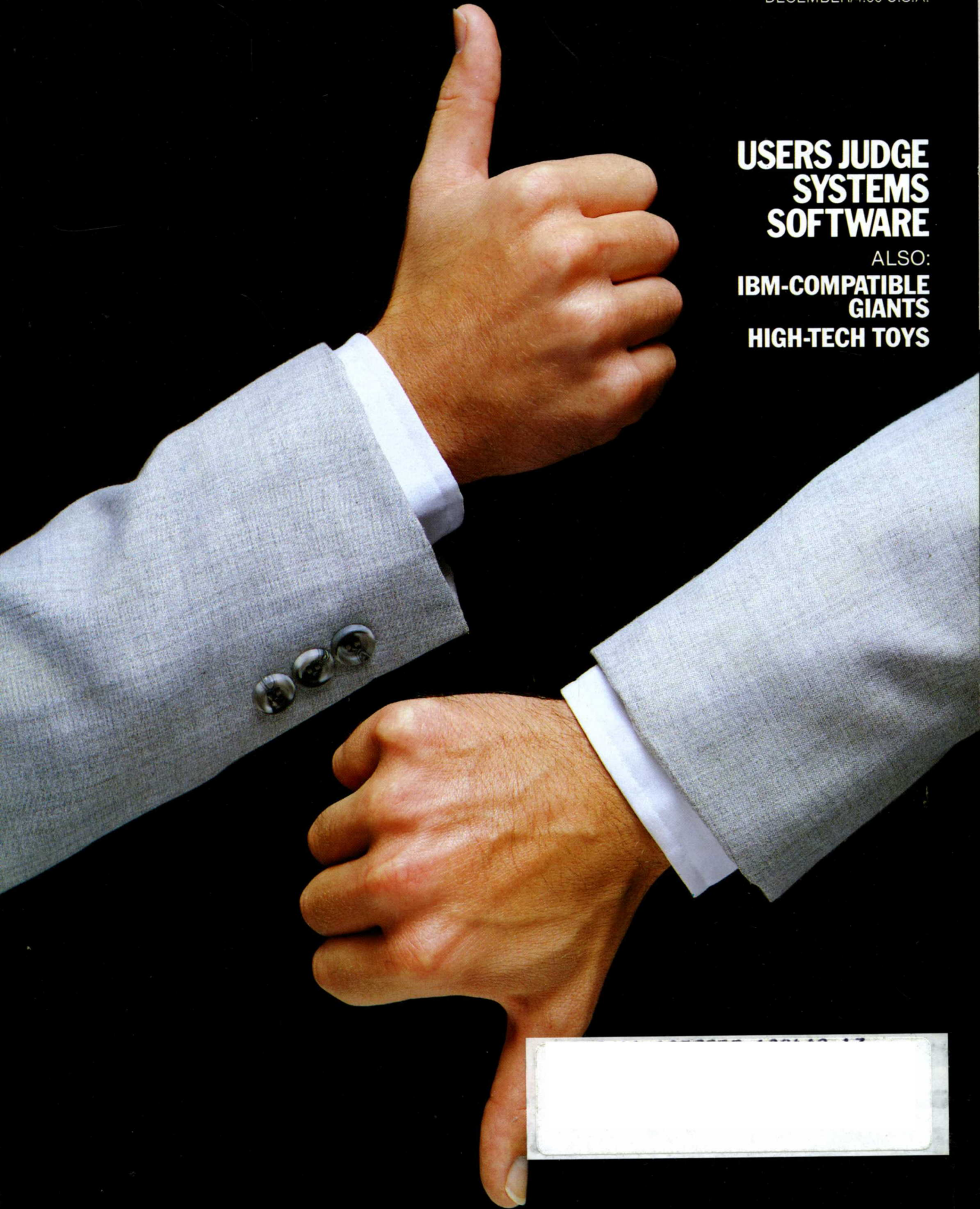


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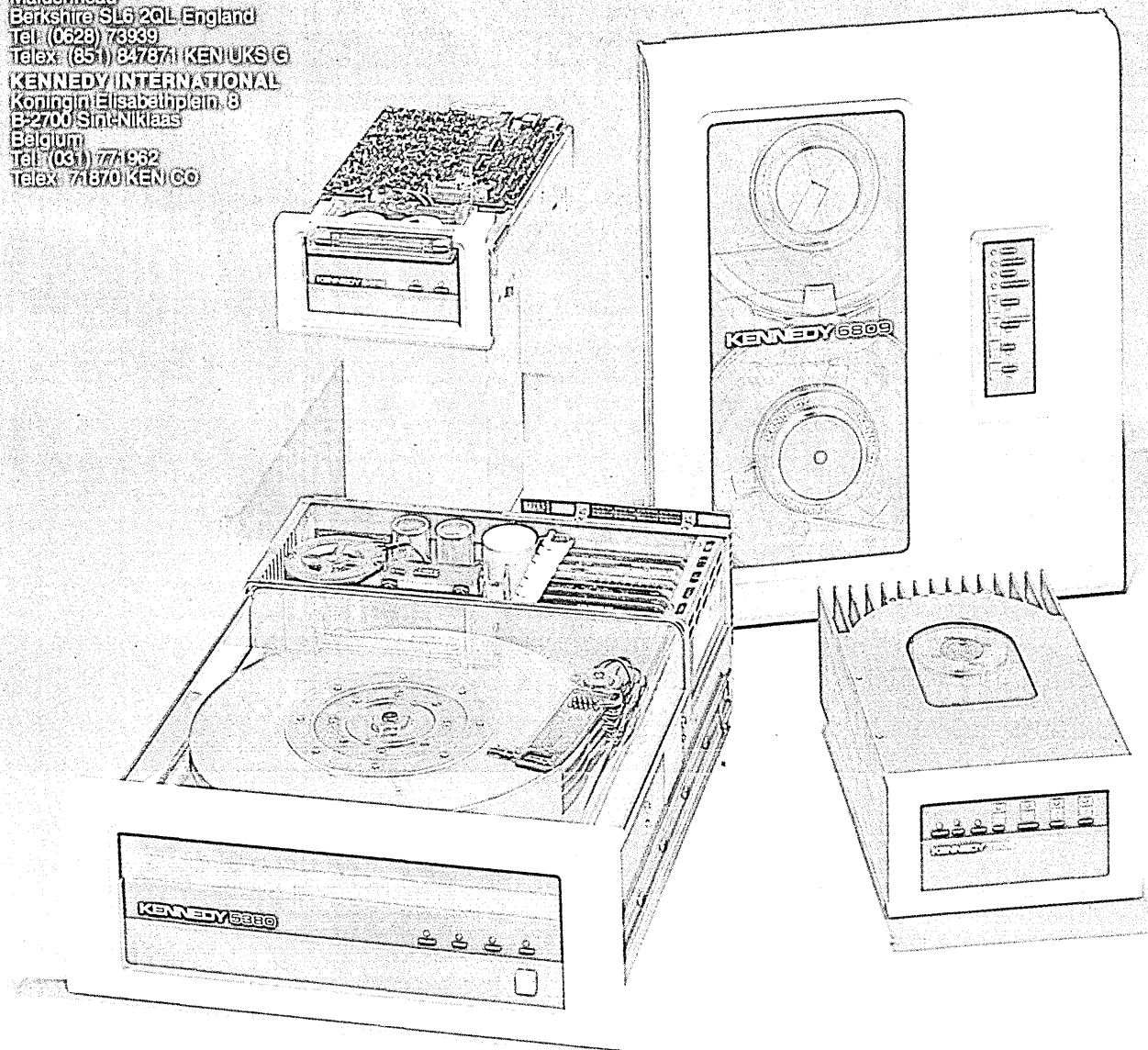
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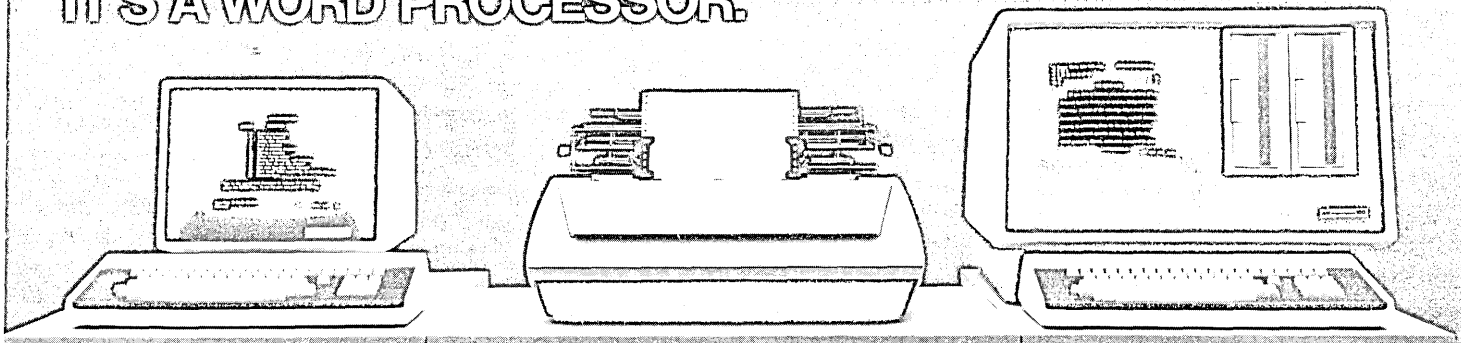
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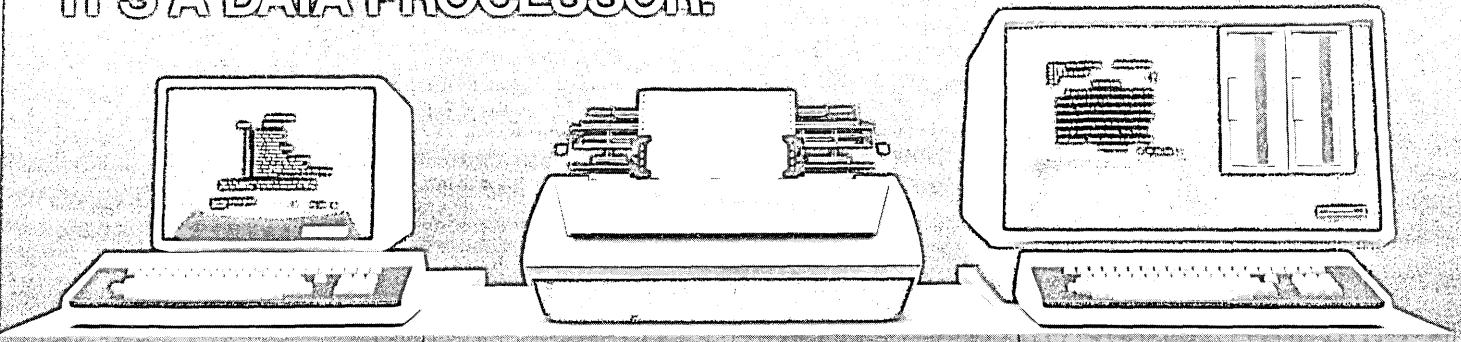
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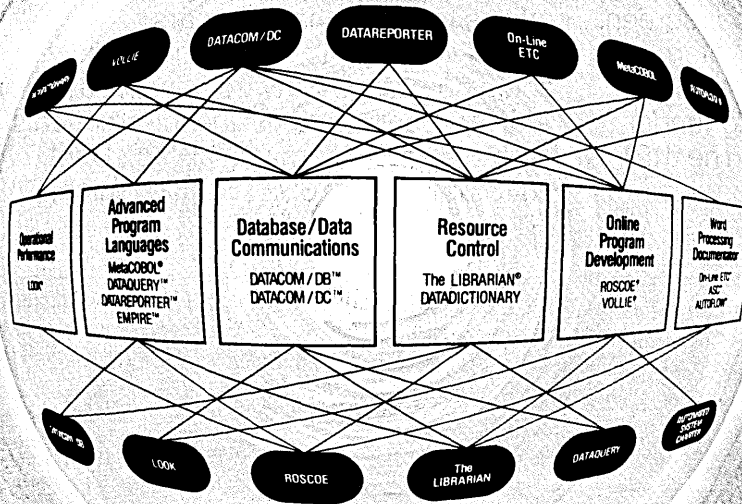


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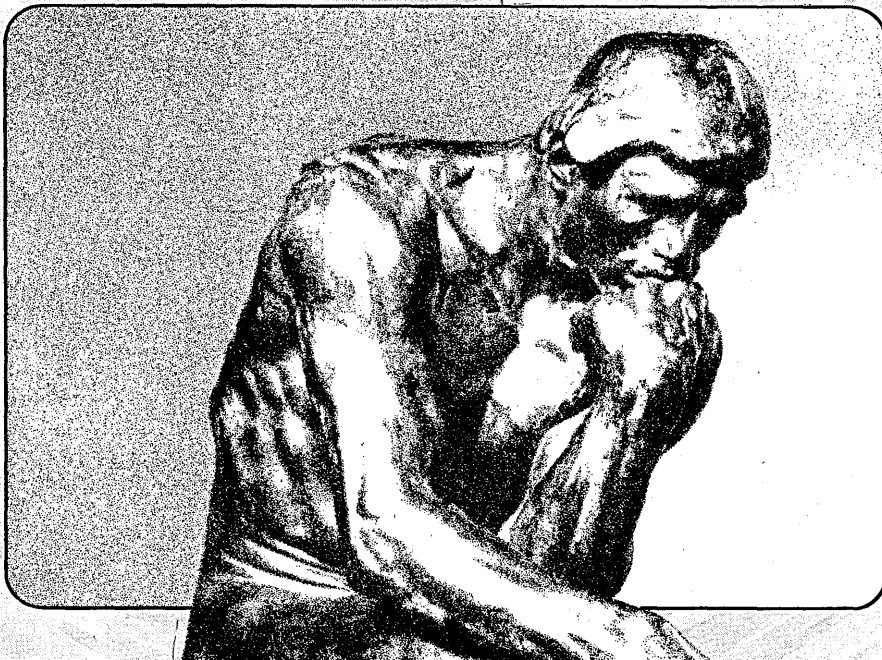
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DECEMBER 1981/\$4.00 U.S.A.  
VOLUME 27 NUMBER 13  
This issue, 162,915 copies

