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The Magazine of the North American
Data General Users Group

September 1985



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From the President . . .

As the outgoing president of NADGUG, I wish to take this opportunity to thank all of you for your continuing support. I feel that during the last year or two we have made some tremendous gains for the organization: an all-new *Focus* magazine, a user bulletin board, plans for a user roster, an MV/4000 computer to support our data processing needs, continuing expansion of the membership rolls, and probably most important of all, serious communications with Data General's corporate management. It's good for us to look back with pride at how far we've come, but we shouldn't forget how much more we have to do.

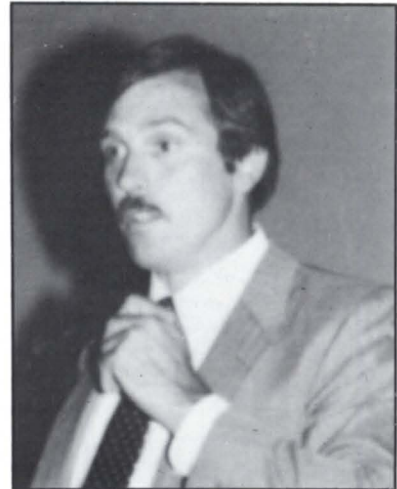
Looking back over the last several years (around eight, actually), I can recall what it was like to be a member of the Data General Users Group in the early days. First, you automatically became a member (sometimes), then every once in a while you would receive a few copies of the user group newsletter, *Focus*. Finally, there was the annual convention. It didn't cost much but you didn't get much either.

Until very recently, the benefits of membership were slim. But as I mentioned earlier, things are changing now.

During my involvement with the national group I have seen a lot of attitudes change. We are now at the point where Data General invites members of the group to their corporate headquarters and spends the time to hear our concerns. We started as a group of individuals trying to solve our individual problems, and have turned into a group trying to help one another get the most out of our investments. There's a big difference between these two approaches, and it's not just a change in the attitudes of members. It also has a lot to do with the way Data General now views its customers.

I believe that Data General now sees NADGUG as a useful ally, rather than a group of pesky—and sometimes irate—dissatisfied users. Data General understands that communication with users may be the best way of solving users' problems and turning dissatisfied users into satisfied customers. DG also has learned that constructive criticism of the kind that NADGUG members provide is an exceptionally fine way for a large company to stay in touch with the changing needs of the market.

To further this "win-win" theme and consolidate our gains, we must all get more involved with NADGUG. Although the group has grown quickly, it is still accessible to any user, and in fact depends on input from all kinds of people. It's easy to get involved: just let the Executive Board know who you are—they'll have you working in no time at all! The more members who become active participants, the better we will be able to maintain and enhance the feeling of mutual benefit.



Before closing, I would like to thank some of the people whose work has brought us this far. Special thanks go to our NADGUG staff (they are paid by Data General, but they work tirelessly for NADGUG), to Frank Keaney (for backing our goals to his North American DG sales force), to Frank Silkman and Bob Miller (for taking time out of their busy schedules to meet and listen to our users group), to Jim Foxworthy and his group (for showing us the Atlanta Support Center, which I am sure will continue to improve service to users), and to Dennis Byron (his DG Marcom group has been able to do everything necessary to keep things moving in a positive direction).

I also want to thank all of NADGUG's members. I hope you will continue to support the new President, Rene Dominguez, so that he may continue where Brad Friedlander, Mort Kahl, and I left off.

—John Brudz, NADGUG president.

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CORPORATE

Making Connections

by Ashok Parikh
Contributing Editor

A Rolm PBX System Answers Data Transmission Problems for Comprehensive Health Services of Detroit

Today more than 42,000 people in Detroit and surrounding communities are depending on Comprehensive Health Services of Detroit. As members of a health maintenance organization (HMO) they go to CHSD's five facilities for services that range from school physicals to major surgery. CHSD is in many ways fairly typical of the health maintenance organizations that have bloomed around the country in recent years. Applying the concept of prepayment for health services, CHSD organizes the delivery of health care services to control costs and take advantage of scale economies. This approach is also evident in the way CHSD solved the communication and data transmission problems that were caused by the company's growth.

Rapid growth is a mixed blessing for any company. Realizing in 1982 that they needed a set of strategies to guide them in managing their company's growth, CHSD's senior management staff began working on a plan that would cover both the short and the long term. The resulting plan called for, among other things, major expansions to handle the increasing demands being placed on voice

communications and data processing. However, at least initially, voice and data communications were considered as two separate systems.

In early 1983, CHSD decided to install an in-house telephone switch to handle voice transmission. Subsequently management selected the Rolm MCBX telephone system for the company's main facility, which houses the health center and administrative offices. Four Rolm VSCBX telephone systems were chosen for CHSD's other four locations.

Meanwhile, the expansion of MIS functions that senior management had set in motion was beginning to cause problems. At the time, CHSD had two Data General systems, a C/330 and an MV/4000. Two more systems were scheduled for installation by 1985, along with several additional application systems. These changes would expand the user community to almost 100 users.

Before this could happen, the computer and data processing staff needed to solve a number of technical problems. To name just a few, we needed to transmit data over distances greater than 1,000 feet, and we

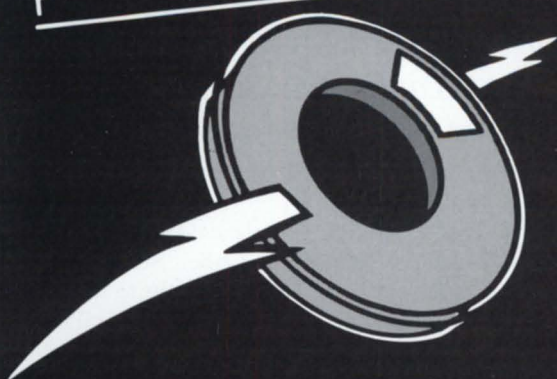
needed to simplify the installation of CRT terminals and printers. We also needed to devise a method of handling port sharing and contention. This article tells how the data communication capabilities of the Rolm MCBX eventually helped us resolve these problems.

The biggest problem we faced was the distance between the computer room and existing users, as well as potential users. On an average, our users were (and still are) approximately 1,000 feet from the computer room. This made it expensive to install printers and terminals with conventional cables simply because of the high costs associated with buying and stringing cables.

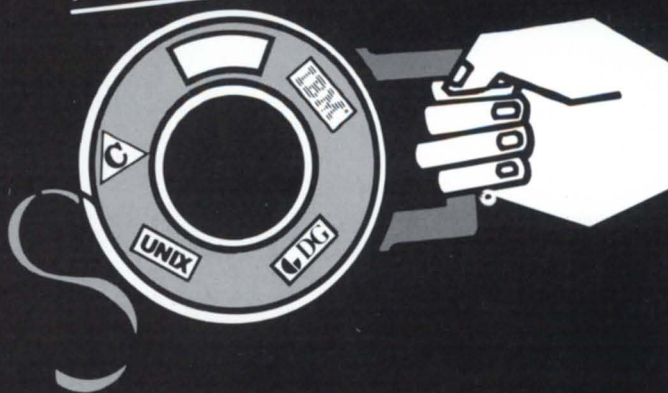
Furthermore, when Data General introduced better and cheaper CRTs, we were unable to use them with either EIA or 20mA current loop interfaces, because the long cable runs weakened the signals. The only alternative we had was to use older, more expensive CRTs (model 6053s) which would work with 20mA current loop at distances almost 1,000 feet from the computer.

We were also having problems with port sharing and port contention, because each

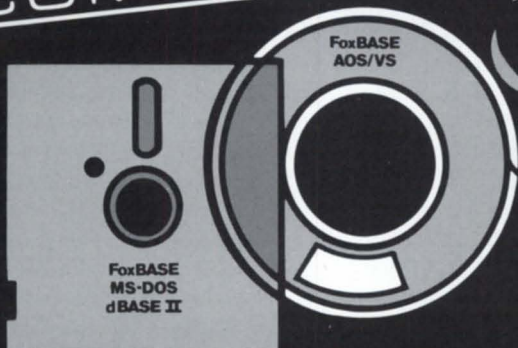
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When Data General introduced better and cheaper CRTs, we were unable to use them because the long cable runs weakened the signals

CRT or printer was hard-wired to a computer port. Since many of our users used the system infrequently, CRT terminals could be inactive and yet continue to tie up computer ports. This was terribly inefficient. With the planned increase in the number of application systems and users, we needed port sharing/contention capability so that a few computer ports could serve the needs of many low volume users. This would allow us to keep the system overhead as low as possible and still maintain an acceptable level of response time.

Another major obstacle was how to provide a back-up system. We had dedicated our MV/4000 to application systems related to health care delivery. These on-line applications and data bases were accessed by many users at three health centers and four pharmacy locations. Providing these users with a back-up system was an absolute necessity in case the MV/4000 failed. However at the same time we did not want to incur the expense of installing a second MV processor just for back-up.

Several of our users also needed to be able to access data bases on more than one system. The only way to do this with the original set-up was to install more than one CRT at those user locations—a very expensive and inelegant solution—or switch the cable from a port on one computer to a port on the other whenever needed. This was also unacceptable because of the technical problems it created.

The bottom line for us was that we needed a way to transmit data more than 1,000 feet, and we had to be able to do it cost-effectively at a minimum rate of 4,800 bits per second.

Since we knew that the CHSD corporate plan included the acquisition of a Rolm MCBX and VSCBX for voice transmission, we began studying the data communication capabilities of the Rolm switches. On paper at least, it appeared to solve many of our problems. We visited a couple of Rolm switch users who used the Rolm MCBX for both voice and data transmission. We were quite satisfied with what we saw, and decided to modify the Rolm contract to include data communication capabilities.

The revised contract basically added only four things to the MCBX order: data communication software, additional memory, data line interface (DLI) boards, and data terminal interface (DTI) units. Each DLI board supports as many as 16 DTI units; each of the DTIs can be connected to a CRT terminal, a printer, or a computer port. When connected to a CRT or a printer, the DTI works as a modem. At the computer end, the DTI has to be connected to an IAC-8 port. (However, it can also be connected to an IAC-16 port with minor modifications and changes in the DTI dip switch setting.) Data is transmitted over telephone cables which have two twisted pairs of wire for digital data transmission. The specifications say that this arrangement can transmit data over an end-to-end distance (i.e., DG computer to Rolm switch to DG terminal) of up to 10,000 feet, and at rates from 110 to 19,200 bits per second.

We started switching data through the Rolm system starting in January, 1984. Today we have four Data General systems serving nearly 100 on-line users (see diagram). The majority of the CRTs and printers are now connected through the MCBX and telephone cable network. With the help of the available data communication features, we are now transmitting at 9600 bits per second over distances of 1,000 feet.

The majority of our users throughout the entire corporate complex are connected to the Rolm MCBX through DTI units and two twisted pairs of wire in the telephone cabling. In addition to solving our basic problem of data communication, this arrangement has a number of other advantages. Users can now log on to any one of the four Data General systems (a C/330, two MV/4000s, and an MV/8000-II).

Users can also share ports. For example, we have several low-volume users who work with the Supercomp electronic spreadsheet. We determined that six ports should be sufficient to serve their needs, and we created a Supercomp data group consisting of six IAC-8 ports that are connected through six DTI units to six data lines in the Rolm system. Whenever a user wants to access Supercomp, all the user has to do is turn on the

CRT, push the request for service switch on the DTI, and type "SUPERCOMP," at the prompt for data group name. At this point the Rolm MCBX will make the connection with one of the six available data lines for Supercomp, and the user will get the AOS/VS log-on screen. If all six lines are busy, the CRT screen will display the "data lines busy" message and place the user in a queue. When some other user frees a data line by logging off, there will be a 30 second continuous beep on the CRT to tell the user to log-on. This data communication feature thus allows several low-volume users to share a few computer ports, and allows port contention.

Since the CRTs and printers are not hard-wired to any particular Data General system, but are connected through DTIs and telephone cables, we have been able to use one of the two MV/4000 systems as back-up for the MV/8000-II system. The MV/8000-II system is used solely to provide operational support to our three health centers. This support includes application systems such as the Membership data base and the Appointment Scheduling data base. All of the systems and the data bases are accessible by users in the three health centers as well as by corporate management.

We have identical peripherals on the MV/4000-A and the MV/8000-II. Therefore, if for any reason the MV/8000-II goes down, we can provide continued access to the operational data bases with a simple four-step process:

1. We ask users on the MV/4000-A to log-off. Since their work is not typically of immediate necessity, it can usually be deferred without great inconvenience.
2. We bring down the MV/4000-A, and move the disk packs from the MV/8000-II disk drives to the MV/4000-A disk drives.
3. We bring up the MV/4000-A with the various on-line systems accessed by our users in the three health centers.
4. Finally, we ask the users in the three health centers to log-on using an alternate log-on procedure. This alternate procedure connects the users with the MV/4000-A instead of the MV/8000-II.

We needed port sharing/contention capability so that a few computer ports could serve the needs of many low volume users

We have been able to complete this procedure within 30 to 45 minutes. This has enabled us to provide the necessary redundancy for our important health care systems. We can avoid down-time problems that might otherwise have an adverse impact on the delivery of care to our members—and we haven't had to buy a redundant back-up system.

The only disadvantage to this type of back-up is that the work being done on the MV/4000-A by administrative staff has to wait until the MV/8000-II is operational, or until the health care personnel log off (typically after hours and on weekends). However, the advantage in terms of cost-effective redundancy far outweighs this modest inconvenience.

We have been very pleased with the data communication capabilities of the Rolm MCBX switch. It has helped us to resolve the problems we faced in early 1983 at a much lower cost than we otherwise would have incurred. Also it has provided us with considerable flexibility and expansion capability.

