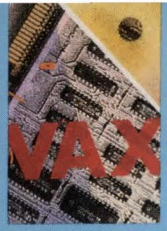

VAX News

OCTOBER ■ 1987 VOL. 6, NO. 10 ■ $4.00

DEC PROFESSIONAL

SPANNING DIGITAL'S WORLD

- Electronic Publishing For VAXstations
- Managing And Developing *ALL-IN-1*
- Buying The Right Breakout Box

Written over the Plains, 1950 by Mark Tobey

Electronic Publishing

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RAF delivers automatic access to remote computers through a scripting mechanism that allows you to define each step of an automatic login. Or complete VT100 and VT220 terminal emulators unlike any other software system. RAF's VT100 and VT220 support allows for instant switching between PC and VAX applications.

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You can use RAF to communicate asynchronously or over Ethernet. A single copy supports both, so you can install RAF asynchronously now and switch to Ethernet if it's available in the future. Also, RAF allows some users to operate asynchronously while others utilize Ethernet. RAF supports asynchronous communications over modems, networks or via direct connections – at speeds from 300bps to 38kbps. Over Ethernet, RAF transfers data up to 100,000 characters per second (800 kbps) – that's about ten times faster than any other comparable communications product! And RAF allows Ethernet users to maintain multiple connections with remote systems – as if they're connected through a DEC terminal server.

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Our new Data PBXs each provide 25 Mbps throughput for 660 simultaneous full duplex connections at 19.2 kbps. With double the throughput of our first generation, and more than any other comparable Data PBX; that's enough for all the terminals, PCs, computer ports and peripherals you can throw at them.

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Reduced manufacturing costs, due to VLSI technology allowed us to lower prices on our second generation Data PBXs. More features for less money means maximum value for your data switching dollar.

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We kept the Equinox hallmarks of reliability, easy installation, comprehensive wiring solutions and user friendly operation.

We based our second generation on the same architecture as our first generation DS-5 and DS-15 Data PBXs. They look the same, configure the same, even the names have stayed the same.

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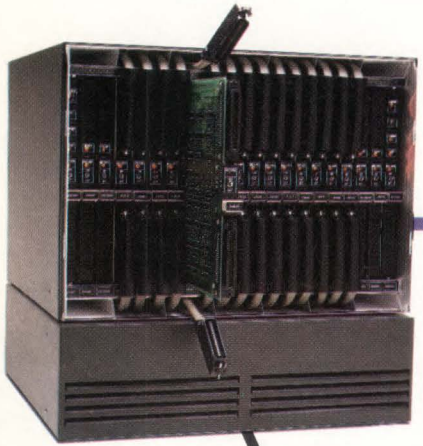
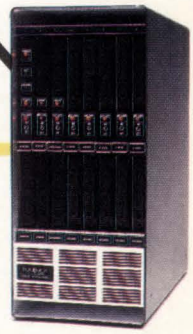


T1 Networking



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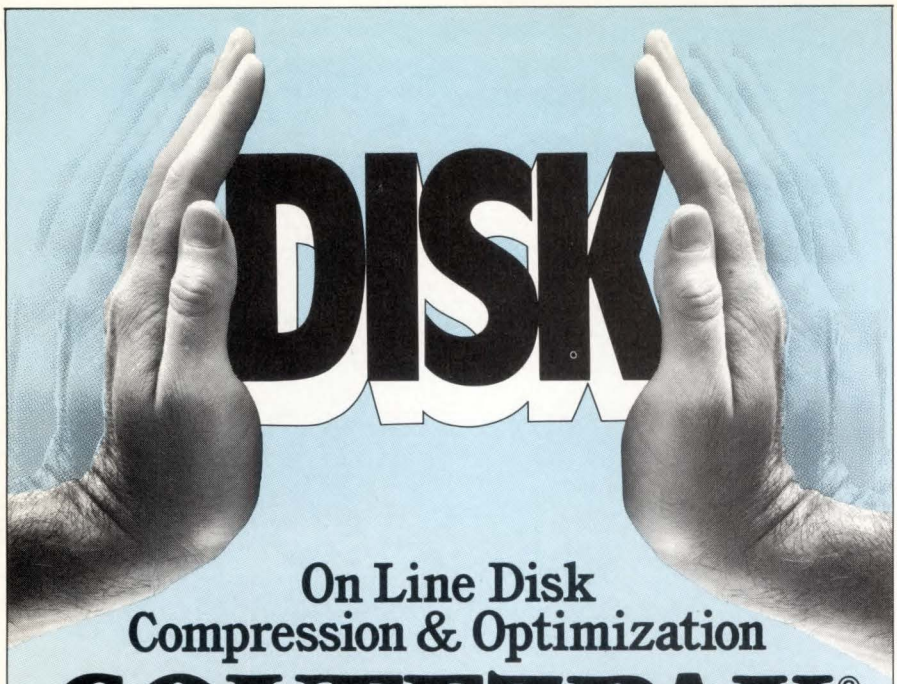

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To design our new through the eyes of

Though it's priced like an alphanumerics terminal, our 600 Series can display both bit-mapped graphics and full-featured text.

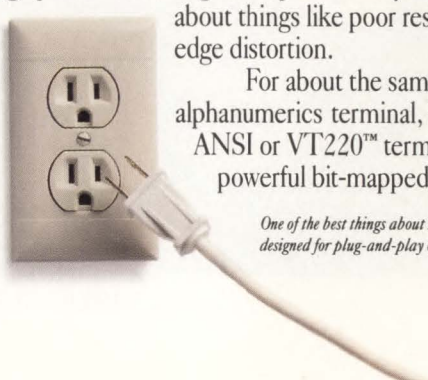
It has been said that the video quality on most alphanumerics terminals doesn't even deserve a second look. Much less a fixed gaze. Unfortunately, we have to agree.

We know what poor video quality can do to an operator's productivity. And we also know that lost productivity can cost you more than any investment you make in terminals.

But until now, it was almost impossible to find good video at a good price. You had to choose between high-performance, high-priced graphics terminals, and lower-priced, lackluster alphanumerics terminals.

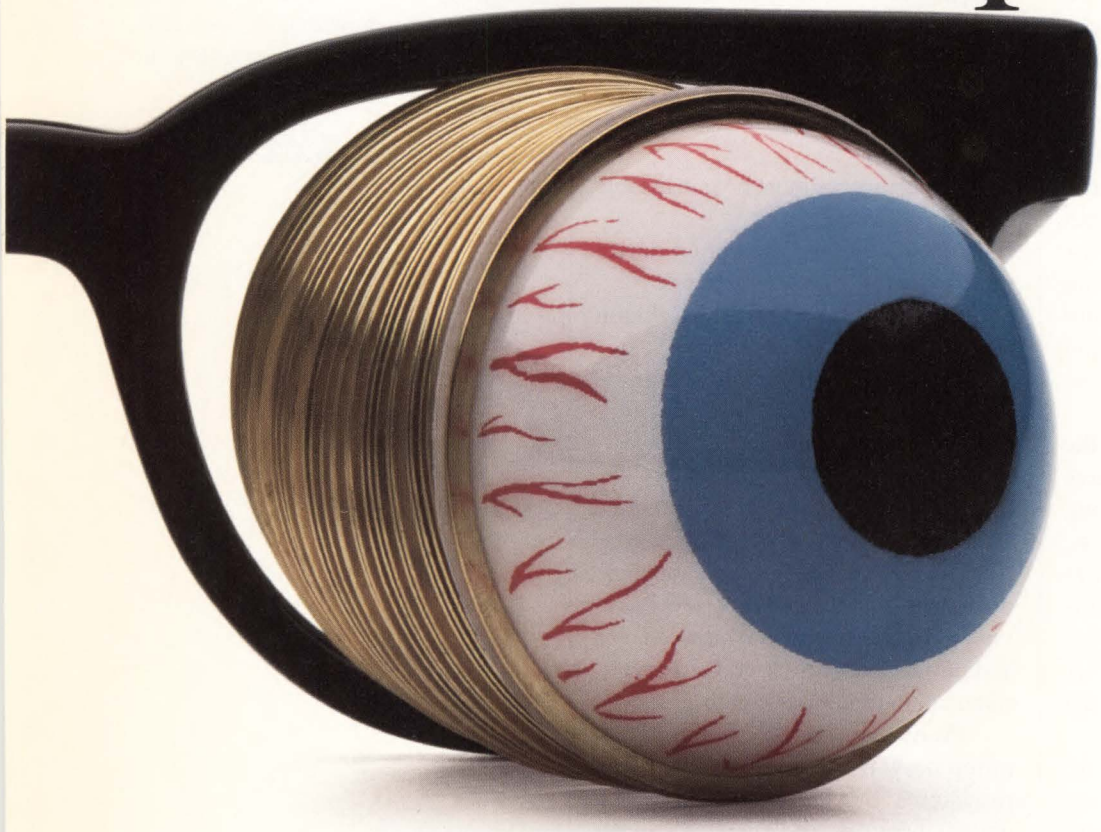
Introducing the Visual 600 Series Integrated Image Display Station.* A new kind of terminal that combines text with graphics for an image so superior that your users will forget all about things like poor resolution, flicker and edge distortion.

For about the same price as a regular alphanumerics terminal, it will emulate ASCII, ANSI or VT220™ terminals, while displaying powerful bit-mapped graphics you would

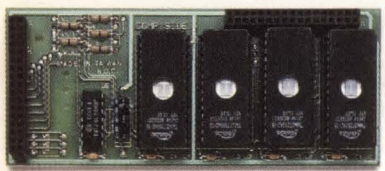


One of the best things about the 600 Series is that it is designed for plug-and-play operation.

terminal, we looked the terminal operator.



only expect from a dedicated graphics terminal. And we think its integration of text and graphics will soon become the standard for business computing.



A plug-in "personality module" tells the 600 Series whether to emulate a DEC, Wyse, Televideo or you-name-it.

Besides relieving terminal operators of eyestrain, our new 600 Series was designed to relieve distributors of inventory strain.

The trick is something we call a plug-in personality module that can change our basic terminal into a VT220, a Wyse 50+ or almost anything. And VARs get an open architecture so they can customize to their hearts' delight.

But don't settle for mere words. Look at our new 600 Series Integrated Image Display Station. Because nobody should look at a terminal through eyes like these.

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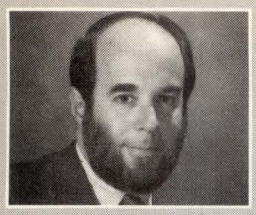


PUBLISHER

Carl B. Marbach

Will Electronic Publishing Fulfill Its Promise?

In a speech I gave recently, I commented that "office automation isn't." While there are computers in offices, it's still hard to say that any office is automated, or to fully define the term office automation. The main reason is that office computers still aren't connected; they unfortunately operate as single workstations. The true approach to office automation includes connecting people together into a coherent work group. This means sharing information, documents and computer functionality. When networking and connectivity isn't in place, office automation becomes something less.

Electronic publishing shares the same fate. Without connectivity there can't be true electronic publishing; whatever we get will be something less.

The phototypesetting industry has been around for some time without calling itself electronic publishing. But along comes a Macintosh computer that can "typeset" on a laser printer and voila! — electronic publishing.

Not so. Just because they say it, doesn't make it true. Full page makeup, the ability to see what you are going to get on the printed page before you print it, sometimes called WYSIWYG (What You See Is What You Get), claims to be electronic publishing. But that ability has been with us for almost five years in standard typesetting equipment without carrying the label electronic publishing.

In order for a system to be given the label electronic publishing it must have the following functionality in the hardware and the software:

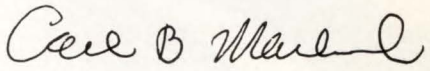
1. What You See Is What You Get.
2. You must be able to edit directly on the screen.
3. The screen must be large enough and have enough resolution to see what you want to see.
4. The documents must be transferable among workstations.
5. Workstations and the output device must exist on the same network.
6. Output must have enough resolution to be used directly for printing.
7. Text, charts and pictures must be manipulated and stored with the documents in an edited form.

Electronic publishing works when an article received via MCI Mail on your VAX can be pulled into an electronic document along with a FAX picture; reviewed by management in another city and output on the back-end laser typesetter in another state for printing.

Producing a newsletter for a small group on your workstation is fun and productive, but electronic publishing doesn't begin or end there; it's much more. For electronic publishing to become an important part of your computer system it will have to be integrated into your network. If you have Ethernet, you're ready to connect either Macintosh or MICROVAX computers that will handle WYSIWYG. By using your existing VAX network, all the connectivity issues are addressed.

In our MAC/VAX section, we'll be looking at the functionality available with Macintosh computers closely attached to your VAX systems. Also, on a regular basis you'll find VAXSTATION issues addressed in *DEC PROFESSIONAL*.

The power of our computers is being expanded because our computers exist as networked machines, not just standalone processors. The networking capability expands our horizons in relation to what we can do with DEC-style computing. Electronic publishing is just one.



A decision support system should handle whatever you throw at it.

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Database Optional

FOCUS is available with its own powerful DBM. Or, if you're planning to work with existing databases, you can get FOCUS without its DBM at a lower cost.

FOCUS offers a common language and user interface in DEC, IBM, Wang, UNIX, PC and PS/2 environments. So applications and skills are portable.

We back FOCUS with local help lines in 13 regional offices, a central hotline, and nationwide technical support and training.

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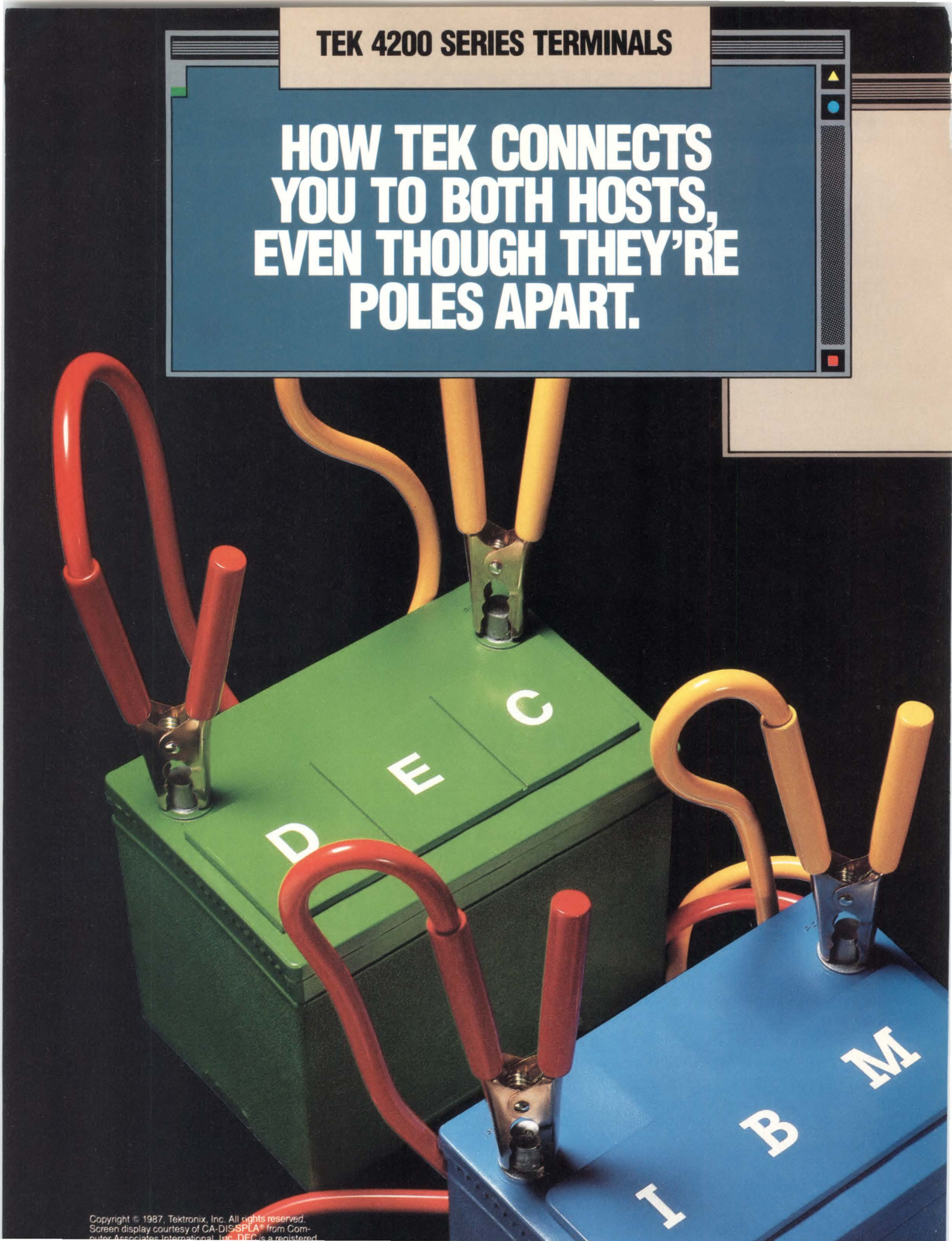

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Typically, one host serves your business applications while another serves your engineering and database needs. Now Tek's 4200 Series gives you one window to them all.

Tek 4200 Series terminals let you switch between IBM and DEC hosts at will, and work with up to six databases at once.

You can work independently of the host, too: Among Tek's superb graphics capabilities is extensive local intelligence that lets you go off-line to better utilize host resources. Local zoom and pan, for example, lets you view data well beyond display addressability.

Compatibility with over 175 leading software packages puts the 4200 Series in the mainstream of CAD/CAM, CAE, technical data analysis and business graphics. Bring your report, presentation and documentation hard copy to life with the 4200-compatible 4690 Family of color printers.

Available in 13-inch or 19-inch versions, as well as a super-tough industrial version, Tek 4200 terminals add the ideal graphic and alphanumeric solution to every station.

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Commentary: A World Of DEC

DECWORLD

Carl B. Marbach and Dave Mallery

September 8 to September 18, 1987 — The city of Boston, the Boston World Trade Center, the cruise ship QE2 and all the Boston area hotels teamed up to produce an all-DEC exposition for Digital employees, customers and prospects.

One hundred twenty thousand square feet of exhibits showed DEC solutions to industry problems, from automated manufacturing to electronic publishing to the *Wizard* of Avis, now apparently running on a DEC computer.

In the center of the exhibition hall was a large computer room with multiple 8000 series VAXs clustered, all connected to the more than 300 smaller computers showing the industry solutions throughout the rest of the hall. Approximately 1,000 terminals were placed around the common areas and each attendee was given an account, making a large mail network operational.

It was an event.

Announcements

The long expected MICROVAX III was introduced in both a workstation and general-purpose configuration. The 3500/3600 (they differ only in the cabinetry) are the general purpose versions. The CPU is approximately three times faster than the MICROVAX II, can address up to 64 MB of main memory (DEC will only support up to 32 MB for now) and is packaged with a 12-slot C-D Q-bus backplane. Unofficial estimates are that a properly configured MICROVAX III can support up to 100 users.

The workstation implementation of the new processor is forever a single-user machine. The hardware has been protected against use by more than one person at a time. In a server class, the processor is used for serving on a network, but again it can't be used by users directly. It's almost as if it isn't a VAX anymore, only a server.

The CPU board implementation of the MICROVAX III has fewer surface-mounted components than the MV2000. There's no memory on the board but there is 1K of cache on the chip itself and an additional 16 KB of cache on the board. Much of the speed increase results from the two-level caching.

In summary, the new MICROVAX III brings the Q-bus back to life, rescues the third-party controller market and allows you to build a truly powerful machine for a reasonable sum.

More Announcements

Ethernet now can run on regular twisted pair wiring with a new DEC interface. If you have existing telephone, or other relatively good twisted pair wiring, it no longer will be necessary to rewire in order to distribute Ethernet.

A new MAILBUS product will allow interconnect among DEC MAIL products and those adhering to several standards. The new MAILBUS will allow most major IBM mail networks to communicate with DEC. Mixed vendor installations (most of the *Fortune* 1000 companies fit this category) now will be able to connect mail networks.

On the software side, DEC unveiled Packaged Application Software Solutions (PASS). The new service from Digital's Software Services is "dedicated to the design, development and delivery of integrated solutions that provide customers with a competitive edge in their industry." According to DEC, it has been providing these types of solutions for some time but now it's bringing together all this experience and software to form a group that can use existing applications as springboards and as the basis for new customized applications.

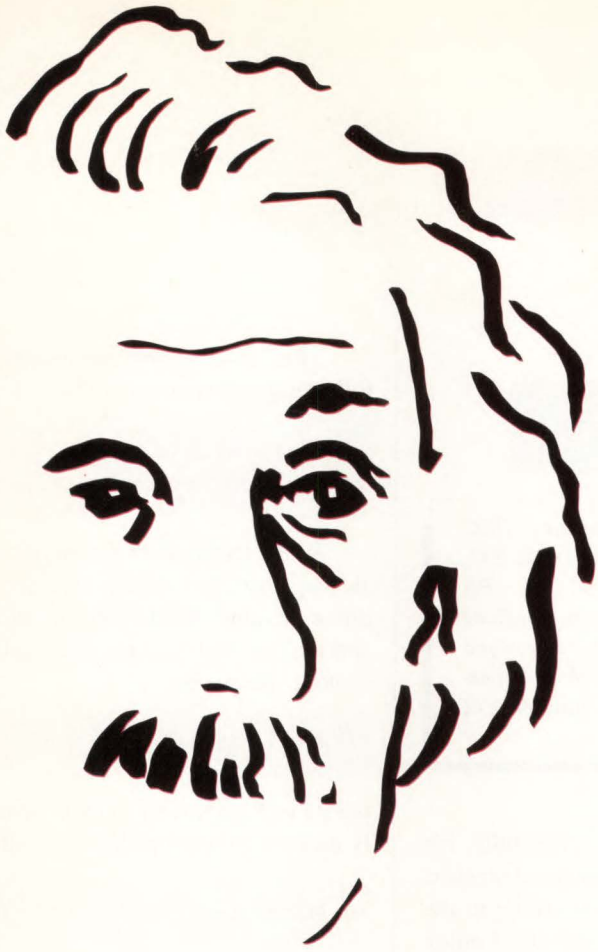
Impressions

DECWORLD had to be experienced, not just seen. It was a feeling, a direction and, in many ways, stated what Digital wants to be. DEC is no longer only a purveyor of fine computers; it offers solutions and these solutions are being used by fine companies around the world.

The industry exhibits showed more than what can be done; they showed who is doing it. It's no accident that the show included British Airways using DEC computers, Avis Rent-A-Car's system, a major newspaper using a DEC electronic publishing system and a telephone company that produces its billings on a VAX.

We looked into DEC computers through terminals that were dramatically displayed throughout. Most were in color and had graphic capability; only few terminals were black-and-white glass teletypes. The face of Digital is big-screen color graphics. There were two small screen black-and-white Macintosh computers. Although DEC computers connect with Macintosh computers and we think that there will be many Macintosh/VAX applications, DECWORLD was a show for DEC and no one else.

The feeling of DECWORLD was that DEC was out to capture the world. About a year ago, we said that Digital could be the number one computer company, beating out IBM in the long run. DEC is still on track, and DECWORLD reinforces the idea that DEC's time is now and Digital is making the most of it.



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LETTERS

Address letters to the editor to *DEC PROFESSIONAL* magazine, P.O. Box 503, Spring House, PA 19477-0503. Letters should include the writer's full name, address and daytime telephone number. Letters may be edited for purposes of clarity or space.

VAX COBOL

This is in response to John Biazzo's article "Transaction Processing, Part 2" (August 1987).

While I have found the series on transaction processing interesting, I must differ with some of Mr. Biazzo's statements regarding VAX COBOL. He wrote, "VAX COBOL . . . requires the programmer to be more verbose (and redundant); i.e., IF STATUS EQUALS FULLTIME OR STATUS EQUALS SALARIED."

While this COBOL statement certainly is acceptable, it need not be so verbose. Saying IF STATUS EQUALS FULLTIME OR SALARIED can replace the above statement. I'm sure most programmers in addition to myself would write it this way.

Then Mr. Biazzo talks about sections, going on to say, "On the other hand, VAX COBOL doesn't allow the use of SECTIONS." Nothing could be further from the truth. VAX COBOL does allow the use of sections, it just doesn't like it on the same line as a paragraph name, so this is how I do it:

```
THIS-IS-ONE-SECTION.
FIRST-PARA-NAME.
```

Correct me if I'm wrong, but I always thought that the use of sections was a part of COBOL.

I don't quite agree with Mr. Biazzo's statement saying that "VAX COBOL is stricter than its blue brother." My feeling is that VAX COBOL is much easier to use. An annoyance I've encountered with IBM COBOL is that it won't let me work with lowercase letters. It either converted them to uppercase as I left XEDIT, or gave an error message for each character or line; thankfully, it's been so long, I don't remember for sure.

I'm much happier working in the DEC environment overall, and I enjoy your magazine.

Roy Zimmer
Programmer/Analyst
Western Michigan University
Kalamazoo, Michigan

CLARIFICATION AND ELABORATION

Regarding my article in the August, 1987, "Transaction Processing, Part 2" comparing VAX COBOL to IBM COBOL, I regret the inclusion of several inaccurate statements that provided a misleading view of the VAX COBOL product. In fact, the VAX COBOL product provides much of the functionality that the previous article implied was missing.

First, the words TRUE and FALSE are reserved words in VAX COBOL. When used in conjunction with 88 level Data Division entries, they are tested easily. For example, you could define the testing condition with the following:

```
01 FILE-STATUS              PIC X.
   88  END-OF-FILE          VALUE "Y".
   88  NOT-END-OF-FILE      VALUE "N".
```

Then, in the procedure division, the following statements could be used:

```
READ CUSTOMER-FILE
AT END SET END-OF-FILE TO TRUE.

IF END-OF-FILE THEN PERFORM GET-NEXT-KEY.
```

When testing the value of one variable against two others, VAX COBOL doesn't require that the full condition be written out. For example, the legal IBM COBOL statement:

```
IF STATUS EQUALS (FULLTIME OR SALARIED)
```

would be legal in VAX COBOL by merely dropping the parentheses as follows:

```
IF STATUS EQUALS FULLTIME OR SALARIED
```

Regarding the concept of SECTIONS used in the Procedure Division of IBM COBOL, the same functionality exists within VAX COBOL. A SECTION in VAX COBOL may contain one or more paragraphs that would be executed by referencing the SECTION name with a PERFORM statement. Consider the following example:

```
PROCEDURE DIVISION.
READ-FILE SECTION.
RF100-START.
      PERFORM 100-READ-NEXT-RECORD.
      STOP RUN.

100-READ-NEXT-RECORD SECTION.
RN100-START.
      READ CUST-FILE.

RN100-CONT.
      DISPLAY "CUSTOMER FILE READ".
```

When this code is executed, the READ and DISPLAY statements would be processed. Control then would return to the line following the PERFORM statement.

In reference to programs that con-

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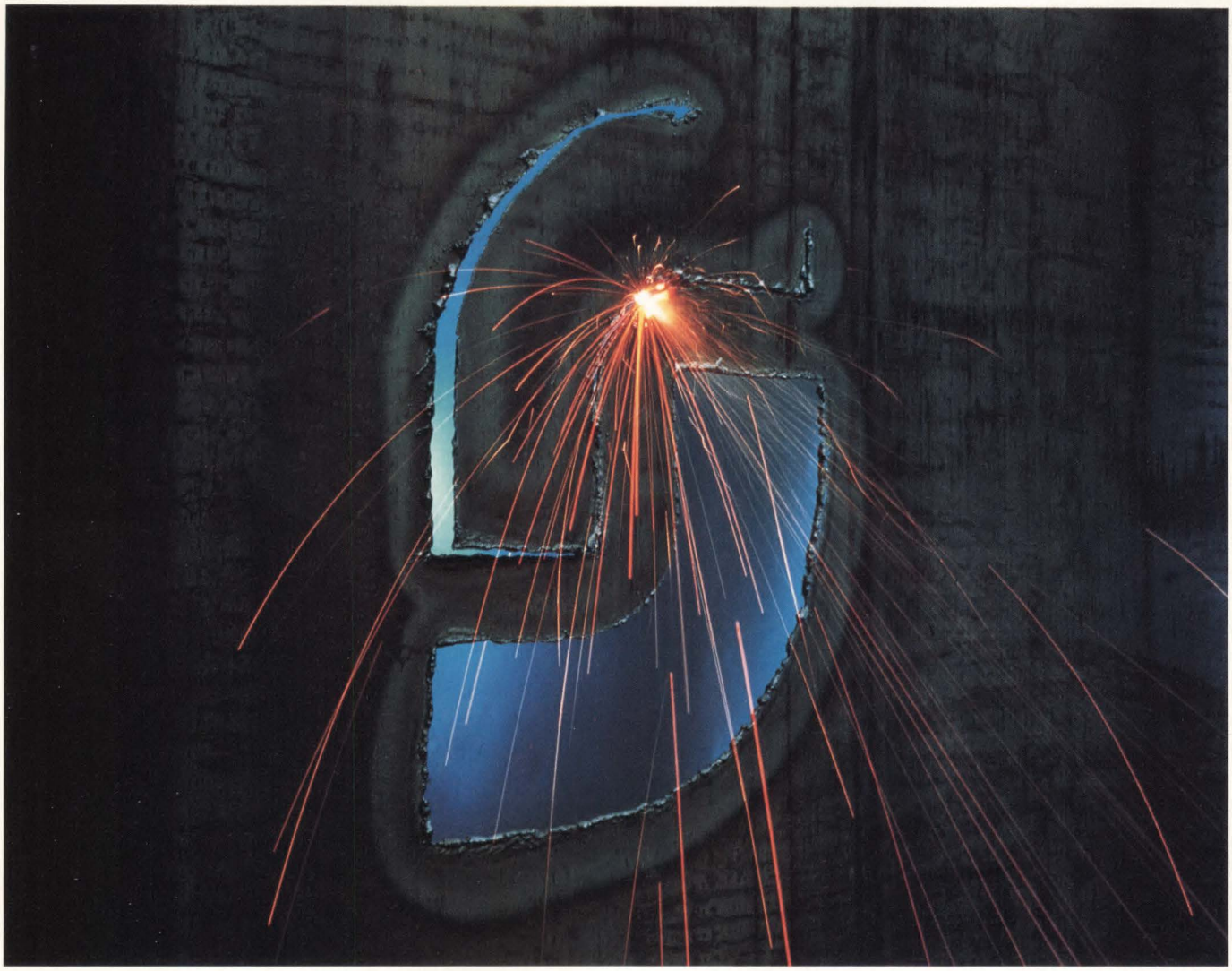

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PROGRAMMING BUSINESS SUCCESS

tain unreachable statements, VAX COBOL doesn't issue a fatal error and abort. Instead, a **W** level warning is issued and compilation continues. The program may then be linked and run successfully.

Each time a VAX COBOL program is executed, the variables contained in the WORKING-STORAGE section are initialized. When a subprogram is called for the first time from a main program, its WORKING-STORAGE section is initialized. If, however, the main program leaves a subprogram using an EXIT statement and then re-enters it, WORKING-STORAGE isn't reinitialized. This is when the PROGRAM IS INITIAL feature is used to request that WORKING-STORAGE variables be initialized.

Finally, the features that are unique to IBM COBOL, namely the ability to abbreviate IDENTIFICATION DIVISION to ID DIVISION, and the GOBACK, %INCLUDE, and EXAMINE statements shouldn't be viewed as a deficiency on the part of VAX COBOL. These items aren't part of the ANSI-74 or ANSI-85 standards, and in fact, support for these statements reduces the portability of the COBOL source code.

Thank you for the opportunity to clarify these issues.

John Biazzo
Digital Equipment Corporation
Meriden, Connecticut

SINCERE APPRECIATION

Congratulations to PERCON and Dave Mallery on their rediscovery of the keyboard interface bar code reader for the VT220 series terminals (see " 'Spotting' A Zebra: The PERCON E-Z Reader," "From the Lab" #3 (June 1987).

TPS Electronics introduced this device in January 1984. Since then, thousands of VT220-compatible PC-350 bar code readers have been shipped. The worldwide base of TPS customers apparently is happy with this industrial-grade, easy-to-use device. The PC-350 interfaces easily with the VT200 and VT300 series of terminals, the DEC Rainbow and Professional, the VAXSTATION and other DEC products that employ the LK-201 keyboard.

Thank you for making your readers aware of this product. It's important that buyers and users understand the options available to them.

Joel Postman
TPS Electronics
Palo Alto, California

THE GIRL NEXT DOOR

I read Dave Mallery's "Telebit's 9600 Trailblazer" in his "From the Lab" #1 article (June 1987) with considerable interest, especially the part about what a sophisticated file transfer package should do when running on a Trailblazer. Are you sure you haven't used *BLAST*?

I ask this question because *BLAST II* takes advantage of the intelligence of the Trailblazer. When I tell *BLAST II* that my modem type is FASTLINK (the DCA-labeled equivalent), *BLAST II* automatically sets the modem's internal parameters to achieve the highest possible throughput, regardless of the modem on the other end.

BLAST II is smart enough to take advantage of the Telebit/Fastlink's intelligence and determine whether it has connected to a regular modem at 300, 1200 or 2400 baud or to another Trailblazer/Fastlink at 19.2K baud or 9600 baud, and then optimize itself accordingly. Our tests between two PC/ATs running *BLAST II* have shown link rates of as high as 16K baud, and throughput rates in excess of 10K baud. Of course, our latest version of VAX *BLAST* also supports the Telebit/Fastlink, and similar results can be obtained.

Considering all of the above, and then taking into account the fact that *BLAST*'s protocol is well suited for use in a packetized environment, it can be said that *BLAST* is the sophisticated file transfer package you hypothesized about in your article. I believe that *DEC PROFESSIONAL* already has *BLAST II* for the VAX and for the PC. As with the proverbial "girl next door," what you've been looking for has been there all the time.

John Clifford
Communications Research Group
Baton Rouge, Louisiana

UP-TO-DATE INFO

I'm writing in reference to Dave Mallery's response to William Vaughan of Richmond, Virginia. Mr. Vaughan's problem, which is mentioned in his letter titled "FAILS TO EXECUTE" (July 1987), was that the system-wide login command procedure on a VAX system failed to execute.

Mr. Mallery's reply stated that the logical name SYS$LOGIN should be defined as the command procedure. The command statement read:

```
define/system/exec sys$login
sys$sysroot:[sysmgr]sylogin.com
```

I've learned, through my VAX experience and courses I've taken at a Digital Training Center, that the logical name SYS$LOGIN is reserved for remembering each process' login device and directory. The standard logical name to use for defining the system-wide login command procedure is SYS$SYLOGIN.

Thus, the command statement should read:

```
define/system/exec SYS$SYLOGIN
sys$sysroot:[sysmgr]sylogin.com
```

The command statement should be placed in SYS$MANAGER:SYSTARTUP.COM. The system will need to be rebooted or the command statement executed interactively for an immediate effect.

Debbie Burke
GTE Government Systems
Billerica, Massachusetts ■

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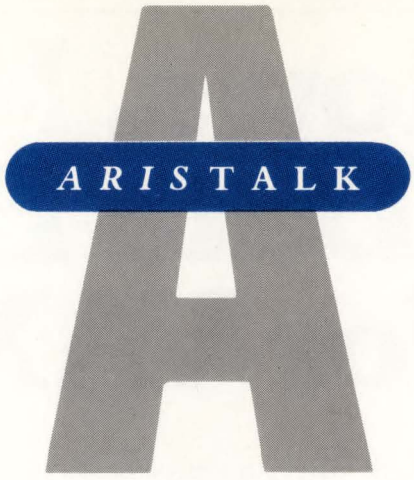

ONE STEP FORWARD ON BACKUP CONTROVERSY

QUERY:

Derek J. Pullen *(SIG 37/MESS 137):* In the article "From The Lab: Aviv Tape Components" (March, 1987), Dave Mallery discusses the BACKUP time savings he obtained by using the parameter /NOCRC.

We did some testing on our MICROVAX with a STC2925 to see if there would be a time difference. These are our results:

```
BACKUP/BUFFER:5/CRC
 for 78,000 blocks — 25 min., 49 sec.

BACKUP/BUFFER:5/NOCRC
 for 78,000 blocks — 03 min., 18 sec.
```

As in Dave's article, a significant time savings was found. But we are unsure as to the integrity of the data when we use /NOCRC. Dave's article said that the hardware should do the CRC testing itself, but can we be sure of the quality of the testing?

Is anyone else out there using the /NOCRC with BACKUP? Have you had any troubles with the data integrity? Is it safe?

REPLIES:

Antonio R. Collins *(SIG 46/MESS 143):* Was that a glitch or did the backup times really go down by 90 percent (28 min. to 3 min.)? I've always wondered about the difference between a media error and an error recovered through the cyclic redundancy group.

I've only received one CRC error in four years of VAXing, and that was on a tape older than our VAX. So, the $64,000 question is, if we limit the times a tape is recycled (which we do), and we limit the tape storage life (one year), do we really need CRCs?

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Richard B. Gilbert *(SIG 46/MESS 144):* Derek, I had an opportunity to talk to the VMS developer responsible for BACKUP, at the DECUS Spring Symposium in Nashville. There was considerable interest in avoiding the performance penalty associated with computing the CRC.

The developer, Keith Walls, was adamant that CRC was necessary in order to give you the greatest possible chance to recover your data.

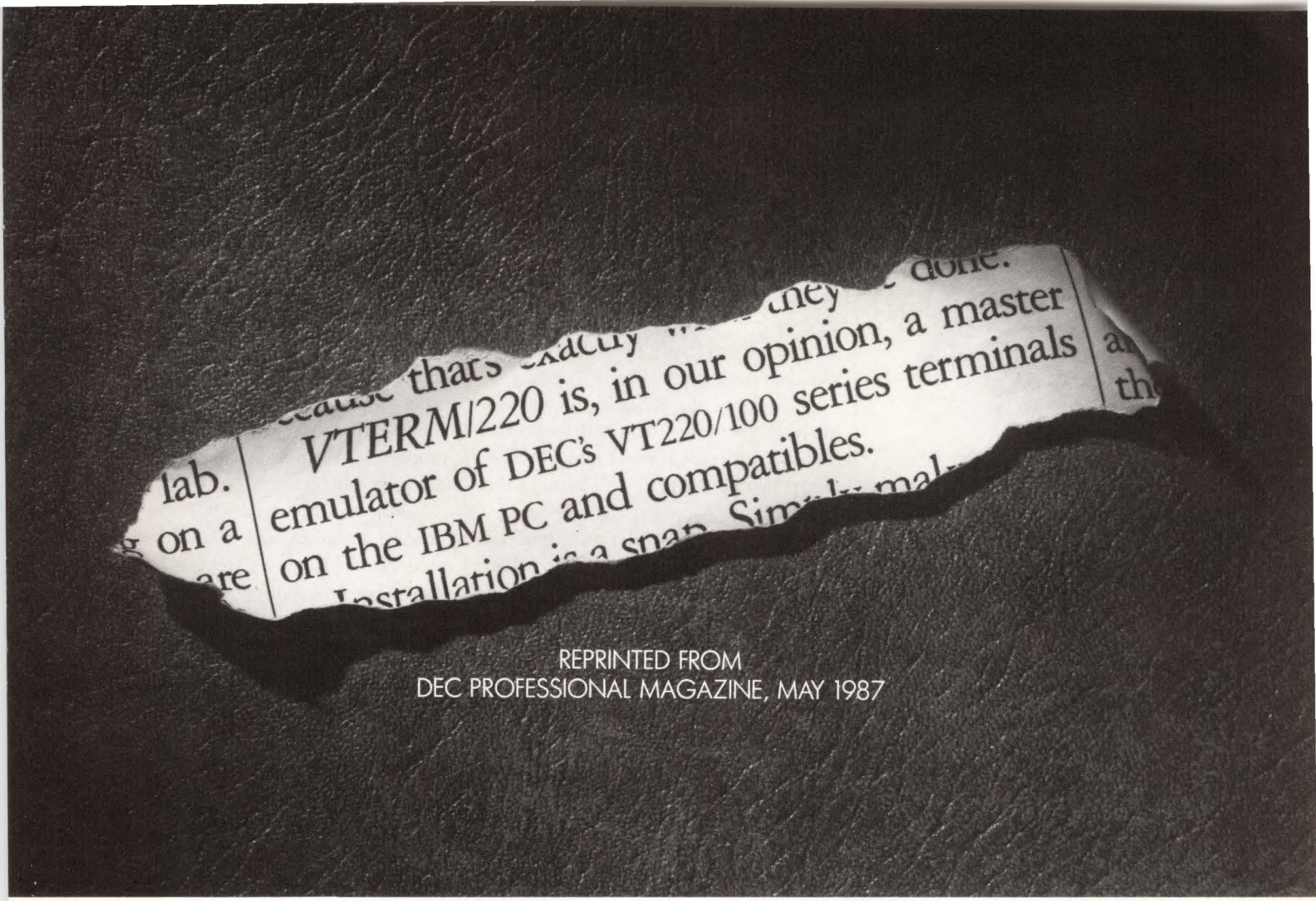
The CRC calculated by some tape drives isn't an adequate substitute because it's done at a fairly low level in the tape system. There are portions of the data path that aren't checked by the tape drive CRC. In particular, there's at least one bus and one bus adapter that must handle the data before it gets to the drive when you are backing up, or before it gets to your buffer in memory when you're restoring.

Other features of BACKUP also are oriented to data reliability rather than speed. The block size is chosen conservatively to limit the damage a piece of bad tape might do. If only one block of an XOR group is in error, it's possible to recover the original data. If two blocks in an XOR group are bad, the data cannot be recovered.

Keith said that if performance is more important to you than reliability, you could use:

```
BACKUP/NOCRC/BLOCKSIZE = 32767
  (or 62535) /GROUP = 20
```

I'd rather suffer the performance penalty myself. If you need to recover



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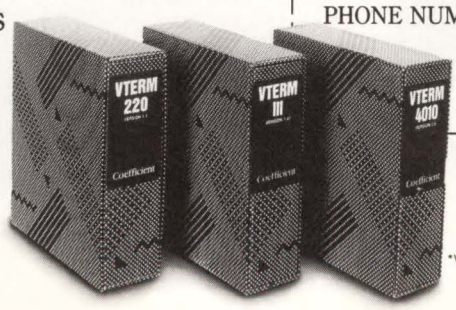

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your data from a backup tape, the last thing you want is an uncorrectable error while reading the tape.

Bill Fincke *(SIG 46/MESS 155):* The concerns about unrecoverable hardware errors are valid. We had a situation where a tape switch between the drive and coupler was trashing the data; the tape drive reported no CRC errors but the data on the tape was garbage.

The only way we discovered it was through software CRC comparison errors during readback of a tape. We had been making useless system backups for a month.

Of course, a /VERIFY during initial backup would catch this problem. We do it now! But I couldn't recommend /NOCRC without /VERIFY. With the time you save on the CRC, you can afford the verify pass.

Phillip Crews *(SIG 13/MESS 38):* About VMS BACKUP:

1. If you're using the TU81+ in GCR (6250 bpi) mode, you can safely turn off CRC (/NOCRC), because GCR tape drives automatically perform a CRC on records.
2. One sure way to stream a TU81 is to do a BACKUP/PHYSICAL. However, this type of backup cannot be restored on a file-by-file basis.
3. The main reason an image backup won't stream isn't because of the number of seeks required, but the number of file lookups. If you have a small number of large files on an RA81, you should be able to stream if you:

```
BACKUP/IMAGE/NOCRC/BUFF=5
  /BLOCK=16384
```

4. The verify pass will never stream with VMS BACKUP. You might want to bypass this step if you're doing full image backups on a daily basis.
5. To further improve performance, specify /GROUP=0. This eliminates XOR redundancy records.

An article in the July *DEC PRO,* page 115, described the /GROUP=N option as specifying the number of tape records with which BACKUP computes the CRC. I'm pretty sure it specifies the number of records in an XOR redundancy group.

For example, /GROUP=10 (the default) writes an extra record every 10 records. This extra record is the "exclusive-or" (XOR) of the previous 10 records. In that way, you can recover any single lost record from a group.

If you've never seen "nn records recovered from redundancy group" or some such message during a restore, then you've never needed this feature. (The parameter /GROUP=10 also causes BACKUP to use 10 percent more tape).

Mark Rief *(SIG 37/MESS 342):* I read Dave Mallery's article in the July *DEC PRO,* page 115, and promptly called my OEM about it. After consulting with someone who he claimed wrote BACKUP.EXE, he recommended against /NOCRC.

We have a MICROVAX II with a TK50 and would like to know if /CRC really does duplicate the error checking in the tape controller hardware.

For the record, I've repeatedly come up with the results in a timed benchmark. (See Tables 1.) As you can see, going from three to five buffers makes no difference with /CRC.

TABLE 1.

BACKUP	Standard
BACKUP/BUFF = 5	28 percent reduction in time.
BACKUP/NOCRC	45 percent reduction in time.
BACKUP/NOCRC/BUFF=5	45 percent reduction in time.

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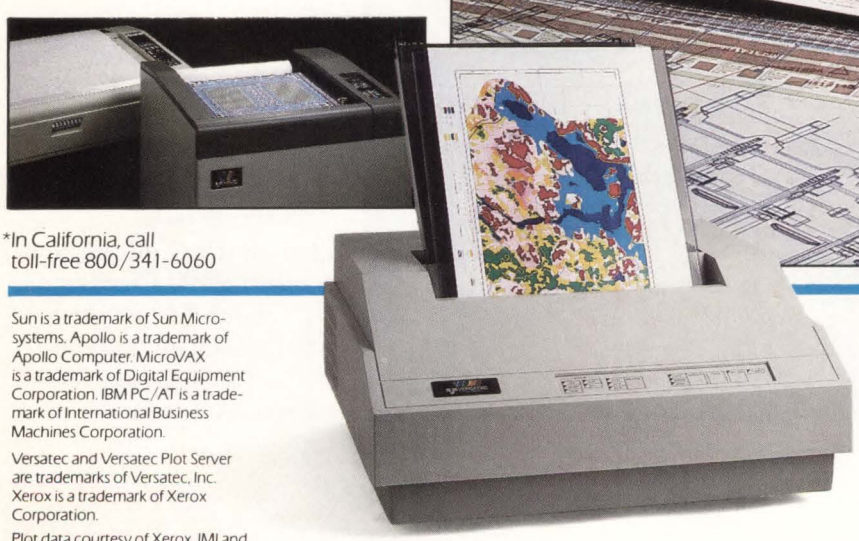

*In California, call toll-free 800/341-6060

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PRODUCT WATCH

EMC Looks To The Future With Optical Archiving System

Strong User Demand Dictates New Ways For Optical Technology With Mass Storage Products

EMC Corporation's VAX offerings traditionally have focused on memory and memory system conversions. But a new system, called the Archeion, focuses on mass storage products for VAX computers. The Archeion is an optical disk subsystem that uses a Write Once Read Many (WORM) technology to store up to 56 gigabytes of data across multiple platters.

According to EMC, Archeion is compatible with the entire line of DEC VAX computers by emulating a TU-series nine-track tape drive. It transfers data at a sustained rate of 485 KB/second, either between the CPU and the optical disk or directly between a tape drive and the optical disk. This second mode allows a user to move data from tapes to optical disk without consuming CPU resources.

Optical storage has several advantages over other storage media. Optical disks store more data than magnetic disks and are more durable. They have an advantage over magnetic tape because any piece of information can be read quickly.

On the other hand, each area of an optical disk only can be written once. If the data are changed, they must be rewritten to a new section of the disk. Reading and writing from an optical disk also takes longer than accessing a magnetic disk.

For these reasons, when data must be accessed quickly or modified, usually it is better to keep them on magnetic disk. Data not needed in milliseconds or not changing, such as last year's tax returns at the IRS, library card catalogues, backup files at computer installations or banking records, can be stored compactly on optional storage.

With a 770 KB/second data transfer rate, the Archeion's throughput is faster than a high-performance 6250 bpi streaming tape drive. It performs all seeks electronically providing users with the high-performance of disk with the benefits of tape emulation.

Archeion transfers data at a sustained rate of 485 KB/second.

The Archeion supports three data transfer modes concurrently:

1. Transfer of information between the computer and optical disk drives;
2. Transfer of information between the computer and tape drives;
3. Transfer of information between optical disk drives and magnetic tape. Because transfers between optical disk drives and magnetic tape are performed without CPU intervention, users are able to convert current tape libraries to optical disk without tying up CPU resources. Optical disk drives can be taken offline without interrupting system activity.

The base Archeion system lists for $41,000. This includes one disk drive capable of storing one gigabyte, a controller capable of supporting 56 drives and a control console. Additional drives are $12,000 each.

For further information, contact EMC Corporation, 171 South St., Hopkinton, MA, 01748; (617) 435-2541.

— Charles Connell

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GraphOn introduces the First Family of color graphics terminals.

We want to show you our new family of color graphics terminals. Like our monochrome terminals, the new GO-400 Series is first in delivering all the features you expect. And then some.

First in Tek and DEC emulation. No one can match our integration of Tek color graphics with DEC alphanumerics and high-resolution ReGIS graphics. We start with a perfect emulation, and then go beyond. Just plug it in and enjoy.

GraphOn	Emulations Tek	DEC
GO-405	4205	
GO-407	4207	ReGIS COMPATIBLE
GO-411	4111	

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GraphOn is first in performance, reliability and value. And we stand behind our products with responsive customer support, expert service and a toll-free hotline.

Call 1-800-GRAPHON for more information or a demonstration. GraphOn Corporation, 1901 Bascom Avenue, Campbell, CA 95008.

GraphOn

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*The TMS34010 Graphics System Processor

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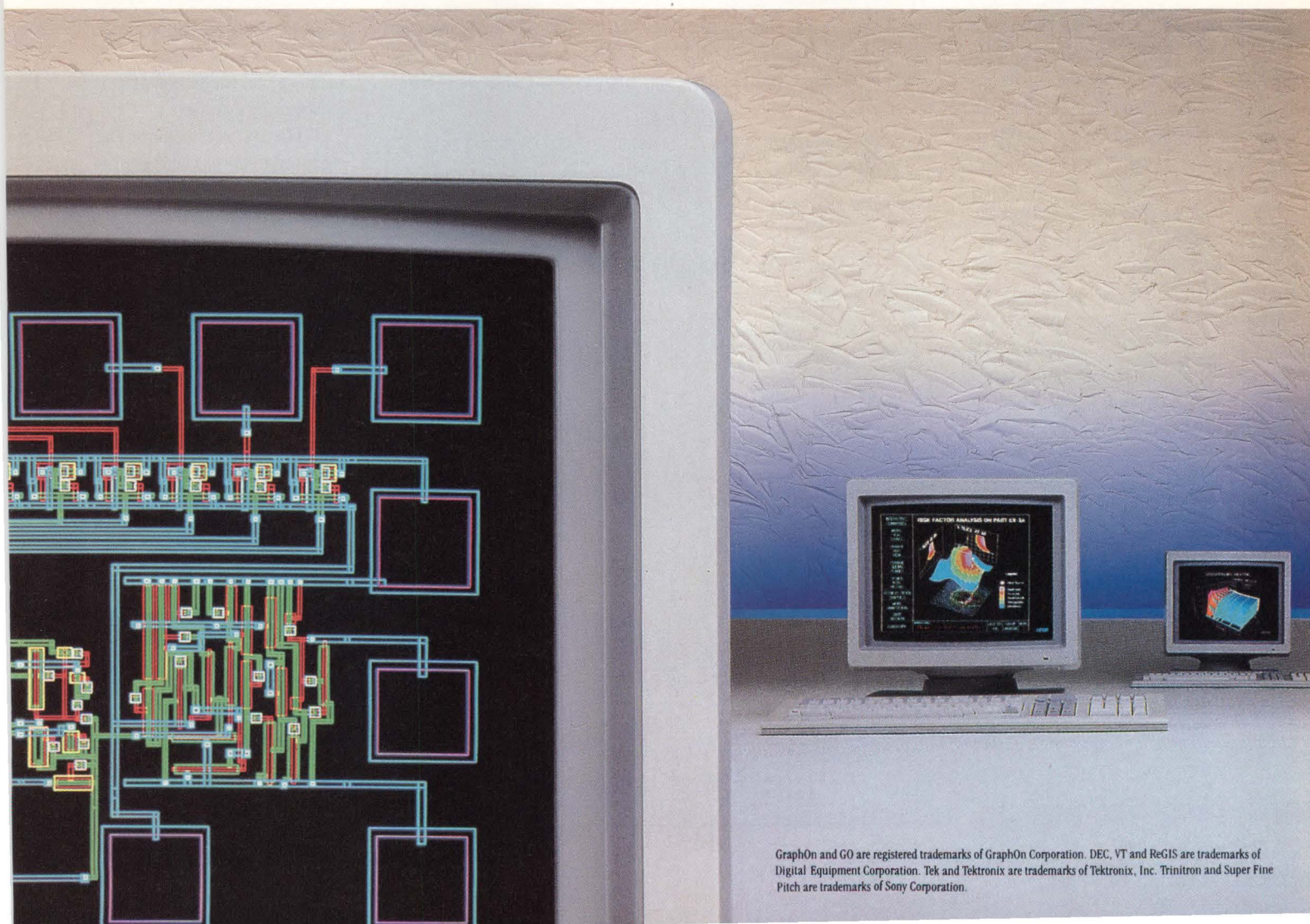

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It's Not How Fast You Make It, It's How You Make It Fast

Regardless Of The Image, The Transferrral From Cache To User Takes Less Than One-Half Second

Process Control Manager (PCM), from Ad Infinitum Inc., negates one of the fundamental shortcomings of VMS — the time spent activating an image. PCM goes one step further; it actually pre-executes cached images such that when a user says RUN, he gets the image instantly. Testing has shown that regardless of what the image does, the transferral from cache to user takes less than a half second.

PCM allows the system manager to define entries in the PCM database. The database contains information to create and maintain the image cache. It resides in a non-paged pool and takes up few pages. Each image that's defined in the database will be executed in the context of the specified process. The interface between the system manager and PCM is similar to the VMS INSTALL utility. The PCM requires no application modification to use it.

The following is an example of the command to add a record to the PCM database:

```
PCM> ADD/USER=JONES/
  IMAGE=DIR_
  APPLICATION:MENU/
  SPECIFIC/COUNT=2
```

This command instructs PCM to create two detached processes, structured as if user JONES had logged in and executed the image DIR_APPLICATION:MENU.EXE. The execution of the image will continue up to the first I/O to the screen, at which point it will be put into a wait state. The processes/images are kept in the cache until user JONES requests that the image be activated, either by the DCL RUN command or one of the run-time library routines. When this happens, PCM trades processes with user JONES and restarts the previously cached image that puts the screen out to user JONES.

If the user/image combination isn't in the cache, or if the combination is in the database but there are no available entries in the cache, the image will be activated normally. The process that JONES previously was working with is put into the PCM cache and a new image is started. This keeps the cache at the desired level perpetually.

The system manager can also instruct PCM to share cached images between users:

```
PCM> ADD/USER=USER*/
  IMAGE=DIR_
  APPLICATION:TRADE/
  SPECIFIC/COUNT=6
```

This command instructs PCM to allow any user whose username begins with USER to access the cached image. PCM also will allow a group of users with unique usernames to share a group of cached images:

```
PCM> ADD/USER=SMITH/
  IMAGE=DIR_
  APPLICATION:INVOICE/
  GENERAL/COUNT=2

PCM> ADD/USER=
  JOHNSON/IMAGE=DIR_
  APPLICATION:INVOICE/
  GENERAL

PCM>ADD/USER=FERD/
  IMAGE=DIR_
  APPLICATION:INVOICE/
  GENERAL
```

When SMITH, JOHNSON or FERD run DIR_APPLICATION:INVOICE.EXE, they'll get the cached image. The last two examples allow the system manager to define a group of users who will get cached images while also keeping the cache count at a reasonable number.

The system manager can monitor the PCM activity by using the list function as shown on the Table.

By looking at the LIST information, the system manager can dynamically adjust the PCM cache. If the HIT/MISS ratio isn't good, the number of processes/images in the cache can be adjusted up or down. The key is to keep the cache count equal to the highest number of concurrent users.

Depending on the CPU, the cost for PCM ranges from 5K to 20K.

For more information, contact Ad Infinitum Inc. P.O. Box 71567 Marietta, GA 33307; (404) 984-8723. **Enter 456 on reader card**

```
PCM> LIST

Specific Entries:

        JONES   DIR_APPLICATION:MENU.EXE

        COUNT:   2
        CACHE:   2
        HITS:    17
        MISSES:  0

        USER*   DIR_APPLICATION:TRADE

        COUNT:   6
        CACHE:   6
        HITS:    32
        MISSES:  0

General Entries:

        DIR_APPLICATION:INVOICE
        SMITH, JONES, FERD

        COUNT:   2
        CACHE:   2
        HITS:    24
        MISSES:  0
```

Who says you have to pay extra to get an ASCII terminal equipped with these three letters?

Introducing the new family of IBM 3151 ASCII displays.

Now you can have the most versatile ASCII terminals IBM has ever made, for the lowest price IBM has ever offered. Our new 3151 family gives you more functions, and greater compatibility with more ASCII host system computers, for single unit purchase prices starting at less than $400* per terminal.

Three models and up to 16 emulations make them flexible.

The entry level Model 110 comes with 10 non-IBM emulations built in, and provides an 84-key keyboard with 12 definable function keys.

The full-function Models 310 and 410 come with 11 emulations, and are easily capable of more (such as DEC VT220/100/52™ and WYSE WY-50/50 +™) by simply adding a new low-cost, slimline cartridge.

Their 102-key keyboards, equipped with up to 36 definable function keys, are also recappable, so you can adapt them to fit just about any program.

We worked harder to make them easier to use.

Besides being designed for compatibility with other computers, IBM's new ASCII terminals are more compatible with people.

