data General.

- Use of advanced scheduling algorithms, an added benefit in helping to make this approach even more impressive.

- The interrupt mechanism, which is well designed for symmetric multiprocessing because it is able to scale to the number of processors and the number of devices being handled.

- The use of virtual processor technology. This has important implications for special-purpose server processes (a key direction in the future of digital numerical control).

- The handling of I/O, especially significant in the large scale end user environment. That all I/O is not handled by a single CPU is a key advantage in a multiprocessor system.

We expect that Hewlett-Packard will develop an approach to symmetric multiprocessing, although to date, no such capability is available. In addition, while Digital Equipment Corporation's symmetric multiprocessing software runs only on VMS and does not perform at the same level of sophistication, DG must assume that DEC will continue to improve its technology in this key area and expect that it will move it to Unix.

The way files are organized and safeguarded is an important factor for commercial applications of DG/UX. This includes:

- Design of a logical file system to allow files (and file systems) larger than the size of the physical media.

- Replication of the system data base as well as the foundation for disk mirroring to provide a high level of reliability and backup. This is a feature that will be of particular interest to commercial data processing organizations.

The modular design of the kernel and operating system itself will position Data General as a credible competitor. Key benefits of the modular design include:

- Isolation of hardware dependencies.
- Ability to pull out parts of the operating system, such as the virtual memory manager, and replace them with new technology that might emerge.

- The streamlined design of the reconstructed kernel, which should greatly improve performance over that of previous DG/UX operating systems.

- New modularity that will allow DG to implement this operating system on new hardware platforms with relative ease. Therefore, scalability is a key feature. That the same operating system can

be implemented on different-sized processors and different architectures is a critical success factor.

- Conforming to a Binary Compatibility Standard for the 88K processors. This makes good marketing sense. In the long term, an Applications Binary Interface would be advisable.

DG needs to distinguish its approach

to virtual memory management from those used by both Hewlett-Packard and IBM. Both HP/UX and AIX allow for users to have transparent access to programs that do not fit into physical memory by swapping segments in and out of main memory. DG's approach allows users to have transparent access to programs that do not fit into physical memory by demand paging on a per page

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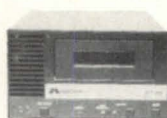
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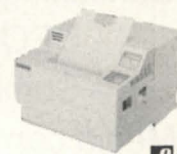
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basis. DG needs to be clear on how its approach is superior to this alternative.

We believe there are several areas not included in release 4 that should be made available either immediately or in the near future.

- National Language Support (NLS). We recommend that DG implement Hewlett-Packard's NLS, which is viewed as a *de facto* standard.

- Support for real-time computing. Traditional Unix lacks this, but it is perceived as an increasingly important requirement. Some of the scheduling and virtual process control features that DG is implementing in DG/UX give it the underpinnings for real time, and DG needs to inform customers about these capabilities.

- User interface. While we understand that X-Windows will be the underlying

networked windowing for DG's Unix, the company needs to develop a standard user interface as well as a tool kit. We expect that X/Open will name a user interface standard in October 1989. DG should comply with the selection, and should consider implementing at least the look of this interface on all its platforms.

**What will it take to distinguish DG/UX from other Unix offerings?** First of all it requires excellence in terms of the operating system itself, service, support, and an awareness that the company is indeed at the leading edge of technology. Once a vendor adheres to these standards, it will face an even bigger challenge: distinguishing itself in the applications software arena. This will be a requirement for survival within the next three to five years. It will happen once there is what we call a level playing field.

In the long run, all vendors surviving will offer the same level of operating system sophistication, the same amount of hardware power, and at least reasonable service and support. So what will be the distinguishing feature at this point? Software! Office and communications software will be what vendors will use to attract and hold on to their customer base within five years. Such software will have to be superbly designed and executed.

As much as possible, DG should offer the same applications on both the proprietary and the standard platform. This will give users freedom to select their preferred environment. Also, it will allow users to migrate to "standards" without forfeiting the applications they need. From a strategic view it will prevent DG from appearing to be two companies with two independent strategies. Providing Simple Mail Transfer Protocol (SMTP) facilities so that Unix and CEO systems can exchange mail is a move in the right direction.

Strengths of DG's approach to applications include:

- Encouraging key applications to be ported to DG/UX, especially in the data base arena.
- Migrating INFOS to Unix.
- Offering industry standard ANSI SQL (a requirement that DG is meeting.)
- Providing assistance to third parties so that they may port their applications to DG hardware (a requirement).

**Our perception is that** Data General intends to have a leading edge version of the Unix operating system for both its proprietary hardware (MV family) and the forthcoming Motorola 88000 series of

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RISC processors. In recognition of the importance of the Intel 80386, Data General intends to have offerings in the market segment, geared primarily to the low end systems market. Therefore, Data General will have a scalable approach to the marketplace, ranging from the 8086 PCs to large scale multiprocessor 88000 and MV systems.

This strategy is workable if the Motorola 88000 family does indeed become one of the industry standard platforms. The 88000 is attractive because it will be one of the industry standard RISC chips. In addition, the 88000 will provide the type of scalability that DG needs.

However, DG should be aware that other RISC chips will also emerge as important standards. For example, Intel has already announced a RISC chip—the 80960. While it is initially aimed at the military marketplace, it will make its way into the commercial arena by 1989. In addition, the full impact of Sun's SPARC chip has not been fully realized. In brief, the 88000 will not be the only game in town. While it is wise for DG to use the 88000 family as its standard platform for the future, it should remain flexible, and recognize the potential of another technology that may prove even more promising. Simply put, it is best to have an open mind, and the portability of DG/UX allows for this.

Keeping the proprietary MV hardware available also makes sense in terms of protecting the company's existing customer base. Data General has earned its reputation for reliable hardware. It should continue to support low-end PCs based on the Intel 8086 and 80386 chips. The 80386 will become increasingly important as OS/2 emerges as a low-end solution for multitasking applications (both stand-alone and in local area networks). Over time, the 80386 will become the de facto desktop machine. Therefore it is appropriate that DG implement both multiuser and server products based on the Intel 80386.

Another important role for these processors is as servers for local area networks. DG should support these servers in its overall strategy. For example, DG would be wise to support LAN Manager both in the OS/2 arena and LM/X (the HP/Microsoft Unix version of LAN Manager). With the power of DG/UX to sup-

*Judith S. Hurwitz is editor in chief of Patricia Seybold's Unix in the Office. For more information, contact her at 148 State St., Suite 612, Boston, MA 02109; 617/742-5200.*

port specialized servers, the support for low end servers should be a fundamental part of its overall strategy.

With the announcement of a high quality Unix operating system with many advanced features, it is important that Data General take steps to make its presence felt in the standards arena. If DG is too cautious it will miss an opportunity.

DG must be bold in its approach to the Unix standards environment. We were surprised to learn how much effort DG has been putting into Unix over the past several years. I believe that the rest of the industry shares this surprise. By focusing attention on some of the areas where DG has superb Unix technology, DG could establish itself as a first class Unix vendor. Δ

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# Creating an environment

## How to customize directories for new Unix users

by John Huddleston  
Special to Focus

Two new people arrived in our office during the last year. Their previous experience had been with mainframes and microcomputers, but not with either Data General equipment or Unix operating systems. They had many of their own ideas about how their computer environment should be set up, and they asked a lot of questions. I loved it! It was a quick way to show them, "Sure, we can do it." How we actually did it is the subject of this article. Although we operate under MV/UX, all the examples used can be applied to either MV/UX or DG/UX.

### Functions operate without disk I/O

One problem the new staffers encountered was how to change directories without typing in the long pathname with the `cd` command. The obvious solution is to use a shell script to move the user into the requested directory. Upon leaving the shell script, however, the user is returned to the original directory. The execution of a shell script spawns a new process, and only those variables that have been *exported* will carry over into the new environment. Once the shell script has completed execution, the user returns to the calling process. For MV/UX users this is equivalent to the PUSH and POP commands in CLI (but these commands do not spawn new processes).

An alternative solution is to use functions, which can be assigned directly from the Unix command line, or entered in the `.profile` for quick startup. No new process is spawned and any changes made with the function remain in effect in your environment. Since functions are stored in memory, once you log off, the functions will disappear. On the other hand, because they use memory, there is no disk access and their execution is faster. If you

Figure 1: Change directory function

```
1  chdir ()
2  {
3      cd $1
4      PS1="pwd"> "
5  }
```

Figure 2: Adding error checking

```
1  wss ()
2  {
3      if test $# -gt 0
4      then
5          if test -d /udd/wss.$1
6          then
7              cd /udd/wss.$1
8          else
9              echo "/udd/wss.$1 does not exist"
10         fi
11     else
12         echo "No WSS code specified"
13     fi
14 }
```

Figure 3: Enhancing the startup file

```
1  set "who am i"
2  set S*
3  case "$2" in
4  tty44)
5      TERM=4105
6      EXINIT="set showmode magic scroll=14"
7      ;;
8  *)
9      echo "Please enter terminal type \c"
10     read TERM
11     case "$TERM" in
12     4105)
13         EXINIT="set showmode magic scroll=14"
14         ;;
15     *)
16         TERM=605x
17         EXINIT="showmode magic scroll=12"
18         ;;
19     esac
20     ;;
21 esac
```

type the Unix *set* command, it will list all the variables and functions in your environment.

Two sample functions in Figures 1 and 2 can be added to the bottom of your *.profile* file. In the first example, MS-DOS users will recognize the change directory command (*chdir*). It has an additional feature in that the user prompt is changed each time *chdir* is used to change directories. The prompt becomes the directory name. The only caveat in the use of *chdir* is that if you make the mistake of using the *cd* command, your prompt will keep the name of the previous directory name although you may now be in a different directory.

**Due to the flexibility of the Unix system, users are not required to use Data General terminals**

Figure 2 shows how you can include additional logic in your functions to check for user errors. The first check verifies that the user has passed an argument. If no argument has been passed then a usage message or a warning message may be printed. The second check verifies that the user argument is a directory. If it is not, then it prints out what the user typed with a warning. Finally, if it passed the first two checks, the user's directory is changed to the new one as requested. On the system where this function is operational, there are 12 users whose names start with "wss." and end with two code numbers representing their state. The *wss* function makes it easy to change to their directories.

**Intelligent processors**

Due to the flexibility of the Unix system, users are not required to use Data General terminals. Many different terminals can be used for graphics, word processing, desktop publishing, etc.

As users log on to the system, the file */etc/profile* executes its commands and then executes the users' *.profile* in their home directory. This startup file can be enhanced to provide intelligent processing.

Figure 3 shows how *set* can be used to determine which port is being used. Once that determination is made, the EXINIT variable can be assigned for use with the *John Huddleston is a computer systems analyst with the USDA Soil Conservation Service. He can be contacted at P.O. Box 4611, Portland, OR 97208; 503/221-2843.*

*vi* editor. If the user is logging in from a modem port or from a different terminal, the user is prompted for a terminal type. A case selection process then determines the appropriate assignment.

**Summary**

The Unix user's startup file (*.profile*) can be enhanced with intelligent processing and functions to provide a quicker startup

and additional commands that are meaningful to the user. The *set* command can be used to parse the port from the *who am i* command. A case selection process can determine the appropriate action for variable assignments for the Unix environment. Functions added to the bottom of the startup file provide users with names that they can identify and use more readily Δ

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# Network Operating Systems

## Specialized control programs provide file service for PC clients

Over the past few months we've studied PC integration alternatives available to Data General users. This month we'll take a look at some of the options for LANs composed entirely of PCs. That is, networks that don't (necessarily) have a minicomputer attached.

There are five major players in this game: IBM, Microsoft, 3Com, Novell, and Banyan. Each offers a different type of product or "Network Operating System." Now, right off the bat, let me say that I don't like that phrase. We're not talking about operating systems in the conventional sense, and this just adds to the confusion, but the idea of a network operating system (NOS) has become pretty much an industry standard concept.

Since there's no minicomputer, the servers must run on specialized hardware, or, more typically, a high-end PC based on an 80286-, 80386-, or MC68000-family microprocessor. The file server does not need to run application programs; its job is to provide services to "client" workstations. But like any computer, the file server needs a control program or operating system, and the choices (as you might expect) include MS-DOS, OS/2, Unix variants, and "specialized" operating systems.

### MS-Net

At the low-end of network operating systems we have Microsoft's MS-Net, versions of which are provided by IBM as their "PC Network" product, and by 3Com as "3+." Can you guess which underlying operating system is used for Microsoft's MS-NET? That's right, good old MS-DOS. As you are probably aware, MS-DOS is not really designed to be a

multi-anything operating system. For example, if a system call is made to read data from a disk drive, there will be virtually no other activity on that server until the desired block has been retrieved from the disk. There is none of the overlap of activity that is supported by multi-tasking or multi-processing systems. For this reason (and others) MS-NET is inherently slow. In addition, because MS-DOS has virtually no redundancy in its simplistic file structure, any NOS based upon MS-DOS will be lacking in this regard as well.

### OS/2

OS/2, heralded by its creators, Microsoft and IBM, to be the great new solution to all our woes, does address these problems. The multi-processing and multi-tasking facilities of OS/2 will allow true overlap and concurrent services for multiple clients. For this reason, the new "LAN Manager" announced by IBM will be a substantially better product than the older MS-NET based products. Once again, Microsoft, IBM, and 3Com all have products based upon LAN Manager or a derivative.

But OS/2 is still a general purpose operating system, just like Unix or AOS/V. For this reason, the scheduling algorithms are designed with capabilities that far exceed the needs of a network server. Since OS/2 does so much more than is required by a LAN server, as you'd expect, it is also slower than an operating system designed strictly for file service. Vines (from Banyan) and Advanced Netware (from Novell) are operating systems designed strictly for file service. They are, therefore, the superior products for this purpose.

Let's spend the rest of this month's column looking at the features of Advanced Netware. In future columns, we'll take a similar look at Banyan's Vines.

### Advanced Netware

Advanced Netware is a network operating system designed to support multiple concurrent users. When the micro-

computer server is turned on, it is Netware, not MS-DOS, that takes control of the server.

Advanced Netware protects network data with several fault-tolerant features. Duplicate directory structures in the directory area of the disk prevent file loss and data mismatching. The initial program load sequence detects problems in the directory and file allocation tables. Read-after-write verification guarantees that data written to the disk is readable.

The Hot Fix feature provides disk media defect detection and correction while the system is running. When a bad block is detected during a write operation, the data is moved to a safe area of the disk, and the bad block is marked as unusable.

The UPS monitoring feature allows Advanced Netware to monitor an uninterruptible power supply (UPS) attached to the file server. When a power failure occurs, the operating system safely shuts the system down. These fault-tolerant features work automatically. They are transparent to the user and do not affect the normal operation of the network or workstations.

**Figure 1:**  
Technical summary of Advanced Netware 2.1

Logical users supported:	100
Concurrent files open per server:	1,000
Directory entries per volume:	32,000
Drives per server:	32
Volumes per server:	32
Volume size:	255 MB
Cache buffers:	1,500
RAM minimum:	1 MB
RAM maximum:	12 MB
Storage capacity:	2 GB

Resource accounting features in Advanced Netware allow organizations to charge for network resource use. Users can be charged for connection time, for bytes read or written to disk, for use of storage space on disks, or for the number

of requests made by a workstation. Rates can vary by the hour or by the day. Supervisors can assign balances and log them off if they overextend their credit limit.

Security features include the prevention of unauthorized access to sensitive network data. A user's access can be limited to designated files, to a specified workstation, and to certain hours of the day. Password restrictions include non-reversible password changes, minimum password length, and limited log-on attempts.

Advanced Netware contains tools for third-party developers: Value-Added Processes (VAPs) and Value-Added Disk Drivers (VADDs). VAPs allow independent software developers or sophisticated Netware users to create server-based applications for Netware networks. Other applications include queue management, network diagnostics, and virtual console.