As a bonus, there are many other data communication features available in our current integration of DG and Rolm equipment. Some of the features we are now using are:

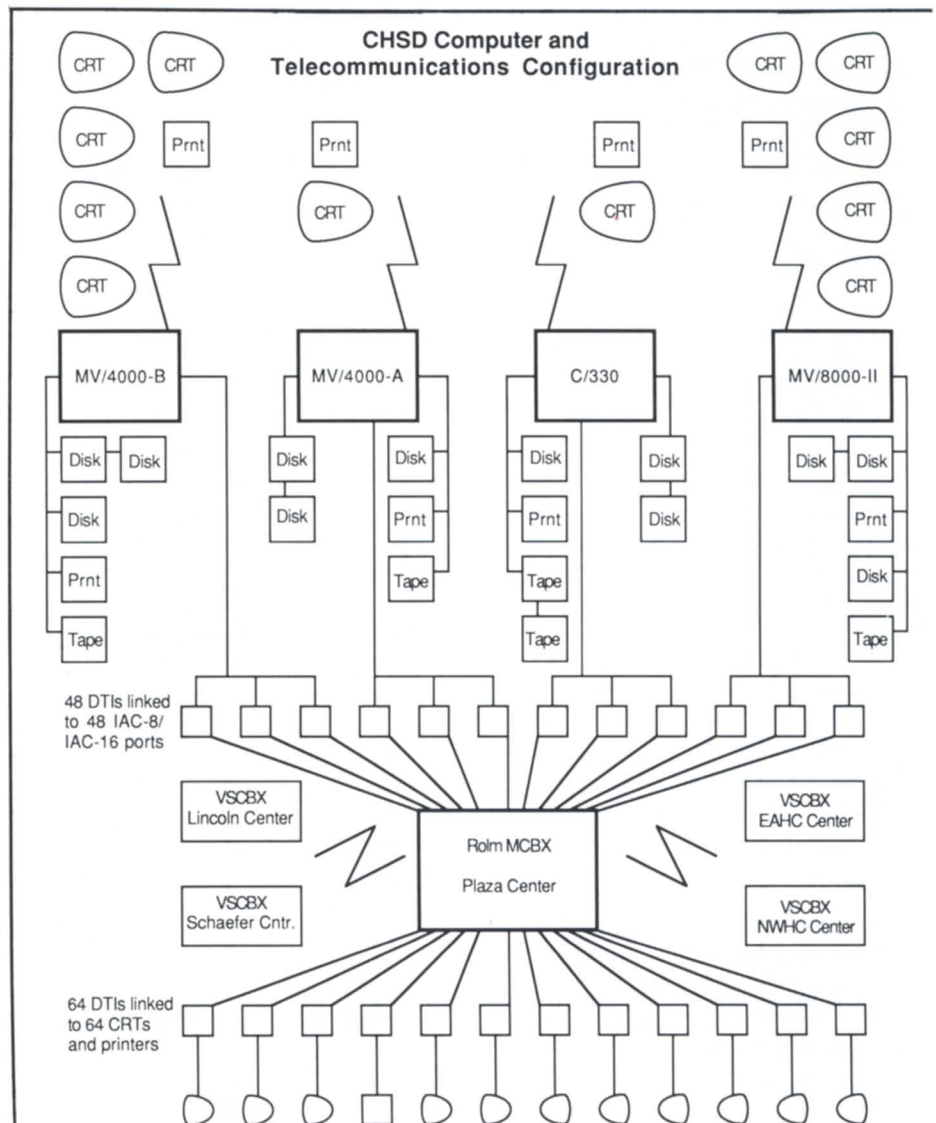
- Auto call/answer by DTI
- Local/remote test of DTI
- DTI/dataline status reporting and monitoring
- Data group status reporting and monitoring
- DLI status reporting and monitoring
- Auto call override
- Call set-up time out
- DTI characteristics changes by user
- Half-duplex, full-duplex, and echoplex modes of operation
- Modem pooling
- Auto baud rate detect
- Message broadcasting
- Queue/priority setting
- Add, delete, and change data line, data group, etc.

Our experience has convinced us that using the Rolm telephone switch or any other PBX for data communication through local/private networks is definitely advantageous

when compared with the traditional method of hard-wiring CRTs and printers to computer ports. The cost savings are considerable since telephone cabling with two twisted pairs of wire permits simultaneous voice and data transmission. Further, the availability of many data communication features and innovative approaches to the use of some of these features provide additional cost savings, flexibility, ease of operation, and considerable expansion potential. The systems administration function available on the main console permits constant interactive monitoring of voice and data transmission activity, and in a user-friendly environment.

Finally, data communication features such as port sharing, port contention, and data call distribution make it easier to optimize the use of computer hardware and maintain an acceptable level of response time. Δ

Ashok K. Parikh administers computer and data processing services at Comprehensive Health Services of Detroit, Incorporated. He is also active with the Detroit area Regional Interest Group, and serves on the executive board of NADGUG.



Although many users who would like the new revision would have to change some hardware, this isn't just an attempt by Data General to increase hardware sales

Easy Upgrade

RDOS BBASIC Rev 8.0: It's As Good As They Say—And Relatively Simple To Install

by George Henne
Contributing Editor

If you've heard about the new release of RDOS Business BASIC, you're probably wondering if it's really as much better as they say. If you've seen the release notice, you may feel daunted by the complexity of the instructions. If you've heard that it's the most revolutionary change to the product in years, you may be concerned about possible unintended effects the upgrade might have for your installation. These misgivings are entirely normal and prudent, but they shouldn't keep you from taking advantage of a significant upgrade. This column may help resolve some of your concerns.

After helping several clients with the upgrade, I can report that everything you may have heard about improved performance is true. I've also found that installing the new rev is not so hard if you take the time to prepare, and if you have the right equipment. Although many users who would like the new

revision would have to change some hardware, this isn't just an attempt by Data General to increase hardware sales. DG's reason for requiring the new hardware seems reasonable: Business BASIC would be strangled if it could not be updated to take advantage of the new equipment currently being produced.

The first casualty is the venerable Nova series. Long the mainstay of Data General's business, the Nova has been left behind by the expanded capabilities of 16- and 32-bit Eclipse machines. Business BASIC rev 8.0 only confirms what we already suspected: the Nova is obsolete. The new rev of Business BASIC gets part of its performance boost by using the expanded 16-bit Eclipse instructions, and that just wouldn't have been possible if the new rev had to work on the old Nova.

It seems inevitable that Nova Business BASIC will eventually go Data General Category C: virtually no further support. I can only recommend that Nova users plan an upgrade, either to a 16-bit Eclipse running RDOS or, preferably, to an MV series. The new MV/4000-DC looks like an ideal upgrade for many Nova Business BASIC users. (I'll talk about converting to AOS/VS in future columns.)

If you already have an Eclipse, all you have to worry about is having enough memory. Rev 8.0 will require more memory than rev 7.0 did, though how much will depend on your own installation. The rule of thumb I use is that for more than 4 terminals you'll need at least 256K, and for more than 16 you'll need at least 512K. If all your programs are small, you might be able to do a bit better, but if you have some large programs, you may not do as well.

To be safe, keep the old programs in a separate directory. Then if you have to go back to rev 7.0, you can easily switch back by renaming directories

The main reason for needing more memory is that in previous revisions (unless you used fixed partitions) each job used only as much memory as the currently-running program needed. With rev 8.0, each job requires the amount of memory needed by the largest program you normally run, plus 2K. This tradeoff is worthwhile, because the new method of organizing memory simplified the scheduling immensely—and that has a lot to do with the increased speed.

This brings us to the second reason for needing more memory. Nearly any system that has been in use for more than a year already has as many terminals as it can handle with a reasonable response time. If you do something to the system to make it run faster, you're sure to add more terminals to slow it down again, right? It's just one of those things. Rev. 8.0 will give you the opportunity to add those new terminals. These terminals will need more memory as well.

How much faster is rev 8.0? Lots, as far as I can tell. My company's users have been unanimous in their raves. What they notice is not only that interactive work is speeded up, but that pauses during displays are shorter and less frequent. The new scheduler seems "fairer" than the old, as well as faster.

With the increased speed, we also find that some users who were considering upgrades to new MV class machines are able to postpone those plans for a while.

So now that you've decided to go to rev 8.0, and you've got an Eclipse with lots of memory, what happens next? You probably know you've got a conversion to do, and if you're a normal programmer, you're nervous about it. (If you'd seriously wanted a dangerous job, you'd be a race-car driver or a government economist, right?)

First, read the Update Notice. There's a lot there, and you should read it carefully. If you have doubts about how something you're doing will work, bring up the new rev and try it on a test system before going live.

Second, look at listings of the conversion programs, BBCNVRT1.BA and BBCNVRT2.BA. Make sure you understand how they work. Then think carefully whether they'll work OK on your site. For instance,

one of the things they assume is that your program names do not have extensions (e.g., progname.XX). If your programs do, you may have to modify the conversion programs, or do those files one at a time.

The conversion is required to change the SAVE format of the programs to a new, more efficient structure called "Reverse Polish Notation." To do this, the conversion programs LIST each program to a disk file in fully expanded form, then ENTER them again with rev 8.0 running. The converted program is then SAVED.

It is during the ENTER phase that you may notice several things going wrong. First, during the LIST command, you might have lines which got cut off because they were longer than 132 characters. This can happen quite naturally due to indents for FOR/NEXT loops, etc. However, when these lines are ENTERed, they are arbitrarily truncated to 132 characters. If you are lucky, this will result in an ERROR 02. If not, you may never know something was lost until the program bombs.

Second, your program may contain variable names which have become keywords since the program was originally written. Many years ago, variables like VAL, POS, and VALUE were all legal. If you haven't looked at your programs since, they've probably run just fine. However, the ENTER statement will catch them, issue an ERROR 02, and lose the statement. For both these problems, you will have to manually type in the missing line of code to replace it.

When you've decided to do the conversion, book the system for the entire day. Give yourself plenty of time to do the job right. To be safe, keep the old programs in a separate directory. Then if you have to go back to rev 7.0, you can easily switch back by renaming directories.

The conversion programs work by driving another terminal as a slave job, and putting commands in its input buffer as if they were typed. Ideally, this slave job should be connected to a serial printer port, such as a TP2. Then, if there are any error messages during the ENTER phase, they will be printed out automatically.

But what if you don't have a serial printer? It's pretty tough to stare at a terminal without blinking for several hours watching for an ERROR 02. You can, however, make life easier for yourself by modifying the ERROR 02 so it beeps and wakes you up. If you value your eyesight, do the following.

The error messages for Business BASIC are stored in a file called BASIC.ER. You OPEN it just like a regular file, and read it as 64-byte records. ERROR 02 is the second record. Just write a little program to read that record (or any other), insert a "<7>."

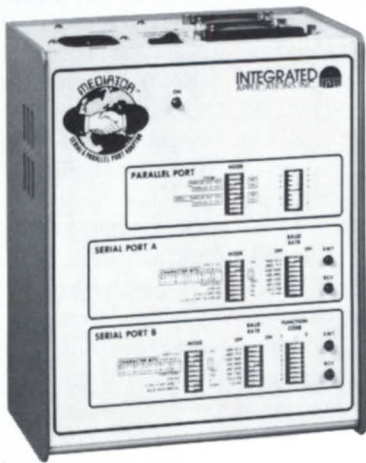
Another frequent problem is with 8-bit character support and serial printers. After putting in the new release, your serial printers may no longer work properly, especially non-DG ones. You may have to change the way you have your options set on the printer.

I've also found problems specifically relating to S/140s with ALM or ATI-16s. If there are several printers or other slow devices connected, some terminals (not all) may occasionally hang. Since these multiplexers are organized as four sets of four lines, the solution is to put only one slow device in any set of four. In other words, leave at least four ports between printers. This balances the load of interrupts.

Also on S/140s with ALM or ATI-16s, there is a problem with ERROR 01 appearing when trying to sign on or off. This problem is made worse because the job doesn't release its system channels when it is terminated. This will eventually cause an ERROR 42 message—No Available Channel. After a couple of months I got a patch that worked; it should be available from your local DG system engineer. Δ

George Henne is Vice President of MICOM Computer Systems; he has installed a large number of Business BASIC systems on many configurations during the past 7 years. Send Business BASIC questions or comments to him at MICOM Computer Systems, 575 Madison Avenue, Suite 1006, New York, NY 10022, or call 416/445-4823.

6 Problem Solving Tools



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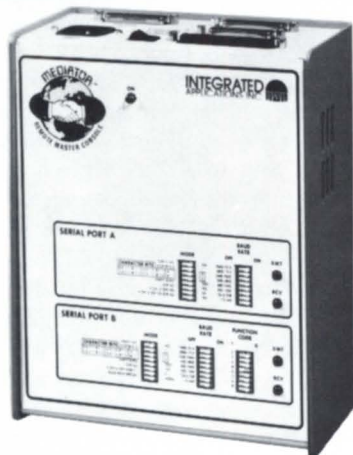
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I have seen many situations where changing the hash frame size improves response time by a factor of four or five

Eternal Vigilance Is the Cost of Performance

by Tim Maness
Contributing Editor

This column is for those of you who work with 32-bit Data General systems. I want this space to become a monthly forum for exchanging information, and I hope it will provide some insights into the workings of your MV system. This month we will take up several issues relating to performance, and in months to come I intend to explore security and file management. Some columns will be directed to systems programmers and operators and others to applications programmers. Whatever your level of expertise or area of interest, please feel free to contact me with comments, questions, and good ideas for future columns. I want this column to reflect your interests.

If you are an applications programmer or user who upgraded from a 16-bit machine you may not have noticed any big changes. It doesn't necessarily show, but the architecture of a 32-bit machine is quite different from its 16-bit predecessors. Before DG could publicly announce its first 32-bit machine in 1980, the company's engineers had to master a long series of technical hurdles. If you were one of those old-timers who anxiously waited for the arrival of the MV/8000, you probably remember it as perhaps the only project of its type ever to be documented with a Book of the Month Club selection. Setting aside the company politics and policies that Tracy Kidder chronicled in *The Soul of a New Machine*, I think it's fair to say that the DG Eagle project gave us what we were waiting for: a lower-cost, higher-performance alternative to the DEC establishment. (Let's hope DG will soon come out with something to counter the MicroVax II!)

32-bit products in general have two advantages over 16-bit products. They provide a larger address space, and they are faster.

The larger address space lets you have bigger programs, larger arrays, and more data in memory without having to worry about overlays. The performance advantage of 32-bit architectures is significant, and is in fact probably what led to your decision to purchase your machine in the first place. However, we all know that it requires constant monitoring and routine maintenance procedures to keep performance at a high level.