New 14″ flat screen displays provide a non-glare viewing surface and smooth scrolling. Our 310 and 410 models also offer a choice of 80 or 132 column displays, with crisp character resolution, in green or amber-gold.

What's more, we built the logic into the monitors, making all three models more compact and more reliable.

However, the most important feature of our new displays isn't on the screen, but above it: the IBM name. IBM provides not only a choice of a one or three year warranty, but a tradition of quality, service and support.

It's no wonder these three letters have come to symbolize so much to so many people. And at these prices, they'll be even more in demand. For additional information, contact your IBM Marketing Representative, or call 1-800-IBM-2468 for a supplier near you.

Model 310 *Model 410* *Model 110*

*Prices subject to change without notice.

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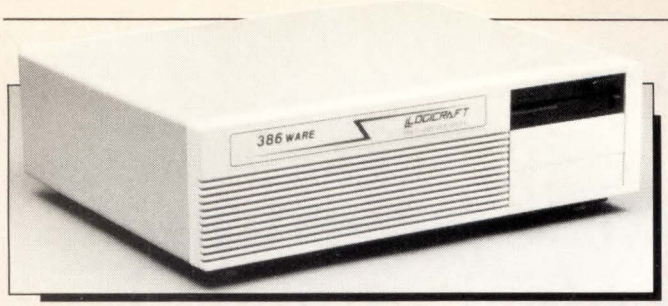


Connect To Host Through Ethernet With 386Ware

The 386Ware Allows You To Gain Access By Any VT Terminal On The System

Logicraft's 386Ware is the newest member of the company's family of DEC/IBM connectivity products, providing VT terminals with the functionality of a high-speed 80386 based IBM PC. It consists of a DOS server workstation that attaches quickly and easily onto Ethernet.

The heart of 386Ware is the high-speed, 32 bit 80386 microprocessor that enables VT terminals to run IBM PC programs at speeds up to three times faster than an AT. The workstation's features include a serial and parallel port, an Ethernet interface card, a 360K floppy drive for loading PC software and standard PC expansion slots for both 16- and eight-bit boards.

Up to eight PC sessions are supported per server. Each DOS user has access to six 32 MB logical disks and easily can switch between MS-DOS and VMS via a hot key. A bidirectional file transfer utility (DOSFLX) is provided for quick and easy transfer of data files between MS-DOS and VMS.

The workstation has 4 MB of RAM expandable up to 16 MB that is allocated dynamically to each user on the system. Application programs that support the Microsoft Expanded Memory Specification can use up to 2 MB of system memory.

Users can take advantage of the VAX resources such as the high-speed printers, plotters and hard disks, eliminating the need for additional PC hardware. All MS-DOS data files and program files are stored on the VAX hard disk ensuring data backup and security and providing ease of software updates.

Logicraft's 386Ware attaches to the VAX or VAXSTATION via DEC standard Ethernet providing every user on the network with access to MS-DOS. And because 386Ware is a network server on Ethernet, it's compatible with all bus structures, thus protecting your original investment in DEC hardware.

The eight-user model lists for $15,995 and the four-user for $9,995.

For more information, contact Logicraft, 22 Cotton Rd., Nashua, NH 03063; (603) 880-0300.

Enter 454 on reader card

Quantum I/O Allows Faster Processing, Full VAX RMS Functionality

Easy, Consistent And Logical Calling Interface With Quantum I/O

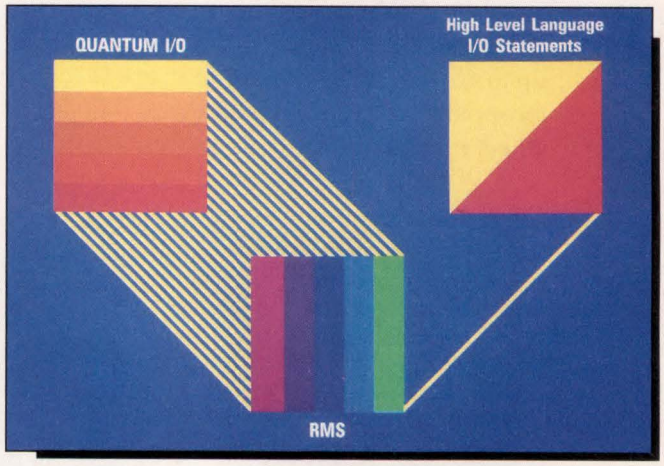
Quantum I/O from Computer Information Systems Inc. permits faster processing for applications using RMS. Until now, there were only two ways for higher languages to interface with RMS: use the high-level language itself, or call RMS directly with code written in MACRO32. The former method is comparatively easy, but inefficient; it also results in the loss of some RMS capability. The second method is difficult to do, but allows access to the full range of RMS capability and, if written properly, will execute efficiently.

Quantum I/O is a layered product consisting of a set of routines written in MACRO32 that calls RMS directly. The code itself is inline and highly optimized. It's actually easier to use than the high-level languages and retains virtually the entire range of RMS capabilities. The software runs completely in user mode and requires no special privileges. Anyone programming in the general purpose VAX languages (for example, COBOL, FORTRAN, BASIC or PASCAL) can use Quantum I/O to make programming easier and to improve performance.

The price range is from $2,000 to $8,000.

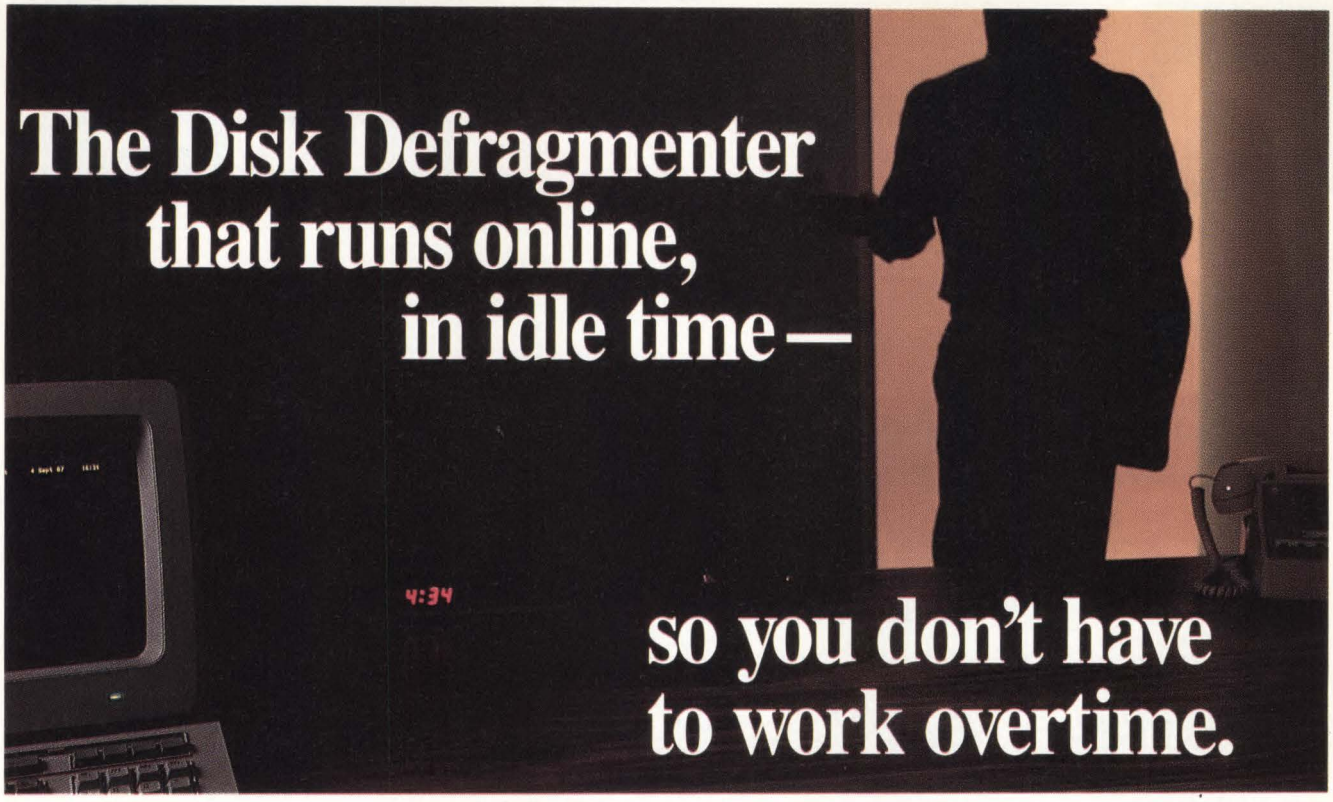
For more information, contact Computer Information Systems, 165 Bay State Drive, Braintree, MA 02184; (617) 848-7515.

Enter 455 on reader card



One of the primary design goals of the Quantum I/O is to provide efficient processing of all RMS file types on direct access storage devices.

DISKEEPER



VAX Performance Like Day One

Keeping your VAX system running as smoothly as it did when it was brand new doesn't have to be a lot of work. It can be the work of DISKEEPER, the #1 selling disk defragmenter from Executive Software.

Once and for all you can put an end to the most common cause of poor system performance—disk fragmentation. DISKEEPER organizes your disks and keeps them that way so your system always runs like new. What's more, DISKEEPER runs online without any operator intervention. You'll never need to spend another minute defragmenting disks.

DISKEEPER's unique design ensures safety of user data and maximizes performance.

Safety Without Sacrifice

DISKEEPER is built to insure that under no circumstances will any data be lost, even if the system crashes. Yet there's never a sacrifice in your system's performance.

Using the VMS read/check and write/check capabilities, DISKEEPER guarantees data integrity without performance-robbing scratch space, second drives or redundant copying.

No File Too Tough

Virtually every fragmented file can be made contiguous. Giant files, partial files, even multi-volume files are processed. DISKEEPER consolidates your free space into a large contiguous area—online—and fast.

Fast and Efficient

DISKEEPER goes right to work on any and all files. There is no unnecessary "analysis" pass to determine which files are the most fragmented.

And forget about CPU-consuming preprocessing to compute the "theoretical" best location for every file and space. Under average system use, such an analysis would become obsolete moments after completion.

DISKEEPER immediately moves each file and space to the best possible location at that moment in time.

Automatic, Easy to Use

What really saves you time is that once DISKEEPER is installed, you do nothing. It automatically monitors your system and activates itself as needed. Just set it and forget it.

Because DISKEEPER uses CPU idle time and unused I/O bandwidth, it runs smoothly and quietly in the background without degrading performance, and without interfering with user access.

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To top it off we provide you with the kind of documentation and support you'd expect from the leader in the field.

In fact, when you put DISKEEPER to work for you, you get more than just the best performance, reliability and support. You get a company committed to making your job easier.

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Company _____ Phone _____ DP93

Address _____

City _____ State _____ Zip _____

How many MicroVAXes?___ How many VAX 7XXs?___

How many VAX 8XXXs?___ How many users total?___

How often do your disks need to be defragmented?_____

ENTER 121 ON READER CARD

The Invisible VAX

AlisaTalk — VAX/VMS-based file and printer services for the Macintosh.

By Al Cini

WHAT REALLY ATTRACTS users to the Macintosh is its uniquely consistent, intuitive, and downright friendly human interface. There are no strange commands to remember, no arcane error messages to decipher, no complicated utilities to apply. Just use your mouse to point to what you want and, with the click of a button, you get it. There's no denying the compelling business reasons for hiding computer power behind the Mac's simple, symbolic "desktop." Reviews of software products available for both the Macintosh and the IBM PC repeatedly note the shorter "mean time to productive use" of the Mac-based versions.

It is the same with a VAX/VMS system connected to a Macintosh and running the AlisaTalk server software package. AlisaTalk, from Apple Computer Inc., delivers the mass storage, printing and networking capabilities of the host VAX to the Macintosh user through the Mac's familiar metaphor of desktop icons and dialog boxes. With AlisaTalk, the VAX's central server role in the Macintosh network is appropriately kept behind the scenes, as invisible as AT&T or Sprint should be during a phone conversation.

AlisaTalk consists of several parts. The three components a Macintosh user sees (the product's file, printer, and remote terminal server features) allow a Macintosh user to store and retrieve data and programs easily from the host VAX's disks, to use the VAX as an intermediate spooling device to Apple LaserWriter printers, and to log in under VAX/VMS using a terminal emulator such as Mac240 or VersaTerm PRO.

FILE SERVICE

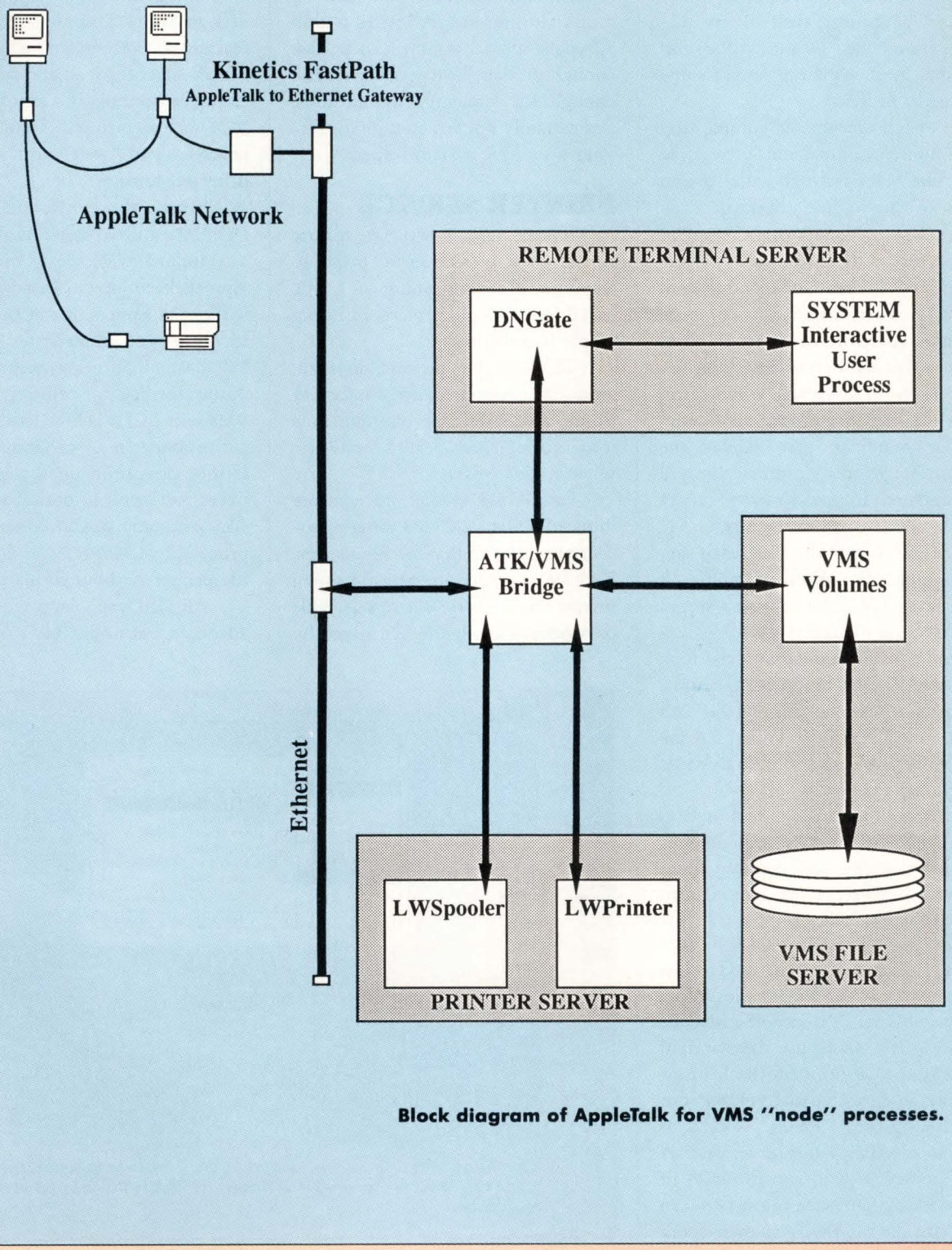
A VAX/VMS USER creates a virtual Macintosh disk volume on the VAX by running AlisaTalk's CREVOL utility. This program prompts for the virtual volume's Macintosh name (the name by which it's known to the Mac's Finder) as well as the name of the VAX/VMS disk directory in which its files will be stored. CREVOL then creates the volume and builds the necessary control files to emulate a Macintosh format "flat" file structure (MFS). A future version of the file server will use Apple's AppleTalk Filing Protocols to emulate an AppleShare volume server, offering the more advanced hierarchical file structure (HFS), as well as a number of other useful features.

To serve this virtual disk volume to networked Macintosh systems, a file server process must be activated on the VAX. This is accomplished by using a standard editor to add the name of the new virtual disk to the file server's VOL.NAMES parameter file, $STOPping the file server process if necessary, and starting it using the supplied STARTFILESERVER.COM command procedure. Under normal circumstances, this is done automatically within the system's SYSTARTUP command procedure.

A Macintosh user accesses the virtual disk volume by mounting it from the Mac's desktop using an Alisa-supplied desk accessory (see Screen 1). The desk accessory presents the user with a dialog box, which permits the selection of several file server processes, optionally organized into different AppleTalk zones, each capable of serving up several virtual volumes. After selecting and mounting the desired volumes, pressing the DONE button returns the user to the

LABORATORY DECPRO TESTING CENTER

FIGURE 1.



Block diagram of AppleTalk for VMS "node" processes.

desktop, where the new volumes are now available. Within the Macintosh Finder, the volumes appear as VAX file cabinet icons (see Screen 2), and each can be treated as though it were any normal Macintosh disk (a few features, such as ERASE DISK and volume-level copying, aren't supported at present).

A particular virtual volume may be mounted simultaneously by more than one Mac user, each with his own view of the volume's desktop. Each user's desktop context is preserved in the virtual volume by the user name he specifies in the Mac's Chooser desk accessary when he initially mounts the volume. Therefore, care must be taken to keep this name consistent. Concurrent users of a virtual volume can store, delete, or rename files. Any Finder windows that display the volume's contents automatically will be updated in real-time to reflect changes made by other users.

Viewed from the VAX, each virtual volume is a directory, and each Macintosh file in the volume is stored as two separate VMS files: a filename.RF file, containing the Mac file's resource fork information; and a filename.DF file, containing the file's data fork. The file's VMS filename generally will correspond to its name on the Mac desktop.

Even though they are stored as separate VMS files, Alisa recommends against deleting and copying them directly in VMS, as this can corrupt their Macintosh desktop context. Instead, an AlisaTalk VAX/VMS file server utility, FSU, can be used to import VMS text and binary files into a virtual volume, or to export a Mac file to VMS. It's OK to use the standard VMS $BACKUP utility to back up or restore an entire virtual volume, but not file by file.

Is AlisaTalk's file server fast? A fair answer depends on the kind of networking hardware in use between the Mac and the VAX, and an in-depth review of the performance of various volume servers and networking hardware is planned for a future issue. A Kinetics *FastPath* (described later) was used in writing this article, and we found storing and retrieving within AlisaTalk virtual volumes to be fast enough for data files, perhaps not fast enough for launching applications, and certainly not fast enough for serving up a Mac system folder.

PRINTER SERVICE

ALISATALK'S PRINTER SPOOLER feature allows a Macintosh user to "print" to a spooler process running on a VAX exactly as though it were an actual Apple LaserWriter.

This spooler process, in turn, stores the printed *PostScript* information in a VAX disk file, and transmits it to its designated "real" LaserWriter when it isn't busy.

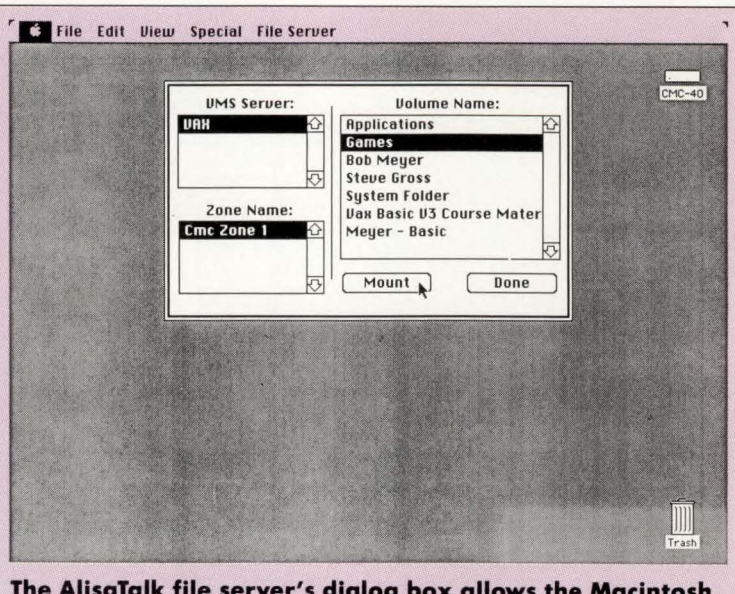
LaserWriter spooler processes are initiated under VAX/VMS using a procedure similar to that for file servers. Each VAX spooler operates in its own private subdirectory, where $EDITable parameter files define the name by which the spooler process will be known to the Macintosh Chooser (its AppleTalk name) as well as the name of the "real" output LaserWriter.

Using the Macintosh Chooser desk accessory, a user will see both the real and the VAX-based virtual LaserWriter (see Screen 3) and may select either for printing. But printing to the VAX virtual printer, of course, will never have to "wait" until a current print job finishes.

From the VAX, AlisaTalk's LWPRINT utility can be used to print a standard VMS text file to an AppleTalk-connected LaserWriter (or, if the user prefers, it can be spooled to the virtual LaserWriter process). LWPRINT supports a variety of special output formats for printing standard VMS text files, such as letter-quality correspondence or program listings. If the application on the VAX produces *PostScript*, an option with VAX GKS and some VAX/VMS-based word processors, LWPRINT can direct it to the printer without formatting.

AlisaTalk's spooler performance is adequate, but noticeably slower than

SCREEN 1.



The AlisaTalk file server's dialog box allows the Macintosh user to select from an assortment of VAX/VMS-based virtual volumes.

most Mac-based laser printer spoolers. Of course, nothing prevents you from using one of these to spool to the AlisaTalk spooler; this will get you back to your Macintosh application quickly, still secure in the knowledge that your job can be printed by the VAX even after your Macintosh has been switched off. Unfortunately, the current version of AlisaTalk's print spooler can't be used with the AppleTalk ImageWriter dot matrix printer.

REMOTE TERMINAL FACILITIES

AVAILABLE FROM ALISA Systems as an extra-cost option, its advanced printing services package uses real VAX/VMS printing queues, rather than the standard package's simple FIFO scheme. This allows for prioritized print jobs, as well as for modifying and reordering print jobs within the queue.

The advanced printing facility also supports output to Digital's PrintServer 40 and LN03R *PostScript*-compatible laser printers. Using AlisaTalk's advanced printer services, these DEC facilities can be Chooser-selected as though they were standard Apple LaserWriters.

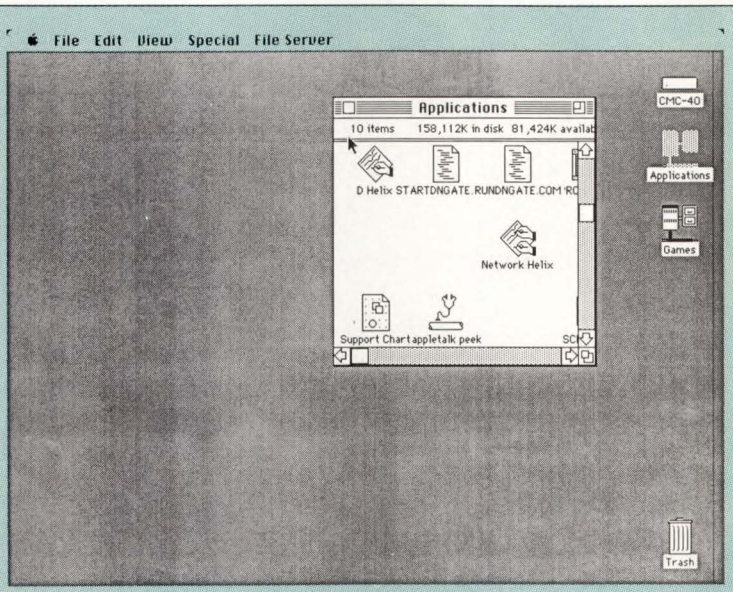
REMOTE FACILITIES

WITH SLIGHTLY MODIFIED versions of a standard terminal emulator (at present, White Pine's *Mac 240*, *VersaTerm/VersaTerm PRO* from Peripherals, Computers and Supplies or *Blast* from Communications Research Group), AlisaTalk's AlisaTerminal remote terminal facility can be used to create interactive VAX/VMS sessions (see Screen 4). With AlisaTerminal, a special VAX-based server process acts as a DECNET remote terminal gateway, creating the session using DECNET's heterogeneous command terminal (CTERM) protocol. This DECNET gateway process exchanges DECNET CTERM packets with the selected host VAX, converting and exchanging them with the Macintosh using AppleTalk protocols.

Interactive response in both *Mac240* and *VersaTerm PRO* under AlisaTerminal is indistinguishable from direct-connect operation at high (9600/19.2KB) baud rates. In testing, the *VersaTerm PRO* implementation seemed less prone to failure, and when launched it offered a handy dialog box (see Screen 5), asking which of potentially several DECNET gateway processes should be used and which VAX DECNET node to SET HOST to. AlisaTerminal is still in field test, so it's too early to draw firm conclusions about which terminal emulators use it most effectively.

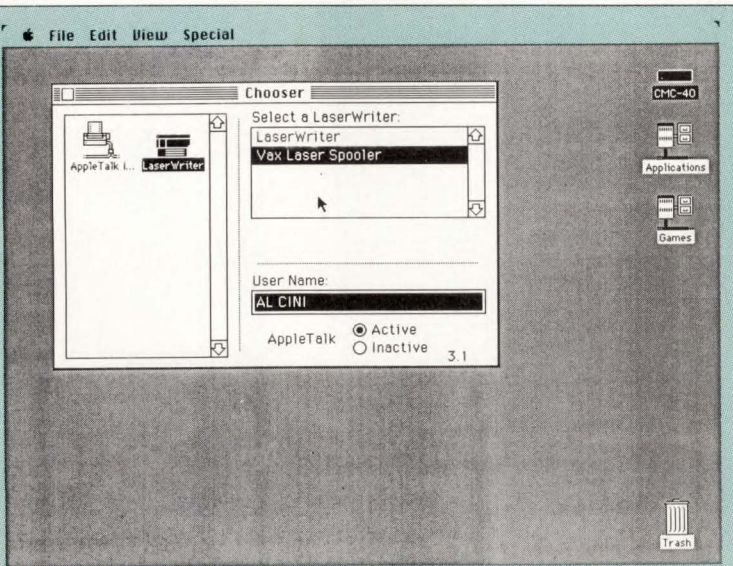
Some advanced VMS terminal

SCREEN 2.



AlisaTalk's virtual volumes, as seen within the Macintosh finder.

SCREEN 3.



AlisaTalk's print spooler (selected) appears in the Chooser Dialog Box along with the "real" Apple LaserWriter.

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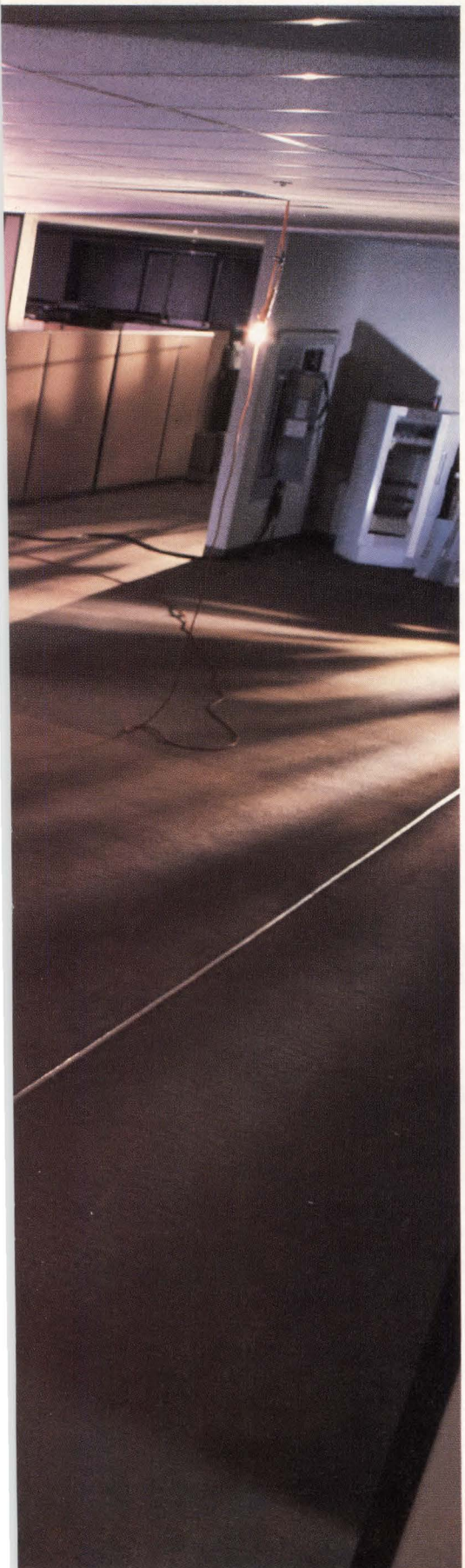

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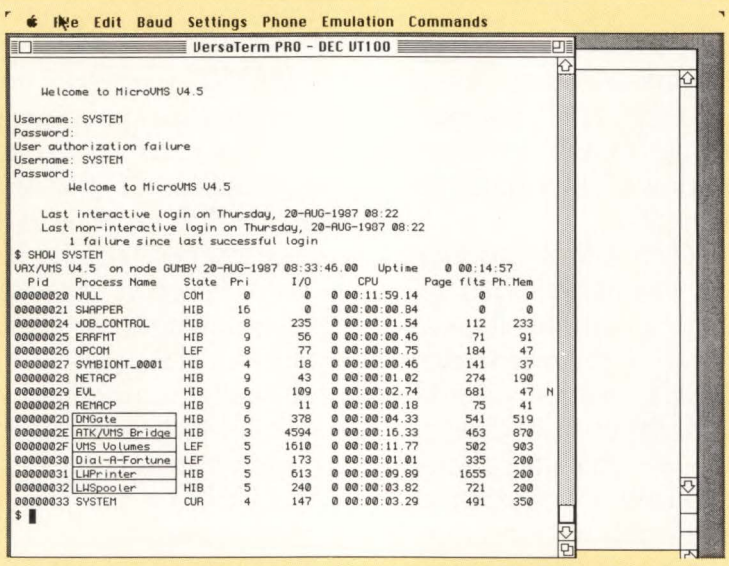
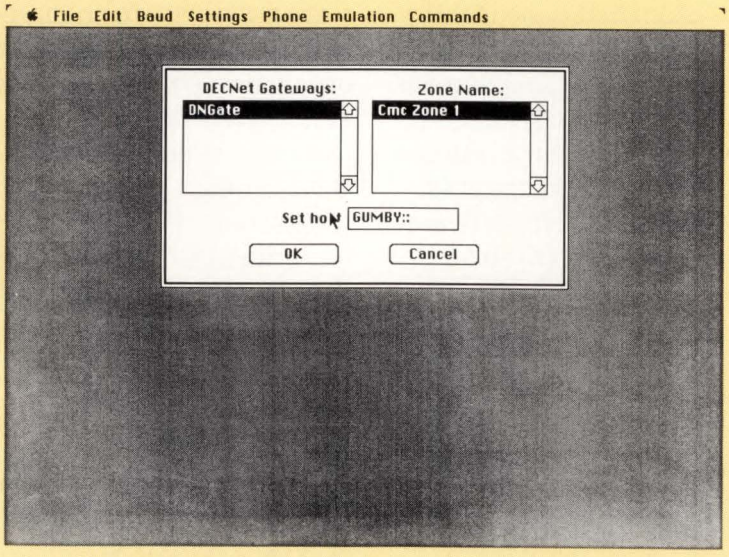
SCREEN 4.



Displayed with *VersaTerm PRO* under AlisaTerminal, this SHOW SYSTEM lists the AppleTalk for VMS server processes (process names enclosed in boxes).

SCREEN 5.



***VersaTerm PRO*, used with AlisaTerminal, allows a user to select an interactive service and host DECNET node.**

driver features, such as preloaded response buffers, don't work with CTERM. Consequently, some VMS host software may not work through AlisaTerminal. Resultant problems can range from the inconvenience of not being able to use DCL command line recall to the potentially major problems of not being able to use certain TDMS or FMS features. You should plan to try mission-critical terminal software with AlisaTerminal before committing to its use.

The people at Alisa have bent over backward to make us VAX/VMS types comfortable with AlisaTalk. The VAX-based software is distributed as standard VMS save sets, easily installed with the VMSINSTAL utility. The Mac-based software consists of a driver for the file server (this should disappear when its AppleShare-compatible version is released) and some feature-enabling patches for *Mac240* and *VersaTerm*, all easily installed from the supplied diskettes using familiar Macintosh procedures.

The AlisaTalk manual looks just like VMS documentation, right down to the fonts and page numbers. VAX/VMS user procedures are clearly described and easy to follow. Unfortunately, however, the documentation's references to AppleTalk terms, such as zones, bridges, and internets, suffer from a lack of AppleTalk background. The manual refers the reader to Apple's "Inside AppleTalk" documentation, which most people don't have, and which is too technical for most people to follow.

Alisa doesn't provide much documentation on the Macintosh end of AlisaTalk because there really isn't much to say about it. A Macintosh-experienced user can figure out how to mount volumes and print to the spooler in just a few minutes, without reading any documentation.

UNDERNEATH ALISATALK

THE KEY TO understanding AlisaTalk's brand of Macintosh/VAX networking is Apple's AppleTalk protocols. AppleTalk was designed as an ISO-standard layered networking system, so information transmitted as AppleTalk packets can ride over an Ethernet as easily as over Apple's inexpensive twisted-pair cables. AppleTalk also can coexist on the same networking medium with the packets of other protocols, such as DEC's DECNET, LAT, and MSCP. By programming the powerful and software-rich VAX to "speak"

AppleTalk, rather than trying to teach the Macintosh something like DECNET, the VAX can be made to function as a Mac server with little modification to standard Macintosh system software, which already is AppleTalk-equipped.

The AlisaTalk distribution kit includes the library of CALLable VMS subroutines which was used by Alisa Systems to build AlisaTalk's end user facilities. Collectively termed AppleTalk for VMS, a creative programmer can use this collection of subroutines and special server processes to build custom VMS-based Macintosh server applications. This software, in effect, implements Apple's AppleTalk protocols under the VMS operating system, creating some enticing possibilities of combining VAX/VMS with the large and growing number of AppleTalk-networked software packages available for the Macintosh. AlisaTalk users are free to apply AppleTalk for VMS in their own applications, but must license the software from Apple if they intend to use it in any commercial products.

Commercial products based on AppleTalk for VMS may not be long in coming. Odesta already has used it to port the server for its networked *Helix* database management package to VAX/VMS, marrying the database power of the VAX with the cost-effective text and graphics display capabilities of the Macintosh.

The marketplace now offers a large and growing number of Macintosh-to-VAX physical connection alternatives. The Kinetics' *FastPath*, for example, forms a "bridge" between a standard AppleTalk twisted-pair network and the VAX's Ethernet (see Figure 1). To AppleTalk's higher protocol levels, the *FastPath* is a standard AppleTalk internet bridge; to the lower, physical levels it serves as a "gateway," translating AppleTalk packets to Ethernet format and vice versa.

The AppleTalk for VMS processes provided with AlisaTalk (see Screen 4) form a "virtual" AppleTalk network under VMS. To the externally connected "real" AppleTalk network devices (nodes), these processes simply appear to be other AppleTalk nodes. The "bridge" ATK/VMS process routes packets between the server process nodes in the VAX's virtual AppleTalk network and the *FastPath*, which in turn routes them to the client Macintosh nodes in the real AppleTalk network.

A single *FastPath*, which costs approximately $2,500, can bridge as many as 31 networked Macintosh systems and Apple LaserWriters to the host VAX. People with bigger budgets and higher throughput requirements can connect each of their Macintosh systems directly (not their LaserWriters) to the Ethernet, for between $850 and $1,250 per connection. People who can't afford direct Ethernet connections and don't want to run new AppleTalk cables can consider Farallon's *PhoneNet* cabling system, which makes it possible for Macs and LaserWriters to AppleTalk to each other over ordinary telephone wire.

Sensitive to both the VAX and Macintosh sides of the network, Alisa Systems' AlisaTalk works well at both the client and server ends of the transaction. As important, the product's underlying AppleTalk for VMS open architecture promises exciting new server applications to come.

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Corporate Electronic Publishing

FROM desktop to enterprise. BY DAVID HENRY GOODSTEIN

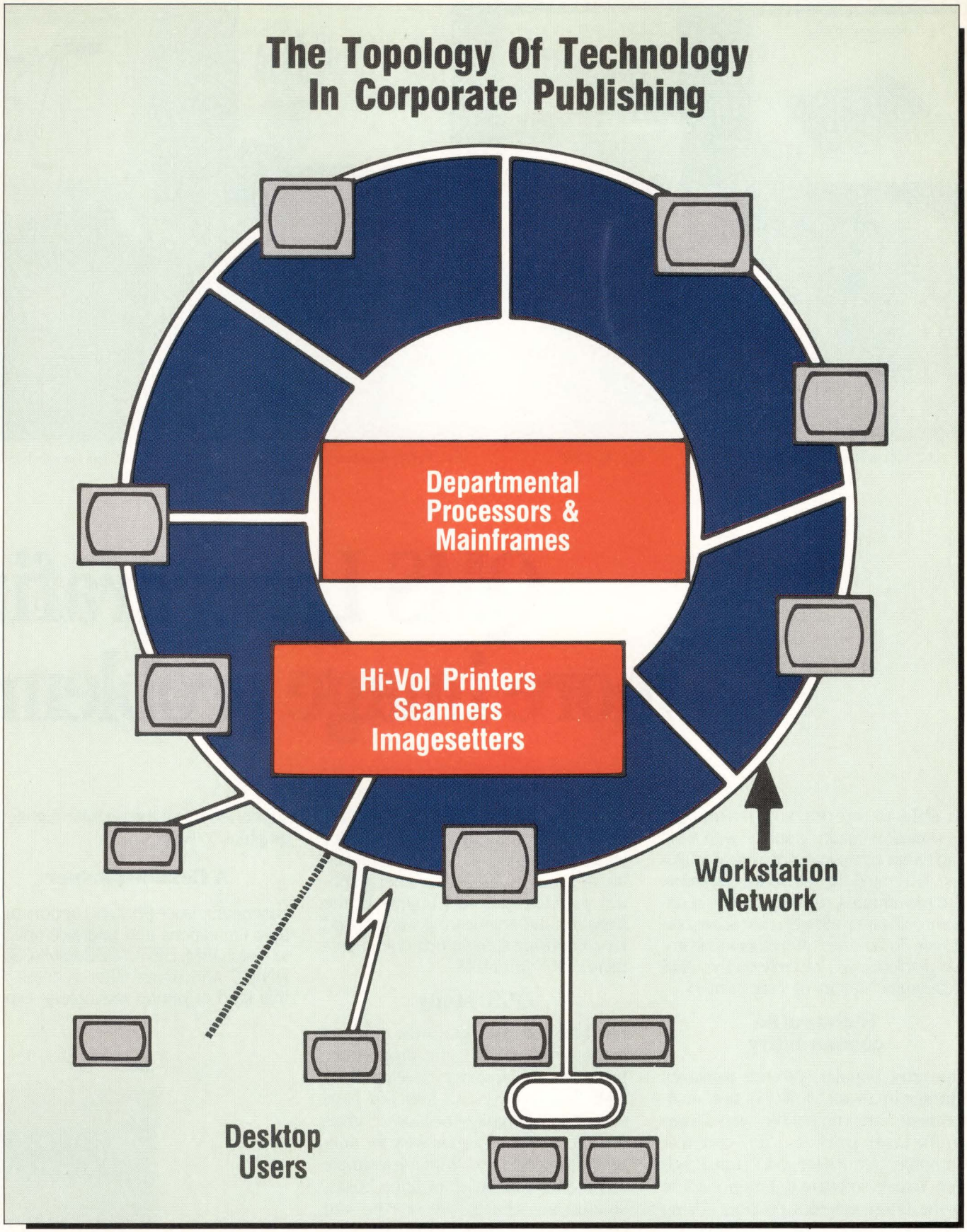
DESKTOP PUBLISHING (DTP) is hot. Seldom in the history of the computer industry has so much hoopla been generated by so many for so long. Seldom has there been as truly revolutionary a set of products, or one with such universal appeal. But "desktop" is only the beginning of a much larger story, one that only now is beginning to be understood by companies everywhere.

Corporate Electronic Publishing (CEP) is an emerging multibillion dollar annual worldwide capital equipment market and a new conceptual framework that will change corporate communication dramatically over the next five years. In fact, corporate publishing represents the largest opportunity for increasing corporate productivity and profitability since the appearance of office automation and computer aided design (CAD).

To understand the reasoning behind this somewhat controversial statement, let's begin by defining publishing as gathering information, reducing it through an editorial process, beautifying and restructuring it through the setting of type, adding illustrations and composing finished pages. This is done in preparation for manufacturing and distribution of the high-resolution information packages called documents. This cycle describes an activity that's done by organizations of all kinds for producing paper-based information for use both internally and externally.

Corporate publishing activities include everything from the production of simple proposals, technical manuals, corporate product sales catalogs and annual reports. Both research and direct experience have shown that publishing is a generic activity. Its importance is second only to meetings or telephone communication. But, publishing also is a decentralized and disorderly process that consumes huge amounts of resources in both time and money.

Behind personnel and product pro-


The Topology Of Technology
In Corporate Publishing
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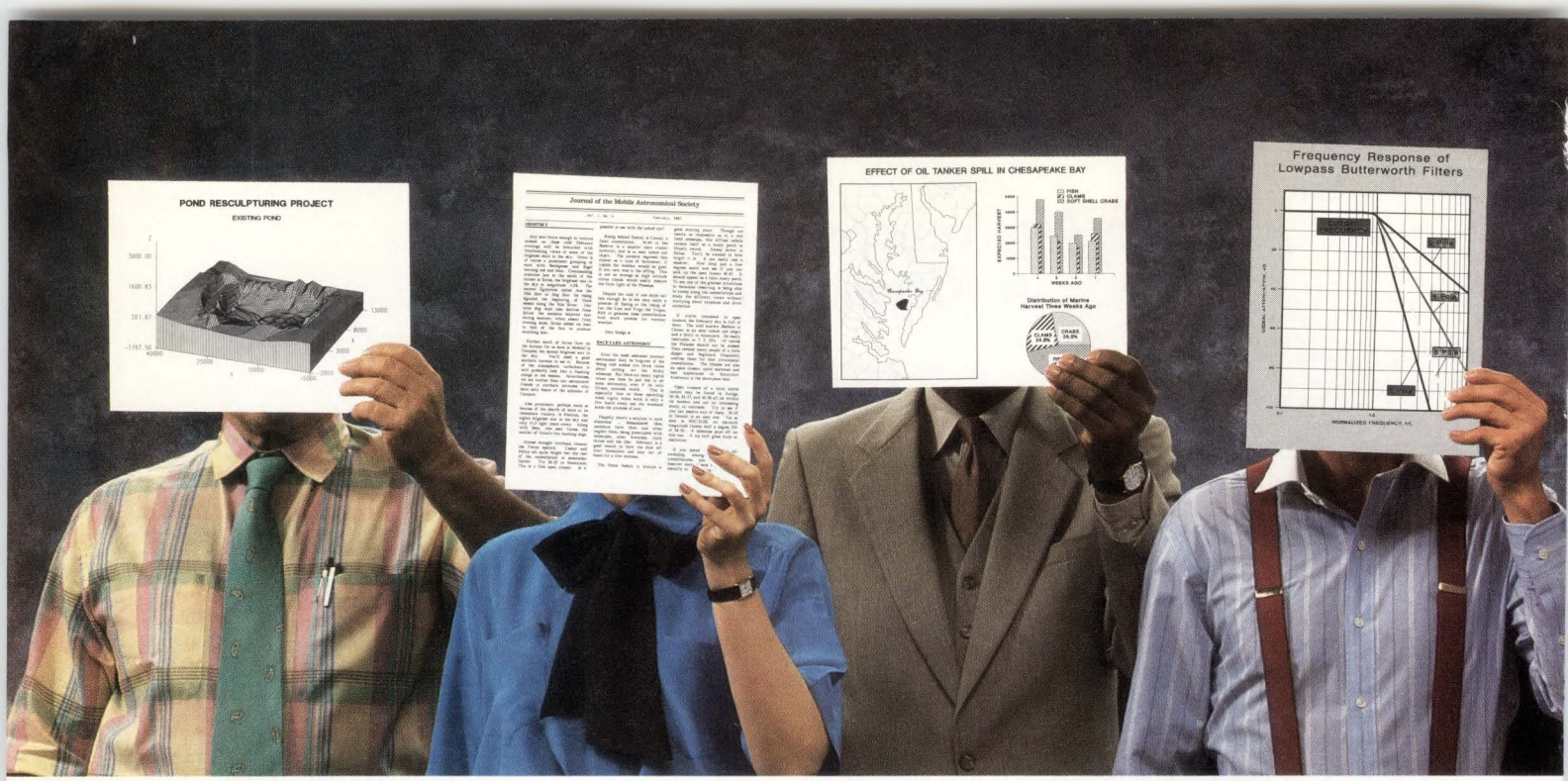
Processors &
Mainframes
Hi-Vol Printers
Scanners
Imagesetters
Workstation
Network
Desktop
Users



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QUIC study

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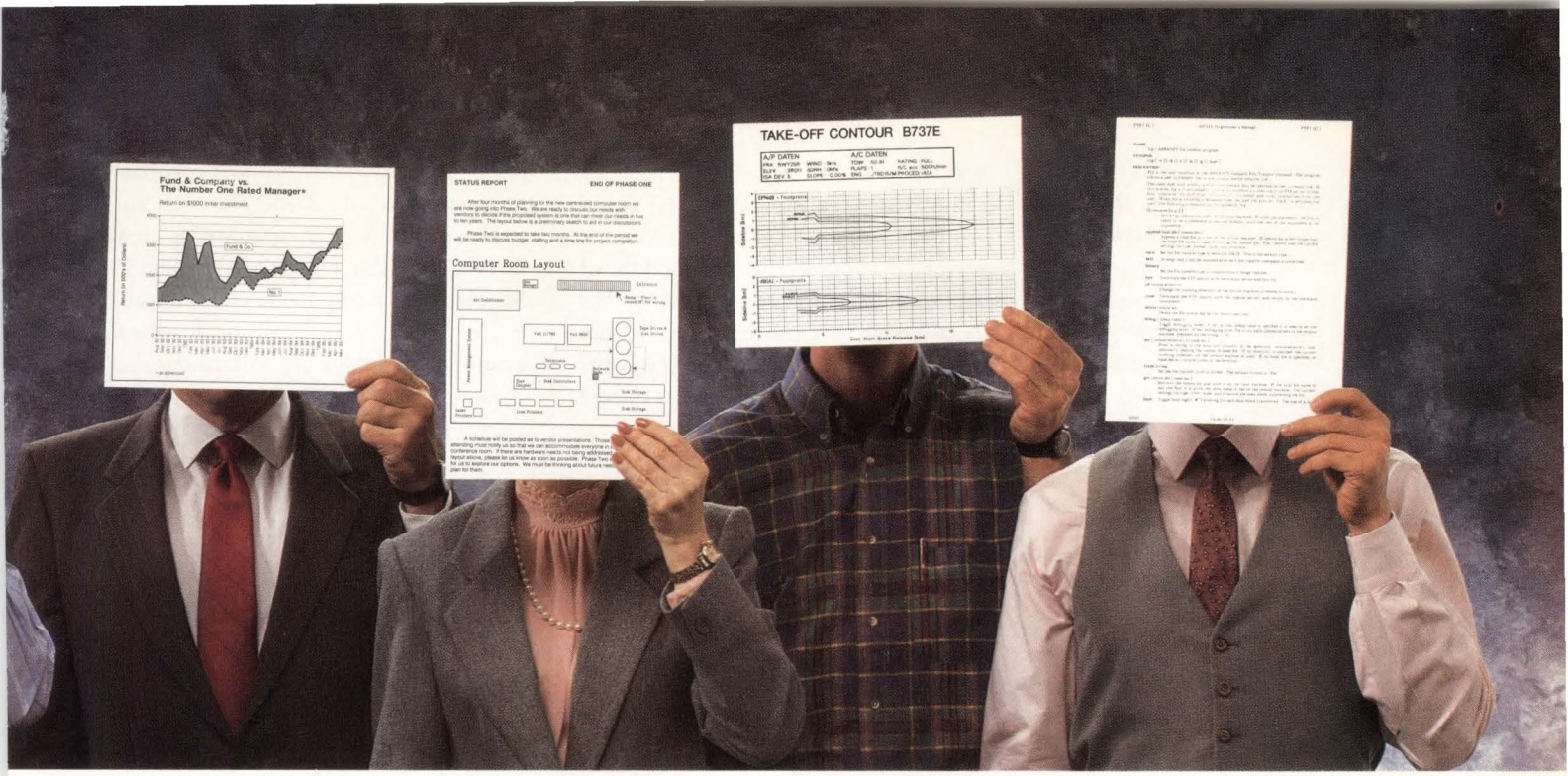

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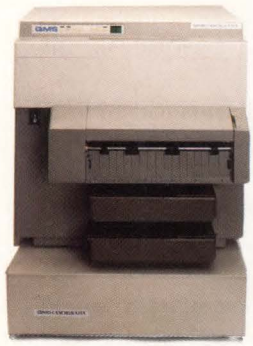

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duction costs, publishing is likely to be the single greatest corporate expenditure in information-intensive industries today. The process of gathering words, numbers and images from a variety of sources and producing fully integrated pages ready for manufacturing and distribution is a painstaking, time-consuming process.

Corporate vs. Professional Publishing

Corporations today must use the same processes, skills and equipment as professionals in the world of newspaper, magazine or book publishing. The difference is that in the professional publishing world, the result of that publishing process is the company's product — the magazine, book or newspaper.

In the corporate environment, however, the product of the publishing process is a byproduct. The real job of Citibank, for instance, is to manage money. As a byproduct, though, it publishes thousands of pages of printed literature to communicate with its customers, employees and prospects each year. The real business of DEC is selling computers and electronic systems, but to achieve that goal, it publishes millions of pages of both product-related and sales-oriented documents.

Two things distinguish corporate publishing and make it more difficult in certain ways than professional publishing. The first is the almost infinite life expectancy of most corporate documents. Many companies produce and maintain manuals continuously for products that are more than 20 years old.

The second is the continuous updating and republishing required for technical product documentation. These requirements, until very recently, put an unmanageable strain on available systems from a computer resources standpoint. Corporations, therefore, have not been able to adopt existing professional publishing systems simply.

Professional publishers have benefited greatly from new technology in the last 10 years. They've experienced tremendous rationalization of costs. Moreover, because the business is organized around the production of published products, one manager has control over that entire process within the organization. The production manager also has a team of specialists trained to use the sophisticated systems.

But in the corporate publishing environment, publishing costs have remained unrationalized, control has remained decentralized, and production typically involves equipment and skills in various departments. In fact, publishing in corporations is a slow, skill-intensive and extremely expensive process. The results frequently are of poor quality and the process can be terribly ineffective.

CORPORATIONS have not been able to adopt existing professional publishing systems simply.

A recent study by the U.S. Government Accounting Office on nuclear weapons systems documentation discovered that 25 percent of all system documentation pages were out-of-date. At present, the Army and Air Force expect an update cycle for documentation to take an average of 270 days. This kind of delay is partly because of the bewildering variety of incompatible processes and equipment used, and partly because it's no one's job to own and operate all publishing equipment and resources in most American organizations.

The U.S. government is the largest publisher in the world. But, in a study of CEP markets, we at InterConsult discovered that many or most corporations also are publishers. The total annual cost of corporate publishing may be twice the $100 billion a year spent in Standard Industrial Code (SIC) 2700 activities that include all professional printing and publishing. Publishing also demands rapid output for certain industries, like computer or information services, where products must be marketed on a timely basis.

The true cost of corporate publishing is unrecognized. As it becomes more evident, top management initiatives toward rationalizing the cost likely will be taken immediately. Recent studies showed that the life-cycle cost for a one-page of black-and-white documentation to support a technical product is as high as $400. For full-color marketing literature, costs can be as high as $2,000 per page merely to prepare it for printing. The amount of product literature prepared in color also is increasing dramatically in the U.S.

A study of several hundred companies that have begun automation efforts over the last five years has shown that between six and 10 percent of corporate annual gross revenue is spent on printing and publishing. The new systems now available allow users to save up to 50 percent of that expenditure.

Fundamentals Of CEP

CEP offers a variety of total solutions to a number of common problems. CEP isn't a single new technology; rather, it's a synthesis of new and existing technologies, techniques and components that only now are being integrated into full-fledged functional electronic networks. By 1990, corporate publishing networks will carry most corporate communications internally and externally in the U.S.

CEP networks integrate input from word and text processing systems, electronic graphics, computer-generated line art from computer aided design and drafting (CADD) programs and photographs digitized by electronic scanners. These inputs must be stored in text and graphic databases for con-

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tinuous updating. Electronic page masters are processed automatically through highly intelligent programs and interactively on pagination terminals.

Page images then can be telecommunicated to remote terminals for electronic viewing, stored in high-density magnetic or optical electronic archives, or output on a variety of peripherals including laser printers, film-oriented typesetters, microform recorders or digital platemakers. The CEP network is linked by local area networks and remote digital telecommunications that allow the movement of full resolution electronic page masters around the office or around the world.

The benefits of CEP in savings of time, materials and labor costs are tremendous. Moreover, CEP users are able to produce instantaneous updates to documents, because production is equivalent to outputting a digital snapshot of the electronic databases at any moment.

A database of electronic page masters available on demand will be preferable in many applications. The McDonnell-Douglas Corporation has announced a plan to replace printed manuals for aircraft field maintenance information. Mechanics instead will work from satellite-linked terminals accessing a massive optical videodisk archive. This source will be updated continuously and directly by the company's engineers and technical writers. Accordingly, the field staff's information invariably will be current and more cost-effective for repairing aircraft in the field.

For the defense, aerospace or nuclear energy industries, this will mean easier and more cost-effective legal compliance. For those in the computer, information or financial services industry, it means quicker delivery of the product. Time savings in getting new products to market dwarfs both the hard cost-justification savings and the capital cost of equipment. It ultimately may make ownership of a CEP network mandatory in highly competitive industries.

To put claims about the size of the CEP market into perspective, you should realize that corporate publishing can't be addressed or solved totally by a single system or set of systems. Research has shown that there are four separate varieties of CEP systems; the simplest is designated desktop and the most complex is a total network that integrates all electronic text and graphics functions of desktop to the kind of full process-color systems needed to produce the annual report. Capital cost for these systems ranges from $15,000 to $5 million.

> THE emergence of CEP as an industry is a function of available technological solutions.

Although many vendors have given lip service to the need for a wide variety of publishing systems and devices, all of which can be deployed in integrated enterprise-wide networks, only DEC is delivering these today. The VAX-MATE is a prototypical answer to DTP requirements. Like the Apple Macintosh or IBM PC-based units, it's based on an MS-DOS personal computer and offers the ability to compose pages typographically to add business graphics or certain kinds of simple line art diagrams. DTP is oriented to laser printer output, although files later may be used for phototypesetting if high-volume reproduction is desired.

LEVEL II SYSTEMS, called Technical Document Systems, like ones from Interleaf or Datalogics, are based on high-powered workstations or supermini VAX processors. These systems accept files from word processors or personal computers. They also are interfaceable to CAD systems or specialized electronic illustration subsystems. Most can process scanned photographs and create electronic master pages either automatically through a set of rules given to the computer, or interactively through operator work at the pagination workstation.

These electronic masters then can be processed by intelligent output systems called raster-image processors.

These allow the network to support a number of different recorders. They typically will include low-cost, low-volume laser printers, high-volume laser printers like the Xerox 9700, and phototypesetters or film imagesetters.

CEP LEVEL III systems add color capability to the electronic publishing network or workstation. Systems like the Atari ST-520 and Commodore Amiga add color to personal or desktop CEP. Dedicated systems like Slidetek or Dicomed add a better quality color image composition capability for production of presentations and marketing literature. Systems like the MCI Quantel allow work to be done for output to video, 35mm or other color media. Widespread acceptance and good price/performance of hardcopy output for color probably must wait until later in the 1980s. However, a number of imaging systems are available that make pictures out of numbers and also have painting and scanning capabilities.

FINALLY, AT LEVEL IV, the addition of Hell Chromacom or SciTex electronic color page composition systems to the corporate network will allow total in-house production of all documents including the corporate annual report. The output of Level IV CEP systems is a set of printable color film page masters. DEC has been a leading adaptor of fully integrated CEP and recently has put its Scitex into operation at the Bedford, Massachusetts facility.

Each of these configurations addresses a different need and hits a different industry. Desktop publishing has become an overnight sensation. Tech-

nical Document Level II systems already are well accepted and widely adopted by aerospace companies for their publishing work. The higher cost Level III and IV color systems appeal to large, presentation-intensive, appearance-conscious corporations who produce product literature in process color.

The emergence of CEP as an industry is a function of available technological solutions. This hasn't helped boosters of videotext begin to make a buck. However, CEP offers a return on investment (ROI) that can be described as sensational. Common experience has shown that a 30- to 35-percent annualized ROI is easy to achieve.