VADDs allow Advanced Netware to support third-party disk drives. Advanced Netware also supports embedded SCSI disk drives and drive sizes greater than 256 MB.

#### DOS 3.10 and NETBIOS

The vast majority of LAN-based MS-DOS applications are multiuser by virtue of their using the file locking and sharing extensions to MS-DOS revision 3.10 and later. Most data base systems, electronic mail packages, etc., fall into this category. Many people mistakenly believe that these applications use the NETBIOS interface directly.

In fact, Novell Netware implements the MS-DOS 3.10 extensions without the use of the NETBIOS protocol. However, for those who absolutely require it, a NETBIOS emulator can be loaded as an option on any Netware workstation.

#### External bridges

External bridge software permits bridging to other networks. Netware supports two remote bridge configurations: X.25 and asynchronous.

#### System Fault Tolerant (SFT) Netware

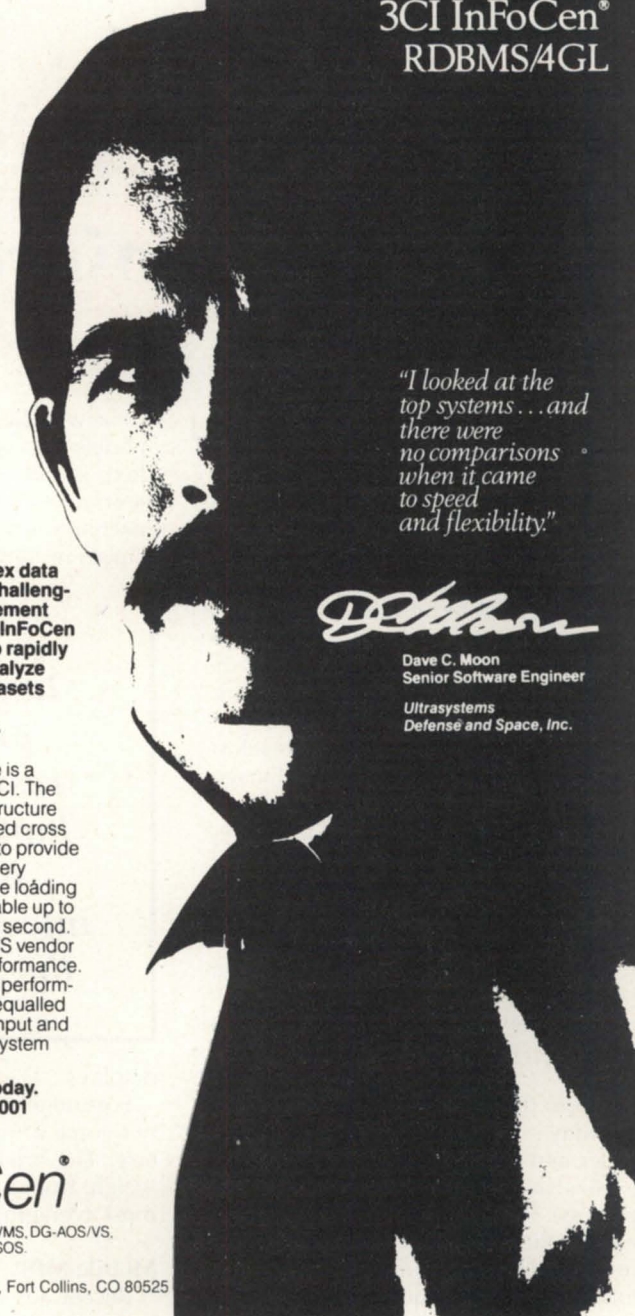
As the need for system reliability increases, Advanced Netware can be up-

graded to System Fault Tolerant (SFT) Netware. SFT Netware delivers the full functionality of Netware while providing the high-level security and fault-tolerant features that meet the requirements of large organizations or transaction processing applications. SFT Netware also includes accounting features that facilitate charging for network use. It is the SFT version of Netware that aims at the price/

performance curve of the minicomputer.

SFT Netware provides insurance against system downtime. With its duplicate directory structures, disk mirroring, and disk duplexing capabilities, it dramatically reduces the impact of network equipment failure. In addition, the Transaction Tracking System (TTS) protects information from being destroyed if a failure occurs during a data base update.  $\Delta$

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*Doug Kaye is a partner in Rational Data Systems. He can be reached at 5725 Paradise Dr., Corte Madera, CA 94925; 415/924-0840. This article is an excerpt from the "Rational Data Systems Report on PC Integration." For a free copy, contact RDS at 330 N. Brand Blvd., Glendale, CA 91203; 818/507-4235. Copyright 1988, Rational Data Systems.*



# Laptop microcomputers

## You can take it with you

by Jim Teed  
Special to Focus

Laptop microcomputers, once used primarily by field technicians as expensive adjuncts to the office PC, are rapidly becoming more than mere satellites of the office-bound computer. With major improvements in portability and computing power, the new models are developing into integral components of Management Information Systems (MIS).

Although the lion's share of the laptop market still belongs to those in the field, significant numbers of desk-bound workers are employing second generation laptops as their only PC. The latest figures from a San Jose, California marketing firm indicate laptop unit sales will increase 36 percent this year, a total that represents 1.4 million machines.

### Laptops: think small

Today's laptops are smaller, lighter, faster, and cheaper (although still not inexpensive)—miniaturization is a costly process). Sophisticated microprocessors, namely the Intel 80286 and the 80386, are responsible for the quantum leap in performance and subsequent increase in usage. The fastest laptops now run at 20

MHz, whereas the clock speed of the first models was 4.77 MHz. And, although there is still room for improvement, the poor screen clarity that plagued earlier machines is vastly improved due to advances in liquid crystal and gas plasma

ing role in MIS possible. In a business climate where timely decisions translate into increased profits, off-site computing offers a relatively inexpensive way for field personnel and management to obtain accurate, up-to-date information.

The laptop can extend the reach of MIS when used as a stand-alone information processor. In addition to processing resident data, laptops swiftly exchange information with the mainframe. For example, a word processing document could be downloaded from the corporate office automation (OA) system, edited on the laptop at home, and returned to the corporate OA.

The Hertz Corporation's "Hertz Instant Return" service uses a two-pound battery operated computer with detachable thermal printer as a stand-alone information processor. When a renter returns a vehicle, a parking lot attendant enters specific data into the computer and, in less than a minute, a rental report is produced. At the end of the day, each Hertz location uploads its data to the main office computer in Oklahoma. In addition to expediting the car return process, the corporate offices use the data collected by the "Hertz Instant Return" service to optimize rental car distributions.

Another company that is successfully implementing laptop computing is the Eaton Corporation. That firm's truck

***In addition to processing resident data, laptops swiftly exchange information with the mainframe***

displays.

Fortunately, these enhancements have not come at the expense of weight and size. The briefcase-sized units range in weight from 8 to almost 30 pounds, with most averaging 10 pounds or less.

### Mobile MIS

Recent advancements in performance and portability make the laptop's expand-

component marketing division uses laptops as portable terminals. Each service vehicle is equipped with a mobile computer and cellular telephone. The laptop electronically transmits reports from the field and probes company data bases for product availability.

The benefits of Eaton's mobile computing program are measurable in increased productivity. Field employees report a 12-

16 hour reduction in paperwork every week, and find they spend fewer hours on time-consuming phone calls. An important by-product—field personnel experience a diminished frustration level.

### Laptop limitations

While the laptop computer's role in MIS continues to broaden, there are obstacles to even greater acceptance. These rough

spots include poor screen readability, low battery life, and nonstandard diskettes, keyboards, and data buses.

Significant improvements have been made in laptop screens in the last two years. The difficult-to-read screens of early laptops have been replaced by liquid crystal and electroluminescent (gas plasma) technology. A new liquid crystal display called page-white has the black-on-white

## DG/One Model 2T

Improvements make this entry a contender in the laptop sweepstakes



By Betsy Zullo  
Focus staff

The DG/One Model 2T is available with a backlit, blue LCD screen (left), or a light-emitting electroluminescent (EL) screen with CRT-quality resolution (right).

More than 40 companies have entered the laptop computer sweepstakes and more are likely to jump in as improved technology makes the units more popular. Data General had one of the first entries, but the original DG/One failed to match DG's high hopes. Most critics blamed lackluster sales of the DG/One on a hard-to-read screen, but it may have been a case of the product arriving before the market was ready.

Last year, Data General introduced its current entry into the laptop market, the DG/One Model 2T. It is a capable machine with a relatively inexpensive base price of \$1,695. (Compare the top-of-the-line Toshiba T5200 at \$9,499.) At any rate, DG appears to be serious about mobile computing, and the continuing evolution of the DG/One makes it a major contender in the laptop market.

PC World recently included the DG/One Model 2T in a rating of what it considered to be the best of the full-featured, battery laptops. As the units were put through their paces, they were tested for memory capability, expandability, portability, design, performance, and value. The 2T did

not fare as well as some of the others, but being among the top 10 still earns it a closer look.

The 2T weighs in at just under 12 pounds, and comes in a 12- by 15- by 3-inch frame. The unit is built around a dual speed 16-bit 80C88 microprocessor that permits a mobile user to choose the speed necessary for specific applications. Options include a 7.16-MHz 8087 math coprocessor. Memory cards can expand the standard 512 KB of RAM up to 2.5 MB, allowing sophisticated programs to be run without sacrificing response times or utility.

### Display enhancements

The DG/One 2T screen is a big improvement over previous models. Recognizing that early laptops had fuzzy, hard-to-read displays, Data General and other manufacturers now offer screens backed by fluorescent light panels that produce crisp, clear images.

The standard 2T unit comes with a choice of either an amber-on-black electroluminescent (EL) screen or a backlit adjustable-tilt liquid crystal display (LCD)

in green or blue. The screens are full-sized displays with room for 25 lines and 80 characters across. The backlighting on the green LCD model provides increased character contrast and can be switched off to conserve power when lighting conditions favor the conventional reflective LCD display. The blue screen uses a transmissive type of LCD technology. This permits the light produced by backlighting to brighten the screen, eliminating the reflection that can make LCDs difficult to read in certain lighting conditions.

The EL screen operates only from external sources such as an AC outlet, automobile adapter, or battery pack, while the LCD version comes with a user-removable internal battery. A quick charger, which rejuvenates batteries in under two hours, can be plugged into a car cigarette lighter and lists for \$95 in the DG/Direct catalog.

Other options available through Data General include external numeric keypad, printer, and modem. The keypad can improve productivity when working with financial modeling software and spreadsheets. It has an inverted T-cursor design to facilitate numerical computations and retails for \$125.

A near letter-quality, ink-jet portable printer is also available. Weighing less than four pounds and measuring just 2 by 10.8 by 6.5 inches, the printer doesn't add much to the size of the laptop—but at \$529 it does add considerably to the total cost.

A 1200/300 bps internal modem can be configured on the DG/One 2T model. The price on this telecommunication hardware is \$400. A Hayes-compatible, 2400 bps modem is also available.

### Ordering information

The DG/One Model 2T is marketed through the Data General Direct catalog. For more information call DG at 1-800-343-8842 or write for a catalog: DG/DIRECT, 4400 Computer Drive, Mail Stop 1D, Westboro, MA 01580-9973. Δ

appearance of a printed page and rivals the readability of cathode-ray tube (CRT) displays. The contrast and brightness of gas plasma displays are on par with desk-bound CRTs but cost more and require much more power.

One major laptop weakness is that it must rely on battery technology. Since this field is progressing slowly, advancements in battery life will come from the reduced power consumption of laptop components—not improved battery products.

Diskette size is another impediment to greater laptop growth. The technically superior 3.5-inch diskette is used in most laptops, whereas the 5.25-inch, commonly known as the "floppy," is used in millions of desktop PCs. Laptop users who routinely exchange data with desktop PCs will confront this nagging problem for several years. An interim solution to the diskette compatibility problem is to connect an additional diskette drive to accommodate different-size disks.

The lack of a standard laptop data bus is still another problem that must be dealt with as the mobile unit evolves. Thou-

***The technically superior 3.5-inch diskette is used in most laptops, whereas the 5.25-inch, commonly known as the "floppy," is used in millions of desktop PCs***

sands of add-in products are available to tailor the functionality of desktop PCs, but the selection of add-in boards for laptops is small because every laptop manufacturer has a proprietary data bus. Without standardization, many board makers

find it unprofitable to produce a board for each laptop manufacturer's small segment of the market. This will become less of an impediment as laptop sales grow.

### Don't fence me in

The major obstacles to greater laptop acceptance are not insurmountable. Significant improvements are being made in laptop power consumption and screen readability. Time will ease the diskette compatibility difficulties and the limitations imposed by nonstandard data buses.

Professionals no longer need to be tethered to their desktop PC or mainframe terminal for essential information. Laptop flaws persist, but they are more than balanced by the advantages of information portability. As the laptop becomes more powerful and the MIS becomes more sophisticated, we will see more laptops in the field, on airplanes, and anywhere else a MIS may roam.  $\Delta$

*Jim Teed is a programmer/analyst with Rockwell International, 555 Discovery Dr., Huntsville, AL 35806; 205/544-0896.*

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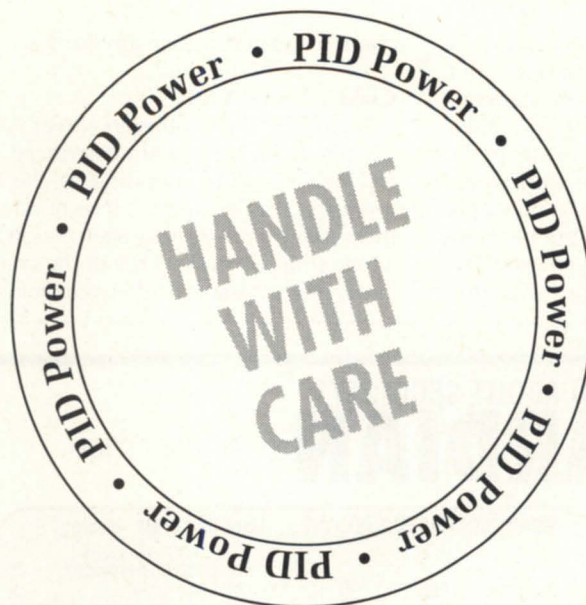
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# PID power

The oft-maligned SMI can be very powerful—and dangerous

Gee . . . it seemed so simple . . .

At one of the roundtable sessions in Philadelphia, a new MV/2000 user wanted to know how to send commands to, and receive feedback from, PID 2 under SMI (System Management Interface). The DG reps had no immediate suggestion, so I felt obliged to share my own solution. The user told me recently that my solution works beautifully and that it should be documented. So, at his suggestion, I am presenting it in this month's column.

In past columns I have noted that under SMI the @INPUT for PID 2 CLI is assigned to a pipe instead of the master console's keyboard. The pathname of this pipe is ".2.INPIPE". Anyone who has write access to this file can send CLI command lines to PID 2. The user's primary concern was how to change default baud rates while the system was up. He needed only two commands:

```
) WRITE/L=:2.INPIPE CX DISABLE @CONXX
) WRITE/L=:2.INPIPE CHAR/DEF/BAUD=YYYY=
@CONXX
```

These two commands are sent to the OP:CLI input file and processed accordingly.

On a standard SMI system, a file called :UP.LOG is built. The OP:CLI @OUTPUT file is assigned to @NULL. (As near as I

Figure 1: PID\_2.CLI

```
push ; prompt pop

?DATE/M/D/Y           ; Comment Sets !string to DD_MMM_YY
string [!string]_     ; Comment Adds underscore to !string
?TIME/H/M/S          ; Comment Adds HH_MMM_SS to !string
string ?[!string].tmp ; Comment !string now has
                     ; Comment ?DD_MMM_YY_HH_MM_SS.TMP

delete/2=ig [!string] ; Comment Make sure it's not there
create/i [!string]    ; Comment Make new one from keyboard
write/l=[!string] send [!pid] All Done!
                     ; Comment This automatically gives
                     ; Comment us /NOTIFY

write/l=[!string] delete [!path [!string]]
                     ; Comment Clean up by deleting .TMP
```

can tell, anyway—it would do no good to have it sent to disk. The file is opened exclusively so you can't read it when you need it, so why waste the disk?)