Before we launch into the technical aspects of tuning your system for better performance, stop to consider for a moment the role of subjective perception in performance measurement. How many times have you heard a user say, "The system seems slower today . . . It must be the new update." Do you have the heart to tell him that the scheduled update hasn't been installed yet? It is this subjective aspect of performance that has led me to adopt the philosophy that most system work is best done without a lot of fanfare. I'm certainly not advocating that you ignore users' assessments of response time, but if changes have an adverse impact you can bet you'll hear about it quickly. If they have no impact, or even if they improve things dramatically, you probably won't hear about it—a happy user is usually a quiet user!

The moral? Keep your own set of benchmarks, and be sure to measure performance before and after any changes you make. Then you will know what impact your change really had.

In the remainder of this month's column I would like to mention a few things that you can do to improve performance. None of them require a purchase order for new equipment. These are certainly not secrets, but they are often overlooked as the first-line de-

fense against performance problems. The procedures discussed below are ways to improve performance by increasing the speed of accessing files on your disk.

Balancing your disks. When was the last time you ran DISCO? It now comes with your AOS/VS system, and it provides a very convenient way to check to see if the disk activity on your system is distributed evenly. Directions for running DISCO and an explanation of the output can be found in your *How to Generate and Run AOS/VS* manual, page 9-40. Briefly, the key thing to look for is under the column heading "% of total." The numbers under this heading should be roughly the same. A 20-80 split on a two disk system is pretty poor and deserves some attention. A 25-40-35 split on a three disk system is pretty good.

If you discover that you have unbalanced disk access, you need to analyze the types of jobs being done on your system. If you have a mix of activity you can probably identify an application to move from one disk to another. If you run only one application, it may be a bit more challenging, but there is almost always a way.

Increasing file element sizes. When files are created, one of the parameters is the element size. This is the amount of contiguous space that the system allocates as the file grows. The system default is four disk blocks, which means that larger files may be spread all over the disk. If your applications do much file access at all it is definitely worth dumping files off and reloading them with larger element sizes. Just as an example, I tested the time required to read a 14 megabyte file (about 28,000 blocks) on an

Making files contiguous does make them faster to access, but they can be unwieldy to work with for other reasons. You have to decide if the extra gain is worth it

MV/6000 with 354 megabyte drives and 20 active users. When the file element size was four blocks, the read took six minutes and nine seconds (elapsed time). Changing the element size to 32 decreased the time to read the entire file to one minute and three seconds.

Changing to contiguous files in this example reduced the read time down to 45 seconds. Making files contiguous does make them faster to access, but they can be unwieldy to work with for other reasons. You have to decide if the extra gain is worth it. As a rule, disk controllers will transfer at most 32 blocks at a time; that's why 32 is usually a good file element size.

The average seek figure from the DISCO program mentioned above can also give you some perspective on file fragmentation. Growing numbers mean the disk is filling up and/or that file fragmentation is slowing access.

Increasing directory hash frame sizes.

This is often overlooked, but it can significantly affect response time. When you access a file by name, the operations used by the system to locate the file involve (1) hashing the file name, (2) sequentially searching the referenced block, and (3) sequentially searching overflow blocks until the file is found. The hashing operation is a simple computation that involves hash frame size. This mysterious number is simply the number of partitions into which the file names in a directory will be divided. For example, if

you have 140 files in a directory and the hash frame size is seven (that's the system default), there are seven partitions with around 20 file names in each partition. If the hash value of file SMITH.CODES is three, then the third partition will be searched until SMITH.CODES is found.

The number of file names that will fit in a disk block depends on the length of the name, but an average of 20 is not a bad assumption. For our example this means that each partition will consist of one block. What happens in directories with lots of file names is that the seven partitions can grow to have several dozen overflow blocks that must be searched. You can start to see what happens if you are working in a directory with lots of files or if you have one in your search list.

I have seen many situations where changing the hash frame size improves response time by a factor of four or five. For example, in a directory with 1500 files, changing the hash frame size from seven to 151 (75 would have been reasonable, but I'm still growing the directory) decreased the time to start SED from 10 seconds to less than two (on an MV/4000-SC). The time required to queue the file to print fell from four seconds to less than one.

You can use the accompanying macro to check your big directories, like :UTIL, and don't forget to check your big user directories, too. The macro makes some simplifying assumptions to let it run in a reasonable amount of time. The first version I wrote fig-

ured out exactly how many files were in the directory and the average file name length. It took more than 37 minutes to run in a directory with 1500 files. This version takes about 37 seconds in a directory of that size. However, if your average file name length is not 14, you should change line six of the macro accordingly. You should also adjust the number of file names per disk block on line eight as follows: one to 10 characters per file name, use 31; 28 or more characters per file name, use 10; anything else, use 20.

After thinking about these types of changes I decided to check one of my clients' systems. I discovered that there were more than 20 actively-used directories that could benefit substantially from a change in hash frame size (i.e., the current size was 10 to 15 times smaller than needed). More than 40 of my client's files that have the default element size need to be reloaded with a larger element size. I'll be talking with him soon.

System performance is a very complicated topic with many variables that can affect response time and throughput. These ideas may or may not help in your environment, but they are easy to implement and easy to check—and they can't make things worse. Δ

Tim Maness is president of DMS Systems, Inc., a software development firm specializing in data base management. He may be reached at 740 East 3900 South, Salt Lake City, UT 84107, 801/268-6671.

```
[!equal,%0/%,]
push
comment Get total length of filenames
delete/1=ignore/2=ignore ?[!pid].hf.tmp
f/cpl=32/1=?[!pid].hf.tmp/nh
var3 14 ; comment average file name length
var1 [!udiv,[!size ?[!pid].hf.tmp],[!uadd,[!var3],2]]
var4 20 ; comment number of filenames per disk
block

var5 [!uadd,[!udiv,[!var1],[!var4]],1]
;comment hashframesize

delete/1=ignore/2=ignore ?[!pid].hf1.tmp
f/hashframe/nh/1=?[!pid].hf1.tmp '[!filename [!dir]]
string ?[!pid].hf1.tmp
```

```
comment tell them what we found out
%0\%/1 [!dir] [!var1] [!var5] [!string]

comment clean things up
delete/1=ignore/2=ignore ?[!pid].hf.tmp
delete/1=ignore/2=ignore ?[!pid].hf1.tmp
pop
[!end]

[!equal,%0/%,1]
write Directory %1% contains approximately %2% files
write,,,,,,,,,—requiring a hashframe size of %3%
write,,,,,,,,,—current hashframesize is %5%
[!end]
```

A General-Purpose Checkpoint Utility

by Jim Siegman
Contributing Editor

This article discusses the second implementation of a checkpoint utility that runs as a son process to the OP:CLI on our AOS/VS system. The article describes and lists the program and macros we have written to assure timely checkpointing of our INFOS files. Those of you who are not using INFOS and differential volumes have no need for this program. Those of you who are using INFOS and have chosen not to use record logging have most likely either implemented a similar program or have decided to rely on Data General Quality Assurance (both hardware and software) to keep your INFOS data bases intact.

Let's take time for a quick review. If you are running INFOS and have lots of memory on your system, you will probably have a major portion of your data base loaded into memory at any given time. This will only be written to disk as the memory is needed for other purposes. INFOS data bases are extremely susceptible to crashes in this type of situation, and Data General has provided several ways to help guard them.

One of the earliest ways to safeguard your data base was to use Modified Page Flush. This simply wrote every data base page to disk as changes were made; in most cases it severely degraded system performance. Then Data General invented differential files. This technique kept all the changes in separate INFOS volumes until the file was closed, or until you manually forced a checkpoint. It then copied all of the changes at once. Since the actual time needed to copy changes was usually an extremely small percentage of elapsed time, this was a very good way to reduce your exposure to crash damage. It presented a problem, however, if your INFOS data base tended to be open for long periods of time. Since none of the changes were saved until the file was closed or checkpointed, older copies of your file were protected at the expense of the safety of updates.

This problem can be handled in one of two ways. One way is to spend \$20,000 on two tape drives and hire an operator to change INFOS logging tapes all day. Those of us who can't afford that luxury have to make do with the other method: forcing checkpoints at desired intervals throughout the day.

Since it is expensive to pay an operator to watch the clock and enter commands at regular intervals, most of us have some sort of system to run checkpoints without constant monitoring. The easiest way is to

write a macro that issues checkpoint commands, then a pause command, and then calls itself again. That is perfectly acceptable. However, it does have some limitations.

To summarize, we wanted a checkpoint utility to meet the following criteria:

- 1) It had to be written in one of our existing languages. (We weren't going to buy a compiler just to make this easy.)
- 2) To minimize the hardware requirements, it had to run as a son process of the root without a terminal.
- 3) It had to have a way to accept command lines.
- 4) To minimize CPU demand during wait state, it had to use the PAUSE system call (not CALL #W).
- 5) It had to be able to adjust the wait state time to compensate for system load.

The first point was fairly easy to resolve. We had the somewhat limited choice of Assembler, AOS COBOL, AOS/VS COBOL, or ICOBOL under AOS/VS. Since we didn't want to take a lot of time to write it, Assembler was out. ICOBOL and AOS COBOL were both obtained for a conversion from earlier systems, and were no longer being used for any production work at all. That left us with AOS/VS COBOL.

Point 2 was the desire to run as a son to PID 2 without a terminal. No problem here, as long as we didn't make it interactive. All output would go to either PID 2 (via ?SEND) or to a disk file.

Point 3 was a little trickier. There are really only two ways to accept commands without a terminal. You can either read an IPC port, or read a diskfile. The IPC approach was unappealing. I had never dealt with them from COBOL and could not find any documentation saying whether it could be done, or how to do it. The file approach wasn't very appealing either, since it meant a lot of code for a "simple" function. However, I chose to use the file method since it was more tedious than difficult, and I already knew how to code it.

Point 4 is quite easy under AOS/VS COBOL. With the newly implemented ?CBSYS calling capability, there was no problem at all to use a system call to suspend the process for any length of time without using a delay loop. This has one disadvantage however. It means that the utility will not react immediately to commands placed in the command file. Thus, real-time control of the utility can only be simulated by using

short delay times. (Had the IPC approach been chosen for design goal 3, this could have been very simply achieved by reading the IPC port with a timeout value of the number of seconds remaining until the next checkpoint needs to be run.

Point 5 would give the utility a modicum of intelligence. It would check the time both before and after running the checkpoints and see what the elapsed time was. If it was less than some "minimal" time it would increase the sleep time. If it took too long, it would decrease the sleep time. Thus the utility would attempt to adjust for factors such as system load and amount of data written to file as it determined the frequency of the checkpoints.

The five listings that follow are the program, three CLI macros to support the utility, and a file referenced by one of the macros. The macros are named CHECKPOINTER, CHECKPOINTER2, and RECOVER; the program was named SYS07. The file contains a list of the files currently being checkpointed, and is referenced by two of the macro commands. The checkpointer is intended to run in our :PROD directory; all the support files are in the :MACROS directory which is on its search-list. All output from the checkpointer will be in the :PROD directory.

The CHECKPOINTER macro is called by the UP macro with no switches. This starts the program as a son to PID 2. The program can also be called by other macros or from the master CLI with the switches for control. Note that before it starts the checkpointer, the macro checks the ending status to see if the last command issued was "STOP". If not, it runs a macro which deletes the differential volumes. (That's the RECOVER/DELETE on the 32nd line of the macro.)

CHECKPOINTER2 is called by SYS07 to actually run the INFOS checkpoint on all of the files. Note that the list of files is stored in a file for easy updating. It also keeps the three most current list files for reference in case something needs to be checked or inspected.

The program itself is fairly self-explanatory, although I must point out that the optimum values for timing adjustment have yet to be determined. I am still experimenting with values to see how quickly it responds and makes adjustments. The current values produce a checkpoint about every 20 minutes for the files contained in the INFOS_FILES list. Furthermore, after the last week of observation it appears that I can greatly reduce the sleep time without any noticeable effect on system performance. Checking the command file more often will have a number of advantages, one of which would be to make the control become more like real-time.

The next modification I will experiment with is to build a list of files in working storage, and to allow selective checkpointing of the various files. Another addition will let it open files so that user programs can start-up and initialize more quickly.

I intend to make this program available on the goodies tape of the AOS and AOS/VS SIG after I have the timing values improved. In the future I hope to be able to make tapes for the general membership. If anybody is interested in obtaining a tape, contact me at home and I will add you to the waiting list. My phone number is (312) 720-1940 from 7:00 PM to 10:00 PM Central (Chicago) time.

Jim Siegman is chairman of the NADGUG publications committee.