In well-managed situations, a 50- to 60-percent annual (ROI) appears achievable. Chief executives, strategic planners and CFOs hardly can afford to ignore the message borne by corporate electronic publishing. Add to ROI the soft benefits of greater control, reduced product lead time to market, simpler management and accuracy, and the package seems irresistable.

An Emerging Marketplace

All of that adds up to an exciting emerging marketplace that's going to be busy and crowded. Research indicates that a lot of participants will be organizations that never thought of themselves as in the publishing business. More than $250 million already has been placed by private investors into CEP startups. An estimated $400 million also has been spent by well established companies to develop new products.

Major competitors will include computer companies like Siemens, CD-ROM suppliers like Phillips, electronic printer companies like Canon and Xerox, workstation manufacturers like Sun and Apollo, systems integrators like Itek, typesetting companies like Linotype, printing equipment suppliers like Gestetner, CAD companies exemplified by PCS and Intergraph, and even newspaper composition system suppliers like Atex.

In addition, a new multibillion dollar service industry also should

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emerge, led by organizations like R.R. Donnelley & Sons Company, that will provide an alternative to capital equipment purchase.

Competition is fierce and getting fiercer, with most of the major corporations in the computer business, including IBM, UNISYS and Wang, already involved in corporate electronic publishing.

The motivations are as simple as greed itself. So many companies can use CEP, and the benefit of investment is so great, that by 1990, the U.S. market for capital equipment should exceed $7 billion. However, this will not be a simple market to understand or plan for because of the different levels of products and their varied technological maturity dates.

Earlier this year, full functionality for all levels of black-and-white publishing systems was reached. But there still are unresolved issues preventing widespread cost-effective publishing in color. For instance, there's the need for easy, cheap, high-quality hard copy and the ability to make multiple copies of color documents. These capabilities are in development and may remain so for some time.

Another reason for a quick market take-off is that companies already have major CEP components, including CADD systems, business graphics software, text and word processing and some form of laser printing. These components are available to be integrated at a higher level into full corporate publishing networks.

At this point, there are few technological obstacles to many corporate publishing applications; there are no cost/benefit obstacles. The remaining problems are management issues. At present, ownership of CEP equipment is spread among the data processing, engineering management, office automation, reprographics and in-plant printing groups. Added to that is the complexity of existing relationships with outside suppliers.

In response, we foresee the emergence of a new job title: corporate publisher. There eventually will be one person within a company who is given the authority to buy and own CEP equipment, operate it and make it a service to others in the corporation. Corporate publishers aren't here yet but there already are professionals helping to establish the positions.

Corporate electronic publishing systems have arrived in the world market. That doesn't mean the end of printing presses, nor does it mean the end of the traditional graphic artists who produced printable masters. But it does mean that during the next few years, those people and processes first will be surrounded and then supplanted by electronic corporate publishing networks.

> . . . WE foresee the emergence of a new job title: corporate publisher.

Those networks will produce finished electronic masters that are illustrated and of high aesthetic quality. Companies will generate reports, documentation and literature of all kinds directly from electronic databases that are updated in real time.

Behind the office of the future isn't a fancy typewriter or a word processing terminal that gets smarter. Rather, there's a publishing technology that has been modified for easy use, made cost-effective and on track to becoming the primary information engine within the corporate office. *—David Henry Goodstein is founder and president director of InterConsult Inc., Cambridge, Massachusetts.*

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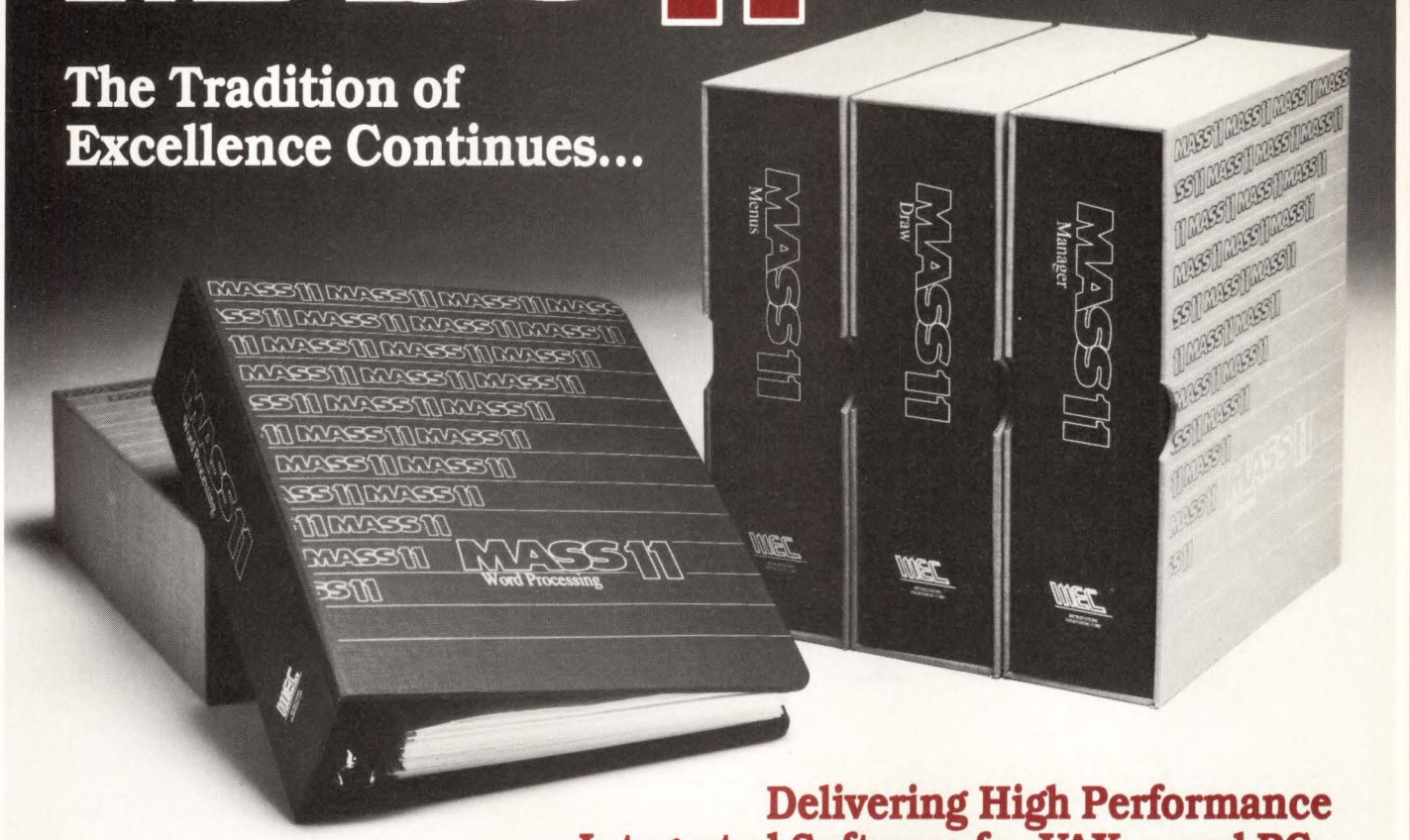

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The Ps & Qs Of PDLs

THE ROOTS of PDLs sprout out into the publishing and printing community. BY KEVIN G. BARKES

PAGE DESCRIPTION LANGUAGES (PDLs), which were unknown just two years ago, now are a major force in the electronic printing and publishing industry.

PDLs provide a device-independent method of generating text and graphics on laser printers, phototypesetters and other output machines. As anyone who has tried to get a specific word processing program or computer to talk to his particular printer will tell you, device independency isn't a trivial feature. The problem is compounded further by the varying capabilities of output devices, the methods used to perform imaging, and the manner in which font and page information is maintained within the output device.

Prior to the introduction of PDLs, composition system vendors had to bear the onus of making certain their software would connect to the user's output device.

In order to appreciate the function of PDLs, it's necessary to review how text and graphics get from the keyboard and scanner onto the output page.

The process begins with a text file that can be read by the host computer containing the composition or publishing software. This text file includes not only the type matter that is to be set, but also commands that control the manner in which the material is to be composed. Depending on the capability of the composition software, these commands also may call in files containing prescanned graphic images in the appropriate format. As part of the composition process, the software may also reference ancillary files holding style and other data not contained within the text file.

The system in Figure 1 produces an output driver file that can be read and acted upon immediately by the output device. The driver file is in the native language of the output device, so the laser printer or typesetter doesn't have to perform any additional processing; like a standard dumb printer, it follows the commands presented to it.

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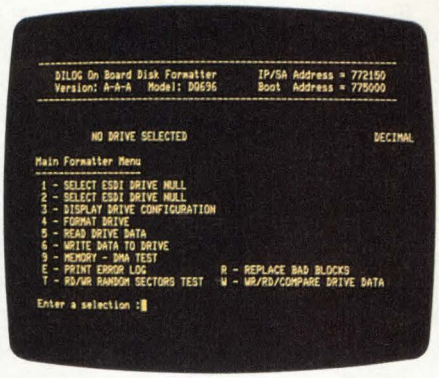

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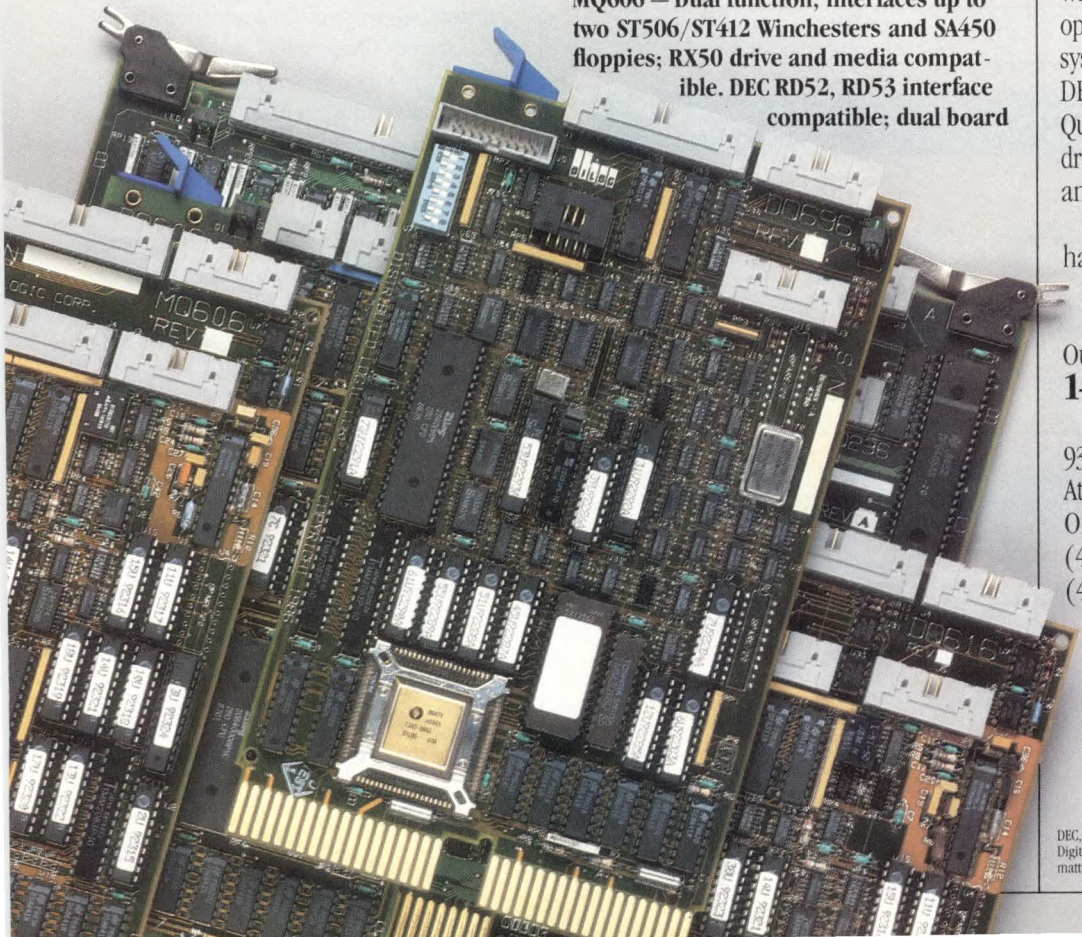

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output device usually are much smaller, because they contain only machine-specific instructions.

Unfortunately, only one type of output device can be supported in this arrangement, an extremely limiting factor. Most sites using large composition systems must support a variety of typesetting and proofing devices.

One solution to this problem is to permit various output modules to be linked to the composition software. This is the approach taken by Datalogics' *Pager* program, which can support virtually all commercial phototypesetter and proofing devices, as well as the *PostScript* page description language. Before initiating a composition pass, the user specifies the output device to which the document will be sent. *Pager* then loads in the appropriate software routine and generates a machine-specific output file.

Unless the output file is in *PostScript* format (and is therefore capable of driving all *PostScript* devices), the document must be composed once for each different output device.

Figure 2 demonstrates an alternative approach used by Donald Knuth's TEX (pronounced "tek") system. Instead of generating a machine-specific file, TEX produces an intermediate or metafile. This metafile is then processed by various translation programs on the host computer to produce the device-specific output file.

Commercial typographers and in-plant typesetting departments generally were pleased with these options, although problems still existed. Graphics were difficult to handle, and the differences in font characteristics between the output devices could cause major problems.

The solution came in the form of PDLs. Page description languages do precisely that; describe in detail how a finished page should appear. The advantage of PDLs is their device independence.

As Figure 3 shows, PDL implementations remove the burden of device-specific output from the composition software and place it on the output device. The composition system generates a PDL file, which is actually a program read by the PDL interpreter in the output device. The interpreter translates the generic PDL commands into instructions for the device's specific raster image processor.

Figure 1.

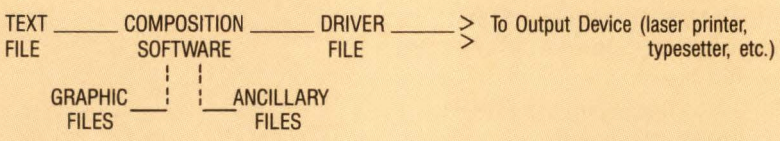


Figure 2.

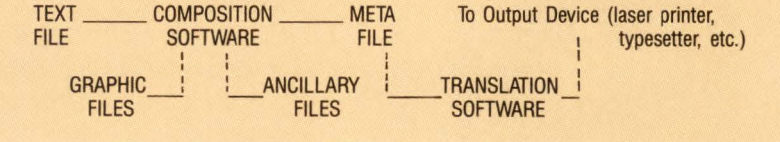
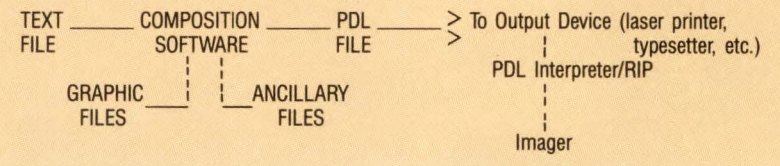


Figure 3.



The Sprouts Of PDLs

At present, there are three major page description languages: *DDL*, *Interpress*, and *PostScript*.

DDL—IMAGEN's document description language is the newcomer in the PDL arena. Originally embraced last year by Hewlett-Packard as the standard for its LaserJet line of laser printers, *DDL* suffered a setback in May when HP announced it would sell an add-on card to its LaserJets that would enable them to use *PostScript* input. HP's actions were interpreted not as a lack of faith in *DDL*, but as a realization of the market. Marketing surveys indicated the new LaserJet line was missing its projected sales marks because of user wariness of a laser printer that didn't have *PostScript* capability.

DDL is an improvement over both *Interpress* and *PostScript*. As the name implies, *DDL* has page description and document description features. *DDL*, like *Interpress*, permits specifying information about the document as a whole such as the number of pages and fonts to be loaded that significantly can enhance performance. Like *PostScript*, it

Do You Want To Know A Secret?

THE COMPANY that until recently advertised itself as "The Best Kept Secret in Photocomposition" is entering its third decade in the DEC publishing market by expanding its marketing efforts and spearheading development in the complex technical documentation field.

Founded in 1967, Datalogics Inc. made its first foray into computerized composition two years later with a system designed to operate on the IBM 360. Encouraged by its success, the firm developed the PDP-11 based "PHATS" system in 1973 that evolved into its current product, *Pager.* Originally introduced in 1977, *Pager* is currently in place in 110 PDP-11 and VAX sites throughout the world. A participant in DEC's cooperative marketing program, the Chicago-based firm's offerings represent the high-end of the DEC publishing environment; *Pager* frequently is referred to by its loyal users as the "Rolls Royce of composition systems."

Datalogics originally marketed *Pager* to legal and financial printers, where the software's ability to handle complex, multicolumn tabular material and extensive footnoting made it an essential tool. From there *Pager* found its way into insurance companies and directory publishers, who needed the complex composition features and high throughput the software provided.

According to Steve Brown, Datalogics' president, more than 100 man years of development have gone into *Pager* since its inception. Brown recently noted at a technical conference that, "*Pager* is becoming a typesetting programming language."

What distinguishes *Pager* from other composition systems is its robust mark-up language, containing nearly 300 commands; its format definition facility, which enables users to create complex command strings to handle just about any typesetting eventuality; and its string processing functions.

Pager string processing is an impressive feature. With it, the user can read in a raw data file, process the data in each record, format and output it, and even make decisions regarding page makeup without having to use a preprocessor or insert mark-up commands into the file.

Page isn't an interactive WYSIWYG system. It operates in batch mode, and is designed to process text and documents of a structured nature, such as legal and financial printing, telephone directories, parts catalogs, and technical manuals. The software's throughput is impressive; on large VAX systems, *Pager* can process upwards of 10,000 characters per second. "On straightforward, mainly text pages, *Pager* usually ends up waiting for data from the disk," according to Chuck Myers, vice president of composition development and one of *Pager's* chief designers.

Pager can generate output files for virtually all commercial phototypesetters, and *PostScript* capability has been added. Supported *PostScript* printers include DEC's LPS40 and LN03R; Apple's LaserWriter; QMS' PS-800, 1200 and 2400; the Diconix Dijit 1/P; Dataproducts, LZR2665 and the Linotronic 300.

Graphics capabilities including output device merge, graphics management and conversions were added recently to *Pager.* For example, Datalogics now can convert graphics generated by InterLeaf's composition system into *Pager*-compatible form.

Having secured the legal/financial and directory publishing areas, Datalogics now is spearheading efforts in the design and implementation of generic coding, or Standard Generalized Markup Language (SGML).

In traditional typesetting, text files must contain codes embedded within the text to provide the composition system with the information it needs to compose the job. This coding renders the files non-transportable to other composition systems.

In SGML, no coding is contained within the text. Instead, descriptive "tags" precede "classes" of text, the tags defining the action the composition system should take on the material.

Generally, composition systems using SGML depend upon a preprocessor to convert the generic tags in the original file into an intermediate file containing mark-up commands. To avoid the preprocessor step, Datalogics enhanced *Pager's* formatting capabilities, essentially building a preprocessor (*Pager's* string processing functions) into the the typesetting language itself. Therefore, *Pager* can handle SGML tags directly, because each tag is recognized by *Pager* as a format call and the format is called directly by the generic tag.

To assist in SGML implementation, Datalogics developed a PC-based editor that can read, analyze and verify a document's SGML coding, and assist the input operator by displaying valid choices for SGML tags.

Datalogics has designed integrated publishing environments for Standard Rate and Data Services, CIGNA, Moody's Investors Services, Standard & Poor's and the Bureau of National Affairs, Commerce Clearing House, Ford Motor, and the U.S. Air Force's Automated Technical Order System.

The system isn't designed for the casual user, but for businesses that must produce large volumes of complex typeset material.

—By Kevin G. Barkes

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supports mixed text and graphics and can perform considerable manipulations to the images on the page. To aid users in debugging, *DDL* can produce tokenized, binary output files that permit faster throughput, or *PostScript*-type ASCII text files.

Interpress—Xerox's *Interpress* is the grandfather of page description languages. The year it was created, 1982, two of its originators, John Warnock and Charles Geschke, left the Palo Alto Research Center to found Adobe Systems Inc., and develop *PostScript*.

Originally designed as a text-oriented PDL for high-speed, networked laser printers, *Interpress* has limited graphics and font manipulation capability, although various versions of the PDL are available for use in specific applications.

Interpress' history is similar to that of the Xerox STAR, the spiritual parent of Apple's Lisa and Macintosh computers. Xerox sat on *Interpress*, afraid that if it released it, Japanese firms would seize the language and integrate it into their low-cost laser printers, thus repeating Xerox's painful experience in the photocopy industry.

As it turned out, *Interpress* wasn't damaged by the Japanese, but rather by the LaserWriter laser printer released by Apple in January 1985. The LaserWriter came complete with a new market, desktop publishing—and a new PDL, *PostScript*.

PostScript—Just as videophiles will tell you Sony's moribund beta video format is far superior to the better marketed VHS format by JVC, persons knowledgeable in PDLs note that *DDL* and, in some respects, *Interpress*, have some technical advantages over *PostScript*. Yet Adobe System's entry into the PDL arena is the standard for laser printer PDLs. With IBM, DEC and HP now in its camp, it seems *Interpress* and *DDL* will be relegated to high-volume or complex niche applications, while *PostScript* cleans up in the consumer and low-end marketplace.

The amazing success of the LaserWriter secured for Adobe a strong foothold in the PDL marketplace, but it would be unfair to state *PostScript* achieved its current status by riding on the coattails of LaserWriter sales.

In addition to OEMing the *PostScript* raster image processor (RIP) in the LaserWriter, Adobe also entered into an agreement with Allied (formerly Allied/Mergenthaler). This pact, even more than the Apple association, instantly legitimized *PostScript* in the eyes of typographers, who consider 300 dpi output to be an affront to their aesthetic sensibilities. Adobe acquired the use of the Allied/Mergenthaler type library, and "Merg fonts" are the standard against which all others are judged.

Typographers who scoffed at the low-resolution capabilities of the LaserWriter definitely were impressed at the 2450 dpi of Allied's Linotronic L300. And the thought of taking a driver file originally intended for the LaserWriter and outputting it on resin-coated, high-quality photographic paper on the L300, without any other manipulation, won over even the most die-hard skeptics. This capability placed *PostScript* in the enviable position of successfully having covered both ends of the market.

The Advantages

The major advantage of *PostScript* is, of course, its device independence. Any laser printer with a *PostScript* interpreter and RIP can output pages generated from a front end with a *PostScript* driver. Like *Interpress*, *PostScript* resembles the

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FORTH programming language. A *PostScript* driver on a publishing system produces a program in human-readable ASCII form. In fact, it would be possible to write a *PostScript* program that would output pages on a laser printer or other device. It also is possible to edit the output from an application that produces *PostScript* page descriptions in order to take advantages of its functions that may not be built into the application.

Also contributing to *PostScript's* device independence is the manner in which fonts are generated and stored. *PostScript* fonts actually are detailed maps describing the shapes of characters. These outlines are supplied to the laser printer's RIP, which scales them up or down, obliques, enlarges, compresses, rotates or otherwise manipulates them, then fills in the outline to produce a solid character. This outline method has several advantages. A font containing a complete alphabet can be stored in less than 20K of memory, and only one description is necessary for all the possible sizes and styles of a font.

The Disadvantages

PostScript capability adds roughly $2,000 to the price of a laser printer; whether this actually can be classified as a disadvantage is essentially subjective. A *PostScript* clone market is in its embryonic stages, with other firms developing *PostScript*-compatible products; this may have an effect on pricing in the months to come.

The current selection of *PostScript* fonts, while growing, is still limited somewhat when compared to the libraries available on traditional typesetting devices.

PostScript requires a great deal of power within the laser printer's RIP; indeed, the memory and CPU of a typical *PostScript* output device exceeds that of a typical MS-DOS microcomputer.

Perhaps the greatest disadvantage of *PostScript* is its relatively low output speed. Users accustomed to their laser printers blasting out eight pages per minute of plain ASCII text are surprised when the throughput is reduced to about a page a minute with *PostScript* documents. Complex pages at high resolution literally can take hours to produce. This is because of the interpretative nature of the language and the relatively low efficiency of serial transmission of *PostScript's* ASCII page description files. Some commercial type houses that purchased Linotronic typesetters, hoping to cash in on the boom in *PostScript* publishing, have eliminated the normal per-page charge for output, and instead bill on a time basis.

Adobe is addressing this problem with constant upgrades to the language itself and improvements in its RIPs. Ironically, some companies now are selling software that permits *PostScript* publishing applications to produce device-specific output files that drive the devices at full speed. IBM recently introduced a PC-based system in which *PostScript* is resident on a board within the PC, rather than the laser printer. The arrangement allows easy updates to the *PostScript* software and much higher data transmission speeds to the specific laser printer that is configured with the system.

Whatever the merits of PDLs, one thing is certain; they are here, they have been embraced by the publishing community, and their influence will continue to grow.

Editor's note: As we were going to press, Imagen announced that it is developing a "*PostScript* clone" for use on its own laser printers as well as those it produces for OEMs. The company, which also has access to the Allied Linotype font library, plans to release the product next Spring. Imagen's clone will be offered first on its networked ImageServer laser printers. Imagen has no plans to drop DDL.

—Kevin G. Barkes is a specialist in VAX systems software, management, tuning and training in Library, Pennsylvania.

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*IDC 1986 U.S. Terminal Census.

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Interleaf's Technical Publishing Software

ELECTRONIC publishing for VAXSTATIONS.

BY PHILIP A. NAECKER

WHEN INTERLEAF'S founders started the company in 1981, they selected the electronic publishing market for their new venture largely because the market was unexploited. Xerox was about the only company talking about electronic publishing using workstations. Everyone else was talking about using workstations for CAD. Many industry watchers now think that Interleaf is the one to beat in the e-pubs market, and the company reported operating revenues of $37 million in 1987 (nearly double the previous year's).

Interleaf's *Technical Publishing Software (TPS)* is the company's flagship product. *TPS* contains functions to address most areas of electronic publishing, including text processing, page makeup, diagrams and charts, images, file management and printing. Except for some preprocessing filters, the entire software product is contained within an integrated environment that gives simultaneous access to all the features of the software from a single beautifully engineered user interface.

Models

The Interleaf user interface is based on just a few basic principles or models. The entire software product uses the same models for the interface, so once you understand how those models work you can successfully apply that understanding to completely unfamiliar parts of the program.

The Desktop

The *TPS* desktop will be familiar to those who have used other icon-based interfaces such as MS-Windows or the Macintosh. Figure 1 shows the portion of my desktop to the right of my editing window as I was working on this article. It contains a clipboard (where objects are pasted for transfer between documents), a System file cabinet, and the Articles cabinet (which is currently open). The contents of the Articles cabinet is visible in the window just

above the clipboard, and it contains "drawers," one of which is open. The open drawer, labeled "Professional Press" contains folders, documents, and books. You can see that this article is "open" in the Interleaf folder window at the top of the figure. It's not necessary to leave the various windows open like I have. Some people may find it more convenient to close them and place other objects in the space on the right.

The hierarchy represented in the desktop has a corresponding hierarchy in the VMS directories; i.e., the pathname to the *DEC PRO* article in my directory is:

```
[PAN.DESKTOP.ARTICLES_CAB.
  PROFESSIONAL _PRESS_DRW.
  INTERLEAF_STUFF_FDR]
```

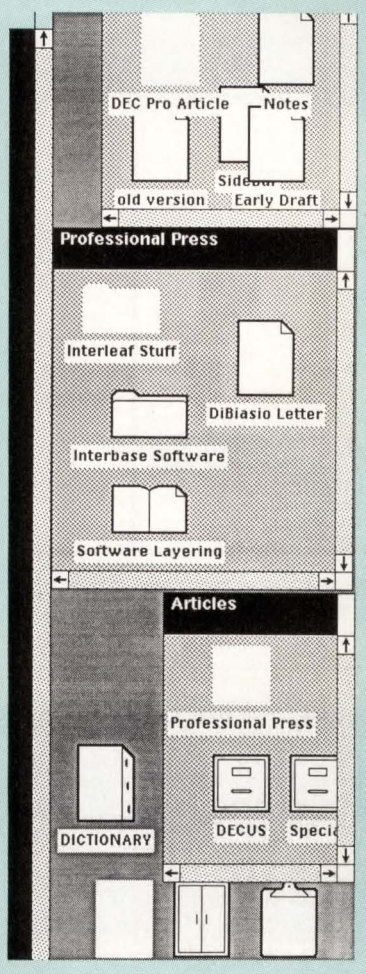
Thus, creating another desktop or other object is a simple act of creating another hierarchy in the VMS file system. Similarly, at the time you start up Interleaf, you can point at a different "desktop"; for example, you might want to have a separate desktop for each project.

The system cabinet on the desktop contains information such as default settings, release notes and other documentation, examples of text and graphic documents suitable for cut-and-paste into your own work area, and similar objects. The system cabinet is pointed to by a logical name and can be updated by a suitably privileged user, which provides a way to disseminate documentation standards across an organization.

The Mouse And Menus

The use of a mouse is by now familiar to almost everyone. Unfortunately, not every software system uses the mouse in exactly the same way. Interleaf uses all three buttons of the VAXSTATION mouse. The left button is used to select objects, the middle button pops menus and selects items within menus, and the right button toggles off selected items or closes a selected region. However, Interleaf's model for the use of the mouse is quite different from that used

Figure 1.



The desktop.

by DEC in the VAXSTATION UIS (workstation software on VMS VAXSTATIONs) software, and may be a little awkward to learn to use at first. For example, once the middle button is depressed, lifting the button causes the currently selected function to be executed. (Most other software products for the VAXSTATION use double clicks to select an item.)

TPS has three types of menus: popups, pulldowns, and stickups. A popup menu appears (pops up) at the location of the cursor. Popups don't require the cursor to be in any particular location, but the menu that is popped depends on the region of the display the cursor occupies (a document, directory window, or desktop background) when the middle button is depressed. A pulldown menu has a menu title or heading that is always visible; the menu is activated by placing the cursor on the title and depressing the middle mouse button. A stickup menu is similar to a popup, but it is used to request user input.

Both popup and pulldown menus may have submenus, indicated by an arrow to the right of a menu item. A submenu is selected when you hold down the middle button and move the cursor across an item with a submenu arrow. Submenus also nest. Defaults are cleanly implemented through submenus: Each time you select an item from a submenu, the path to that submenu is made the default for the next time you select the pulldown menu. Thus, repeating a nested submenu item is trivial — you simply depress and release the middle mouse button. Submenus are very well implemented and very well liked by most *TPS* users.

Windows

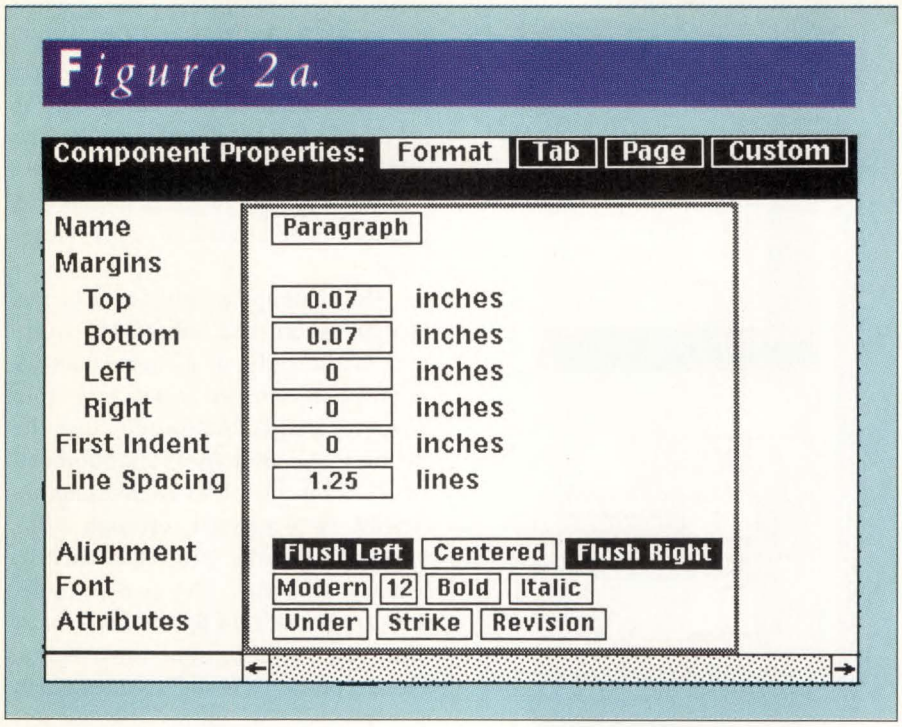
Windows contain menus, directory information (like the contents of a file cabinet) or documents. You can resize any of the windows up to the size of the VAXSTATION monitor (or to the size of the UIS window if you are running *TPS* from within a UIS window). There is a scroll bar for moving up and down through a window, although the scroll bar doesn't contain a marker for the current position of the cursor and acts more like a variable speed control for page up/down. Scrolling is very fast, and is accomplished by a complete repaint of the document window.

You can have as many windows open at once as you want, and that can include multiple document windows. Using the clipboard (a special window) you can cut objects from one document and paste them in another.

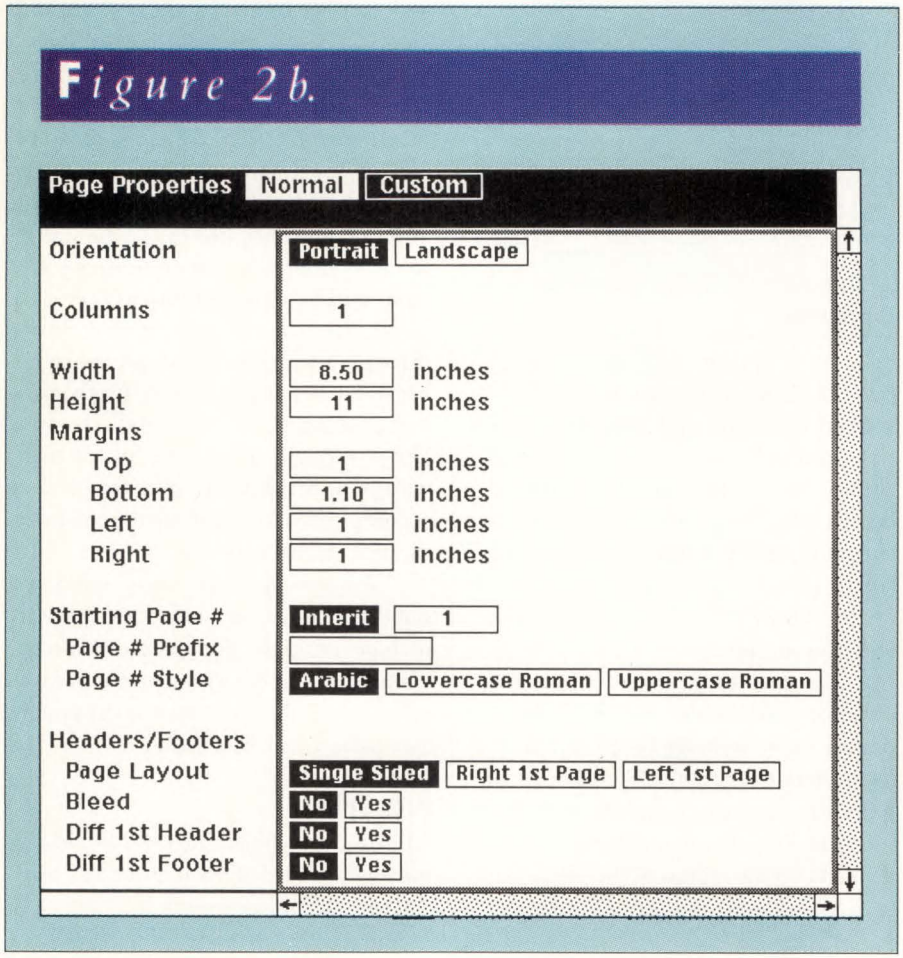
Properties

Almost every object in *TPS* has hidden metadata stored with it. Interleaf calls

A sample component properties sheet.



A page properties sheet.



these metadata properties, and to change the properties you simply select the item and use the middle mouse button to bring up the Properties Sheet (see Figures 2a and 2b). The properties sheets contain different information depending on the type of object you select. For example, a page property sheet describes the page orientation (portrait or landscape), number of columns on the page, size, margins, pagination instructions and similar information. A chart object contains properties for the data, the style of the chart, the fill patterns used, and so forth.

Once you've changed a property (e.g., increased the font size to be used in a title or changed the margins of paragraphs), you can choose to apply that change to just the one object or globally apply it to all objects with the same name. In this way, you can control or change the properties for many objects with a single operation.

Page Makeup

Of course, the purpose of all those properties is to let you create a document that looks exactly the way you want it to look. Page makeup in *TPS* seems to be nearly unbounded (see Table 1). Most of the page makeup features are automatic; for example, you don't need to do anything to paginate the document (it's always paginated as you type) and hyphenation is continuous. On the other hand, if you want to be in complete control of some makeup operations — "I want this page break here, I want that word hyphenated there" — you can. You can change the page orientation from portrait to landscape with the click of your mouse, or change the margins, or the leading (line spacing), or the fonts, or just about anything else about the way the document looks on the screen and when it's printed.

A *TPS* document is made up of components. You create components and give them names that are useful to you, such as "paragraph," "heading," and so forth. This architecture allows you to create structured documents, so you can change component properties

for all components of the same name. In this way, for example, you can change all headings into a bold font without actually having to edit any of the headings themselves. This is a very powerful construct, and Interleaf has exploited it well throughout the *TPS* product.

Much of *TPS*'s most sophisticated page makeup capability revolves around the use of frames. A frame is an object that is treated as a unit during justification and other page makeup activities. Frames typically are used to isolate tables and illustrations in the body of the document. There also are special header/footer frames for the top and bottom of pages.

Although many users have found the page makeup functionality of *TPS* to be sufficient for their needs, not all users are satisfied with its capabilities. Don DePalma is the documentation writer, and a TPS user, at InterBase Software Corporation, Tyngsborough, Massachusetts. DePalma is now using *TPS* to produce certain documents that have many diagrams and figures, but he is sticking with the TROFF markup language for most of the company's documentation. According to DePalma, "The problem with WYSIWYG in *TPS* is the WYS; that is, what you see. For instance, take font sizes. For the type of documentation we do, Interleaf doesn't give us enough choices for font sizes. *TPS* provides only even point sizes, and the difference between 10 point and 12 point fonts is dramatic."

Other limitations become apparent after you've used the system for a length of time. For example, tables, especially tables with rules (lines) between rows and columns, are not very easy to create. You can certainly create and align text using tabs, but tabs don't have adequate power for controlling wrapping in a multicolumn table. Using frames you can prevent wrapping by creating each document as what Interleaf calls a "microdocument," but this process is awkward and revision of tables created in this fashion is not as easy as in some much less capable word processing systems. Interleaf has said, however, that it intends to provide a sophisticated table-generation tool as an option in a future version of the software.

The main idea behind TPS as a page makeup system is that the page image you see on the screen is identical to what will be printed; *TPS* truly is a What-You-See-Is-What-You-Get editor — the physical image on the monitor is identical to the printed image, including the size of the characters. With a one-inch margin at the top and bottom of the printed page, the 19-inch VAXSTATION monitor is just large enough to display the text area of an 8½- by 11-inch page at full size. If, however, you run *TPS* in a UIS window (which is the only way you can do it on a GPX VAXSTATION since the GPX doesn't support the Alt Screen function), you will lose just a bit for the borders of the window and the resulting window won't be quite large enough to display a normal sized page. If you have a larger page or thinner margins, you're stuck. *TPS* doesn't have a way to display a page at a reduced size. If you shrink the window, *TPS* simply will display less of the page and the size of the characters and spacing will be unchanged. Interleaf says this is a feature.

Personally, I find the fact that I can't view the entire page on my screen to be a serious limitation. When I am concerned with the aesthetics of page makeup, I want to be able to see the entire page even if the actual size of the type is a little off. I will select a typeface

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and size when I begin to design the document. It won't change very often so I don't need to be able to have it represented exactly on my monitor at all times. On the other hand, page breaks and other page-format questions arise continually, and I find it important to be able to view the entire page image to address them. With *TPS* I don't have the option of shrinking the page image to fit my monitor; I have to change the page properties and then view the image. This can be a very tedious process.

Text Processing And Input Performance

It certainly is possible to create a *TPS* document that contains no text, but most documents are heavy on text, so text processing capability is a major component of a page makeup system. Text processing includes most of what you would think of as word processing, such as input of text, editing, and combining text from multiple documents.

As a writer's workstation, I'd say that *TPS* leaves something to be desired. There are several problems, not the least of which is the editing interface. For high-speed typists who edit their writing as they go, using the mouse for editing is simply impractical.

You would expect an excellent keyboard-based editor in a product such as *TPS*, but the one provided is no more than average. You use the main keyboard keys (control keys) for functions, but since there is no way to redefine the key bindings or create keyboard macros (something almost every word processing package and editor allows), it's a bit difficult to use the editor. *TPS* takes very little advantage of the excellent VAXSTATION VK201 keyboard. The only syntax-based operations are based on words; there is no keyboard function to move by sentence or paragraph (those operations require the use of the mouse or arrow keys). Most of the keys on the editing and application keypads are not used, and the alternate function key is the F11 or F12 key on the top row of function keys instead of the familiar and ergonomically preferable

PF1 (Gold) key.

There is also the problem of performance. It seems that *TPS* is justifying the line constantly, even when I'm typing furiously and am far from the end of the line. Delete operations seem to be especially time consuming. It isn't unusual for the display to be at least a word behind me if I am typing at a good clip, and that can be annoying to say the least. It's amusing to watch the display constantly update as you type, but as DePalma says, "that wears off in about 30 seconds. It's kind of like watching EDT's journal recovery — the first time it's cute, but after a while you just wish that it would get on with it and quit making the cursor dance." It's just plain distracting.

Another performance problem is the speed at which a document is loaded. On a VAXSTATION with an RD53, loading this article takes approximately 10 seconds. If you have to load a big chapter of a reference manual, it's coffee break time, particularly if there are many figures. For those of us who have been spoiled by the rapid file-load time of kept EVE, it's a definite drag to wait for documents to load.

However, some aspects of *TPS*'s performance are very respectable. Screen repaint seems to be limited only by the VAXSTATION's display hardware; i.e., it's very fast even on a plain VAXSTATION without the QDSS (Dragon) board and moving about in the document using the page-up/page-down keys or the mouse is quite acceptable. Most of the icon work and file accesses (opening file cabinets and the like) are also fast. Dictionary operations seem to be very fast, although the spelling checker is not terribly bright about possessives, plurals and such. (Those of us who work in the acronymic world of computers really need a spelling checker that can be told to ignore all-caps words, treat hyphenated words intelligently, and ignore special characters like slashes.) Hyphenation is, as you might expect from an e-pubs package, very fast and very good. And, the human interface, especially the automatic defaulting in

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the nested popup menus, definitely improves performance (in the user sense) by making it easy to use the mouse.

Document Management

TPS not only provides you with tools to create documents, but also with tools to manage them. Document management is done primarily from the *TPS* desktop. Using the desktop, you can group documents together, delete them, copy or rename them, and perform all operations you would expect from a sophisticated file management system. All file operations are done "safely" so that you can recover from things like accidental deletions (of parts of documents or entire documents) by retrieving the object from the clipboard.

A new feature in Version 3.0 of *TPS* is the ability to group documents together into a superdocument called a book. Books provide a convenient way to keep related documents together. Typically, each chapter or section of a book will be represented by a separate document in *TPS*. Using the Book feature, you can perform certain operations on the entire group; for example, you might want to prepare a table of contents for the entire book, and using Books and the Table of Contents generator is an easy way to do that. There also is a function that lets you create a master index from all the documents in a book. You can reorder chapters simply by moving the icon around.

Diagrams And Charts

In today's market, one of the things that distinguishes electronic publishing from word processing is the ability to display and create complex graphics integrated with the text. Perhaps the most powerful feature of *TPS* is its ability to place really good looking graphics anywhere in a document, in a true WYSIWYG fashion. The graphics can be input from a CAD system or a image scanner, or they can be drawn in place using *TPS*'s own very powerful tools.

Diagramming is the capability for doing CAD-like drawing in a *TPS* document, composing graphic objects from lines, boxes, arcs and other graphics primitives. You can combine primitives into compound objects and build a library of such objects from which you can work. You can draw freehand as well. Typical diagrams you might create include data flow diagrams, organizational charts and maps. Interleaf provides a nice library of prebuilt graphics objects in the system file cabinet, and you can use the Cut-and-Paste function to copy those objects into your own diagrams. *TPS* provides a complete set of tools for sizing, stretching, and editing graphic objects.

Charts are a special kind of diagram. They are data-driven diagrams that use data in a spreadsheet-like table to construct bar, pie and line charts and the like. You can change the chart just by changing the data in the table, and you can change chart types easily by selecting a new chart attribute from a menu (see Figures 3a, 3b, 3c).

I found the *TPS* diagramming and charting functions to be full-featured but not trivial to use. With practice, you can become very proficient in creating diagrams, but it does take some time to learn to use the tools.

Input And Output

TPS has the ability to import documents from a number of other word processing systems, as well as ASCII text (see Table 2). *TPS* uses a separate program (not available from within the *TPS* desktop) to convert the document from the word processing system's internal format to a page markup language in an ASCII file. This method seems to work well with some input formats, but not as well with others. I've had occasion to convert *MASS-11* word processing documents into *TPS*, and the process was not completely satisfactory. The method used is this:

1. Use a *MASS-11* utility to convert the document into *DDX* format. *MASS-11* is a word processing system from Microsystems Engineering Corporation, Hoffman Estates, Illinois. *DDX* is a document exchange utility from Digital.
2. Use a *TPS* filter to convert the *DDX* format document into an Interleaf page markup format ASCII file.
3. The filter creates a file in the location you specify. If the file is in a location in the VMS directory structure that corresponds to your desktop (simply a file in the appropriate directory in your VMS directory hierarchy [DESKTOP...]),

***TPS* Page Makeup Capabilities.**

Table 1.

Single or multicolumn text with full justification
Headers and footers
Single-sided or double sided page layout with variations on placement of headers and footers
Orphan, widow, and break control
Column straddle
Bleeding for headers and footers
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the file also will appear as an icon on your desktop or in one of the file cabinets, drawers or folders.

4. Open the resulting ASCII file from the desktop. The document will include some typographic information such as fonts, centering, tabs, etc. The filter attempts to locate and create a number of distinct components such as headings and paragraphs, and it assigns the components temporary names such as "para01" and "head02." You either can extract certain information from the document or move the entire document to a folder or cabinet for future use.

Unfortunately, not all the typographic information is captured by this process. It's not clear whether the information is lost by the *MASS-11* utility that converts to the *DDX* format, or by the *TPS* filter that converts *DDX* to Interleaf's page markup language. Nonetheless, the end result is that the text and a small amount of formatting information is preserved, but much of the formatting information is lost. I suspect that the process may work more satisfactorily with other word processing (WP) systems, and *TPS* provides filters for page markup languages such as *Scribe*, and *nroff* and *troff* from the UNIX world. So, if you're interested in this capability, I suggest you try it for the WP system of interest. The process certainly will work to input raw text into the *TPS* format.

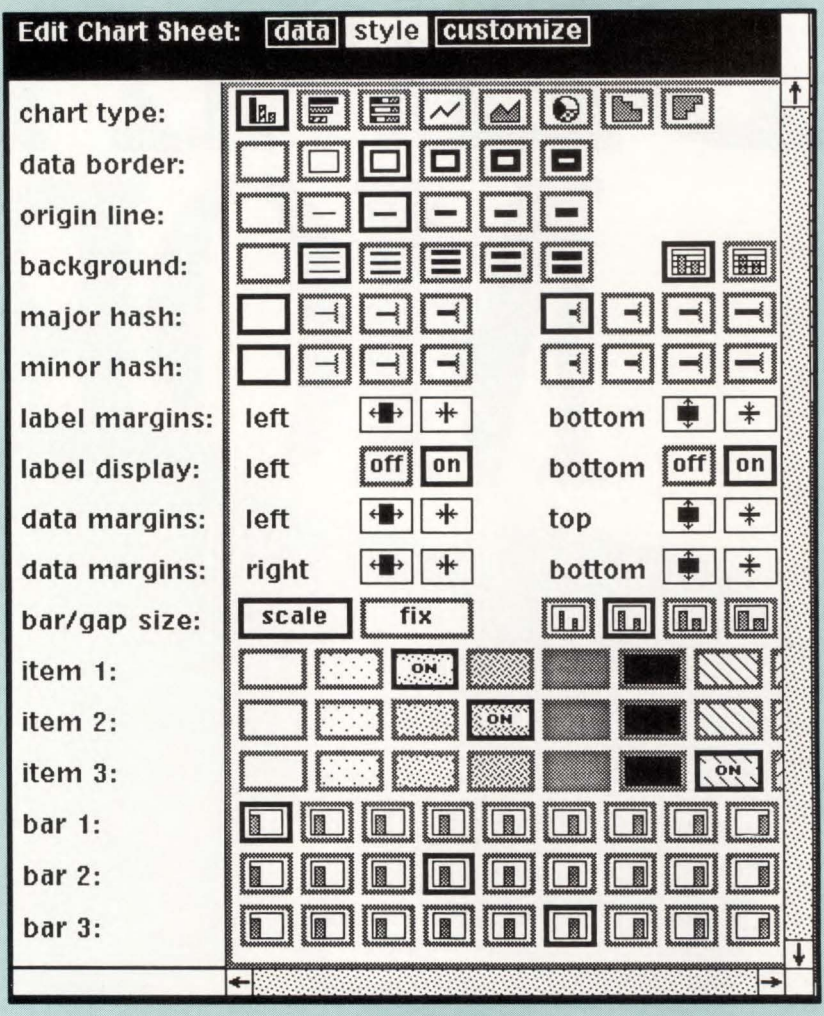
Inputting Graphics

Drawings from CAD systems and scanned images can be imported into *TPS* and included in a document in a WYSIWYG fashion. The process essentially is the same as that for importing word processing documents. *TPS* includes filters that support most of the popular formats for plot files (see Table 3). For Macintosh users, there are filters for input of *MacPaint* and *MacDraw* documents. To port a CAD drawing to *TPS*, you must create a plot file using your CAD software. The plot file then may be filtered to create a drawing document on your desktop. You may then place the drawing in any document, anywhere you choose. You can scale, rotate, or annotate the drawing but, of course, you cannot edit the CAD information directly (because the plot file doesn't contain adequate information about the attributes of the objects that make up the drawing). However, the ability to annotate the drawing with arrows, text, boxes and the like is usually adequate for technical documentation purposes.

Images can be input to *TPS* in several ways. You can scan an image up to 8 x 11 using an ImagiTex 1100 or 1085 scanner, and you can interact with the scanner from your desktop. Alternately, you can capture a screen image, either using UIS's features for capturing a screen bitmap or from within the *TPS* desktop. Both allow you to grab a portion of the screen bitmap and put it in a file. Once you have an image (either from the screen or a scanner) you can edit that image using *TPS*'s very powerful image manipulation functions. You can scale, rotate, crop, or even change the contrast of the image all from within the *TPS* environment.

TPS currently supports three printers that don't use page description

Figure 3a.



A style property sheet allows you to set options for *TPS* charts.

Figure 3b.

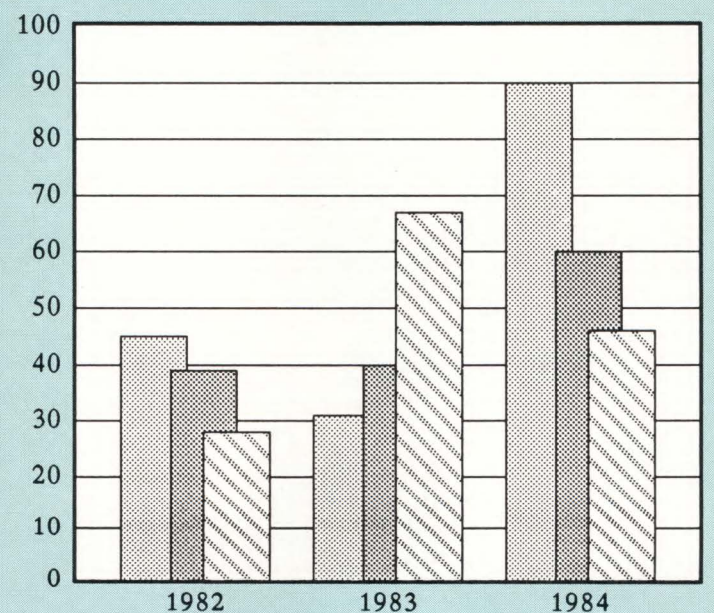
Edit Chart Sheet: data style customize

Do you want to erase all data? yes
Do you want to erase all unused data? yes
Do you want to scale axis yourself? yes no

	text	1	2	3	4
1	1982	45	39	28	
2	1983	31	40	67	
3	1984	90	60	46	
4					
5					
6					
7					
8					
9					
10					

The data to create a chart.

Figure 3c.



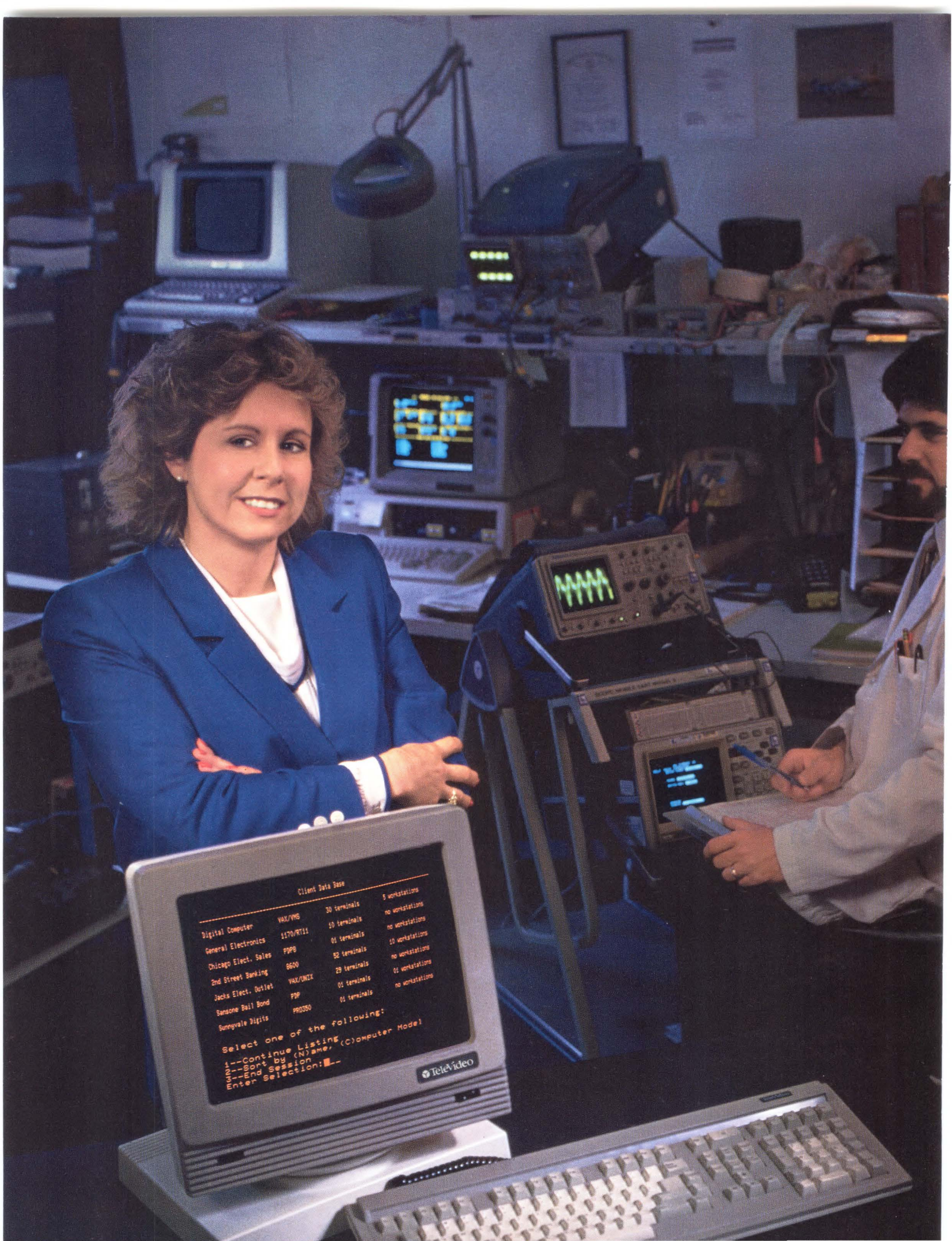
The chart is automatically drawn from its data.

languages (see Table 4), but with the advent of PDLs it seems unlikely that printer-specific support will be a major issue in the future. *TPS* soon will support *Postscript* (I'm told that will probably have happened by the time you read this), so in theory you will be able to print directly to an Apple Laserwriter, DEC LN03R Scriptprinter, or DEC LPS40 PrintServer. You will also be able to make a *Postscript* file to ship around, edit, or combine with other *Postscript* files.

TPS On The VAXSTATION

TPS version 3.0 was released in August for VAXSTATIONs, although earlier versions of the product have been available for a number of years. I wrote this article using *TPS* version 3.0.10, however, the documentation I used was from V2.5. Version 3.0 has been out for Sun workstations since April, and Apollo workstations followed shortly thereafter. (Interleaf has said that it intends to shorten the lag between the Sun release and the VAXSTATION release in future versions.)