## FEATURES

### 30 IN FOCUS

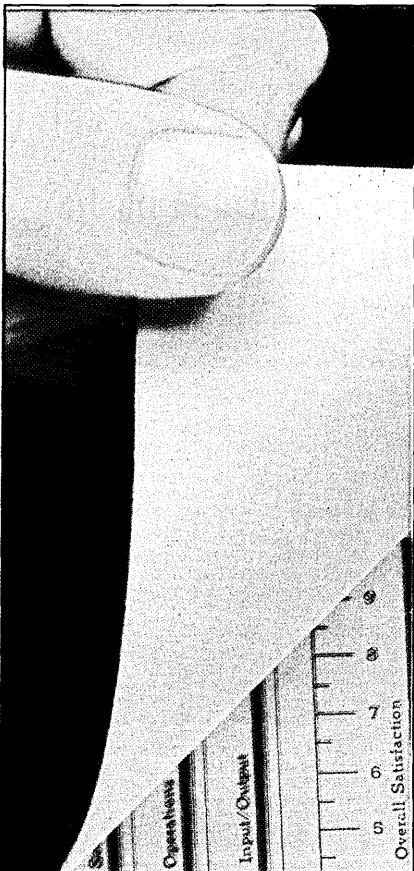
If you haven't crossed off all the names on your holiday shopping list, you might get some gift ideas from the high-tech toys shown here. They're for adults as well as for the young.

### 92 IBM-COMPATIBLE GIANTS Dale F. Farmer

A consideration of two competitors of the 3081, and a comparison of the speed, technology, and design of all three systems.

### 108 SYSTEMS SOFTWARE SURVEY Data Decisions

More than 2,100 users of systems-oriented software packages, four-fifths of those who responded to the survey, are well satisfied with their packages. Detailed charts of the survey begin on p. 114.



### 146 IN LOCO PARENTIS Marvin Grosswirth

Subtitled "A Technological Christmas Tale," this story is about a couple whose perfect son fit beautifully into their carefully planned lives. At least he was perfect for the first dozen years . . .

### 157 COMPUTING IN KUWAIT A. El-Sayed Noor

One of the first attempts to compile information about computing in an Arab country.

### 205 READERS' FORUM

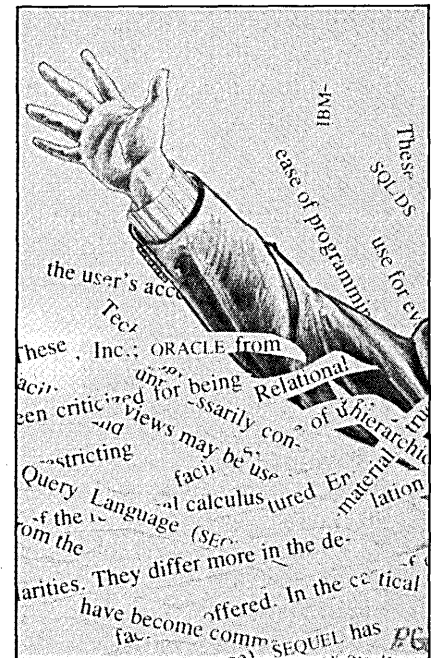
Edward C. McManus offers a poetic "Merry Xmas from the Legal Dept." David A. Feinberg then urges education for users of the office of the future in "Smoothing the Paths." From India, M.K. Rana makes some suggestions towards more successful implementation of automation in "What Goes Wrong," and Richard P. Scivetti, Sr., offers "The Dennis Doctrine," his solution to the problems of estimating and scheduling.

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- COVER PHOTOGRAPH BY CARL FLATOW

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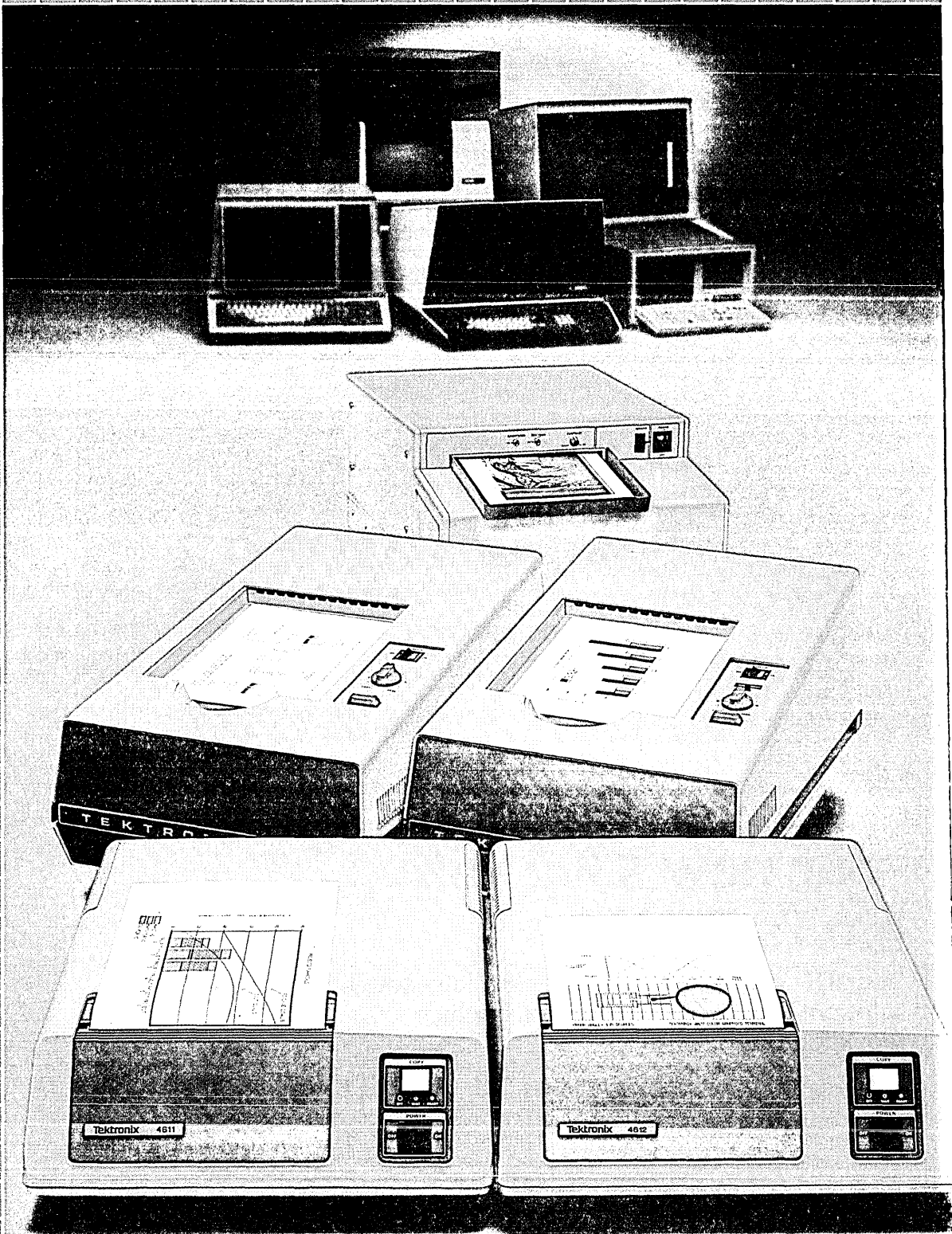
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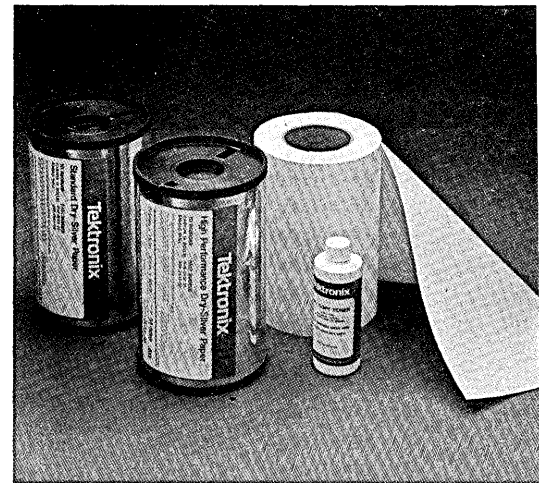
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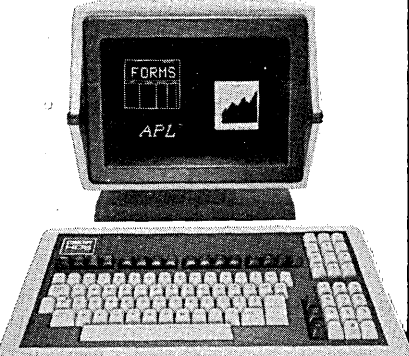


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# LOOKING BACK

## NORRIS EXPLAINS

*December 1961:* When the company was founded in 1957, its total cash assets amounted to \$19,000. It had four employees and no common stockholders. By 1961, cash assets had jumped to \$677,101, and there were 1,350 employees and 8,180 common stockholders. Within four years, the company's net profit after taxes had gone from zero to \$842,524.

The numbers were impressive, especially when compared with the competition's (there was only one outstanding success at the time), and when one considered how few computer companies made big money in 1961. In this issue of DATAMATION, Control Data Corp. president and founder Bill Norris discussed his company's success.

When asked how he accounted for CDC's phenomenal growth, Norris answered that the most important factor was planning. "We spend more time on planning an undertaking than on any other single thing. Another important factor is our conservative accounting. We have been charging off all of our R&D costs as we incur them. In addition, we depreciate our leased equipment on a four-year, double declining basis. This means that along with some other conservative accounting practices, we face today's problems today and we don't defer them for five or 10 years." CDC had no unique management policies, Norris said, aside from quick implementation of those well-made plans by as few management people as were necessary.

CDC's bottom line was also helped by the company's heavy reliance on existing design, as opposed to large R&D expenditures, and its concentration on a single segment of the market, namely, sophisticated scientific users. Norris saw a bright future in the business application of computers, but realized the time was not yet ripe. Norris hesitated to commit himself to the concept that the 924, then in production, marked CDC's entry into the business marketplace. "We built this machine with the idea of looking into the business market," he said, "and eventually we will go into it. However, I don't really know if this is the machine or the time." After all, it was easier to ride the waves than to make them, and neither Bill Norris nor CDC was in any hurry.

## JAPANESE CONSOLIDATION

*December 1971:* Japan's six largest computer manufacturers, prodded by the Ministry of International Trade and Industry (MITI), were beginning to consolidate. The six companies were Hitachi, Fujitsu, Nippon Electric, Toshiba, Mitsubishi, and Oki. MITI had nurtured these computer firms for some time, but by the early '70s, it became evident that six firms were too many for Japan and the world to handle. The Big Six were encouraged to merge, consolidate—whatever it took to come up with two or three companies that could compete effectively in world markets.

By mid-1971, the Japanese industry could be broken down into the following (approximate) shares: IBM had 30% of the market; Hitachi, an RCA licensee, had 17%, based on the value of installations; Fujitsu, the only company that was out on its own, had another 17%; Nippon Electric, a Honeywell licensee, had 11%; Oki had 5% and was licensed with Univac; Toshiba, with 4%, was no longer licensed with a U.S. firm because of GE's departure from the computer industry; and finally Mitsubishi, licensed with Xerox Data Systems, had 1.5%.

When President Nixon discontinued the redemption of dollars for gold and proposed a 10% surcharge on imports to the U.S., the Japanese were hit with a bad case of "dollar shock." That shock, combined with RCA's decision to quit the business, proved to be the turning point for Japan, and restructuring of the industry soon began.

The two largest firms, Hitachi and Fujitsu, were the first to announce a link-up. According to one source, MITI had encouraged and sped up this decision with a contract to develop a large-scale computer for the phone company's on-line services. This operation, called the Dendenkosha Information Processing System (DIPS), was the government-backed phone company's own timesharing network.

Although Mitsubishi and Oki had been cooperating for some time (Oki sold Mitsubishi's small systems, and Mitsubishi sold Oki's large systems), they would not disclose the details of their consolidation agreement. Toshiba and Nippon Electric were still negotiating, and were expected to reach an agreement "sooner or later."

—Deborah Sojka

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Our **PIX** system was developed to relieve the host computer

of telecommunications tasks. **PIX** allows remotely located peripherals to appear to the host as if they were in the computer room.