Contents of the INFOS FILES parameter file

```
:PROD:INT:ARADDR.DB&
:PROD:INT:ARCUST.DB&
:PROD:INT:ARSTMT.DB&
:PROD:INT:IVCDETL.DB&
:PROD:INT:OPENORD.DB&
:PROD:INT:ORDETL.DB&
:PROD:INT:ORDMSTR.DB&
:PROD:INT:REQUEST.DB&
:PROD:INT:TABLFILE.DB&
:PROD:DOM:ARADDR.DB&
:PROD:DOM:ARCUST.DB&
:PROD:DOM:ARSTMT.DB&
:PROD:DOM:EMPLOYEE.DB&
:PROD:DOM:ERRMSG.DB&
:PROD:DOM:INSHISTORY.DB&
:PROD:DOM:INUMSTR.DB&
:PROD:DOM:INVTRANS.DB&
:PROD:DOM:ITEMMSTR.DB&
:PROD:DOM:IVCDETL.DB&
:PROD:DOM:MENUFILE.DB&
:PROD:DOM:OPENORD.DB&
:PROD:DOM:ORDETL.DB&
:PROD:DOM:ORDMSTR.DB&
:PROD:DOM:REQUEST.DB&
:PROD:DOM:TABLFILE.DB&
:PROD:DOM:TIMECARD.DB&
:PROD:DOM:UPSHISTORY.DB&
```

Comment - RECOVER.CLI - Macro Command

```
QB/M/JOB=RECOVERY/QPRI=0
SUPERU ON
IRECOVER%0/% ([INFOS FILES])
```

```
Comment MACRO COMMAND - CHECKPOINTER2.CLI - 6/13/85 - JKS
delete/2=IG :prod:checkpoint.output.2
rename/2=IG :prod:checkpoint.output.1 checkpoint.output.2
rename/2=IG :prod:checkpoint.output checkpoint.output.1
superuser on
['equal,['path infos files],]
send 2 ['ascii 207]
send 2 *** WARNING *** Unable to find list of INFOS FILES
send 2 ['ascii 207]
send 2 *** WARNING *** Did not checkpoint the differential files.
send 2 ['ascii 207]
[!else]
checkpoint/1=:prod:checkpoint.output ([infos files])
[!end]
```


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Comment - MACRO command - checkpoint. CLI - 6/21/85 - Siegmán
 Comment - Test for switches one at a time.

```

push ; prompt pop

Comment ***** /STOP *****

[!eq,(%D/stop%),(/stop)]
  delete/2=ignore :prod:checkpoint cntrl
  write/1=:prod:checkpoint cntrl STOP
  send 2 *** Command to stop the checkpoint utility ***
  send 2 *** issued at [!time] by [!user]. ***
[!else]

Comment ***** /WAIT *****

[!eq,(%D/wait%),(/wait)]
  delete/2=ignore :prod:checkpoint cntrl
  write/1=:prod:checkpoint cntrl WAIT
  send 2 *** Checkpointing suspended and in wait state ***
  send 2 *** Command issued at [!time] by [!user]. ***
[!else]

Comment ***** /???? *****

[!nequal,(%D/%),()]
  write
  write **** ERROR **** Invalid switch - %D/%
[!else]

Comment ***** no switches *****

superuser on
str [:prod:checkpoint cntrl]
[!neq,(!str),(!stop)]
  write **** WARNING **** STARTING IRECOVER WITH DELETE
  write,,,,,IN 10 SECONDS. HIT 'C'A TO KILL THIS!!!
  write
  pause 10
  write **** STARTING RECOVER/DELETE ****
  recover/delete
[!end]
delete/2=ignore :prod:checkpoint output
create :prod:checkpoint output
proc/dir=:prod/output=:prod:checkpoint output/list=:prod:checkpoint output/&
def/name=checkpoint :prod:sys07
delete/2=ignore :prod:checkpoint cntrl
write/1=:prod:checkpoint cntrl CONT

[!end] ; Comment This is for the invalid switch check
[!end] ; Comment This is for the /WAIT switch check
[!end] ; Comment This is for the /STOP switch check
pop
  
```

Source file: SYS07.CO
 Compiled on 25-Jul-85 at 15:25:54 by AOS/V5 COBOL Rev 02.20.00.03
 Options: COBOL/L=SYS07.LS, SYS07.CO

```

1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. SYS07.
3 AUTHOR. SIEGMAN.
4 *
5 INSTALLATION. FAST HEAT.
6 DATE-WRITTEN. June, 1985.
7 DATE-COMPILED. 25-Jul-85
8 * Copyright 1985 by James K. Siegmán. Permission granted to
9 * NADGUG members for non-commercial use on their systems.
10 ENVIRONMENT DIVISION.
11 * This program reads a checkpoint command line that was created
12 * with write/1=:prod:checkpoint cntrl from CLI. The commands
13 * that are currently implemented are:
14 * STOP - End all functions - STOP RUN
15 * CONT - Continue - Monitor control file and issue checkpoints
16 * WAIT - Continue monitoring control file but do not checkpoint
17 *
  
```

```

18 CONFIGURATION SECTION.
19 SOURCE-COMPUTER. M/8000-II.
20 OBJECT-COMPUTER. M/8000-II.
21 *
22 SPECIAL-NAMES.
23 INPUT-OUTPUT SECTION.
24 FILE-CONTROL.
25     SELECT OPTIONAL COMMAND-FILE
26     ASSIGN TO KEYBOARD COMMAND-FILE-NAME.
27
28 DATA DIVISION.
29
30 FILE SECTION.
31 FD COMMAND-FILE
32     RECORDING MODE IS DATA-SENSITIVE.
33 01 COMMAND-LINE.
34     05 WS-CP-COMMAND PIC X(4).
35     05 WS-CP-COMMAND-2 PIC X(1).
36     05 WS-CP-COMMAND-3 PIC X(10).
37 /
38 WORKING-STORAGE SECTION.
39 01 COMMAND-FILE-NAME PIC X(16) VALUE "CHECKPOINT CNTRL".
40 01 PREV-COMMAND-LINE PIC X(15) VALUE SPACES.
41 01 WS-CURRENT-TIME PIC 9(8).
42 01 WS-CURRENT-HMSH REDEFINES WS-CURRENT-TIME.
43     05 WS-CURRENT-HMS PIC 9(6).
44     05 WS-CURRENT-H PIC 9(2).
45
46 01 CHECKPOINT-MACRO-NAME PIC X(250) VALUE "CHECKPOINTER2".
47 01 WS-CLI-WARNING-LINK.
48     05 FILLER PIC X(07) VALUE "Send 2 ".
49     05 WS-CLI-WARNING-MESSAGE.
50         10 FILLER PIC X(35) VALUE "*** WARNING FROM CHECKPOINTER ***".
51         10 WS-CLI-WARNING-TIME PIC 99/99/99 VALUE ZERO.
52         10 FILLER PIC X(03) VALUE " - ".
53         10 WS-CLI-WARNING PIC X(44) VALUE SPACES.
54         10 FILLER PIC X(90) VALUE LOW-VALUES.
55
56 01 WS-CLI-MESSAGE-LINK.
57     05 FILLER PIC X(07) VALUE "Send 2 ".
58     05 WS-CLI-MESSAGE.
59         10 FILLER PIC X(33) VALUE "*** MESSAGE FROM CHECKPOINTER ***".
60         10 WS-CLI-MESSAGE-TIME PIC 99/99/99 VALUE ZERO.
61         10 FILLER PIC X(03) VALUE " - ".
62         10 WS-CLI-MESSAGE-1 PIC X(49) VALUE SPACES.
63         10 FILLER PIC X(150) VALUE LOW-VALUES.
64
65 01 WS-TEMP-1 PIC S9(9).
66 01 WS-TEMP-2 PIC S9(9).
67 01 WS-TEMP-3 PIC S9(9).
68 01 WS-TEMP-JUNK PIC S9(9).
69
70 01 WS-DELAY-FOR-CONTROL PIC S99 VALUE 15.
71 01 WS-PAUSE-SECS PIC S9(4) VALUE ZERO.
72 01 WS-SECS-TO-CHECKPOINT PIC S9(4) VALUE 900.
73 01 WS-SECS-SINCE-CHECKPOINT PIC S9(4) VALUE ZERO.
74
75 01 WS-CHECKPOINT-BEG PIC 9(8) VALUE ZERO.
76 01 WS-CP-BEG-RED REDEFINES WS-CHECKPOINT-BEG.
77     05 WS-CP-BEG-HH PIC 99.
78     05 WS-CP-BEG-MM PIC 99.
79     05 WS-CP-BEG-SS PIC 99.
80     05 WS-CP-BEG-XX PIC 99.
81 01 WS-CHECKPOINT-END PIC 9(8) VALUE ZERO.
82 01 WS-CP-END-RED REDEFINES WS-CHECKPOINT-END.
83     05 WS-CP-END-HH PIC 99.
84     05 WS-CP-END-MM PIC 99.
85     05 WS-CP-END-SS PIC 99.
86     05 WS-CP-END-XX PIC 99.
87 01 WS-CHECKPOINT-MIN PIC 9(8) VALUE 99999999.
88 01 WS-CHECKPOINT-MAX PIC 9(8) VALUE ZERO.
89 01 WS-CHECKPOINT-PREV PIC 9(8) VALUE ZERO.
90 01 WS-CHECKPOINT-ACTUAL PIC 9(8) VALUE ZERO.
91
92 01 WS-SYSTEM-CALL-AREA.
93     05 SYSCALL-SEND PIC 9(4) COMP VALUE 206.
94     05 SYSCALL-WIDELAY PIC 9(4) COMP VALUE 179.
95     05 SYSCALL-ERROR PIC 9(9) COMP VALUE ZERO.
96     05 SYSCALL-AC0 PIC 9(9) COMP VALUE ZERO.
  
```



```

97      05 SYSCALL-AC1      PIC 9(9) COMP VALUE ZERO.
98      05 SYSCALL-AC2      PIC 9(9) COMP VALUE ZERO.
99 /
100 PROCEDURE DIVISION.
101 MAIN-LOGIC SECTION.
102 MAIN-LOGIC-BEGIN.
103 *** Wait a couple seconds for effect ***
104 CALL PROGRAM "MW".
105 MOVE "Production auto-checkpoint utility started"
106 TO WS-CLI-MESSAGE-1.
107 ACCEPT WS-CURRENT-TIME FROM TIME.
108 PERFORM CALL-CLI-MESSAGE.
109
110 MAIN-LOGIC-LOOP.
111 PERFORM READ-CONTROL-FILE.
112 **** Non-standard indentation here! Before any syntax perfectionists
113 **** get worked up, I did it to conserve column inches.
114 IF WS-CP-COMMAND = "WAIT" GO TO MAIN-LOGIC-WAIT
115 ELSE IF WS-CP-COMMAND = "STOP" GO TO MAIN-LOGIC-END-PROGRAM
116 ELSE IF WS-CP-COMMAND = "CONT" GO TO MAIN-LOGIC-CHECKPOINT
117 ELSE MOVE "Unknown Command - Resume Checkpointing" TO WS-CLI-WARNING
118 PERFORM CALL-CLI-WARNING.
119
120 MAIN-LOGIC-CHECKPOINT.
121 IF WS-SECS-SINCE-CHECKPOINT > WS-SECS-TO-CHECKPOINT
122 PERFORM START-CHECKPOINT.
123
124 MAIN-LOGIC-WAIT.
125 PERFORM WAIT-A-WHILE.
126 GO TO MAIN-LOGIC-LOOP.
127
128 MAIN-LOGIC-END-PROGRAM.
129 STOP RUN.
130
131 READ-CONTROL-FILE SECTION.
132 READ-CONTROL-FILE-BEGIN.
133 OPEN INPUT COMMAND-FILE.
134 READ COMMAND-FILE
135 AT END MOVE PREV-COMMAND-LINE TO COMMAND-LINE.
136 MOVE COMMAND-LINE TO PREV-COMMAND-LINE.
137 CLOSE COMMAND-FILE.
138
139 WAIT-A-WHILE SECTION.
140 WAIT-A-WHILE-BEGIN.
141 ACCEPT WS-CURRENT-TIME FROM TIME.
142 *** More non-standard indentation here.
143 IF WS-CURRENT-TIME < 07000000 MOVE 08 TO WS-DELAY-FOR-CONTROL ELSE
144 IF WS-CURRENT-TIME < 16000000 MOVE 05 TO WS-DELAY-FOR-CONTROL ELSE
145 IF WS-CURRENT-TIME < 19000000 MOVE 02 TO WS-DELAY-FOR-CONTROL ELSE
146 MOVE 08 TO WS-DELAY-FOR-CONTROL.
147
148 MULTIPLY WS-DELAY-FOR-CONTROL BY 60
149 GIVING WS-PAUSE-SECS.
150 MULTIPLY WS-PAUSE-SECS BY 1000
151 GIVING SYSCALL-AC0.
152 CALL "CBSYS" USING
153 SYSCALL-WDELAY
154 SYSCALL-AC0
155 SYSCALL-AC1
156 SYSCALL-AC2
157 SYSCALL-ERROR.
158 ADD WS-PAUSE-SECS TO WS-SECS-SINCE-CHECKPOINT.
159
160 START-CHECKPOINT SECTION.
161 START-CHECKPOINT-BEGIN.
162 ACCEPT WS-CHECKPOINT-BEG FROM TIME.
163 CALL "CLI" USING CHECKPOINT-MACRO-NAME.
164 ACCEPT WS-CHECKPOINT-END FROM TIME.
165
166 *** Don't bother to recalculate delay if midnight is involved
167 IF WS-CHECKPOINT-END < WS-CHECKPOINT-BEG
168 GO TO START-CHECKPOINT-END.
169
170 *** Calculate actual seconds of elapsed checkpoint time.
171 COMPUTE WS-CHECKPOINT-ACTUAL =
172 ((WS-CP-END-HH * 60) + WS-CP-END-MM) * 60 + WS-CP-END-SS)
173 ((WS-CP-BEG-HH * 60) + WS-CP-BEG-MM) * 60 + WS-CP-BEG-SS).
174
175 * If we have a new minimum or maximum, adjust things accordingly.
176 IF WS-CHECKPOINT-ACTUAL < WS-CHECKPOINT-MIN
177 MOVE WS-CHECKPOINT-ACTUAL TO WS-CHECKPOINT-MIN
178 IF WS-SECS-TO-CHECKPOINT < 3600
179 ADD 100 TO WS-SECS-TO-CHECKPOINT
180 GO TO START-CHECKPOINT-END
181 ELSE
182 GO TO START-CHECKPOINT-END.
183
184 IF WS-CHECKPOINT-ACTUAL > WS-CHECKPOINT-MAX
185 MOVE WS-CHECKPOINT-ACTUAL TO WS-CHECKPOINT-MAX
186 IF WS-SECS-TO-CHECKPOINT > 300
187 SUBTRACT 100 FROM WS-SECS-TO-CHECKPOINT
188 GO TO START-CHECKPOINT-END
189 ELSE
190 GO TO START-CHECKPOINT-END.
191
192 * Well, it was within the range. Now lets calculate a new delay time
193 SUBTRACT WS-CHECKPOINT-PREV
194 FROM WS-CHECKPOINT-ACTUAL
195 GIVING WS-TEMP-1.
196 DIVIDE WS-TEMP-1 BY 10
197 GIVING WS-TEMP-2
198 REMAINDER WS-TEMP-JUNK.
199
200 * I know, more wierd stuff that's hard to read...
201 IF WS-TEMP-2 > 15 SUBTRACT 060 FROM WS-SECS-TO-CHECKPOINT ELSE
202 IF WS-TEMP-2 > 30 SUBTRACT 090 FROM WS-SECS-TO-CHECKPOINT ELSE
203 IF WS-TEMP-2 > 45 SUBTRACT 125 FROM WS-SECS-TO-CHECKPOINT ELSE
204 IF WS-TEMP-2 > 60 SUBTRACT 175 FROM WS-SECS-TO-CHECKPOINT ELSE
205 IF WS-TEMP-2 > 75 SUBTRACT 250 FROM WS-SECS-TO-CHECKPOINT ELSE
206 IF WS-TEMP-2 > 90 SUBTRACT 350 FROM WS-SECS-TO-CHECKPOINT ELSE
207 IF WS-TEMP-2 < -15 ADD 060 TO WS-SECS-TO-CHECKPOINT ELSE
208 IF WS-TEMP-2 < -30 ADD 090 TO WS-SECS-TO-CHECKPOINT ELSE
209 IF WS-TEMP-2 < -45 ADD 125 TO WS-SECS-TO-CHECKPOINT ELSE
210 IF WS-TEMP-2 < -60 ADD 175 TO WS-SECS-TO-CHECKPOINT ELSE
211 IF WS-TEMP-2 < -75 ADD 250 TO WS-SECS-TO-CHECKPOINT ELSE
212 IF WS-TEMP-2 < -90 ADD 350 TO WS-SECS-TO-CHECKPOINT.
213
214 * Enforce some minimum and maximum values.
215 IF WS-SECS-TO-CHECKPOINT < 300
216 MOVE 300 TO WS-SECS-TO-CHECKPOINT.
217 IF WS-SECS-TO-CHECKPOINT > 3000
218 MOVE 3000 TO WS-SECS-TO-CHECKPOINT.
219
220 START-CHECKPOINT-END.
221 MOVE ZERO TO WS-SECS-SINCE-CHECKPOINT.
222
223 START-CHECKPOINT-EXIT.
224 EXIT.
225
226 CALL-CLI-MESSAGE SECTION.
227 CALL-CLI-MESSAGE-BEGIN.
228 MOVE WS-CURRENT-HMS TO WS-CLI-MESSAGE-TIME.
229 INSPECT WS-CLI-MESSAGE-TIME REPLACING ALL "/" BY ":",
230 CALL "?CBADDR" USING WS-CLI-MESSAGE SYSCALL-AC1.
231 PERFORM CALL-SYSTEM-SEND.
232 CALL-CLI-MESSAGE-EXIT.
233 EXIT.
234
235 CALL-CLI-WARNING SECTION.
236 CALL-CLI-WARNING-BEGIN.
237 MOVE WS-CURRENT-HMS TO WS-CLI-WARNING-TIME.
238 INSPECT WS-CLI-WARNING-TIME REPLACING ALL "/" BY ":",
239 CALL "?CBADDR" USING WS-CLI-WARNING-MESSAGE SYSCALL-AC1.
240 PERFORM CALL-SYSTEM-SEND.
241 CALL-CLI-WARNING-EXIT.
242 EXIT.
243
244 CALL-SYSTEM-SEND SECTION.
245 CALL-SYSTEM-SEND-BEGIN.
246 MOVE 2 TO SYSCALL-AC0.
247
248 *** NOTE: ALL OF THE POTENTIAL MESSAGES ARE 243 BYTES IN LENGTH IS WS.
249 *** THE CODE FOR INDICATE PID NUMBER IS ZERO. ADD THESE TWO FOR AC2.
250 MOVE 243 TO SYSCALL-AC2.
251 CALL "CBSYS" USING
252 SYSCALL-SEND
253 SYSCALL-AC0
254 SYSCALL-AC1
255 SYSCALL-AC2
256 SYSCALL-ERROR.
257 CALL-SYSTEM-SEND-EXIT.
258 EXIT.