TPS runs on all the flavors of VAXSTATIONs under the VMS operating system. On the QVSS VAXSTATIONs (the VS-II and VS-II/RC) there is the option of either running in a UIS window or on a separate "page" of the display using the Alt Window key. This option doesn't markedly change the performance of *TPS*, but it allows applications in other UIS windows to run without being slowed by the presence of the large *TPS* window. (On a QVSS VAXSTATION, scrolling is handled by the MICROVAX CPU in a way that makes it much harder to scroll if there are other windows on the same scan line [horizontal line] of the display. By running in the Alt Window, this problem is avoided, at the cost of an "either/or" display: Either *TPS* or the standard UIS windows is displayed, but not both. I actually find it to be a considerable convenience because it lets me toggle easily between *TPS* and the rest of my applications.) Actual *TPS* use of the MICROVAX CPU is pretty minimal. Normal editing-type stuff with occasional reformatting and dictionary work causes *TPS* to use only about 25 percent of the CPU (as measured using MONITOR with 60 second averaging). Of course, heavy-duty operations such


Client Data Base
Digital Computer VAX/VMS 30 terminals 5 workstations
General Electronics 1170/RT11 10 terminals no workstations
Chicago Elect. Sales PDP8 01 terminals no workstations
2nd Street Banking 8600 52 terminals 10 workstations
Jacks Elect. Outlet VAX/UNIX 29 terminals no workstations
Bansone Bail Bond PDP 01 terminals 01 workstations
Sunnyvale Digits PRO350 01 terminals no workstations
Select one of the following:
1--Continue Listing
2--Sort by (N)ame, (C)omputer Model
3--End Session
Enter Selection:
TeleVideo

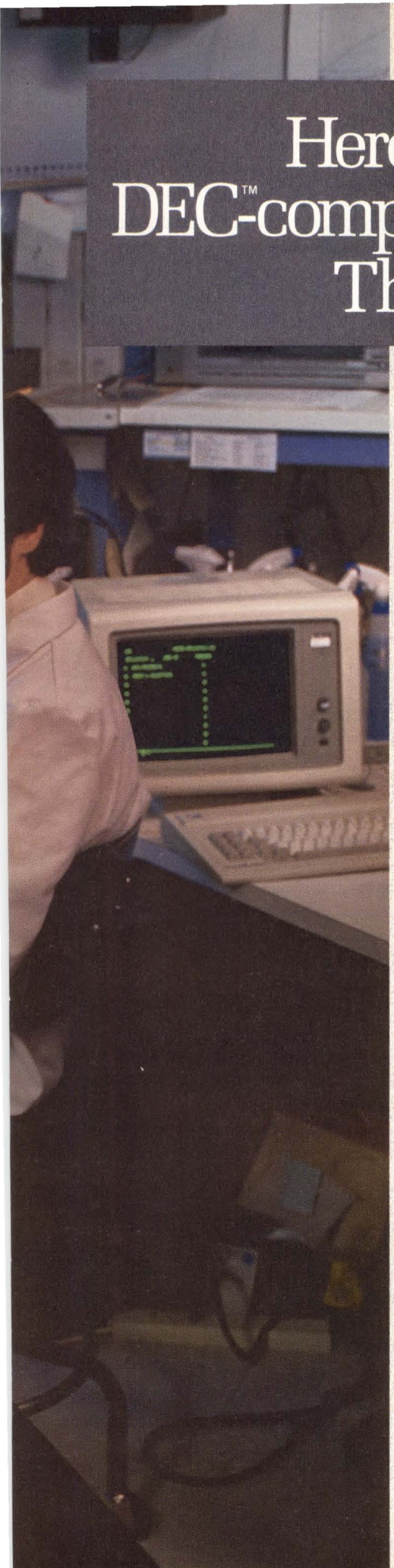


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Table 2.

ASCII	Doesn't require a filter - read directly
DX	Digital's Document Exchange Utility
DCA	IBM's Document Content Architecture
NROFF	Unix Page Markup Language
SCRIBE	Page Markup Language
TROFF	Unix Page Markup Language
Wang	Wang Word Processors
Wordstar	Word Processing Software for PC's
WPS Plus	DIgital's WPS-Plus Word Proc. System
Xerox 860	Xerox 860 Word Processors

Available Text Input Filters.

Table 3.

Calcomp Plotter Format	Int'l Graphics Interchange Std.
Calcomp Plotter Format	Macintosh MacDraw Format
Hewlett-Packard Graphics Language	Macintosh MacPaint Format

Available Graphics Input Filters.

Table 4.

Imagen 3/800	DEC LPS40 (soon)
Interleaf 3/800	Monotype Lasercomp
Dataproducts CX	Compugraphic 8600G
Apple Laserwriter (soon)	Autologic APS-Micro 5G
DEC LN03R (soon)	Linotype Linotronic 300

Printers and Typesetters Supported by *TPS*.

as massive document restructuring always will be CPU-intensive, but the truth is that they aren't done very often.

TPS takes reasonably good advantage of the VAXSTATION monitor and VMS. It produces great looking text and graphics on my monochrome VR260 monitor, and performance is reasonable (with the exceptions noted above). It runs as an unprivileged process, uses the VMS directory hierarchies and VMS long file names to good advantage, and installs cleanly using VMSINSTAL. *TPS* creates an extra batch queue for its own use, and printing and similar activities happen in background batch mode. I have only two complaints about *TPS* under VMS: The Interleaf folks decided to use dollar signs in their filenames and logical names, even though the dollar sign is reserved for Digital's use, and *TPS* uses the DIR file extension for things that aren't VMS directories.

Documentation

The *TPS* documentation has three parts: a reference manual, a training guide and an installation guide. The documentation is all VAXSTATION-specific and addresses the use of *TPS* from a VAXSTATION point of view, right down to discussing the use of UIS, the VMS file system and its various idiosyncrasies. For example, in addition to telling you how to use the software, it addresses associated topics, such as maintaining the user authorization file (for turnkey systems), style guides for creating attractive printed documents, using the VAXSTATION and *TPS* in a networked environment when some printers may be on other nodes, and even turning on the laser printer or image scanner.

Products

The *Technical Publishing Software* currently sells for $15,000. Options available include software for editing continuous tone or line art scanned images, software for working with the scanners, an equation editor and a tracing tool.

Although *TPS* is Interleaf's lead product, there actually are several products that make up the Interleaf family

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Publishing Terms

Ascenders — The part of the letter that rises above the main body of type — the top of the letter "h," for example.
Baseline — A line serving as a base for measurement or comparison.
Bleed — Running the image to the edge of the page.
Camera ready — Copy ready to be photographed for printing.
Column inch — An area one column wide by one inch high.
Composition — Arranging the way a page will appear by combining typeset elements, margins and column settings into a specific layout.
Descenders — The part of the letter that drops below the baseline— as in "y" and "g".
Dummy — A sample layout presenting the position of images and text as they will appear in the final output.
Em space — A fixed space, usually the width of an uppercase "M" of the font and typeface being used.
En space — A fixed space, equal to one-half the number of units of the Em space.
Font — In printing, the entire set of a typeface, including all sizes, styles and weights. In desktop publishing, each size, style and weight is an individual font.
Galley proof — A printer's proof taken from composed type before the page is complete, upon which errors can be marked for correction.
Gutter — The white space between printed areas on facing pages or columns on a single page.
Justification — Aligning text to produce even margins on a page.
Kerning — Reducing the amount of space between characters. The portion of typeface that projects beyond the body of a character, thus lessening the space between characters.
Layout — The spread or arrangement of images and text on a page.
Leading — The space between lines of text.
Line spacing, or leading — Amount of space, usually measured in point size, between two succeeding lines of text from baseline to baseline.
Offset — Indirect image transfer, such as printing from photographic plates.
Pasteup — A layout made of typed proofs and/or art exactly positioned and prepared for an offset photo.
Pica — A unit of measurement equal to one-sixth of an inch.
Point — A unit of measurement equal to one-seventy secondth of an inch. With 72 points to an inch, there are 12 points to a pica.
Quadding — Placement of a line of text. Quad left places text flush against the left margin, quad right places text flush against the right margin, and quad center places text an equal distance from either margin.
Reverse — White printing on a black background.
Roman — The upright version of a typeface.
Runaround — Setting type in a specific shape through the use of indents. Creates copy that's contoured.
Serif — A small line added to the main stroke of a letter. Serifs are believed to make type easier to read.
Thin space — A fixed unit of space that is one-fourth the width of an Em space and one-half the width of an En space.
Type style — One version within a typeface —Italic, Roman, Bold, Light and so forth.
WYSIWYG — or "what you see is what you get:" An attribute of page-composition systems that display full pages on screen so the user can check the layout.
X-height — An alphabet's X-height is the height of the lower case x, that has neither ascenders nor descenders.

(some only recently announced). The company has recently shown products for electronic publishing on PCs and VAXMATEs, including an advanced WYSIWYG editing station, a "viewstation" on ATs, and a text editor that will run on PCs, VAXMATEs, and VT220s and generate text that includes *TPS* typographic instructions. Interleaf has plans to introduce technical publishing software for IBM mainframes under MVS and for VAXs (other than workstations). The company also is working on its future product, *Multi-Lingual Electronic Publishing System (MLPS)* which will bring the text and graphics capabilities to European and multinational organizations.

Currently, the company offers two products in addition to *TPS*. *IWPS (Interleaf's Workstation Publishing Software,* not to be confused with DEC's *WPS,* a word processing system) is a non-dedicated, low-end workstation-based version of *TPS*. *IWPS* lacks only a few of the most powerful features of *TPS*, such as multicolumn support and book capability. But documents created in *IWPS* are completely compatible with *TPS* and can be edited directly in either system (provided that the advanced features of *TPS* are not used). Interleaf has indicated that it will continue to sell and support *IWPS*, but probably not enhance it any more. *IWPS* sells for $3,000 on all platforms.

There is also a turnkey *TPS* system. Based on the VAXSTATION-II, the hardware platform includes 5 MB of memory, an RD53 (71 MB) disk, and an Interleaf LPR-308 laser printer. The entire system, including software, sells for $29,900. The monochrome GPX system (without a printer) is $40,500. In addition, all of the products available on VAXSTATIONs are available on Sun and Apollo workstations and the IBM RT, and the document format is identical on all platforms.

Interleaf's *TPS* is a formidable pioneer in the electronic publishing market. If you're evaluating the need for an e-pubs system, you owe it to yourself to attend a demonstration and see how *TPS* really performs. ■

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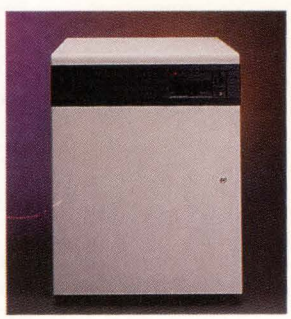

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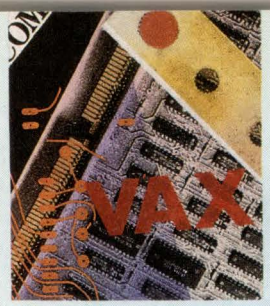

VAX

OLDER IS BETTER

Mid-Life Kickers For Your VAX 750, Part 2 — The Nemonix 750 Accelerator.

By Dave Mallery

This is the second in a series on mid-life kickers for the VAX 11/750 (see DEC PROFESSIONAL, *March 1987, Vol. 6, No. 3., for Part 1).*

Now that we can have up to 15 MB of memory in our old friend, we have to be able to use it to its fullest. Basically, more memory means that more users realistically can fit into reasonable working sets before the box starts swapping and ruins everything. More users use more CPU, so the dog chases the tail. But not quite.

We who have lived with Digital's wonderful machines for so many years, know that there's always a margin of padding built into everything it makes. After all, the machines all have to work. Parts have to be interchangeable worldwide, and one way to ensure that is to keep the actual performance of a box well within safe margins.

All of the above is true of the 750. In addition, there's another factor that must have influenced the design and tuning. The 750 was introduced a few years after the 780. The intervening time was significant. The 780 (which essentially was built out of late PDP 11/70 technology) really had to work to generate one mip. In those days, one mip was *a lot*. The 750, following several years later, could exceed the performance of the flagship easily unless steps were taken to prevent it. The machine was targeted at .75 mips, and you can bet your bippy that's what it delivered.

Any student of DEC processors knows that there are many places in the design of the 750 where steps were taken to slow the beast down. CPU accelerators have been around for some time. There used to be a way of changing the clock speed of an 11/70. With a properly tuned board (that's the problem), you could attain a solid 20 percent improvement. More recently, people have been changing the crystals on their KDJ11-AA boards. Most boards will tolerate 18 MHz, and a few chosen ones, 20 MHz. Again, the problem is that you've customized a DEC board. Heaven help you when it breaks. Similar things have been done with most machines (including the 11/23-PLUS).

Design element number one of a successful accelerator is that it must not modify a DEC board! If it absolutely must, then the vendor must supply the modified board so that the customer can keep the old unmodified one around for a DEC Field Service inspection.

The Nemonix 750 Accelerator consists of a board that connects to the backplane pins of the 750 (and it interrupts merely a single wire on the backplane). I keep a little "blue meanie" stuck to an adjacent pin to restore the jumper if I should have to remove the accelerator.

The single wire you interrupt on the backplane is the system clock. This is the master source of all timing pulses in the machine. The clock pulses provide the basic heartbeat, and everything marches to this beat. Now, as DEC sets up things, this master clock pulse provides a time frame within which each microword is fetched from the control store, set up in the arithmetic logical unit (ALU) and

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TABLE

Instruction	Class			Type	Before	After	DIFF
MOVx	MCOMx	MNEGx	MOVZxx	(reg-reg)	2.00	1.71	15%
MOVx	MCOMx	MNEGx	MOVZxx	(reg-mem)	7.33	6.44	13%
MOVx	MCOMx	MNEGx	MOVZxx	(mem-mem)	11.05	9.62	13%
CVTxx				(reg-reg)	1.36	1.16	15%
CVTxx				(reg-mem)	3.31	2.91	12%
CVTxx				(mem-mem)	4.98	4.33	13%
ADDx2	ADDx3	SUBx2	SUBx2	(reg-reg)	1.71	1.47	14%
ADDx2	ADDx3	SUBx2	SUBx2	(reg-mem)	7.01	6.10	13%
ADDx2	ADDx3	SUBx2	SUBx2	(mem-mem)	12.11	10.48	14%
MULx2	MULx3	DIVx2	DIVx3	(reg-reg)	6.97	5.97	15%
MULx2	MULx3	DIVx2	DIVx3	(reg-mem)	12.16	10.51	14%
MULx2	MULx3	DIVx2	DIVx3	(mem-mem)	16.98	14.66	14%
BICx2	BICx3	BISx2	BISx3	(reg-reg)	1.71	1.47	14%
BICx2	BICx3	BISx2	BISx3	(reg-mem)	8.85	7.71	13%
BICx2	BICx3	BISx2	BISx3	(mem-mem)	12.05	10.45	14%
ASHL	ASHQ	ROTL		(reg-reg)	2.27	1.94	15%
ASHL	ASHQ	ROTL		(reg-mem)	5.57	4.87	13%
ASHL	ASHQ	ROTL		(mem-mem)	8.52	7.40	14%

Benchmark results for integer instructions, before and after acceleration.

executed. Every microword gets the same time slot. The heartbeat is steady, and rather slow.

The inspiration for this product is that during every instruction, your good old 750 spends dozens of nanoseconds doing nothing. All you have to know is how much time each microword really needs; then, when you know it has to be finished, fire off the next clock pulse early. Now the heartbeat is arrhythmic, but much faster.

Other clocks are derived from this master clock, and for those of you (like me) with hot stuff in your CMI slots, lots of CMI controller timing also is derived from the clock. These are just some of the hills and valleys encountered by the designers as they labored to achieve performance levels worth the expense.

There are just a few states that a machine can be in, and it only can be in one state at a time. If the machine is occupied totally inside the CPU executing instructions that access registers and not referring to memory on the bus, then maximum acceleration is possible. Should the machine be accessing memory, or a CMI or UNIBUS controller, then less is possible. The Nemonix board simply senses the state and acts accordingly.

Almost anyone can achieve a 10 percent throughput enhancement, but that's not enough to make a commercial product. The commercial price/performance leading edge is at approximately 20 percent. That will promote your 750 to just about one mip. In order to sell, the product must produce a tactile difference, and the buyer must feel the difference. A figure of 10 percent doesn't deliver.

Installation

The board fits onto the pins of backplane slot two. There's a connector that goes onto slot three. Needless to say, installation is available. I would recommend installation unless you're an old hand with a wire wrap tool and aren't paranoid about backplanes. Backplanes are not designed to sustain constant fiddling. Pins can be pushed through from the rear with disastrous results when they hit the CPU board inserted in the other side. We cremated a chip on a CPU board by pushing a pin through that just happened to have 12 volts on it! But the *DEC PRO* Lab is never daunted by a little smoke.

We used a benchmark standalone that measures the improvement of different classes of instructions. The measured improvement on our unit ranges from 12 percent to 15 percent for integer instructions. This is based on a before and after run of 100,000 iterations of specific instructions. That's seldom the case when running VMS!

The Table shows the specific benchmark results for integer instructions, before and after. The average improvement is 13.7 percent. If a 750 rates a .75 mip rating, then an accelerated 750 rates a .85 mip.

Caveats

A CPU accelerator could show no improvement at all on a machine that's

The Nemonix 750 Accelerator
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totally I/O bound. Many factors eat away at performance: totally fragmented disks, excessive interrupts from terminals, excessive CPU time consumed by terminal handlers and protocols, slow peripherals, working sets that are unreasonable, etc.

When I gave a talk at DEXPO East 86 in New York, I polled the audience members who had 750s. Not one had anything on his CMI bus. Really significant performance gains can be achieved from superdisks and controllers for the CMI. I'll review all of these in a subsequent article.

I'm also working on different options for terminal handling. We've been running the Xyplex system for several months. That company rewrote the terminal driver because all of the echoing (and therefore the majority of the interrupts) is handled in its cluster controllers, rather than by your CPU. All the CPU time saved is available now for other users.

Editor's note: As we go to press, we've discovered that there's a problem if the UNIBUS contains old devices such as DHV emulators. Nemonix is working on several "fixes." This problem affects only a small segment of the population, but does affect our lab.

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ENTER 103 ON READER CARD

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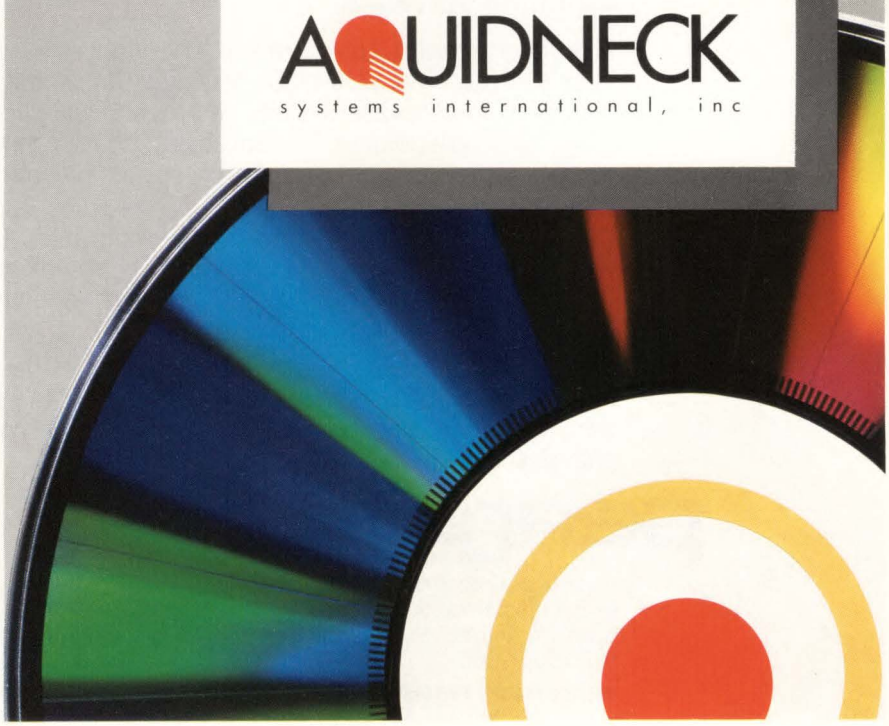

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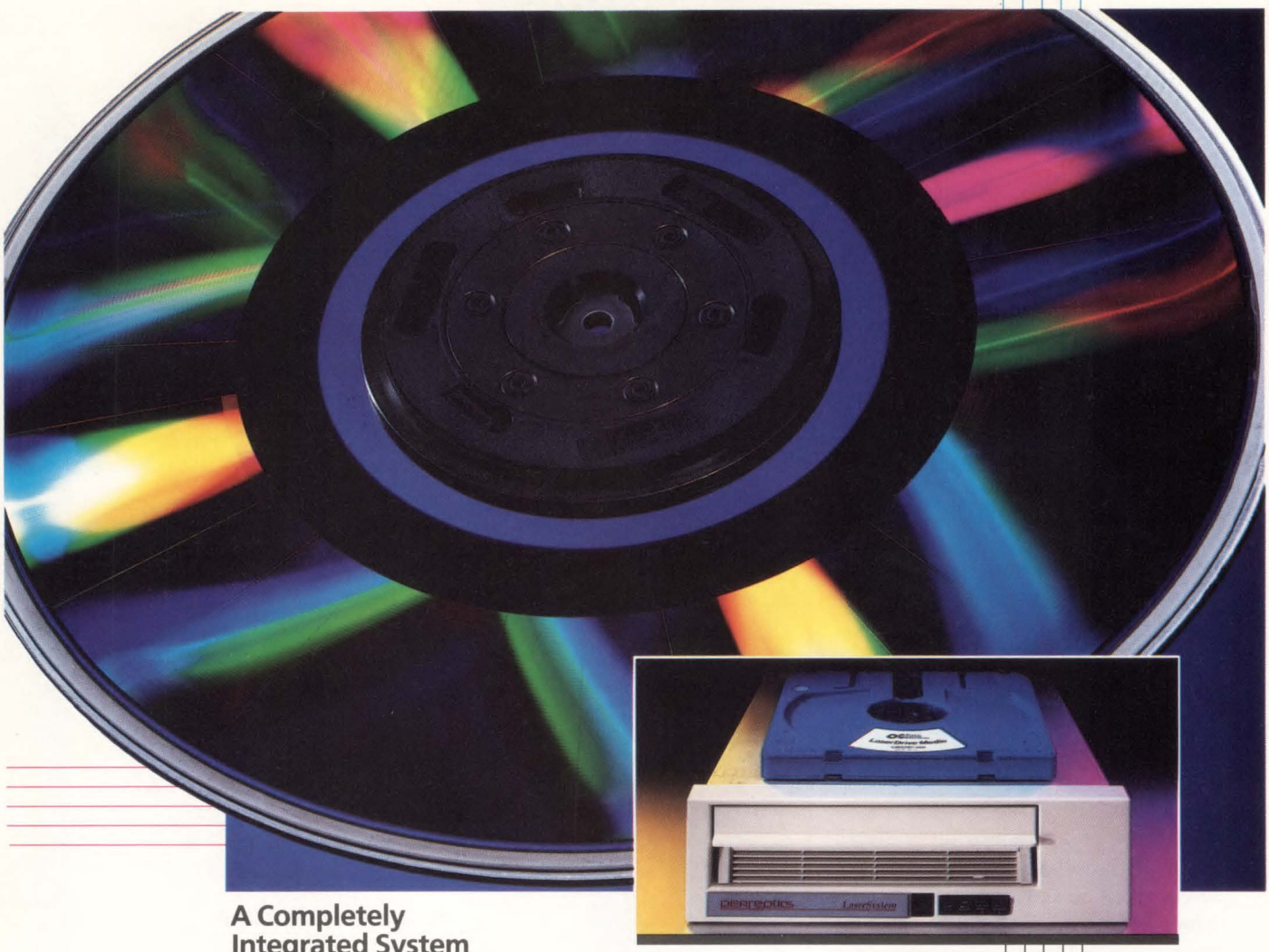

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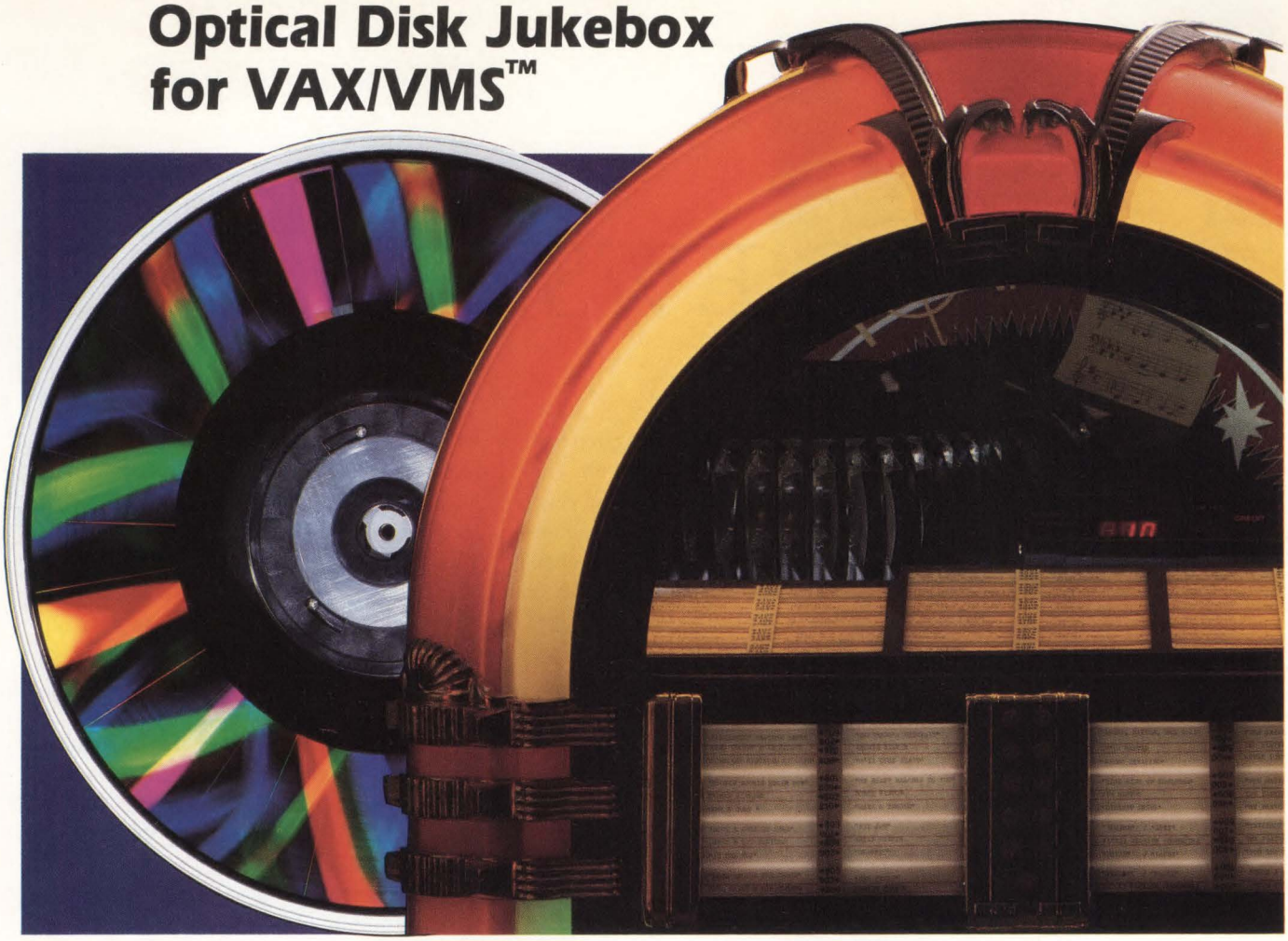

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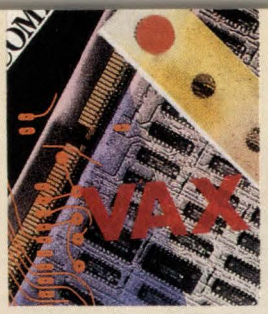


VAX

NEWS

A VAX-Based Newspaper For Your Installation.

By Antonio R. Collins

Companies often have events that all employees should be aware of, like system shutdowns, backup times, supply shortages, equipment failures and training classes. As an alternative to sending memos, mail messages or having a lengthy notice at login time, NEWS became our method of informing users of system related events. There are always users who never read their memos, or forget about their mail messages, or clear the screen before they read the notices. With NEWS, even these users can be up to date.

NEWS simplifies the distribution of information to the user base by collating the information in one central location and allowing users to browse through these files at their leisure. NEWS creates a tree-like hierarchical structure allowing information to be grouped under topics and accessed through a simple menu interface.

Although NEWS was designed as a tool for the system manager, it's also an effective companion for the corporate newsletter and bulletin board, allowing an editor to issue updates between publications and give employees an easily accessible in-house bulletin board for their announcements.

File Structure

All NEWS files must reside in one directory referred to as the NEWS directory (specified as parameter P1 to NEWS.COM; see Program 1). A NEWS file is any text file in the NEWS directory whose name begins with the NEWS prefix (specified as parameter P2 to NEWS.COM). The default prefix is "NEWS$," so NEWS$.TXT, NEWS$0.TXT and NEWS$ABCD.TXT are all valid NEWS files. The filename should not include any special characters after the NEWS prefix.

The tree structure of NEWS is generated by the NEWS filenames. NEWS$.TXT is the top level (Level 0) text file and NEWS$A.TXT, NEWS$B.TXT and NEWS$1.TXT are all Level 1 text files subordinate to NEWS$.TXT (see Figure 1). NEWS$A1.TXT and NEWS$BA.TXT are Level 2 text files subordinate to NEWS$A.TXT and NEWS$B.TXT respectively. Because VMS supports filenames up to 39 characters long, the maximum number of levels in one NEWS tree is 39 — the length of the NEWS prefix.

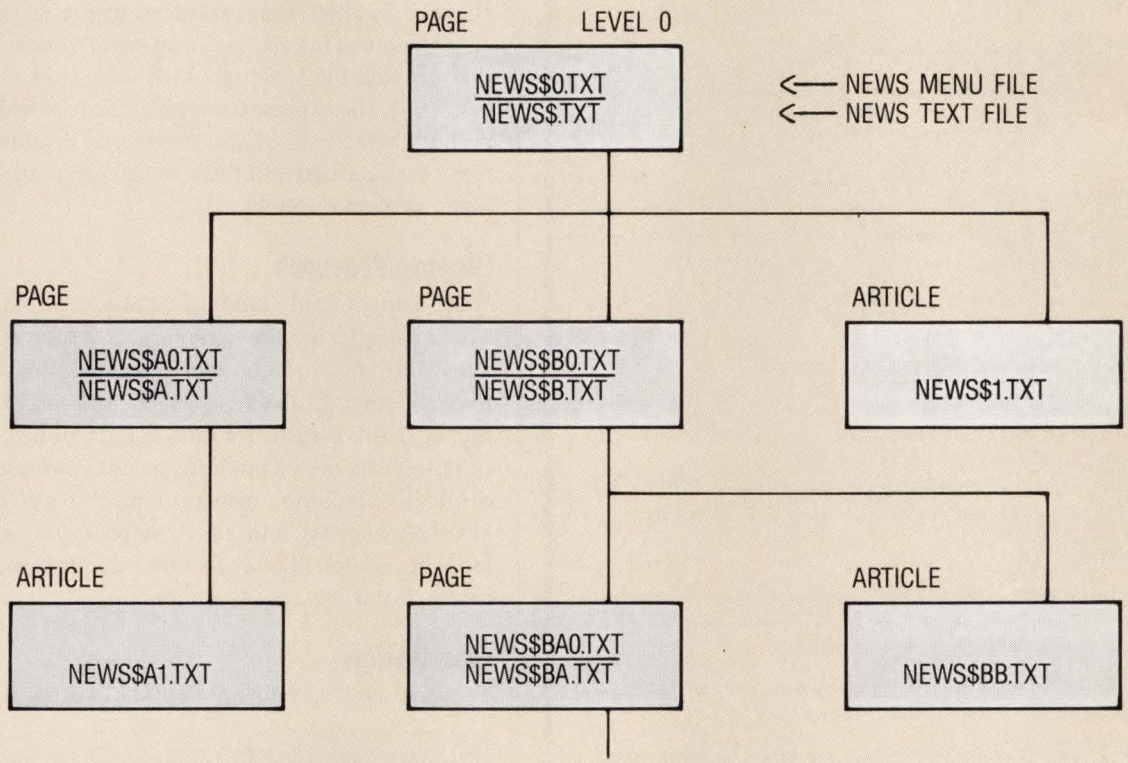
All NEWS files are either articles that have no subordinate files, or pages that have one or more subordinate files. To determine if a NEWS file is a page, NEWS checks for the existence of a subordinate file named "0", which is the menu for that page. For example, NEWS$0.TXT is the menu file for NEWS$.TXT, and NEWS$BA0.TXT is the menu file for NEWS$BA. If no menu file exists, the file is considered an article and any other subordinate files are ignored. Because NEWS supports only alphanumeric page and article names, the maximum number of subordinate files under one file is 36 (A-Z, 0-9).

Menu Interface

The menu interface also is based on the NEWS filenames. When calling NEWS, you have the option to supply an initial topic (specified as parameter P3 to NEWS.COM). If no topic is given, a default topic is obtained from the logical name NEWS$TOPIC. Upon entering NEWS, the user topic or default topic is validated and the appropriate menu and article files are displayed. Menu selections are validated by checking for the existence of a subordinate file with that name.

For example, "A" is a valid initial selection if NEWS$A.TXT exists. If the selection is

FIGURE 1.



The tree structure of NEWS.

PROGRAM 1.

```
$ !
$ ! NEWS.COM - Command procedure for news facility
$ !
$ !    param       description                    default
$ !      P1      Home Directory of NEWS files    SYS$MANAGER:
$ !      P2      Prefix for all NEWS files       NEWS$
$ !      P3      User supplied topic
$ !
$ ! logical names       description
$ !   NEWS$TOPIC      System wide default topic
$ !   NEWS$HELP       File to display for user help
$ !
$ ! Note:  See VID.COM for definitons of capitalized symbols
$ !
$ !            Refer inquiries to:
$ !            Antonio Collins, Hardware Manager
$ !            T S Infosystems, Inc.
$ !            4200 Forbes Blvd #100
$ !            Lanham, MD  20706-4342
$ !
$ ON CONTROL_Y THEN GOTO finis
$ ! Default directory if none given (colon must be appended if logical name)
$ !
$ IF p1 .EQS. "" THEN p1 = "SYS$MANAGER:"
$ directory = p1
$ ! Default prefix if none given
$ !
$ IF p2 .EQS. "" THEN p2 = "NEWS$"
$ ! Determine news file prefix (main page)
$ !
$ main_page = p2
$ ! Default topic if none given
$ !
$ IF p3 .EQS. "" THEN p3 = F$TRNLNM("NEWS$TOPIC")
$ response = p3
$ topic = response
$ page = main_page
$ SET NOON
$ ! If no menu for main page, no news exists
$ !
$ IF F$SEARCH(directory+ main_page+ "0.TXT") .EQS. "" -
  THEN GOTO no_news
$ ! Validate initial topic, default to main topic if bad
$ !
$ IF F$SEARCH(directory+ main_page+ topic+ ".TXT") .EQS. "" THEN topic = ""
$ ! To preserve screen integrity
$ !
$ SET TERM/NOWRAP
$ ! Define NEWS prompt on line 24
$ !
$ news_prompt = VIDOFF + BOLON + ESCAPE+ "[24;40H" + ERLNB + ESCAPE+ -
  "[24H"NEWS Topic [? for help]:  "+ VIDOFF
$ ! Clear screen, activate bold and reverse video, smooth scrolling
$ !
$ WRITE SYS$OUTPUT VIDOFF, BOLON, REVON, ERSCC, SSCR
$ ! Set scrolling region, display banner with process name and time
$ !
$ WRITE SYS$OUTPUT ESCAPE, "[2;23r", F$FAO("TSI NEWS: !24AS!17AS!29AS", -
  F$GETJPI("", "PRCNAM"), F$TIME(), "")
$ ! Display exiting instruction, clear video rendition
$ !
$ WRITE SYS$OUTPUT -
  VIDOFF, ESCAPE, "[24;41H", BOLON, "Press <Ctrl-Z> to exit NEWS", VIDOFF
$ ! Find text of article
$ !
$ file = F$SEARCH(directory+ main_page+ topic+ ".TXT")
$ ! If main page, main topic, no need to check for menu
$ !
$ IF topic .EQS. "" THEN GOTO type_news
$ ! Drop last letter of topic to find page
$ !
$ page = main_page+ F$EXTRACT(0, F$LENGTH(topic)-1, topic)
$ ! If topic has a menu file, then set current page to be topic
$ !
$ IF F$SEARCH(directory+ main_page+ topic+ "0.TXT") .NES. "" -
  THEN page = main_page+ topic
$ type_news:
$ ! Type menu file
$ !
$ TYPE 'directory''page'0.TXT
$ ! Type topic file
$ !
$ IF file .NES. "" THEN TYPE 'file'
$ get_topic:
$ ! Display current time
$ !
$ WRITE SYS$OUTPUT -
  VIDOFF, BOLON, REVON, ESCAPE, "[1;47H", F$EXTRACT(12,5,F$TIME()), VIDOFF
$ ! Get topic while updating time
$ !
$ READ/PROMPT="''news_prompt'"/END=finis/TIME=80/ERR=get_topic -
  SYS$COMMAND response
$ ! Erase old message
$ !
$ WRITE SYS$OUTPUT ESCAPE, "[24;41H", ERLNA
$ file = ""
$ ! Get first character of response
$ !
$ topic = F$EXTRACT(0, 1, F$EDIT(response,"COMPRESS"))
$ IF topic .EQS. "*" THEN GOTO bad_file          ! Ignore wildcards
$ IF topic .EQS. "?" THEN GOTO do_help           ! Check for help
$ check_main:
$ IF topic .NES. "$" THEN GOTO check_parent      ! Handle $ to goto main page
$ page = main_page
$ file = directory+ page+ ".TXT"
$ GOTO type_news
$ check_parent:
$ IF topic .NES. "-" THEN GOTO check_topic       ! Handle - to go back one page
$ IF page .EQS. main_page THEN GOTO top_warn     ! Check if on main page
$ page = F$EXTRACT(0, F$LENGTH(page)-1, page)
$ file = directory+ page+ ".TXT"
$ GOTO type_news
$ check_topic:
$ file = directory+ page+ topic+ ".TXT"          ! Append topic to current page
$ ON ERROR THEN GOTO bad_file
$ IF F$SEARCH(file) .EQS. "" THEN GOTO bad_file ! Check for valid topic
$ ! If topic has menu file, set current page to be topic
$ !
$ IF F$SEARCH(directory+ page+ topic+ "0.TXT") .NES. "" -
  THEN page = page+ topic
```

valid, NEWS checks if the file is an article or a page. If an article is selected, the current menu file is displayed followed by the article. If a page is selected, that page's menu file is displayed followed by the page. That page then becomes the current page. The given version of NEWS limits selections to one character; however, this is a matter of preference and can be changed to allow faster traversal of the menus.

The menu interface also supports three special characters that provide the functions Help (?), backward traversal of pages (-), and express traversal to the top menu ($). The underline character (__) also is reserved to allow for continuation of long articles, but this feature isn't implemented in the given version of NEWS.

Display Features

NEWS contains only minimal display control features. A banner line displaying the user, time and page is provided with a one-line NEWS prompt and a scrolling region between the two. All other display features (cursor positioning, highlighting, etc.) are contained within the actual news files. Because of this, NEWS can be modified to suit your tastes (132-column displays, scrolling displays, paste-over displays, etc.). MAKENEWS.COM and MAKEMENU.COM are provided to facilitate creation of news files for our display method (see Programs 2 and 3).

Installation

To install NEWS, define the symbol NEWS as:

```
$ NEWS := = @[dir]NEWS.COM <news dir> <news prefix>
```

Our NEWS.COM resides in a directory of command procedures whose logical name is SYS$COMMANDS, while our news files are in SYS$NEWS. With this configuration, NEWS is defined as follows in SYS$SYLOGIN:

```
$ NEWS := = @SYS$COMMANDS:NEWS SYS$NEWS: NEWS$
```

To default the initial menu and article to NEWS$3S0.TXT and NEWS$3SP.TXT respectively, NEWS$TOPIC would be defined as:

```
$ DEFINE/SYSTEM NEWS$TOPIC "3SP"
```

Multiple NEWS systems can be made for different groups of users or unrelated subjects by defining other news symbols in group login commands or SYS$SYLOGIN:

```
$ VPWNEWS := = @SYS$COMMANDS:NEWS
  SYS$NEWS: VPWNEWS$ A
$ WPNEWS := = @SYS$COMMANDS:NEWS
  WP$DISK:[WPNEWS] NEWS$ W1P
$ DENVERNEWS := = @SYS$COMMANDS:
  NEWS DENVER::SYS$NEWS: NEWS$ " "
```

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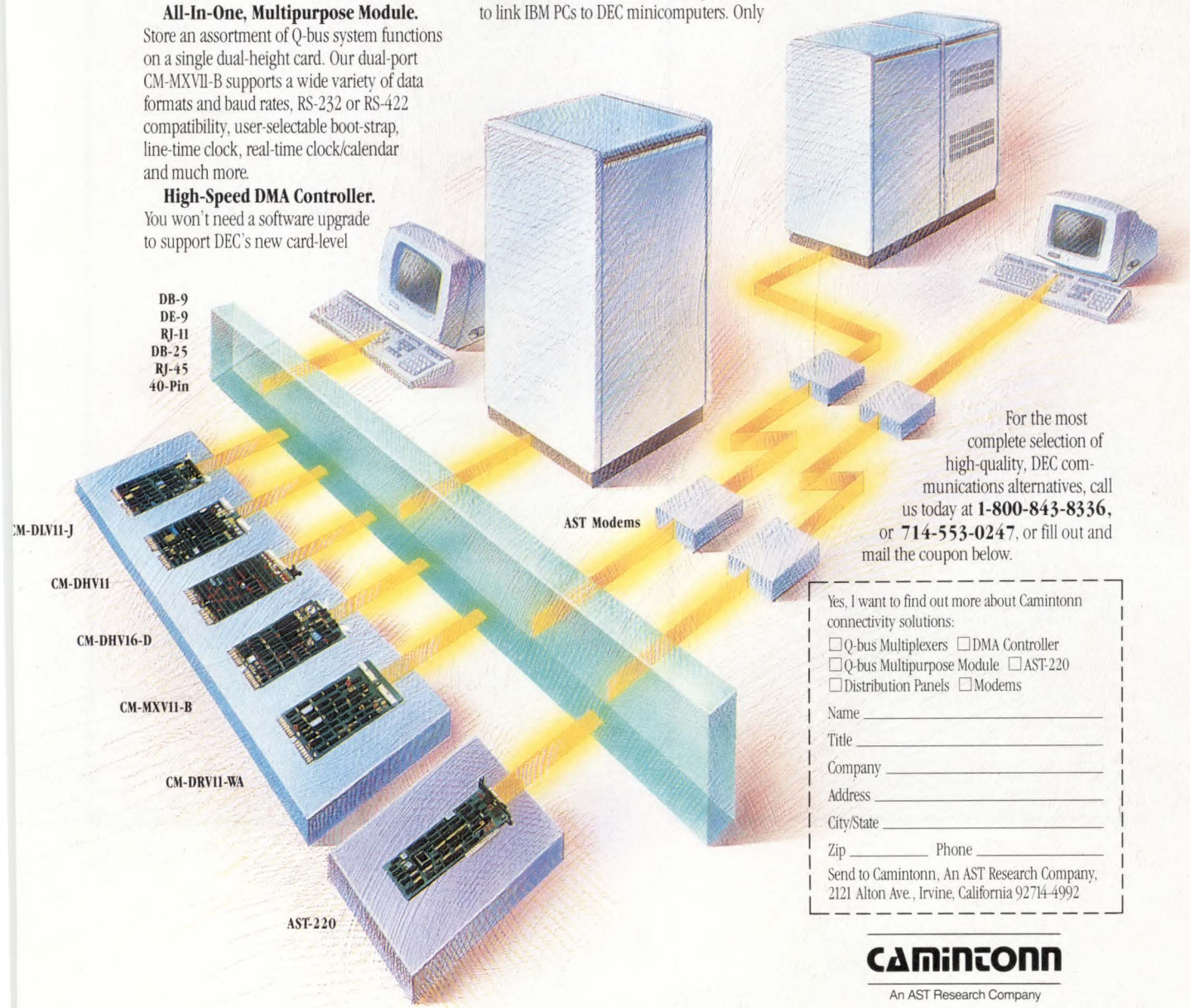

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PROGRAM 1. . . . *continued*

```
$ GOTO type_news
$ bad_file:
$ WRITE SYS$OUTPUT ESCAPE, "[24;41H", BOLON, "Invalid topic - ", BLION, -
  response, BELL
$ GOTO get_topic
$ do_help:
$ IF F$SEARCH("NEWS$HELP") .EQS. "" THEN WRITE SYS$OUTPUT ESCAPE, -
  "[24;41H", BOLON, "Help file not found", BELL
$ IF F$SEARCH("NEWS$HELP") .NES. "" THEN TYPE NEWS$HELP
$ GOTO get_topic
$ top_warn:
$ WRITE SYS$OUTPUT ESCAPE, "[24;41H", BOLON, "At Main Page - <Ctrl-Z> to -
  exit", VIDOFF
$ GOTO get_topic
$ no_news:
$ WRITE SYS$OUTPUT VIDOFF, "No NEWS", BELL
$ finis:                                ! Reset screen and exit
$ WRITE SYS$OUTPUT ERSCA, USCS, VIDOFF, ESCAPE, "[r", ESCAPE, -
  "[24H", FSCR, CURUP
```

PROGRAM 2.

```
$ !
$ ! MAKENEWS.COM - Command procedure to change a text file
$ !                into the TSI NEWS format
$ !
$ !   param       description                   default
$ !     P1      Text file to use
$ !     P2      File to create                MAKENEWS.TXT
$ !
$ ! NOTE:  See VID.COM for definitions of capitalized variables
$ !
$ ON CONTROL_Y THEN GOTO cancel
$ news_file = ""
$ IF p1 .EQS. "" THEN INQUIRE/NOPUNC p1 "Text file?  "
$ ! Get text file if none specified
$ !
$ file_name = F$SEARCH(F$PARSE(p1, ".TXT"))
$ IF file_name .EQS. "" THEN GOTO no_file
$ ! Default .TXT extension and check for file
$ !
$ news_file = F$PARSE(p2, ".TXT")       ! Default .TXT extension
$ IF news_file .EQS. "" THEN news_file = "MAKENEWS.TXT"
$ ! Default MAKENEWS.TXT if no news file is given
$ !
$ OPEN/READ/ERR=bad_file in$file 'file_name'
$ line = 0
$ long = 0
$ check_long:
$ READ/END=end_check_long in$file inrec
$ IF F$LENGTH(inrec) .GT. long THEN long = F$LENGTH(inrec)
$ line = line + 1
$ GOTO check_long
$ ! Find length of longest record
$ !
$ end_check_long:
$ CLOSE in$file
$ OPEN/READ/ERR=bad_file in$file 'file_name'
$ ! Reset to beginning of file
$ !
$ OPEN/WRITE/ERR=bad_file out$file 'news_file'
$ READ in$file inrec
$ outrec = F$FAO(ESCAPE+ "[1;7m  !''long'AS  "+ ESCAPE+ "[m", inrec)
$ WRITE out$file outrec
$ ! Expand record to length of longest record and add highlighting
$ !
$ outrec = F$FAO(ESCAPE+ "[1;4;7m  !''long'AS  "+ ESCAPE+ "[m", "")
$ WRITE out$file outrec
$ ! Insert a blank underscored record to seperate headline and text
$ !
$ get_rec:
$ READ/END=last_line in$file inrec
$ outrec = F$FAO(ESCAPE+ "[1;7m  !''long'AS  "+ ESCAPE+ "[m", inrec)
$ WRITE out$file outrec
$ GOTO get_rec
$ ! Expand records to length of longest record and add highlighting
$ !
$ last_line:
$ outrec = F$FAO(ESCAPE+ "[1;7m  !''long'AS  "+ ESCAPE+ "[m"+ ESCAPE+ "[A", "")
$ WRITE out$file outrec
$ ! Add one blank line on the end and move cursor up to prevent excess scroll
$ !
$ CLOSE in$file
$ CLOSE out$file
$ WRITE SYS$OUTPUT BOLON, file_name, " formatted to ", news_file, VIDOFF
$ EXIT
$ no_file:
$ WRITE SYS$OUTPUT BOLON, "Can't find file - ", BLION, p1, VIDOFF
$ EXIT
$ bad_file:
$ WRITE SYS$OUTPUT BOLON, "Can't open file - ", BLION, file_name, " or " -
  news_file, VIDOFF
$ cancel:
$ IF F$TRNLNM("IN$FILE") .NES. "" THEN CLOSE in$file
$ IF F$TRNLNM("OUT$FILE") .NES. "" THEN CLOSE out$file
$ WRITE SYS$OUTPUT BOLON, "MAKE NEWS cancelled", VIDOFF
```

PROGRAM 3.

```
$ !
$ ! MAKEMENU.COM - Command procedure to create/modify a TSI NEWS
$ !               menu file
$ !
$ !   param       description                   default
$ !     P1      File to create or edit        MAKEMENU.TXT
$ !
$ ! NOTE:  Unfortunately, this routine does not provide field editing.
$ !        To change the contents of a field, re-enter the entire field
$ !        See VID.COM for definitions of capitalized symbols
$ ON CONTROL_Y THEN GOTO cancel
$ page_title = ""
$ menu_lines = 0
$ ct = 1
$ index = 0                             ! Initialize variables
$ ! Default MAKEMENU.TXT if no file specified
$ !
$ menu_file = F$PARSE(p1, "MAKEMENU.TXT")
$ ! Create file if not found
$ !
$ IF F$SEARCH(menu_file) .EQS. "" THEN GOTO create_file
$ OPEN/READ work$file 'menu_file'       ! Open existing menu file
$ READ/END=end_read_rec work$file rec   ! Read first record
$ page_title = F$EXTRACT(13,20,rec)     ! Get page title from first rec
$ read_rec:
$ READ/END=end_read_rec work$file rec   ! Read next line
$ ! Menu lines must be 80 characters long for this method
$ !
$ IF F$LENGTH(rec) .NE. 80 THEN GOTO end_read_rec
$ read_topic:
$ num = ct + index * 4
$ topic_'num' = F$EXTRACT((ct- 1)* 20,20,rec)
$ ct = ct + 1
$ IF ct .LE. 4 THEN GOTO read_topic
$ index = index + 1
$ GOTO read_rec
$ ! Read_topic loop reads 4 topics per line while read_rec loop reads all
  ! menu lines
$ end_read_rec:
$ CLOSE work$file                       ! Page title and all topics loaded
$                                       ! into variables
$ menu_lines = index
$ create_file:
$ OPEN/WRITE work$file 'menu_file'      ! Create new file, same name
$ prompt_fao = ESCAPE+ "[1;7m!20AS"+ ERLNA+ ESCAPE+ "[20D"+ ESCAPE+ "[0m"
$ prompt = "Page Title:  "+ F$FAO(prompt_fao, page_title)
$ ! Build prompt for page title
$ get_title:
$ READ/END=cancel/PROMPT="''prompt'" SYS$COMMAND response
$ IF F$LENGTH(response) .GT. 20 THEN GOTO get_title
$ ! Get title until response no more than 20 characters long; <Ctrl-Z>
  ! cancels edit
$ !
$ IF response .NES. "" THEN page_title = F$EDIT(response, "COMPRESS,TRIM")
$ ! If response was given response becomes title; otherwise title is unchanged
$ !
$ fill = 20 - F$LENGTH(page_title)
$ WRITE work$file -
  ESCAPE, "[1;7m", ESCAPE, "[1;61H", F$FAO("!''fill'* !AS", page_title), -
  ESCAPE, "[0;7m"
$ ! Write title line with appropriate escape sequences
$ !
$ topic_0 = ""
$ index = 0
$ get_line:
$ rec = ""
$ ct = 1
$ get_topic:
$ num = ct + index * 4
$ IF index .GE. menu_lines THEN num = 0
$ prompt = "Topic "+ F$STRING(ct+index*4)+ ":  "+ F$FAO(prompt_fao, -
  topic_'num')
$ READ/END=close_file/PROMPT="''prompt'" SYS$COMMAND response
$ ! <Ctrl-Z> will trash current line and finish file
$ !
$ IF response .EQS. topic_'num' THEN GOTO end_get_line
$ ! If on new (blank) topic and no response given then end entry
$ !
$ IF response .EQS. "" THEN rec = rec+ F$FAO("!20AS",topic_'num')
$ IF response .NES. "" THEN rec = rec+ F$FAO("!20AS",F$EDIT(response, -
  "COLLAPSE")
$ ! If no response given use existing response; otherwise use response
$ !
$ ct = ct + 1
$ IF ct .LE. 4 THEN GOTO get_topic
$ ! Get four topics per menu line
$ !
$ WRITE work$file F$FAO("!80AS",rec)
$ WRITE SYS$OUTPUT REVON, rec, VIDOFF
$ ! Write and display menu line
$ !
$ index = index + 1
$ GOTO get_line
$ ! Loop for line entry; loop terminated by null response on new topic
$ !
$ end_get_line:
$ IF index .EQ. 1 THEN GOTO cancel
$ ! If entry terminated on first topic then cancel
$ close_file:
$ WRITE SYS$OUTPUT REVON, F$FAO("!80AS",rec), VIDOFF
$ WRITE work$file VIDOFF, ESCAPE, "[24M"
$ CLOSE work$file
$ EXIT
$ ! Write sequence to clear remainder of scroll region
$ !
$ cancel:
$ IF F$TRNLNM("WORK$FILE") .NES. "" THEN CLOSE work$file
$ WRITE SYS$OUTPUT BOLON, "MAKE MENU cancelled", VIDOFF
```

NEWS can be customized in many different ways (the version supplied is the flavor we like the most). Here's a list of some of the possible variations and hints on how to construct them:

1. Article Extension — If you choose not to use a scrolling display, each text file will be limited by 20 lines (fewer if you have long menu files). To overcome this, split the article into multiple files and append an underline to the filename for each file.

For example, suppose NEWS$A.TXT is 50 lines long (three screens). Trim NEWS$A.TXT to 20 lines, place lines 21-40 in NEWS$A.TXT and lines 41-50 in NEWS$A_.TXT. Then add a check to NEWS.COM just before the label "gettopic" to determine if the displayed file has a subordinate file named " "; if so, loop back to the label "typefile."

2. Scrolling Display — Although the given version of NEWS.COM has a scroll region, it's not a scrolling display (the scroll region provides an easy method to clear the display area). Because the menu is in the scrolling region, a long page or article will cause the menu to disappear. To create a true scrolling display, remove the scrolling region escape sequence (ESCAPE, "[2;23r") from the banner line and instead include it as part of the last line of the menu file. Determine the number of lines in the menu and adjust the scroll region accordingly (i.e., a one-line menu allows a 21-line scroll area, a three-line menu allows a 19-line scroll area). This can be done manually or included as part of MAKEMENU.COM.

3. Paste-over Display — A paste-over display doesn't clear the display area with each successive article or page, but rather each article writes over the existing text. By using various highlighting and the line drawing character set to create borders, some very attractive window-like displays can be made. To do this, change MAKEMENU.COM and MAKENEWS.COM to include the appropriate escape sequences with each page and article.

4. NEWS Update Message — To inform users of when NEWS has been updated, insert a line in SYS$SYLOGIN that displays the revision date and time of the main menu file (SYS$NEWS:NEWS$0.TXT). With each update or addition to NEWS, update the main menu file's revision date or create a new version of the file.

Editor's Note: All primary and supplementary programs mentioned in this article are available for download from ARIS. See page 22 for details.

— Antonio R. Collins is hardware manager at TS Infosystems Inc., Lanham, Maryland.

ARTICLE INTEREST QUOTIENT
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High 309 Medium 333 Low 336

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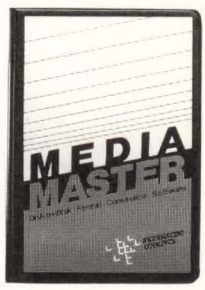

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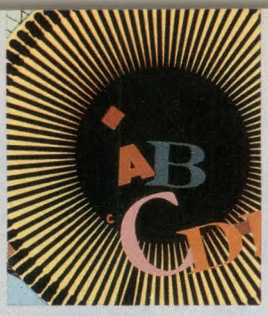


PRINTERS

THE SEIKOSHA VP-95 II VIDEO PRINTER

By David B. Miller

An Alternative To Laser Printing In Certain Applications.

Do you plan your coffee or lunch breaks around your graphics printer's speed? Do you work in an environment requiring frequent printouts of scientific, engineering or design drawings? Want to get high-quality graphics output in a fraction of the time? If your answer is yes, the VP-95 II video printer from Seikosha of Mahwah, New Jersey, distributed by Codonics of Middleburg Heights, Ohio, may be your ticket.

The VP-95 II is the middle sibling in a trio of video printers recently introduced at COMDEX, Spring, 1987. Thermal technology coupled with line head construction provides a high resolution (152.4 dots/inch), positive or negative graphics screen dump on thermal paper from your VT series (or other graphics-capable) terminal in a mere 10 seconds.

Images can be printed immediately upon power up; no warm-up period is required. It can handle screen input up to a resolution of 1280 x 1280 pixels and can accommodate composite, monochrome or RGB monitors. This particular model cannot generate gray-scale images; it's big brother, the VP-115, is needed for applications requiring that capability.

The VP-95 II accommodates many display devices ranging from low, medium and high resolution monitors, to low, medium and high resolution graphics terminals and workstations.

Any image can be output to the VP-95 II, including zoomed images on high-resolution terminals and workstations.

These display devices interface to the VP-95 II via a video input at the rear of the unit. Video signal frequency ranges from 10 — 80 MHz can be accommodated.