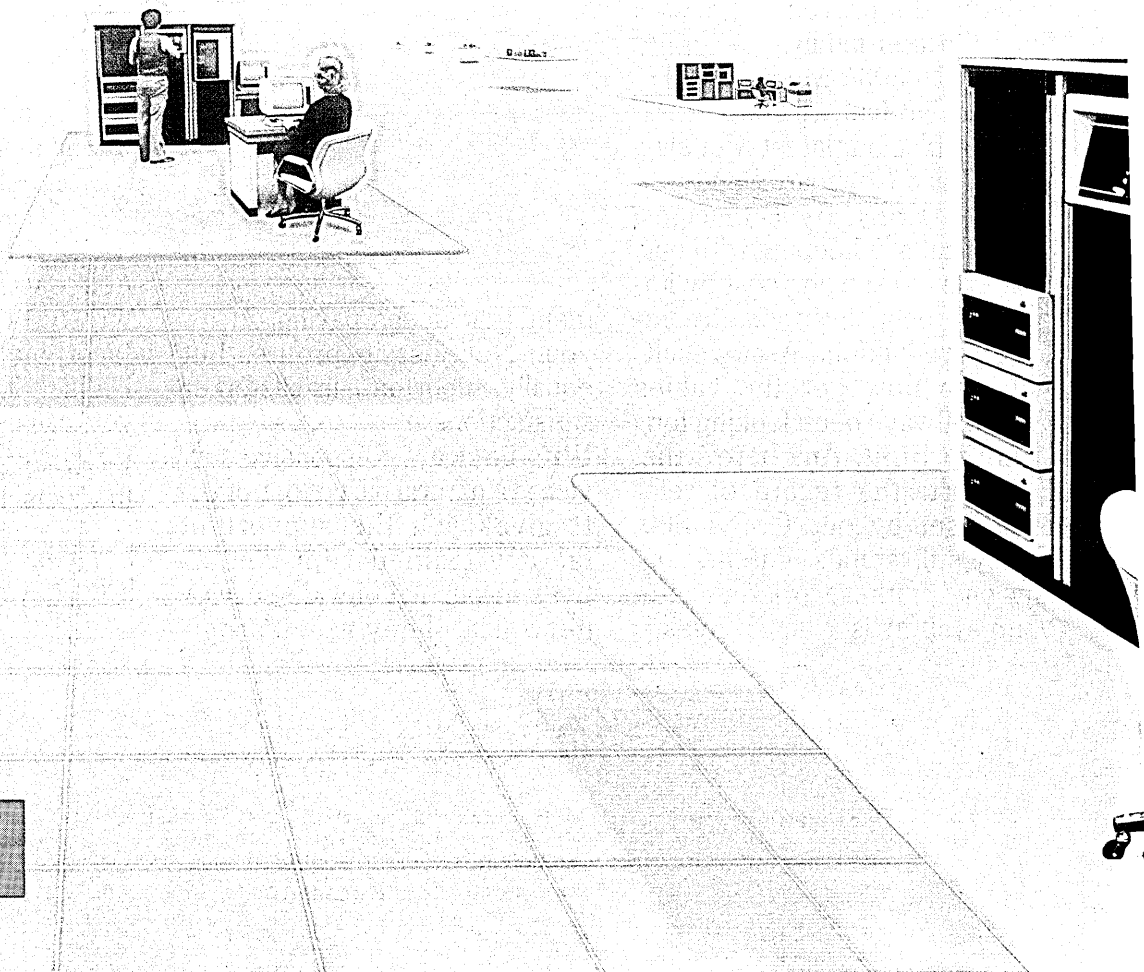
To provide networking capability in more complex processing environments, **PIXNET** allows the devices attached to multiple **PIX** systems to interconnect with more than one **IBM** host processor.

The result? Simplified and more cost efficient communication!

Paradyne's **RESPONSE** adds an additional level of advantage to the benefits of **PIXNET** by providing the capability for on-line, interactive processing applications.

**RESPONSE** gives **IBM** users a distributed data processing capability by putting transaction processing, word processing and data entry functions in remote locations and utilizing **PIXNET** for its distributed communications.

The result? Again, more efficient and cost effective communications!



# and Much More!



**ANALYSIS: Network Management System**

## Superior modems/network management

As the leader in using LSI and microprocessor technology to develop modems, Paradyne produces a complete family of modems for operation at data rates of 1,200 to 16,000 bps.

We were the first with high speed LSI modems. The first with high speed microprocessor modems. The first with the 14,400 bps modem. The first with a 16,000 bps modem designed for computer data. And, most recently, the first with an end user 9600 bps modem for under \$2600.

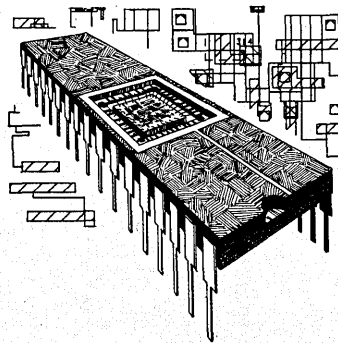
Because we were also the first to use modems to measure line impairments, our **ANALYSIS** Network Management System offers features unique in the industry. In complex RJE, teleprocessing and distributed networks, **ANALYSIS** constantly monitors the status of all modems, telephone lines and terminal connections.

With our new **DATALYZER** option, **ANALYSIS** can now provide system performance information such as response time for CRT's and computer transaction time. Our newest advance, the **NETWORK ADMINISTRATOR**, makes problem management, inventory control and report generation capabilities available to the teleprocessing network manager.

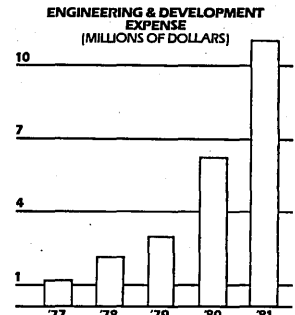
Once you've seen all the members of the **ANALYSIS** family of products, you'll know why it's become the standard against which all other systems are measured!

## Advanced technology

We've used advanced technology to develop and patent superior communications products. Products that



have better features, lower costs and longer lives. Products that satisfy today's communications requirements better than any available alternatives. And by continuing our policy of spending 8-9% of revenues on product development, we are ready for tomorrow's requirements as well.



## Rapid growth

With annual revenues increasing at a rate of over 50%, Paradyne has become a leader in an industry known for its rapid growth.

Our remarkable sales increases to both end users and to "Value-Added-OEM's" indicates our philosophy of using superior technology to develop unique data communications products has been accepted by the marketplace.

And by understanding that data communications means going where the data needs are, our marketing and service offices aren't just in the major metropolitan areas. We're in smaller cities as well with a rapidly growing network of offices across the United States and around the world.

We're **PARADYNE** ... THE Data Communications Company of the 80's.

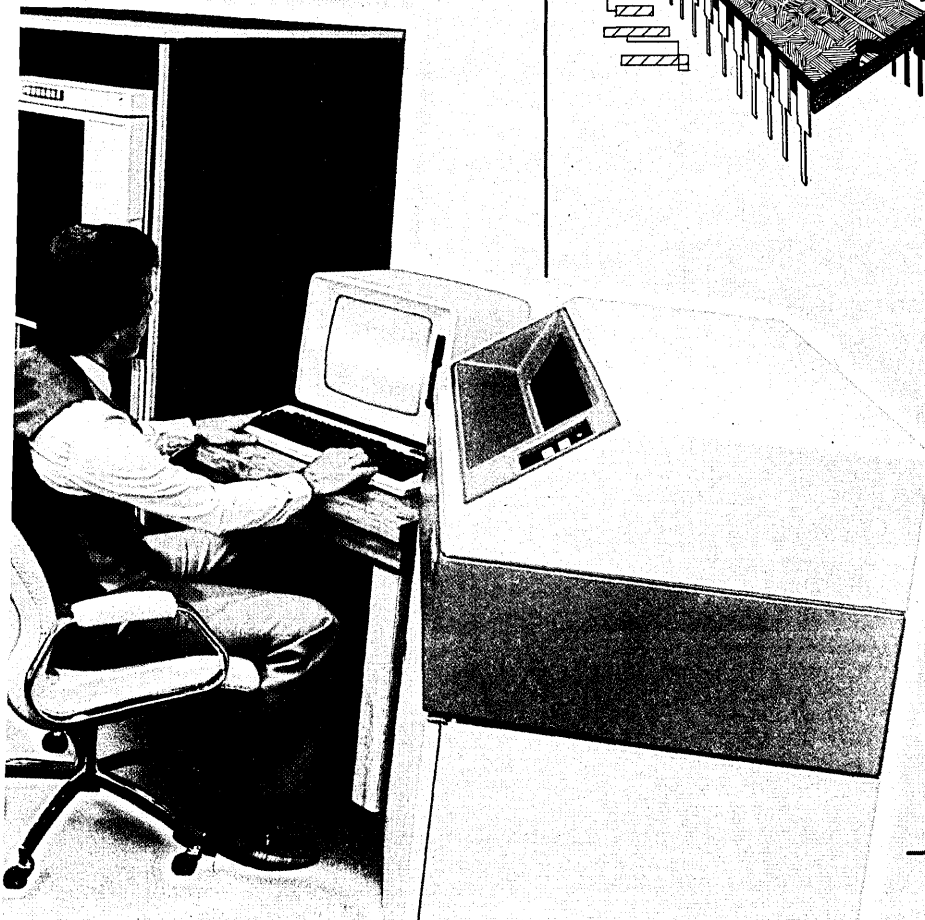
If you would like to know more about Paradyne's products and services, write on your letterhead or call:

**PARADYNE, 8550 Ulmerton Road, Box 1347, Largo, Florida 33540 (813) 530-2000.**

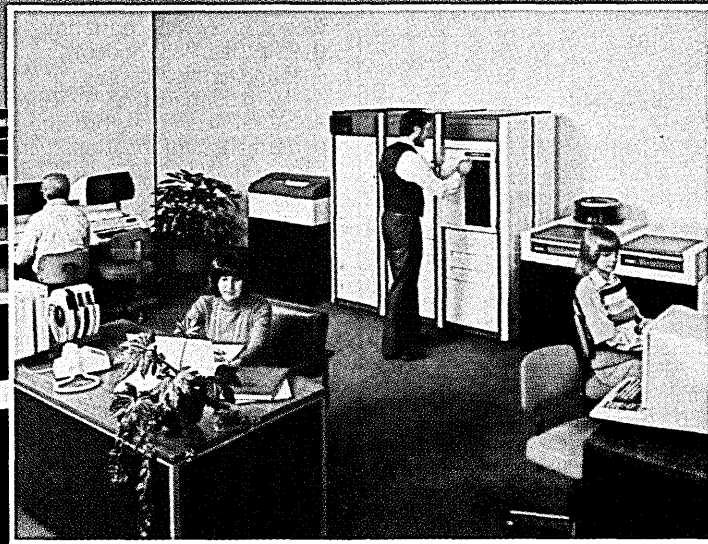
**Paradyne Canada LTD., (416) 494-0453, Telex 986911, PARADYNE TOR; Paradyne (U.K.) Ltd., (07535) 56712, Telex 849943, PARADUK-G; Paradyne G.m.b.H. (0221) 491078, Telex 888-5516, PARA D; Paradyne Japan, (03) 245-0431, Telex 222-7024, SCPDYN**

**CIRCLE 12 ON READER CARD**

**paradyne**



# 200 reasons to buy the BTI 8000



**BTI 8000 32-bit  
multiprocessor system**

With one BTI 8000, you use up to 200 terminals simultaneously running programs in COBOL, FORTRAN, BASIC and PASCAL. What's more, you can run interactive and batch jobs at the same time — in any mix!

The key is BTI's exclusive Variable Resource Architecture. Starting with an entry level system, you can increase processing power by a factor of ten, by just plugging in modules — up to 8 CPUs, up to 16 Mbytes of memory and up to 8 Gbytes of mass storage. All without rewriting any software.

The BTI 8000 also features a virtual memory environment, fail-soft architecture, built-in security and privacy, and remote diagnostics. And, if

all that's not enough, consider this: the base system price for the BTI 8000 is 30% lower than that for comparable systems from other "supermini" manufacturers.

As for reliability and support, they're an established BTI tradition, thanks to more than 10 years' experience with service via remote diagnostics. BTI currently supports over 3000 systems in the U.S., Canada and the United Kingdom. For even more reasons to buy the BTI 8000, contact your nearest BTI sales office.



Corporate Offices: 870 West Maude Avenue, Sunnyvale, CA (408) 733-1122; Regional Offices: Piscataway, NJ (201) 457-0600; Palatine, IL (312) 397-9190; Atlanta, GA (404) 396-1630; Sunnyvale, CA (408) 749-0500. Sales Offices in major U.S. cities. In the United Kingdom: Birmingham (021)-477-3846.

BTI is a registered trademark of BTI Computer Systems

CIRCLE 13 ON READER CARD

# LOOK AHEAD

## DEC DREAMS OF 36-BIT MACHINES

DEC is rumored to be building two new 36-bit powerhouse challengers to IBM. Known internally as Venus and Saturn, the machines are a second and largely incompatible stream to the company's more familiar run of 16- and 32-bit minis; their roots are in the DECsystem/10 and 20 offerings. "The company has ambitious plans to build the machines at its new Marlborough (Mass.) facility," says one source. "DEC is trying to arrange it so that chips go in one door and whole computers come out the other, in a fully integrated manner. But they're having big problems pulling the whole project together." The result? Don't expect any new 36-bit offerings from DEC in 1982.