```



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NADGUG Comes of Age

by John Hartzell
Focus Staff

Has the North American Data General Users Group finally come of age? My first assignment as a new staffer for Focus was to answer that question. On the basis of progress made in the last few years, the answer appears to be a resounding "Yes!" In talking with half a dozen former and present NADGUG leaders, I'm impressed by the positive change in the relationship between Data General and NADGUG. A spirit of cooperation, of mutual benefit—the "win-win" philosophy—seems to have replaced the often adversarial, always tentative, interaction of the past.

But positive change has not been limited to the Data General-NADGUG relationship. In fact, perhaps the more significant change has been evident in the way the user group actively negotiated its own maturity. In keeping with the computer vernacular, NADGUG might be said to have booted itself up. But that would be oversimplification; rites of passage are seldom simple.

The following is an informal history and assessment of NADGUG. The facts and impressions presented here did not have the benefit of hard copy records. Although people's memories of specific dates and the order of events may be somewhat hazy, the flavor of the times, then and now, comes through.

Within only a little over a year after its April 1968 organization, Data General Corporation had shipped the 100th Nova. Soon after that, the company introduced and began shipping the SuperNova and the Nova 1200. Sales generated users, and users required a network of support. Hence, the Data General Users Group was formed.

In the 15 years since the founding of the users group, the quality and quantity of



John Brudz has just completed his term as NADGUG President. He assumes the office of Past President, which will entail chairing the Planning Committee. Brudz, who has his own consulting company (Mentor Data Systems, Marlborough, CT), expects to remain busy in his new role, since the Planning Committee "is basically the steering arm of NADGUG."

Brudz says that, as President, he has had to deal with a broad range of issues. These include such things as the question of whether or not NADGUG should incorporate, the strengthening and promotion of SIGs and RIGs, and membership problems. He is excited at the prospect of fully implementing the MV/4000 that Data General has provided.

support—by the users themselves and by Data General—have fluctuated considerably. Don Gross, president of the users group from 1970 to 1972 and now with Vista Computer, Inc., says those early users generally did not require much hand holding. What hand holding was needed Data General usually supplied quickly and on an individual basis. Capitalizing on the relative self-sufficiency of its early customers, Data General expanded its market share by selling through OEMs. The majority of Data General customers in those days were usually able to fend for themselves.

Although at first such early users may not have required much hand holding, they did pursue new applications in new markets. The result was rapid horizontal and vertical growth. Growth generated problems that needed practical, immediate solutions. Inevitably, the users began to turn to each other to achieve these solutions. The need for a periodic, somewhat formal opportunity to discuss problems and solutions face to face led to increased attendance at the annual meetings. The number of attendees grew from about 25 to more than 100 in two years. According to Gross, these early meetings consisted primarily of Data General announcements and relatively informal user discussions. Although none then existed, the organization of special and regional interest groups was encouraged.

As Data General became more successful, Gross became disenchanted with what he saw as an irreversible trend toward the company's domination of the users group. He eventually decided that annual meetings would never be more than showcases for new and upgraded products. Discouraged by what he interpreted as Data General's insensitivity to users' needs, Gross left the group at the end of his

presidency. (His current company, however, happily continues to use Data General equipment.)

In 1975, when Brad Friedlander (later to serve as 1982-83 NADGUG president) first associated with the group, he found that matters were much as they had been in 1972. Now with Arthur D. Little, Inc., he then was with Data General systems software development. He recalls being the first Data General employee from that division to interact with the user group (today, numerous systems software personnel do so). But when he departed Data General in 1978, Friedlander felt that the users group was still only a marketing vehicle for Data General.

Mort Kahl was 1983-84 president of NADGUG and currently is with R. T. Vanderbilt Co., Inc. In 1978, when he first associated with the users group, Kahl felt that the group showed much promise, but that its annual conference was still primarily a forum for Data General to pitch sales. At one of his first conferences, Kahl "delivered an impassioned speech at the business meeting," in which he declared he would not return the next year unless the users group took positive, immediate steps toward greater independence.

It was about this time that those who believed that the users group needed to assume a truly active role shifted into high gear. According to Brad Friedlander, Pat Shultz, then Data General Users Group Director, deserves much of the credit for organizing a steering committee. The steering committee's immediate purpose was to identify users group goals and to select a slate of officers.

Friedlander, who also helped organize the steering committee, became its chairman. In turn, Friedlander appointed a committee to develop a new set of by-laws for the users group. Mort Kahl vividly remembers poring over other groups' constitutions to hybridize a charter for what was by then informally being referred to as the North American Data General Users Group. When the task was finished, and the executive committee had finally approved the new by-laws, the general membership voted them into effect at the 1981 general meeting.

The erstwhile Data General Users Group



J. Calvin Durden has served as Treasurer of NADGUG for the last year and now assumes the office of Vice-President. Durden has been with the Tractor & Equipment Corporation of Birmingham, Alabama, for 25 years. He expresses pride in his long involvement with DG systems. He recalls that, in 1973, his company decided to investigate "a new wave of computers, called mini-computers." According to Durden, DEC and DG were the main players then.

had officially become NADGUG, the North American Data General Users Group. The change was not just cosmetic. Users now could speak with one voice to Data General itself and could expect Data General to heed that voice. Data General has fulfilled that expectation, more so as time has passed. According to Calvin Durden, incoming vice-president, Data General saw the problems other companies were having with their user groups and decided that they did not want a similar fate to befall NADGUG. As a result, some of Data General's severest critics among NADGUG members have now become strong supporters.

Nevertheless, the process was not instantaneous. Since NADGUG and its by-laws were officially instituted, the trend

toward greater independence has been accompanied by an uneven growth toward cooperation between NADGUG and Data General. But the present status bodes well for the future. Data General has made several overtures of significant note.

In addition to helping to generate an atmosphere of cooperation, Data General has provided impressively tangible benefits to the users group. These benefits include providing a small staff (to handle *Focus* as a newsletter and to coordinate member inquiries), funds for mailing, office space, and a computer for handling membership records.

With regard to computer access, Data General has generated a lot of excitement recently by donating the use of an MV/4000 to replace the C/350 Eclipse that has served the last few years. Data General also has made available terminals and modems so that NADGUG officers can serve the membership better. The MV/4000 will provide several new options. For example, complete, accurate membership rolls will be easily accessible and quickly updatable. A bulletin board will be available to members. Eventually, a roster data base allowing members to query for other users who have similar system configurations or applications will be implemented.

The on-line bulletin board presents an especially exciting prospect. According to John Brudz, 1984-85 NADGUG president and owner of Mentor Data Systems, "An informational bulletin board will serve as a great integrating factor for NADGUG." Brudz feels that the bulletin board, along with the roster data base and a monthly, expanded *Focus Magazine*, should induce far more formal, frequent sharing of ideas and solutions to problems.

The decision to assume publication of *Focus Magazine* may epitomize NADGUG's rite of passage.

Rene Dominguez, incoming president of NADGUG and currently with Deutsche Credit Corporation, sees the new *Focus* as a very positive step toward effective user support. Brad Friedlander adds, "Even from the days of the steering committee, it was recognized that *Focus* should become independent of Data General as soon as possible. But," Friedlander continues, "*Focus* can hurt NADGUG's future if it doesn't measure up."



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He points out that, between meetings, members often base their appraisals of how an organization is doing on just such externals as the group's publication, and that such a publication may even be the primary basis for nonmembers' judgments. Friedlander feels that a *Focus* that projects a good image will encourage member participation and induce other Data General users to join NADGUG.

Friedlander believes that the new *Focus* should "do more than just announce products." He hopes that articles will help users in deciding when to upgrade and which product to choose. Mort Kahl sees a major role of *Focus* as that of providing constructive criticism. Similarly, John Brudz believes that *Focus* should present an accurate—but balanced—view. He hopes to see "neither all good nor all bad, because both views are skewed."

Brudz sees the new *Focus* as a reflection of the current, positive relationship between Data General and NADGUG. According to Brudz, Data General now considers NADGUG to be a legitimate source of feedback on user needs and product modifications. Similarly, NADGUG officers and members better than ever realize the importance of working closely with Data General to meet those needs. Brudz feels that regular opportunities for communicating directly with upper management at Data General have proved especially beneficial.

An active, independent NADGUG will attract new members. According to Calvin Durden, membership in NADGUG the last five years has grown at a compounded 20 percent annually (current membership is about 1,500). Such a phenomenal growth rate would be difficult for any organization to maintain, and he feels that the rate may taper off to 10-12 percent over the next few years. Nevertheless, he also believes that the coming of age of NADGUG, and especially of its ability to offer quick and competent technical assistance to members, may go a long way toward maintaining the higher growth rate.

Durden says that the rapid growth of NADGUG has provided its share of headaches, especially with regard to planning the annual conference. He quickly adds, with a laugh, that "these are the sorts of headaches



Rene Dominguez brings a broad expertise as the 1985-86 President of NADGUG. For example, when his company, Deutsche Credit Corporation (Deerfield, IL), first entered the Data General market, he served as the first president of the reconstituted Chicago users group. When he went to the national level, he "stuck my hand up at the wrong time" and thus assumed responsibility for starting up the SIG/RIG committee. Last year he served as Vice-President of NADGUG.

you like to have." Durden feels that, by 1990, if NADGUG's new status and offerings are successful, membership "could end up at 3,500 (with 1,800 attending the annual conference), rather than 2,500 (and 1,200 attendees)."

What of the future? With respect to the organization of NADGUG itself, there is general consensus on several issues. Foremost is that NADGUG continue to increase its service to individual members. Mort Kahl feels strongly that "close peer contact at the annual conference is important. If I get one good idea out of a conference, it is well worth it. It pays for the conference." He is glad to see expanded seminars, with better topics and better scheduling. He feels the bulletin board, enabled by Data General's donation of the use

of the MV/4000, will be invaluable: "Once the novelty wears off, valid information will be exchanged."

Another area of agreement is the need to increase support to SIGs and RIGs. According to Calvin Durden, RIGs in particular need encouragement, because often they are started by only one or two people, who then find it difficult to attend the conference. John Brudz believes that support of the interest groups is especially important, that they should be integrated into NADGUG much more than they are now. He believes that the expanded seminars at the annual conference will serve SIGs well. He hopes that NADGUG will become more active in helping SIG/RIGs to start up, possibly with interest-free loans or small donations.