The factory version of :UP.CLI starts by creating :UP.LOG as the CLI log file. This can be TYPed by the user. The output from PID 2 and also the responses from EXEC are logged here. Thus, if you issued the two commands above, and then did a TYPE :UP.LOG, you could read the whole file. The last couple of lines would be the two commands you executed, and you could check to see if any errors were encountered.

Variations on this theme would allow you to route your responses to other files. For example:

```
) WR/L=:2.INPIPE CHAR/DEF/L=[!dir]:op.out
@CONXX
```

would send the default characteristics to a file called OP:OUT in your current directory, assuming of course that OP has at least append and execute privileges for that directory, or that a previous command had turned superuser on.

There are many ways to send a group of commands as a single command. You could have a macro called PID\_2.CLI (summarized in Figure 1) to build a temporary file and submit it to PID 2. This is probably the easiest and most flexible since it behaves just the same as a QBATCH/I command for a batch job.

I have shown only a few basic ones here. The oft-maligned SMI can be very powerful (and also very dangerous) to a user who knows how to take advantage of it.

Let me give you an idea of how useful this one feature can be. Many of our clients

are set up using the SMI. Every now and then the boss gets annoyed that he can't just tell the user to go to the master console and enter this or that. He then comes and asks if I can think of any problems that might occur if we were to remove SMI from his system. My answer is always the same: "Not really, but it means we would lose our ability to get to PID 2 commands when we dial in." The dis-

cussion has never gone any further.

## Classic VS vs. VS II

Regarding the controversy over AOS/VS and AOS/VS II, I am convinced that DG believes it is operating in the best interests of its customers. It responded to three requests users have been making for a long time: a "frozen" rev of the system, better quality assurance between releases,

and a newer, more flexible file and disk system. The first two items were alternative solutions to the same problem. Almost 100 percent of the users would have been satisfied with only one of the two, but DG has given us both. No wonder we're overwhelmed; we didn't expect it.

Many of the users I have spoken to feel that both the presentation and implementation of the plan were handled poorly. I do not know if this will hurt DG in the long run, but I have seen a certain scenario developing. A number of users are saying they will drop all of their software support and subscriptions, and will purchase upgrade licenses only when there is a significant improvement in the product.

In a way, that is what DG is offering with its versioning policy . . . but with one major variation: DG would still like you to pay for support between releases. Some larger companies may agree to this (after all, IBM has been doing this for decades) but smaller users can't afford to.

It was because of improved technology that many companies were able to buy an MV/4 or MV/2 as their first computer. Many had been waiting years for declining hardware prices to make a software application affordable. Many didn't purchase SPSA or subscriptions because it would have stretched the budget too far. Even with a 70 percent discount as an incentive to move to a new version of a product, a lot of camels with sore backs are going to sit down and stay with what they have.

A lot of small- to medium-size shops may decide that rather than pay a couple kilobucks a year in software support, they will just wait out the periods between releases (make that versions) and pay the upgrade fees.

This should be real good for NADGUG. Everyone who cancels support contracts will need an alternative source for help and information and NADGUG can be that source. We already have a number of mechanisms in place for handling long-term planning and short-term crises. Please don't misread me. I don't want to sound like I am recommending that you go out and cancel your software support. I feel that every shop should subscribe fully; we have chosen not to because we don't feel like taking a pay cut.

Was there a better way for DG to handle this? I think so. Suppose DG had said, "Hey folks, we want to give you the opportunity to stay on good old AOS/VS Classic until the cows come home. Since we won't be adding any new features to it we're dropping the subscription cost from \$1,600 to \$1,300 per year. However, if you

## AOS/VS: WORRIED ABOUT SECURITY?

# GUARDIAN

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GUARDIAN PROFILE EDITOR

User name: DL. Husing

1-Password:		3-Password life:	90	24-Encrypt password:	Y
2-Profile expire:	12-Jul-89	25-Superuser:		26-Superprocess:	N
4-Initial Program:	CLI.PR	27-Use IPC:		28-Use console:	N
5-Initial IPC file:		29-Use batch:		30-Use virtual cons.:	N
6-Initial directory:		31-Use modem:		32-Change password:	Y
7-Default user priority:	2	33-Change priority:		34-Change type:	N
9-Unlimited son processes:	N	35-Change username:		36-Access devices:	N
11-Disk quota (blocks):	500	37-Create w/o block:		38-System Mgr priv.:	N
<b>BATCH</b>		<b>NON-BATCH</b>		39-Access local device remotely:	N
12-Log. addr. space:	-1	18-Log. addr. space:	-1	40-Change address space type:	Y
13-Min. working set:	-1	19-Min. working set:	-1	41-Change working set limit:	N
14-Max. working set:	-1	20-Max. working set:	-1		
15-Def. user local.:	0	21-Def. user local.:	0		
16-Use other local.:	N	22-Use other local.:	N		
17-Other locality:		23-Other locality:			
Time of last logon:	18-Jul-88 08:39				
Last password change:	15-Jul-88 06:40				
Last profile change:	15-Jul-88 13:01				
42-Comments:					

Edit which field?  
"Help line"...

### 1. AUTOMATIC PASSWORD CONTROL

GUARDIAN allows management to set a time limit on each user's password life. At each log-on this limit is checked. If it has expired, the user is notified of the need to change passwords within 7 days. If they do not, the profile is automatically disabled.

### 2. EASY-TO-REMEMBER PASSWORD PHRASES

Knowing users have trouble with random characters, GUARDIAN can create 250,000 password phrases composed of two "5-7" letter English words, with space a valid character, e.g. COWBOY LOVER.

### 3. SET 47 USER PRIVILEGES WITH JUST ONE SCREEN & WINDOW

GUARDIAN replaces PREDITOR with a single profile editor screen. 47 user privileges can be set using any existing profile as a template; default values; or by changing any single menu item.

### 4. CONTROLLING ACCESS BY TIME OR GROUPS

GUARDIAN'S profile editor window can limit a user's access to specific hours, and can assign a user to one of ten groups each of which can be granted or denied access.

### 5. MANAGEMENT REPORTS

GUARDIAN uses a log file to track unauthorized access attempts. Management reports show who has expired passwords or profiles, "super" class privileges, "obvious" passwords, and has not used the system for a specified number of days.

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want to upgrade to this wonderful new system called AOS/VS II with a lot of neat new bells and whistles, fine, but the subscription cost on that will be \$2,400/year because of how much has been added. Take your pick."

One last thing that doesn't add up. In the December issue, DG's manager of the Software Business Unit, Frank Kenney, said that subscription revenues were not enough to support the programming effort to maintain the software and the releases that were shipped. He said there were more than 50 updates sent out to subscription service users between 1981 and 1988. During that seven-year period the average user who bought his system in 1981 would have shelled out over \$9,520 in subscriptions, which works about to about \$196 per update. Then on page 14, he is quoted with the incredible statement, "It probably doesn't even pay for the media that was sent out over that time frame."

If it cost DG over \$200 per tape just for the media they sent out, I would like to suggest they take two courses of action immediately. Step one is to fire the purchasing agent who bought those tapes, provided they can find what country he's in. Step 2 is to call me and buy those same tapes at a 90 percent cost reduction. After a couple years, I'll be able to join that purchasing agent.

#### Mailbag time

Dennis Berman asks: Is there a utility to read COBOL source files and produce a cross-reference of all files used in all programs?

I don't know of any utilities for that specific purpose, but we developed one in-house which reads ICOBOL source files (.CO extension) and finds all active copy statements. It then produces two reports, one by program and one by copy library filename. If all of your files or data bases had corresponding .SL or .FD libraries, then this would give you what you need. The program will compile and run in either ICOBOL or COBOL but a minor enhancement is needed in order to recognize the .COB extension or to disallow an extension. I don't have any plans to implement the latter since I believe every file needs an extension to give a slight hint at its purpose in life. I have been meaning to add a command line switch to allow either

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

.CO or .COB but just haven't gotten around to it for this purpose.

Here is an item from the Land of the Rising Sun. M. Hazelrigg, a director at KLS in Saitama-Ken, Japan, sent in this problem: He is currently using an NEC 98-XA and wants to know if "Data General [can] be useful with this high resolution graphics software?" He is especially interested in "International Networking for a

multinational desktop scientific journal with diverse Russian and Japanese capability with English." Yipes! Here is an application that is well out of my experience. I suspect that there is indeed a way to solve the problem, but I think it would be wiser for me to have someone in DG try to contact Hazelrigg. In the meantime, can any of our readers help him out? Domo arrigato. △

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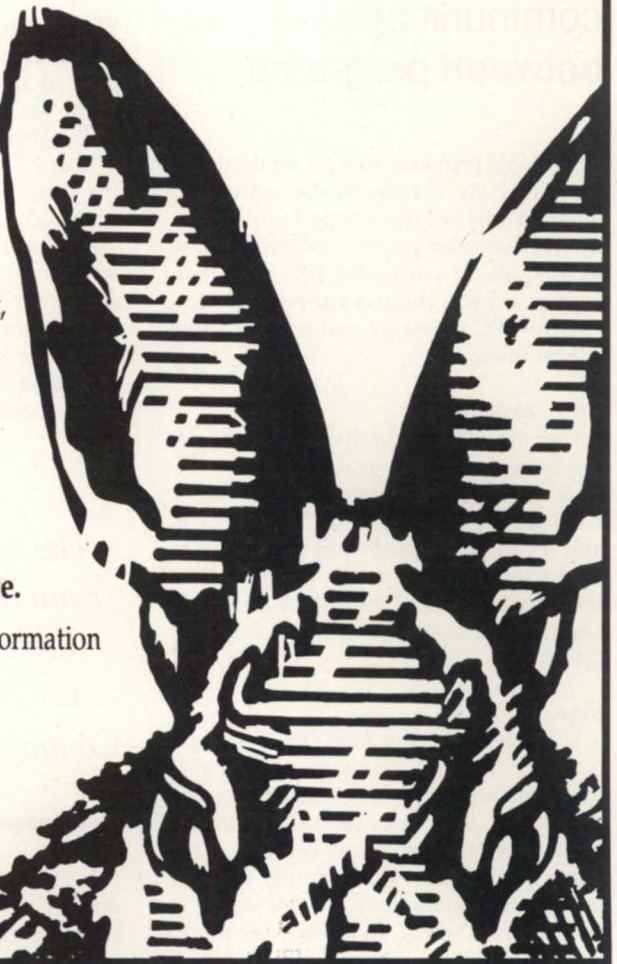


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on

# UNIX



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# The IPC Man Cometh (Part 1)

## There are several routes to communication between programs

AOS/VS provides several methods for programs to communicate with each other. In Part 1 of this article, I will review the various inter-process communication techniques, in particular, IPC messages. In Part 2, I will discuss various practical uses for IPC messages and present a few subroutines.

### IPC messages

The simplest method of communicating between two programs is to use IPC (Inter-Process Communication) messages. Each message can be up to 256 bytes long, and it can be spooled until it is ready to be read by the destination program. The IPC facility incurs some system overhead because the messages are spooled to a disk file.

### Signal

This relatively new AOS/VS technique is faster than IPC messages because it does not access disk resources. On the other hand, it requires careful synchronization between processes because there is no actual message: it simply "wakes up" the task in another process which is waiting for a signal. In a way, it is an extension of the inter-task communication

facility, which only operates within a single process. Signals are sent with ?SIGNL and ?SIGWT to another process (or the same process), which is waiting for the signal with ?WTSIG.

### Shared pages

The shared page technique is relatively easy to use. All of Data General's program development languages automatically generate shared and unshared areas in the .PR file. When multiple copies of the same .PR file (same pathname) are executed, only one copy of the shared area is in memory and within the logical address space of all of the programs. This conserves memory.

The shared page technique can also be used to share a block of memory between two different programs using an intermediate file. Each program does a shared

able to all processes sharing that page, since there is only one copy in memory. Each process that modifies a shared page can notify the other processes of the change via IPC messages or signals.

### Customer/server

This technique is perhaps the most complex and requires a "connection" to be made between a "customer" and a "server" process. Once this connection has been made (?SERVE, ?CON), the server can use ?MBTC or ?MBFC to move up to 2,048 bytes of data to or from the logical address space of the customer into its own logical address space. This is different from the shared page technique in which the data does not actually move. After moving the data to/from the customer, the server can use IPC messages or signals to notify the customer that the data has been delivered/taken. This technique allows more data to be transferred than the IPC technique and uses several additional system calls to ensure a robust environment.

### Using IPC messages

IPC messages are sent with system call ?ISEND or ?IS.R and are received by system call ?IREC. Each process has local and global port numbers. The sender specifies a local port number on which to send the message; a process can have several ports and the port number is arbitrary. In addition, the sender must specify the global port number of the receiver. When the message arrives at the receiver, AOS/VS has translated the sender's local port number into the sender's global port

*The simplest method of communicating between two programs is to use IPC (Inter-Process Communication) messages*

page open (?SOPEN) on the file and then reads (?SPAGE) the required pages into shared memory. If one process modifies such a shared page, the change is avail-

number, so that the receiver can then send a reply directly.

Obviously, each sender knows which local port number to use to send a message, but how does the sender know the global port number of the destination? Global port numbers consist of the local port number plus PID and ring number and therefore can not be specified in advance and hard-coded in the two programs. The normal way to do this is for the receiver to create an IPC file; then the sender can use ?ILKUP to look up the global port number of the file. In order for the programs to communicate, they must both know the name of the IPC file. IPC files are transient—they disappear when the process that creates them terminates. Since servers generally receive requests via IPC files, the absence of the IPC file is a sure indication that the server is not running.

#### How not to do it!

A few years ago, I wasted several hours on a problem with CEO WP (who didn't?). I could edit a certain file, but when I tried to print it, out came a message "ERROR

21". Now the klutz who wrote that part of the program made three unforgivable errors. First, the program should have

*In order for the programs to communicate, they must both know the name of the IPC file. IPC files are transient—they disappear when the process that creates them terminates*

used ?ERMSG to retrieve and display the text "FILE DOES NOT EXIST" for error code 21. Second, the name of the file that did not exist should have been listed. In fact, it wasn't *my* file that "did not exist." It was the IPC file through which it was trying to channel the request to the server

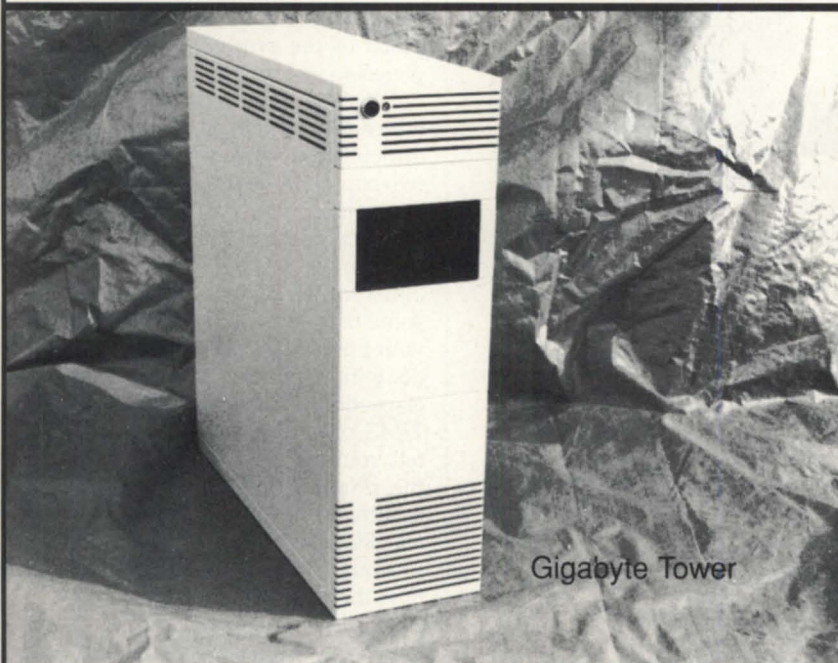
that did not exist, because the server had died. Finally, the error was not interpreted in the proper context; it should have said something like "PRINT SERVER NOT RUNNING." Don't make the same mistake(s) with your IPC programs.