## NORTHERN TELECOM TURNS TO RETAIL

Northern Telecom is jumping on the dealer/retail bandwagon (a mention was made of Sears) for its Iris and Display Phone products. Iris is a modem and single-line display unit with storage for typewriters. Display Phone is a combination telephone and computer, with display screen and hideaway keyboard. While Display Phone won't hit the dealer/retail outlets for some time, it's available starting this month through NT's direct sales force.

## IBM PROMPTED BY PINETREE

Pinetree Systems Inc. of Grand Prairie, Texas, is understood to have delivered to IBM some samples of its Dataprompter, a handheld, Z80-based data terminal. IBM reportedly wants the terminals for its field service forces, giving them access to centralized databases and helping to speed reporting.

## MORE IN STORE FROM MASSTOR

Masstor Systems will unveil its low-end mass storage system, dubbed the M860 after IBM's 3850, next month. The system is expected to appeal to medium-sized concerns that can't cost-justify a 3850.

## SEYMOUR SPEAKS UP

Seymour Cray of Cray Research has lifted the veil for the first time on his Cray 2, revealing a round frame, 38" in diameter, that will stand about 26" high, and will have four processors instead of one. He says it will run about six times faster in scalar and 12 times faster in vector than the Cray 1. Built out of 16-gate ECL chips made by Fairchild, the new machine calls for eight boards per module -- the new "3-D" design, as he calls it. (Cray 1 is a 2-D design with one board per module.) The heat? No problem. Seymour immerses his modules, stacked 26 high, in a cooling tank filled with an inert liquid -- the same liquid used by hospitals for transfusions. If a board has to be repaired, the tank has to be drained. Cray 2 will cost between \$10 million and \$20 million and should be

# LOOK AHEAD

HELP WANTED:  
4,000 PEOPLE

ready in two to three years. To hurry development along, Seymour is stepping aside as chairman, and is being replaced by John Rollwagen, who retains the title of president.

LM Ericsson, the \$2.8 billion Swedish telecom giant, plans to hire 4,000 salespersons for its new information systems activities. While the sales power buildup will take 10 years, watch out in '82 for a host of new products in data handling, transmission, storage, and software. Eripax, Eribus, and Eritex will offer packet switching, local networks, and teletex.

PRESTO  
CHANGE-O

Turning typewriters into desktop computers is the business of a little-known typewriter maker in Dallas, Contitronix Inc. By the end of '82, a user will be able to field-upgrade CI's model 1200 electronic typewriter (which has two 8-bit micros and asynchronous and RS 232 communications features) to a CI model 5000. The 5000 is CP/M-compatible and has up to five micros and 64K of internal memory. The 5000 will be priced around \$5,000.

HARRIS HEEDS  
CALL FOR DDP

Heeding the call for upward compatibility and distributed processing, Harris Corp.'s datacom division in Dallas is merging its 500, 1200, 8000, and now its 9200 families under one umbrella -- the 1600 family. A new arrival to the family is expected in early '82, named the 9240 and having many of the attributes of the 1670, inside sources say. The 1600 series takes a user from the 1610 (replacement for the 500 remote batch) to the 1670 ddp system, which handles all the functions of the 500, 1200, and 8000.

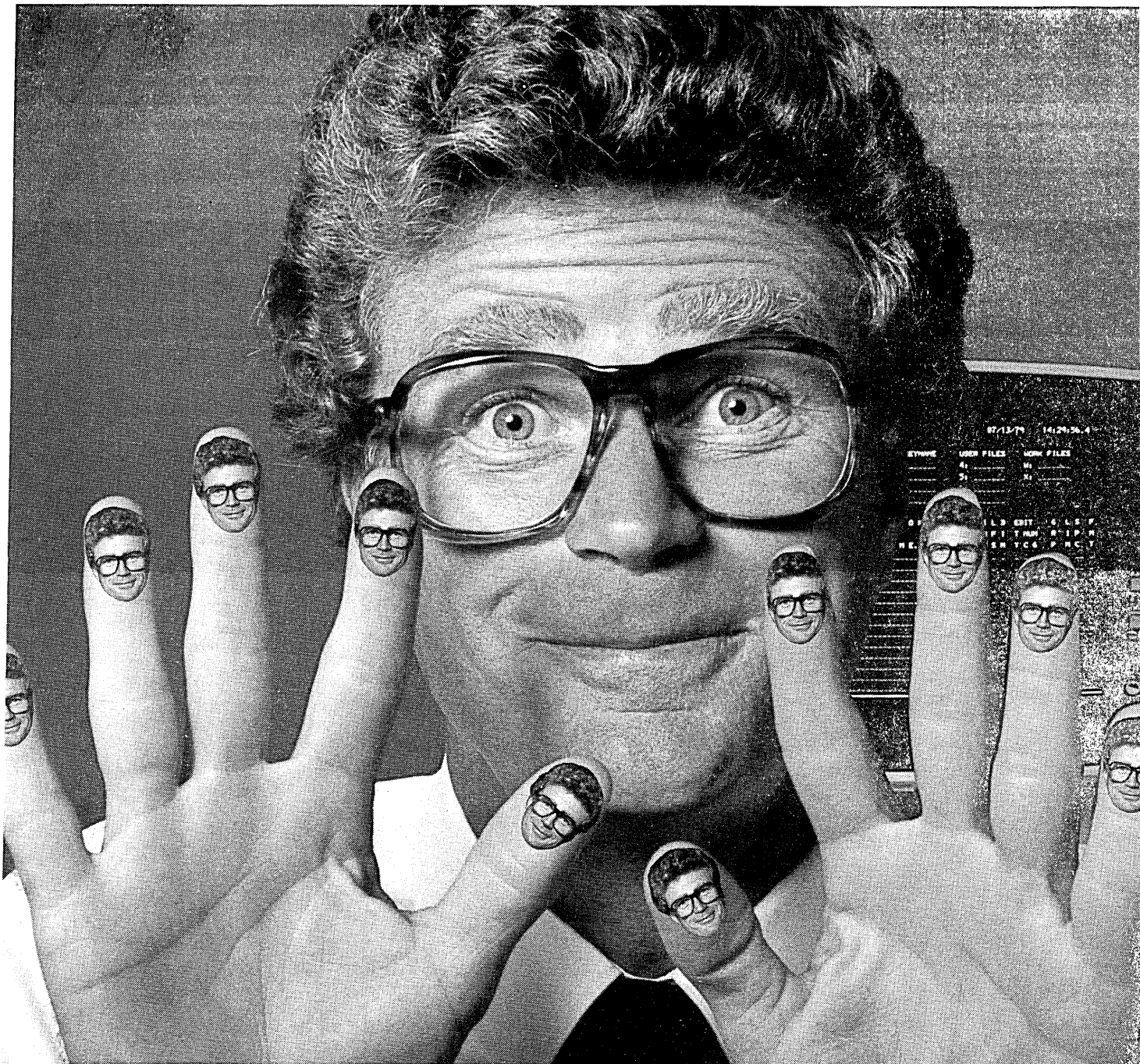
COM SOFTWARE FOR  
SMALL COMPUTERS

A small Beaverton, Ore., telecom research firm which has been selling electronic mail systems for two years to the shipping industry is quietly laying plans to broaden its horizons. Computer Development Inc. is packaging its own special modem for offerings on various small computers. Initially the package will be offered for Zenith Data Systems, Radio Shack's color computer, and IBM's Personal Computer. Others will follow.

RUMORS AND  
RAW RANDOM DATA

Siemens may be shooting for a record, having targeted up to 24,000 people worldwide for the ax. The executions will take place in the course of the company's current fiscal year, which began Oct.1... Tandy plans to offer SNA support to its TRS-80s by mid-'82...Now that TI is out of the bubble business, there's talk of dropping the bubbles from its Silent 700.





## It's like multiplying your CICS programming staff by ten.

TRANS IV lets you increase programming productivity ten times or more – without adding CICS programmers.

This solution-oriented application development system performs CICS/VS functions automatically.

With it, programmers can write on-line application programs interactively, without referring to CICS macros or internals.

**Features For Productivity.** With TRANS IV, you can define files and display formats in real time – also procedures unique to your applications (like edit and range checks).

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TRANS IV operates under all releases of CICS/VS.

With our Informatics classes and learning aids, programmers are fully productive with TRANS IV within a week.

**The Problem Solver.** If you've got a scarcity of CICS expertise and a growing demand for on-line applications, find out the details of TRANS IV.

It's an impressive system that can help you go a long way toward maximizing your CICS investment. In a very short time.

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CPU _____	Operating System _____	

# TRANS IV for DOS/VSE by Informatics®

CIRCLE 14 ON READER CARD

The Information Management Company.



The road, word processing, data, state, what do I do?

There's really no need for the chaos and confusion of missing files and incomplete reports.

Not when you can have a single information system that actually combines word and data processing with communications. A single business system that rolls everything into one.

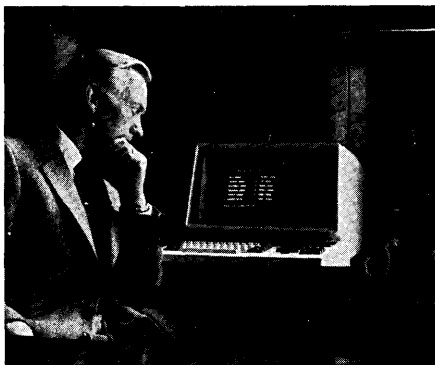
It's called multifunctionality and it means you can integrate and access all your information, no matter where it is.

From a single terminal you can search files, organize data, analyze key business statistics. Whether it's document preparation, sales forecasting, or report generation, the information is all there at your fingertips.

Multifunctional office automation systems are a more efficient and cost-effective way of managing the flow of information within a company. Simply put, that's information processing at its best.

Talk to someone who knows about information processing and who understands how it applies to your office.

For more information call Mr. Laurie Reeves at (800) 225-3222/3 (within the 617 area, call 552-2048). Or write him at Honeywell Office Automation Systems, Three Newton Executive Park Drive, Newton Lower Falls, Massachusetts 02162.



# Honeywell

CIRCLE 15 ON READER CARD

# CALENDAR

## DECEMBER

### **WSC '81, December 9-11, Atlanta, Georgia.**

The annual Winter Simulation Conference is cosponsored by seven organizations, including the ACM/SIGSIM, and the IEEE's Computer Society. Contact Claude Delfosse, CACI, Inc., 1815 North Fort Myer Dr., Arlington, VA 22209.

### **The Gulf Computer Exhibition, December 15-19, Dubai, United Arab Emirates.**

The Arabian Gulf will have its first computer conference and exhibition at the Dubai International Trade Center, sporting the theme "Computer Applications in Business and Commerce." Contact Diana Clifton Sewell, Seymour House, 17 Waterloo Place, London, SW1Y 4AR.

## JANUARY

### **Communications Networks 1982, January 11-15, Atlanta.**

The fourth annual program will include coverage of electronic mail, teleconferencing, and local area networks, for both office and in-plant systems. Contact Bill Leitch, 375 Cochituate Rd., Box 880, Framingham, MA 01701, (617) 879-0700.

### **Pacific Telecommunications Conference, January 17-20, Honolulu, Hawaii.**

PTC will provide a broad outlook on telecommunications in the Pacific area. It is sponsored by the Pacific Telecommunications Council. Contact Richard J. Barber, Conference Director, 1110 University Ave., Honolulu, HI 96826, (808) 949-5772.

### **Data & Telecommunications/Japan, January 20-23, Tokyo, Japan.**

Suppliers of PABX equipment, modems, cables, etc., from all over the world will be exhibiting at the Tokyo exposition and conference. Contact Industrial & Scientific Conference Management, Inc., 222 West Adams St., Chicago, IL 60606, (312) 263-4866.

### **EDINFO '82, January 20-22, Madras, India.**

The International Symposium on Education in Informatics is sponsored by the Computer Society of India, and will focus on new instructional techniques, employee and user training, international cooperation, and social consequences. Contact T.V. Natarajan, Organizing Committee, Computronics India, 11, Kasturi Ranga, 2nd St., Madras 600 018, India.

### **ASEE '82, January 26-28, San Jose, California.**

The Advanced Semiconductor Equipment Exposition is the fourth annual expo of semiconductor processing, production, and test equipment and materials suppliers. Contact Carlidge & Associates, Inc., 491 Macara Ave., Sunnyvale, CA 94086, (408) 245-6870.

## FEBRUARY

### **IWP Spring Symposium, February 2-4, Anaheim, California.**

There will be educational sessions backed by a manufacturers'

exhibit at this year's spring meeting, held by the International Information/Word Processing Association (formerly the International Word Processing Association, still known as IWP). Contact IWP Conference Services, 1015 North York Rd., Willow Grove, PA 19090, (215) 657-6300.