A third topic on which all agree is that of the need to continue to bring in active members who will assume leadership roles and provide new lines of interest. "We need doers, not just joiners," says John Brudz. And, according to Brad Friedlander, the new guard seems to be strong (he chuckles at the realization that the "old guard" comprises members who came on the scene in the latter half of the 1970's).

Finally, with respect to the relationship between Data General and NADGUG, the feeling is unanimous that the great promise of the last three years will continue to be fulfilled. Rene Dominguez believes that it is important that Data General and NADGUG succeed together. He appreciates the technical assistance Data General departments provide, and believes that this responsiveness will improve even more. Calvin Durden feels that even as NADGUG grows more independent, the cooperative relationship with Data General will only become more firmly established.

To this observer, NADGUG's growth from a group of individuals with individual problems to a collective force intent on pursuing shared goals and determined to open up lines of communication internally and with Data General has been impressive. Both NADGUG and Data General really do seem to have come of age.

Mort Kahl apparently agrees. Asked to evaluate NADGUG's current status and its new relationship with Data General, he responded with one word: "Whoopee!" Δ

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by Brian Johnson
Contributing Editor

:NADGUG:RECREATION

Lots of you are probably reading this while attending the NADGUG conference in Boston August 26 thru 29. If it's after 21:00 and you're getting tired of the geeks sitting around the hospitality suites muttering that they'd switch to AOS if only it was as fast as RDOS, I suggest you climb into a taxi and tell the driver to take you to the Combat Zone.

Back at the '83 conference a little tradition got started one night when a group of us decided to do a serious survey of the Toronto Night Club area. Quite a few DG users who were fast asleep that night back at the hotel don't know it, but they were being lavishly wined and dined (actually beer'ed) by a collection of consultants huddled at the Club Zanzibar. At least that's what my expense report shows.

The tradition continued at San Diego in '84, but the San Diego Night Club situation was lame at best. In spite of a recent flurry of morality-faults (logical and physical) on the part of Boston's finest, the Zone is still one of the best recreation areas in the States.

Oh, by the way, there will also be a lot of other interesting stuff happening at the conference. Drop by the System Manager's Roundtable on the 27th. Decisions, decisions.

:NADGUG:CHOW: +

BJ recommends Durgin Park, The Hilltop Steak House, anyplace in Chinatown, and the light-bulb-oven burritos at the biker bars in Revere (reservations are not necessary at the latter, but a Revere tourist visa is required).

:BJ: BIO

I first got involved with computers in 1964 (gak!) on ILLIAC II and III at the University of Illinois. After school I worked on various IBM, Westinghouse, General Electric, and Univac computers until one day in 1969 when my desk collapsed from the weight of the stacked-up reference manuals. I switched to a new machine called a Nova because it had only one manual ("How To Use The Nova"), and a memorizable instruction set (so I didn't have to carry one of those program reference cards in my pocket protector anymore).

In those days the entire DG pricelist was two sides of a single sheet of paper. The monthly newsletter was a single-page memo

from Bob Ford. If you had a DOS question you simply dialed DG and asked for the programming department. John Henderson was very helpful. I was also one of the first guys to ever try booting DOS from \$TTR (it eventually worked).

In 1972, it started snowing in Chicago one day while I was riding my motorcycle to work. When I got to the office I resigned, packed the car, and moved to San Francisco. Shortly afterward somebody from DG broke the news that they had decided to hire some field software support people (egad!), so I went to work in the Palo Alto office with three salesmen, two FE's, and a secretary. My patch was east of the Mississippi to Tehran and from the North Pole to the Mexican border.

One day a memo from Westboro crossed my desk asking for volunteers for Middle East duty. Sure, why not? 30 months later, after a short detour via DG Deutschland, I made it back to Baghdad By the Bay.

I left DG in 1980 to start my own consulting practice and shortly afterward got sucked into a startup with some other ex-DG'ers. That lasted 20 months, but the death certificate on the company wasn't signed until just a few weeks ago.

Recently my activities have been confined to acting as the "Red Adair" of the DG world and teaching system performance classes for DG. An autobiography is in the works, but the contents probably dictate posthumous publication.

:SERIOUSLY...

So what is this column? Restaurant reviews? Movie reviews? The ramblings of some deranged DG freak? Yep.

This is the place in *Focus* where you'll find topics of interest to System Managers. In future columns I'm going to cover things like backup strategies, disk organizations, tape management, username management, system performance, configuration, system accounting, and documentation. Along the way I'm also going to inject a little humor into this inherently dry business by recounting a few anecdotes (my old pals at DG have nothing to fear; discretion comes with age).

If you have a favorite topic, or something that's driving you especially crazy, drop me

a line in care of *Focus*. I'll stick my neck out this month and promise a reply to whatever comes in. However, if your system is on fire don't wait for me to recommend a particular brand of Halon system.

I'll be in South America, Europe, and the Middle East for most of September and part of October. My secretary is accompanying me and the toll charges from a phone booth in the Milan train station are horrendous, so be brief on my answering machine.

:BULLETIN BOARD

Does anybody out there have a relatively unscathed copy of "How To Goad And Levitate KAOS"? I seem to have misplaced mine. I have a virgin copy of the "Elusive Bird Programmer's Reference, Rev. 0.00" and various other early DG software manuals which I'd be willing to temporarily exchange for photocopying purposes.

:CONTEST CORNER

Describe in 200 words or less a way to log onto a strange AOS/VS system using a username/password with no special privileges and arrange things so that you can log back on with full privileges without having a privileged user logon record written to the SYSLOG file. A solution consisting of a one-line CLI command which closes the loophole will be accepted in lieu of a complete description.

Assume that you have been supplied with the innocuous username/password and that the system ACL's are those supplied on the AOS/VS release tape. Assume also that only DG software is on the disk and that you are the only user logged on during the penetration.

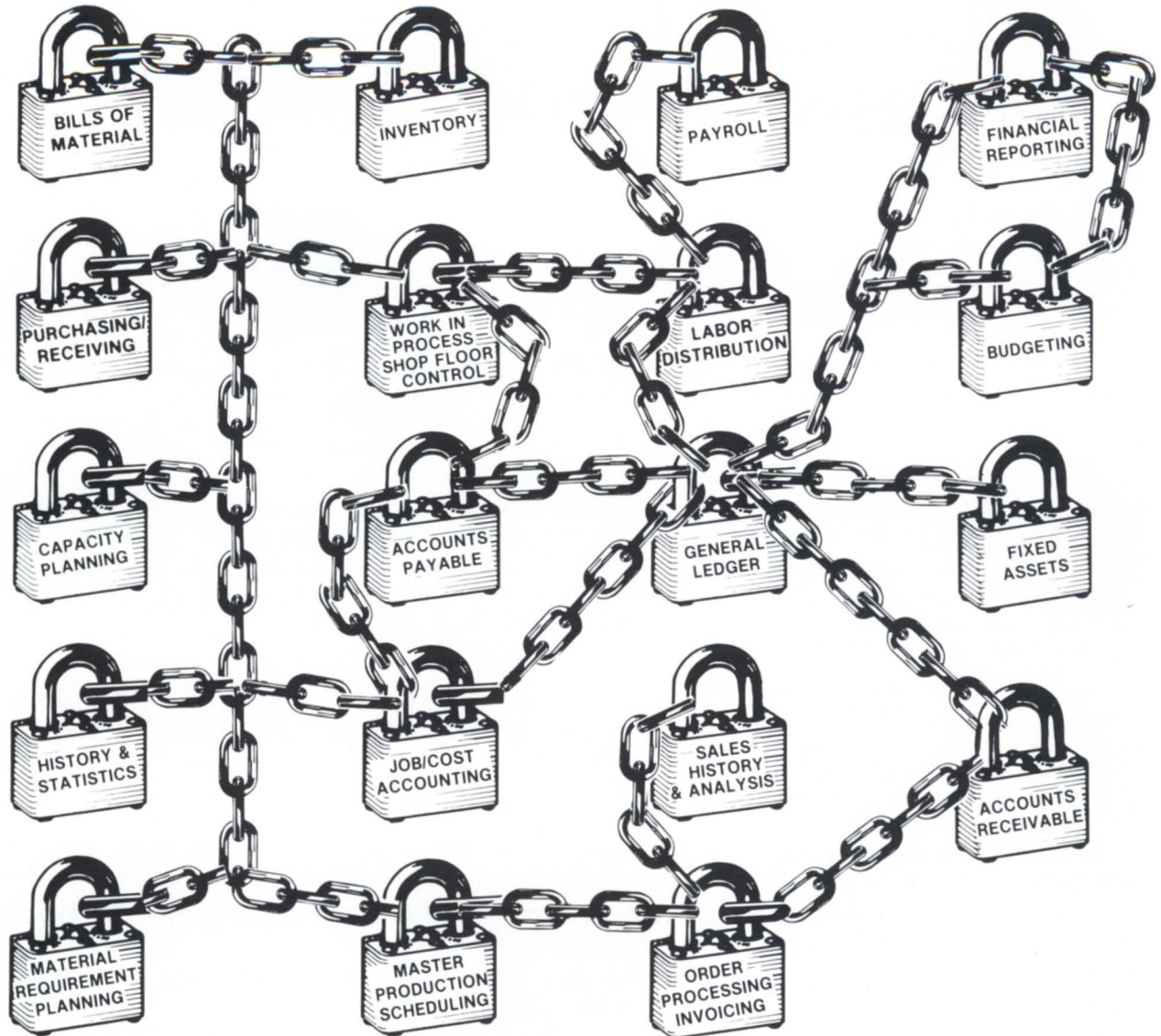
The first correct solution gets a can of original Coca Cola. Employees of DG France and the DG European HQ in Paris are not eligible. Thanks to Messr. Dave Gilbert of DG Europe for suggesting the problem.

:EPILOGUE

Next month we'll get down to some really useful stuff. I suggest you spring for whatever the NADGUG membership fee is so you can get future issues of this mag. Δ

B.J. is the President of B.J. Inc., a San Francisco-based consulting practice. He can be reached at (415) 550-1444.

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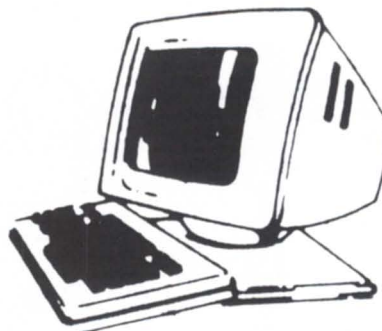
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Reusable Ada Building Blocks Offered

Rockville, MD—EVB Software Engineering, Inc., has introduced GRACE (Generic Reusable Ada Components for Engineering). Available through subscription, GRACE is marketed as a series of reusable Ada software components delivered at the rate of approximately 20 per month.

Each subscription includes documented source code listings, design documentation, examples of the component's usage in larger applications, and EVB's in-house coding style guide. The company says it will use object-oriented design for the components where appropriate. EVB guarantees all GRACE components will perform in accordance with the documentation for as long as the customer uses it in its original form.

A company spokesman emphasizes the growth potential for Ada since it was adopted as the standard programming language for the Department of Defense. Because of the rigorous certification procedures for Ada compilers, programs written in Ada are highly portable between machines.

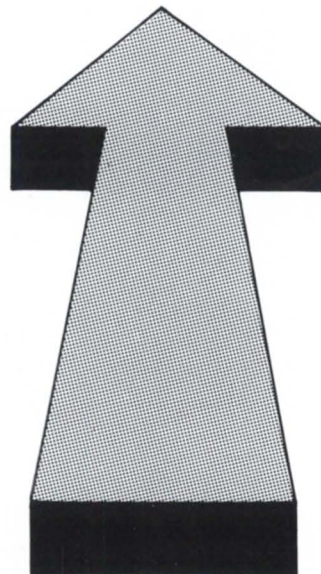
EVB says that its reusable Ada "building blocks" can help Ada users to develop applications quickly and accurately, because it relieves them of the need to code many of the low-level components they will eventually need.

The GRACE software license authorizes each customer to copy the software and documentation without limitation, provided the copies are not transferred to other sites or resold outside the organization. Cost per component is less than \$100, depending on the individual subscription arrangement. Δ

*EVB Software Engineering, Inc.,
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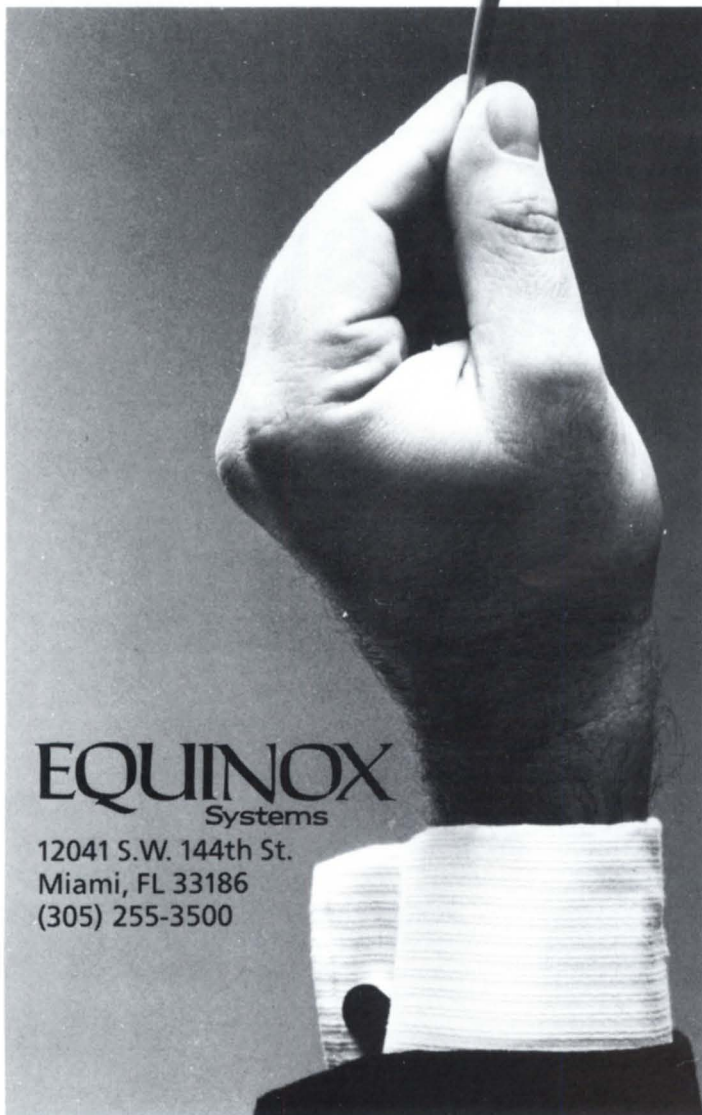
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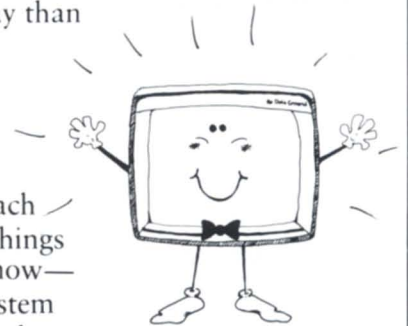
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now devotes more pages each month to the things you need to know—subjects like system management, industry trends, new products, programming languages, and data communications. It covers all aspects of the North American Data General Users Group and its activities, as well as reporting on developments within Data General. In short, it's your best source of information that affects the DG community.