#### CLI has done half the work!

Most people may not have a direct use for IPC communication between two programs unless they implement server-type processes. Even then, the server is usually a commercial product that handles the communication for you at a high level. Older versions of INFOS used IPCs, but I don't know about current versions. If you are writing your own programs, a typical application might have one program that runs continuously (unblocked, without a console) collecting data or accumulating statistics. A second program would request and receive the information via IPCs, perform computations on it, and display or perhaps write it out to a file.

There are many possibilities for using IPC messages between the CLI and an application program. But how can the CLI

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send and receive IPC messages? First of all, if you want to send a message to an application program, the program itself must create a file of type "IPC." Then the CLI CONTROL command is used to send a message; argument 1 is the name of the target IPC file created by the program, and the remaining arguments constitute the message. For example, when EXEC is started up, it creates an IPC file called

"EXEC" (in directory :PER, hence the pathname of the IPC file is "@EXEC") and you use CONTROL to communicate with EXEC:

```
) CONTROL @EXEC UNITSTATUS @MTB0
```

The CLI uses ?ILKUP to look up the global port number of the IPC file (:PER:EXEC) and uses ?IREC to send the message.

How does an application program talk back to the CLI? The CLI is not waiting for a reply IPC message with either ?IREC (receive IPC message) or ?IS.R (send IPC message). However, when the application program receives the IPC message, it is also told the global port number of the sender and can use ?GPORT to look up the corresponding PID of the CLI that sent the message. Then it can use ?SEND (equivalent to the CLI SEND command) to send a reply to that PID (sender's screen). For example, EXEC might send the following messages:

```
(EXEC) @MTB0 NOT MOUNTED
```

```
(EXEC) 15:20:14
```

which appear on your screen as:

```
From PID 3 : (EXEC) @MTB0 NOT MOUNTED
```

```
From PID 3 : (EXEC) 15:20:14
```

Note that ?SEND is specifically designed to send a message to a console screen and is entirely different from ?ISEND, which sends an IPC message to a port. AOS/VS adds the "From PID n:" prefix to all messages sent with ?SEND.

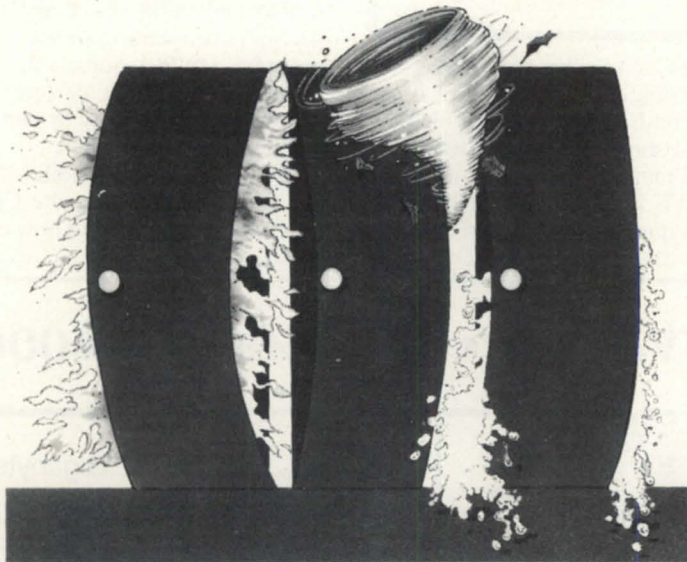
### Batch applications

If you have an application running in batch, it might be useful to know how much of the processing has been completed so you can estimate the time it will finish. Your first problem is to identify which PID is your program. This may be difficult to determine if you are running two copies of the program from the same username. Even QDISPLAY won't help you much, since it doesn't give PID information.

Just for the sake of discussion, let's assume that you could find out the PID of your application program. What can you do with that? You could ask for run/elapsed time statistics with the CLI RUNTIME command, but this doesn't really tell you anything about the progress of the program in the user context. Next month, in Part 2, I will present an easy-to-use IPC sentry that will enable you to talk to your batch programs and ask them how they're getting along. 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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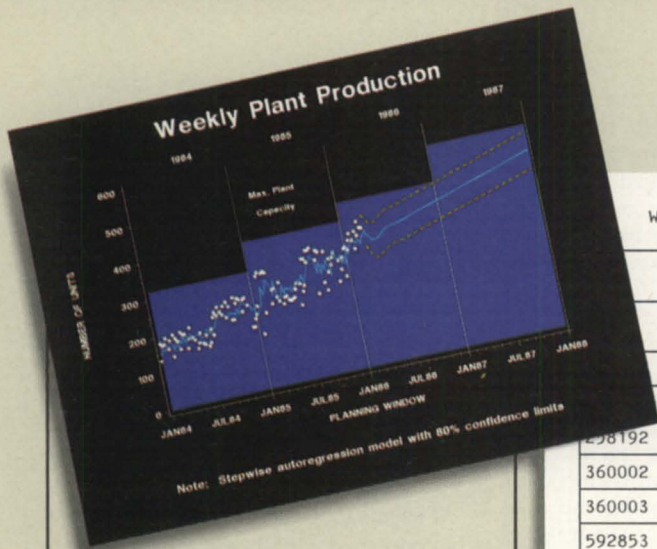
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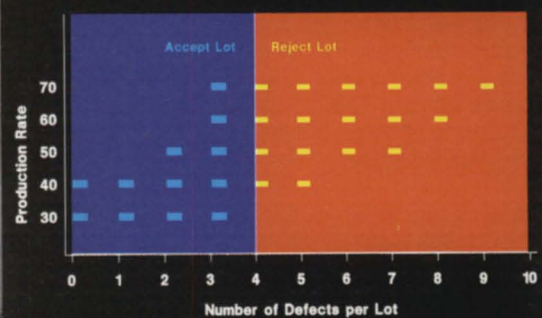
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# :XLPT\_revisited

New version,  
same old wrap



Last summer, I detailed some design flaws (at least in my opinion) in the way that 7.5x and earlier XLPTs and PMGRs dealt with printers connected to serial ports. At the time that I wrote the trilogy (June, July, and August 1988), I submitted

what surely must have been one of the longer and more detailed STRs that DG has ever received on a software product.

Maybe because my STR arrived at a time when DG knew that the new completely rewritten 7.62 XLPT was about to ship, the response was the familiar "fixed in 7.62." Hardly.

In fact, the most fundamental problem I cited in the STR, having to do with the way that CPL is handled on ports which have /OFF/WRP, also exists in the 7.62 XLPT/PMGR combination. XLPT still generates an extra blank page when the last line of the previous page is CPL columns long, or longer, on printers which don't wrap at column CPL, or which have /NAS turned on. /ON/NAS/OFF/WRP is typical of the proper configuration of most third-party printers, including the HP LaserJet Series II, that I used as the basis of the trilogy.

In the original columns, I published a patch for the old XLPT which disabled the CHAR/CPL=n @CONxx command that XLPT does whenever it receives a CX CPL

Figure 1.: 7.62\_BJS\_XLPT.PR\_PAT

```

;BJ's Unofficial XLPT.PR rev 7.62 patches
;
;Unofficial patch no. 1:Eliminate extra blank pages on serial printers
;
;This patch solves the problem of an extra blank page when
;the last line of the previous page is exactly the length
;specified by the last CPL command. For this patch to work,
;you should set the default CPL for the port to the actual
;device width plus 1 and turn /WRP on. Then use CX CPL
;@CONxx to set the no. of printable columns (typically
;the actual printer width).
;
;What the patch actually does is keep XLPT from doing a
;CHAR/CPL=n every time that you do a CX CPL @CONxx n command.
;See my XLPT trilogy in the Jun-Jul-Aug '88 issues of Focus
;and my Feb '89 column for details on why this is necessary.
;
%PROGRAM
XLPT_JOB_INIT+1444                [XNSTA 1,16,3]          [XJMP .+2]
^+1                                []                       []
;
;End of patch
    
```

## Fill in the blank

**Problem:** XLPT generates a blank page when the last line of a page is exactly CPL columns long.

**Description:** The problem cited above is only a single symptom of a complicated problem with the way that XLPT/PMGR handles page shapes on serial printers. There is a philosophical conflict between how XLPT handles the page shape for printers connected to serial ports, and the way that PMGR handles the page shape. This problem has existed for many revs of AOS and AOS/VS, and persists in AOS/VS 7.62.

It seems to me that PMGR should only be concerned with the *physical* page shape characteristics of the device attached to the port (as specified by the port characteristics), and should handle terminator conversion (in the case of /ON/NAS) and wrapping (in the case of /ON/WRP) on that basis. On the other hand, XLPT should be concerned with the *logical* page shape characteristics of the device and leave the mapping of physical page shape characteristics to PMGR. This implies that XLPT should NOT instruct PMGR to change LPP and CPL values based on CX LPP and CX CPL commands. In fact, XLPT should make no decisions based on the current port characteristics. XLPT should limit its use of LPP and CPL values (as determined by CX commands, not CHAR settings!) to determining splash page widths, determining where to inject <FF><LF><LF><LF>, and to implementing the /FOLDLONGLINES job switch.

Rather than submit a detailed analysis of the actual character traffic on the serial port, as I did in my last STR on this same subject, I would like you to hook up a PC, or terminal like the D410, which is capable of showing control characters to a serial port, and start a spooler operating against it. For one specific failure mode, do the following:

- Set the port characteristics to /HARD-COPY with /ON/NAS/NRM (all other on/off characteristics should be off).



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• Create and start a queue, TESTQ, against the port (note that LPP and CPL will default to 66 and 80 and CHAR the port accordingly; that's okay for this test).

• Create a 64-line text file, TEST.TXT, whose last two lines are exactly 81 characters long (e.g., 80 "X"s plus a NEW LINE) and then do a QPRINT/QUEUE=TESTQ TEST.TXT.

When you take these steps, notice that line 63 is sent to the port as "...XXX<CR><LF><FF>". The <LF> should not be there; it causes the printer to step to line 1 of the next page, and then the <FF> causes a skip to the next page, resulting in a blank page. The <CR> is also unnecessary for printers which have "FF implies CR" logic, but it doesn't hurt to leave it in for the case of printers that don't.

I've described only one of the many failure modes that occur. You should also do tests for the following conditions:

- All four combinations of /WRP/NAS on and off;
- With line 63 terminated by <FF> instead of <LF>;
- With line 63 unterminated (as with COBOL print output files);
- With line 63 terminated by <CR> followed by <FF>.

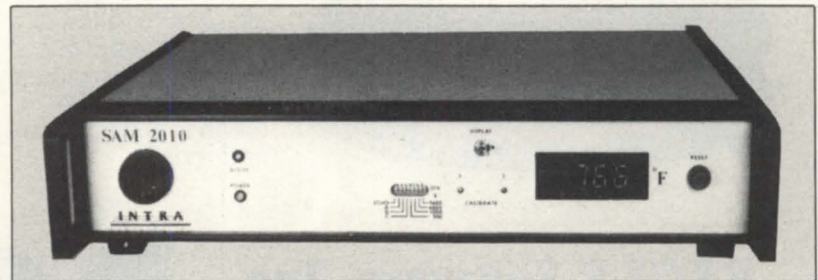
There are many other more obvious problems with the new XLPT, and I'm sure you've received plenty of STRs on them, including a few of mine, so I won't cite them here.

Although I applaud your decision to release the new XLPT prior to AOS/VS II in order to spread the risks across several revs of AOS/VS and AOS/VS II, you should be aware that a large number of users of 7.62 have either back-revved to 7.60, or are running the 7.60 EXEC/XLPT pair under 7.62. It can't possibly be in your best interests to have users become gunshy of new revs given the impending migration to AOS/VS II. Δ

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@CONxx command. Until now, I haven't been able to duplicate the patch on the 7.62 XLPT. Last weekend, though, I got sufficiently annoyed by the problem to resort to a debugging frenzy on XLPT and finally came up with the patch. The full text of the patch is shown in Figure 1.

The original trilogy and its accompanying mega-STR required nearly a solid week of work over the course of several months

to produce the supporting documentation in the form of datascope output. I'm afraid I just don't have the time or energy left to repeat that effort for the new STR, so this time I'm just going to make it short and hope that somebody at DG appreciates the implications of the problems. For your edification, I am including the guts of the STR I submitted as a "sidebar" to this article (see page 60).

## :OTHER\_PROBLEMS

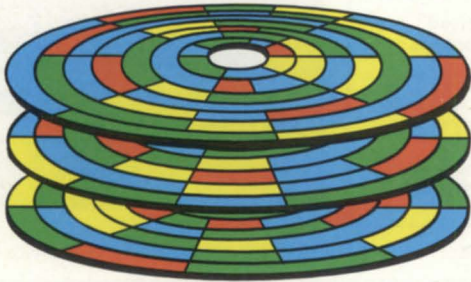
In order to avoid the inevitable phone calls from readers asking "What are the 'other' problems you ran into?" I'll list the major outstanding STRs that I currently have on 7.62 XLPT/PMGR:

- XLPT CPU consumption doubled compared to the old XLPT.

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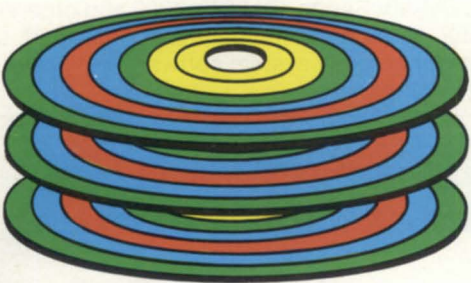
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***A single XLPT process does not gain enough of anything to make up for the lack of control over spooler priorities afforded by separate XLPTs***

- XLPT no longer removes trailing blanks (common in COBOL print files), which dramatically reduces throughput to serial printers.

- Whether to send the cleanup file before, after, and/or between jobs and copies within jobs should be a switch parameter at CX BINARY time.

- A single XLPT process does not gain enough of anything to make up for the lack of control over spooler priorities afforded by separate XLPTs. How about a CX START/UNIQUE option to specify that a separate XLPT is desired?

- An option to convert embedded spaces to tabs in print lines, especially on the splash pages, before sending them to the printer, would be appreciated for serial printers. Almost every printer I know of is capable of the standard eight column tabs.

- XLPT used to handle dial-up printers just fine. Now it aborts processing on the port when the first caller hangs up.

- XLPT is thin-skinned when it comes to handling unusual, but not unlikely, errors like specifying a forms file with an invalid UDA.