### **ISSCC, February 10-12, San Francisco.**

The International Solid-State Circuits Conference, in its 29th year, is sponsored by the IEEE Solid-State Circuits Council, the IEEE San Francisco Section and Bay Area Council, and the University of Pennsylvania. Contact Lewis Winner, 301 Almeria, Box 343788, Coral Gables, FL 33134, (305) 446-8193.

### **Industrial Productivity Conference and Exposition, February 16-18, Memphis, Tennessee.**

The Society of Manufacturing Engineers (SME) is sponsoring this show, which will emphasize plant maintenance and cost-efficient plant operations. Contact SME, PR Dept., One SME Drive, P.O. Box 930, Dearborn, MI 48128, (313) 271-1500.

### **Federal DP Expo, February 22-24, Washington, D.C.**

This is the eighth annual conference and exposition for computer systems users in the U.S. government. Hardware and software products, and systems and services will be included in the show. Contact The Interface Group, 160 Speen St., Framingham, MA 01701, (617) 879-4502.

### **Comcon Spring, February 26-28, San Francisco.**

Sponsored by the IEEE Computer Society, this season's theme is "High Technology in the Information Industry." Contact IEEE Computer Society, 1109 Spring St., Silver Spring, MD 20901, (301) 589-3386.

## MARCH

### **National Conference on Information Systems Education, March 22-24, Chicago.**

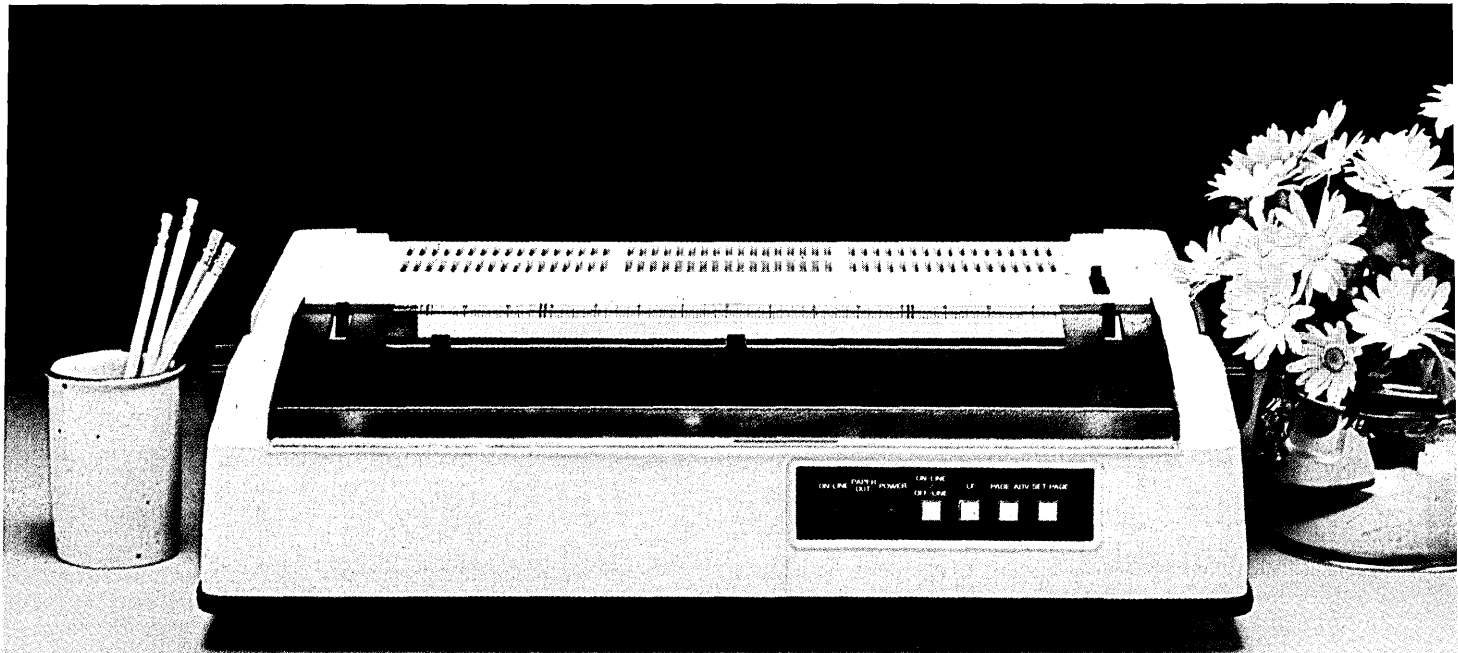
The conference is sponsored by the Education Foundation of the Data Processing Management Association (DPMAEF), an organization established in 1975 to "expand the educational opportunities for system professionals and to conduct research and programs to benefit dp industry, educators, government, and the public." Contact the Conference Manager, USPDI, 12611 Davan Dr., Silver Spring, MD 20904, (301) 622-0066.

### **Interface '82, March 22-25, Dallas.**

This is Interface's 10th annual appearance, and once again the conference will be devoted to data communications, ddp, and networking. Contact the Interface Group, 160 Speen St., P.O. Box 927, Framingham, MA 01701, (617) 879-4502.

### **CAD '82, March 30-April 1, Sussex, England.**

The entire project development cycle, from concept to manufacture, will be discussed at this international conference and exhibition on computers in design engineering. Contact Alan Pipes, Conference Organizer, IPC Science and Technology Press, P.O. Box 63, Westbury House, Bury St., Guildford GU25BH, England.



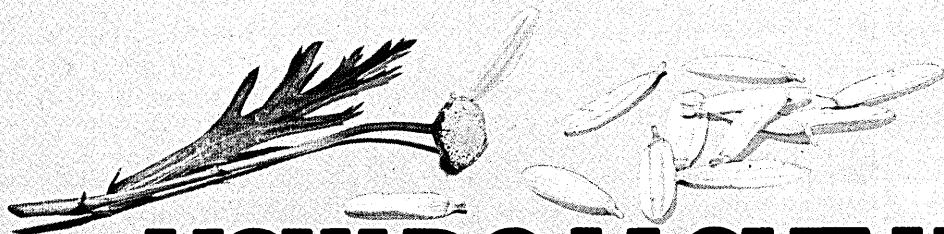
C. Itoh's new F-10 Printmaster Daisy-wheel printer is the compact beauty you can easily get attached to. Just look at what you get:

1. Small footprint, low-profile design (only 6" high) fits easily into your system.
2. Downloading wheel and impact sequences allow use of a variety of unique wheels and permit OEM's to tune the printer to specific needs.
3. Comes in two Shannon-text-rated speeds. 40 CPS and 55 CPS.
4. Industry-standard parallel or RS 232-C interfaces and ETX/ACK, XON/XOFF protocols provide maximum OEM flexibility and installation ease.
5. Extensive, built-in word processing functions allow easy adaptability and reduced software complexity.
6. Uses mono and dual-plastic wheels. (Unlike metal wheels, dual-plastic provides superior print quality over the entire life of the wheel.)
7. Field proven, firmware intensive technology for increased reliability.
8. Cast aluminum base plate with high quality metal parts provide lasting dependability.
9. Low-noise operation is ideal for office environment.
10. Choice of friction feed or bidirectional tractor feed for precise print positioning of tabular and graphics data.
11. Uses industry-standard wheels and ribbon cartridges available from multiple sources at low prices.
12. Universal power supply is standard and allows worldwide power source compatibility.
13. FCC approved and under 50 lbs. in weight for fast shipments and sales.
14. Easy-to-load wheels with tested and proven method of wheel support (spring loaded with positive detent).

We could go on. But quite frankly, once you see Printmaster perform, you'll never look at another Daisy.

Printmaster is fully backed by C. Itoh's warranty and complete support organization. Contact C. Itoh Electronics, Inc. 5301 Beethoven St., Los Angeles, CA 90066 (213) 306-6700.


**C. ITOH  
ELECTRONICS, INC.**  
One World of Quality



# HOW DO I LOVE YOU? LET ME COUNT THE WAYS.

CIRCLE 16 ON READER CARD

**Prime.**  
**One line of compatible  
systems. A whole spectrum  
of powerful solutions.**

Just a few years ago, advanced technology and system compatibility were mutually exclusive. But when Prime began making computers, technology and compatibility became one.

**Big. Better. Best.** The Prime 50 Series includes the Prime 250-II, 550-II, 750, and the new Prime 850. The Series is so flexible, it can handle virtually any application you have. And so powerful, it can meet your most demanding needs.

If you're in a start-up mode, the perfect way to begin building your system is with the Prime 250-II. If you need more power, you'll find the solution in the Prime 550-II or the Prime 750. And if you're looking for maximum performance, the Prime 850 is the most powerful mini available today.

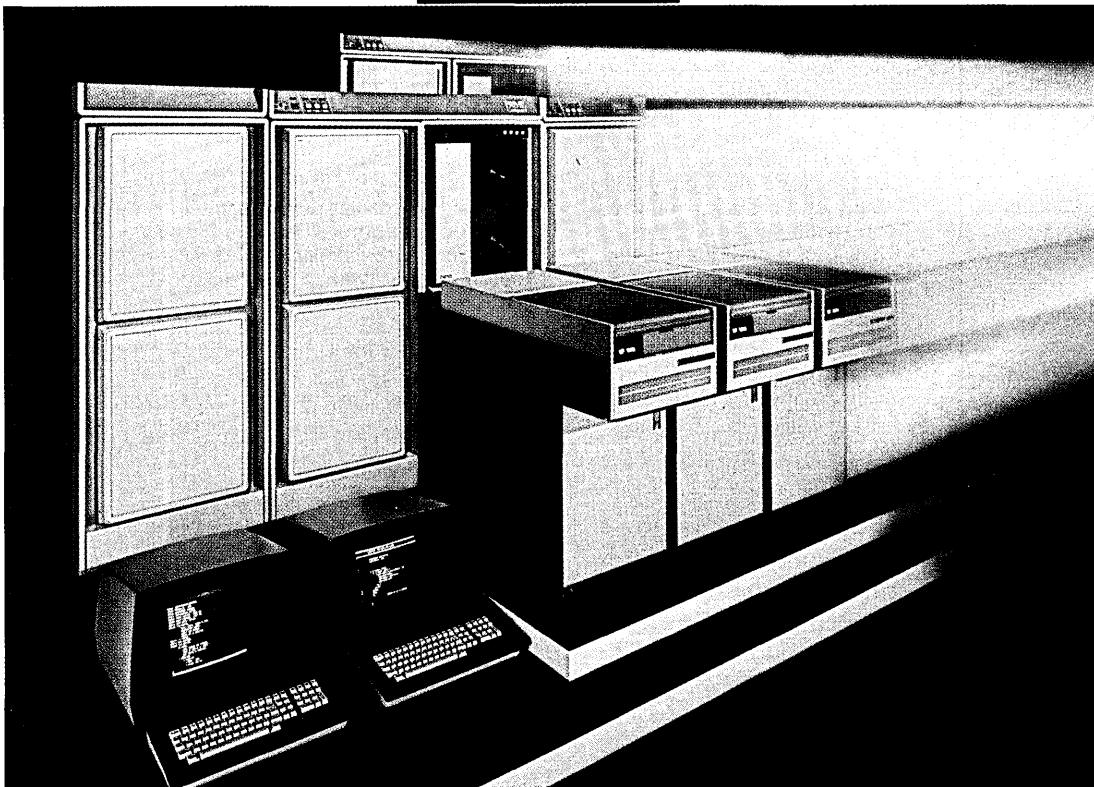
You should know too that any 50 Series system can be networked with any other. They can also communicate directly with mainframes. And all Prime systems support a broad band of industry-standard languages.

**The economy of compatibility.** The Prime 50 Series is designed around a single operating system, which makes all systems compatible with each other. So you can easily and economically move up to a larger system, or expand to any number of small, remote systems. And you'll have nothing new to learn because the same software goes with you.

**A spectrum of solutions.** The 50 Series was designed to provide a broad spectrum of solutions for just about any application you might have, including manufacturing, financial, education, utilities, engineering, energy, automated office, you name it.

**Consider Prime first.** Today, more than ever before, you need the compatibility and the spectrum of solutions that only Prime can offer. For more information, write to us at Prime Park, MS 15-60, Natick, Massachusetts 01760. In Europe, write Prime Europe, 6 Lampton Rd., Hounslow, Middlesex, TW3 1JL, England. Telephone: 01-570-8555.

**PRIME**  
Computer



# LETTERS

## KEEP PRAYING

Re: "The Doomsday Pulse" (September, p. 37), your editorial is most timely and appropriate. Not only communications equipment and computer systems would be disabled, but also those automotive ignition systems and numerically controlled production tools that utilize semiconductor components. What should we be doing besides praying to alleviate this problem?

BRUCE L. MEYER  
Data Communications Consultant  
Bloomington, Minnesota

## WHAT MANAGERS WANT

Re: "You Mean I Just Can't Plug It In?" (September, p. 196), personal computer sales have boomed in the corporate environment because they permit businesspeople to manage information in ways *they* need to, not in ways that the MIS organization's database permits.

Out of the hundreds of applications for personal computers in business, we've identified five general areas where managers use personal computers: spreadsheet analysis, graphics, text editing, database, and data communications. Each of these improves the professional's personal productivity, because he can manipulate information in ways he needs to and when he wants to.