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(over)

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	_____	_____ Megabytes
	_____	_____ Megabytes
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	_____	_____ Bytes/inch
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11. Languages:

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<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____	

13. Committee Interest:

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 B. Meetings
 C. Audit
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14. Special or Regional Interest Groups:

Are you interested in joining a special interest or regional Data General Users Group? _____

15. Enclosed is my check or money order in U.S. dollars for \$_____, made payable to North American Data General Users Group. This is payment in full for the class of membership I have checked above.

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Continued from 4

on you to check and double-check the accuracy of your article. If you are presenting a sequence of steps, have someone else try performing the procedure just by reading what you've written (no fair helping them). It's easy to overlook a critical step or assume that the reader knows how to fill in the missing information.

4. If you are solving a common problem, clearly illustrate the problem first. Who can appreciate your solution if they don't first understand the problem? Persons who have encountered the problem will identify with you when they read your problem description, and will want to continue reading to get the solution. Persons who have not encountered the problem won't appreciate your solution if you don't describe the problem.

5. Pattern your article after the material you've seen in *Focus*. Look over the depart-

ments we regularly feature. Analyze them for content, style, length, and depth of technical presentation. If the articles in a particular department are never longer than a few hundred words, be sure your contribution fits that requirement, or consider writing it for another department.

6. If you have an idea for an article, but aren't sure exactly how it would fit into *Focus*, call the editor. It's the editor's job to help you refine ideas and to suggest a structure for presenting them. Your idea may fit perfectly in an upcoming issue that only the editor would know about. Or, we might like your idea, but want to suggest a slightly different approach.

7. If you commit to write an article, get it to the editor by the deadline. Our production and printing schedule can't wait for late submissions. The minute you know your article may be late, call the editor. We may

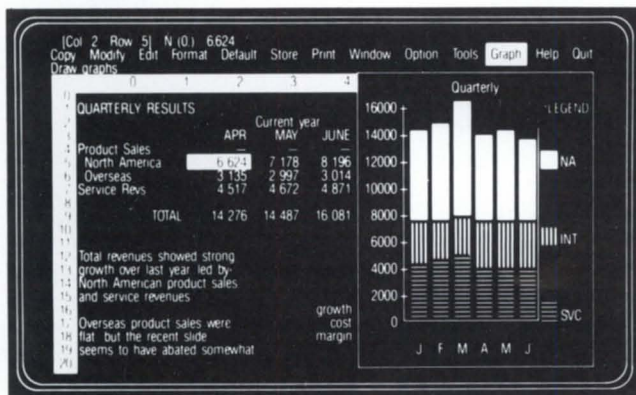
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The title page should include your full name, address, daytime phone, and your Social Security number (this is for the IRS in case you're submitting a feature article for which you will be paid). Below the title of your article, show your name the way you want it to appear in the byline. Include the word or character count. Number all pages, and put your last name and an abbreviated title

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on all pages after the first page. Also include a "bio"—a brief paragraph telling what you do, where you work, and where readers should call or write for more information.

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Regular Features and Departments in Focus

Perspective—opinion pieces by staff and others, including letters.

Roundtable—patterned after the traditional roundtable discussions at NADGUG's annual meetings, this department brings users, DG employees, and technical experts together to discuss issues that affect users.

Product Spotlight—Concise announcements describe new products from Data General, as well as from other vendors whose products can work with Data General systems to improve productivity and performance.

System Manager's Log—expert advice for people who are responsible for keeping their computer systems running smoothly.

Network Notes—technical coverage of issues involved in communicating data and integrating systems that are physically separated, but functionally related.

MV/ Systems—coverage of products, issues, techniques, or developments that primarily affect the users of 32-bit systems.

16-Bit Systems—coverage of products, issues, techniques, or developments that primarily affect the users of 16-bit systems.

Discoveries—guest columnists present short programs/routines that address a particular concern.

Industry Scope—a brief run-down of

recent developments in the industry, including a stockmarket chart, significant new products, and pronouncements from the gurus.

Prism—brief notes from all over, emphasizing user group news, RIG meetings, SIG happenings, and business developments.

Feature Articles—scheduled well in advance, longer articles will explore topical issues in a more tutorial fashion than is usually the case with regular columns.

In addition to the regularly featured departments, *Focus* runs product reviews. If you feel specially qualified to do a review, send us a brief letter outlining your qualifications for doing an objective analysis. Most products selected for review are average to outstanding in quality and value. We prefer to politely ignore products that don't measure up. Δ

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Grand Opening for Eagle Software's VS Toolbox

Salina, KS—Eagle Software, Inc., has released its VS Toolbox, a set of utilities that supplement Data General's AOS/VS operating system. According to Eagle Software, the utilities in VS Toolbox improve INFOS file organization, monitor system performance, enhance system security, and improve AOS/VS file access times.

Eagle Software says the eight utilities in the VS Toolbox were developed in response to requests from customers. They include:

- The Inspector, which analyzes INFOS file organization to help determine when it is time to reorganize an INFOS file.
- The Architect, which allows the user to recreate an INFOS file and change any of the file's characteristics (e.g., key and record compression, space management, number of index levels, etc.).
- The Rebuilder, which reorganizes an INFOS file to reduce sequential processing time.
- The Cross Examiner, which logically compares the keys, partial records, and data record in two INFOS indexes.
- The Secret Agent, which monitors system performance. It allows the user to compare system activity during different times of the day, and to identify peak utilization times.
- The Terminator, which watches the system for inactive consoles that waste system resources and cause security problems.
- The D.A., which examines directories to determine an optimum hashframe size. It also examines files to determine if the number of index levels could be reduced, thus improving access time.
- The Surgeon, which recreates a file with the same creation time, but different element size and fewer index levels.

A two-week trial copy of the VS Toolbox is available for \$50. The price of the trial copy can be applied toward the purchase price. The company says that as new utilities are added to VS Toolbox, current customers will receive them at no additional charge for the first year.

Eagle Software, Inc., P.O. Box 16, Salina, KS 67402-0016, 913/823-7257.

Unix Application Features Function Keys and Windows

Santa Clara, CA—The most recent revision of a high-level programming language called Style includes new features like windowing and user-programmable function keys. Style is a product of Foothill Research, and is available for a number of 32-bit computers that can run the Unix operating system, including those from Data General. The vendor states that programs developed using Style are completely portable among computers that run version 7 of Unix.

According to Foothill Research, Style is designed to replace COBOL for business applications, but can co-exist with programs, files, and data previously developed in COBOL or other programming languages.

Style uses only 33 commands and 14 keywords to produce programs. In addition to windowing and function keys, rev 2.3 of Style adds a transaction logging/recovery system. It also allows programmers to use programming constructs found in other languages and software tools.

The new function key feature lets developers designate special keys that can execute any routine or application, whether or not it was written with Style. The windowing feature lets programmers segment their screen and call up additional information without leaving the current screen. Both of these features are familiar and popular among users of microcomputers, but according to a Foothill Research spokesman, Style is the first high level programming language for minicomputers that supports these features.

The transaction logging/recovery system in the new rev provides an integrated method for keeping track of records that have been changed. Users can automatically make a copy of each record before and/or after each change to that record. The transaction system can cross between applications, data sources, and files, and can keep a collective log of the data that has been taken from other sources. A "logical view" feature also lets an MIS manager set up access to the data base so that particular end-users will see

only information that is pertinent to them.

The new revision lets programmers change the terminology of Style to match the constructs they are familiar with from other languages or productivity tools. According to the Foothill Research spokesman, programmers who have been working in languages like COBOL will find all of the constructs they are used to in Style 2.3. These include "block ifs" (as in if/then/else statements), "repeat groups" (also known as heterogeneous arrays and data substructures), variable length records, alternate record structures, and "case logic."

A single-copy license for Style ranges in price from \$17,500 to \$45,000. Δ

Foothill Research, Inc., 1301 Shoreway Road, suite 300, Belmont, CA 94002. Call 415/593-6696 for more information.

Adapter Connects RS-232 Devices to MV Processors

Cleveland—Integrated Applications has introduced an RS-232/RS-422 adapter for Data General installations. Called the Mediator RS-232/RS-422, the adapter was designed to allow simple interfacing of existing terminals, printers, and modems to the newer MV series of 32-bit minicomputers.

The RS-232 port terminates on a DB-25 connector. Internal jumpers enable it to interface with either DTE devices (data terminal equipment, e.g., CRTs and printers) or DCE devices (data communications equipment, e.g., modems). The RS-422 port is brought out on a two foot cable terminating with a DB-25 connector that can plug directly into the system multiplexer. Other RS-422 port configurations are available, such as the standard DB-37.

The Mediator RS-232/RS-422 is housed in a metal enclosure, and comes complete with a modular power supply and user manual. The unit is priced at \$169. Δ

Integrated Applications, Inc., 8600 Harvard Avenue, Cleveland, OH 44105, 216/341-6700.

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Tuesday, August 27

Special Morning Session

- Guest Speaker Dr. Hideo Aiso, president of Nippon Data General Users Group and professor of Engineering, Keio University

First Morning Session (choice of one)

- AOS/VS and User Facility Security, Tim Reiter, Data General Corp.
- ICOBOL: The Promise Fulfilled, Gerry Manning, Creative Synergy Corp.
- Intro to Programming Ycur D410/D460, Joseph Cannata, Data General Corp.
- Atlanta Service Center Workshop, chaired by Gerry Cromwell, Data General Corp., with Jim Foxworthy, Troy Taylor, and Denny Mack

First Afternoon Session (choice of one)

- Security Options for Data General Users, Patti Johnson, Data General Corp.
- RDOS Roundtable, chaired by Dennis Doyle, INGRID
- The Evaluation, Selection, and Operation of Equipment for Academic Computing, Dr. Thomas C. McMillan, Radford University
- New Developments at Special Systems, Dave Norquist, Data General Corp.

Second Afternoon Session (choice of one)

- Enhancement of the MV/10000, Steve Staudaher, Data General Corp.
- RDOS Roundtable, concluded
- An Academic Computing Model in a Data General Environment, Monny Sklov, Ph.D., University of San Francisco

- Data General's Continuing Products Division & DG/Direct Organizations, Howard Berg, Data General Corp.

Third Afternoon Session (choice of one)

- Conversion of a Real-Time System—From Data General C/330 Computers to Data General MV/10000 Computers, Linda A. Dietz, Rockwell Hanford Operations
- Moving Business BASIC to the AOS/VS World, George W. P. Henne, MICOM Computer Systems

- Software Development of a Medium-Sized, Real-Time Embedded System in Ada, Dr. William Gilmore, BDM Corp.

- Software Testing: A Practitioner's Viewpoint, Patricia W. Daggett, Data General Corp.

Fourth Afternoon Session (choice of one)

- CEO Roundtable, chaired by Charlene Kirian, On-line Computer Library Center
- A Data Base Management System for an Information Analysis System, Bernadette L. Kirk, Martin Marietta Energy Systems
- Intelligent Minicomputer Control of a Multirobot Process Line, John F. Follin, GA Technologies

- DG/BLAST—Use and Abuse, Glenn Mead, Data General Corp.

Fifth Afternoon Session (choice of one)

- CEO Roundtable, concluded
- MCSnet—A Network Featuring X.25 Communications Between an MV/8000 and a VAX/750, Bruce E. Weeks, Boeing Commercial Airplane
- Group Technology: A Practical Means to Achieve Computer Integrated Manufacturing, Frederick Bambara, OIR/Organization for Industrial Research

- Navy Standard Benchmark System, Robert F. Depin, Navy Data Automation Facility

Evening Session

- NADGUG RIG/SIG Meeting, chaired by Joyce Carter, University of Nebraska Medical Center.

Wednesday, August 28

First Morning Session

- NADGUG Business Meeting

Second Morning Session (choice of one)

- EXSYS—An Expert System for Software Development, Roger Nixon, Exsys Inc.
- WordPerfect/CEO Integration, Pete Peterson, Satellite Software International
- Designing and Writing Interactive Programs Using AOS CLI Switches and Arguments, John A. Grant, Geological Survey of Canada
- The Cobbler's Children: The Pitiful State of CAT and CAI for Computer-Related Products, Michael D. DeVine, CS Laboratories, Inc.

First Afternoon Session (choice of one)

- AOS & AOS/VS Roundtable, chaired by David Novy, 3M Corp.
- Implementing Accounting Software: Integration and Office Automation, Gary Layton, Computer Associates
- Small Aperture Satellite Earth Stations Bring a New Dimension to Office-Oriented Data Communications Networks, Tom Anderson, Equatorial Communications Co.
- Corporate Technical Publishing Automation, Soto M. Flouris, Intercom Associates

Second Afternoon Session (choice of one)

- AOS & AOS/VS Roundtable, conclusion
- Technical Aspects of the DG/One Architecture, Paula Gatts, Data General Corp.
- Gross Profit Control in Manufacturing, David N. Sneed, Sandy Hook Scientific
- Comparing Powerhouse and DNA-4 As Applications Prototypers, Michael Reddy, Ph.D., Kraus Enterprises

Third Afternoon Session (choice of one)

- Solutions to Technical Problems, Ian Mackay, Data General Corp.