The VP-95 II can print pages up to 8.5 inches wide and boasts a small footprint of 15.7 x 16.8 x 6.6 inches with a weight of 27.6 lbs. A visible control panel consists of only two buttons, Print and Paper Feed, and two indicator lamps, Power and Ready. The usual method of multiple audible signals indicates a paper out or other power-up error. Other error conditions are printed upon a failed attempt to generate a graphics image.

An enclosed control panel at the top rear hides a number of indicator lamps, pencil switches and trimmers for such adjustments as horizontal and vertical position, graphics image size in relation to the terminal screen from which input is coming, and vertical and horizontal dot size. The rear of the printer provides BNC and nine-pin connectors for the composite, RGB and separate video signals, and a host of two-position switches to match the printer with the type of video signal coming from the graphics source.

Communicating with the VP-95 II simply requires making the right connections through

the BNC and nine-pin connections, and setting the associated switches for video type. The large number of switches can overwhelm the faint of heart. To help, the owner's manual contains a chart displaying various hookup combinations and switch settings that can be set to the user's needs. A variety of cables is available to allow for differences between terminal and printer port types from the signal source.

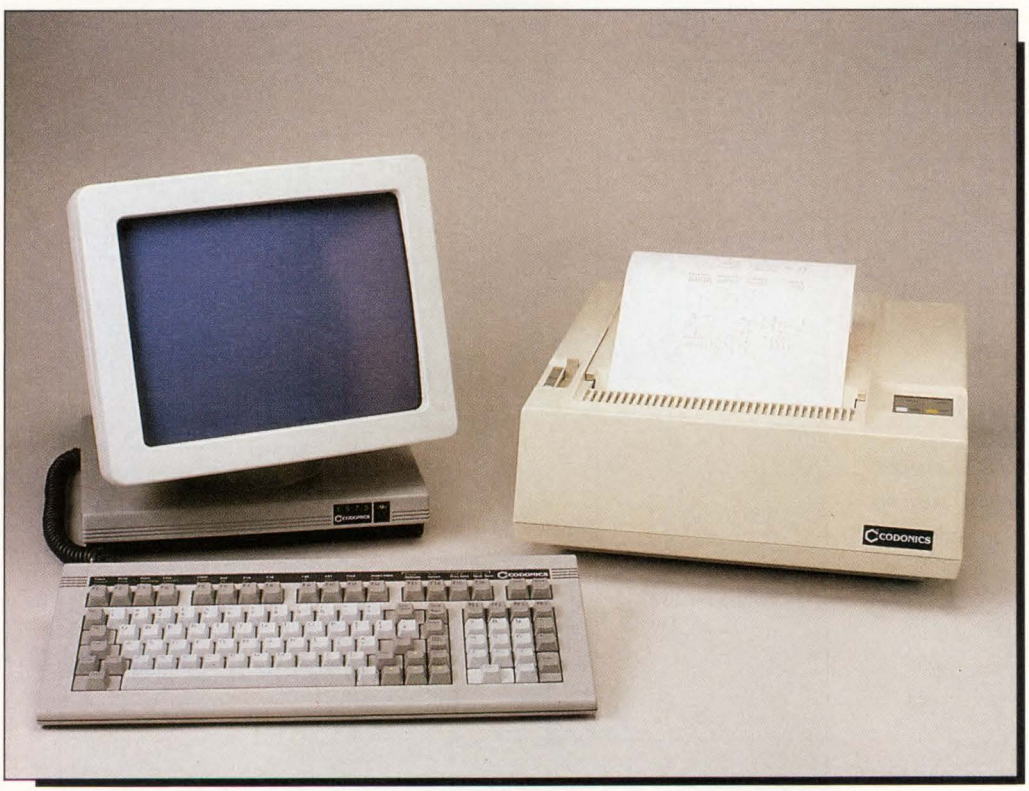
After physical connections are made, you should check the settings of the various pencil switches and trimmers housed on the top rear control panel. Standard factory settings provide for a composite signal source. Another chart in the owner's manual lists the correct settings.

The function of each switch and trimmer is described in the manual as well as how to make appropriate adjustments and the proper interpretation of the panel indicator lamps. We were able to go with all of the factory settings except for monitor type, which had to be set from Composite to Separate.

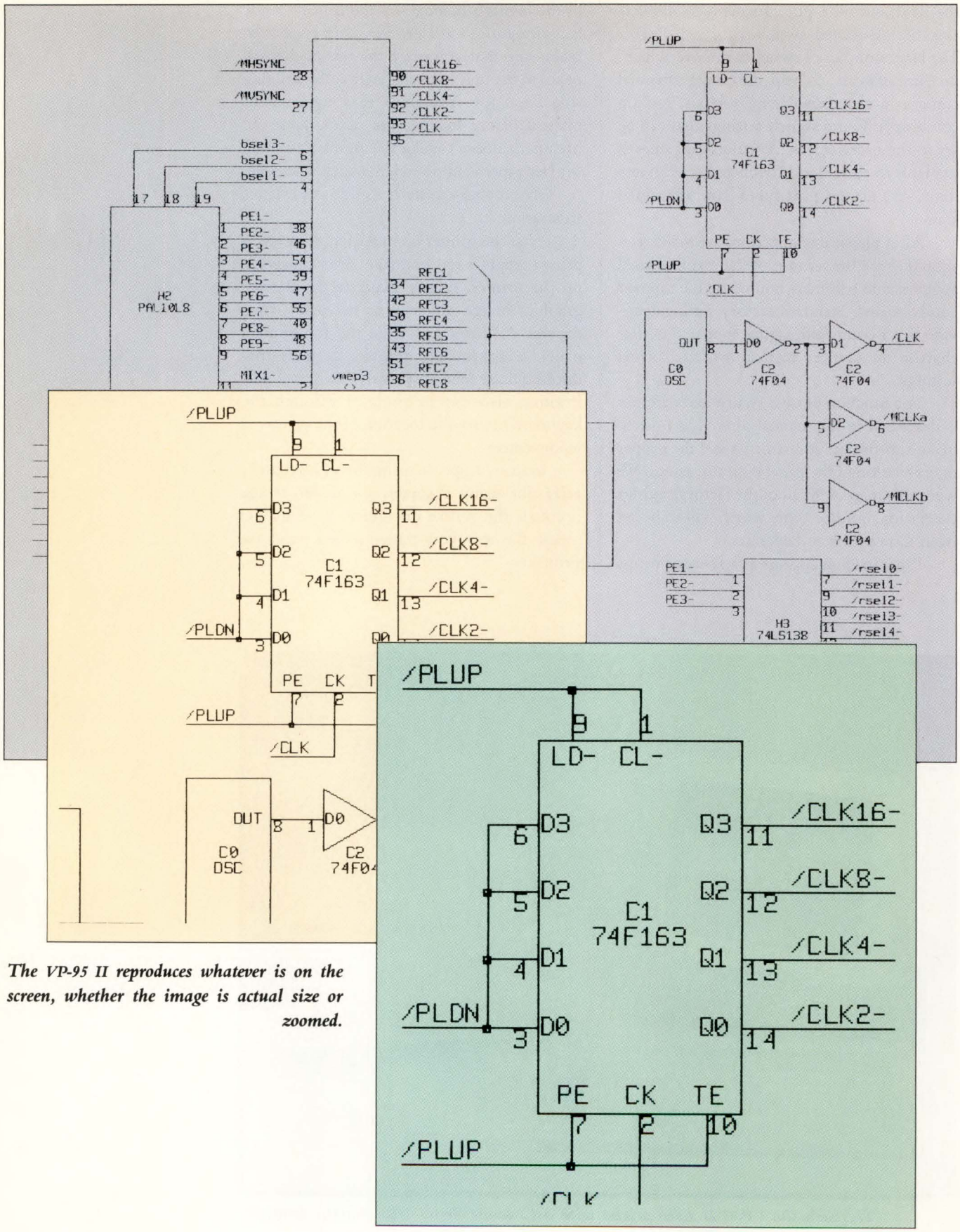
Paper loading appears as a 12-step process in the owner's manual but the routine really is a straightforward process. The trick is to make sure that you place the roll of thermal paper in the unit correctly so that the printing side faces out. You must read the owner's manual before loading the paper, however, because it doesn't make this point clear until the last paper loading step has been described. A relative newcomer could experience frustration.

After the printer is connected, it's easy to print a graphics screen image. After powering up the printer, simply generate the desired graphics image, adjust it as necessary, then depress the Print key from the top control panel. A high-quality graphics image is produced quietly (almost silently) in 10 seconds. Printing also can be initiated through the keyboard in case the location of the printer is inconvenient.

In many respects, using the VP-95 II is exactly like using a copier; the screen image becomes the source document. Line up the image the way you want it, then press the Print key.



The Seikosha VP-95 II video printer with a Codonics Series 1500 graphics terminal.



The VP-95 II reproduces whatever is on the screen, whether the image is actual size or zoomed.

If you're not happy with the printed image, you can make certain adjustments by accessing and making changes to selected trimmers and pencil switches. The trimmers can be adjusted as with any video monitor. You'll find settings for horizontal and vertical synch and hold, horizontal dot size, buzzer volume and course and fine tuning.

The two banks of piano (pencil) switches allow for reverse video printing, vertical expansion adjustments, signal separation level and enabling/disabling of the trimmers. As with your monitor, you may wish to adjust these until you find a suitable setting, then leave them alone, except for perhaps the regular/reverse image printing switch.

While the number of available adjustments can make you feel overwhelmed, it's comforting to know that the image can be changed to suit your preference much like a normal monitor screen.

Overall, the VP-95 II provides a low cost, quiet and speedy way of generating clear, crisp graphic screen images from your terminal or other video device. The unit is attractive and fits where other types of printers would.

For The Future

The only improvements I'd like to see involve the arrangement and number of switches existing on the unit and the documentation. I am not sure the average computer terminal user could or would want to understand the various adjustments that can be made to the graphics images produced by the printer. As long as nothing is going wrong, you don't have to look any further than pages one and two of the manual to ascertain how to use the unit. Those not basically literate in video terminology, though, would have to seek out the local printer/terminal expert or make a call to the distributor for advice should problems arise.

It would help if the switches that control features like positive/negative video orientation were moved to the main control panel. They're more accessible there and also would be out of harm's way. Adjustments better left set permanently wouldn't be changed accidentally.

The documentation also could be improved. The switch settings and descriptions of the general parts of the machine were repeated throughout the manual. It seemed like everywhere I turned, I was reading about a vertical synch trimmer adjustment and its function. One detailed section is sufficient and would reduce confusion.

At $4,200 before quantity and educational discounts, you may wonder if a laser printer would be a better choice. Keep in mind, however, that the VP series of thermal printers has speed and versatility features not possessed by comparably priced lasers.

The thermal unit is capable of printing any image generated by a device producing a video signal. This includes terminals, monitors and lab instruments. The 10-second print time also is an advantage, especially for the type and quality of graphic output that it's capable of producing. *—David B. Miller is associate director of computer services at Beaver College in Glenside, Pennsylvania.*

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Enter On Reader Card
High 495 Medium 496 Low 497

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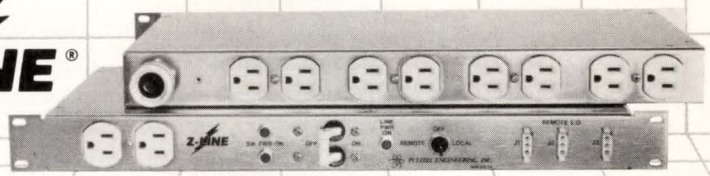

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NETWORKING

MULTIPLEX

A Tool For Remote Database Access And Manipulation.

By Howell E. Dell

Multiplex, from Network Innovations of Cupertino, California, is a networking software tool that allows Digital's VAXMATE and IBM-compatible computers to access and extract data stored in databases using DEC's Information Architecture products.

The differences among operating systems, applications and data formats on the PC have made it difficult to exchange information in a decentralized or distributed manner. *Multiplex* overcomes this burden of reformatting data for use by a PC.

For example, a PC user can browse database contents in row/column format on the PC display and extract the desired data across the network into a *1-2-3* worksheet. *Multiplex* handles all of the communications and reformatting, enabling the PC user to work on the data immediately instead of spending time reformatting files and learning *DTR* or *Rdb* query languages.

Multiplex provides a solution that goes beyond the previous PC-to-host systems. The following is a list of features incorporated in the software:

1. Networked remote database access
2. Network file management
3. Terminal emulation
4. VAX-host hot key with end-to-end communication protocol
5. Keystroke macros
6. Unattended operation
7. Remote printing of PC files via VAX queue manager.

The *Multiplex* Communication Link

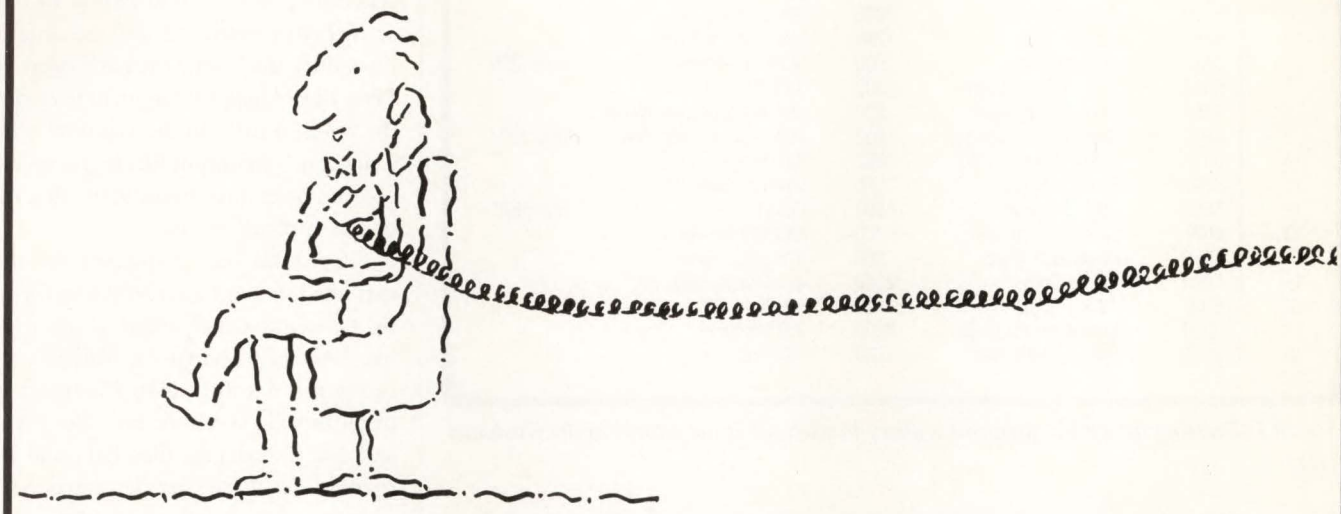
Multiplex consists of two pieces of distributed networking software: a user interface on the PC and a host server residing on the VAX. The package adapts nicely into a VAX network and supports three communication strategies: direct asynchronous communication link, remote asynchronous communication link and DECNET.

When using the asynchronous communication link, *Multiplex* provides its own end-to-end communications protocol. When using DECNET, either Ethernet or asynchronous communications are possible.

For each type of communications network, *Multiplex* insulates the user from the network details. It provides exactly the same features and functions, and the same user interaction, regardless of the type of network you're using. Keep in mind, the difference in performance between an Ethernet LAN and a 9.6K asynchronous communications link.

The PC Application

The PC application provides a *Lotus*-style ring menu interface for database queries and performs all of the data reformatting. Because *Multiplex* is a distributed network product, the user doesn't have to learn VAX database management systems or query languages. Fur-



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MENU

Browse Column Window Inquiry Table Database Output Quit
Browse the contents of the active window

MAIN	CUST_N	CUST_NAME	CUST_	ADDR1	ADDR2
1	5010	Acme Manufacturing Co.	300	345 Main St.	Littletown
2	5020	Dennison Distributing	100	678 Palmas Drive	Suite 301
3	5030	Paulsen Packing	2100	678 Hialea Blvd.	
4	5040	Fred's Markets	2300	394 Bourbon St.	
5	5050	Gingiss Inc.	1700	546 Gingiss Drive	
6	5197	Holcum Mfg.	600	1439 Des Plains Ave.	Suite 200
7	5327	John Jacobs Corp.	300	345 Main St.	
8	5450	Noble Distributing	200	567 Alameda des Pulgas	
9	5500	Genesis Distributing	1900	4588 Loma Linda Way	RFD 1234
10	6010	Raphael Tool & Die	888	100 Tareytown Rd.	
11	6100	Franklin Savings	1100	947 Harrison St.	
12	5600	ASQ Corporation	1400	RD #1	Box 5678
13	5870	Graham Industries	900	483 Granite Rd.	
14	5888	Charleston Brass	200	578 River Road	
15	5090	Nicole Corp.	2300	413 Riviera Blvd.	
16	5100	Falcon Ridge	100	P.O. Box 473	
17	5200	Compton Industries	2200	216 Ventura	
18	5123	Felton Enterprises	1200	345 Chauncy	

Screen 1: Pressing the F9 key performs a query to select all of the records in the Customer table.

PRINT

Select table for lookup window: _

MAIN	CUST_N	CUST_NAME	CUST_	ADDR1	ADDR2
1	5010	Acme Manufacturing Co.	300	345 Main St.	Littletown
2	50				Suite 301
3	50				
4	50				
5	50				
6	51				Suite 200
7	53				
8	54				
9	55				RFD 1234
10	60				
11	61				
12	56				Box 5678
13	58				
14	5888	Charleston Brass	200	578 River Road	
15	5090	Nicole Corp.	2300	413 Riviera Blvd.	
16	5100	Falcon Ridge	100	P.O. Box 473	
17	5200	Compton Industries	2200	216 Ventura	
18	5123	Felton Enterprises	1200	345 Chauncy	

List of Tables in Database

CUSTOMER OFFICES ORDERS **STAFF**

Screen 2: The list of accessible tables appears as a window.

thermore, the PC interface provides a single, consistent user database query interface for a full range of host systems, which can be intermixed in a complex network.

Multiplex can sort, drop and change the order of data fields selected from the record definitions. The entire query process can be stored (via keystroke macros, as in *Lotus*), retrieved and executed to reproduce the results over and over. For *Lotus* files, *Multiplex* can include or omit the column titles in the window when it generates an output file. If you include column titles, they become the first row of the spreadsheet file.

Once the data is queried and then extracted, it can be reformatted for use by PC data management applications like *Lotus 1-2-3* and *dBASE. Multiplex* also can format data for use by Microsoft applications via symbolic link files (SYLK) and data interchange files (DIF), and also regular ASCII files or delimited ASCII files for most word processors.

VAX Server Software

The VAX host-server software provides *Multiplex* access to the processing power of the VAX and files stored in *Rdb* or RMS format (via DATATRIEVE). The VAX processor is used to carry out the database query requests from the PC; therefore, it only transmits back to the PC data selected as a result of the query.

Multiplex enforces all of the security provisions provided by the VAX. The server software runs as a normal user mode process and so can only have access to files and CDD domains that normally would be granted to an interactive user.

Installing *Multiplex*

Installing *Multiplex* is a snap. Both installation processes for the VAX and the PC are automated, so it's only necessary to answer a few short questions. It only took 20 minutes to install the software on both the VAX and the PC here at the Lab.

If you're using DECNET on a VAXMATE or IBM PC, the installation process will take more time because of the

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ENTER 151 ON READER CARD

MENU

Sort Criterion **Lookup** Unique Reset Go Template Quit
Specify table lookups

MAIN	CUST_N	CUST_NAME	CUST_	FIRST_NAME	LAST_NAME
1	5010	Acme Manufacturing Co.	300	???????????	???????????
2	5020	Dennison Distributing	100	???????????	???????????
3	5030	Paulsen Packing	2100	???????????	???????????
4	5040	Fred's Markets	2300	???????????	???????????
5	5050	Gingiss Inc.	1700	???????????	???????????
6	5197	Holcum Mfg.	600	???????????	???????????
7	5327	John Jacobs Corp.	300	???????????	???????????
8	5450	Noble Distributing	200	???????????	???????????

LOOK	REP_N	FIRST_NAME	LAST_NAME	REP_	TITLE	SALARY	COM

QUERY

Screen 3:* Multiplex *splits the screen and requests that the user enter the fields upon which a database join (or DATATRIEVE cross) function can be performed.

I1: (F8) 300

READY

	E	F	G	H	I
1	Hamford	105	New York	Eastern	300
2	Jorgenson	105	New York	Eastern	300
3	Biggie	302	Los Angeles	Western	100
4	D'Angelo	105	New York	Eastern	300
5	Mathis	220	Dallas	Midwest	800
6	Benjamin	210	Chicago	Midwest	800
7	Hamford	105	New York	Eastern	300
8	Lifkin	110	Washington	Eastern	200
9	Nichols	105	New York	Eastern	300
10	Smith	210	Chicago	Midwest	800
11	Jones	302	Los Angeles	Western	100
12	Nakasura	210	Chicago	Midwest	800
13	Binghamton	210	Chicago	Midwest	800
14	Lifkin	110	Washington	Eastern	200
15	D'Angelo	105	New York	Eastern	300
16	Jorgenson	105	New York	Eastern	300
17	Marci	105	New York	Eastern	300
18	Crawford	220	Dallas	Midwest	800
19	Bittle	302	Los Angeles	Western	100
20	Biggie	302	Los Angeles	Western	100

***Screen 4. The data is displayed as represented by* Lotus 1-2-3.**

added information required by DECNET; however, the procedure is well documented. The Program shows the output from the VAX installation.

An Example

After installing *Multiplex*, I took it for a test drive. The following example uses a DATATRIEVE demonstration database provided with the software.

The first step in starting *Multiplex* on the PC is with the command:

```
C> MPX
```

When using the asynchronous communications link, *Multiplex* attempts to connect to the VAX via the COM1 or COM2 port, and transmits the username and password sequence defined in the *Multiplex* configuration file. *Multiplex* displays the status messages and informs you of the connection. Once *Multiplex* detects the "$" character, it transmits the HOSTMPX command which starts the protocol.

Multiplex then prompts you to select a database table "(domains):". I selected CUSTOMERS. *Multiplex* queries the VAX to find the format for each data item in the record and displays the results in a window, in row/column format.

Next, I pressed the F9 key to perform a query to select all of the records in the Customer table (see Screen 1). I wanted to extract the names of the sales representative for each customer, so I selected Inquiry, then Lookup. The list of tables I could access appeared as a window. I chose Staff (see Screen 2). *MULTIPLEX* split the screen (see Screen 3) and requested that I enter the fields upon which a database join (or DATATRIEVE cross) function could be performed between the Customer and Staff files.

Multiplex requested the data fields to be selected from the Staff file, then it expanded the original Customers window to provide room for the new fields. Again, the F9 query key was pressed

Everything before was guesswork

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PROGRAM 1.

```
Username: SYSTEM
Password:
        Welcome to MicroVMS V4.4

    Last interactive login on Tuesday,  9-JUN-1987 14:13

$ @SYS$UPDATE:VMSINSTAL MPX012 MSA0:
        VAX/VMS Software Product Installation Procedure V4.4
It is 10-JUN-1987 at 12:03.
Enter a question mark (?) at any time for help.
%VMSINSTAL-W-DECNET, Your DECnet network is up and running.

* Do you want to continue anyway [NO]? YES

* Are you satisfied with the backup of your system disk [YES]? YES

Please mount the first volume of the set on MSA0:.
* Are you ready? YES

%MOUNT-I-MOUNTED, MPX mounted on _MSA0:

The following products will be processed:
  MPX V1.2

        Beginning installation of MPX V1.2 at 12:05

%VMSINSTAL-I-RESTORE, Restoring product saveset A...
%MPX-I-VERSION, Checking for VMS Version 4.4 or later.
%MPX-I-FREE, Checking for 500 free blocks.
%MPX-I-DIRECTORY, Checking for [MPX] on system disk.
%VMSINSTAL-I-SYSDIR, This product creates system directory [MPX].
%VMSINSTAL-I-SYSDIR, This product creates system directory [MPX.ETC].
%VMSINSTAL-I-SYSDIR, This product creates system directory [MPX.DEMO].
%MPX-I-SPECIFY, Specifying target directories for the appropriate files.

        System Manager:

                Upon completion of this installation, you must edit
        the file SYS$MANAGER:SYLOGIN.COM and include the following
        line:

                $ HOSTMPX :== $SYS$SYSTEM:HOSTMPX.EXE

                Please refer to the Host Installation Guide for
        further information.


%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
        Installation of MPX V1.2 completed at 12:07


        VMSINSTAL procedure done at 12:07


$ SET DEF DUA0:[SYS0.MPX.ETC]
$ @MKDEMODB DATATRIEVE

Multiplex Demonstration Database Installation Script

You must be logged in as SYSTEM for successful execution of this script.

The default directory should be set to the [MPX.ETC] directory on the
logical drive where the Host Multiplex software was installed.

NOTE: Any pre-existing Multiplex Demonstration Database will be replaced.

Press RETURN to continue, or Ctrl-Y to abort...

Building Multiplex Demonstration Database for DATATRIEVE

Generating data files...
Creating database...
Loading data...

Demonstration Database Installation Procedure Complete.

$ LOGOUT
  SYSTEM        logged out at 10-JUN-1987 12:20:24.29
```

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and the results of the query were displayed as one window.

I performed another join operation, but this time against the Staff and Office tables. The same steps were followed, and in minutes the data was pulled by the PC from the VAX.

At this point I created a window with fields from three tables (domains). I wanted to output the data to *1-2-3*. This was accomplished merely by selecting Output and *1-2-3*. *Multiplex* then creates the *Lotus* files and asks if you wish to chain to *Lotus*. I answered yes. Screen 4 shows the data as represented by *Lotus*. Compare Screens 3 and 4 to see the data displayed with the correct data formats.

Multiplex is a powerful tool that can provide the PC community with the productivity promised by the advent of the under-$10,000-computer systems. *—Howell E. Dell is a Pennsylvania-based consultant specializing in VMS and networking.*

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TEXAS INSTRUMENTS

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*In locations where a phone jack is not accessible, the optional acoustic coupler may be required.

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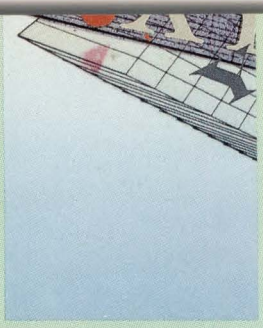

DEC vs. IBM

TRANSACTION PROCESSING

DEC/ACMS vs. IBM/CICS, Part 4.

By John Biazzo

This is the last in a series comparing the IBM/CICS and DEC/ACMS transaction processing systems. This month we discuss the choices for data I/O processing available under the two environments.

In the IBM environment, CICS supports the use of Virtual Storage Access Method (VSAM), Indexed Sequential Access Method (ISAM), or Blocked Direct Access Method (BDAM) files. The DL/I database system also is available. Because ISAM and BDAM have been obsolete for 10 years (sound familiar?), the majority of CICS shops use VSAM files and the remainder use DL/I databases.

The file control feature of CICS is the portion that handles VSAM file processing. File control commands or service requests allow the programmer to read, add, delete, update or browse VSAM records. The file control commands within CICS resemble all other CICS calls. They're preceded with the words EXEC CICS and followed by keywords that denote the desired service request and its selected options. The EXEC CICS call then is terminated with the END-EXEC statement.

There are three types of VSAM files: key-sequenced data sets (KSDS) relative-record data sets (RRDS) and entry-sequenced data sets (ESDS). KSDS files are used most often because they allow random access by key, or sequential access with the ability to also retrieve a group of sequential records. RRDS files also can be randomly accessed, but they require the use of a relative record number instead of a key field in the record. ESDS files can't be accessed randomly and are used primarily as output files in batch processing.

CICS and VSAM allow the programmer to use 10 different file control commands. The READ command is used to read a file for update or inquiry. A READ FOR UPDATE is completely different from a READ FOR INQUIRY. As such, the READ FOR UPDATE command must contain the UPDATE keyword. The READ FOR UPDATE also locks the particular record until another command releases the lock.

The WRITE command is used to add a new record to the file. CICS returns an error condition to the application program if a duplicate key is detected or there's no room in the file to add the record.

The DELETE command is used to delete a specific record from the file. Also, multiple records can be deleted using a generic key if the feature was enabled when the file was created. Most VSAM files are created with the generic delete feature disabled for obvious reasons. A DELETE operation will release the lock applied from a READ FOR UPDATE.

In order to update a VSAM record, it first must be retrieved using a READ command with the UPDATE option. Once changes have been applied, the REWRITE command is used to write the updated record back to the file. Once the REWRITE command has completed, the record lock is released.

If a record is read for update and neither a DELETE nor a REWRITE command is issued,

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the record lock must be released by issuing the UNLOCK command.

A unique feature of CICS, available when using VSAM files, is the ability to retrieve a group of records sequentially. This capability is called browsing. Browsing can be used, for example, to retrieve a group of records whose key starts with the same letters.

A browse operation is begun by issuing a STARTBR command that sets up the starting point in the VSAM file. From this starting point, CICS allows records to be read before or after the starting point. A READNEXT command is issued each time the next record forward is to be read. A READPREV command can be used to read the previous record. An ENDBR command is used to terminate the browse procedure. Rather than terminating a browse operation and starting a new one, a RESETBR command can be used, if desired, to reset the starting point during a browse operation.

VSAM also allows the use of an alternate index that defines a secondary key for the file. This is particularly important because CICS doesn't allow the use of a COBOL SORT in its online programs. With the addition of a secondary or tertiary key, a record can be found faster when there's more than one way to find it.

DL/I is the second choice for data I/O processing in the CICS environment. A DL/I database is comprised of a collection of related data items organized into a hierarchical structure. Each data item consists of a key field and many data fields. Like a VSAM file, the key field is used to store and retrieve the data item.

The hierarchical design creates several segments within the same database. In order to minimize searching through the entire structure of the database, CICS allows the programmer to specify a particular segment that he wishes to process. Within each segment are more narrow subsets known as segment occurrences.

A DL/I database is comprised of a collection of related data items organized into a hierarchical structure.

CICS and DL/I allow a DL/I database to be accessed either sequentially or randomly. Rather than using file control commands, CICS uses DL/I calls to process the database. A DL/I call doesn't resemble a typical CICS call. A DL/I call begins with the keywords CALL 'CBLTDLI' USING followed by the DL/I function code desired, the PCB-mask, the segment I/O area and segment search arguments.

The Program Communication Block (PCB) mask defines which database to use. The segment I/O area specifies the segment of the database that's to be processed. The segment search arguments further define the criteria to be used for data item selection. After the appropriate segment or segment occurrence has been located, parentage can be set up. Parentage further establishes a hierarchy, in that items directly below the parent can be processed directly.

DL/I calls fall into five categories. The GET calls are used to find a segment occurrence either sequentially or randomly for read-only purposes. There are three GET calls. GET UNIQUE (GU) will retrieve randomly a segment occurrence. A GET UNIQUE call can be used to establish parentage.

The GET NEXT (GN) call will retrieve sequentially the next segment occurrence that satisfies the search requirements. The GET NEXT WITHIN PARENT (GNP) is used to retrieve sequentially the next segment occurrence, within the present parentage, that satisfies the search criteria. A GNP call typically is used following a GU call that establishes parentage.

There are three GET HOLD calls that also perform sequential or random retrievals of segment occurrences. The difference between an ordinary GET and a GET HOLD call is that the latter is used when an UPDATE is intended.

The first GET HOLD call is the GET HOLD UNIQUE (GHU) that will retrieve a segment randomly in preparation for an UPDATE operation.

The GET HOLD NEXT (GHN) sequentially retrieves the next segment occurrence that satisfies the search criteria. The premise, once again, is to prepare for UPDATE.

The GET HOLD NEXT WITHIN PARENT (GHNP) sequentially retrieves the next segment occurrence that satisfies the search requirements and is within the present parentage. A GHNP call typically follows a GET UNIQUE call that has established parentage. All three GET HOLD calls typically are followed by an UPDATE operation of some type.

Finally, the REPLACE (REPL) call is used to update a segment occurrence that previously was retrieved with one of the GET HOLD calls. Only the data portion of the segment occurrence may be updated. The DELETE (DLET) call deletes the segment occurrence as well as all of its dependents from the database. The segment occurrence to be deleted must have been retrieved using one of the GET HOLD calls.

On the DEC side, ACMS supports the use of VAX DBMS, Rdb/VMS, or VAX Record Management Services (RMS). VAX DBMS is a hierarchical CODASYL-compliant database management system. VAX DBMS is the functional equivalent to IBM's DL/I. Rdb/VMS is a

relational database management system. CICS doesn't provide equivalent functionality to that of Rdb/VMS. VAX RMS is the functional equivalent of IBM's VSAM.

VAX RMS is provided as the default file management system supplied with VMS. There are three types of RMS files available. Sequential files allow sequential access only, indexed files allow sequential or random access by key, and relative files allow sequential or random access by relative record number.

With COBOL as the application programming language, the following commands can be used to process RMS files:

1. START — Used with an indexed or relative file to position a logical record pointer. The logical record pointer is used as a starting position from which to perform the next sequential record retrieval.
2. READ NEXT — Follows a START command to retrieve the next logical record. When a READ command is issued against a relative RMS file, a specific record is made available. Additional qualifiers allow the retrieved record to be locked from access by other users.
3. WRITE — Adds a record to an RMS file. When an existing record is retrieved from an RMS file and changes are made to it, a REWRITE command is used to replace the record in the file with the updated information.
4. DELETE — Used to remove a record from an RMS file.
5. UNLOCK — Releases any locks held against a particular record or RMS file as a whole.

A database manager should be employed when an ACMS application requires the use of very complex data structures or when recovery capabilities in the form of journaling are required.

Journaling protects the integrity of the database if a system or program failure occurs. Both VAX database managers provide the same two types of journaling. Before-image or run-unit journaling allows a partially completed transaction to be fully backed up should

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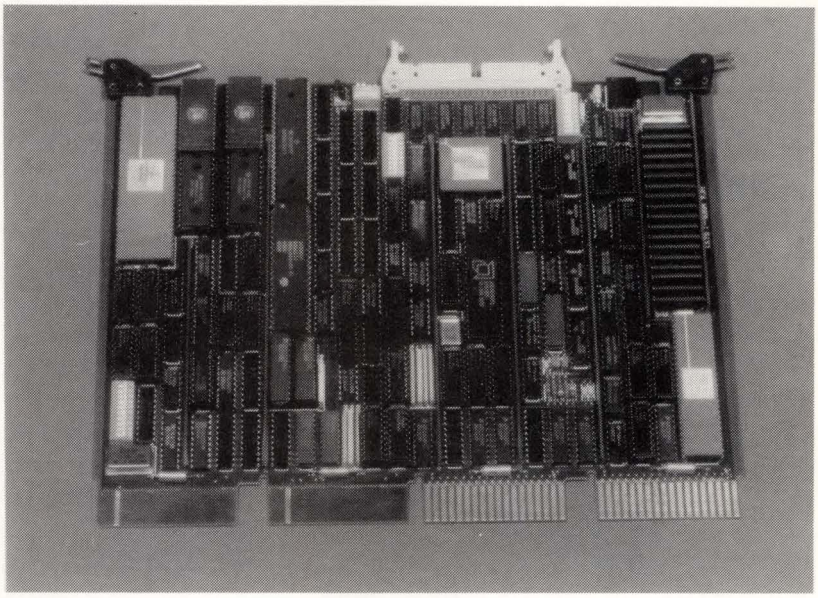

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an error in processing occur. After-image journaling maintains a separate file, on disk or tape, which contains all the changes that occurred to the database over a period of time. If there's a system failure, the previous database backup can be restored from tape. The after-image journal file then can be applied to the restored database to include all the updates that occurred until the time of the system failure.

> DML statements resemble English-like sentences that contain verbs . . .

Until journaling is available for RMS, the need clearly dictates the use of a database management system as opposed to RMS files. The question of which VAX/VMS database manager to use now comes to mind.

Three factors must be considered when deciding between VAX DBMS and Rdb/VMS. The first factor is the complexity of the relationships within the database. VAX DBMS is preferable from a performance standpoint when complex relationships exist within the database.

The second factor is the probability for change to occur in the structure of the database. If the database structure is susceptible to frequent change, Rdb/VMS is preferred because it permits interactive restructuring.

The final factor to consider is the amount of data involved. Typically, VAX DBMS performs better than Rdb/VMS when large databases are involved.

When performing operations in VAX DBMS, a User Work Area (UWA) is maintained where all activity pertaining to a user is kept until it's applied to the database permanently. This operation is transparent to the user. VAX DBMS also maintains pointers to records within the database. One such pointer always is kept for the current record in use.

VAX DBMS employs the Data Manipulation Language (DML) to perform database lookups, additions, deletions, etc. DML statements resemble English-like sentences that contain verbs like the following:

1. FIND — Locates a record in the database and marks it as the user's current record. KEEPLIST values are supplied with the FIND command to define the search list criteria. A FIND command may be issued optionally with a FOR UPDATE argument to lock the specified record.
2. GET — Moves the data item values from the current record (previously determined perhaps by the FIND command) to the UWA. Some or all of the individual data items may be moved to the UWA.
3. FETCH — Combines the functionality of the FIND and GET commands. Logically, the FIND portion is executed first and, if successful, the GET command is completed. The FETCH command differs from FIND and GET because it doesn't allow individual data items to be selected. Instead, it automatically moves all data items in the record to the UWA.
4. MOVE — Changes and enters values into the data item fields found in the UWA.
5. MODIFY — Applies the changes entered into the UWA back to the current record in the database.
6. COMMIT — Terminates the VAX DBMS database transaction and makes all changes to the database permanent.
7. ROLLBACK — Terminates the VAX DBMS transaction and undoes all changes made to the database, if for some reason, the programmer doesn't want to save the changes.
8. STORE — Adds an entirely new record to the VAX DBMS database. The values for the new record come from the UWA. After the record has been added, it becomes the new current record.
9. ERASE — Removes the current record from a VAX DBMS database. Any records that comprise a subset of the current record also will be deleted.

As you may suspect, Rdb/VMS works differently when compared to its cousin VAX DBMS. Rdb/VMS doesn't use a UWA. Instead, for Rdb/VMS to perform operations on a group of records, a record stream must be established; that's a group of records that satisfies a specified record selection criteria. After the record stream is established, it's said to be open. Like VAX DBMS, a current record pointer also is maintained in Rdb/VMS.

Rdb/VMS uses the data manipulation statements of the Relational Database Operator (RDO) utility to perform record additions, updates, deletions, etc. RDO statements resemble the DML statements used in VAX DBMS. Once again, English-like sentences containing verbs like fetch, get, modify, commit, rollback, store and erase are constructed.

All actions that take place during an Rdb/VMS session constitute a transaction. If an update activity is intended, the programmer specifically must start the transaction in READ_WRITE mode. In addition, by specifying the RESERVING option, selected records are locked from other users until the update operation is completed.

After a record stream has been opened, a FETCH statement marks the first record in the stream as the current record. Next, the GET command is used to move the values from the current record in the record stream to variables within the application program.

The value of a field within a record can be changed by using the MODIFY command. In order for this command to work however, a READ_WRITE transaction must have been started. MODIFY can be used to change the value of a field in one or more records within an opened record stream.

To terminate an Rdb/VMS transaction and make all changes to the database permanent, the COMMIT com-

mand is issued. This statement also releases any locks held by the transaction and closes the record stream. Conversely, a ROLLBACK command undoes all changes made to the Rdb/VMS database during the transaction. Like the COMMIT statement, a ROLLBACK also will release any record locks and close the open record stream.

To add an entirely new record to an Rdb/VMS database, the STORE command is used. For this command to complete successfully, the transaction that contains the STORE command must have been started in READ_WRITE mode.

The ERASE command is used to delete records from a record stream. To delete successfully records from an Rdb/VMS database, the transaction must be started in READ_WRITE mode.

In summary, the data I/O subsystems of the DEC/ACMS environment are very similar to those offered in the IBM/CICS environment. Nearly the same functionality is provided by each with the following exceptions. First, IBM/CICS doesn't offer a relational database manager like Rdb/VMS. Second, a BROWSE function isn't an inherent feature of the VAX RMS file system, though similar functionality can be implemented easily with user-written code. Third, the IBM file systems are preallocated and don't extend automatically when a file becomes full.

This completes a broad brush comparison of the two very different transaction processing environments. My hopes are that valuable knowledge has been gleaned from these articles so that true online, interactive transaction processing will begin to replace the majority of what presently exists in the field. **Author's note:** My second article comparing VAX COBOL to IBM COBOL contained some inaccurate statements relative to VAX COBOL. Please read my letter in "Letters," on page 18. *—John Biazzo is a senior software specialist with Digital Equipment Corporation in Meriden, Connecticut.*

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HANLOD* Load a fresh copy of handler ("fixes" some hung device situations).
LDSHOW* Show another user's logical disk subset (or subdirectory) mounts.
PDUMP* Dumps out memory of TSX+ or of another user's running program.
SETOP* Sets operator console (terminal that OPERATOR messages go to).
SHOFIL* Lists all open files: filename, size, date, for each running program with job number and program name.
SQSY* Squeeze system disk from non-operator console terminal under TSX+.
TSBOOT* Reliably boot RT-11™ from TSX+ (for unsupported TSX+ devices).
TTPEEK* Most wanted utility! Displays what is being output to another user's terminal. Invaluable for locating problems with dialup users.
XSEND* Extended SEND command, sends to terminal whether or not logged on, time/date stamps message.
USAS* Show another user's assignments.

** A user must have sufficient privileges to use this program.*

For use with either TSX+ and/or RT-11:

CMPRES Data compression program minimizes data transmission time or storage space.
COPBLK Generalized copy utility. Copies blocks, or byte strings, optionally concatenates at high speed.
CRSEG* Adds a segment to a directory (use with ?PIP-F-Device full).
CS Compute CRCs of files on a disk, or display names of those files that have changed since last run.
DIRBAK* Create a backup copy of a disk directory in case the directory becomes corrupted. A "must" program.
DIRDMP* Display directory in dump format (Octal, ASCII).
DIRRST* Restore a disk directory from the backup copy made by DIRBAK.
DMPMAC Convert binary file (e.g. TRANSF.SAV) to MACRO for down-loading to a remote system.
DSKCOM High speed disk compare.
FIXDIR* Patches an invalid directory to ignore bad segments.
MTCOPY Copy between magnetic tape and disk files. Duplicate arbitrarily formatted tape.
MTDUMP Dump a tape. Necessary tool for tape analysis.
NCRYPT Encrypt or decrypt a file with user specifiable encryption key.
SDIR Search through (possibly nested) subdirectories without having to mount them.
SEARCH High speed search and optional replace through wildcarded file(s) or devices.
SET* Allows SET command of RT handlers under TSX+ and vice-versa, also invaluable for debugging SET routines in handlers.
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TRUNC Program to truncate a file to a smaller size.
UNDEL* Undeletes files selected by wildcards. Preserves original date. Works when CREATE command fails.
YT Type a file backwards (for looking at the end of a file—where error messages are found).
ZFILE* Zeros a file/device/tape at high speed (for security reasons).

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BD Use BD to recover files on a disk when directory becomes un-readable (if DIRBAK has been run).
DLTEST Show CSR/Vector/Speed of DL-11's on system. Emit test pattern to a selected port.
SR For debugging a program which traps to 4 or 10. Dumps registers, stack, and instructions.
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BOIS

David W. Bynon

ALL-IN-1

Welcome to Business and Office Information Systems, a column for those who develop and maintain VAX-based office systems. We'll discuss issues that deal specifically with managing and developing *ALL-IN-1* applications, DEC's flag ship office system, and other office products. This column will be both tutorial and theoretical, covering a wide range of topics such as user management, training, performance, reducing the risk of developing business and office information systems, and developing applications. We encourage your questions and requests, and welcome your comments.

Business and Office Information Systems (BOIS) is a new DEC marketing strategy and term. It has a likeness to MIS in that one of its goals is to provide the information that management needs for effective decision making instantly. MIS and BOIS typically refer to information systems whose objectives are to integrate all of an organization's subsidiary information. BOIS also includes word and document processing, electronic publishing, business communications, and end-user information management. MIS, in general, is limited to providing information to an organization's management, while BOIS is designed to address the information needs of the whole organization.

ALL-IN-1 — An Integrating 4GL

DEC's *ALL-IN-1* is a complete application development system. Its power is demonstrated in the standard functions included with the *ALL-IN-1* office system:

1. Word processing
2. Electronic mail
3. Desk management
4. Time management
5. File cabinet
6. Communications

These major functions of *ALL-IN- 1* were created using the application development tools that constitute *ALL-IN-1*. These very same development tools are available to programmers who, with very little practice, can use them to prototype and create their own custom applications.

By using *ALL-IN-1* as an application development system, you can progress from the conceptual model (specification) to a working model (prototype) quickly. When designing an application to solve a specific problem, generally only a small part of the application addresses the actual problem. Most of the programming goes into the user interface, file input/output, screen presentation, and so on. *ALL-IN-1* was designed to minimize this detail work by providing a user interface on which to develop applications.

For most types of business applications, *ALL-IN-1* already has the framework completed; you can add options to existing menus or build applications around new *ALL-IN-1* menus. This functionality of *ALL-IN-1* inspires a "Do it, try it, fix it" approach to applications development, and it works.

By using the *ALL-IN-1* facilities to create a model of an application, the developer quickly can present and demonstrate a new application for constructive input from the users. From this input, the application then can be modified and presented again. When a final application design is agreed to, the developer may implement the full functionality of the application. In this way, the model or prototype system simply is an intermediate step to the final application. Also, note that *ALL-IN-1*'s built-in applications are available for the developer to use as models to new applications, further decreasing development time.

ALL-IN-1 provides the application developer with use of the same tools needed to create the standard *ALL-IN-1* applications; i.e., electronic mail, file cabinet, time management. Applications can be developed that follow the *ALL-IN-1* standard, thereby decreasing user training and application maintenance dramatically.

Finally, *ALL-IN-1* has the capability to tap and integrate the entire resources of the VAX. By using built-in *ALL-IN-1* functions and DCL command procedures, the application developer can draw from the vast resources of the VAX and DECNET.

In summary, *ALL-IN-1*'s potential arises from:

1. Fast application modeling capabilities;
2. A standard user interface (menus);
3. Standard applications that may be used as models;
4. The ease with which *ALL-IN-1* can be customized;
5. The ability to take advantage of all VAX resources.

ALL-IN-1 And The VIA

The VAX Information Architecture (VIA) is an integrated approach to data definition, manipulation, maintenance and retrieval. It's devised of software tools clustered around a data dictionary called the CDD. Each of these tools can function independently; however, they were designed to work together.

A key design function of the VIA and *ALL-IN-1* is the separation of form

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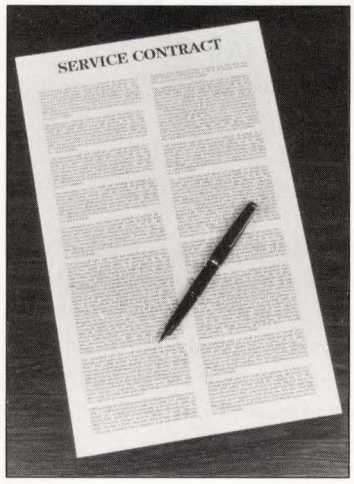

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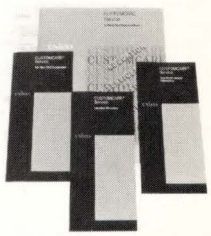

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and function. For this reason, *ALL-IN-1* can take full advantage of all VIA products and has many built-in functions that enhance access to these products.

To achieve the separation of form and function, *ALL-IN-1* organizes its information into data sets. Data sets keep the separation of information consistent throughout the system and allow you to combine different types of information in certain situations.

ALL-IN-1 *has several unique features that include command stacking and the ability to trap responses and error conditions.*

ALL-IN-1 has its own special language consisting of myriad functions. These functions are the verbs of the *ALL-IN-1* facilities. They're used in the form of function calls — calls to a built-in *ALL-IN-1* function. *ALL-IN-1* functions may be called:

1. From Named Data of a Forms Management System (FMS) screen;
2. From an *ALL-IN-1* script;
3. Through a VMS mailbox in a command procedure;
4. From within a MERGE template;
5. Interactively from the CHOICE field of a menu.

ALL-IN-1 has several unique features that include command stacking and the ability to trap responses and error conditions.

FMS Forms

VAX/VMS FMS is a DEC product that creates, modifies and displays screens of information. An FMS form consists of two distinct parts: the screen information or picture, and stored information called Named Data.

The FMS screen has numerous functions, but its primary purpose is to display a screen of information, like a menu. It also has secondary functions, however, like entry validation and field help.

Named Data is fixed information accessible by name; i.e., a program may access Named Data by its name. FMS stores named data with the form but doesn't interpret it in any way. Named Data doesn't appear on the screen.

ALL-IN-1 makes use of FMS forms by defining standard form types. An *ALL-IN-1* form type is declared through the use of Named Data and the *ALL-IN-1* directive .TYPE.

What's On The Menu?

Of many *ALL-IN-1* form types, the Menu form is by far the most common. In fact, when a user first enters *ALL-IN-1*, he receives a Menu form called MAIN, which in turn selects other Menu forms. As you then will see, adding, modifying and removing Menu forms is the easiest type of *ALL-IN-1* customization.

If you inspect the Named Data associated with an *ALL-IN-1* Menu form, you'll see that the first piece of Named Data is .TYPE, which is an *ALL-IN-1* directive that specifies and qualifies a form type. Form qualifiers, which begin with a slash (/), tell *ALL-IN-1* how to load and process various informational fields on the screen. For example, a Menu form could contain the following Named Data entries:

```
Named Data

1 Name: .TYPE
MENU/CHOICE=CHOICE/CLEAR
```

In this example, the qualifier /CHOICE is used to inform *ALL-IN-1* that the user's selection from the menu will be entered in the FMS field named CHOICE, while the /CLEAR qualifier clears the CHOICE field prior to the user entering a selection.

Following the first Named Data entry are subsequent entries for each item on the menu. For example, if your menu choices are:

```
C Create
E Edit
P Print
```

then your Named Data would look like this:

```
Named Data

1 Name: .TYPE
MENU/CHOICE=CHOICE/CLEAR

2 Name: C
DO DOCCREATE

3 Name: E
DO WPEDIT

4 Name: P
DO WPPRINT
```

In this simple example, menu selections are made to execute *ALL-IN-1* script files (*ALL-IN-1* command procedures). However, as we'll see below, Named Data provides a wealth of processing capabilities.

Making the Transaction

Another commonly used form is Entry, *ALL-IN-1*'s primary data-entry interface. Entry forms are used to define, create and solicit indexed Record Management Services (RMS) files.

To develop an Entry form, simply lay out on your form the fields that you want in the data file. The arrangement of the fields will determine their position in the record structure. The name of your file (and index key information) is specified in the forms Named Data

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using the .FILE directive. For example:

```
1 Name: .TYPE
ENTRY/MODE = UPDATE

2 Name: .FILE
PERSONNEL.DAT, SSN
```

The Named Data requests that the data file PERSONNEL.DAT be used, and that the file be accessed using the SSN field as its key.

Before Entry forms can be used to store and retrieve information, a data file first must be created to accompany them. The *ALL-IN-1* CREATE function accomplishes this. CREATE uses the FMS form fields and the forms layout to construct a record structure. If a File Definition Language (FDL) file specification is supplied, in the .FILE directive, CREATE will use the FDL specification.

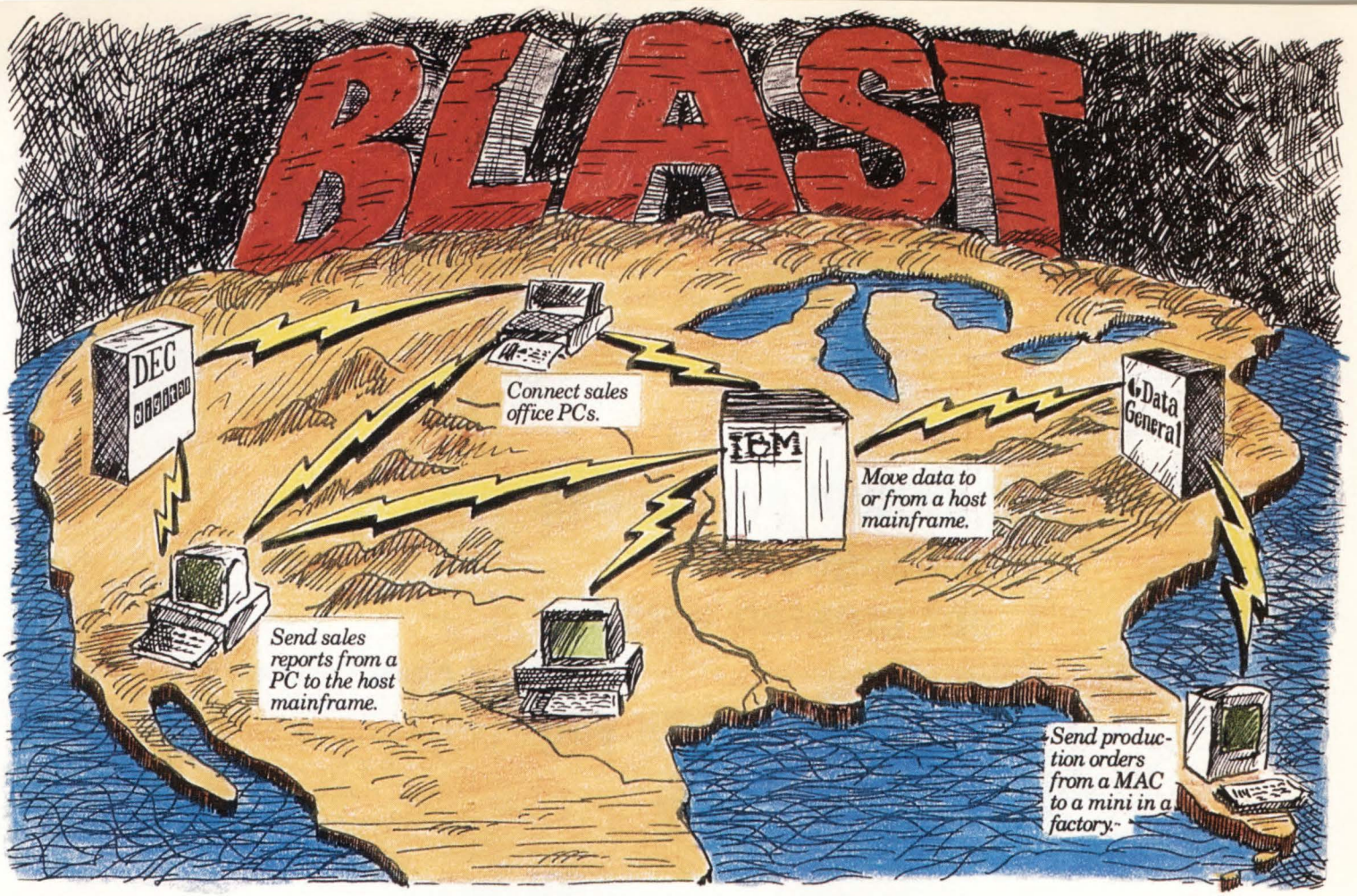
To use an Entry form, you use the *ALL-IN-1* FORM function. When an Entry form is displayed with the FORM function, *ALL-IN-1* does all of the transaction work for you. *ALL-IN-1* first makes the primary key field reverse video and then prompts the user for input. This input, or key information, then is checked against existing records.

If a record with the specified key exists, then the form will be filled in with the rest of the record information. *ALL-IN-1* then asks the user to select a transaction function: Add, Change, Delete, Inquire or Copy. By using Entry form qualifiers, the developer can preselect the transaction function. All functions can be accomplished from the same Entry form.

Using the *ALL-IN-1* Entry form eliminates the complexity of managing data files. Best of all, this method is fast, efficient and standard. In many instances, a simple application can be met using the Menu form, Entry form and Named Data. In most cases, building a data entry application like a mailing list or personnel file will take less than a day.

Searching For Mr. Good-Record

When dealing with data file applications, it's often useful, if not necessary, to search for records based on a given



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criteria. For this reason, *ALL-IN-1* has the Search form, .TYPE SEARC. The Search form is used to solicit Record Selection Expression (RSE) criteria from the user, which then will be presented to the *ALL-IN-1* Search facility. The RSE, specified in the forms Named Data, consists of a data set to be searched and instructions for matching fields. The result of the search is a collection of records from the data file source that match the RSE criteria from the data file source. This collection may be displayed on a form or written to a file.

Search forms have a single Named Data requirement, the .TYPE SEARC directive:

```
Named Data

1 Name .TYPE
SEARC [Sel-list-file] DATA SET,
   BOOLEAN EXPRESSION
```

Sel-list-file is a sequential file to contain the keys of the records that match the RSE. The file is referred to as a selection list. This is an optional argument. The DATA SET is the name of an Entry form that describes the indexed file to be searched. Finally, the BOOLEAN EXPRESSION is the set of instructions for searching the specified data set.

Picking The Cream Of The Crop

Typically, when a collection of records has been selected, the user will want to view and then single out or select a record from that collection. For this reason, *ALL-IN-1* has the Select form. The Select form displays one or more records from a collection and allows the user to select a single record from that collection.