Business decisions aren't made from relational database reports. Only when the MIS departments stop providing CIS reports (Clerk Information Systems—that is, pages and pages of printouts that a manager gives to his secretary to boil down into useful management information) and start providing true decision support and personal productivity capabilities will these business executives turn to the MIS organization to help solve their information processing needs.

JOHN E. ZEISLER  
Manager, Retail Sales Development  
Apple Computer Inc.  
Cupertino, California

Re: "The DBMS Market Is Booming" (September, p. 153), the portion of the article describing Intel's System 2000/80 DBMS states "there are an estimated 70 users." Ouch! It should have been 700 users.

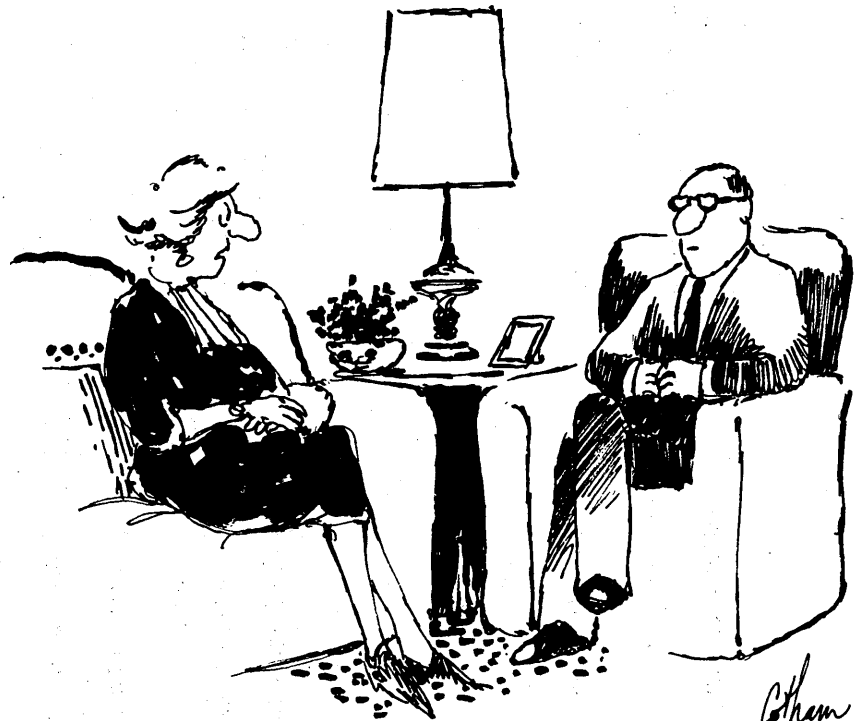
BARBARA J. WIGGINS  
Manager, Marketing Communications  
Systems Group, Intel Corp.  
Austin, Texas

We would like to add OSIRIS IV system to your list of DBMS vendors. OSIRIS IV is both a statistical analysis and database manage-

ment system. Its capabilities include rectangular and hierarchical files with storage in any mode or mixed modes.

OSIRIS can be used on IBM/360 or 370 or compatible machines with at least 150K bytes of main storage. It has approximately 40 users in the U.S. and seven other countries.

NAN COLLIER  
Systems Analyst  
Survey Research Center  
The University of Michigan  
Ann Arbor, Michigan



"Can't you be serious for just one minute?"

©DATAMATION

# THE AJ 862.

## WHEN YOU NEED MORE THAN JUST A PRINTING TERMINAL.

No other dot matrix printer terminal can match the new AJ 862. For print quality. Features. Performance. And ability to handle a wide range of applications.

Most dot matrix printers use a 7-wire print head. The AJ 862 has a 9-wire head for crisper, cleaner printing, lower case descenders, and separate underline. Plus a number of enhancements including double-width characters, condensed printing, automatic centering, and right margin justification.

The AJ 862 gives you a one-of-a-kind totally programmable keyboard, so you can substitute key positions at will to suit *your* requirements. And you can program seven keys with sequences of up to 31 characters each, so you can perform complicated sequences at the touch of a single key.

"Look ahead" bi-directional printing, a 2K byte buffer, and print speed of up to 180 characters per second assure high throughput. Line speeds are selectable at up to 9600 bps in full or half duplex.

And, for unique application flexibility, the AJ 862 is capable of concurrent operation of up to three character sets—ASCII or optional APL and graphics—plus international symbols.

There's a lot more. Get details from your nearest AJ regional office: San Jose, CA (408) 946-2900; Rosemont, IL (312) 671-7155; Hackensack, NJ (201) 488-2525. Or write Anderson Jacobson, Inc., 227 Devcon Drive, San Jose, CA 95112.

Also available through AJ subsidiaries in Markham, Ontario, Canada; Montrouge, France; Slough, Berkshire, U.K.; and Bergisch Gladbach, West Germany.

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JACOBSON**



**ANOTHER AJ  
INNOVATION  
TO MAKE YOUR  
COMPANY RUN BETTER.**

CIRCLE 16 ON READER CARD

## LETTERS

### MORE MAGIC MOMENTS

Re: "Magic Moments in Software" (August Special Report, p. 7), I was disappointed to see you perpetuating the myth that System/38 was the first "built-in relational DBMS." Doesn't that honor go to the Microdata Reality?

Also, why ADA but no CORAL? McCarthy is mentioned for LISP but what about C? And also Pascal, Nicklaus Wirth, Bell Labs and UNIX, and especially, what about CP/M and the whole issue of transportability?

BERNIE GREEN

General Manager  
CL Systems Limited  
Melbourne, Australia

### JUST THE FAX

Re: "Faxpak Plays Catch-Up" (June, p. 46), as I am sure you are aware, FAXPAK is ITT Domestic Transmission Systems' proprietary service mark for its facsimile transmission services. As such it should never be used as the generic name for such services nor should it ever be used in a possessive form "Faxpak's managers." What you really mean to say is ITT Domestic Transmission Systems' managers in charge of FAXPAK services.

JOHN R. GABER

Senior Staff Trademark Counsel  
International Telephone & Telegraph Corp.  
New York, New York

*If you say so.*—Ed.

### FEWER INTELLECTUAL IDIOTS

Re: "Growing Up Computing" (June, p. 210, to update Winston Churchill: "No English boy should be punished for failing to learn mathematics [or computer science], but he should be severely corrected for not knowing the grace and beauty of the English Language and his own essence [history]."

When I entered college, I had no idea that I would find a career in data processing. Even had I known that, though, I would still have majored in history and minored in English literature.

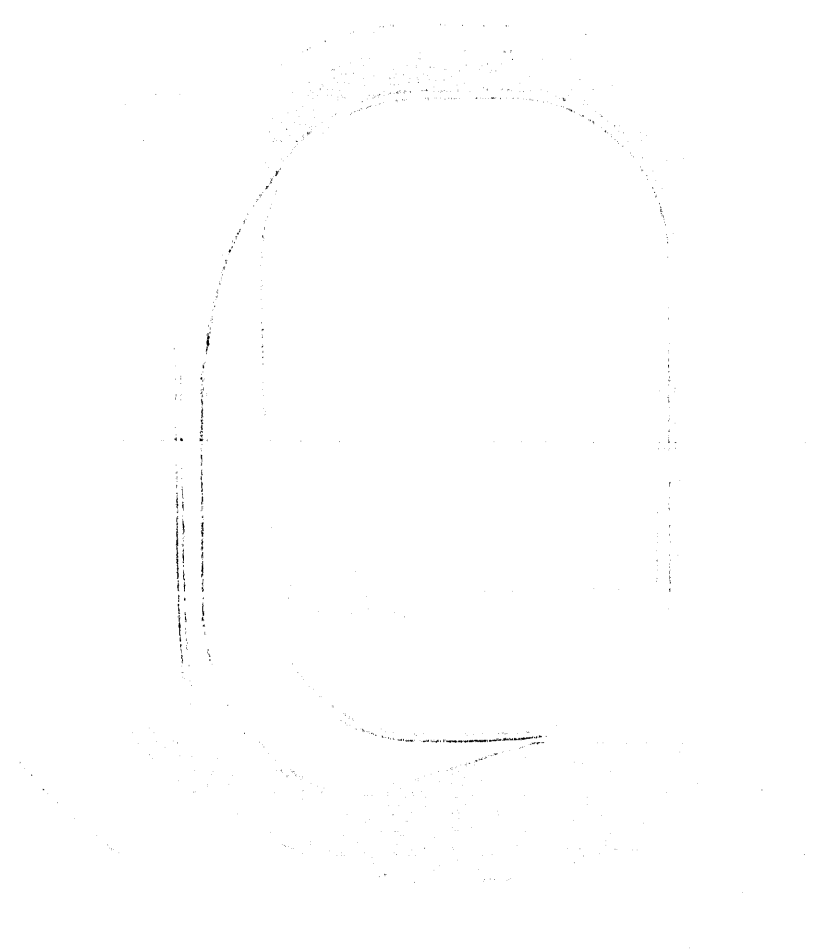
One of the most intelligent (as opposed to being smart) people that I know has a PhD in physics and an undergraduate minor in history because the worth of the human experience is recorded here, not in formulas or databanks. Colleges require English and history for all lower classmen (at least they did 10 years ago when I matriculated) for this very reason. In addition, my friend's outlook on the world and people is broad, not restricted by blinders.

Finally, the most pervasive problems that I have found in myself and most other dp professionals is lack of ability to communicate. We (read: the world) need fewer intellectual idiots, not more.

JERRY C. ADAMS

Data Processing Manager  
Burn Construction Co.  
Las Cruces, New Mexico





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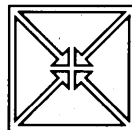
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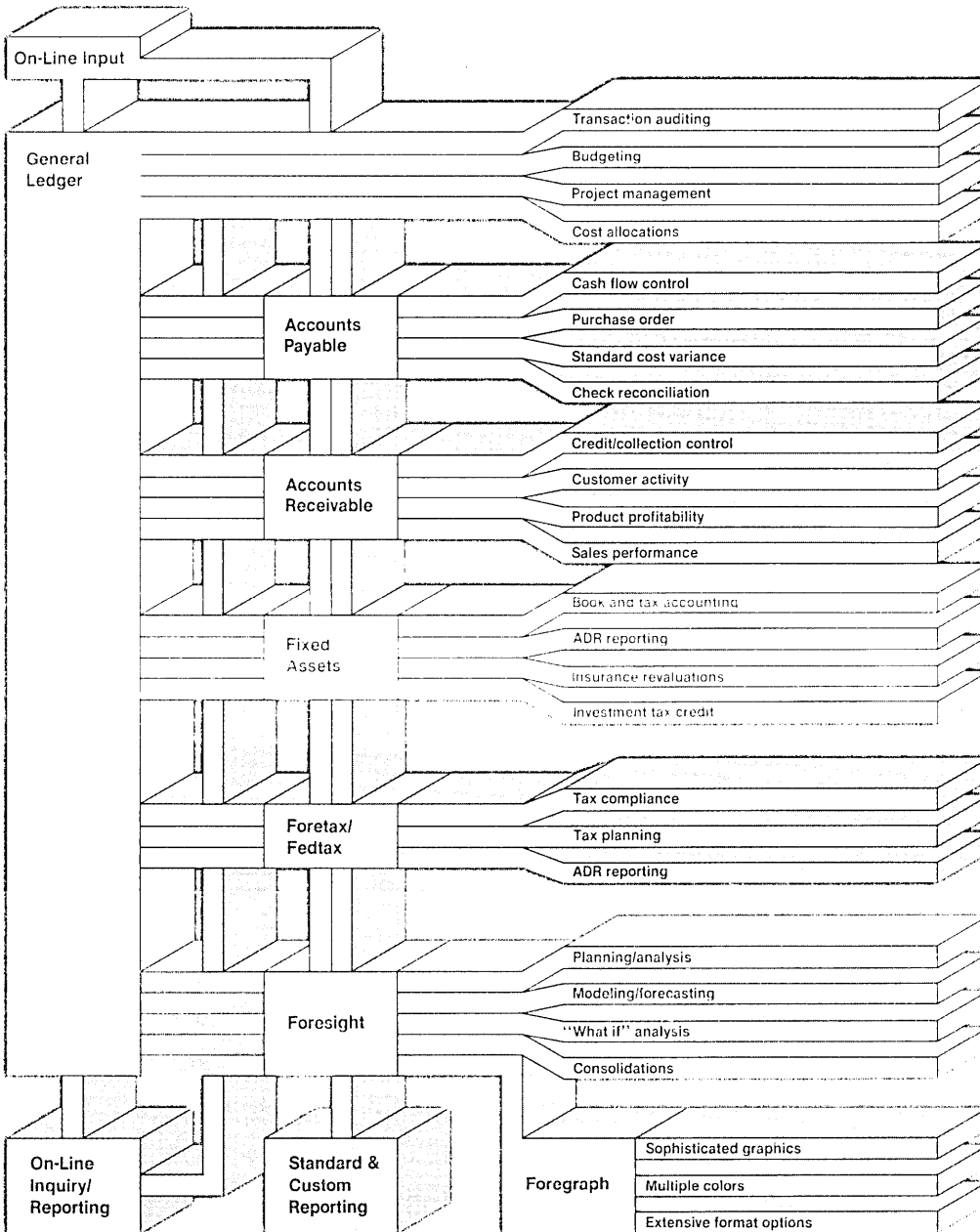
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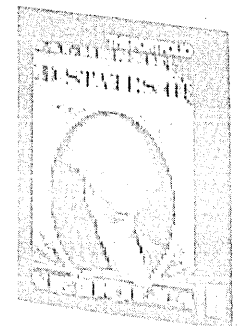
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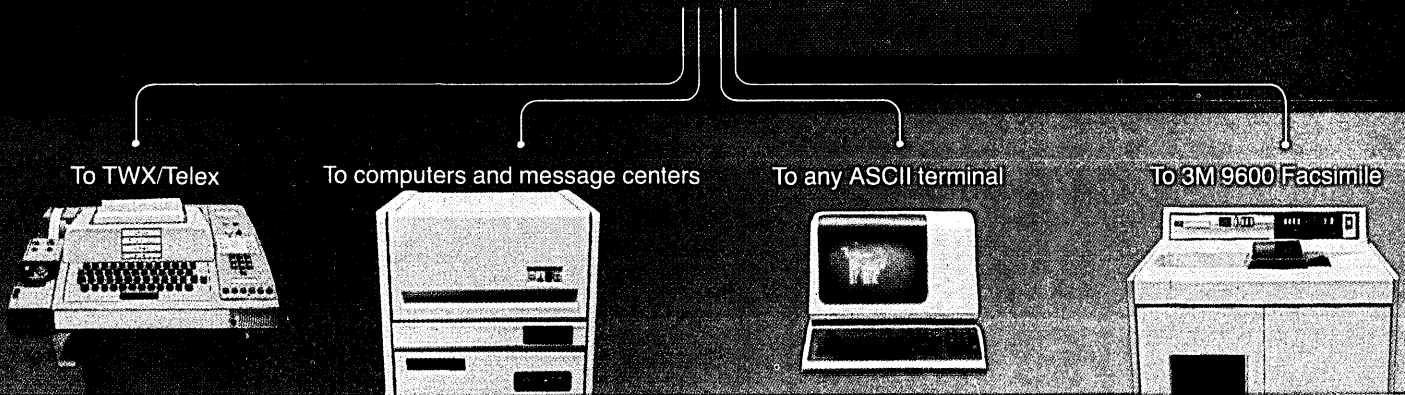
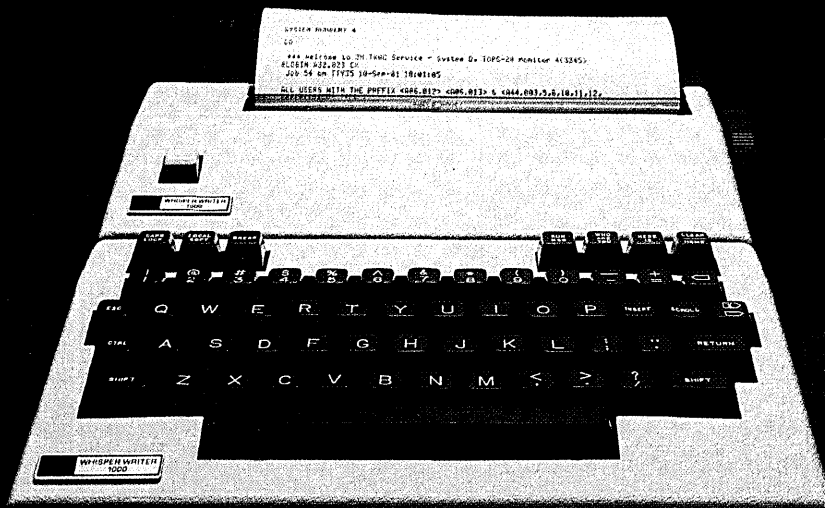
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CIRCLE 20 ON READER CARD