## :OLD\_BUSINESS:AOSVS\_II:NFS

The patch that I published last month (to allow AOS/VS7.6x to mimic the AOS/VS II New File System's ability to create files with any element size) has now been in-

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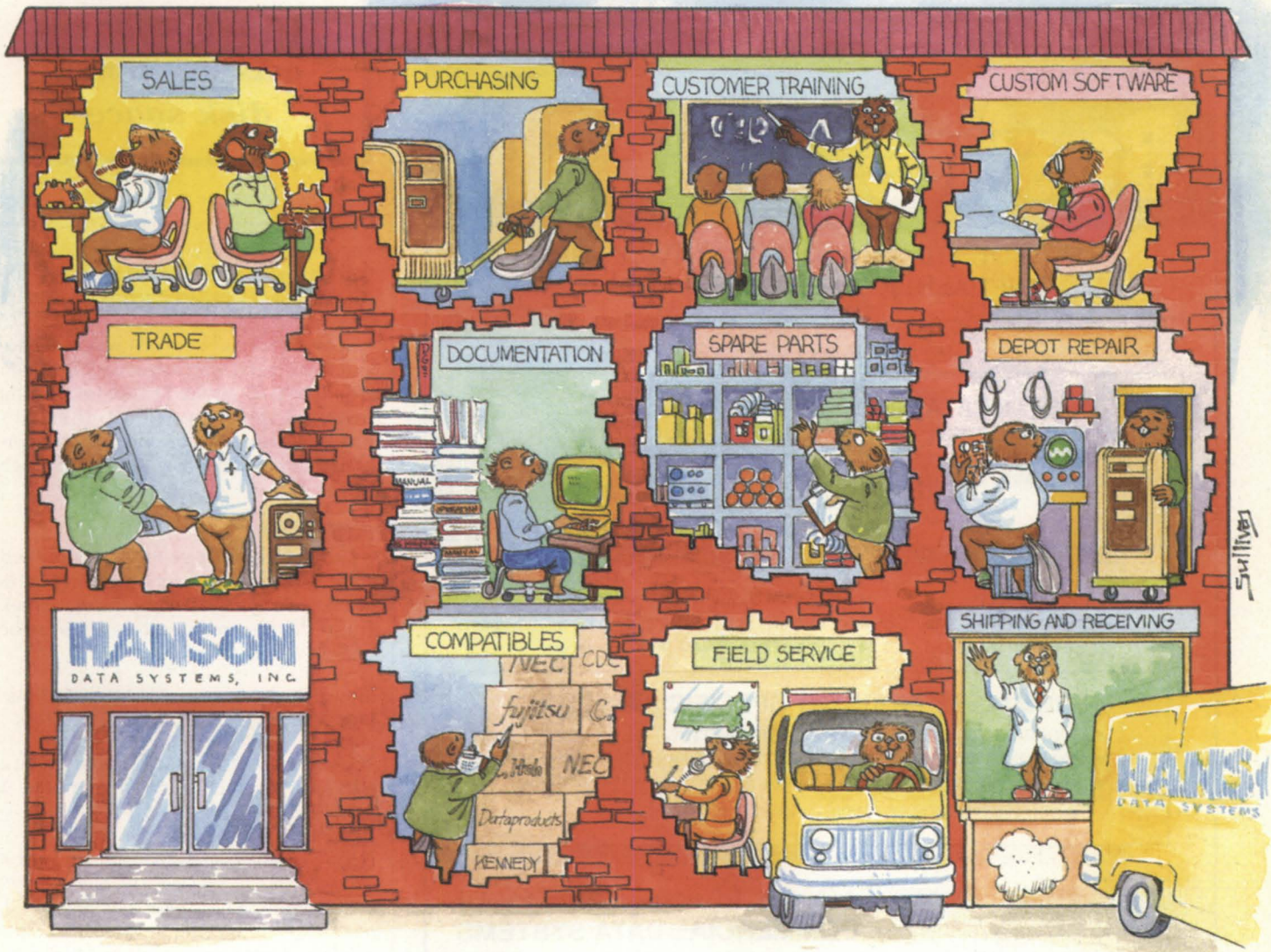
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stalled for over a month on our twin MV/4000s, with nary a chirp from the huddled masses. Unfortunately, it's still true that only newly created files can take advantage of the space savings (SED 7.6x creates text files with an element size of 1), without specific intervention on your part (like running the HAZEL utility in our :PERFMGR product). However, the real rationale for applying the patch, to ensure

that existing software will work under NFS, is still valid.

Preliminary research on several 7.62 systems with a view toward recommending a kind of "until you know better" File Information Table default element size is starting to produce enough data to be significant. The current range for a reasonable default value seems to be 8 to 24 blocks (24 to 72 files per directory before the onset of

index levels), with a practical upper limit of about 32 blocks.

If this is lower than you would have guessed, then either a) your system has more heavily populated directories, or b) you don't have many INFOS files (they

***In any trade-off between wasted space and extra cache searches of disk I/O, you would be well-advised to opt for wasting some disk space***

typically have only 2 or 4 files per directory). Setting the FIS element size too large appears to have little downside risk, other than the wasted disk space. Setting it too small causes extra cache activity and extra disk I/O.

In any trade-off between wasted space and extra cache searches or disk I/O, you would be well-advised to opt for wasting some disk space. If you must err, and it's practically unavoidable in the case of per-LDU FIS element sizes, err on the high side.

#### :ADDENDA

Back in December's column, I published some ballpark ranges for disk access times (seek + rotational latency + transfer time). I didn't list the average access times for the CSS drives. They are:

Slow CSS drives (e.g., 234 MB):28-32 ms  
Fast CSS drives (e.g., 322 MB):23-27 ms

These representative times are based on a survey of several of our customer sites. Δ

*BJ is the President of B.J.Inc., a San Francisco based consultancy specializing in system auditing, system management, and performance analysis. :SYSMGR is a division of B.J. Inc. B.J. can be reached at 109 Minna St., Suite 215, San Francisco, CA 94105, (415) 550-1444, FAX 415/956-6960. The :SYSMGR bulletin board number is (415)391-6531 (1200 baud) or (415) 550-1454 (voice).*

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# I'd rather switch than fight

From RDOS to AOS/VS: getting more mileage from your mule

by Al Takach Hill  
Special to Focus

**W**hen a system has a disk crash, management is only concerned about the data files and source code. That's because data and source are what make your system unique. Without the data and source, your system is no different from any other system. When a piece of hardware or software has run its course, you discard it. Often, new specifications are derived and built from existing applications. As long as your data and source are safe, however, you are safe.

When a new revision of the operating system becomes available, there is no better way to develop confidence in it than running your own application. If your application runs without error, you are confident. If there are explainable errors, you are still confident, but not as confident as you could be. This process of revision and upgrade allows new functionality to be introduced and old errors to be discovered and corrected.

Thus, introducing new operating system software is a form of evolution. Just as the operating system undergoes evolution, so does the hardware. Why continue to drive a 19-year-old Volkswagon squareback when you can drive a new model car without the worries of maintenance and failure? Although it may have character or carry some sentimental weight, the cost of maintenance usually exceeds its value. And it can't compete functionally. Allowing your children to ride in such an ancient vehicle would be nerve-racking. Why then would you trust your source and data to old hardware and operating systems?

You could make many comparisons to old technology, but the truth is we must accept change. To rely on old equipment, old operating systems, and old utilities indicates masochism that probably could be relieved by several hours of professional therapy.

See Hill page 67

# RDOS grows old gracefully

But when it's all over, AOS/VS will join it in the software graveyard

by Ira Ellenbogen  
Special to Focus

**A** Hill is half right, anyway. RDOS is indeed dead, or at least dying. But in my opinion, AOS/VS is too. If there is anything RDOS users should *not* consider in their upgrade plans it would be AOS/VS. It's a dead end, an anachronism, a behemoth, fossil, relic, mastodon.

Harsh words? Perhaps. But forget the marketing hype and just knuckle down to business. It's your bottom line that really matters—your productivity, your project schedules, your customer satisfaction.

You are out there in the real world. You have to compete with no-name clone boxes running generic Unix, generic networks, generic third and fourth generation languages. You need hardware platforms with price/performance ratios that you'll never be able to match with single CPU, complex instruction set architectures. It just can't be done.

Like Unix, AOS/VS has its roots in Multics. Multics was developed 20 years ago, even before minicomputers had taken hold. Hardware was expensive—so expensive it needed to be shared. Disks were slow and small. Memory was even more expensive. Swapping, time-sharing, and batch streams were the buzz words.

Today, hardware is cheap, memory is cheap, disks are fast and huge and cheap. Information is expensive. Information needs to be shared. There are only two reasons to put your users on a single shared CPU. One is that there must be a shared data base and the other is that you can save dollars that way. With AOS you can share data and lose dollars. The processing overhead, the disk overhead, the shared page overhead, the swapping overhead, the IPC overhead . . . require resources that cost big money. The software license fees cost big money.

With RDOS you can save money. RDOS was designed to be

See Ellenbogen page 68



Hill continued from page 66

## The needs of the many . . .

Those who complain about Data General's lack of support for RDOS are those types of individuals. DG has not forgotten RDOS; instead, DG decided to accept the changes many users wanted, such as multiuser systems, a variety of software packages that could be used simultaneously, better and faster disk systems, intelligent multiplexors, 32-bit hardware, larger address spaces, etc. The change in needs for multiprogramming systems came at a time when the computer community reached a level of need and the cost of minicomputers justified it. Less than a decade later, a similar need for small, affordable personal systems produced the PC. Perhaps RDOS users view the PC as a threat to their environment also. Those who complain the loudest about DG's lack of support for RDOS are those who also wave a flag stating that DG is lacking as a leader in state-of-the-art developments.

DG didn't abandon RDOS. By making ICOBOL, BBASIC, DG/L, INFOS, Fortran V, and Fortran IV, as well as several communication and other utility products available on AOS and AOS/VS systems, DG allowed a majority of user applications to be rehosted under a newer operating system on new hardware. For most user- or OEM-developed applications, nothing more than simple edits and recompilation were required. A small percentage of applications may have required some specific manipulations for the new operating system, but nothing that couldn't be solved on a one-time basis.

The applications that would have trouble with such a conversion, specifically those applications that were real-time oriented with heavy reliance on the RDOS multitasking scheduler, exceed more than 32 tasks per program. For DG to continue to develop hardware and support software for a handful of applications would have been both unprofitable and unreasonable. DG finally answered both the real-time and task limits problems with AOS/RT32 on the MV hardware. DG asked users to accept change and come forward into the present. DG even provided the RDOS Agent, which isn't a bad product. But despite rehosted languages, compatible assemblers, compatible instruction sets, real-time and large task count production environments, RDOS Agents, etc., some users still cling to RDOS. These users can continue to sing the blues into the 21st century, or they can convert.

## The needs of the few . . .

There are ways to assuage the fears of the die-hard RDOS users and bring them into the present. If they are frightened by the assembler conversion along with the system and task calls, there is a way out. AOS/VS MASM 16 will correctly assemble any RDOS MAC assembler source. The only real problem is recoding the system and task calls. The major complaint from the RDOS community will be that the AOS/VS system requires packets for nearly all calls, and that the allocation of and coding for these packets would certainly cause their program to exceed the 32 KW limit imposed on 16-bit programs. This is simply not so.

## New architecture supports upgrades

The architecture of the MV hardware allows the experienced developer several methods of handling such concerns. By utilizing the ring structure of AOS/VS and the MV hardware, you can separate such conversions from the 16-bit application program, while increasing the available space in the user's 16-bit application. Careful planning will actually yield more available space to a 16-bit RDOS application converted to AOS/VS than it previously had under RDOS. In fact, the 16-bit RDOS application program could be easily extended to more than 1.5 GB of logical address space. By converting to AOS/VS, the RDOS application will be able to run without modification using new hardware with better, faster, cheaper peripherals. The maintenance savings may alone justify the cost to convert.

While under AOS/VS, the user may make plans to fully convert to 32 bits in the future. Or you may consider a complete conversion to some HLL to port the application to some other environment. The degree of compatibility between RDOS system and task calls and the AOS/VS system calls allows this type of conversion. RDOS system and task calls could have been converted manually, but it would be convenient if a utility existed to perform such a conversion. It's not surprising that what one can consider "task" calls are almost directly translated into AOS/VS equivalents. If the developers of these RDOS applications had designed their application with the thought in mind to use standardized interfaces to system-specific resources, then conversion to any manufacturer's machine and operating system would have been a relatively easy task. A case in point is the early Textronix

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## FOCUS ON: RDOS

Plot 10 software. Written completely in Fortran, the entire system could be ported to a variety of operating systems with simple changes to I/O-specific primitives. But then, they were guilty of thought and planning.

The RDOS community also desires more off-the-shelf software under RDOS. There aren't many developers lining up to produce products for the RDOS systems. However, under AOS/VS, there are a myriad of products available. The RDOS user isn't necessarily committed to using ICOBOL in foreground while HAMLET runs in background. Any combination and number of grounds can be achieved under AOS/VS. The best communications products available today are available under AOS/VS. Excellent statistical packages, all current languages, relational/networked/hierarchical data base managers and query products, CAD/CAM systems, source-level debuggers, PC integration, Unix, and many more software products could be accessed by RDOS users if only they would convert.

The hardware manufactured by DG produces high up times. Character I/O processing is greatly improved with intelligent controllers. Disk speeds and capacities are no longer concerns, no matter what your application is. New file system software will ultimately provide a platform that will make physical disk failures no longer a concern for users. Improved remote diagnostic capabilities are available to sites. If you are a remote RDOS site, this capability could be of tremendous value to you. Hardcopy devices, CRTs, laser printers, high-density tape drives, and more are available to the present-day AOS/VS user, but not to the RDOS user. If only those system and task calls were available to the RDOS assembler application, they could enjoy the advancements of the MV hardware and AOS/VS software that they're missing out on.

The biggest complaint from the RDOS community is lack of support from DG. Few third-party packages are available for the RDOS user today, and the amount will probably diminish when the remaining developers find that it isn't profitable to continue to support this small community. The advocates of multiple-ground RDOS systems are fooling themselves to think that their applications and data are safe on a system that might not be supported tomorrow. The only group that will continue to profit and flourish are the third-party field engineering groups who recycle boards and power supplies a few hundred times. Their biggest profits

come from the old RDOS installed base.

### One possible method . . .

The system and task calls from RDOS that I have been referencing throughout this article are available. I have developed support for more than 122 of the 133 documented RDOS system and task calls and have implemented them using the architecture previously described. The degree of ease with which they were implemented indicates that the reluctance of the surviving RDOS community is unfounded.

### Where will the future take us?

Several years from now, when propriety operating systems are all but extinct, I will be enjoying new developments in conversions of other applications to Unix, if that is the desired standard. It is the understanding of the old and the intrigue of the new that stimulates thought and progress. The failure of some in the computer community to accept change and advancement will leave them far behind.

△

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*Al Takach Hill is president of Hill Computer Consultants. He also teaches courses on RDOS systems programming and internals for Data General. He may be reached at 703/471-4104.*

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## ELLENBOGEN

*continued from page 66*

resource stingy. With a one MB RDOS system and 70 MB of disk you can comfortably run 12 users in Business Basic or Interactive COBOL on something as lowly as a DG 500 or an MV 1400. If you have an older, multitasking application in Fortran or assembler you could run twice that many users with good, reliable response time. But would you want to?

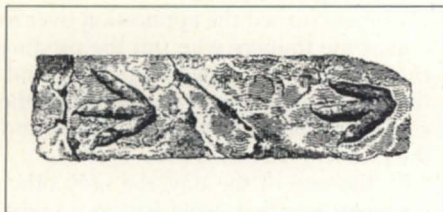
### Personal preferences

I have a Desktop Generation computer that runs RDOS. Except for supporting my own software and RDOS customers, I seldom use it. But, I need the functions of a personal computer. I need small business accounting, word processing, a touch of desktop publishing perhaps, communications software, terminal emulation, project management . . . you name it. A



Macintosh or a nicely configured PC will do this perfectly. Most of these programs and functions are either unavailable or not practical under RDOS.

Well, what if I grow my business? Let's say I add three or four users, some with the same needs and some who bring specialized needs. A Novell or other PC network would allow shared data and the same independent power for each independent user. A four user RDOS environment might cost about the same as four PCs, but I would be able to do so much more with the PCs that I wouldn't even think about it.



Lets say the business grows again. I've got departments. A couple of people doing purchasing, a couple in accounting, a couple in word processing, etc. Clearly this would be a bad problem for RDOS. But do I go to AOS/VS (with CEO or WordPerfect library)? Probably not. We can still use networking by clustering the groups that need shared files, and networking the servers.

Finally, the departments get big. They have enough users doing the same thing at once so they might share their own computer. Networking becomes a bit unwieldy. Do we go with RDOS or AOS/VS in the departments? I think neither. We choose Unix, because the same plethora of user friendly, graphically oriented, generic software we found on the PCs is now, finally, becoming available on Unix. And the same powerful business languages that run on any good business computer have always been available.