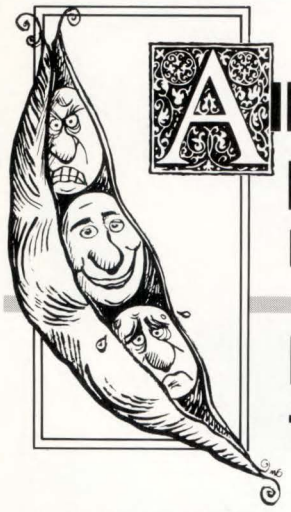
A Select form is comprised of two areas, which, at the designer' discretion, may be on separate forms. The first area is a scrolled region called DISPLAY, used to display the record collection selected through a FOR function. The second area is the fields to be filled in by the user for the RSE selection criteria. These fields may be any subset of the total record structure of the file to be searched. Consider:

```
Named Data

1 Name: .TYPE
SELECT FOR PERSONNEL WITH
   .LNAME = = LNAME

2 Name: .TYPE
DO SEL__STYLE.FNAME.LNAME.SSN/
   STYLE = CHOICE
```

In this example, all records with the last name matching the user's entry will be selected. The fields that will be displayed are defined by the SEL__STYLE function. The qualifier /STYLE=



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CHOICE is used to display the record collection and offers the option of selecting one of the records.

Other Useful InFORMation

The forms described above are by far the ones most commonly used in *ALL-IN-1* applications. There are, however, other *ALL-IN-1* form types to be aware of: Argument form, Calc form and Desk form.

The Argument form (.TYPE ARG), functionally the simplest of *ALL-IN-1* form types, is used to solicit information from the user. This information, or arguments as they're called, can be used by your application immediately or stored in symbols for later use.

The Calc, or calculation, form (.TYPE CALC) is used to perform repeated operations. This form type typically is used to solicit, evaluate and then display algebraic expressions. The related Desk form is a simple non-customizable desk calculator.

A typical problem when developing transaction-related applications is validating user input. *ALL-IN-1* solves this problem for the application designer by providing a Field Processing facility. Field Processing, like *ALL-IN-1* form processing, can be performed in Named Data.

The *ALL-IN-1* Field Processing facility is used to manage the flow of data through form fields. This facility is capable of processing information that passes through the fields, and of interpretation of defined keys.

In general, Field Processing qualifiers will be a part of the Named Data used in Entry and Argument type forms. For example:

```
Named Data

Name: CAR_TYPE
/VALID = OA$TABLE:"SEDAN,SPORT,
  COUPE,COMPACT,TRUCK"
```

In this Named Data illustration, CAR_TYPE is the name of a field on the form that only will accept the entries SEDAN, SPORT, COUPE, COMPACT and TRUCK. OA$TABLE is a special data set type.

> ***Once ALL-IN-1 is discovered for its true ability, rather than its supplied functionality, I think you'll see a boom in ALL-IN-1 product development.***

Programming In *ALL-IN-1*

Although it's possible to invoke *ALL-IN-1* functions from Named Data in FMS forms, it's often necessary to construct more elaborate procedures to accomplish a task. It's for this reason that the *ALL-IN-1* Script environment was created. *ALL-IN-1* supports two types of scripts: Do-mode scripts, invoked with the *ALL-IN-1* DO function; and Script-mode scripts, invoked with the *ALL-IN-1* SCRIPT function.

Do-mode scripts are, for all practical purposes, *ALL-IN-1* command procedures. They're similar in function to the VAX/VMS DCL command procedure. Do-mode scripts add functionality to *ALL-IN-1* in the form of script directives; e.g., .IF...THEN...ELSE, .JUDGE, .GOTO, .LABEL, etc., which provide the application developer with true programming power and flexibility.

Script-mode scripts, unlike Do-mode scripts, can simulate user keystrokes. This makes the Script-mode script ideal for such tasks as computer-based instruction and user-defined procedures. The Script-mode script typically isn't used to develop applications.

The Tie That Binds

Of the many *ALL-IN-1* functions, the ability to integrate any VAX/VMS application into its menu structure potentially is the most valuable. *ALL-IN-1*, like other VAX/VMS programs, runs in the context of a process. VAX/VMS allows each user to have multiple subordinate processes (subprocesses) in his or her main processes. *ALL-IN-1* uses this capability to its fullest extent, providing the application developer the tools to execute VAX/VMS applications easily in a subprocess from within *ALL-IN-1*. *ALL-IN-1* can communicate with applications running in the subprocess through the use of VAX/VMS mailboxes, global symbols, and command procedure parameters (P1 to P8).

ALL-IN-1 creates and opens three VMS mailbox devices for each subprocess. These mailboxes may be used to execute *ALL-IN-1* functions.

To pass parameters to a DCL command procedure, *ALL-IN-1* allows eight parameters to be defined when the command procedure is invoked. These eight parameters correspond to the symbols P1 to P8 in the command procedure.

Any permanent symbols defined in *ALL-IN-1* may be referenced as global symbols in the subprocess. These symbols typically would be defined by an Argument form in *ALL-IN-1*.

Once *ALL-IN-1* is discovered for its true ability, rather than its supplied functionality, I think you'll see a boom in *ALL-IN-1* product development. Will you be on that band wagon? — *David W. Bynon is a VAX systems consultant in Silver Spring, Maryland.*

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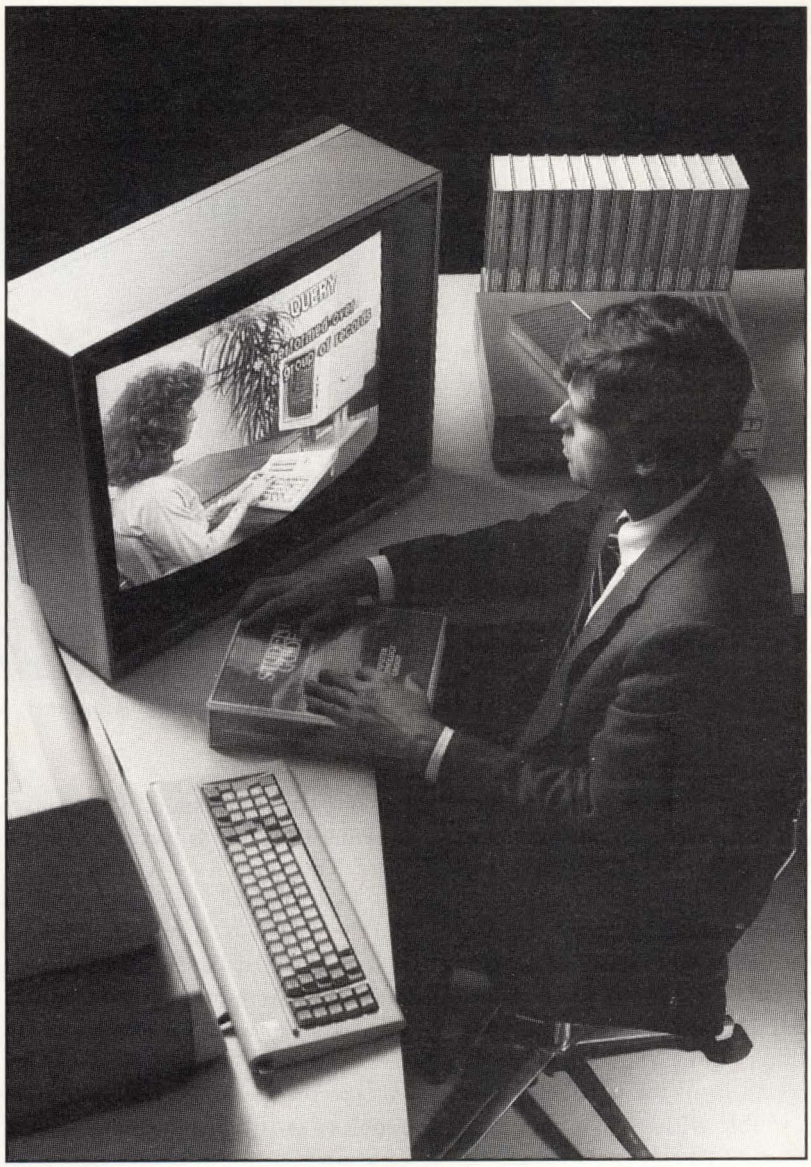

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DEC WATCH

Charles Connell

Custom Services From DEC

Imagine this: You own a business that sells a few high-technology products. To improve service to your customers, you set up a phone line and invite them to call about any problems. Before the first year is over, *one million* people have called.

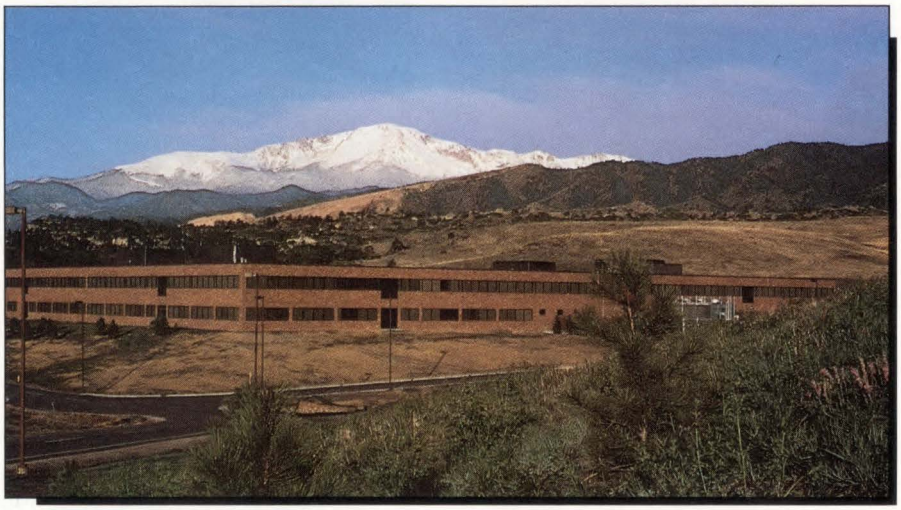
While this story is simplified, essentially this is what happened at DEC's Customer Support Center in Colorado Springs.

The Customer Support Center (CSC) opened in April 1986 to consolidate DEC's remote customer services and internal Field Service support. The facility employs 630 people, including 300 software specialists and 130 hardware specialists. The 300,000 square foot building contains 250 computer systems, 5,000 telephones and 1,700 incoming phone lines.

If you purchase telephone support from DEC, most of your calls will go to the Colorado CSC (some products are supported from other locations). When a call comes in, it's routed to someone who specializes in the product you're having trouble with.

Within a particular product group, the CSC has a number of levels of expertise. If your problem is tricky, it will go to a more experienced person. DEC also tries to match gurus with gurus. If you call and start spouting technical jargon, the CSC will try to route your call to someone who can swap tech-talk with you.

Closely related to dial-in customer support at the CSC is DEC's effort to improve its reputation for on-site service. DEC is acutely aware that its image in this area lags behind IBM's. When you now call DEC about a problem with your computer system the person who responds has the responsibility to fix it whether the cause is hardware or software. This wasn't always the case.



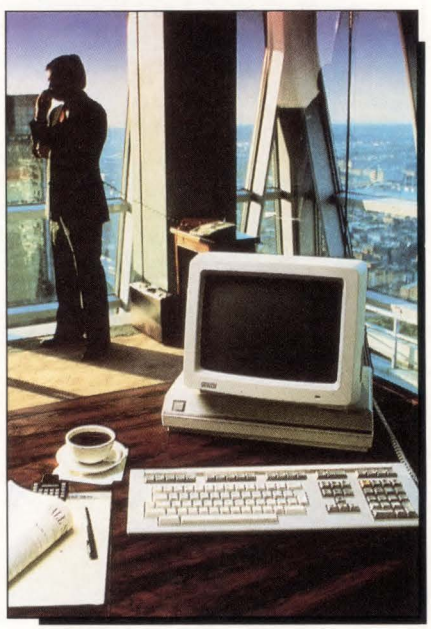
The Colorado Springs Customer Support Center (CSC) is one of Digital's 14 worldwide centers.

DEC's Field Service personnel use the CSC for help in delivering this integrated service. Given the complexity of current computer systems, and the interaction between hardware, software, firmware and networks, no Field Service person possibly can solve every problem on his own. Along with its function of customer phone support, the CSC is DEC's largest internal resource for Field Service backup.

Customized *ALL-IN-1* For Sale

ALL-IN-1, DEC's office automation system, has been one of its biggest selling products. Besides direct revenue from its software licenses, DEC also has leveraged a lot of hardware sales with *ALL-IN-1.* Customers buy VAXs because they like the office automation software.

Vanilla *ALL-IN-1* comes with a set of menus that allows users to perform word processing, filing, electronic mail and other common office functions.



ALL-IN-1, ***with its flexibility and customizability, allows you to modify the list of choices on any menu, add entire new menu trees and change the screen headers to include your company's name.***

One of the software's major selling points, however, is its "customizability." You can modify the list of choices on any menu, add entire new menu trees and change the screen headers to include your company's name. You also can link other DEC software and your own applications into *ALL-IN-1,* making them callable from its menu structure.

Using this flexibility, some customers have modified *ALL-IN-1* to the point where it bears little resemblance to the product they received from Digital. Over the last two years, DEC has joined the action as well and released its own customized *ALL-IN-1* environments. It now sells three such products: System for Employment Management (SEM), System for Business Operations (SBO) and System for Sales and Marketing (SSM).

You could create each of these systems on your own by writing application programs and tailoring *ALL-IN-1.* What you're buying are the hours of work that DEC has put into the customization.

SEM, for example, contains a variety of functions that are likely to be useful in personnel departments. Two of these functions are an applicant/job matching application program and standard report writing. Applicant/job matching accepts information about each applicant and each job opening. A menu choice then searches for matches between jobs and applicants, and vice versa. Report writing is aided by 18 standard forms that come with SEM and corresponds to reports that often are required in personnel offices.

SBO, on the other hand, is tailored to meet general business needs. It includes spreadsheet software, chart-making graphics and a database system. One interesting feature of SBO is its ability to send spreadsheets through electronic mail. DEC suggests that this function can be used to let each manager fill in his part of a forecast. After filling in the data he knows about, a manager can send the spreadsheet back to the forecast coordinator or on to another manager.

These systems are layered on top of *ALL-IN-1* and other products, and often require that the other software be in place before they will run. SSM, for example, uses *ALL-IN-1, DATATRIEVE, FMS, CDD* and *DECGRAPH.*

Prices for SBO range from $6,000 for the MICROVAX to $36,000 for the VAX 8800, and do not include required ancillary software. For SSM, the prices are $6,600 for the MICROVAX to $39,600 for the VAX 8800. SEM is sold bundled with other software, and prices reflect the composition of the package.

If you're thinking about buying *ALL-IN-1* and plan to customize it, one of these products might save you months of work. —*Charles Connell*

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FROM THE LAB

David Bynon

TurboDisking My MICROVAX II

In my recent quest to have the ultimate MICROVAX II, I found a new product — the TurboDisk — that makes sure my MICROVAX II will absolutely, positively get the job done overnight.

TurboDisk, by EEC Systems Inc., is a memory disk that emulates a physical Mass Storage Control Protocol (MSCP) disk device. EEC has labeled the package improperly as a Virtual Memory Device. It's not. VAX/VMS memory management doesn't control the physical memory occupied by the memory disk; TurboDisk memory is allocated permanently and never is swapped or paged to disk. TurboDisk is in fact a pseudo disk device with performance just short of incredible.

TurboDisk has specific applications, which, if applied correctly, will net a dramatic increase in disk I/O for the application using it. TurboDisk won't improve CPU performance. In fact, it could rob your system of precious CPU cycles. But, this requires an explanation: Most VAX disk/disk controller subsystems in current production are intelligent DMA devices that off-load processing from the CPU. They can accept and process multiple I/O requests and read/write data to/from a common buffer, which frees the CPU to process other instructions while the disk I/O is completing.

The only responsibility the CPU has is to request the disk transaction and to move the data to and from the buffer. In the case of TurboDisk, the aforementioned also is true. Plus, the CPU must perform the same activities as the disk and its controller.

The EEC TurboDisk performs best reading and writing small amounts of data. The claimed performance on a MICROVAX II is a continuous 1.3ms access time with a transfer rate of 1 MB per second. This compares favorably against my RQDX3/RD54 combination, which clocks in with an average access time of 56ms and an average transfer rate of 0.3 MB per second.

With this information firmly implanted, I thought a new test, something tangible, was in order. So I dusted off one of my customer's mailing lists, a 50,000 name beauty that spans the continental United States. Before printing, the mailing list is updated by searching for and deleting names contained in a delete database, and adding names contained in an add database. This operation, for 3000 names in each database (delete and add), takes six to eight hours on the MICROVAX II. It's typically done overnight in batch.

For the test, I randomly selected 1000 records from the mailing list. The mailing list file format is 117-byte fixed-length records with one key. The key field is the ZIP code.

Two tests were performed that

TABLE.

	SORT	WRITE
TurboDisk	1:26.21	2:07.00
RQDX3/RD54	2:08.00	4:08.32
(Time is in MIN:SECONDS.1/100th of SECOND)		

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would gauge the realistic performance difference between the TurboDisk and RQDX3/RD54. The first test was to sort the 1000-record database and the second was to write the sorted list of records to a new indexed file, causing VMS to write the records sorted by the key field. I used *DATATRIEVE* to perform the operations.

In both test cases, the TurboDisk outperformed the RQDX3/RD54. However, the performance did not fall in line with benchmark statistics provided by EEC. (See Table). What the TurboDisk test proved to me, however, is that I will be able to cut my indexed database processing time in half. That's pretty good news.

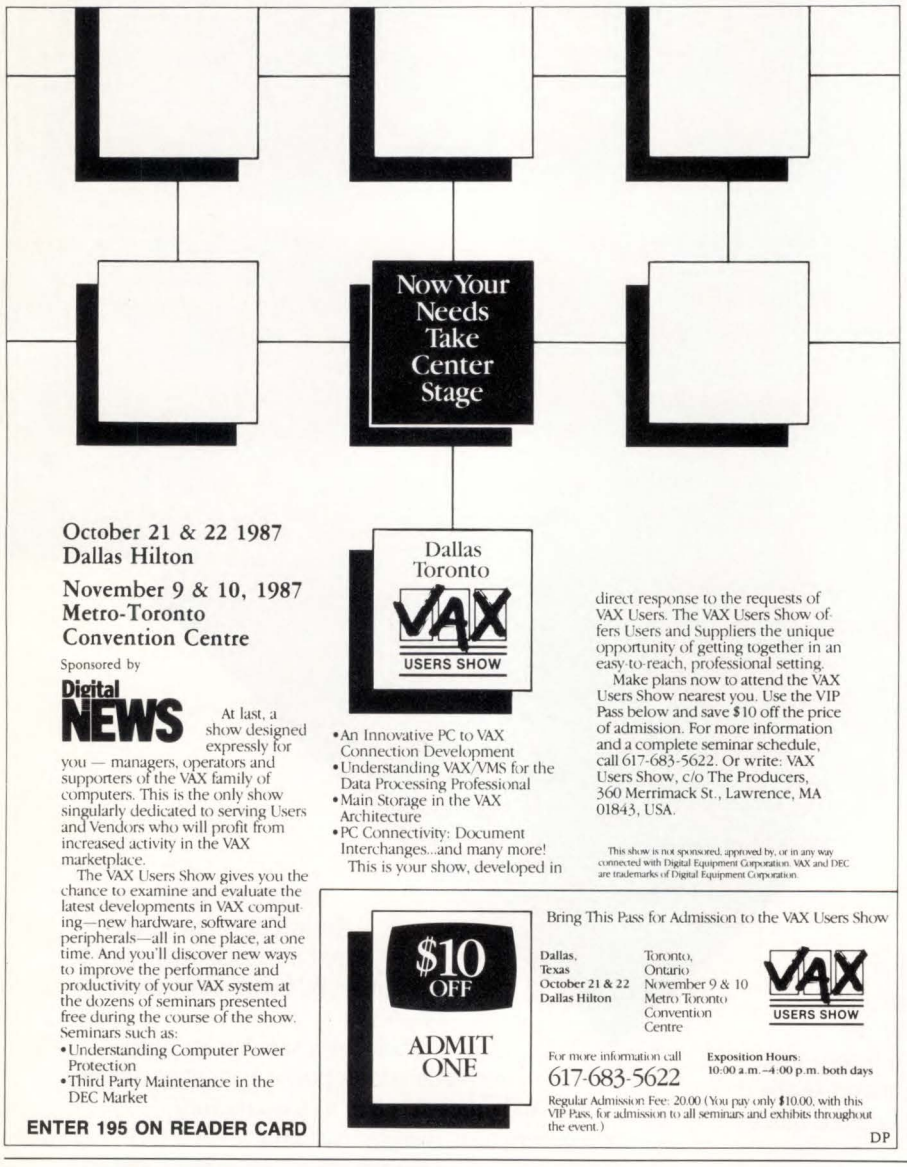
The bad news is that using the TurboDisk for data files is risky and time consuming. If the system crashes or loses power, the contents of the TurboDisk will be lost. Second, it's up to you, the user, to safeguard your files by moving them into and out of the TurboDisk before and after processing.

> ***"In both test cases, the TurboDisk outperformed the RQDX3/RD54."***

A better use of the EEC TurboDisk would be for activation of images or command procedures. This is because the system, at startup time, could control management of the disk (i.e., creating directories and logical names, and copying files). This is a safe use of the TurboDisk because the original files still lay safely on the system disk.

By installing programs that are accessed frequently, system performance on a heavily used system can be improved. The reason is simple: On a heavily loaded system, for example, a system running *ALL-IN-1*, *DATATRIEVE*, *Rdb, Oracle, Ingres, WPS-PLUS* or any product that relies on numerous shared images, the page fault rate or long duration of a high page fault is what kills the system.

When investigating performance complaints on systems running *ALL-IN-1,* I consistently find the same problem: *ALL-IN-1* systems will peg the system page fault rate to the red line and hardly work the CPU at all. With these facts firmly implanted, and the knowledge that TurboDisk has lightning fast access, at the expense of the CPU, I set out on a new venture.



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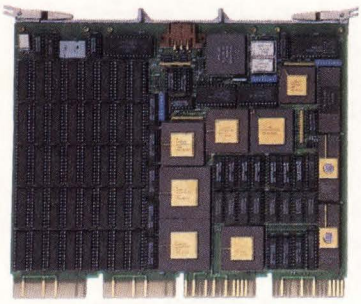

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What I did, for the sake of the experiment, was to allocate half of the MICROVAX's 16 MB of main memory to TurboDisk. Next, I used a slick tool, provided with TurboDisk that allows you to find the "Hot Files" on your system. EEC calls it file I/O recording and, as its name implies, it records information about disk file access. Information recorded for each file access includes the FILE-ID, DEVICE-ADDRESS, PID, BLOCKS-TRANSFERRED and a WINDOW-TURN flag. For a system in need of continuous disk load balancing, the file I/O recording alone is worth the cost of TurboDisk.

After a day of file I/O recording, I used the TurboDisk reporting facility to sort out my *ALL-IN-1* hot files. I was not surprised to learn that there are almost 16 MB worth of executable files, scripts, form libraries and data files that *ALL-IN-1* accesses routinely. I was forced to decide what files to install in TurboDisk.

I chose the small hot files, the precompiled form libraries and script files (TXLs) and the *ALL-IN-1* data files. The *ALL-IN-1* image (A1.EXE), at 1.5MB, was too large, as were most of the shared executables (files from SYS$SHARE and SYS$MESSAGE).

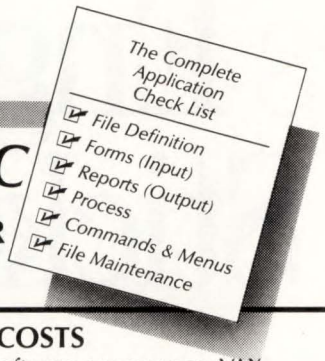
Running the new *ALL-IN-1* installation, I perceived only a small difference. This was to be expected because the *ALL-IN-1* image wasn't on TurboDisk. The noticeable difference was the speed with which *ALL-IN-1* displayed new menus and executed named data and script functions.

To test a loaded system before and after putting *ALL-IN-1* in the TurboDisk, I executed six *ALL-IN-1* sessions using scripts to stand in for users. The scripts performed various random functions. The TurboDisk test demanded an average of 10 to 25 percent more CPU utilization, the system direct I/O rate was a whopping 30 to 50 percent higher, and the page fault rate duration went down by as much as 20 percent.

In real-life terms, what I experienced was a smoother running system with less delay between menus and functions. There was no doubt that TurboDisk increased the disk I/O throughput. That's good news!

Unfortunately, I was unable to load the system down with a realistic number of users because of the memory restriction the TurboDisk placed on the MICROVAX. My only reservation about TurboDisk, especially on the MICROVAX, is that it robs a system of precious memory.

Not to worry, says Eric Dickman, president of EEC. EEC recently has started shipping a new TurboDisk product, called TurboDisk Plus, which provides TurboDisk functionality in its own private QED1 memory, available from



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Clearpoint. TurboDisk Plus may be from 4 to 60 MB (even more when VMS V5.0 rolls out) in size, in increments of 4 MB. To house the new memory, EEC is producing a special expansion box with power supply and backplane. A backplane extender is used to connect the original MICROVAX backplane to the expansion chassis. If your system has backplane slots available, the expansion chassis isn't required.

Impressions

TurboDisk installed easily and the documentation is both informative and easy-to-use. However, I would hope to see a professionally printed manual soon.

Several management tools provided, such as startup, shutdown, backup and file I/O recording, help the system manager maintain the TurboDisk. These are a welcome addition over previous versions.

Overall, TurboDisk is a fine product. Installed on a system bound by disk I/O, TurboDisk will produce dramatic results. Be aware, however, that you must be willing to put in the time necessary to investigate your systems file I/O load and then experiment. But when you do it right . . .

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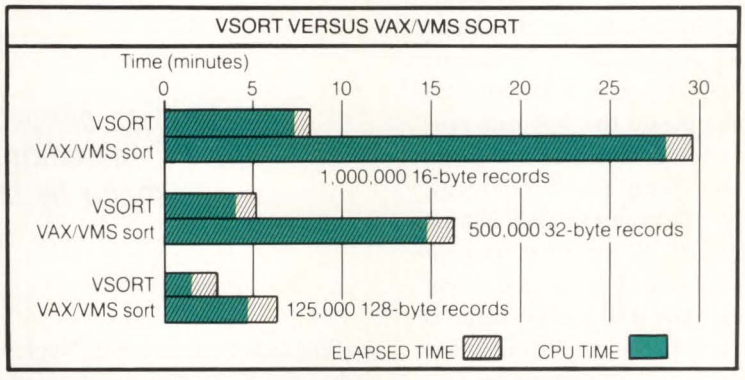

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FROM THE LAB

Carl B. Marbach

The Xyplex/*Mobius* Connection, Part 2

Editor's note: Part 1 of this two-part review appears in the September issue. FEL Computing of Williamsville, Vermont, has designed a software package that lets you communicate between your PC (or clone) and a VAX from just one side — either the PC or the VAX. If you're a VAX user it's possible to operate the PC, run programs and transfer data back and forth, without ever using MS-DOS directly. Conversely, a PC user can have and use the full power of the VAX without knowing anything about VMS or using the VAX directly. The *Mobius* name is well chosen: A *Mobius* strip has only one edge, one side and is continuous.

At its basic level *Mobius* is a simple communication package that allows minis and micros to talk to each other; at its most complex, *Mobius* is a complete integration package that includes a language built for these communications.

Hardware

In Part 1 we discussed the Xyplex network and the installed PC Xpander card in the PC that allows connection directly to that distributed network. When linking PCs to a VAX, particularly when doing file transfers, the fact that Xyplex handles the incoming characters without interrupting the CPU can lead to reduced overhead.

In our test of copying a large file from the PC to the VAX, *Mobius*/Xyplex used approximately one-third of the CPU resources required using a DMF32 asynchronous terminal link.

Mobius works on a standard RS-232 port, but using the higher bandwidth Xyplex network results in faster transmissions and screen paints. Xyplex distributes *Mobius* as an OEM, and its version has some added banners informing you about the Xyplex connection. The version supplied from FEL Computing didn't tell us about Xyplex, but it has the Xyplex protocols available.

> **Mobius *supports several keyboards for the PC including the DEC LK-250, specially made by DEC for non-DEC PCs.***

The Xyplex network will run over its own cable or will use any Ethernet as a pathway. Because every device on Ethernet has its own manufacturer-supplied address, there is no interference with other protocols, like DECNET, running on the same Ethernet.

Loading The Software

Both the PC and the VAX have micro/host software that must be installed before *Mobius* will work.

On the PC, adding the command:

```
>RUN \MOBIUS\MOBIUS
```

installs the package memory resident on the PC. *Mobius* will work with other memory resident software, but you'll have to be careful which gets loaded first, or last. For example, Borland's popular *Sidekick* program must be started last.

To set the defaults for the micro *Mobius*, use the MSETUP program. This ensures that *Mobius* will start using the correct communication parameters. MSETUP also allows you to specify other *Mobius* options such as key click or terminal type.

Note: To deinstall *Mobius*, simply run the NOMOBIUS program. Sometimes, however, because of the interaction between memory resident programs, you may not be able to deactivate it.

Terminal Emulation

Once micro *Mobius* has been installed, you can connect to the VAX and begin a terminal type session by typing CNTL-A. To return, the command is CNTL-\.

Mobius supports several keyboards for the PC including the DEC LK-250, specially made by DEC for non-DEC PCs. In addition, it allows you to change the key definitions for the keyboard you are using via a table-driven file. Remapping the keys to your personal emulation takes some of the horror out of running a VAX application on a PC keyboard, but not all. Although terminal emulation is part of the *Mobius* package, its main goal is to move the PC closer to the VAX.

VAX Installation

Mobius is distributed as a BACKUP saveset and is easily installed. The distribution contains a START control

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file that is added to the SYS$STARTUP. VAX users run *Mobius* with the command MOBIUS.

The VAX software acts as a file and process server to *Mobius* on the PC. For a user to take advantage of this, he must start MOBIUS in his VAX account, where it will have access to whatever privileges, directories and files regular security grants him. *Mobius* is a user process, not a system one.

Once it has been run, *Mobius* takes control of the user's process, and commands to *Mobius* are used for any VMS functionality needed. From the MOBIUS>> prompt you can define a PC device to point to that VAX directory:

```
DEFINE D: HOST *.*
```

This makes the user's current directory available to the PC as if it were drive D:. All files (*.*) on the HOST are available. For example, if you only wanted BUDGET.DAT and ALLOC.DAT to be available, use the command:

```
DEFine D: HOST BUDGET.DAT,ALLOC.DAT
```

Or you could redirect the printer output with:

```
DEFine PRN: HOST LPT:
```

which directs PC printer output to the VAX LPT:. Or you could direct it to the laser printer on port TXA6: simply by typing:

```
DEFine PRN: HOST TXA6:
```

You can specify VAX subdirectories by:

```
DEFine D: HOST
  [MARBACH.PC.BACKUP]*.*
```

Devices can be removed from use with a similar UNDdefine command.

Only the first letters of any command have to be typed; when the three characters are followed by a space, *Mobius* automatically fills in the rest of the command.

The STAtus of the MICRO/VAX link can be listed and several channel parameters can be set, including seven- or eight-bit transmission, error tolerance and time-out features for deciding when the VAX isn't responding. For the Xyplex configuration the SET CHANNEL BUFFER 2048 command will set the buffering to 2048 characters using the capability of the Xyplex add-in card. If this change is not made, the transfers will fail.

Note: All of these commands assume that you're in terminal emulation mode, attached to the VAX via a

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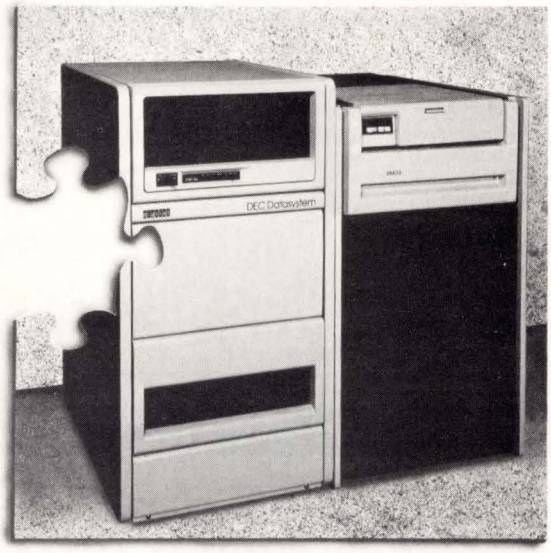

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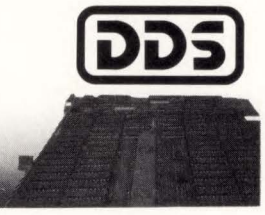

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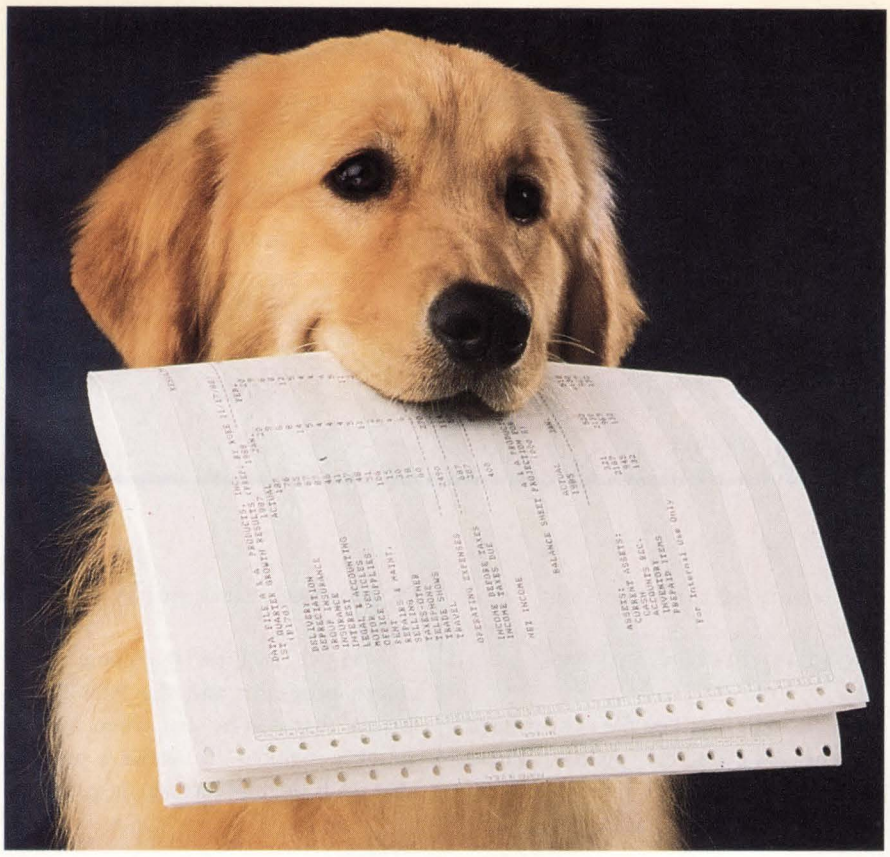

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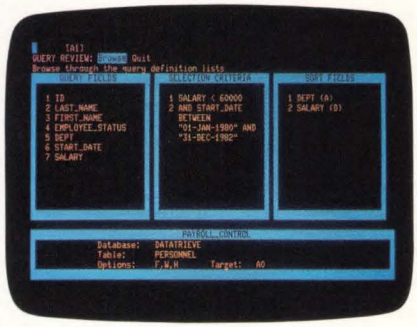

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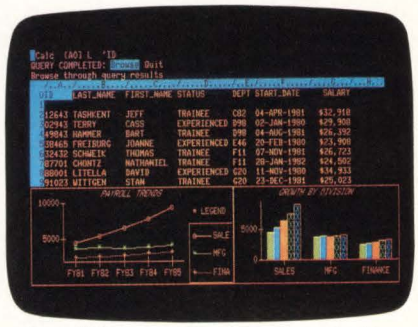

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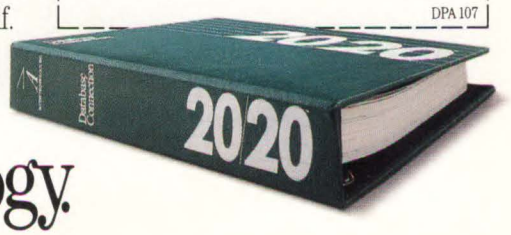

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FEL Computing
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Williamsville, VT 05362
(802) 348-7171
Enter 445 on reader card

TABLE 1.

	Xyplex/*Mobius*	DMF32 TRANSFER
CPU sec	58	191
BUFFERED I/O	3780	21925
DIR I/O	1153	652

CNTL-A, and that micro *Mobius* is running on the PC.

Auto Startup

Mobius will look for a system-wide file, MOBIUS.MBS, when it first starts. Failing to find it system wide, *Mobius* will look in the user's account for the file. MOBIUS.MBS can contain commands exactly as they would be typed to *Mobius*. Our MOBIUS.MBS file looks like this:

```
DEFINE D: HOST *.*
DEFINE PRN: HOST TXA6:
SET CHANNEL BUFFER 2048
SET CHANNEL TIME-OUT 30
```

This file defines drive D: on the PC to be the current VAX default directory; the PRN: printer on the PC to be the spooled device TXA6: (a laser printer); and it sets the channel buffer and time out to acceptable values.

The VAX user just logs in and runs *Mobius*; all the commands are already in the MOBIUS.MBS file.

Running The PC From The VAX

The distribution tape contains a VAX program called PC, which sends commands to the micro that will be answered on the VAX. For instance, the command:

```
PC DIR A:
```

will produce a listing of the PC's drive A: directory on the VAX. And:

```
PC COPY D:LOGIN.COM PRN:
```

causes the LOGIN.COM file to be printed on the PC's logical printer. These facilities give the VAX user access and control from either VMS or the PC.

Auto Processing PC

Mobius provides utilities that allow you as a PC user to access the VAX host *without* manually connecting it with a CNTL-A and typing VMS commands. The utilities allow you to define PC programs or procedures that send your request along to *Mobius* running on the VAX, allow the VAX to process that request, and then pass control back to the PC.

The master of the utilities is a language called TASK-FORCE. This language allows you to write procedures on the micro that will send messages to the VAX host and then act on the host's response.

Running a VMS utility or program from the PC uses a utility called RUN. For example, typing RUN MAIL invokes the VMS mail facility, and displays all the usual prompts and functions normally without the PC user ever knowing he was in VMS! When the MAIL is exited via the EXIT command, control returns to the PC.

Another option is a utility called MAKE, which allows you to construct a file that can be invoked like any other PC program, that is, just by typing its name.

MAKE requires the name of the micro program, and the HOST commands that will be sent when the program is invoked. To MAKE a program that reads the first message in your mail:

```
MAKE
READ1          !Micro Name
MAIL           !This goes to VMS
READ 1         !Command to MAIL
EX             !Finished
```

At the micro prompt:

```
C:> READ1
```

reads your first message and then returns to the micro prompt C:>.

In case you forget what you put in a file that you've "made," the utility UNMAKE tells you what's in it.

Any VAX program or utility can be run this way, insulating the PC user from VMS, but giving him access to the corporate MAIL. Now if only we could make the connection and log in automatically, the PC could be connected automatically at boot-up time without user intervention.

Auto Login/Connection

The TASK-FORCE procedural language allows you to control the communication channel and commands sent both ways across it. Using verbs such as SEND and READ_KB, or T_E (terminal emulator), the TASK-FORCE allows you

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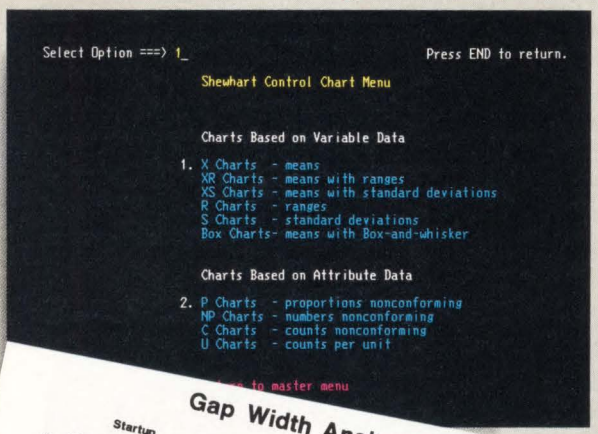

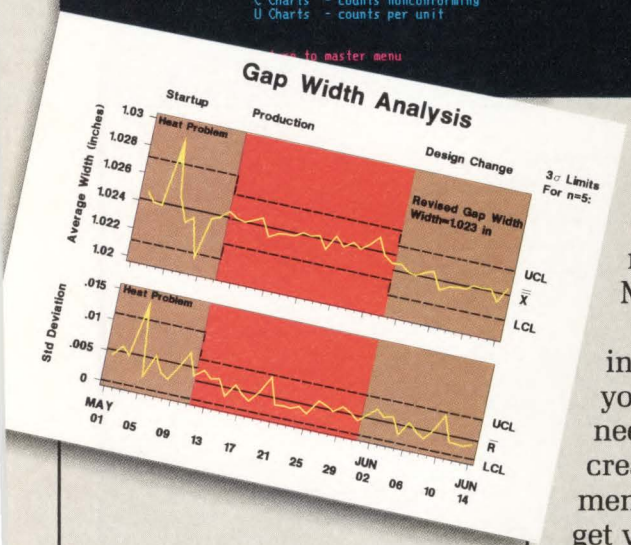

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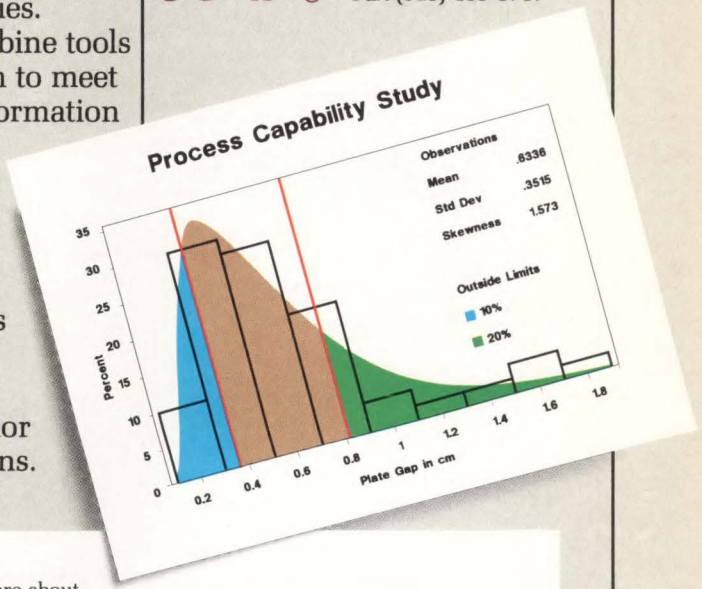

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to construct an automatic system to access the VAX from the PC. Program one is an auto login program that shows how you automatically can connect to the VAX and then log in.

Our AUTOEXEC.BAT contains commands to attach automatically to the VAX. You simply log in, let the host MOBIUS.MBS file set up the host values, return to the micro and start the VMS MAIL facility.

Performance

Mobius on the Xyplex network is fast and efficient. In our lab, we copied a 1683 block file (1683 X 512 bytes = 861,696 bytes transferred) using the MS-DOS copy command for *Mobius* and a file transfer routine from another communications package (see Table 1).

Our test times included the overhead necessary to start up the respective systems. In real-time on our busy VAX, the *Mobius*/Xyplex combination was almost six times faster in wall clock time, 3:45 to 24:00. If you're doing a lot of file transfer into the VAX, Xyplex handles it efficiently, relieving the CPU of a lot of the work. Some of the savings also comes from the fact that there is a 2K buffer in the Xyplex PC card that makes the PC end more efficient.

The *Mobius* transfer rate works out to approximately 14,300 baud including all overhead; that's more than 1400 bytes per second. When in the terminal emulator, screens paint so rapidly that they look more like PC painted screens than VAX screens filling at 9600 baud. On output from the VAX, where less work is done, the rate is very fast.

The *Mobius* manual comes in the

PROGRAM.

```
COMMENT *
        LOGIN.TSK           FEL Computing


        Modified for use by DEC PROFESSIONAL

        USAGE: TASK LOGIN USERNAME PASSWORD

        For use as a standalone routine, from a .BAT file, etc.

        Connects to a XYPLEX Network with the command:
        C VAX

        Then.....

        Logs into a VAX SYSTEM with your USERNAME and PASSWORD

        This expects a standard '$ ' VAX Prompt
        *

         PARAMETERS [ User_Name, User_Pass ]

         ALLOCATE VAX_Buffer, 512   ! This buffer is 512 bytes long

COMMENT *
        The PROMPT_TYPE is used to check for a
        successful LOGIN. This could be a parameter, or
        a better way to do this would be to look for
        the USER_NAME as a result of a SHOW PROCESS
        command
      *

          CLEAR_SCREEN
          PRINT "                                    Connecting to VAX"
          PRINT"  "
          PRINT"  "
          PRINT"      D: will be VAXdisk"
          PRINT"    PRN: will be TXA6:"
          PRINT" "
          PRINT"   BUFFER set to 2048"
          Prompt_Type = "$"


COMMENT *
        This is the MAIN routine

        This global variable is used to return a
        value to DOS when the program terminates.
        The BATCH ERRORLEVEL can be used to check
        this return status.  Initially set to 1 for
        an error.  Set to 0 on a successful LOGIN and
        returned to DOS.
      *

        Log_Status = 1              ! Set for an error return

        VAX_Echo = _RECEIVE_ECHO    ! Save the echo

        _RECEIVE_ECHO = _FALSE      ! Set to _TRUE for DEBUGGING

        _SCREEN_LOCK = 1            ! Turn off the display for silent running

        CALL Get_VAX                ! Try to login


        _SCREEN_LOCK = 0            ! Restore system operations

        _RECEIVE_ECHO = VAX_Echo


        PRINT "" | PRINT ""

        QUIT Log_Status             ! Make this a return for use
                                    ! by other procedures


PROCEDURE Get_VAX

        Retries = 3

Retry_Loop:


        SEND
        SEND "C VAX"
        SEND

        SEND _NAK           ! Send a ^U CR to clear out line garbage
        WAIT 1              ! and get its attention

        RECEIVE VAX_Buffer,
         [
          "Username: ": GOTO Enter_Name
         ], ,10

        Retries = Retries - 1

        IF ( Retries == 0 ) THEN GOTO Failed

        GOTO Retry_Loop

Enter_Name:

        SEND _NAK;          ! Send a ^U to clear out line garbage

        SEND User_Name      ! Send user_name followed by CR

        RECEIVE VAX_Buffer,
         [
          "Password: ": GOTO Enter_Pass
         ], , 10

        GOTO Failed

 Enter_Pass:
                            ! Same as above, but now the password
        SEND _NAK;
        SEND User_Pass

        RECEIVE VAX_Buffer,
         [
          Prompt_Type: GOTO Success
          "User authorization failure": GOTO Failed
         ], ,60

        GOTO Failed

Success:
            ! Start up Host Mobius
            ! Report success to user, let her know what's going on
        PRINT "                                 Login successful"
        PRINT ""
        PRINT "                                 Starting Host Mobius"

        SEND "MOBIUS"

        RECEIVE VAX_Buffer,
         [
          "MOBIUS>>": GOTO Init
         ], , 20

        PRINT "Unable to start Host Mobius"

        GOTO Failed_Mob


Init:

COMMENT *
            Now initialize the micro by sending an OK
            and get into the terminal emulator to
            complete the initialization process.  This
            will cause the micro to exit the terminal
            emulator when initialization with Host Mobius
            is complete.
          *

        SEND "OK"
        ENTER_TE


        Log_Status = 0          ! Success return for DOS

        PRINT "                                 Host Mobius started."

        RETURN

Failed:
        PRINT "Unable to LOGIN to VAX"

Failed_Mob:
                        ! Log_Status is left at 1 - an error - and
                        ! this is an implied RETURN
END_PROCEDURE
```

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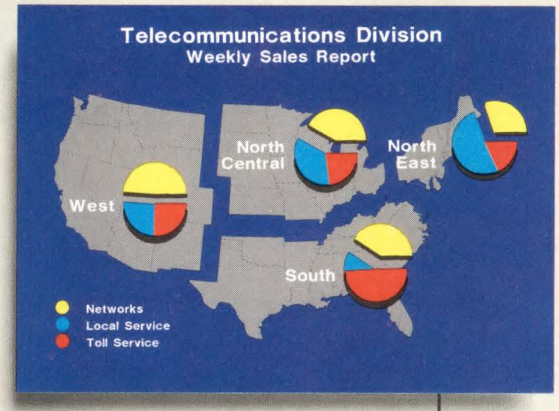

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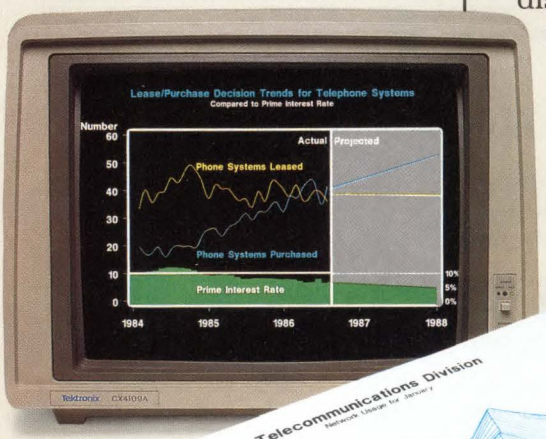

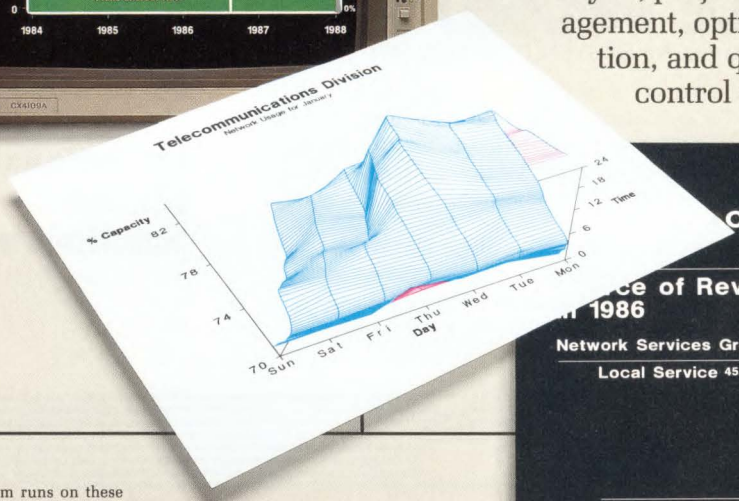

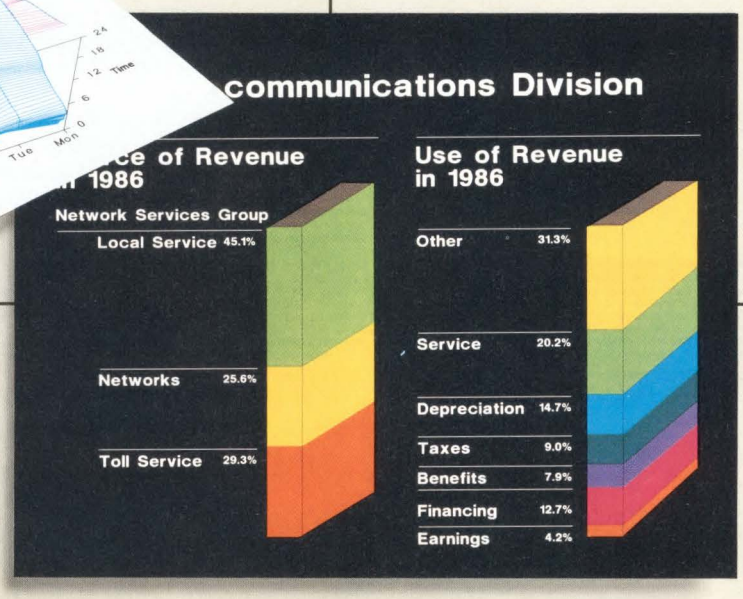

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familiar small three-ring binder. The manual starts simply and then adds detail in an effort to lead you through the system without becoming overloaded. But there is a problem in that after you've read the manual and you need to go back to find out about a particular area in more detail, that in-depth section is hard to find. I prefer manuals that start out and go right through on a subject.

You can get all you need out of the manual, but it's harder than necessary. The people at FEL should take the time to rewrite the manual; it would be worth it.

In addition, there are some glitches in the simplest of transfers. Did you want seven- or eight-bit transfer? If you want seven bit, but transfer eight bits, there's a host *Mobius* utility called TEXTIFY to convert eight-bit to seven. This is easy to do, but hard to understand. It's one of the many small problems, inconsistencies really, between a PC and a VAX that have to be solved in your own environment.

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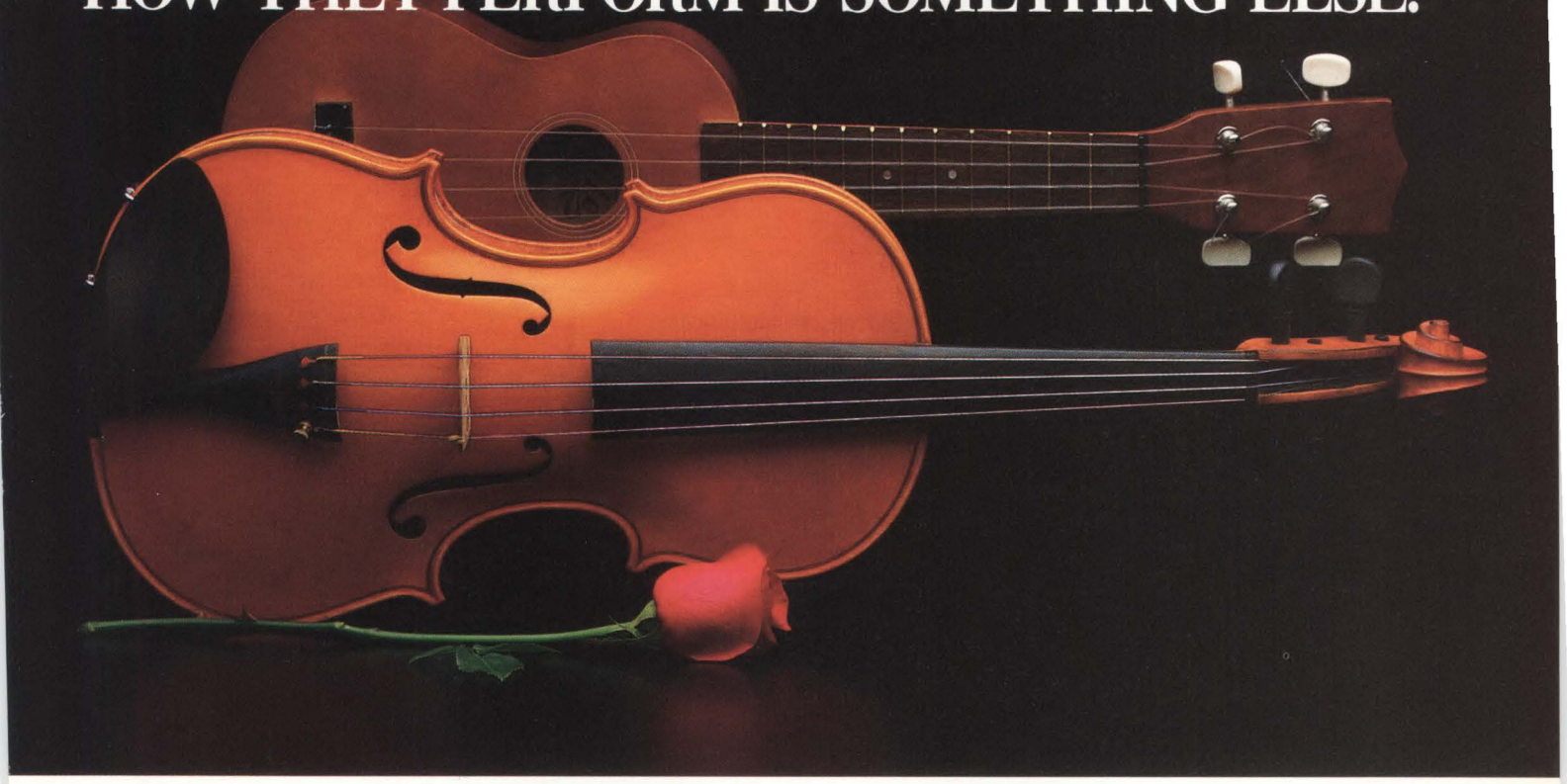

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RSX CLINIC

TACKLING THE FULLBACKUP

QUESTION: *We want to do a full disk backup from MICRO/RSX, but the backup procedure keeps telling us we can't copy our RD53 to a TK50. What's wrong?*

REPLY: Nothing. The MICRO/RSX backup procedure is designed to prevent you from backing up an active system disk.

When MICRO/RSX runs (or any RSX for that matter), it opens some files and keeps them open. For instance, the accounting file is opened in M-PLUS and MICRO/RSX systems so that the executive can log resource accounting information as it runs. This file is subject to active change and would fail the VERIFY step in the backup procedure, creating doubt about the integrity of your backup.

The only way to back up your system disk under MICRO/RSX is to take the system down, boot up the Installation diskette that came with your MICRO/RSX distribution kit, and use the included backup procedure. Your system will back up cleanly, because no files will be open on your RD53.

NAME WITHOUT AN INITIAL(IZING)

QUESTION: *How can we change the volume name of a disk that's already in use? Do we have to INI it? Won't that destroy the disk?*

REPLY: If you INI your disk, you'll irretrievably destroy major information. INI creates a new index file ([0,0]INDEXF.SYS), and thereby destroys the information RSX needs to find files on the disk. You certainly can avoid running INI just to change your volume name. Install INI as HOM with the command:

```
INS $ INI/TASK=...HOM
```

and you'll be able to change the volume name. Mount your disk /FOREIGN and then invoke HOM. It then will enable you to change not only the system name, but also several other parameters that INI sets on the disk. Check your *DCL Manual*, under the DCL INITIALIZE/UPDATE command, or your *MCR Operations Manual* under the HOM command, for the actual commands and options details.