Whisper Writer 1000 communicates via phone lines at 300 baud, TWX at 110 baud, and Telex at a proprietary 110-baud/66-wpm rate.

# The remarkable new Whisper Writer, from 3M.

*Data communications, TWX, and Telex. All in one compact machine, at an astonishingly low price.*

Make a modest investment in 3M's new Whisper Writer 1000, and you'll be able to communicate with your own mainframe computer, a DDP network, or a time-sharing service. You'll also have the ability to send and receive messages by TWX, Telex, phone lines, or electronic message center, along with transmission to 3M's 9600 Facsimile Transceiver. In short, you'll be getting both a desktop communications terminal *and* a portable DP terminal for less than the cost of most single-purpose machines.

In its standard configuration, the Whisper Writer comes with an internal modem, telephone jack, and programmable

automatic answering feature. Options include a carrying case with acoustic coupler and an automatic line selector that lets you leave your Whisper Writer connected to both a telephone and a TWX line. A special version is available with an RS-232 interface in place of the standard modem for direct hookup to a computer, external modem, or CRT terminal.

When ordering any Whisper Writer, you can specify either a 40-column or 80-column printer. The unusually quiet thermal printing mechanism prints sharp, black-on-white characters at 40 cps and is able to produce graphics under the control of a compatible computer.

### Editing memory lets you prepare text off-line.

Whisper Writer's four-page dynamic memory and editing features allow you to get messages and data letter-perfect before you dial. The result: lower phone, TWX, and Telex charges, along with less tying up of communications lines.

### Easy to learn, simple to use.

The separate keyboard module in the Whisper Writer 1000 has a conventional typewriter layout. Additional function keys reduce the need for memorizing special control codes.

### Also available as a low-cost RO teleprinter.

Whisper Writer can be ordered without a keyboard as a

modem-equipped or RS-232-compatible, 40-column or 80-column printer. To add a keyboard later, merely buy the separate module and plug it in.

### Reliability backed by 3M's national service network.

Whisper Writer's dot-matrix printer has already demonstrated its durability in more than 55,000 home and small business computer systems. Whenever maintenance is required, it's available from the same people who market and service 3M business products nationwide.

Phone 800-328-1684 toll-free or mail the coupon for literature or a demonstration. (In Minnesota, call 800-792-1072.)

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3M Business Communication Products Division	
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St. Paul, MN 55144	
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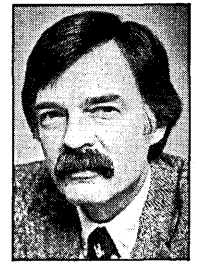
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CIRCLE 21 ON READER CARD



# EDITOR'S READOUT



## TOO MUCH TO READ

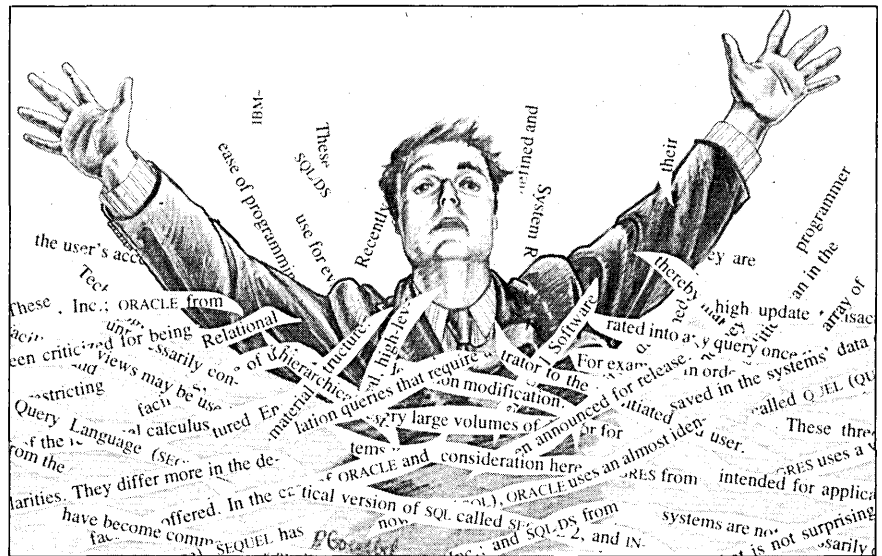
**OR, STOP THE PRESSES, I WANT TO GET OFF.**

This probably sounds like heresy coming from a magazine editor, but there's just too damn much to read.

We seem to be drowning in information. Our in-baskets are overflowing. Just to stay current in the computer field means reading monthly trade journals, weekly trade magazines, newsletters, business magazines, and special reports. All this is heaped on top of the ever-increasing flow of paper that seems to characterize life in the modern corporation—the claims of office automation buffs notwithstanding.

As an information processing professional you are categorized as a "knowledge worker," a subset of a broad grouping that encompasses some 56% of the working population as we shift from the industrial revolution into the information age. You spend your days collecting, digesting, manipulating, and disseminating information. To do this you need enormous amounts of information about information handling.

One of the problems you face is the limitations imposed by the logical structure of the human mind. Paul Strassman of Xerox notes the discrepancy between channel capacity and actual throughput in the man/machine interaction. For example, the telephone has a channel capacity of 4800 bits per second but the actual throughput is about 300bps. Throughput of printed text, the medium of traditional data processing, is about 1000bps. But pictorial representations—at Xerox dubbed "icons"—permit an interchange between people and electronic



mediums at speeds of 10,000 to 100,000bps.

Comments Strassman, "It is a cultural curiosity that ancient pictographic symbols like hieroglyphs or Chinese characters are perhaps ideally suited for the 21st century commands to the electronic medium." If the pictograph is the wave of the future, this might be the right time to sign up for a Berlitz course and begin reading Japanese trade magazines.

There are some other alternatives. If you have the clout and the manpower, you can designate someone to digest key articles from your major information sources. There are publications which digest selected articles from computer publications; others simply list tables of contents to help you scan and select.

Time-management consultants in our frenetic culture find "nonproductive" waiting time intolerable. They would have you copy or tear out the articles you wish to read for consumption on the train, in the dentist's office, or while stuck on the freeway.

We would caution that you not become too restrictive in your reading. By screening out everything that is not

of immediate pertinence to your job function you are facing two dangerous consequences: first, you short-circuit the absolutely necessary human capacity for serendipity; and second, you may well become an expert—that is, one who has learned more and more about less and less and in due time knows absolutely everything about nothing.

There is an ancient and wonderful curse which goes, "May you be born in interesting times." Well, not only have you been born in interesting times, but you are part of an industry that is complex, rapidly growing, and has a major impact on the world around you. As long as you're a part of it, you must read as fast as you can just to keep up.

We'll attempt to do our part in this magazine by being as concise, pertinent, and readable as possible.

We might even throw in some pictographic symbols to assist in your throughput. For openers, here's a message from the DATAMATION staff:

メモ クリスマス。  
明けましておめでとうございませう

ILLUSTRATION BY PONDER GOEMBEL

# Which information processor

At last, here's an information processor that gives you everything you need. All in one small package. And at one small price.

It's the 503: the newest member of Northern Telecom's DDP family.

Just check out the check list.

Powerful, state-of-the-art DDP? Check.

Full-function word processing (using our exclusive Omniword™ software)? Check.

A wide range of networking communications, so you can share information with a remote host as well as other Northern Telecom family members? Check.

FEATURE	DATAPOINT 1536	IBM 5285	MDS 21/10	XEROX 860	NORTHERN TELECOM 503
STORAGE— BASIC SYSTEM	500K	246K	243K	184K	1,638K
BASE PRICE UNDER \$6,500		✓		✓	✓
SPACE-SAVING DESKTOP DESIGN	✓	✓			✓
BASIC LANGUAGE	✓			✓	✓
UNATTENDED NETWORK CONTROL SYSTEM	✓		✓		✓
WORD PROCESSING	✓		✓	✓	✓
EASY-TO-READ FULL 15" CRT			✓	✓	✓
SIMULTANEOUS DUAL TASK OPERATION	✓	✓	✓		✓
PROGRAMMABLE OPERATOR HELP KEY					✓
3270 SDLC EMULATION		✓	✓		✓
DUAL PRINTER CAPABILITY		✓		✓	✓

Based on information available at date of publication.

# checks out across the board?

And that's just part of the picture.

This amazing little machine checks out on friendliness, too. It's simple to use and human-engineered with all kinds of features like a non-glare display with clear, readable text and a keyboard that doesn't tire you out.

Why don't you check out the 503 for yourself? Call your local Northern Telecom sales representative or write Dave Smith, Northern Telecom, Inc., P.O. Box 1222, Minneapolis, MN 55440.

You'll see there's no other information processor like it.



## Introducing the 503 from Northern Telecom

CIRCLE 22 ON READER CARD

# INFOCUS

## HIGH-TECH TOYS

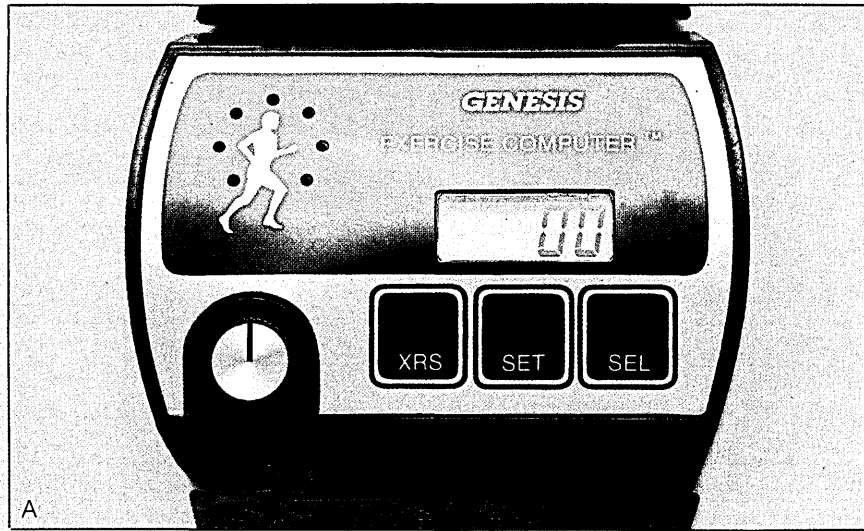
Christmas comes but once a year, thank goodness. If shopping has slipped a few notches down your list of things to do, falling someplace after maintenance programming, these pages may give you some inspiration.