### The passing of RDOS

Well, RDOS is dying. But it didn't have to be that way. RDOS users are a loyal lot and as they switch to other machines and relish their new capabilities they often lament the loss of the speed, simplicity, and friendliness of RDOS. The loss is not their's alone.

Data General loses more than anybody from the passing of RDOS. As RDOS goes away, DG loses customers and faces narrowed markets where it once dominated.

The death of RDOS is not mysterious, though. In my opinion, DG killed RDOS by restricting licensing and putting nominal resources into support and development. In the real time markets, where RDOS is still the best thing going, DG just seemed to give up.

The world of proprietary operating systems and languages is gone. Fortran and COBOL set the standards in the industrial and business world a generation ago and they are still with us. Unix (and MS-DOS?) are the standards for single and multiuser computing that have emerged in this generation. They'll be in common usage well into the next century. You don't have to like them. There are many of us who hate Fortran and COBOL, and equally many who hate and deride Unix — but it's the standard for multiuser operating systems and seems as if it's here to stay. AOS/VS, RDOS, VMS, etc. are all on a long, slow but inexorable decline to join the ranks of forgotten programming systems like Autocoder.

RDOS has outlasted 16-bit AOS. It has weathered the changes to microprocessors and 32 bit architectures. RDOS multitasking runs rings around anything on the market. User device support is a piece of cake. It offers a lightning fast standalone version with RTOS. It'll run with next to no memory. It's fast, simple, reliable and well documented. But the statistics point the other way. The lack of modern languages and graphics turn people away and of course DG's own policies are in an entirely different direction. The RDOS road, the one less traveled, is filled with rewards but pockmarked by neglect.

Data General has Unix and MS-DOS offerings and has publicly bet the future of the company on building the premier Unix offering based on the 88000. These are facts. I think they'll succeed. The company builds good hardware and with commodity software they'll be able to sell it. Compaq does well building high end MS-DOS systems. There's no reason DG can't do the same for Unix. Obviously, this does not bode well for AOS/VS or RDOS. I'm sure we'll see an AOS/VS or RDOS (or both?) agent running under the new Unix where they can write their own little footnotes in history and then warmly fade from memory.  $\Delta$

*Ira Ellenbogen is the president of Nanosecond Systems in Woodland, CA. Contact him at 916/662-4334.*

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# UBB offers portability, speed

## Transoft turns an ordinary Compaq into a serious machine

Some months, the world of Business BASIC seems to move faster than others. By any measure, we're in an exciting time; month after month brings new developments.

Last week, the folks from Transoft paid me a visit. Based near London, England, these people have been working on hosting Business BASIC to PC hardware for a couple of years.

Their initial product, called Unitran, ran on MS-DOS and XENIX. It was a compiler that translated BBASIC source code into files that could be executed by a run-time executive. One of its biggest drawbacks was that in its run-time form, it lacked the friendly user interface that is such an advantage to Business BASIC programmers. If a program had an error, the code couldn't just be altered and the program restarted; you had to exit, go to the editor, recompile, restart, etc.

### UBB unveiled

At the NADGUG show, Transoft unveiled UBB, Universal Business BASIC. This product looks and feels just like its cousin on Data General equipment, except it runs on a variety of hardware: basically, anything that runs MS-DOS or XENIX. During their visit, they gave me a chance to test it with Maxon's software.

We chose a couple of straightforward packages that were written several years ago. The reasons we chose older applications are that they are extremely stable, and they do not use a lot of new features. If these packages couldn't be made to work, we figured, nothing would. Why, they'd even run under RDOS without changes!

First, we copied the programs and files to floppy disks, using a PC. The programs had to be in LIST format, and we knew that Transoft would be bringing a Compaq 386 with 1.2 MB floppies on it. (If you are curious, we used MIRROR, from SOFTKLONE in Tallahassee, Florida (904/878-8564) on the PC side, and TEX, available on the NADGUG bulletin board, on the DG side. We used Ymodem protocol over a 9600 baud line.)

The files required almost no translation. I say almost, because our filenames are 10 letters long. MS-DOS allows only eight letters. Even though we eventually planned to test under Unix, which allows the longer file name, the diskettes were being created under MS-DOS, and therefore had to follow MS-DOS rules. We renamed the files once they were safely

*"It works just like on the MV, what's the excitement?" she asked. Of course, that was exactly the point.*

under Unix.

After Transoft representative David Diaz set up his Compaq, it took him only a few hours to copy the diskettes to the hard disk, and get the software running. A variety of switches allowed him to tailor Unix to provide the needed searchlist capability.

Transoft has implemented the entire Business BASIC instruction set. The notable exceptions are operating system related, and wouldn't make sense to implement. These are very unlikely to appear in properly written application programs, anyway.

The only function I found missing was SYS(5), which returns CPU time used.

However, after I complained, Dave soon had it installed.

### Put through the paces

We then turned the application over to one of the trainers who put the product through its paces. A bug was soon found; the ASC function was not handling the sign bit properly. Another half hour, and the problem was fixed.

By the end of the day, the only other problems we discovered had to do with cursor positioning (under very special circumstances) and an odd arithmetic problem. Dave lugged the Compaq home under one arm and worked on it that evening.

It turned out the odd arithmetic problem was due to a bug in our software, which must have been there for nine years. While it was a bug, Business BASIC tolerated it. UBB was a bit more strict. We agreed with UBB, and fixed our application code.

Our trainer who was doing the testing couldn't understand any reason to be excited by the whole process. "It works just like on the MV, what's the excitement?" she asked. Of course, that was exactly the point.

On the basis of this test, it is reasonable to say that Transoft has provided a working version of BBASIC for the 386 under Unix. It is likely that each new user will uncover a few nits where Transoft's implementation is slightly at odds with Business BASIC. Fortunately, Transoft appears to be able to cure these quickly.

Transoft has also provided a number of useful extensions to the language, including a windowing facility, help facility, and better trace capabilities. As well, they provide for up to 256 open files (via an LRU method), programs up to 1 MB, line numbers to 65,000, and hot key interrupts.

Having said all this, we at Maxon are currently unable to use the product. We made heavy use of B32's extensions in our recent software. Since UBB does not implement these extensions, all of our software will not work with it. On the

other hand, Dave was able to add about half of them into the product during his stay, and was hopeful about doing the rest.

The \$64,000 question was, of course, performance. How fast is a Compaq running XENIX compared to an MV/15000 under AOS/VS? Pretty quick, it turns out. Figure 1 has some entirely arbitrary and unofficial results. Remember, as the window sticker on that new car warns, your mileage may vary.

**Figure 1**

**Test 1: Add 10,000 keys, 10 bytes long.**

	Elapsed	CPU
1. MV/15000 mod 8 AOS/VS BBASIC 4.20	3:18	:47
2. MV/15000 mod 8 AOS/VS B32	2:03	:39
3. COMPAQ 386 XENIX UBB	2:03	1:19

**Test 2: Generate Prime Numbers**

1. MV/15000 mod 8 AOS/VS B32	2:01	1:09
2. COMPAQ 386 XENIX UBB	6:05	5:57
3. 386 (20 megahertz) XENIX B32	:57	:56

These results (see Figure 1) prove very little. Sure, for a single terminal, an MV/15000 uses only half the CPU time as a computer weighing 21 pounds and costing a thirtieth as much, as shown in Test 1. Test 2, which looks at raw CPU power, is also interesting; could it be that not all versions of Business BASIC are re-created equal? Figure 2's results also mark the first appearance of B32 under Unix, a product which has been rumored for some time.

All that the tests really show is that the Compaq 386 running UBB is a serious machine; probably faster than most computers that Business BASIC is installed on today.

What is the significance to the DG world? Well, it seems that DG is putting its efforts into the Unix and 88000 work

not a moment too soon. These small hot boxes are hardly toys anymore; they will have a significant impact on the market. I'd rather buy these machines from DG than some vendor I don't know, so I'm looking forward to DG's offerings.

A second significance is that we all can be reasonably assured that Business BASIC will still be a healthy language once it is transplanted. Existing applications will run without changes, and the programmer interface will remain, if not improve.

Want more information? Contact Mike Edwards, Transoft, Shear House, Petersfield Ave., Slough, Berkshire SL2 5DQ, England. Phone 011 44 753 692332. Fax 011 44 753 694251.

Transoft is not the only company working on BBASIC portability, although it does seem to be the first with a full, working implementation. Close behind are B32, Alloy, and Bluebird. I'll keep you posted on developments in the coming months.

**BASIC SIG organizes**

The Business BASIC SIG continues to organize. The cheap entrance fee (free, until the budget runs out) has proven quite popular. All the B32 users in North America were automatically drafted as members, and more registrations are coming in daily by mail and fax. To register, send a note giving the normal contact information and perhaps some information on machine used and application. Fax it to BBASIC SIG, 416/445-6228.

The BBASIC SIG continues to be a non-denominational congregation: we don't care whether you run versions from Data General, TAC, B32, Bluebird, Transoft, Alloy, or whatever. Nor even what hardware you use. The common denominator is a healthy interest in Business BASIC and its future.

Over the last month, I've contacted each of the third-party vendors of Business BASIC products to find out if they would be willing to support a standard list of BBASIC statements, to be decided by or in conjunction with the BBASIC SIG. Representatives of each have agreed to do so.

I'd love to get Data General to participate as well: Unfortunately, I really don't know who to call. Could someone call me with a name? Δ

*George Henne, a contributing editor to Focus, has worked with Business BASIC users for more than a decade. He is the vice president of Maxon Computer Systems, 575 Madison Ave., Suite 1006, New York, NY 10022; 416/445-4823.*

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# Q & A

## Management's view of disaster recovery

### Advice for everybody except the competition

By Steven A. Handlos and Liz Straus  
Special to Focus

We have talked to enough company presidents to realize that those who are most successful seem to have a special appreciation for their corporate data resources. They see their computer systems and data in a different light than do the people who actually operate the systems. They tend to see data as a strategic resource to be safeguarded and used competitively.

This way of looking at the data center is worth understanding in more depth. Let's start with an imaginary interview with a company president who has recently taken steps to implement a disaster recovery plan.

**Q. What would happen to your company if you weren't able to use your data processing center for 10 to 15 days?**

**A.** We would be in serious trouble. You know we have a large investment in data processing. We made that investment to keep our company competitive. I saw

some statistics published recently by the University of Minnesota that described the loss of efficiency of a company on a daily basis after losing the use of its computer. They found 93 percent of the companies that lost the use of their computer for 10 days or more filed bankruptcy within one year. Half of those companies failed immediately. Those statistics are meaningful. The business community doesn't invest a great sum of money in data processing without some tangible benefits. If those benefits are interrupted, there are serious consequences. A company of any size could fail, if the right computer is lost. Large companies with multiple data centers might not fail if they lost a single center, but they would suffer substantial loss.

**Q. So what are you doing to protect your company from that risk?**

**A.** Surprisingly enough, it took us quite a while to do anything. For one thing, we didn't want to think about the problem. Then I was hoping our data processing people would take the lead. Eventually I realized they couldn't take the lead.

**Q. Why was that?**

**A.** Data processing people don't have

the same outlook as I do. Backup and recovery are strategic problems. Data processing personnel are more concerned with day-to-day technical and operational problems. And don't forget, they are working to meet the goals we set for them.

**Q. So recovery planning isn't their main concern?**

**A.** Right. Before they would work on this project, I had to make it a priority. Once they realized that this was important to me and to the company, they were happy to help. But, we had to adjust the other priorities. This is a management decision, but it requires the input and analysis of the technical people.

**Q. Once the project was started, what alternatives did you consider?**

**A.** We looked at a lot of alternatives. An unused duplicate center was too expensive for us. The old style reciprocal agreement couldn't possibly work. Fast replacement is unreliable and couldn't be tested. Reverting to manual systems wouldn't work because we didn't have enough people to handle the volume. Doing nothing was unthinkable. It just was unacceptable taking unnecessary chances that could cost the total loss of the company.

**Q.** But don't a lot of companies decide the risk is low enough that they can afford to take it?

**A.** While it's true the risk is low, the consequences are so significant that I felt we had to do something. Finally we decided to use a backup center. The backup data center is supplied by a company that operates a data center for the sole purpose of providing backup to companies that have compatible equipment.

**Q.** So you solved the problem by turning it over to outsiders?

**A.** Not at all. To make a service like this work, we first had to develop what is called a contingency plan. It's something like a fire drill. The plan defines who does what, and in what order, after an emergency has been detected. In order to be certain the contingency plan will work, it is necessary to test it. Like a fire drill in your office, it won't work as you anticipated the first time you try it out. It takes practice, testing, and evaluations to refine the plan and to train the people to

respond. Once the plan is workable, you have to continue to test it on at least an annual basis to correct for changes and to keep the people trained.

**Q.** To get your contingency plan worked out, did you have to modify the priorities of your current projects?

**A.** Only slightly. We looked at our personnel, and evaluated their skills. We evaluated the amount of time they would spend on this type of project every year. We looked at the impact of diverting their attention to contingency planning. While some larger companies may decide to do the planning internally, we decided to use a consultant who would work as a full-time part of our staff for a given period. That brought some expertise and objectivity to the process that we would have had trouble matching on our own.

**Q.** So now you're prepared for any emergency that might cause you to lose your data center?

**A.** Not quite yet, but we're on the right track. It takes quite a while to get all the

bugs out of the contingency plan. We're working on it and testing as we go. We're certainly a lot better prepared than when we first started.

**Q.** Do you have any advice for other people in your position?

**A.** With the exception of my competition, I recommend any company that uses information strategically should consider the consequences of not being able to use its data center. If the consequences are serious enough, they should have a backup plan. Every major company needs a backup plan. Yet, surprisingly, it's my understanding that fewer than one percent of them do. Δ

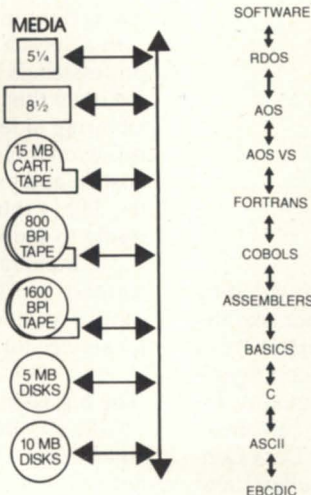
*Steve Handlos, the founder of Productivity Systems Development Corp. and Data Safe Corp., can be reached at 2138 Ashley Phosphate Rd., Suite 206, Charleston, SC 29418; 803/553-6649. Liz Straus, the president of Stewart and Assoc., can be reached at P.O. Box 11944, Columbia, SC 29211; 803/771-4636.*

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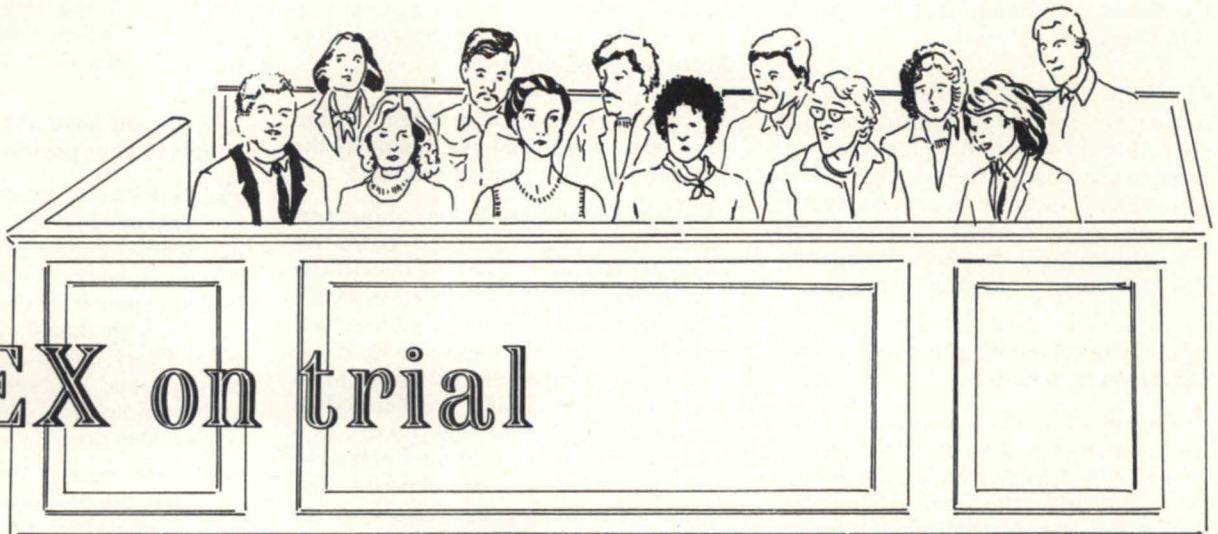
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## ADEX on trial