- Fourth Generation Software Tools for Data General Equipment, Tom Koulopoulos, Henco Software Inc.

- Case History: Computer Aided Process Control at the Rainbow Park Regional Water Treatment Plant, Thomas M. F. Doyle, Fremont Sanitation District

- Productivity with Performance, Paul Rogers, Cybertek Computing Ltd.

Fourth Afternoon Session (choice of one)

- Data General Windowing, Walt O'Brien, Data General Corp.
- AOS/VS Capacity Planning for Beginners, Dom Henry, Exploration Consultants Ltd.
- Standard File Maintenance Reporting, William R. Topoly, Webber Gage Division of the L. S. Starrett Co.
- Data Definition in GENISYS, Sue M. Dintelman, DMS Systems, Inc.

Evening Activities

- Cocktail Reception and Banquet
- Special Guest Speaker: Edson D. de Castro, president, Data General Corp.

Thursday, August 29

First Morning Session (choice of one)

- AOS & AOS/VS System Manager's Panel, chaired by Brian Johnson, B.J. Inc.
- Nerco Minerals Communications Network, Mark W. Espe, Nerco Minerals Company
- Automated Configuration Management, Alex Lobba, Softool Corp.
- SIR/DBMS, The Intelligent Relational System, Barry Robinson, SIR, Inc.

Second Morning Session (choice of one)

- AOS & AOS/VS System Manager's Panel, concluded
- A Process Activity Monitor for AOS/VS, Sharon Lindley and Robert A. McKosky, Rockwell International
- Network Management Using Relational DBMS Technology, Carol Kellett, 3CI and Jim Wright, Miner & Miner, Consulting Engineers, Inc.
- COBOL Program Generators—A Fourth Generation Approach With Third Generation Benefits, Arnold D. Leak, CS Laboratories, Inc.

- COBOL Program Generators—A Fourth Generation Approach With Third Generation Benefits, Arnold D. Leak, CS Laboratories, Inc.

Third Morning Session (choice of one)

- AOS & AOS/VS Special Interest Group Meeting, David Novy, 3M Corp.
- Time set aside for other special interest group meetings

Afternoon Session

- Lunch with Data General
- Data General Management Roundtable, chaired by Rene Dominguez, NADGUG president elect.

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CMS/Data Will Court Legal Market With Seminar Series

Tallahassee, FL—CMS/Data, a Data General Authorized System Distributor, has launched a seminar series that will introduce the company's Comprehensive Law Office software to the legal market. Working closely with the DG sales force, CMS/Data will present the CLO seminars in each of DG's North American sales areas. The first seminar for Data General sales representatives was scheduled for Atlanta during August.

The CLO system is designed to address the office management and practice management needs of law firms. It also provides several special-purpose options, according to CMS/Data. The nucleus of CLO is a time and billing package that lets individual attorneys be flexible in how they format their bills, enter their time, and structure their rates. The time and billing package is integrated with a general ledger and management reporting module.

In addition to the core modules, CLO can support a number of optional office management modules to assist a law firm's administrative staff. Office management modules include payroll, accounts payable, and several special-purpose packages. One of these tracks originating credits for attorneys who bring business to the firm.

According to CMS/Data, two of the most popular office management modules are Data Copy Recorder and Call Accounting. These modules link the firm's copier and phone systems directly with the computer to capture, cost, and bill all chargeable copies and telephone calls made on behalf of clients. Dick Crum, a C.P.A., said of the modules, "Call Accounting is very cost-effective because it totally automates the process of filling out and collecting call slips, figuring the charge, and then entering the call data for billing." Crum works with the West Palm Beach, Florida, law firm of Boose, Ciklin, Martens & Lubitz.

CLO also offers features to help lawyers with their practice. The practice management modules include a litigation support module called Co-Counselor that is designed to assist attorneys with litigation. According to CMS/Data, Co-Counselor can reduce the amount of time attorneys spend manually organizing and reviewing documents and other factual information. The Conflict of Interest module helps track names involved in matters, while Calendar Call helps attorneys monitor and coordinate their docket activity so as to optimize how they use their time. Other practice management modules can help attorneys look up old matters for research purposes, and track clients with whom they have not corresponded recently.

Other special options available with CLO include Phantom (an after-hours report generator), a report writer, color graphics, an electronic spreadsheet, and an interface with Westlaw and/or Lexis (two popular legal research data bases).

CMS/Data reports it is working with Data General to develop an applications interface with DG's CEO office automation software. CLO now provides an electronic "help" manual to provide instructions from any field or menu item. An interrupt feature allows the user to stop in the middle of a process to perform a different function, and then return to the original process without disruptions. Δ

CMS/Data Corporation, 187 Office Plaza Drive, Tallahassee, FL 32301, 904/878-5155.



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SMD-Compatible Disk Options

Mountain View, CA—Spectra Logic Corporation has introduced four new disk and tape controllers that the company says will let users of Data General Eclipse or Nova minicomputers integrate virtually any SMD-compatible drive.

Software support for Expanded Emulation is available at no extra charge for the AOS and AOS/VS operating systems. Expanded Emulation is configured specially for individual customers to let them access a high capacity disk drive as one logical unit. This allows a single controller to attach up to 2.8 gigabytes of formatted data storage using available drives.

The four new controllers from Spectra Logic emulate Data General's SMD 606X, 616X, 6122, and 6214 disk subsystems. The

new Spectra 27-Plus, 120-Plus, 17-Plus, and 210-Plus replace Spectra Logic's models 27, 120, 17, and 110, respectively. Prices for the new boards are the same as for the products they replace.

According to the vendor, the new controllers support disk transfer rates of 2.5 megabytes per second. Two of the models also provide simultaneous control of NRZI, PE, and GCR tape drives with speeds of up to 125 inches per second. The controllers use offset forward/reverse, 32-bit error correction code, overlapping seeks, and alternate sectors. FCC or non-FCC cabling is provided.

The Spectra 27-Plus was designed for the Eclipse and MV series. It interfaces any combination of four SMD drives with the Burst Multiplexer Channel (BMC) or Data Channel. Up to eight 1/2-inch tape drives, including streaming and start/stop, can be interfaced to the DCH. The Spectra 27-Plus supports Data General's RDOS, AOS, and


AOS/VS operating systems, as well as Point 4 Data Corporation's IRIS; and IPI's BLIS/COBOL operating systems. Its list price is \$5,300.

The Spectra 120-Plus provides the same features and emulation as the 27-Plus, but interfaces only with the Data Channel. Its list price is \$4,500.

The Spectra 17-Plus provides the same disk subsystem emulation, but does not provide the tape drive controller function. Designed for Nova and Eclipse minicomputer systems, it is priced at \$4,500.

Priced at \$3,700, the Spectra 210-Plus can interface four SMD disk drives to the Data Channel of Nova and Eclipse systems. It supports only RDOS, AOS, IRIS, and BLIS/COBOL. Δ

Spectra Logic Corporation, 297 N. Bernardo Ave., Mountain View, CA 94043; 415/964-2211.




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Let's go through a typical purchase with TBS. Suppose that you want an extra CRT, let's say a 6053 or D200. Your best bet is to call for price and availability. When we agree on the price and discuss a method of shipment, we ask you to mail a check to cover the equipment and shipping costs. People who have never dealt with us before worry about sending checks. Some flatly refuse and we lose a sale. We really have no choice, though.

**I want to talk seriously to NADGUG members
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After we receive the purchase order, we test the CRT on our system. If it performs OK, the unit is cleaned. Careful inspection of the equipment may show some slight marks, but after cleaning they often look cleaner than the unit sitting on your desk now. If we are unable to do a good job of preparing the CRT, we call the customer and describe the actual condition. It is better at this stage to return the customer's money than to ship a CRT, have it rejected, and pay the freight costs to recover it later.

For shipping we use the original DG boxes or an assortment of thick wall cardboard boxes of various sizes. We bubble wrap the CRT, then drop in the styrene peanuts to completely protect it. UPS visits us every day between 3 and 4 P.M. If we have two hours notice we can ship the same day. For overnight shipments of larger packages FED X is 5 minutes from our door.

All the care and protection in the world does not guarantee that the item will still be working when it arrives, but that's another topic that we will cover next month.

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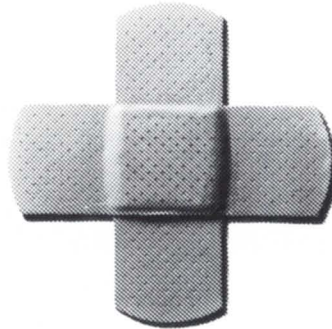


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George Henne felt like gloating in June. His Micom baseball team had just trounced Data General's Toronto squad—it was no contest, Henne reported. Closer questioning revealed that he was telling the precise truth: the Micom team had to accept a forfeit from the DG squad when the local office couldn't field a team—even after Henne offered to lend them several of his players.

Finding NADGUG President John Brudz in the office was tough this summer. Although he's an independent consultant, Brudz spends much of his time working with former NADGUG President Mort Kahl at R. T. Vanderbilt Company. With Vanderbilt expanding its DP and communications capabilities at the company's branch offices, Kahl dispatched Brudz on trips to Kentucky, Los Angeles, and points in-between to install Desktops and communication equipment. According to Kahl, the results are outstanding.

The Law Enforcement Data General User Group may be young, but they're active. LEDGUG held its second annual Training Seminar and User Meeting May 7-9 in Falls Church, Virginia. The seminars covered topics like system tuning, law enforcement applications, Data General products and support, and CEO/word processing/CRTEdit. Videotapes of the large group sessions are available for a mere \$15 (the LEDGUG newsletter refers to them as "unedited collector items"). Make checks payable to LEDGUG in care of Lt. John Myers, Black Hawk County Sheriff's Department, 316 East 5th Street, Waterloo, Iowa 50703. Myers is the newly-elected LEDGUG president.

Videotaping of presentations during the 1984 NADGUG conference in San Diego was an experiment, but from now on it's an institution. Although the technical quality of last year's videotapes was uneven, the presentations have been a boon to the program chairpersons of many regional interest groups this year. Ashok Parikh reports, for example, that 48 people came to a Detroit RIG dinner meeting this summer to watch videotapes from San Diego. Videotaping will be expanded for Conference '85 as part of NADGUG's campaign to support RIG activities. For information about how your RIG can borrow copies of the videotapes, contact NADGUG Publications Chairman Jim Siegman.

Siegman will be especially responsive if you can help him find the source code for Empire, which he describes as a "wonderful wargame." If he can find the source, he wants to add a few convenience features to make it even more fun. If you can help, or even if you only want to swap a few war stories, call him at home, 312/720-1940. (Editor's note: I have a lot of misgivings about printing this—Siegman admits that his Empire addiction is serious. Since he has promised to write several articles for *Focus* in coming months, I hesitate to contribute to a vice that might keep him from making deadline.)

Brian Johnson, the colorful proprietor of B.J. Inc., a San Francisco consulting firm, is considering whether to change his corporate logo. If he does, it would be a symbolic protest against the new Coca Cola. B. J.'s distinctive red and white swirling logo was concocted some time ago to reflect his well-known affinity for the old Coke. Unable to tolerate the taste of Coke's new rev, he's drinking Royal Crown until he can lay in a supply of Classic Coke.

Ed Egan of Diplomat Systems has been talking for some time in a general way about his company's pending release of a version of Ryan McFarlin COBOL to run on DG Desktops under RDOS. As press time approached, he reported the product is on the verge of release. Diplomat is the exclusive owner and distributor of the port, although the work was done by IPT Corp., a long-term software developer for the DG market. Egan says that with the enthusiastic support of Ryan McFarlin, "Diplomat hopes to succeed in a market that previously was dominated by IBM, Televideo, Texas Instruments, and others. Situations like the Ryan McFarlin port will allow us to enter new markets and bring DG with us." With an estimated 250,000 installations, RM COBOL does indeed represent a significant potential market for the Desktop. Egan believes that Diplomat is the first of DG's industrial distributors to "take the VAR plunge." The RM COBOL compiler will be priced around \$4,000, while an interpreted version will cost about \$1,600; software bundled with Desktops will be priced considerably lower.

Paul Keys, president of Computer Engineering Associates, is serving on the

board of directors of the new National Computer Service Network. The non-profit NCSN serves DG and non-DG users by helping them to find sources of service and support for their computer equipment. They expect to have a toll-free number in place soon.

MIS Week recently quoted DG President Edson D. de Castro as saying that by the end of the century, Data General will be one of only six survivors in the United States computer industry. The only other sure survivor, according to de Castro, is IBM. The key is to offer a broad, low-cost product line, and de Castro wasn't ruling out acquisitions as part of DG's survival strategy. Another source at Data General hints that we can expect a rush of new products this fall as the company enters its "introduction season."

Rational Data Systems is showcasing a new communications product called PC/VS at NADGUG's Conference '85. As might be expected from its name, the new product is a hardware/software package that can connect IBM PCs and PC-compatibles with Data General MV/series computers. The hardware is Ethernet (IEEE 802.3), which operates at 10 million bits per second. It can also use "cheapernet," the lower-cost cabling that performs the same over shorter distances. According to RDS President Doug Kaye, the PC/VS package will let PCs use and share files on the MV's disk drives, print to the MV's printers, transfer files to and from AOS/VS, emulate DG terminals, and develop distributed applications through a remote IPC interface. Sample prices for the package range from \$9,815 for a four-PC configuration to \$55,415 for a 64-PC configuration.

Unisoft, the Berkeley, California company that brought the Unix operating system to the Desktop Model 45, is also distributing a variety of Unix application software for the DG/45. According to a source at Unisoft, the exact dimensions of the agreement with Data General are still being determined, but the software is ready. Unisoft is distributing RM/COBOL and FORTRAN; SVS/FORTRAN, Pascal, and BASIC; Oregon Pascal; ICSC/Ada; and a collection of spreadsheet, data base, word processing, and communications programs. Our source at Unisoft gave the DG/45 high marks as a multi-user, multi-tasking Unix machine. Δ

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