By James McGlinchey

I respond to those questions that are interesting and applicable to the general RSX user. Please mail your questions to: RSX Clinic, *DEC PROFESSIONAL*, P.O. Box 503, Spring House, PA 19477-0503. Questions also can be submitted through ARIS.

BATCH OF LOGS

QUESTION: *How can I log a terminal session into a file?*

REPLY: An interactive terminal session with a fairly unpredictable sequence of commands and responses always can be logged into the console logging file if the procedure is run from the system console, and console logging has been enabled with the SET /COLOG command. The console log file then can be extracted with the editor.

A convenient alternative, useful if you have a predictable sequence of terminal operations and if you're using M-PLUS or MICRO/RSX, is to submit the entire process as a batch procedure. Use the /LO switch when you submit the batch job to create a batch log file. This can be done from any terminal, and doesn't require privilege. The batch log file will contain the entire session, everything that normally would appear on the screen if the procedure were done interactively. The batch log file can be printed or edited for whatever purpose you have in mind.

SHUTUP AND RUN!

QUESTION: *Do I have to RUN SHUTUP every time I turn off my system?*

REPLY: No. Any RSX system can be halted safely simply by hitting the HALT switch on the CPU's switch panel, even those M-PLUS systems that have disk data caching enabled. Your applications, however, might be active and would be affected adversely. The SHUTUP command brings your system down in an orderly manner, giving your users advance warning. If you need to stop your applications in an orderly manner, create an LB:[1,2]SHUTUP.CMD file that issues the proper commands for stopping your applications and SHUTUP will invoke it as part of the system bringdown procedure. Of course, you'll have to design your applications so that they can be aborted via commands. I recommend use of the Requested Exit AST; read about it in your *RSX Executive Manual* under the SREX$ Directive. ■

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DCL DIALOGUE

Kevin G. Barkes

Where It's @

The DCL execute procedure command @ has another function many users seem to overlook.

What the @ actually does is tell DCL to stop looking at SYS$COMMAND for its input, and instead to read the device or file following the sign.

This permutation is handy when using DCL commands containing a large number of qualifiers and arguments. As an example, look at a typical ACCOUNTING command:

```
$ ACCOUNTING /USER=SMITH -
   /SINCE = YESTERDAY -
   /BEFORE = 12:00 -
   /QUEUE = SYS$PRINT -
   /OUTPUT = LOGFILES:PRINT.LOG
```

You can create a command procedure containing the full command, of course, but you also can enter just the command qualifiers in a file:

```
! ACCQ.COM
/SINCE = YESTERDAY -
/BEFORE = 12:00 -
/QUEUE = SYS$PRINT -
/OUTPUT = LOGFILES:PRINT.LOG
```

and then issue the command by entering:

```
$ ACC /USER=SMITH@ACCQ
$ ACC /USER=JONES@ACCQ
```

The rules regarding the use of @ in this manner are simple. If the file begins with command qualifiers (anything beginning with a "/"), there should be no space between the @ and the preceding command string. If the file starts with a command parameter, a space should be included:

```
---------
! LIST.COM
*.OBJ, -
*.LST, -
*.EXE
---------
$ DIRECTORY @LIST
```

The lines containing command parameters and qualifiers should not begin with dollar signs. However, you can place additional DCL commands following the parameter and qualifier lines:

```
---------
!PURGE.COM
*.OBJ,*.LST,*.EXE
$ INQUIRE/NOPUNC ANS "Purge files?"
$ IF .NOT. ANS THEN EXIT
$ PURGE/LOG *.OBJ,*.LST,*.EXE
---------

$ DIR @PURGE
Directory DISK1:[SMITH]
1.OBJ;1     1.OBJ;2     1.OBJ;3

Total of 3 files.
Purge files? Y
%PURGE-I-FILPURG, DISK1:[SMITH]
  1.OBJ;3 deleted (23 blocks)
%PURGE-I-FILPURG, DISK1:[SMITH]
  1.OBJ;2 deleted (23 blocks)
```

PROGRAM

```
! TYPE_PRINT_FAST.COM
! By Gerald Soo
!
! Prints files to an LA50 printer attached to a VT220 terminal.
! Files being printed are not displayed on the terminal.
! To print in 16.5 c.p.i. mode, enter a "W" as the second
! parameter to the procedure.
! For help, enter "?" as the first parameter.
! .LIS is the default extension for files to be printed.
! Wild cards are permitted.
! Entering a "D" as the third parameter will cause the file
! to be deleted after it is printed.
!-------------------------------------------------------------
$       put := write sys$output
$       form_feed[0,8] = %d12
$       escape[0,8] = %d27
$       csi = escape + "["
$       on control_y then goto turn_off_printer_controller
$       if p1 .eqs "" then goto get_input
$ continue_init:
$       if p1 .eqs. "?" then goto print_help
$       if f$locate(".",p1) .eq. f$length(p1) then p1 = p1 + ".LIS"
$       if f$locate("*",p1) .eq. f$length(p1) then goto check_file
$       goto check_file_wild
$ print:
$       put "File size for ",f_name," = ",f$file(f_name,"eof")," block(s)"
$       vfy = f$verify(0)
$       put csi,"5i",csi,"0w" ! turn on printer controller at 10cpi
$       set term/form/nobroad
$       type 'f_name
$       put form_feed,csi,"4i" ! print <ff> and turn off printer controller
$       if p3 .eqs. "D" then delete/nolog 'f_name
$       end_vfy = f$verify(vfy)
$       if f$locate("*",p1) .eq. f$length(p1) then goto exit
$       goto check_file_wild
$ get_input:
$       inquire/nopun p1 "File to print : "
$       if p1 .eqs. "" then goto get_input
$       if p1 .eqs. "ABORT" then goto exit
$       goto continue_init
$ check_file:
$       f_name = f$search(p1,1)
$       if f_name .eqs. "" then goto no_such_file
$       if f$file(f_name,"org") .nes. "SEQ" then goto not_seq
$       if f$file(f_name,"rfm") .nes. "VAR" then goto not_var
$       if p2 .eqs. "W" then goto print_gt_80
$       goto print
$ check_file_wild:
$       f_name = f$search(p1,1)
$       if f_name .eqs. "" then goto exit
$       if f$file(f_name,"org") .nes. "SEQ" then goto not_seq
$       if f$file(f_name,"rfm") .nes. "VAR" then goto not_var
$       if p2 .eqs. "W" then goto print_gt_80
$       goto print
$ print_gt_80:
$       put "File size for ",f_name," = ",f$file(f_name,"eof")," block(s)."
$       put csi,"5i",csi,"4w"
$       set term/form/width=132/nobroad
$       type 'f_name
$       put form_feed,csi,"0w",csi,"4i"
$       if p3 .eqs. "D" then delete/nolog 'f_name
$       if f$locate("*",p1) .eq. f$length(p1) then goto exit
$       goto check_file_wild
$ not_seq:
$       put "File ",csi,"7m",f_name,csi,"0m is not a sequential file."
$       if f$locate("*",p1) .eq. f$length(p1) then goto exit
$       goto check_file_wild
$ not_var:
$       put "File ",csi,"7m",f_name,csi,"0m is not a variable length file."
$       if f$locate("*",p1) .eq. f$length(p1) then goto exit
$       goto check_file_wild
$ no_such_file:
$       put "File ",csi,"7m",p1,csi,"0m not found"
$       goto exit
$ print_help:
$       put "<parameter1> File to print on slave printer"
$       put "<parameter2> A """W""" as this parameter indicates that WIDE mode"
$       put "             printing is to be used."
$       put "<parameter3> A """D""" as this parameter will delete the"
$       put "             file after it has been printed."
$       put " "
$       put "NOTE: The file MUST be variable length and sequential."
$       goto exit
$ turn_off_printer_controller:
$       put csi,"4i"
$ exit:
$       set term/noform/broad
$       if p2 .eqs. "W" then set term/width=80
$       exit
```

As you can see, this capability presents users with a great deal of versatility, and can help reduce the number of symbols normally used to eliminate typing of long parameter/qualifiers on the command line.

Readers Write

The May column contained a discussion concerning selective procedure verification; i.e., a way to turn verification on or off prior to invoking a command file.

Linda M. Book, a programmer/analyst with Monsanto Company in St. Louis, cut through all the arguments about the use of lexicals and logicals, etc., with a devastatingly simple and wonderfully elegant suggestion.

"Instead of defining a global symbol to contain all the filenames for which you want verification enabled, and then adding at least five lines of code to parse and determine whether or not to verify, I have an easier way. Use the statement:

```
$ SAV_VER = F$VERIFY('VER_TEST' + 0)
```

at the beginning of your procedure. Then, if you want to verify it, enter:

```
$ VER_TEST = 1
```

at the DCL command level before invoking your procedure. To turn off verification, enter:

```
$ VER_TEST = 0
```

If you use this method, you never have to worry about whether or not the symbol ver_test has been defined. If not, it will have a null value, and verification will be off."

Linda also suggested placing most of the documentation and help information after the final EXIT command in command files to help increase execution efficiency. "This results in speedier code," she notes, "plus the ability to include a large amount of documentation internal to the file."

This month's user command file is from Gerald Soo. An active ARIS user and frequent contributor, Gerald's .COM file is used to print out files on LA50 printers slaved to VT220 CRTs (see Program).

"You probably will think, 'Why does he need a command procedure to do this when all he has to do is hit CTRL-<Print Screen> before and after the file is printed?'" Gerald notes. "Well, this command procedure will do that for you and, if you use wildcards, form feeds will be printed between each file. When the file is being printed, it's not displayed on the screen, only to the printer."

Because I don't have access to a VT220-printer combo, I didn't have an opportunity to completely test Gerald's procedures. You're encouraged to send your comments and suggestions to him directly c/o Shared Medical Systems, 2201 Broadway, Oakland, California 94612. ■

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FIELD SERVICE

The Breakout Box

Ron Levine

The merging of data processing and data communications is becoming commonplace at many DEC installations. Almost every field engineer (FE), at some time, will have to troubleshoot a communications problem that entails "looking at" the interface over which computers, terminals, and remote peripherals "talk" to each other. The FE must determine if the problem's origin is in the sender (source from which the information is transmitted), the medium (channel over which the information is transmitted) or at the destination (the receiving hardware). The best tool for inspecting and troubleshooting this communications path between devices is the breakout box (BOB).

There are many different types of breakout boxes — from basic models, which provide bare bones monitoring and testing of data transmission over specified interfaces, to sophisticated models with many troubleshooting aids built in. Some boxes have a wide choice of selectable options that have little to do with the primary function of a breakout box; they aid in the monitoring and testing of information transmission over a specified interface. The question of which breakout box to buy can become problematic with so many choices being offered by so many manufacturers.

While there are many interfaces used to transport signals between communicating equipment (and each type of interface requires a separate breakout box wired for its specific line configuration), the most commonly used interface in a DEC environment is the RS232-C. We'll discuss only this type of breakout box.

The recommended RS232-C interface standard calls for a 25-pin connector and the data carried over the interface must be coded in ASCII. Though 25 pins are available, not all 25 lines necessarily are used by all manufacturers, and different manufacturers may not use the pins in the same order or for the same purpose; i.e., three manufacturers may use pin number 15, but each may use it for a different signal. Some equipment also may deviate from the standard by not using all of the bits present in a standard data transmission, such as parity or start bits. Because the "standard" is only a recommendation, many line configuration variations exist and this can cause vast troubleshooting headaches. The RS232-C, although the most common interface in use, also is the hardest to monitor and test due to these variations.

> ***"The question of which breakout box to buy can become problematic with so many choices being offered . . ."***

Why And How To Use A Breakout Box

A breakout box monitors the individual pins of a communications interface in order to detect the presence or absence of activity (indicating whether a specific pin or line is being used). This capability is needed during tasks like cable checking or during new installations. Before installing a system, the breakout box can simulate the finished wiring (you can "rewire" the cable by opening leads with the switches and jumpers on the box). This can be done any number of times until the wiring format that allows the devices to communicate with each other is found. At this point, it's only a matter of installing the correct cable match up; the breakout box has done the rest.

A breakout box shows only if a line is active. It doesn't test the detected signal for errors, determine if the signal is correct, or monitor for "garbage" on the line. The box cannot do such tasks as store, send, receive, check or interpret signals. It also doesn't test baud rates, check telephone lines, or measure voltages; it simply monitors the individual leads (pins) of a communications interface for activity.

Most manufacturers follow the basic RS232-C standard for interfacing devices on the first 10 or 12 pins (i.e., they use these pins for the defined functions). Many don't follow the standard at all when using the remainder of the pins (lines 13-25). And remember that not all pins are used by all devices. Therefore, to use the breakout box and interpret its results properly, the FE also

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needs to have the manufacturer's manual showing which pins are used and for what.

Choosing From So Many

With 40-plus companies distributing breakout boxes having a seemingly unending list of features and options, and seeing prices ranging from $39 to more than $1,000, how do you select the right one?

At the low end of the price scale, the boxes have fewer LEDs and no or few troubleshooting features. These usually aren't flexible enough for FE needs. At the high end, the boxes are loaded with options for voltage checking, signal conversion and cable and bit error testing, however, most of these features have little or nothing to do with the primary purpose of a breakout box. The ones that are FE oriented and perform in accordance with our definition of the purpose and use of a breakout box generally are priced in the $100 to $600 category.

To determine the right breakout box for your application, concentrate on three main considerations: your hardware, how often the box will be used, and your price range.

The hardware to be serviced will determine the type of breakout box needed. For example, if you work with an RS232-C interface channel, you'll need a box that can monitor RS232-C signal paths between the sending and receiving of equipment. Each breakout box usually handles only one type of interface. Multiple boxes are required to service more.

The more often you install, repair or troubleshoot communications equipment, the more cost effective it is to buy a box with additional features, one that's durable and easy to use. For instance, a trap option, which can be used to identify the momentary loss of a data carrier detect (DCD) signal while the device is unattended, may be needed fewer than 10 times over the life of the box. However, this option is extremely valuable during those times, possibly saving many hours or days of service time.

Generally, RS232-C interfacing hardware that requires infrequent service and is used in an asynchronous, slow speed environment (up to 2400 baud) can be handled satisfactorily with a basic, line-powered breakout box that monitors only the 12 basic lines and provides a spare LED (it can be jumpered to look at any of the remaining lines on the interface).

Synchronous, high-speed hardware environments necessitate full 25-line dedicated monitoring capability; and, it may be useful to look at a large number of lines on both sides of the interface. The best kind of breakout box for this type of troubleshooting is the 100-LED unit that looks at all 25 lines on the

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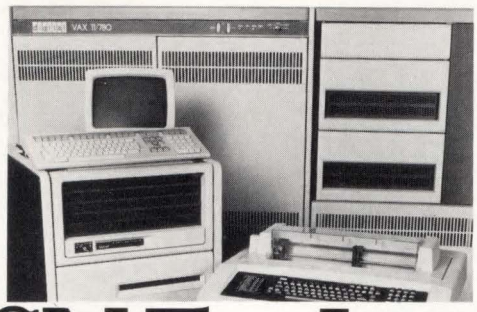

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transmit end (DTE) and all 25 lines on the receive end (DCE).

Each additional option purchased should make the troubleshooting task easier and less time consuming; they should not change the purpose of the box. Some common breakout box features are battery power (vs. line power), gender menders, null modem cable switch selection, faceplate voltage sources, and tri-state or dual-LED boxes.

Further Considerations

Your intended use will determine the size and design of the breakout box best for you. The cable lengths should be sufficient for your application and the connector gender must be correct for your equipment.

There should be enough test points available on the faceplate to handle the largest lead-count that you'll encounter in your application. All boxes examined by us supplied at least 48 test points, 24 on each side of the interface. This should be an ample number for most FEs. These test points are used for patching/rerouting individual signals and are easier to use if they're arranged in the same order as they appear on the RS232 connector. An adequate supply of jumpers also should be included with the box, with replacements readily available at local electronic stores.

Check to ensure that all LEDs and switches are marked for easy readability. It's easier to use a limited LED box if the LEDs are located on the side of the interface that sends the signal; e.g., TRANSMIT DATA LED on the DTE side, RECEIVE DATA LED on the DCE side. This eliminates the need to refer to a chart continually. Some of the higher priced boxes have LEDs installed on each side of the interface, allowing for the monitoring of all lines on both sides of the interface, even if lines are open.

A well-written manual with many illustrations should be included with the breakout box, and it should be written for the specific model you're purchasing.

To help in your search, the following is a list of the more common breakout box features available.

1. **Power** (line or battery) — Line-powered, often referred to as unpowered, boxes use the active voltage level on the lead itself to light the LED. Power is supplied by the signal being monitored. There are no batteries to replace and there's less circuitry involved, making the cost of the box cheaper. Although signal current may be drained out of the circuit (1.75ma to over 3ma), possibly affecting the accuracy of your test, this shouldn't be a problem in most circumstances (remember, it's not the purpose of a BOB to measure the signal — only to monitor for activity).

LEDs on these passive BOBs may be dimly lighted and hard to see if signal levels are low. Intensity levels will vary from LED to LED depending on the signal being monitored (lighting won't be uniform, but this may provide a good visual indication of a possible interface problem).

Line-powered boxes are best for occasional use requirements. Batteries become degraded or go completely "dead" over extended periods of non-use, making it likely that the BOB will not be ready when needed if used infrequently. Also, the problem of reading dimly lit LEDs is less frustrating in occasional use situations. Line-powered BOBs usually cost substantially less than battery-powered boxes.

Battery-powered boxes supply their own voltage for LED lighting, making viewing easier in lighted areas (brighter LEDs). There's no voltage drain on the active signal, rendering it unaffected by the monitoring circuitry. And there's a higher sensitivity to detecting crosstalk and noise on the monitored line. Because batteries are required, it's necessary to maintain the BOB in an operating condition. And additional circuitry enters the testing "picture" making the boxes more expensive.

Battery-powered boxes should be

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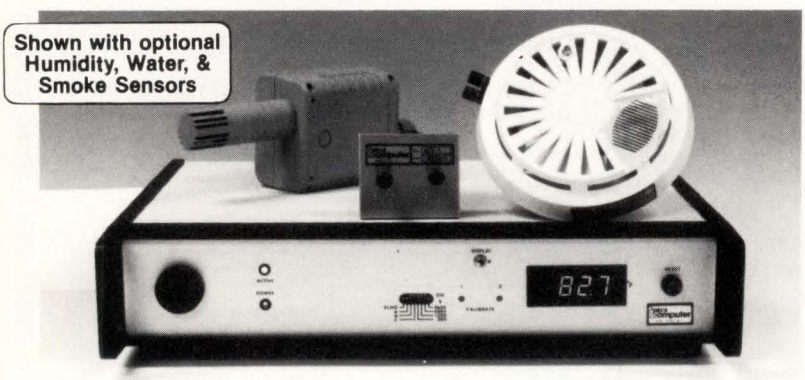

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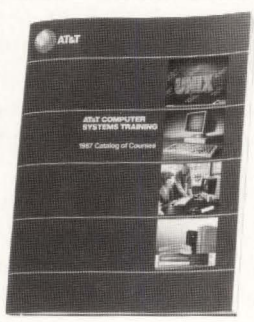

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considered if working in a heavy use environment. LED lighting is greatly improved, speeding up troubleshooting time. In special circumstances (e.g., if voltage accuracy or current drain is important to the testing procedure) a battery-powered box is a must. Some special features (pulse trap, faceplate voltage) usually require battery-type boxes.

2. **LEDs** — There are several different LED schemes employed by the various breakout box manufacturers. There are single-state, dual-state and tri-state configurations.

The single-state LED monitors one voltage level only — usually the positive level. It's a single color LED, normally red and it's turned off for the opposite, non-monitoring level or when the line is inactive. This system leaves the FE guessing whether the line is at the opposite level, negative or isn't in use. Single-state BOBs are priced much lower than dual- and tri-state boxes, but are recommended only for extremely light use and when cost is the major factor affecting purchasing of field equipment.

Dual-state LEDs monitor both positive and negative levels via pairs of red and green LEDs. This type of BOB provides the clearest indication of line activity, noting if the line is high, low or off. Although priced higher than the other two types, it provides the easiest readouts to interpret.

Tri-state LEDs also monitor positive and negative levels. They use one LED that lights red and green or stays dark depending on the signal being high, low or non-existent, respectively. However, there are possible readability problems when monitoring high data rates with short data bursts. It can become difficult to distinguish between highs and lows because the red and green tend to blend into each other.

3. **Number Of Lines Monitored** — The BOBs studied monitored from seven to 25 lines (100 LED boxes monitor 25 lines on each side of the interface).

The breakout box line from Beckman Industries, Brea, California, is the 100 LED-type enabling all 25 lines on both sides of the interface to be monitored.

The boxes that didn't provide full 25-line dedicated LEDs did supply one or two spare LEDs for monitoring the additional signals on the interface. The "extra" line(s) is monitored on a switch or jumper selection basis.

Generally speaking, only six to 10 RS232-C interface lines are used in a majority of applications; i.e., up to 2400 baud, asynchronous. BOBs having 12 or more LEDs provide ample capacity for most users.

In field environments where 13 or more interface lines are used, full 25-line BOBs should be purchased. These installations also will have more non-standard RS232-C line usage requiring closer inspection of each line on the interface. Dedicated monitoring during the troubleshooting process is helpful under these circumstances.

4. **Faceplate Voltage** — With a voltage source available on the BOB's faceplate, it's simple to force a signal to a particular pin under test. The signal can be conditioned either negative or positive by the use of jumpers. The most common cause of non-communication between two devices on opposite ends of an RS232-C interface is the improper wiring of pins 2 and 3 within the connecting cable. The pin 2 and 3 reversal option automatically connects pin 2 on one side of the interface to pin 3 on the opposite side. Another name for this option is the null modem reversal. This option is useful if frequent installation work is being performed.

The dual gender connectors option eliminates the need for external genderbenders in mating non-standard connectors. It provides male and female connectors at both ends of the interface. This feature is useful in the field engineering environment, because the variations of equipment encountered may require different connector types.

5. **Switches** — All of the BOBs investigated had 24 or 25 switches available to control interface signals (lines) at the box. With the switch closed, the signal is monitored and continues through the box in its normal path. With a switch open, the signal is captured at the box's test point and can

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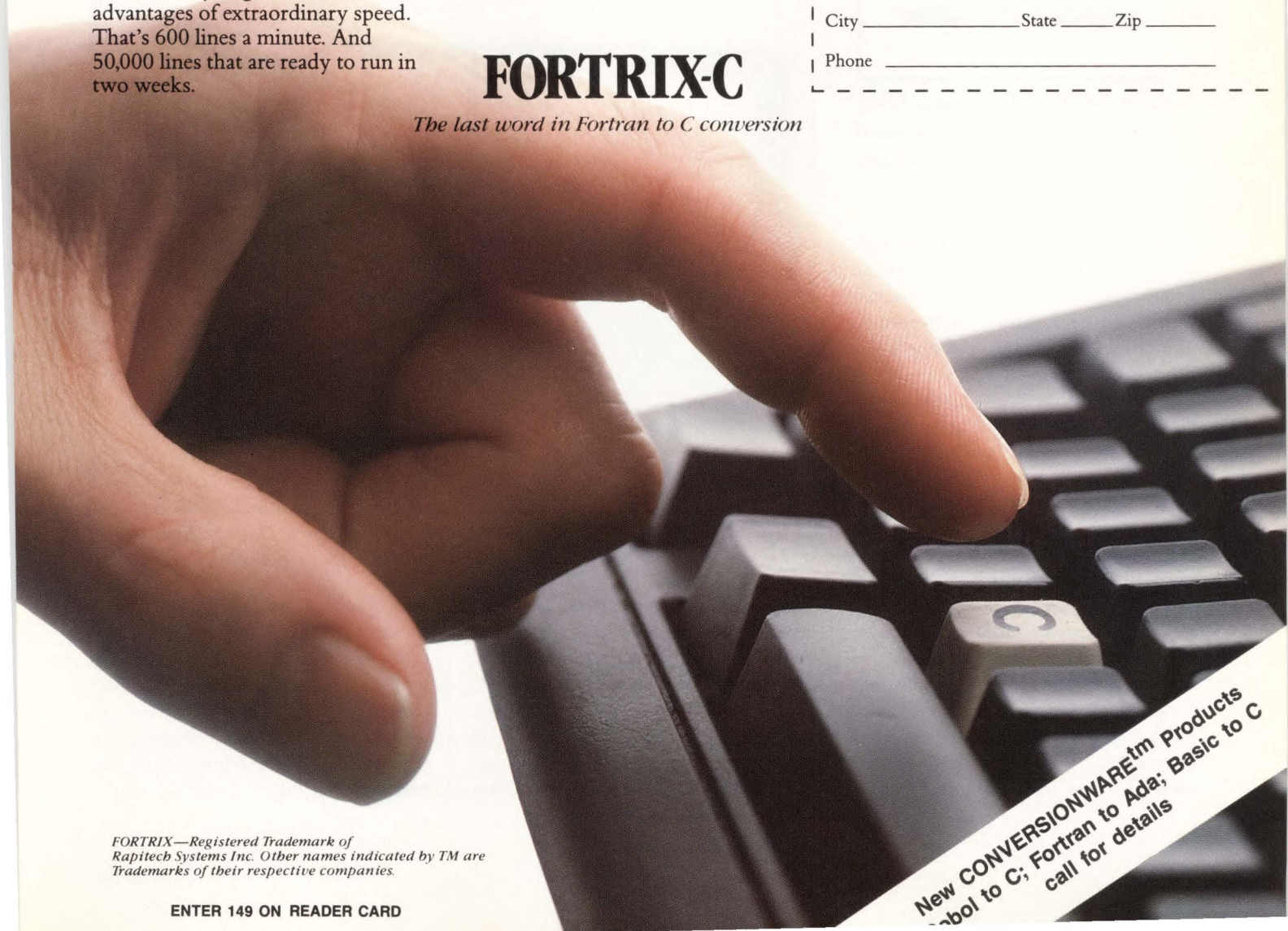

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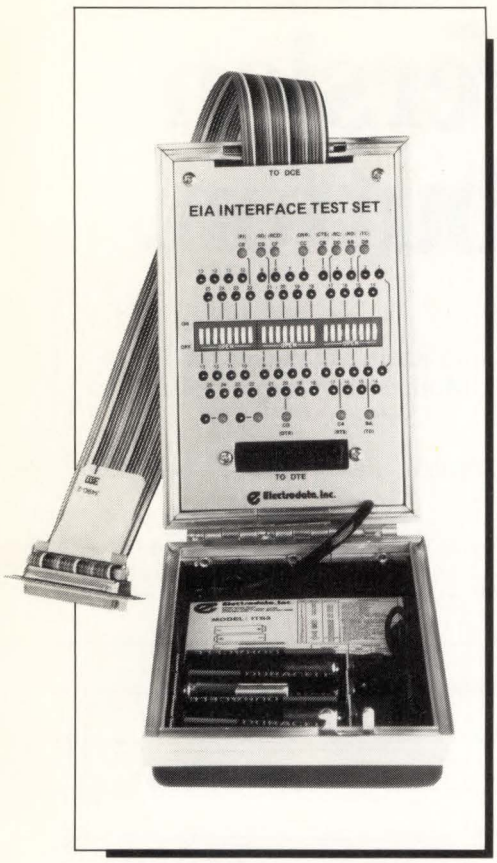
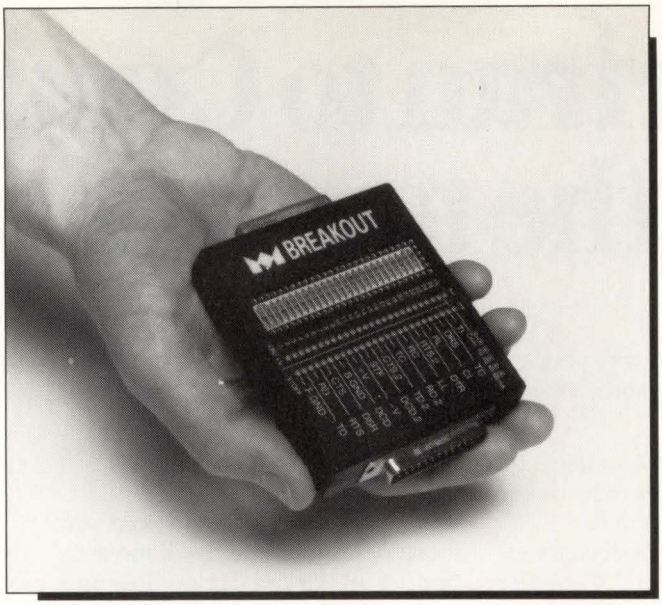
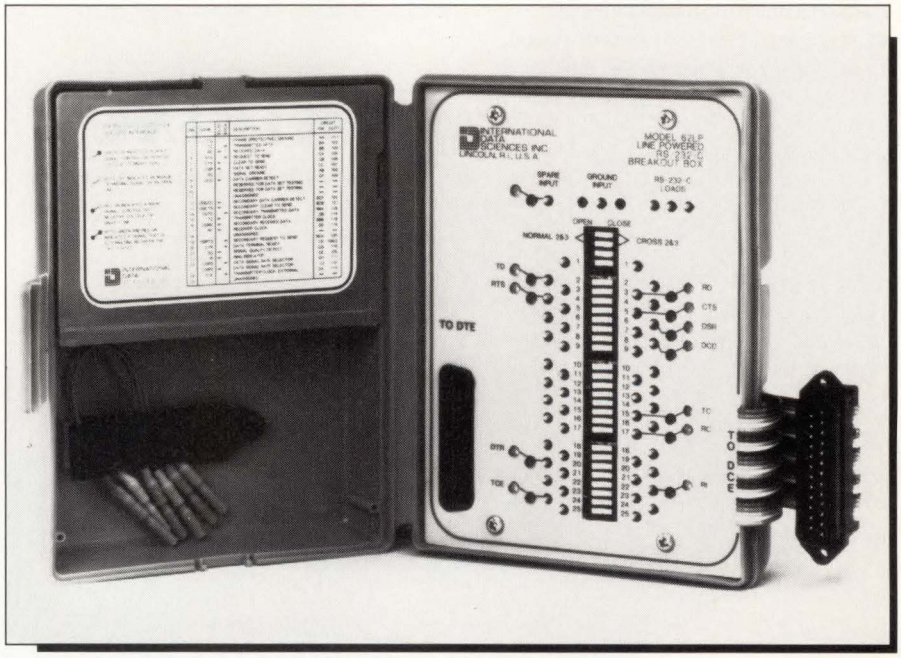


Electrodata Inc. of Bedford Heights, Ohio offers a ITS3 battery powered red/green LED.



M-Breakout — a complete RS-232/V24 interface troubleshooter can break and cross-patch all 25 lines from M-Test Equipment, San Francisco, California.



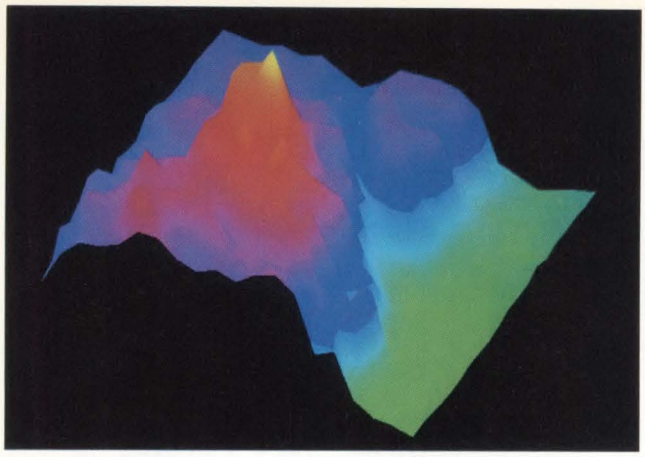
The Model 62 RS-232-C breakout box from International Data Sciences Inc. of Lincoln, Rhode Island.

be forced to a selected path. BOBs with a 25th switch monitor the first frame ground, pin 1 (24-switch boxes monitor pins 2-24). This extra switch permits you to isolate grounds and check for ground problems.

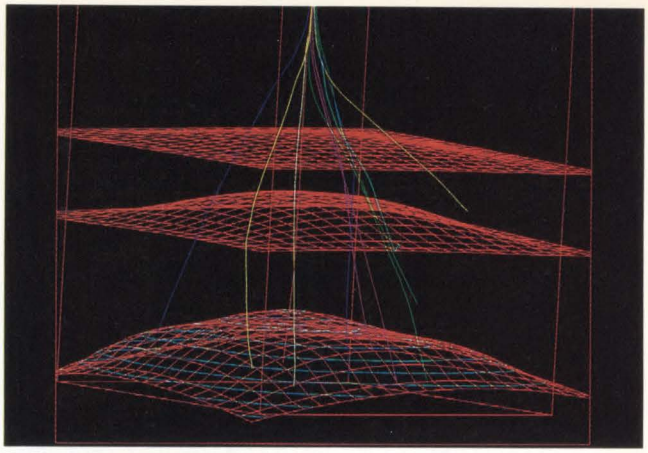
Normally, the BOB's ribbon cables are permanently attached to the box. A few BOBs can be equipped with detachable cables at the breakout box end. This helps in eliminating possible intermittent connector problems that can occur, in time, because of the continual bending and flexing of the ribbon cable assembly where it leaves the box.

Pulse traps are used to find those high-speed glitches that are too short to register during normal line monitoring. By jumpering the suspected line to the pulse trap, a "glitch" can be held for observation. This feature also can be used to locate an intermittent loss of signal. Although a pulse trap is needed infrequently, when used it can save hours of troubleshooting time.

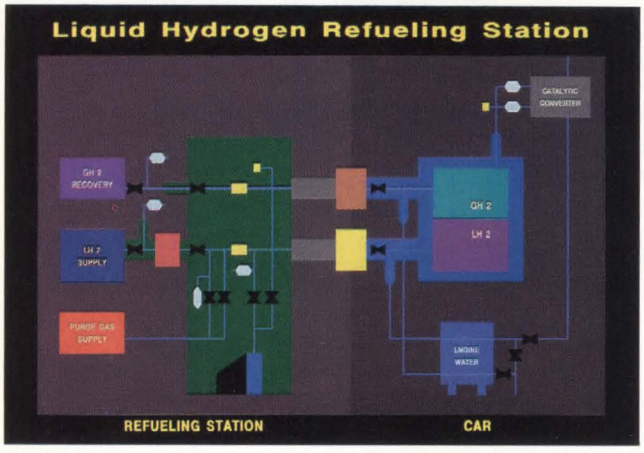
These "Field Service" tips provide a background into what breakout boxes do, what features are available, and which options are right for your situation. There also are boxes on the market with specific features for special, non-standard needs, such as waterproof boxes and heavy-duty boxes that can withstand abusive handling. With your own needs in mind, and with the many manufacturers currently competing for your dollar, you'll be able to find the one breakout box that's perfect for you.



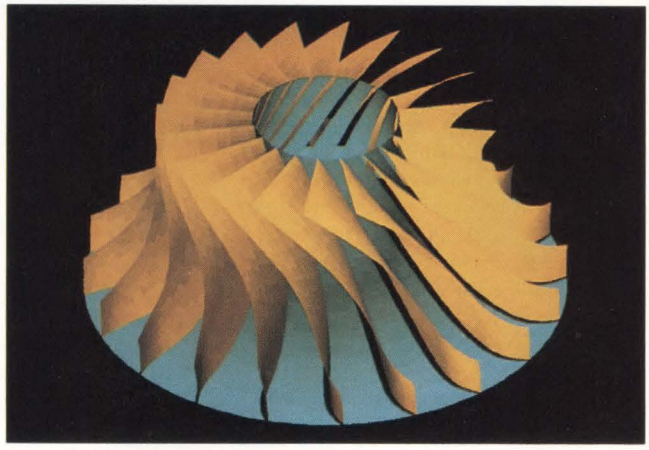
Local, interactive 3D manipulation of mapping data captured on a Tektronix 4129.



The 3D modeling capabilities of DI-3000 XPM are shown in this interactive drilling application.



The DI-3000 XPM graphics database excels at process modeling applications.



Using DI-3000 XPM, a turbine impeller is realistically rendered with local light source modeling.

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DI-3000 XPM is machine and device independent, with initial support for the VAX/VMS environments. In the DEC environment, Precision Visuals' products install automatically as run-time shareable libraries, allowing run-time selection of device drivers and efficient use of machine resources. Over 100 graphics devices are supported, including graphics terminals and hardcopy devices from Tektronix, DEC, and HP, as well as PostScript-supported laser printers. Prices for DI-3000 XPM start at $5,500 on the DEC MicroVAX GPX; license fees scale up and down depending on CPU power.

The Features

DI-3000 XPM includes the entire DI-3000 2D/3D graphics subroutine library. For sophisticated development tasks, the XPM extension includes graphics data management based on the PHIGS output model, hidden line processing, and many extended primitives such as rectangles, ellipses, arcs, spheres, extruded polylines, extruded fill area sets, and solids of revolution. Graphics structures can be built, edited, and archived with or without images appearing on a graphics device. Output can also be displayed and rendered locally on Tektronix 41xx/42xx terminals by combining DI-3000 XPM with Precision Visuals' AddSys-3000™ software. DI-3000 XPM also supports a powerful name set filtering option for controlling the display and detectability of graphics picture components.

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DI-3000 XPM is a tool for programmers building design, simulation, process monitoring, and other applications including: ☐ Transportation or Communication Networks ☐ Simulation of Flow Phenomena ☐ Manufacturing Simulation ☐ Molecular Modeling ☐ 2D Layout ☐ Architectural Modeling ☐ Any Simulation Where 2D or 3D Objects Change Based on Events. Less complex applications can be fully addressed with the basic DI-3000 package.

The Story

To get the full story on DI-3000 XPM, including technical information and a complete list of supported systems and users,

Call Chris Logan at:
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Chromatics Offers 3-D Graphics System

Chromatics Inc. has announced a high-speed, high-resolution color graphic system in 2-D and 3-D configurations. Both CXII models offer 1536 x 1152 display resolution on a 60 Hz, non-interlaced monitor, driven by a 13-board, high-performance graphics engine. The configurations are available for Sun Microsystems and VAX/MicroVAX.

The 2-D configuration of CXII includes 4 MB of display list memory, eight planes of double-buffered memory, text overlay, and GKS firmware and microcode.

The 3-D system provides a shading processor and CX3D microcode and firmware with a 2-MB display list memory, an eight-plane, double-buffered memory, and text overlay.

Both CXII 2-D and 3-D models are priced at $39,995.

Learn more by contacting Chromatics Inc., 2558 Mountain Industrial Blvd., Tucker, GA 30084; (404) 493-7000; TWX: (810) 766-8099.

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Isotek Supports Tektronix Applications

The Bristol Group Ltd. has announced Isotek for monochrome and color Sun workstations. Isotek is a software bridge for Tektronix color terminals that interprets stream protocol and is compatible with various Tektronix libraries. It migrates mainframe applications software and databases to networked technical workstations.

Application software can reside on any host including mainframes and superminicomputers from AT&T, Cray Research, Control Data Corporation and DEC.

Isotek costs $3,990 for single copies, with site licensing for multiple workstations. Learn more by contacting The Bristol Group Ltd., P.O. Box 910, Londonderry, NH 03053; (603) 437-3700.

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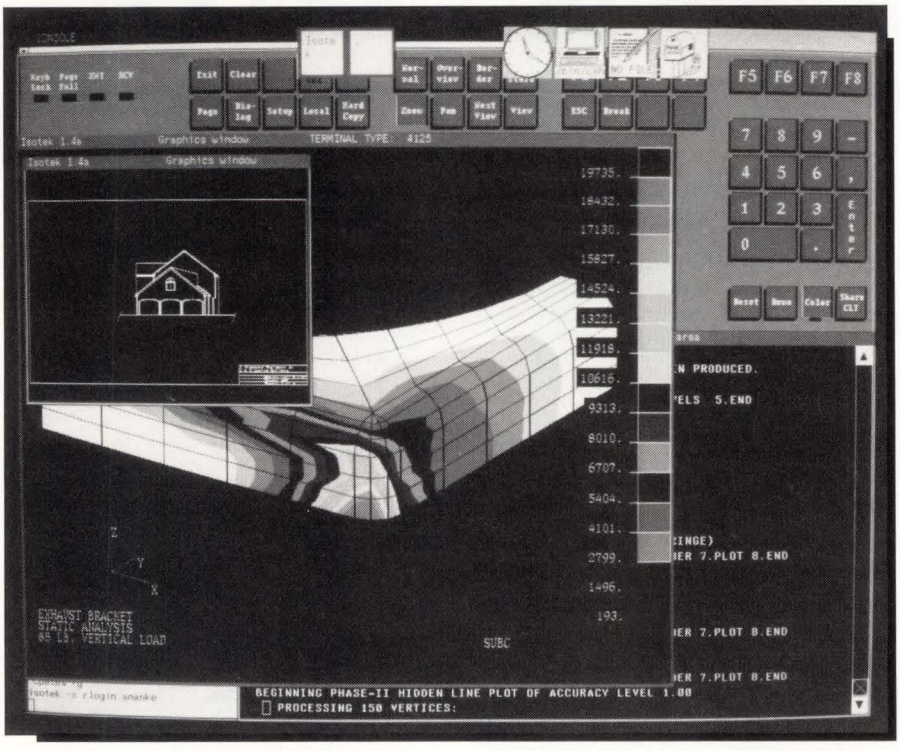


Isotek, a software bridge for Tektronix color terminals, migrates mainframe application software and databases to networked technical workstations.

COM_NET Permits Downline Loading

COM_NET, developed by Distributed Data Networks Corporation in conjunction with DJ Technology Inc., is a VMS-based diagnostic package written under the application software of DEC's VAX line of computer mainframes. This package offers the client the ability to downline load all of the operating parameters of the Micom 6600 structured under VMS.

The product loads the required parameters into the Micom 6600 in minutes. It also offers additional diagnostic features, including statistical port sorting and monitoring function, error detection and flag feature and log-compare. The base price is $4,800.

For more information, contact Distributed Data Networks Corp., 36E Grant Ave., Bayshore, NY 11706; (516) 242-0594.

Enter 303 on reader card

Eakins Announces Electronic Tape Switch

TAPE SHARE is an economical, fully electronic Pertec-BUS- compatible tape switching system for DEC, Sun, Data General, IBM PC and compatible computers.

TAPE SHARE supports interconnections between two or more multivendor computer systems to one or more existing tape drives. No system software changes are required to install TAPE SHARE. Expansion from the basic TAPE SHARE configuration that supports two CPUs and one tape drive is accomplished by adding CPU interface cards. An expanded system will support up to four CPUs.

To learn more, contact Eakins Associates Inc., 67 E. Evelyn Ave., Mountain View, CA 94041; (415) 969-5109.

Enter 301 on reader card

Ethernet To STARLAN LAN Bridge Introduced

CrossComm Corporation announces a new Ethernet to STARLAN LAN Bridge. The Model 487-ES is the first of a series of low-

cost high-performance devices used to interconnect dissimilar networks. Using a proprietary software algorithm, the MAC layer Bridge automatically reconstructs and retimes packets so that they can be transferred from one network to another.

The Bridge maintains battery-backup address tables for filtering packets that are intended to be local or are to be transferred across the bridge. Because it operates directly with Ethernet and STARLAN networks, it allows protocol transparent communication to take place between the two interconnected networks.

The 487-ES is priced at $4,900. CrossComm Corporation can be reached at (617) 835-4226.

Enter 305 on reader card

Telebit Provides Integrated Support

Telebit Corporation announced its new integrated support within a modem for the communications protocols KERMIT, UUCP, Xmodem and Ymodem. Software has been added to the company's programmable TrailBlazer 18,000 bps dial-up modem to allow it to support these protocols automatically at fast speeds.

The Telebit software release also contains MNP error correction for error-free communications at 2,400, 1,200 and 300 bps. When operating at 18,000 bps, the TrailBlazer employs Telebit's patented PEP protocol to guarantee error-free transmission.

To learn more, contact Telebit Corp., 10440 Bubb Rd., Cupertino, CA 95014; (408) 996-8000.

Enter 307 on reader card

Alden Offers PC And 3-D Options

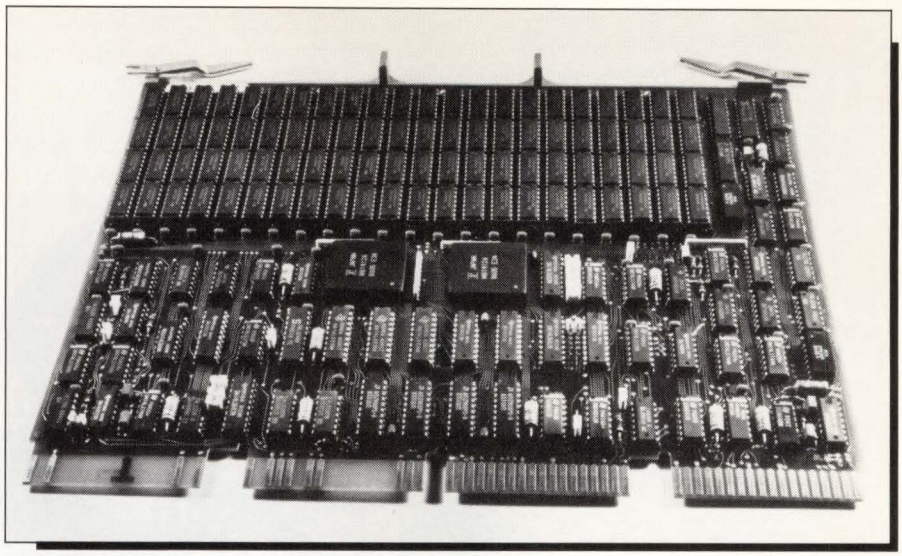
Alden Computer Systems Corporation announces two new APPS/2 products: a complete APPS/2 software for the IBM PC AT, and a 3-D tracer option for the CMM version. The PC-based APPS/2 system is available in both digitizer and CMM versions.

The tracer option is the first of a family of 3-D utilities for the CMM version. It's available for both PC- and DEC-based systems. The tracer option employs the cross-sectioning technique used by contour tracing systems. Using this option, 3-D CNC programs can be prepared off-line and then run on any suitable machine tool.

The PC-based APPS/2 basic system begins at $20,900.

For further information, contact Alden Computer Systems Corp., 1 Salem Green, Ste. 420, Salem, MA 01970; (617) 744-1314.

Enter 308 on reader card



Chrislin Industries' high-performance memory board enhances the LSI-11, J-11, MicroVAX I system.

Chrislin Has Two New Memories

Chrislin Industries introduced the CI-1173 and CI-1173-EDC, two high-performance memories for LSI-11, J-11, MicroVAX I system.

The CI-1173 is a 4-MB parity board that can be configured with start and stop address on any 16K byte boundary in the 0 to 4-MB address range. Double-bit error detection and single-bit error correction is a special feature of the CI-1173-EDC 2 MB.

On-board Control Status Register, LED indicators and Block Mode DMA are additional features of the CI-1173 and CI-1173-EDC ultra-high density modules. Memory protect logic and battery backup power busing allow the user to operate in a battery backup mode.

For more information, contact Chrislin Industries Caribe Inc., P.O. Box 1657, Canovanas, Puerto Rico 00629-1657; (800) 468-0736 or (809) 876-5205.

Enter 304 on reader card

Whitesmiths Announces V3.2 C Compiler

Whitesmiths Ltd. offers its 3.2 C Compiler for VAX/VMS. New features include C source level interactive debugging with breakpointing and variable display and improved code generation. The compiler also produces compiler and assembler source listings, including the ability to display high-level source code and machine-object code on one listing.

Version 3.2 C Compiler conforms closely to the emerging Standard C, allowing faster user migration to Standard C environment. Some Standard C features include structure assignment, functions returning structures, cost and a complete ANSI C Library.

Prices for the Version 3.2 C Compiler start at $1,500 for the MicroVAX/VMS and $4,000 for the VAX/VMS.

For further information, contact Whitesmiths Ltd., 59 Power Rd., Westford, MA 01886; (800) 225-1030; in MA (617) 692-7800. Telex: 750-246.

Enter 310 on reader card

UR2 Increases I/O Throughput

Stritec Inc. has announced the availability of its UR2 mass storage subsystem that enhances the speed and capacity of mainframe computer installations to eliminate or reduce downtime or slow response during high-demand periods.

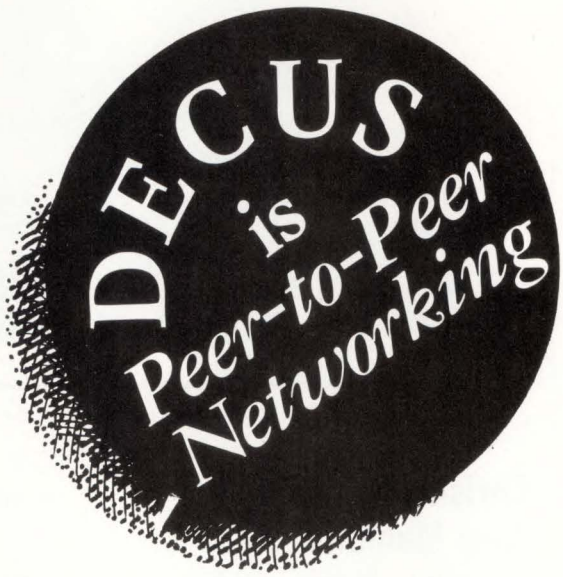
The UR2 includes a complete power conditioner, uninterruptible power supply and Winchester disk drives for backup and recovery functions. The hardware design allows connection to major systems as a disk device, requiring no software or hardware changes to the host system. The UR2 is for use with VAX, UNIX and Digital Systems.

For more information, contact Stritec, State Rd. 32 East, P.O. Box 666, Crawfordsville, IN 47933; (317) 362-9045.

Enter 312 on reader card

Clearpoint Introduces Single Slot 16-MB Memory

Clearpoint expanded its MicroVAX II-compatible series of memory products to include 16 MB on one board. The MV2RAM/16



The Digital Equipment Computer Users Society is your best connection to fellow users of Digital's computers.

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delivers the full 16-MB address space of the MicroVAX II but requires only a single slot. This is accomplished by using 1-MB DIP DRAMs.

The MV2RAM/16 requires no jumpers for memory sizing or addressing. It's compatible with DEC memory and MicroVAX system requirements. A single MV2RAM/16 card using CMOS devices runs cooler and uses less power than two 8-MB cards.

List price for the MV2RAM/16 is $3,500.

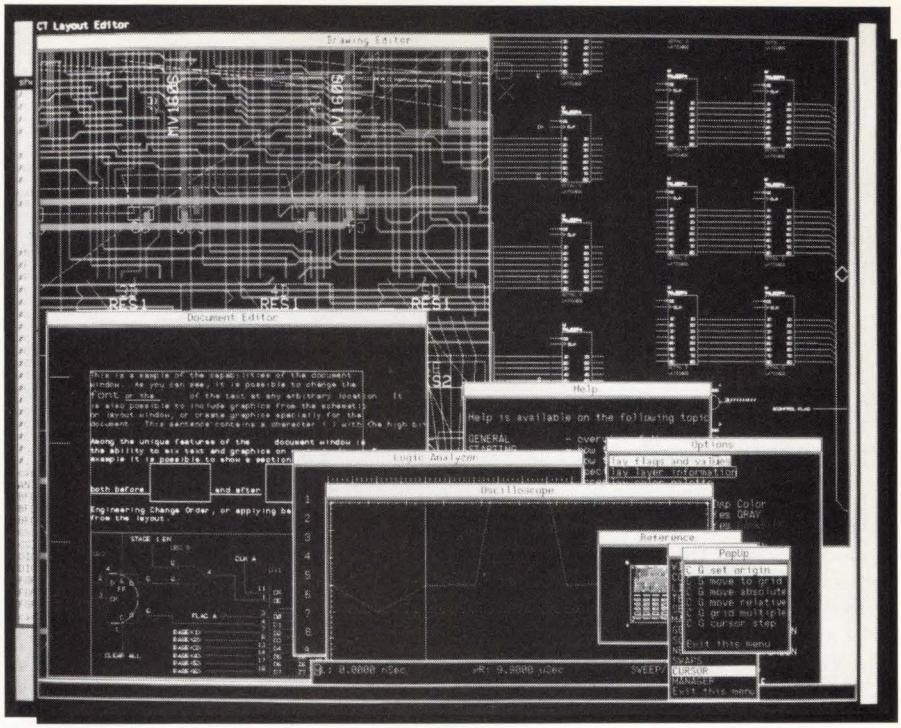
To learn more, contact Clearpoint Inc., 99 South St., Hopkinton, MA 01748; (617) 435-5395.

Enter 314 on reader card

CASE Introduces CAE Design System

CASE Technology Inc. introduced the Vanguard Stellar CAE Design System that provides a windowed operating environment allowing complete design file compatibility, file sharing and portability across industry-standard hardware platforms. Within the system graphical shell, the Stellar Design System integrates a complete CAE tool set.

The Vanguard Stellar CAE Design



CASE's new product, the Vanguard Stellar CAE Design System, is an interactive windowed operating environment.

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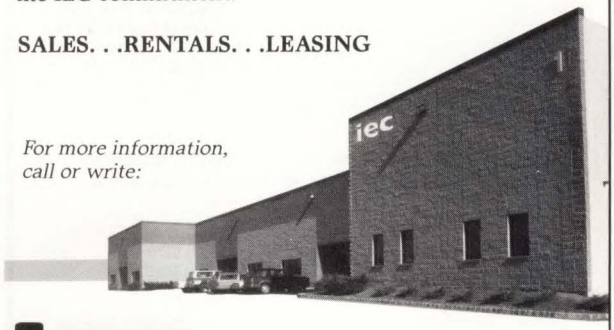

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System provides a powerful system "shell" capability. Using the CASE macro language, the user can configure scripts or command sequences to interface existing software on the Sun, VAX or PC to the CASE tools.

The Vanguard Stellar CAE Design System sells from between $14,900 and $49,000 depending on hardware and software features required.

For additional information, contact CASE Technology Inc., 2141 Landings Dr., Mountain View, CA 94043; (415) 962-1440.

Enter 311 on reader card

Computer Room Fire Protection Available

A new self-contained Halon 1301 fire suppression system was introduced by NF Fire Control Systems. The system, called Self-Contained Engineered Suppression and Detection Apparatus (SESDA), protects computer rooms, telecommunications centers and clean rooms.

SESDA systems come complete with ionization and/or photoelectric smoke detectors with prewired connectors, UL plenum wire cable harnesses, manual stations and audible alarms. These devices are matched to the control panel that was designed to incorporate all the normal functions for a UL listed automatic fire detection and Halon releasing panel plus an optional feature to continually monitor the quantity of Halon 1301 agent. More information is available from NF Fire Control Division of National Foam System, 150 Gordon Dr., Lionville, PA 19353; (215) 363-1400; Telex: 685-1085.

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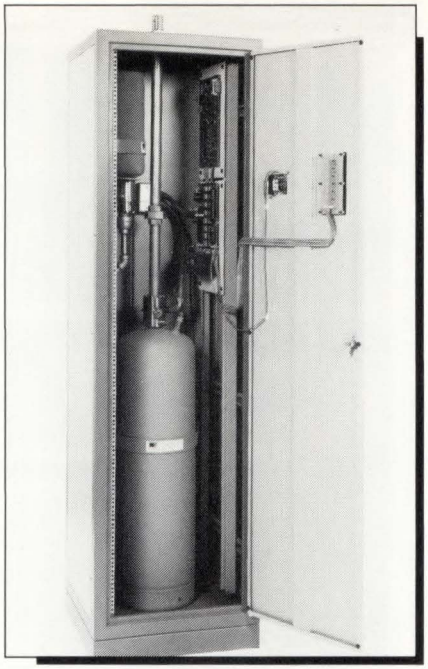


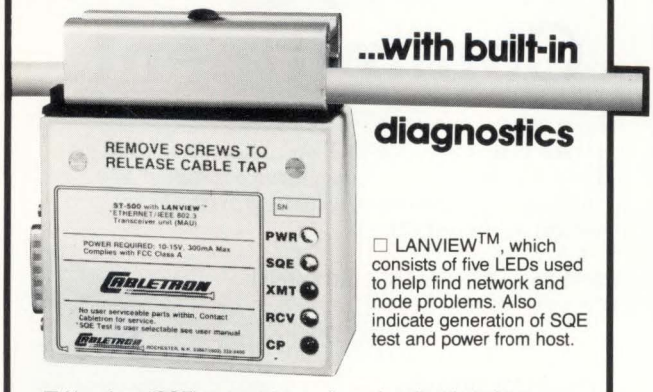
NF Fire Control's new SESDA Halon 1301 fire suppression system protects computer rooms and telecommunication centers.

Emulex Chip Sets For OEM Integration

Emulex Corporation introduced three additional computer peripheral controller chips for system integrators wanting to incorporate the speed, size and cost reduction benefits of Very Large Scale Integration (VLSI) technology into their products.

The buffer controller (BCI or II) chip is the connecting link between the embedded microprocessor and buffer memory. The disk formatter (DF) and microprocessor work as a team to handle all the disk functions. The MAC chip is a combination of the buffer controller chip, disk formatter chip and interface logic. These chips are designed to be used individually or as part of a chip set.

Ethernet Transceiver ST-500



...with built-in diagnostics

☐ LANVIEW™, which consists of five LEDs used to help find network and node problems. Also indicate generation of SQE test and power from host.

☐ Heartbeat (SQE) test can be configured or disabled without disassembling the unit. Therefore, you need inventory only one transceiver type.

☐ Compatible with Ethernet Versions 1.0 and 2.0 and IEEE 802.3 specifications. Recognized by: UL-478; CSA 220; VDE 0806; VDE 0871, Class B; IEC 380; FCC Part 15, Subpart J, Class B; and NEC 725-2(b).