### Third party maintainers demand access to DG's diagnostic software

by Robin Perry  
Focus staff

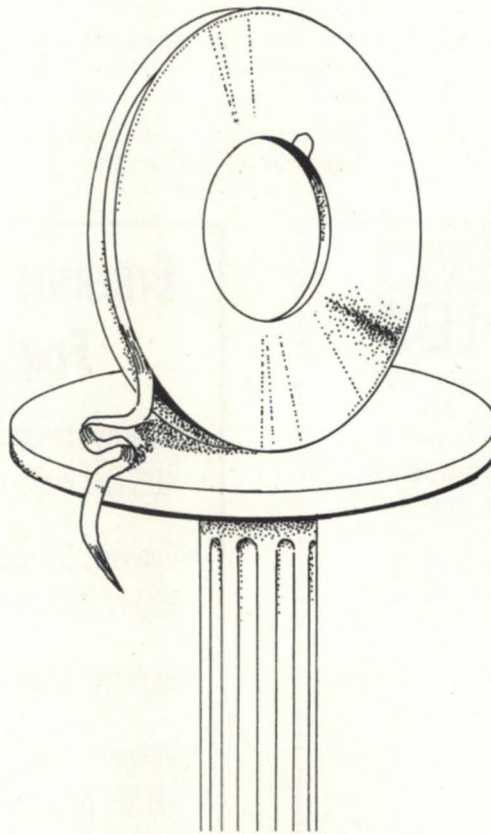
Two California-based computer maintenance companies filed antitrust actions against Data General, joining forces with Grumman Systems Support Corp. in a court battle over the use of DG's diagnostic software ADEX, and other maintenance services.

In late November, Computer Products and Repair, Inc. (CPR) and NPA Systems of California, delivered twin end-of-year gifts to federal court in San Francisco. The suits allege that Data General monopolizes the market for maintenance of DG computers by cutting service companies off from sales of spare parts and by restricting the sale of ADEX.

"As is the case with the Grumman group, these cases are completely without merit and will be vigorously defended," said Jim Dunlap, DG's manager of corporate public relations. "The key point is that these are minor lawsuits."

#### DG vs. Grumman vs. DG

Grumman Systems Support Corp., the computer maintenance division of the large aerospace company, filed an antitrust action against DG last July that protests DG's policy of tying the sale of ADEX to the purchase of certain maintenance agreements.



According to information provided by Data General, ADEX and other maintenance tools are available to members of DG's Cooperative Maintenance Organizations (CMO) program. To qualify for membership in the program, customers must be one of the following: Data General VARs (Value-Added Resellers) and end users; self-maintenance organizations; companies with projects under research and development with potential for sizeable future hardware purchases;

educational and other nonprofit institutions.

While declining to discuss details of DG's ADEX policy, Dunlap dismissed the suit as "a tactical response to a suit DG filed (in 1987) against Grumman alleging copyright and trade secret theft." The suit alleges that Grumman field personnel use illegally obtained copies of ADEX.

The three computer maintenance companies are represented by attorney Ron Katz, of the San Francisco law firm of Coudert Brothers, an expert in the flourishing field of software litigation. (He successfully sought an injunction against Hewlett-Packard forcing it to provide Hy-Point, a third-party maintenance company (TPM), with certain services.) "This is a field that is very troubled right now. This is becoming a major issue and Data General is right in the middle of it," he said.

In a speech given to computer service professionals last year, Katz summed up the issue this way: "Those on the manufacturing side think that TPMs are free-riding on their facilities, using their diagnostics, and proprietary information; and the TPMs think that manufacturers are trying to squeeze them out of business . . . If manufacturers refuse to provide support to TPMs, then buyers become captive customers of the manufacturer for service for the life of the equipment."

#### The big issue

CPR President Larry Neaz said that "the big issue in the lawsuit is whether or not DG will sell ADEX." Neaz said that DG has become "increasingly hostile" in efforts to hamper his company's ability to win new accounts. According to Neaz, DG representatives have told potential

CPR customers that their computers cannot be serviced properly without ADEX diagnostics. CPR technicians do not use ADEX, Neaz said, and he has "spent a great deal of time and money" developing an alternative.

Recently, "DG convinced (an) account that the warranty on some of their new equipment would not apply if we serviced the rest of the system. After all, we could blow it up and DG couldn't tell," Neaz said.

CPR has also had trouble getting spare parts from DG, the suit claims. "When we place an order, the part is either not in stock or there is a 120-day wait," Neaz said. "We've ordered similar things through the DG VARs. They typically get the part before our order is accepted." Neaz, who owns over 100 DG CPUs, said this has not always been the case.

"They (DG) used to sell us repair on certain items. About a year ago they sent us a form to fill out. It said that in order to continue to get DG parts we must qualify. We filled out the form and were told that we did not qualify because we are in the third party maintenance business. That

was the reason given," Neaz said.

CPR is a seven-year-old business with home offices in Carson, California. It has 50 employees, Neaz said, two branch offices and annual sales of approximately \$5 million.

Similar complaints to those of CPR are listed in the suit filed by NPA Systems of California, a Berkeley company that specializes in the maintenance of DG processors and DG-compatible equipment. NPA California has approximately 30 employees, and branch offices in Phoenix, Portland, Pasadena, and Sacramento. It is owned by Alan Rees, who bought the West Coast operation from the parent operation in New York about a year ago. Rees declined to comment on the lawsuit.

#### What the future holds

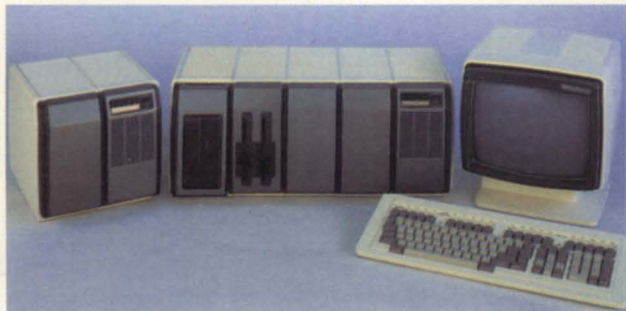
The litigation process on these cases is advancing slowly and it will probably be years before all the issues are resolved. In the meantime, DG will have to decide whether to change its policies regarding TPMs, or to stand by its guns and be prepared to take the consequences, said an-

other expert in computer software litigation.

John Land, of the San Diego law firm of Spensley, Horn, Jubas, & Lubitz, is a patent attorney who has litigated a number of computer software cases. The cases against DG are in a sticky area of software protection that has yet to be resolved. "Normally a company can determine who it is going to sell to, or who it is going to license, (however) you can't use your property to leverage yourself into a position you wouldn't have otherwise," he said. DG's policy on ADEX "is reasonable on its face, but if for some reason it is not possible for an outsider to develop the software . . . then that could conceivably be unfair competition."

He predicts that the courts will see more disputes over software use in the future. "It's a certainty," he said. "The (computer) industry is becoming a tremendously valuable aspect of the world economy. First, the legislature decided that software could be copyrighted. Now it is deciding, *how* is it protected? These cases are exploring the outer boundaries of software protection." Δ

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## Fast Track announces electronic vaulting service for LANs, PCs

New York—Fast Track Systems, Inc. has announced an electronic vaulting service for PCs and LANs. According to Jay Gelman, Fast Track's vice president, the new service, known as SafeTrack, was developed to give businesses a systematic and accurate way to back up PCs and LANs. SafeTrack also addresses business concerns of data loss due to fire, theft, water, and employee sabotage.

Every night SafeTrack automatically backs up the PC's data by encrypting the data and transmitting it off the client's premises to the SafeTrack host computer. An up-to-date copy of the PC's disk resides on the SafeTrack host computer at all times. Lost data files can be instantly retrieved on-line.

In addition, SafeTrack manages the backup process. It verifies the completeness of the backup procedure, analyzes the disk, and diagnoses potential prob-

lems. Management reports are furnished to subscribers.

Fast Track Systems, Inc., a subsidiary of Track Data Corp., provides a full range of computer security services, including contingency planning, off-site data storage, and computer hot sites.

*Fast Track Systems, Inc., 61 Broadway, New York, N.Y. 10006; 212/943-4555. Δ*

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## Pacer Software links DG to Macintosh

Westboro—Data General signed an Independent Software Vender (ISV) agreement with Pacer Software, Inc. of La Jolla, California. Under the agreement, Pacer will supply PacerLink terminal emulation and desktop connectivity software that integrates Apple Macintosh personal computers with Eclipse MV/family systems.

"Data General has taken the first step in linking the Macintosh into the Data General environment. Our objective is to offer integration alternatives for Macintosh

users that are comparable to those we currently provide for the IBM PC world, with MV/family systems as a platform," said Jane Ingalls, product marketing manager for Workgroup Computing at DG.

PacerLink offers terminal emulation, file transfer, print spooling, command procedure scripting, and virtual disk capabilities for MV/family systems and several other vendors, including Unix hosts. By extending the Macintosh interface into the MV/family host environment, PacerLink eases the interaction between the two systems.

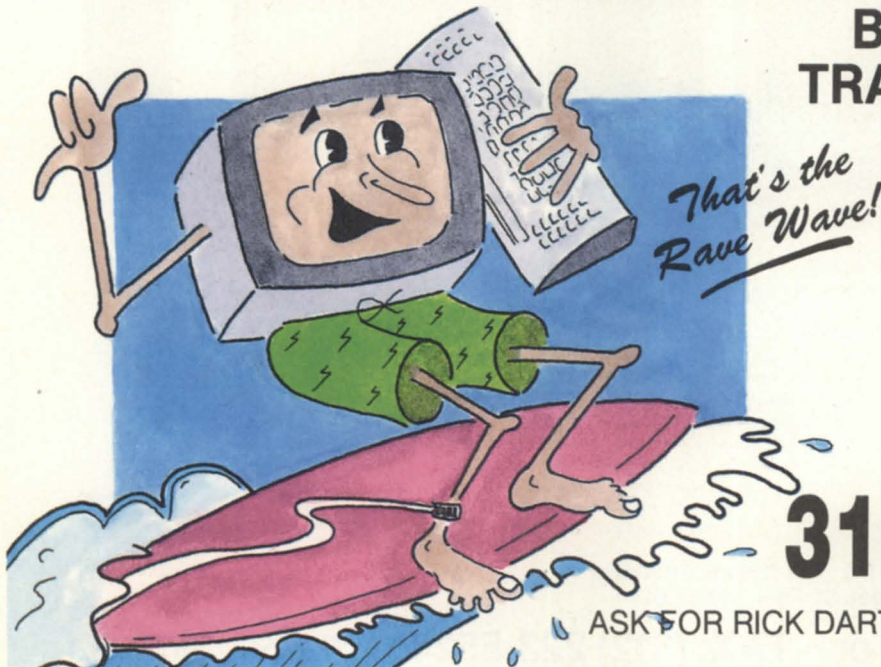
PacerLink emulates the Dasher D461 terminal, making Macintosh multiple windows, command menus, and mouse-operated function keys available to applications running on MV/family systems, including CEO office automation software.

Pricing for PacerLink is based on the number of logical network connections, known as concurrent sessions, supported by the PacerLink software installed on the host MV/family computer. Prices range from \$2,000 for five concurrent ses-

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sions, to \$10,000 for 50 concurrent sessions, to \$37,500 for 500 concurrent sessions.

*Pacer Software, Inc., 7911 Herschel Ave., Suite 402, La Jolla, California, 92037; 619/454-0565.* Δ

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## Fast Track Systems named DG/hot site

New York—Fast Track Systems, Inc. has been qualified by Data General Corp. to provide hot site disaster recovery services to users of Data General equipment.

The qualification program was initiated by DG to offer its users a hot site backup capability through qualified vendors. The evaluation process included an inspection of Fast Track's facilities by representatives of DG's field engineering staff.

According to James Shapiro, executive vice president of Fast Track Systems, "Data General has qualified Fast Track Systems as a provider of DG/hot site services, based on Fast Track Systems having met criteria established by Data General."

DG's Vice President for Eastern Operations Bob Tway said that "Data General and Fast Track have had a long working relationship."

Fast Track Systems, Inc. provides a full range of asset protection services to users of Data General equipment. Services include disaster recovery, off-site data storage, PC electronic vaulting, and contingency planning. FTS has headquarters in New York, with hot site back up centers in Brooklyn, Wall Street, and Chicago. In addition, FTS has communication hubs in San Francisco, Los Angeles, Dallas, Philadelphia, Miami, Chicago, and Toronto.

*Fast Track Systems, Inc., 81 Broadway, Suite 2301, New York, NY 10006; 212/943-4555.* Δ

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## Service depot for DG opens in Colorado

Colorado Springs, CO—A new international service depot for Data General systems, S&T Depot Express, opened in Colo-

rado Springs last month. Operated by Service and Training, Inc., the depot provides parts and repair service by factory-trained technicians.

The facility services all DG systems, including the MV/15000 and MV/20000, Argus disk drives, and all parts, components, and peripherals. Parts and components are backed by a 90-day warranty.

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*S&T Depot Express, Airport Square, 1641 South Murray Blvd., Colorado Springs, CO 80916; 800/225-7779.* Δ

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## Connectivity tool transfers data between products

Houston—Conceptual Software, Inc. has released DBMS/COPY, a software connectivity tool that transfers data between software products, including spreadsheets, databases, statistical programs, and ASCII. DBMS/COPY is designed for use with the MS-DOS operating system.

With DBMS/COPY, users do not have to create intermediate character files when moving data, the developers of the product say. DBMS/COPY sells for \$195 plus \$5 shipping and handling.

*Conceptual Software, Inc., P.O. Box 56627, Houston, TX 77256; 713/667-4222 or 800/STAT-WOW.* △

Circle 79 on reader service card.

## Logical Solutions introduces HVAC business management

Melville, NY—Logical Solutions, Inc. recently announced a new business computer system designed to automate the proposal, contract, dispatch, and billing functions for heating, ventilation, and air-conditioning (HVAC) contractors. Called Service Solution, the system assists the HVAC contractor in the following areas: scheduling, inventory, billing, collections, and contract renewal.

Service Solution is leased or sold to customers as a complete turnkey system including installation, comprehensive training, and support, according to Logical Solutions President Richard S. Music. Logical Solutions, Inc. has designed and marketed turnkey business systems since 1980. Service Solution runs on the entire line of Data General computers.

*Logical Solutions, Inc., 425 Broad Hollow Rd., Melville, NY 11747; 516/293-7730.* △

Circle 80 on reader service card.

## Director screens Fax messages from human voices

Austin—The Fax Director is an answering machine for your Fax machine that

can screen human calls from Fax calls, saving businesses the expense of a dedicated telephone line for Fax messages.

According to the vendor, the machine works best when it is hooked up to the last line in a sequential telephone system. When a call is placed to that line, the Fax Director answers on the first ring, then instructs human callers to press a number that will connect them to the tele-

phone system. Fax messages are automatically connected to the receiving Fax.

The Fax Director is compatible with all Group II, III, and IV Fax machines, both autodial and non-autodial. Cost is approximately \$425.

*Data-Doc Electronics, Inc., 4903 Commercial Park Dr., Austin, TX. 78724-2638; 512/928-8926.* △

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## DataCom makes V.32 Modems at under \$1,000

Cleveland—Western DataCom, a manufacturer of modems and port protection devices for dial-up and leased lines, has announced two new V.32 modem cards for central site installations: the 432 Error Free and the 432 Network Node.

Both modem cards are designed for operation over standard dial-up and leased lines. Their features include synchronous or asynchronous operation, password protection, downward compatibility with all lower classes of MNP error correction, telephone number storage, and nonvolatile EEROM memory. The modems also support Class 8 diagnostic features such as automatic Bit Error Rate Tests (BERT), Analog LoopBack (ALB), and Remote Digital Loopback (RDL) in normal or reliable modes, remote configuration, status reporting, pass through of local or remote

modem's EIA lead status, and serial number reporting.

MNP class 4 error correction is incorporated into the 432 Error Free modem. The 432 Network Node implements up to class 5 MNP, which offers all of the error correcting characteristics of class 4, plus a data compression algorithm that provides an average throughput of 19.2 KB per second when using a standard V.32 modem. Speed conversion up to 19.2 KB per second allows for maximum throughput, while allowing for connection with lower speed modems without reconfiguring the port.

Both modems are compatible in asynchronous and synchronous modes with V.32 at 9600 bits per second, CCITT V.22bis at 2400 bits per second, CCITT V.22 at 1200 bits per second, and Bell 212A at 1200 bits per second.

Price for the 432 Error Free is \$995, while the 432 Network Node costs \$1,095.

*Western Datacom, P.O.Box 45113, Cleveland, OH 44145; 1-800/262-3311 or 216/835-1510.*

Circle 82 on reader service card.

## Memory Makers' panic button for tense situations



Bellingham, WA—Here's a useful tool for those times when the phone won't stop ringing, the computer is down, and the boss is in a bad mood: a bright red key imprinted with the word, "PANIC." The button's adhesive backing lets you mount it wherever it will do the most good.

According to Memory Makers, the company selling the buttons, many companies are buying them to distribute at annual board meetings. Others buy them to give to secretaries and DP staff; a convent reportedly bought 10 of them for its nuns.

The buttons cost \$1 each, plus a stamped, self addressed envelope. For orders of 10 or more, Memory Makers pays postage and handling.

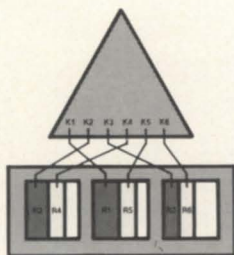
*Memory Makers, 3024 Haggin St., Bellingham, WA 98226; 206/734-9506*

Circle 83 on reader service card.

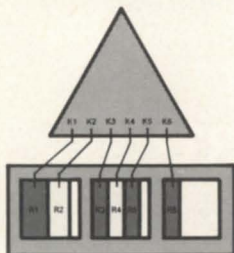
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**Before reorganization:** Modifications have made the INFOS file disorganized. As each record is accessed, a different page must be read from disk. A large amount of I/O is required, and INFOS performance is poor.



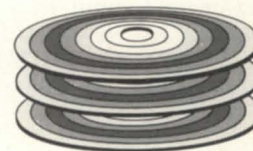
**After the VS.TOOLBOX:** Data records have been re-written sequentially. During sequential processing, each page must be read from disk only once. The amount of I/O is reduced, and INFOS performance is improved.

**PHONE:**  
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### EAGLE Software, Inc.

P.O. Box 16 / 169 E. Cloud  
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**FAX:**  
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Circle 30 on reader service card.

The Value Added Resellers whose products are advertised on these pages are all Data General VARs and have been recognized in the marketplace as leaders. This section of Focus provides a sampling of the products that are available through DG VARs. If your company is a DG VAR that would like to be included, or if you know of other DG VARs that may be interested, please contact the Focus Associate Publisher at 512/345-5316.

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Circle 11 on reader service card.

Company	PG#	RS#	Company	PG#	RS#
Ames Sciences, Inc.	36	1	McIntyre's Mini-Computer Sales Group, Inc.	47	46
AMR	25	2	MegaTape Corporation	19	47
BL Associates Inc.	3	3	Minitab Statistical Software	65	48
Catalina Computers, Inc.	16	4	NADGUG	44	-
Clafin & Clayton, Inc.	73	5	NPA Systems Inc.	26	49
Coastal Computer Services	61	6	Productivity Systems Development Corp.	28	50
Commercial Data Systems Corporation	4	7	Qualstar	12	51
Commercial Data Systems Corporation	64	8	Rational Data Bulletin Board	83	-
CompuTek Ltd.	71	9	Rational Data Systems	52	52
Computer Arts, Ltd.	71	10	RAVE Computer Association, Inc.	76	53
Computer Engineering Associates, Inc.	81	11	Rhintek, Inc.	15	54
Computer Systems Remarketing Corp.	83	-	Robson & Deakin Ltd.	24	55
Computer Systems Remarketing Corp.	83	-	SAS Institute Inc.	59	-
Computer Wholesalers	31	12	SCIP	69	56
Concept Automation, Inc.	31	13	Security Computer Sales, Inc.	75	57
Concept Automation, Inc.	32	14	Service & Training, Inc.	10 & 11	58
Concept Automation, Inc.	33	15	Service & Training, Inc.	10 & 11	-
Cybertek Software, Inc.	C2	16	Synergistic Software Company Ltd.	36	59
Data Assurance Corporation	58	17	Sysgen Data Ltd.	24	60
Data Bank Associates, Inc.	36	18	:SYSMGR Bulletin Board	83	-
Data General Continuing Products Division	5	19	:SYSMGR, a division of B.J. Inc.	36	61
Data General Corporation	29	-	:SYSMGR, a division of B.J. Inc.	67	62
Data General Direct	7	20	3CI	49	63
Data General Software Products & Services	21	21	Threshold, Inc.	35	64
DataLynx	14	22	Threshold, Inc.	12	65
DataLynx	54	23	TLC	42 & 43	66
Dataram Corporation	C3	24	Track Data	83	-
DataSafe Corporation	68	25	TRI-DATA Services Inc.	67	67
Delphi Data	57	26	Vanguard International Mgmt systems	33	68
Detroit RIG	25	27	Vantage Software, Inc.	61	69
DMS Systems, Inc.	79	28	Verdugo Computers, Inc.	9	70
Eagle Software, Inc.	62	29	Viking Software Services	39	71
Eagle Software, Inc.	80	30	Wild Hare Computer Systems Inc.	55	72
Fast Track Systems	17	31	WordPerfect Corporation	23	73
Fast Track Systems	83	-	Zetaco	C4	74
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Fast Track Systems, Inc.	78	77
Logical Solutions, Inc.	79	80
Memory Makers	80	83
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S&T Depot Express	78	78
Western Datacom	80	82

**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.....508/898-4067

**Information on RIGs or SIGs**  
 Cathlene Gentry .....512/345-5316  
**Editorial questions, comments, article suggestions**  
 Greg Farman or Robin Perry (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  
 3400 Computer Drive, MS C-228  
 Westboro, MA 01580  
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**Compusystems, Inc.**, a Data General VAR based in Fort Wayne, Indiana, has signed an agreement with Execucomp, Inc., for exclusive marketing rights to Execucomp's Name Base software package.

Name Base software, which has been on the market since 1978, is designed for use by catalog distribution wholesalers, and consists of product system, marketing system, and financial system modules.

Compusystems specializes in the design, marketing, and support of manufacturing and industrial control applications.

**Powerhouse Partners '89** is a directory of over 300 applications and services developed using the Powerhouse fourth generation language (4GL). Published by Cognos, the paperback directory contains descriptions of applications in 23 subject areas and a list of vendors throughout the world. Each entry gives the name and description of the product, the price, hardware requirements, and other helpful information like availability of training and service, plus the name and address of the manufacturer or vendor.

The directory will be mailed to members of Cognos' Powerhouse Partners program for value-added resellers and system integrators, but also can be obtained at no charge by nonmembers who call one of the following toll-free numbers: 800/426-4667 in the United States; 800/267-2777 in Canada; INTL + 44-344-486668 in Europe.

**The Data General User Group** for the United Kingdom and Northern Ireland will hold its annual general meeting March 9-10 at the Forum Hotel on Cromwell Road in London. Featured speakers will include a cabinet member of the British government, a representative of a leading PC software firm, and a DG management panel. According to DGUG Vice President Richard Finmore, AOS/VS II will be a major topic—the DGUG recently recommended that its members boycott the new version rather than pay DG a separate license fee. For more information about the meeting, contact Sheila O'Reilly, 14 Thistleworth Close, Isleworth, Middlesex, England. The conference fee (£ 235) includes meals and lodging, and reservations are required.

**Financial forecast.** Ronald Skates, DG executive vice president and chief financial officer, predicts that the company will show a profit in fiscal 1989 after three years of losses, according to an article in *The Wall Street Journal*.

Skates, speaking to a group of investors in Boston, said the company should have 5 to 7 percent growth this year, due in part to general growth in the computer industry. Faster growth should occur in the early 1990s, he said, crediting DG's strategy of building new computers based on the Unix operating system, and using standard microprocessors built by Motorola, Inc.

He added that he doesn't anticipate further extraordinary charges from restructuring and lawsuits, which have cost the company a great deal in recent years.

**Promotions at the DG home office** in Westboro include the following: Tom West, former head of the Systems Development Division, was named senior vice president. With his promotion, West announced the creation of Central Technical Services, which will be headed by 12-year DG veteran Fred Cochrane. The departments of Field Engineering and Customer Service have been combined under Michael Schneider. Former Field Engineering Division VP Richard Camuso resigned to pursue other interests.

The promotions "are part of a series of organizational steps we are taking to improve the company's operating efficiency and effectiveness in serving customers," said DG Executive Vice President and Chief Operating Officer Ron Skates.

**Other announcements.** Frank Silkman, senior vice president of Manufacturing and Field Engineering, announced that he will retire this year. Ray Fortune has been named senior vice president of Sales Planning, a new position. He is the former senior vice president of Sales.

**Promotions abroad.** Several changes in the top management of DG's Japanese operation, Nippon Data General (NDG), were announced. Naohiro Okada was named president of NDG, succeeding Hisashi Tomino. Tomino is now the chair-

man of the board of NDG. Takashi Suzuki has been promoted to Jomu (there is no exact English translation of the title, but according to DG, it means roughly junior executive board member of NDG's Board of Directors, which consists of the most senior NDG executives). Suzuki will be named to a new position in Research and Development. His former job as general manager of the Sales and Marketing Division now belongs to Kunio Sako.

These changes were made in order to strengthen management at NDG and improve DG's presence in the Japanese market, as well as its world-wide operations.

**Data General has opened** a Systems Evaluation and Performance Center (SEPAC) in Hounslow, England. Modeled after Data General's SEPAC facility in Norcross, Georgia, this facility will provide a full range of performance services in the United Kingdom, Ireland, and the rest of Europe. In the United Kingdom, SEPAC is part of the Software and Services Division, which also administers all machine-based services for the United Kingdom and Ireland.

**Grumman Systems Support**, an independent third party computer maintenance company serving the DG community, has opened a second office in San Diego. Dana Leslie, a Grumman field engineer formerly with the company's San Francisco operations, has joined Grumman field engineers Bob Wigfall and Greg Pash at the new office. The Grumman San Diego offices serve corporations and health care facilities throughout San Diego County.

**On Jan 5**—two days after the *Focus* press deadline, DG was granted a federal injunction against Grumman Systems Support Corporation preventing Grumman from using DG's diagnostic software ADEX. (See related story page 74.) Watch the March issue of *Focus* for details.

**Registration is underway.** The deadline to register to present papers or exhibit products at the NADGUG conference in New Orleans, Sept. 18-21, is Friday, February 24. Contact Debra Bedrosian, 508/898-4067, for information.



# Gilt-Edge Security: Memory from Dataram

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### **Options and futures**

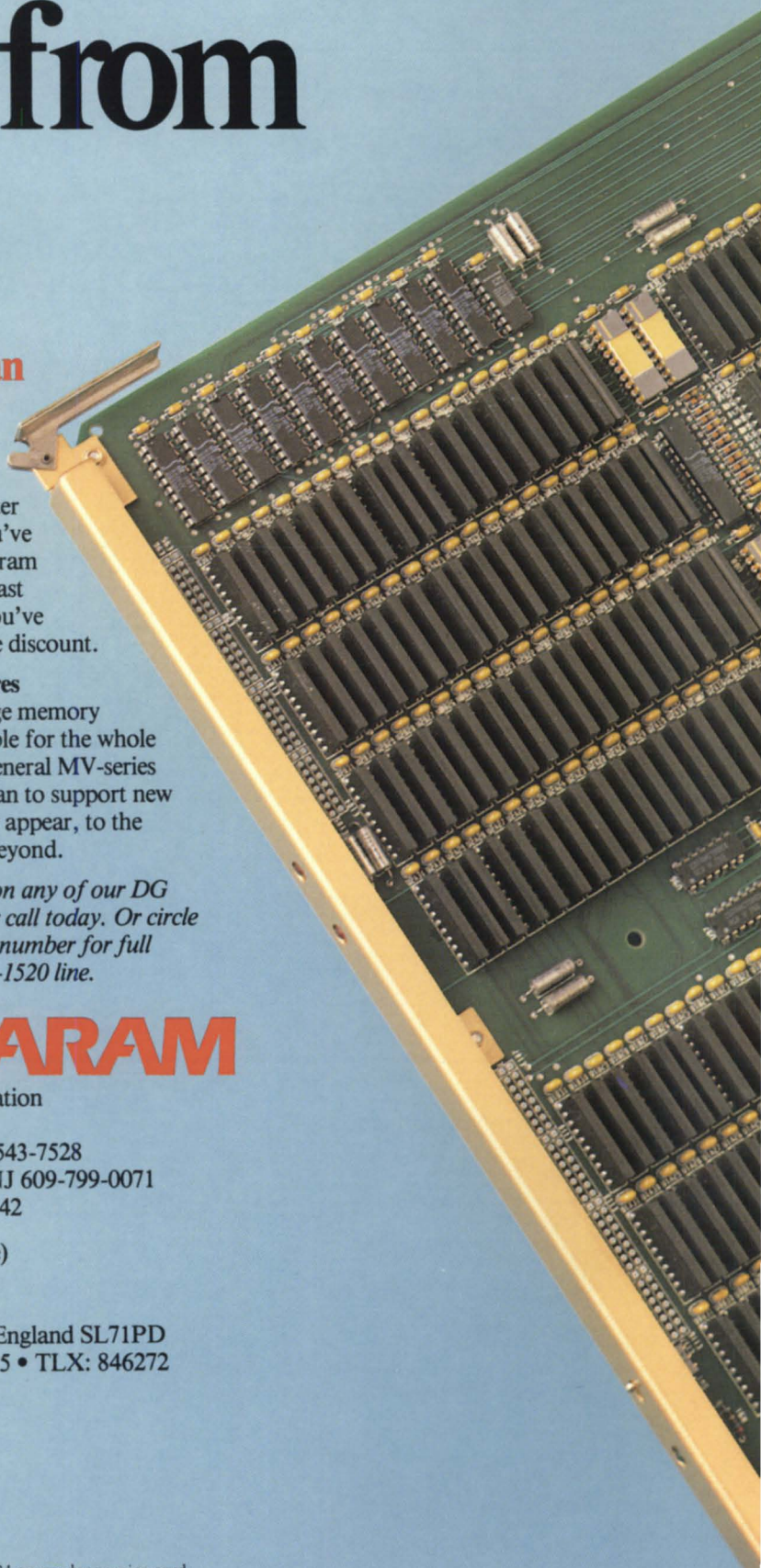
Dataram Gilt-Edge memory boards are available for the whole family of Data General MV-series processors. We plan to support new processors as they appear, to the MV/99000 and beyond.

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