In addition, Cabletron Systems manufactures coaxial and fiber optic Ethernet/IEEE 802.3 repeaters, multiport repeaters, multiport transceivers, LAN test equipment and in-stock, custom-length network cabling.

Ask for literature and prices.

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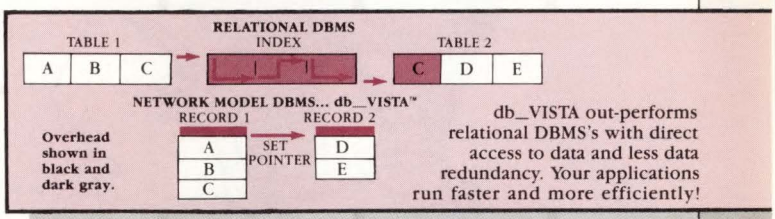
RAIMA'S COMMITMENT TO YOU: No Royalties, Source Code Availability, 60 days FREE Technical Support and our 30-day Money-Back Guarantee. Extended services available include: Application Development, Product Development, Professional Consulting, Training Classes and Extended Application Development Support.

HOW TO ORDER: Purchase only those components you need. Start out with Single-user for MS-DOS then add components, upgrade ... or purchase Multi-user with Source for the entire db_VISTA III System. It's easy... call toll-free today!



db_VISTA out-performs relational DBMS's with direct access to data and less data redundancy. Your applications run faster and more efficiently!

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1 db_VISTA™: The High Performance DBMS

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- File and record locking.
- Automatic database recovery.
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- Timestamping.
- Database consistency check utility.
- Fast access methods based on the network database model and B-tree indexing. Uses both direct "set" relations and B-tree indexing independently for design flexibility and performance.
- An easy-to-use interactive database access utility.
- File transfer utilities for importing/exporting ASCII text and dBASE II/III files.
- A Database Definition Language patterned after C.
- Virtual memory disk caching for fast database access.
- A runtime library of over 100 functions.
- **Operating systems:** MS-DOS, UNIX V, XENIX, VMS, OS/2.
- **C Compilers:** Lattice, Microsoft, IBM, Aztec, Computer Innovations, Turbo C, XENIX, and UNIX.
- **LAN systems:** LifeNet, NetWare, PC Network, 3Com, SCO XENIX-NET, other NETBIOS compatible MS-DOS networks.

2 db_QUERY:™ The SQL-based Query.

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All chip sets sell in the range of $50 for quantity 10,000, depending on chip selection. Find out more by contacting Emulex Corp., 3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, CA 92626; (714) 662-5600 and (800) EMU-LEX-3 outside CA.

Enter 315 on reader card

Pacer Enhances pcLINK

Pacer Software Inc. has announced that its pcLINK software package now provides high-speed Macintosh and PC-to-VAX integration over Ethernet. The package consists of configurations that let users take advantage of the full range of pcLINK functionality over an Ethernet connection to VAX systems running the VMS operating system. pcLINK includes features for moving data between the DOS and Macintosh environments and provides high-speed VAX Ethernet connectivity for both the Macintosh and IBM PC.

The pricing for pcLINK is server-based (only the VAX portion of the software is licensed, allowing unrestricted distribution of the microcomputer software, both PC and Macintosh). Pricing starts at $2,000 per VAX.

To learn more, contact Pacer Software, 7911 Herschel Ave., Ste. 402, La Jolla, CA 92037; (619) 454-0565.

Enter 316 on reader card

OPTIFILE II Supports 5¼-inch Worm Drive

KOM Inc. adds another write once, read many (WORM) drive to the list of drives supported by the OPTIFILE product. The latest drive is Maxtor Corporation's 5¼-inch optical drive. OPTIFILE is a proprietary technique that allows WORM optical drives to emulate standard magnetic disk drives. OPTIFILE II is the implementation of this technique on DEC's series of PDP/RSX and VAX/VMS computer systems.

Using OPTIFILE II, various types of WORM optical drives can be plugged into a DEC system and be immediately put to use. All software utilities, applications and layered products can be used without changes to any software.

For further information, contact KOM Inc., 145 Spruce St., Ottawa, ON K1R 6P1, Canada; (800) 267-0443.

Enter 320 on reader card

Persoft Adds VT240 Color Graphics Emulation

Persoft Inc. has announced V2.0 of SmarTerm 240, which includes emulation of the DEC VT241 color graphics terminal, and support for Enhanced Graphics Adapters (EGA) when displaying ReGIS graphics images.

SmarTerm 240 allows an IBM PC or 100 percent compatible computer to communicate with minicomputer and mainframe hosts and emulate the display and keyboard characteristics of a range of DEC and Tektronix graphics and text terminals.

V2.0 of SmarTerm 240 supports three "error-free" file transfer protocols: Xmodem, KERMIT and proprietary PDIP protocol.

V2.0 is priced at $345.

For more information, contact Persoft Inc., 465 Science Dr., Madison, WI 53711; (608) 273-6000.

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Datacube Supports MicroVAX II

Datacube Inc. announced support for the MicroVAX II for its MaxVideo Family of im-

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age and digital signal processing equipment.

Datacube signed a cooperative marketing agreement with Vista Systems, whereby Vista Systems will provide integration and programming services for users of DEC's MicroVAX II.

The agreement is for two years and covers all MaxVideo family products for use in imaging and digital signal processing applications.

For further details, contact Datacube Inc., 4 Dearborn Rd., Peabody, MA 01960; (617) 535-6644.

Enter 324 on reader card

StationLock Designed For Security

Secure Technologies Inc. has announced new pricing for the StationLock family of access control security locks. The StationLock replaces the on/off switch with a key-operated switch lock, which is designed for high security and easy installation. It restricts access to systems and networks via the VT200/330/340, Rainbow, DECmate II and PRO 300.

Features include high-security Medeco lock and key, with the key removable in both the on and off positions. Keying options include keying alike and master keying.

The new price for the StationLock is $49.95 with a lifetime warranty.

For more information, contact Secure Technologies Inc., 297 High St., Dedham, MA 02026; (617) 326-7979.

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Secure Technologies' StationLock replaces the on/off switch with a key operated switch lock.

TCP/IP for your PC

Networking for the IBM PC, AT and compatibles with the ARPA standard TCP/IP protocol family. These programs can be used to communicate from PC to PC, but more importantly, they can be used to communicate with other computers such as Vaxes running Ultrix or VMS, Sun workstations, Lisp Machines, and many others.

Programs Included:
- File transfer: *ftp, rcp, tftp*
- Remote login: *telnet, rlogin*
- Electronic mail: *smtp, mail*
- Remote printing: *lpr*
- Information: *finger, whois*
- Remote execution: *rexec, rsh*

Networks Supported:
- Ethernet from 3COM, BICC, Excelan, Interlan, National Semiconductor and Ungermann Bass
- Token Rings from Proteon
- X.25 from Scope
- SLIP (Serial IP) with standard async port

Requires MS-DOS 2.x - 3.x, 256K, one floppy, and a network interface. Binaries $400; programming libraries $500.

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GENEX Offers Intellisys Applications Generator

GENEX Technology Group offers the Intellisys Database Applications Generator, an intelligent menu-driven tool that allows end users and data processing professionals to develop custom database applications. No programming is required to develop, test or operate serious filing, forms management, accounting and manufacturing applications.

The work windows provide space for designing the files and forms. In form designs, Intellisys provides access to the data dictionary through the list menu and zoom window. Multifile and form applications can be developed easily and quickly. Intellisys helps develop personal and departmental applications on MicroVAX, VAX, and PDP-11 Systems.

For more information or a demonstration, call GENEX Technology Group, 224 King Street West, Hamilton, ON Canada L8P 1A9; (416) 527-2191.

Enter 349 on reader card

AST Introduces Postscript Printer

AST Research Inc. announced that it is offering Adobe Systems' PostScript bundled with a new model of its TurboLaser printer for desktop publishing applications. At a cost of $3995, TurboLaser/PS is the lowest-cost PostScript printer available on the market.

AST's new TurboLaser/PS printer features a Ricoh 4081 engine that enables printing of eight pages per minute and provides 300-dots-per-inch resolution. The printer's input and output trays hold 250 sheets of paper each, and the printer has a total life expectancy of 600,000 pages. TurboLaser/PS works with DEC, IBM PC, XT, AT and compatible computers such as the AST Premium/286, as well as all Apple Macintoshes.

The add-on PostScript board retails for $1995.

For more information, contact AST Research, 2121 Alton Ave., Irvine, CA 92714; (714) 863-1333.

Enter 352 on reader card

Sun FORTRAN 1.0 Connects To VAX/VMS

Sun Microsystems' new version of its FORTRAN programming language, Sun FORTRAN 1.0, will ease the movement of hundreds of established applications currently running on VAX/VMS to advanced Sun Workstation technology. Applications, such as real-time flight simulation, petroleum resources analysis, and complex physics simulation, can be ported to run on high-performance Sun workstations.

With Sun FORTRAN 1.0, software developers can incorporate easily Sun workstations into installations of DEC equipment to take advantage of the 1.5- to 4-mips performance of the Sun-3 workstation family.

Sun FORTRAN 1.0 lists for $400. Additional information is available from Sun Microsystems Inc., 2550 Garcia Ave., Mountain View, CA 94043; (415) 691- 6411.

Enter 356 on reader card

MASS-11 V7-A Supports PostScript

Microsystems Engineering Corporation announces the release of MASS-11 Version 7-A word processing software for IBM PCs and compatibles. The major enhancement in this release is the support of 43 PostScript fonts. MASS-11pc word processing sells for $395 per PC.

Another version of MASS-11 with virtually identical features and functionality is available for VAX computers. Pricing for VAX computers ranges from $5,750 to $17,250. Subsequent and cluster pricing for VAXs is also available.

For further information, contact Microsystems Engineering Corp., 2400 W. Hassell Rd., Ste. 400, Hoffman Estates, IL 60195; (312) 882-0111.

Enter 357 on reader card

MicroVAX System Monitor Provides 16 Channels

The Model 190 System Channel Monitor, introduced by Codar Technology Inc., provides MicroVAX/Q-bus users with 16 channels of high-speed eight-bit A/D along with onboard temperature and system voltage sensors. Each of the software-selected A/D channels is scanned sequentially using an onboard real-time clock. The 190 also can be used as a standard interrupt driven A/D converter with auto scanning or manual channel selection.

The Model 190 is priced at $595 including a one-year warranty.

To obtain more information, get in touch with Codar Technology, Inc., 1500 Kansas Ave., Bldg. 2E, Longmont, CO 80501; (303) 776-0472.

Enter 360 on reader card

DECnet and VAXcluster Gateway to IBM, CDC

RJEnet is a new option to complement both Datanex HASP + and ezSNA/RJE communication software products. It allows VAX and MicroVAX users on DECnet nodes and VAXclusters to use HASP + or ezSNA/RJE software on any VAX or MicroVAX in the network. HASP + allows VAX users to perform remote job entry (RJE) and file transfers into most mainframes and minicomputers while ezSNA/RJE performs the same functions into SNA networks.

Prices start at $1,000 for a host module for the HASP + or ezSNA/RJE node and support for one remote node. Expansion to serve more nodes is available for $250 per additional node.

For further information, please call or write Datanex, P.O. Box 1728, Eugene, OR 97440; (503) 687-2520. Telex: 494-1300 DATANEX.

Enter 358 on reader card

Commander Executive Is Available Commercially

Comshare released Commander Executive, a PC-based software product for executive-level workstations implementing information systems in medium-to-large sized companies. It provides user interface, series of applications for executive use, and builder's tools for use by those who are responsible for providing information to executives.

Commander EIS runs on IBM mainframes using VM/CMS or MVS/TSO and on VAX/VMS. The executive workstation workstation component requires an IBM PC AT, or a fully compatible computer with EGA, using DOS 3.0 or higher.

The system costs from $28,500 to $77,000 for DEC computers.

To find out more, get in touch with Comshare, 3001 S. State St., P.O. Box 1588, Ann Arbor, MI 48106; (313) 994-4800.

Enter 359 on reader card

New Blast II Announced For VAX

The new BLAST II series from Communications Research Group provides PC-like features and functions, including a Lotus-style menu, plus virtual terminal capabilities for VAX/VMS to dial out and interact with other computers on a peer-to-peer basis. Script files and macro commands allow the VAX user to set up repetitive routines or frequent transactions quickly and easily.

The most significant capabilities include automatically retrieving selected files or distributing data to remote sites; automated backup or archiving of data from PCs to VAXs or IBM mainframes; repetitive functions such as auto-dialing preset numbers; automated invocation of data transfer between applications; and more.

Find out more from Communications Research Group, 5615 Corporate Blvd., Baton Rouge, LA 70808; (504) 923-0888.

Enter 319 on reader card

TransFile Provides 3780 Protocol Emulation

TDT Group has developed TransFile, a bisynchronous file transfer program and protocol emulator that provides 3780 protocol emulation for PC communication (including PS/2 Models 50 & 60) with IBM, Sperry, DEC, and other mainframes.

TransFile emulates all the common RJE synchronous communications protocols. When used as a remote job-entry terminal, TransFile allows a PC to coexist on the same remote communications lines as other PCs or terminals. During such emulation, the PC functions exactly as a 3780 terminal with card reader and attached printer. In addition, TransFile offers three ways to send and receive files: user-friendly menus, a predefined command file or through a unique application program interface.

For more information, contact TDT, 444 Brickell Ave., Ste. 902, Miami, FL 33131; (305) 372-9332.

Enter 321 on reader card

SYNCRA Connects SNA Mainframe

Eastman Communications (Eastcom), a Kodak company, has announced a compact control unit equipped with special software and offering fast file transfer capabilities and terminal emulations. The SYNCRA LAN Server offers a choice of remote connections or a channel-speed adapter to effectively link all the computers on an Ethernet LAN to an SNA mainframe.

SYNCRA Software LAN Terminal Emulation packages operate on UNIX-based workstations, IBM PCs or compatibles and DEC VAX/MicroVAX systems with a VMS environment.

For more information, contact Eastman Communications, 1099 Jay St., Rochester, NY 14650; (716) 464-5500.

Enter 322 on reader card

ACC Offers Links For ULTRIX 2.0 on DEC

In support of DEC's recent introduction of version 2.0 of its ULTRIX-32 operating system, Advanced Computer Communications (ACC) announced the availability of two compatible communication interfaces. Designated ACP 5250 and ACP 6250, the interfaces bring X.25 networking to DEC MicroVAX II and VAX systems, respectively, running the new ULTRIX 2.0.

The ACP 5250 and 6250 relieve their DEC hosts of the CPU- consuming task of processing X.25 protocols by performing it in their own boards' firmware. Both the ACP 5250 and 6250 support 64 simultaneous virtual circuits that are multiplexed over single networked lines.

The ACP 5250 is priced at $4,200 and ACP 6250 at $6490.

To obtain additional information, get in touch with Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, CA 93101; (805) 963-9431. TWX 910 334-4907.

Enter 361 on reader card

Lucid Offers Lisp For VAX In Europe

Lucid Common Lisp for the VAX now is available in Europe. Lucid Inc. has signed agreements with three companies to handle the distribution of Lucid's VAX product in Great Britain, France and the Benelux countries. These distributors will be selling two versions of the product: the Development

Lotus™ on a VAX™?

With The BRIDGE™, you can run virtually *any* MS-DOS® or PC-DOS® program from *any* terminal on the VAX or MicroVAX.

Plus, with our optional PC expansion bus, you can attach virtually *any* PC peripheral, such as floppy disks, printers, plotters, OCR equipment, etc., directly to the VAX.

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Call! 415-841-9594

virtual Microsystems, Inc.

Virtual Microsystems, 2150 Shattuck Avenue, Suite 300, Berkeley, CA 94704

Trademarks: The BRIDGE—Virtual Microsystems; Lotus—Lotus Development Corporation; VAX, PRO—Digital Equipment Corporation; dBASE II—Ashton-Tate; PL/M—Intel Corporation; MV/10000—Data General. Registered Trademarks: PC-DOS—IBM Corp.; MS-DOS—Microsoft Corporation; WordStar-MicroPro.

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JOIN THE DATA TRADE ASSOCIATION

Tales of alleged discriminatory trade practices and its litigation fill today's business press. Datagate takes on Hewlett-Packard. Knaus Systems files against Honeywell. Allen-Myland sues IBM. IDSC locks horns with DEC. Third parties wrestle the giants as independents try to maintain or increase their competitively won piece of the industry pie.

DEC's new strategy limits access to the marketplace.

Nowhere have the battlelines been more defined than between Digital and DEC-compatible interests. Recently, Digital has made fundamental changes in the way it deals with customers, vendors and third party manufacturers and maintainers. These changes are designed to increase Digital's control over the marketplace it already dominates.

These changes will affect YOU.

- Third party manufacturers' products are being denied DEC field service and access to newer architectures, thereby reducing innovation;
- OEMs are being denied the opportunity to add value to Digital systems in special markets, reducing the choices available;
- Third party maintenance companies are being denied the opportunity to provide cost effective service on Digital systems;
- End users are being denied access to superior price/performance offerings from third party manufacturers, maintenance firms and vendors.

United we stand; divided . . .?

Historically, there has been no DEC-related trade association to look out for third party interests. DECUS is a tech group dominated by DEC. Other associations, primarily representing IBM, are either user groups or Washington lobbying interests. Dealers have associations but they exclude users, competitive vendors, manufacturers and maintainers. Third party opposition to DEC muscle has been fragmented and has suffered from the lack of strong representation. The DATA Trade Association (DATA) plans to change all that.

Act now to strengthen your third party options.

Complete and forward the bound-in DATA membership application with your financial commitment to Board of Directors, DATA Trade Association, 6360 Orcutt Road, San Luis Obispo, CA 93401; (805) 544-8588; FAX (805) 541-0792. Or fill out the coupon below, and DATA will send you an application.

Start working immediately with other DATA members to ensure a vital, competitive third party market. It's in DEC's best interest and YOURS.

Gentlemen: My company would like to apply for membership in the DATA Trade Association (DATA). Please send me more information and a DATA membership application form.

COMPANY NAME

ADDRESS CITY STATE ZIP

PRINCIPAL MEMBER (CEO of member company is customarily principal representative.)

TITLE

TELEPHONE

ALTERNATE MEMBER

TITLE

TELEPHONE

Please clip and send this coupon to:

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Board of Directors, 6360 Orcutt Road, San Luis Obispo, CA 93401
(805) 544-8588 FAX: (805) 541-0792

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Environment and the Application Environment.

Lucid Common Lisp for the VAX provides VAX users a fast, efficient Common Lisp offering high performance and portability across all Lucid implementations. Lucid Common Lisp for the VAX is available for the ULTRIX, UNIX and VMS operating systems. The product has been available in the U.S. since the fourth quarter of 1986.
To find out more, contact Lucid Inc., 707 Laurel St., Menlo Park, CA 94025; (415) 329-8400.

Enter 327 on reader card

IT*OS Goes UNIX

Intermation Corporation released its UNIX System V of the IT*OS document management system.

IT*OS creates a link between many operating systems. Standard features include status line, multiple cut and paste buffers, full-screen editing, spelling correction, multinational keyboard support, math and calculator capability.

IT*OS features opening multiple files, disk-full protection, conversion of several manufacturers' database application files to list processing, extensive laser printer commands, integrated diagram editor, sophisticated system management support, completely individual storage functions and support of the same file structure between all systems.
For more details, contact Intermation Corp., 234 E. Colorado Blvd., Pasadena, CA 91101; (818) 796-9371.

Enter 338 on reader card

Calendar Manager Schedules Meetings

Version 3.0 of Calendar Manager has been announced by Russell Information Sciences. Enhancements to this sophisticated scheduling package include resource and facility scheduling for full control of equipment, such as projectors, vans, etc., as well as conference rooms and other meeting facilities.

Calendar Manager lets you schedule meetings without entering dates or times. Simple cursor movements select the date, time, and even attendees, for a meeting. All attendees' schedules are searched, and conflicts are resolved automatically.

Available in VMS standalone as well as A-to-Z integrated versions, Calendar Manager is priced from $1,200 to $5,995 plus documentation and media.
To find out more, contact Russell Information Sciences Inc., 26552 Wild View Terrace, Laguna Hills, CA 92653; (714) 831-8656.

Enter 339 on reader card

SYNTAX Reprices VIM Software

SYNTAX Systems announced new pricing and product configuration of the VAX Interface Manager (VIM) software package. The VIM package, which works over Ethernet and allows networks of PCs to use VAXs and MicroVAXs as file servers and print servers, provides electronic mail services, as well as DOS-to-VMS transfer capability and VT100 terminal emulation.

The VIM software is available, including both VAX and PC sides, for $82.50 per connection.
For further information, contact Syntax, 1501 W. Valley Hwy. N., Ste. 104, Auburn, WA 98002; (206) 833-2525.

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EMU-TEK Seven Plus Graphics Terminal Emulation Software

Compatible—works with virtually all 4107 compatible programs. PATRAN,® UNIRAS,® REACCS,® and DI-3000® are just a few.

Affordable—at $695, our 4107 emulation software is the cost-effective way to link a PC to host computer graphics.

Sensible—adds versatility to your PC-based workstation. The PC you use for word processing or spread sheets can be used as a graphics terminal, too.

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C.Itoh Introduces 250 CPS Matrix Printers

C.Itoh Electronics Inc. introduced a pair of 250 cps dot matrix printers to OEM markets that provide full compatibility with DEC's LA50 printer in both wide and narrow carriage models. The new 10-inch carriage 9500D, and the 15-inch carriage model 9515D, provide greater performance and versatility than the LA50 while retaining full compatibility for use with existing software applications.

Standard interface for the DEC environment is RS-232C. As an OEM product, the printers' LA50 emulation can be customized to handle most ANSI requirements within the DEC environment.

The 9500D has a single-unit price of $749. The 9515D has a single-unit price of $949.

Additional information is available from C.Itoh Electronics Inc., 19300 S. Hamilton Ave., Torrance, CA 90248; (213) 327-9100.

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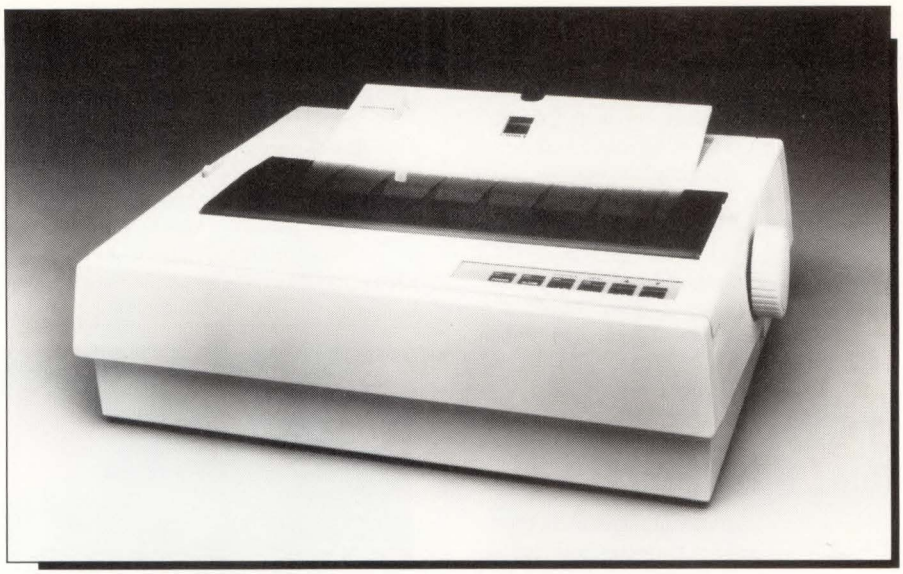

C.Itoh Electronics offers this 10-inch carriage DEC-compatible dot matrix printer, model 9500D, and a 15-inch carriage model 9515D.

Allen-Bradley Announces Internetwork Bridge

Allen-Bradley announced the IB/1 internetwork bridge, one of a series of VistaLAN/3 products that provide connectivity from A-B factory floor control systems to the technical office and manufacturing management areas.

The IB/1 interconnects Ethernet-compatible networks to the VistaLAN/3 broadband network, forming an extended network that covers a radius of up to 10 miles.

For more information, contact Allen-Bradley Response Center Dept., COM/165-51, P.O. Box 92846, Rochester, NY 14692.

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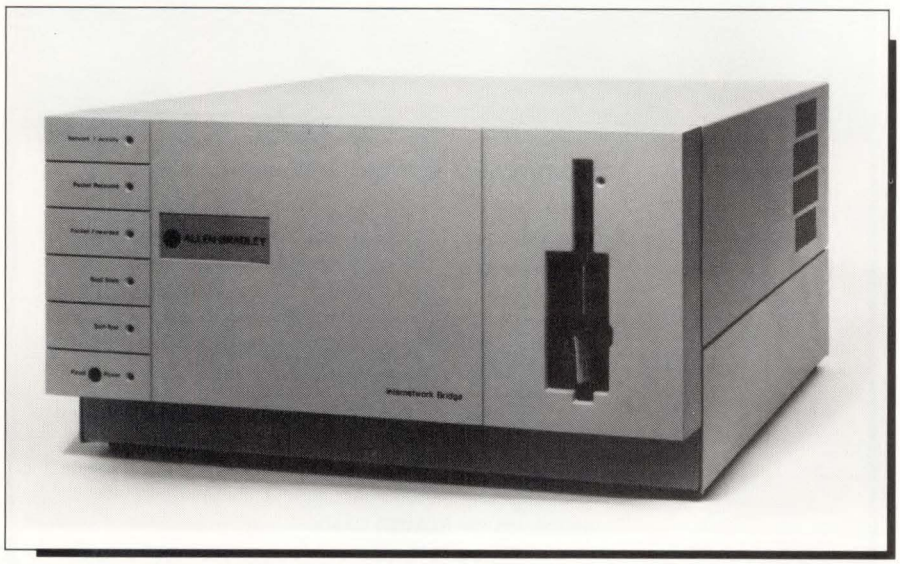

The IB/1 internetwork bridge from Allen-Bradley connects from factory floor systems to manufacturing management areas.

NEXPERT/OBJECT Offers Price/Performance

DEC has announced NEXPERT OBJECT, an expert system development tool written in C for VAX systems that offers integration and price/performance when teamed with DEC's VAXstation workstations or VAX 8000 series.

Developed by Neuron Data, NEXPERT OBJECT is a graphics-oriented expert system tool that provides most of the features of higher priced tools as well as innovative artificial intelligence functions. It also uses all of the graphics facilities provided by DEC workstations.

NEXPERT OBJECT and a fully configured VAXstation workstation now can be purchased for less than $15,000. A NEXPERT OBJECT license costs from $5,500 to $8,800, and comes with one year of Digital support services.

For more information, contact Digital Equipment Corp., Maynard, MA 01754-2571; (800) DEC-INFO.

Enter 328 on reader card

Celerity Announces Increased Compatibility

Celerity announced the addition of three software applications. To increase their systems' compatibility with DEC systems, Celerity has acquired a VMS command shell, an emulation of the VMS editor EDT and a workalike of DEC's ALL-IN-1 business software package.

Celerity is making the VMS user interface, Digital Command Language (DCL), available to its users. Through a shell that will run on top of the Celerity UNIX, DCL commands will be interpreted and then executed through UNIX. The shell will allow the manipulation and editing of VMS files and the compiling, linking and running of user programs. The shell also will have both online help and learn mode that shows the user the equivalent UNIX command.

Additional information can be obtained from Celerity, 9692 Via Excelencia, San Diego, CA 92126; (619) 271-9940.

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"It's easy looking at you, kid."

This is the screen that dreams are made of–the DEC-compatible ADDS 3220. Its unique 70Hz refresh display gives you a stunning flicker-free performance. Along with a presentation so brilliant your operators will be happy to work with it all day.

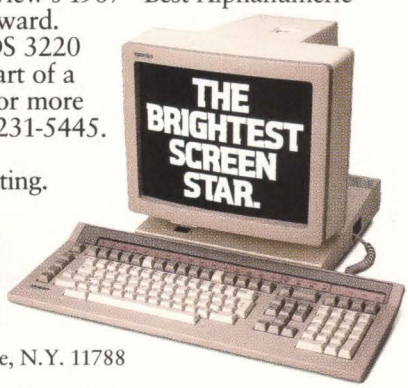
And you'll appreciate our supporting cast of bigger-than-life characters. Presented on a 14" flat green, amber or white screen, our easy-to-read double wide and double high/wide characters can be viewed in your choice of 80 or 132 column format. With operator selectable settings for brightness and contrast.

Brains and beauty.

But more than just a terminal that's great to look at, the ADDS 3220 gives you brains behind the beauty. Our DEC-style keyboard enhances the performance of your software. With value-added features like 22 fully programmable function keys and 256 bytes of non-volatile memory that help distinguish your product from the competition.

Naturally the ADDS 3220 is fully compatible with the DEC VT220, VT100, VT52, and ANSI X3.64. What's more, it won Digital Review's 1987 "Best Alphanumeric Terminal of the Year" award.

Screen test an ADDS 3220 today. It could be the start of a beautiful relationship. For more information, call 1-800-231-5445. In N.Y. 516-231-5400. Ask for Displays Marketing.



ADDS
Applied Digital Data Systems Inc.
A Subsidiary of NCR Corporation

100 Marcus Blvd., Hauppauge, N.Y. 11788

The person pictured above is a celebrity look-alike.
The estate has not authorized or approved the use of look-alikes.

See us at Comdex/Fall - #2746, & DEXPO West - #1448

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Computer Command Adds Ada To MODEL System

Computer Command and Control Company added Ada to its MODEL repertoire of code-generation capabilities that include PL/1 and C.

MODEL automates software development by translating a problem description into a highly efficient procedural program. The MODEL system includes a compiler for specifying individual modules, a configurator for synthesizing complete systems and a timer for performing timing analysis and evaluating design bottlenecks.

All systems operate on VAX/VMS and IBM under VM/CMS and MVS.
Get in touch with Computer Command and Control Company at 2401 Walnut St., Ste. 402, Philadelphia, PA 19103; (215) 854-0555.

Enter 334 on reader card

JMI Unveils Real-Time Operating System

JMI Software Consultants Inc. announced an 80386 version of the C EXECUTIVE, a real-time, multitasking, ROMable operating system. C EXECUTIVE now supports 12 separate CPU architectures, including DEC LSI-11, Motorola 6809, 68000 and 68020; Intel 8080, 8086 and 80286; and AT&T WE 32100.

C EXECUTIVE is written in portable C language. Time critical sections, however, including context switching, task scheduling, and interrupt handling, are all written in optimized assembly language. This combination results in quick, efficient ports to new CPUs, while automatically taking full advantage of the instruction set via a C compiler. For more information, contact JMI Software Consultants Inc., 904 Sheble Ln., P.O. Box 481, Spring House, PA 19477; (215) 628-0846.

Enter 335 on reader card

MCBA Releases S/H For DEC VAXs

MCBA Inc. has released Sales History (S/H), a sales analysis package written in COBOL for VAXs. S/H is a management tool for planning sales strategies and tracking results. The package obtains data automatically when invoices are printed. Sales comparison reports allow the user to compare data from current periods with data from the corresponding periods of the previous year. Sales detail reports provide presentations of invoice data generated by MCBA's customer order processing package.

The company's accounting, distribution and manufacturing software runs on DEC, Wang, Hewlett-Packard, Texas Instruments, AT&T, IBM PC XT/AT and others.

Recommended retail prices for S/H range from $2,000 to $4,000.
For more information, contact MCBA, 425 W. Broadway, Glendale, CA 91204-1269; (818) 242-9600. Telex: 194-188.

Enter 332 on reader card

STREAMLINE Goes To The VAX

STREAMLINE, the micro-to-mainframe link that makes it easy to select, extract and download data to a PC in an immediately usable format, now is available to VAX users from KEYSTEP Corporation.

Via a completely menu-driven user interface, STREAMLINE allows you to point

Spend Less on a Graphics Terminal and Get More From Your PC!

With Grafpoint's Tektronix Emulation Software you can unleash the power of a Tektronix Graphics Terminal from your PC. Only Grafpoint gives you VT100/52 alphanumerics and a selection of Tektronix 4010, 4105, 4107/09, and 4115 emulation.

Grafpoint combines extensive experience in terminal emulation with a commitment to quality in performance, compatibility, and customer support that is second to none. Grafpoint provides its customers with free updates and customer service for 12 months, and a 30-day guarantee on our software. To find out why Grafpoint is the acknowledged leader in Tektronix emulation, call or write us at: Grafpoint, 1485 Saratoga Avenue, San Jose, CA 95129, (408) 446-1919. Outside of California (800) 426-2230.

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It's your best strategy.

DEXPO brings you the best of DEC-style computing ... 300 vendors demonstrating over 10,000 DEC-compatible products and services. You get the answers you need. Plus hands-on technical assistance. Fast.

Push Your System to its Maximum Potential

Improve the productivity of all your VAXs — from MicroVAX to VAX 8800 clusters. Uncover the mysteries behind PC-VAX connectivity. Explore a universe of DBMS, Storage and Memory, CAD/CAM/CAE products. Keep your PDP-11s and older DEC systems at peak performance levels. You'll discover applications, ideas and solutions you've never even considered!

Register Now ... Call 800-433-0880

Complete and mail the attached reply card today or call to get your **FREE** *Show Preview* featuring over 100 of the newest DEC-compatibles. (And, be sure to ask for your money-saving VIP tickets!) Admission is **FREE** for Anaheim DECUS* Symposium Attendees.

IDC in cooperation with DEXPO presents:
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DEXPO is organized by Expoconsul International, Inc.,
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December 8-10, 1987

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to the desired file and data items, specify the selection criteria, indicate whether detail or summary data is desired, and specify the final format for the extracted data. All STREAMLINE data requests are developed on the microcomputer, entirely offline. Requests can be saved on the micro for repeated use or future editing.

STREAMLINE works with INGRES, ORACLE and DATATRIEVE on the VAX systems.

The price of the VAX portion of STREAMLINE ranges from $2,000 to $9,900 depending on the host system configuration. The PC portion of the software starts at $425.

STREAMLINE is distributed by KEYSTEP Corp., 7580 W. 16th Ave., Third Floor, Lakewood, CO 80215; (303) 238-7710.

Enter 329 on reader card

Proteon Enhances ProNET-10 Network

Proteon Inc. announced additions to ProNET-10, the company's 10 megabit/second token ring network, including a new IBM Micro Channel interface, and an advanced network management software package, called TokenVIEW-10.

ProNET-10 includes interfaces for DEC's UNIBUS and Q-bus systems, MULTIBUS and VMEbus-based computers, and the IBM PC, XT and AT. TokenVIEW-10 is Proteon's new advanced network management software package that offers new and existing ProNET-10 users a software solution with comprehensive management capabilities.

For further information, contact Proteon Inc., 2 Technology Dr., Westborough, MA 01581-5008; (617) 898-2800.

Enter 337 on reader card

BL8000 Shared Database System Introduced

Britton Lee Inc. introduced the BL8000 Shared Database System, its new high-end relational system with performance capabilities more than 10 times greater than its current high-end product.

The BL8000 is based on a combination of parallel processing and fast reduced instruction set computer (RISC) concepts optimized for efficient database processing. The BL8000 is available in three models: the BL8000 models 400, 420 and 460. Disk storage ranges from one gigabyte to 120 gigabytes. Data memory ranges from 16 MB to 256 MB.

The BL8000 supports IBM VM/CMS and PC/DOS, VAX/VMS, Apollo and Sun workstations, and AT&T System V UNIX.

The base price of the BL8000 is $320,000.

For further information, contact Britton Lee Inc., 14600 Winchester Blvd., Los Gatos, CA 95030; (408) 378-7000. Telex: 172-585.

Enter 340 on reader card

Financial Management Provides Essential Info

Gemisys Inc. released a new Financial Management or General Accounting software package. The system is an interactive, relational database software package that provides for the information, accounting and reporting needs of general and financial management.

Five integrated modules, each of which can be used on a standalone basis if desired, comprise the system: general ledger (including a financial report generator), accounts payable, accounts receivable, fixed assets and payroll. The system is suited for small-to-medium size hardware.

More information can be obtained by contacting Gemisys Inc., P.O. Box 17047, Denver, CO 80217; (303) 969-6000.

Enter 341 on reader card

Async Multiplexer Works With Any Device

Black Box 8-Channel Async Local Multiplexer from Black Box Corporation enables users to transmit RS-232 data to up to eight local terminals, PCs, modems or other async devices over twisted pair lines, saving wiring costs and simplifying network design.

Bidirectional transmission over existing unloaded twisted pair lines using RJ-11 modular jacks at up to 9,600 baud on each channel (continuously and transparently) is but one feature of this device.

This multiplexer's built-in transformer and optical coupling reduce common ground induced errors while providing power and signal isolation. The multiplexer sells for $395.

For more information, contact Black Box Corp., P.O. Box 12800, Pittsburgh, PA 15241; (412) 746-5500.

Enter 342 on reader card

68020 Computer Serves As A Slave Processor

Ranyan Corporation introduced the 68020-based supercomputer designed to serve as a slave processor in high-volume data processing applications on UNIBUS based PDP-11 and VAX computers by DEC.

The new Ranyan Model 68 SUM board uses a Motorola 68020 32/32 bit central processor and a 68881 floating point coprocessor to provide high-speed computational capabilities at up to twice the performance of any PDP-11 or VAX 700 series computer. The 68020 is packaged with 2 MB of dynamic RAM memory and a 68881 floating point coprocessor on a single hex-sized board.

The single hex-sized board is list priced at $5,850.

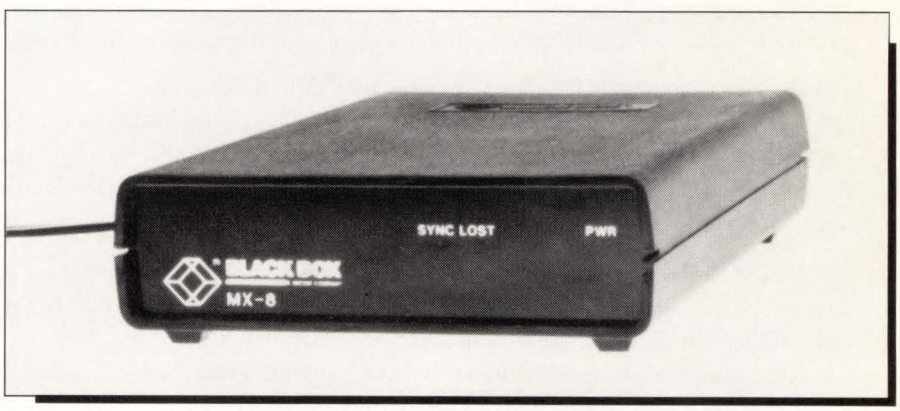
For further information, contact Ranyan Corp., 15239 Springdale St., Huntington Beach, CA 92649; (714) 895-5504.

Enter 343 on reader card

Counter/Timer Module Has Control Capability

DATEM Ltd. announced the BITBUS compatible dDCM345 COUNTER/TIMER module for PDP and VAXs that provides support for a range of control applications including rate counters, synchronizers, position control and frequency monitoring.

The dDCB345 features the same software capabilities as the dDCM345 with the addition of dDCBASIC interpretive language. dDCBASIC provides the user the



Black Box 8-Channel Async Local Multiplexer transmits RS-232 to eight local terminals, PCs, modems, etc., over twisted pair lines.

It's Not That Easy.

PC-to-DEC Communications, The Right Way.

Some companies think it's easy to make your IBM PCs act like a DEC terminal. But before you settle for some patch job, consider these facts.

Only Polygon has consistently offered true emulation through the years. In fact, when Digital Equipment Corporation went looking for terminal emulation software to license, they didn't choose just anyone. They chose Polygon. Today Polygon continues to be used in more DEC installations than any other competitive product.

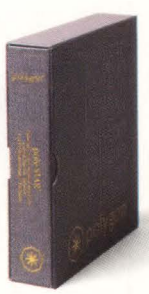
Polygon is ahead in other ways, too. We were first to ship VT220 emulation. First with VT240 emulation. First with full-color VT241 support. And now we provide Ethernet (LAT) communications as well.

You'll find our dedication shows in a whole range of products, featuring error-free file transfers, and sharing PC files in a VAX library. Our poly-STAR, poly-SHARE and the famous poly-COM series of products have set the standards for DEC communications software.

So if you want it done right, talk to Polygon.

Call 1-(314)-576-7709 For Free Demo.

We'll send a free demo package to any qualified company. Just call or write us. Polygon, Inc.,1024 Executive Parkway, Saint Louis, MO 63141 (314) 576-7709, Telefax: (314) 275-9185. Telex 883245.



polygon

Terminal Emulation, The Right Way.

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capability of programming the local I/O module using the BASIC language.

The dDCM345 lists for $575 and the dDCB345 for $625.

For further information, contact DATEM Ltd., 148 Colonnade Rd., Nepean, ON Canada, K2E 7R4; (613) 225-5919. Telex: 053- 3864. FAX: (613) 225-5996.

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NRC Adds NetBIOS Option To Fusion

Network Research Corporation added NetBIOS capability to its FUSION Network Software allowing the NetBIOS interface to run on multivendor networks.

The FUSION option allows users to run any NetBIOS application program over a TCP/IP network. In addition, NetBIOS users can transfer files between their systems and systems supported by FUSION Network Software, such as VAX/VMS computers and UNIX workstations. Users also can use a variety of link layers such as Ethernet and Token-Ring from different vendors.

FUSION runs on 8086, 80286, M68000, and VAX computers, under MS-DOS, XENIX and VMS.

For more information, contact Network Research Corp., 2380 N. Rose Ave., Oxnard, CA 93030; (805) 485-2700.

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PC Doctor Offers Alternative Maintenance

PC Doctor now offers alternative Racal Redac mini and maxi CAD system maintenance throughout the Western states. The Racal Redac line will be serviced by factory-trained technicians familiar with DEC systems.

PC Doctor provides remedial and preventive maintenance at approximately 50 percent lower than the OEMs service. Parts are replaced on an exchange basis at 50 percent of retail price. Emergency same day service, weekend on-site calls, and rentals and upgrades are available for the PDP line of Racal Redac CAD systems.

Additional information may be obtained by contacting PC Doctor, 24861 Alicia Parkway, Ste. C, Laguna Hills, CA 92653; (714) 643-3500.

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James River Offers Laser Icon Paper

The Groveton Division of James River Corporation announced the addition of Laser Icon Parchment to its Pro-Tech Laser Specialty Paper line. Available in tan, ivory and gray, Laser Icon Parchment is suited for desktop publishing applications including letterhead, newsletters, certificates, awards, announcements, greeting cards and price lists generated from laser printers.

Pro-Tech Laser Icon Parchment produces sharp, clear images, accepts printing on both sides, is feed-reliable and has controlled moisture properties.

To obtain additional information, contact the Groveton Division of James River Corp., 356 B Sewall St., Ludlow, MA 01056; (413) 589-7592. Telefax: (413) 583-2978.

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APL PLUS System Suits VAX/VMS Environment

STSC Inc. announced the APL PLUS System for VAX/VMS. It includes a direct interface

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between APL and other programming languages, allowing programs written in C, FORTRAN and other languages to be integrated easily into APL-based applications.

A variety of APL and non-APL terminals are supported as full-screen devices, including the DEC VT220 terminal with downloaded APL font and the IBM PC or Apple Macintosh running the SPL PLUS System.

The retail price for the system ranges from $5,000 to $30,000 depending on the VAX model being used.

For more information, contact STSC Inc., 2115 E. Jefferson St., Rockville, MD 20852; (301) 984-5000.

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PPI Offers New Object User Interface

Productivity Products International Inc. (PPI) introduced ICpak 201, a set of 49 pretested software components that enable professional software developers to build sophisticated, multiwindow iconic user interfaces for workstation applications in both color and black and white.

ICpak 201 will be available initially on the VAX, under ULTRIX, and BSD 4.2 and 4.3, color monochrome, running X Windows; Hewlett-Packard 9000 series 200 and 300, under HP-UX, color, running Starbase or X Windows; and Sun Microsystems, under Sun OS version 3, color and monochrome, running SunWindows. Customer shipments begin in October.

To learn more, contact Productivity Products International, 75 Glen Road, Sandy Hook, CT 06470, (203) 426-1875. Telex: 506-127.

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Computerline Announces Plantrac/VMS

Computerline Inc. has announced PLANTRAC/VMS, an integrated critical path method project management system that manages up to 250,000 activities in a single project. Each subproject is available for individual analysis. A multiproject feature allows you to link up to 100 subprojects and allocate across projects. The PLANTRAC advance graphic module supports color printing, screen displays and plotting of bar charts, network logic diagrams, histograms and graphs.

PLANTRAC/VMS is available for any VAX running VMS or MicroVMS. Prices range from $2,995 to $6,995 depending upon configuration.

For more information, contact Computerline Inc., P.O. Box 308, 52 School St., Pembroke, MA 02359; (617) 294-1111.

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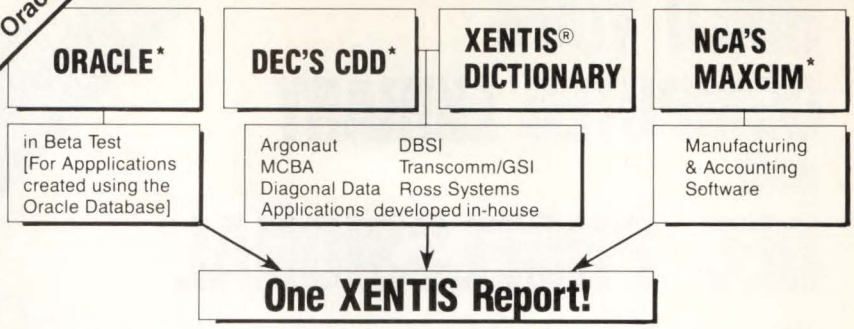

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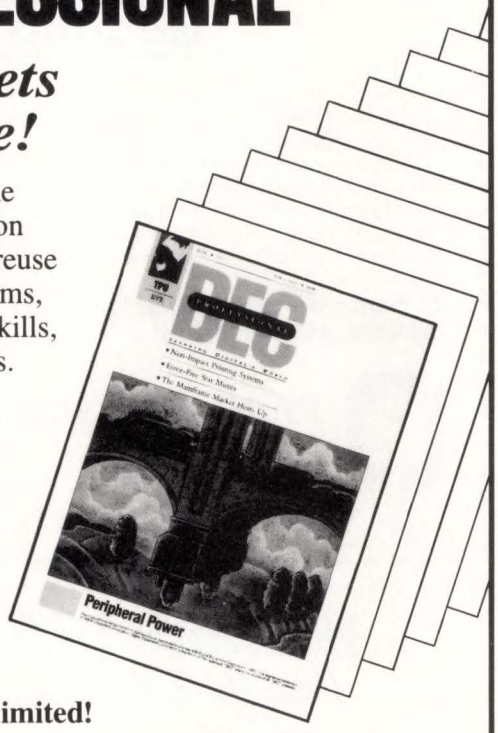

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Colt Software Offers ExecuDesk

Colt Software Technologies introduced ExecuDesk, an executive organizer for VAX and MicroVAX running VMS V4.5 or later.

It contains windowing to allow several functions to be viewed simultaneously. The windows may be moved around the screen for convenience. It offers A-to-Z integration but A- to-Z isn't necessary. A clock with the time and date is displayed on the screen. Reminders from the calendar are displayed on the main screen and a date book may be printed with daily appointments and an expense list. The printer selection uses VAX print queues.

To obtain additional information, contact Colt Software Technologies, Inc., P.O. Box 8716, Red Bank, NJ 07701-8716; (603) 823-8756.

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Drive Subsystem Insures Data Integrity

A high-capacity, high-performance dual-drive subsystem that provides totally redundant data storage and eliminates the need for file backup was announced by the Ford/Higgins Division of Century Data Inc.

The Shadow is a new concept in data integrity for PC/AT, Macintosh and Digital Q-bus systems. It's comprised of two 86- or 170MB 5¼-inch Winchester fixed disk drives, two controllers and two power supplies and switches.

The SO305-01 is priced at $4,395; the S4406-01 is $5,995.

The Shadow is available immediately by contacting Century Data Systems, Ford/Higgins Division, 1301 South Sunset Street, Longmont, CO 80501; (800) 262-6743.

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Zoltech Increases Slots For Backplane

Zoltech's new H9278-BP replacement backplane is a quad-width backplane assembly that's compatible with the original DEC backplane; but it provides usable connectors for all eight slots in the DEC BA23 chassis. The H9278-BP can be installed in a few minutes with a screwdriver to increase greatly the capacity of the VAXstation II/RC system.

The installation of the Zoltech H9278-BP backplane for $269 gives the /RC model the same capacity as the standard VAXstation II.

For additional information, contact Zoltech Corporation, 7023 Valjean Ave., Van Nuys, CA 91406-3997; (818) 780-1800. Telex: 755-451.

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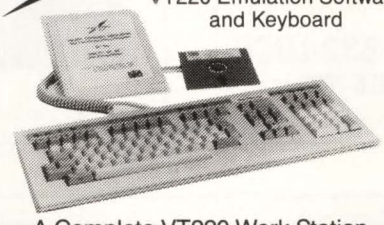

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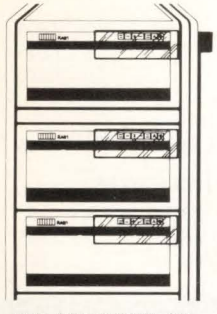

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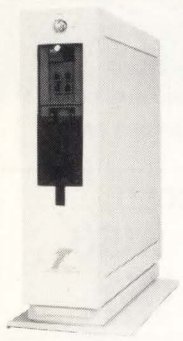

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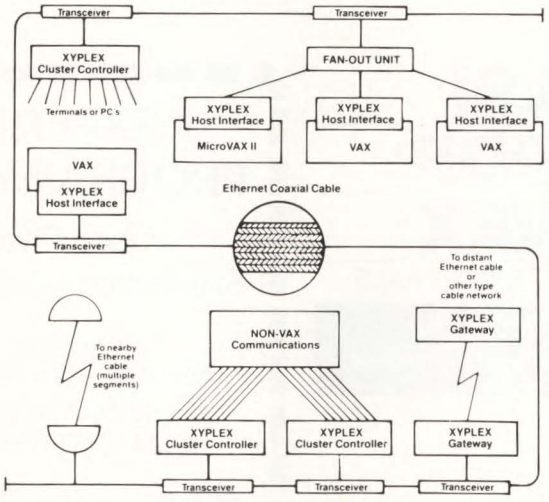

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If my memory serves me right... It must be Clearpoint!

BACK END

John C. Dvorak

Fast Books, Fast Bucks

Here's a story about electronic publishing and a guy named Dick Brass. He went around New York in the waning days of the CP/M microcomputer operating system and asked one publisher after another for the electronic rights to their dictionaries. He finally got Random House to bite and for peanuts, he ended up owning all the electronic rights to its dictionaries.

Then he turned around and developed a spell checker (with the brand name) and sold his company for millions. Amazingly, few publishers in the late 1970s even knew what a floppy disk was. Why anyone would want to put data on one had to be a bigger mystery to them.

The earliest assumption about electronic rights was derived from the microfiche business. It's such a smallish business compared to hardcover book publishing that the publishers decided to let specialists make microfilms of their books and documents. They sell them the rights for very little money. After all, who'd buy the microfiche version of a best-selling novel when you can have it in hardcover for $19.95? Fiches were only for libraries or the archives.

It followed that electronic versions of these same books or dictionaries had the same significance as the fiche. The audience was a small, specialized one that wasn't important.

Now those of us in the computer industry knew from day one that electronic publishing was going to mean big dough for someone and any rights to anything might pay off like a government land oil lease. The bigger question became: What the heck is electronic publishing, anyway?

To this day, the meaning of the term is vague, and the potential bonanza has yet to be realized by anyone except floppy disk game manufacturers. I suppose we can call all software sold on diskette as a form of electronic publishing. Or can we?

It's really floppy publishing. The data is encoded electronically on a floppy, but the floppy isn't by any means electronic. Stuff to be brought out on laser disk is even more of an enigma. This is in no way electronic in the pure sense. The disks are stamped out like records and we don't refer to phonograph records as electronic publishing, do we?

Now we can ask, "What's it good for and why would anyone want to do it?" Well, Dick Brass showed that it's good for making a dictionary work with a word processor. It's good to sell software this way.

And it's good for, uh, well, let's see....I guess that's about it. It looks to me like nobody's been able to find many ordinary uses for electronic publishing. Sure, there are the big databases that one guy in a million finds a use for. There must be something else.

Well, with the advent of CD-ROM and its ability to store 600 MB online, there's one new use that at least will save the trees from deforestation: directories. Large, fat directories.

They cost money to produce, money to print, money to bind. They're expensive. Real estate people use them. Travel agents use them. Car parts dealers use them. Librarians use them. Any big fat book you see should be turned into a CD-ROM. One company is putting all the nation's phone books onto three or four CD-ROMs.

The bigger the book, the more likely it will find its way to CD-ROM. Forget novels and pop nonfiction on CD-ROM.

What's the point? A small book always will be easier to read if it's in book form and this will be the great irony of the century: It will cost more to manufacture a small novel as a book than it will cost to manufacture a monstrous 30,000-page catalog of Western art on CD-ROM. How, then, will an electronic publisher justify selling a cheap disk for $300 or more when it costs $1 to stamp out?

There's always a certain amount of buyer resistance when the consumer knows that $299 of the $300 he's spending is what looks like pure profit. He doesn't consider that keying in 30,000 pages of data costs money. This buyer resistance means bootlegging is just around the corner.

Electronic publishers have to realize that they must change the way they do business. The key is to set up their operations so that the constant update of information results in monthly or even weekly changes in their CD-ROM database.

A buyer of a 30,000-page catalog won't object to paying $300 for 52 disks — one a week (even though they're mostly the same). Making 52 disks still is cheaper for the vendor than manufacturing that 30,000-page catalog, so this shouldn't be a problem. And this is the only solution to bootlegging (forget about copy protection schemes). End of lecture.

Now if someone wants something to complain about, imagine the pile of old CD-ROMs we'll see in the future. Come up with a way to use them as building material and you'll make a million bucks. Now there's an opportunity!

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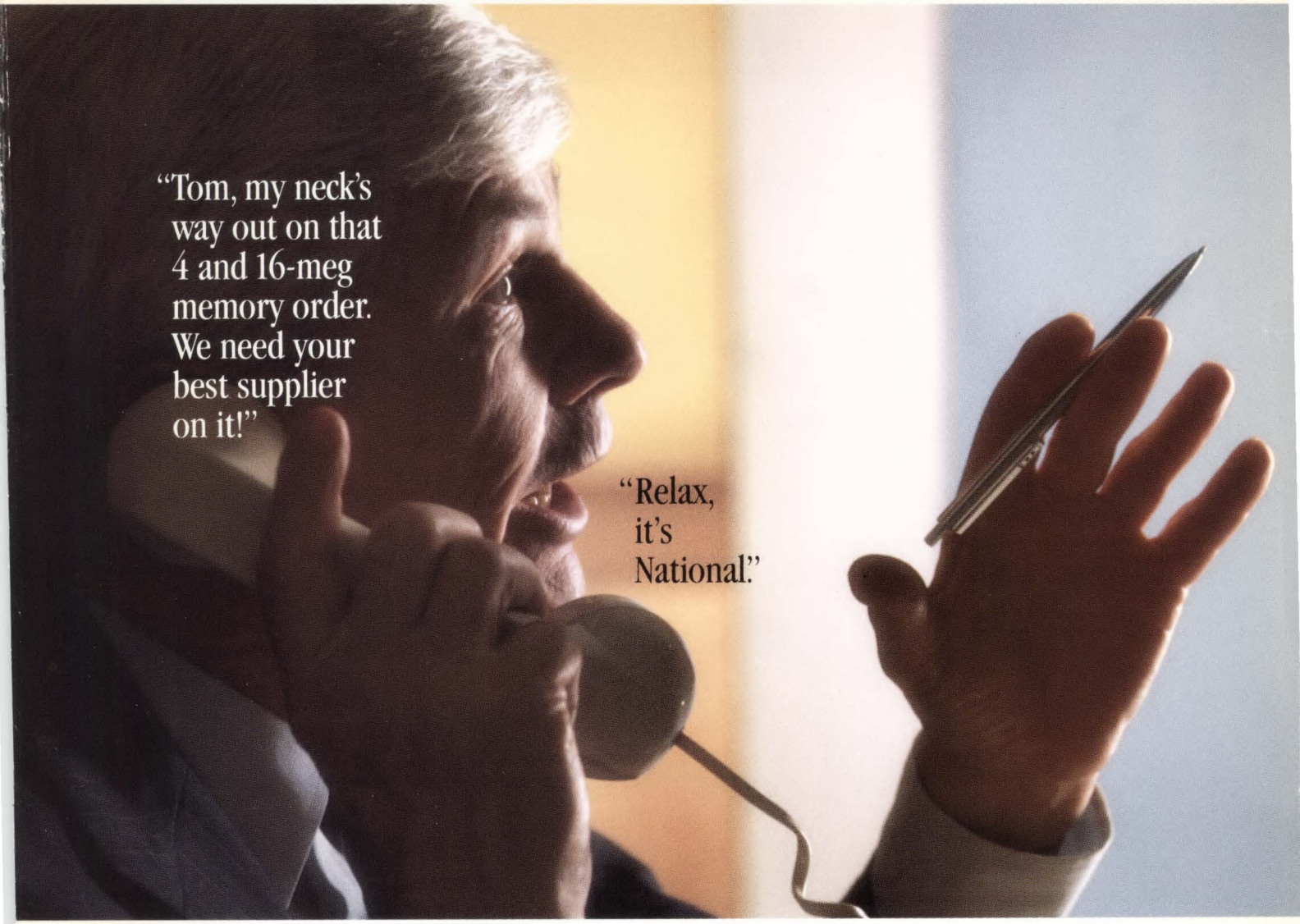

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