A. While it may look like a watch—and indeed it does tell time—the Genesis Exercise Computer (\$175) can help you with your fitness program. It measures your pulse, and you can “program” it with the upper and lower limits of exertion prescribed by your doctor. It automatically beeps when you go out of the training zone you have stored, and it will help you pace yourself by acting as a variable speed metronome while you work out.

B. You can be your own one-man or one-woman band with the Casitone

401 (\$695). The portable music machine has 14 preset sounds, including piano, organ, clarinet, oboe, flute, violin, and trumpet. Polyphonic effects, eight built-in rhythms, and delayed vibrato pour out of the mini music maker's four-inch speaker. About the only thing it won't do for a musical entrepreneur is pass the hat.

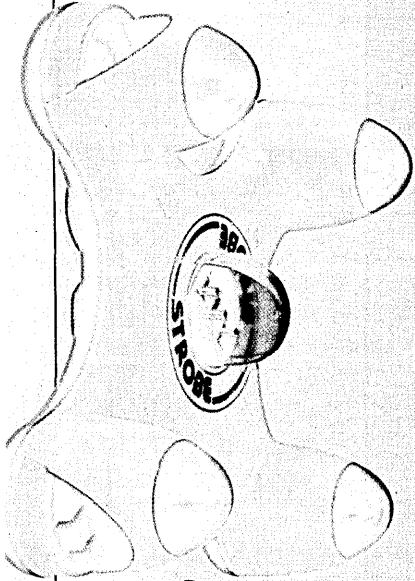
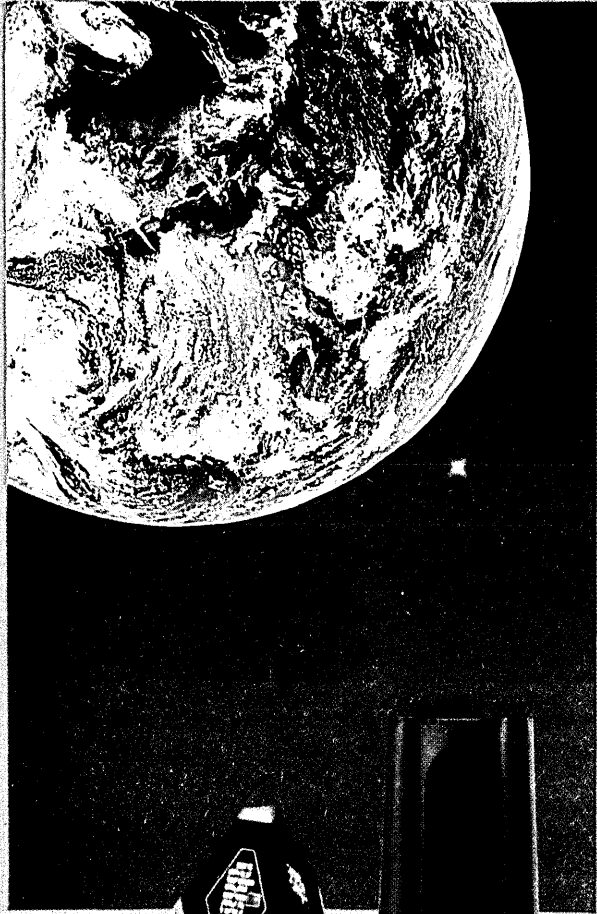
C. In the 18th and 19th centuries, several “chess automatons” won accolades (and matches) in the courts of Europe. Unfortunately, although the inventors always opened the box for inspection, they always did it in such a way that the contortionist, midget chess master hidden inside never came into view. There's no man inside this Robot Chess Computer (\$1,300), just silicon. But the machine does move the pieces, and it can be programmed for “emotions,” to the point that it will become angry with you and knock the pieces off the board if you try to pull a fast one. It's part of a system that can include a printer to record games and a chess clock.



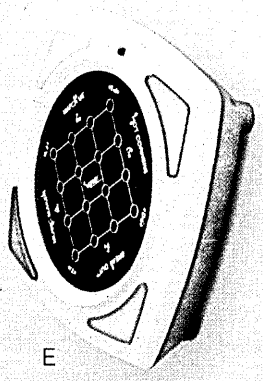




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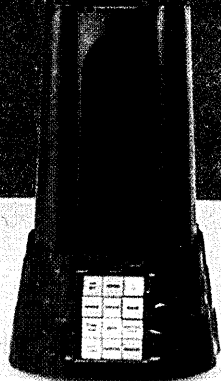
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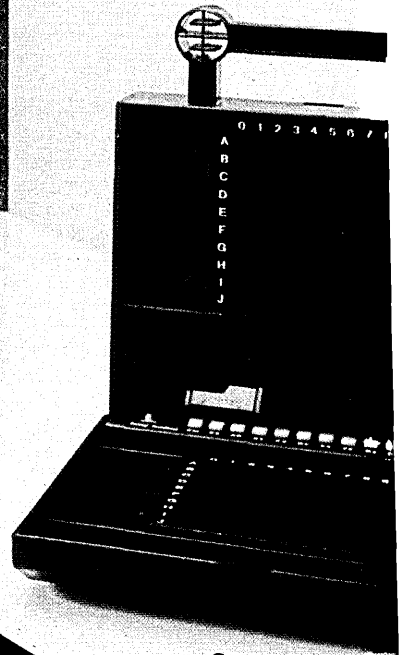
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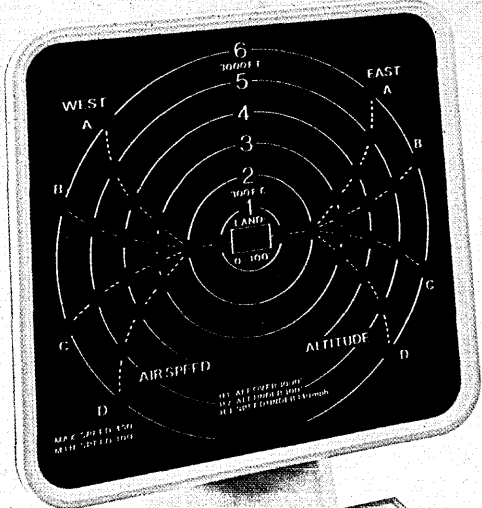
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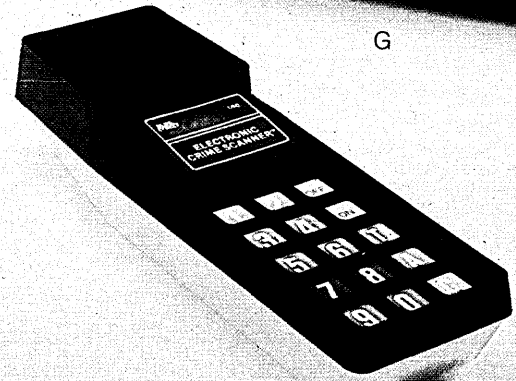
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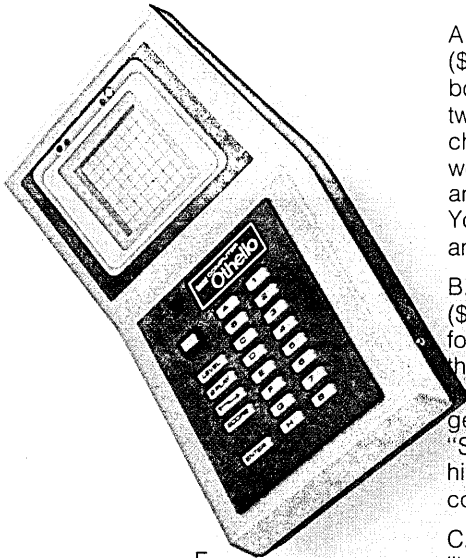
G



A



H



F

A. The TC7 Air Traffic Control game (\$55) features four skill levels and boasts that "there's nothing like it between heaven and earth!" You can choose flight paths to the east or west, control ascent and descent, and increase or decrease air speed. You control taxiing, lift-off, landing, and flight paths.

B. On the left wall, we have Strobe (\$75), the game that lets from one to four players test their reflexes against the speeds of light and sound. It's like an electronic "hot potato." Things get faster and faster with this one; "Strobe knows all," so you lose if you hit your button before or after your control light shines.

C. Plus One (\$29.95), the pyramid-like contraption in the rear center, is a board game for two or more play-

ers. You must tumble the tetrahedron computer along the proper path, using tones and colors as clues (board not shown). You move the Plus One computer, then the next player tries to retrace your steps and add another; make a mistake and Plus One gives the "Razz."

D. Dark Tower (\$79), of which we show only the electronic tower, challenges you to find and return the Ancient Magic Scepter—ripped off by a tyrant king—in return for which you are offered a kingdom as reward. A fierce band of heavies guards your quest within the Dark Tower, and you must discover the three keys that will open the door to the tower (and your future, should you survive).

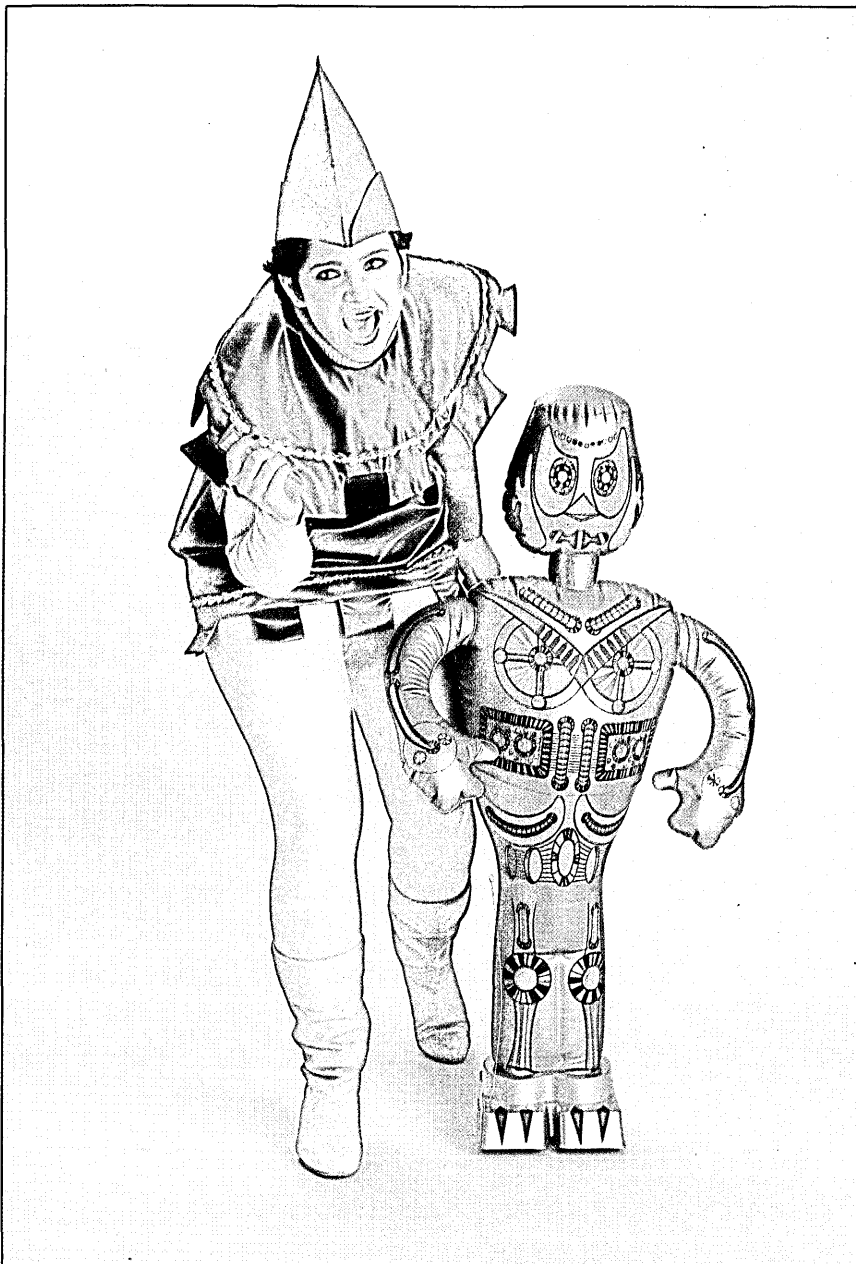
E. Wizard (\$59.95) offers four basic games involving moving lights, sound, and action. Play Hot Corners, Match Me, Music Maker, or Break Out, each of which offers two or three variants. Some of the games are solitaire, some multiplayer.

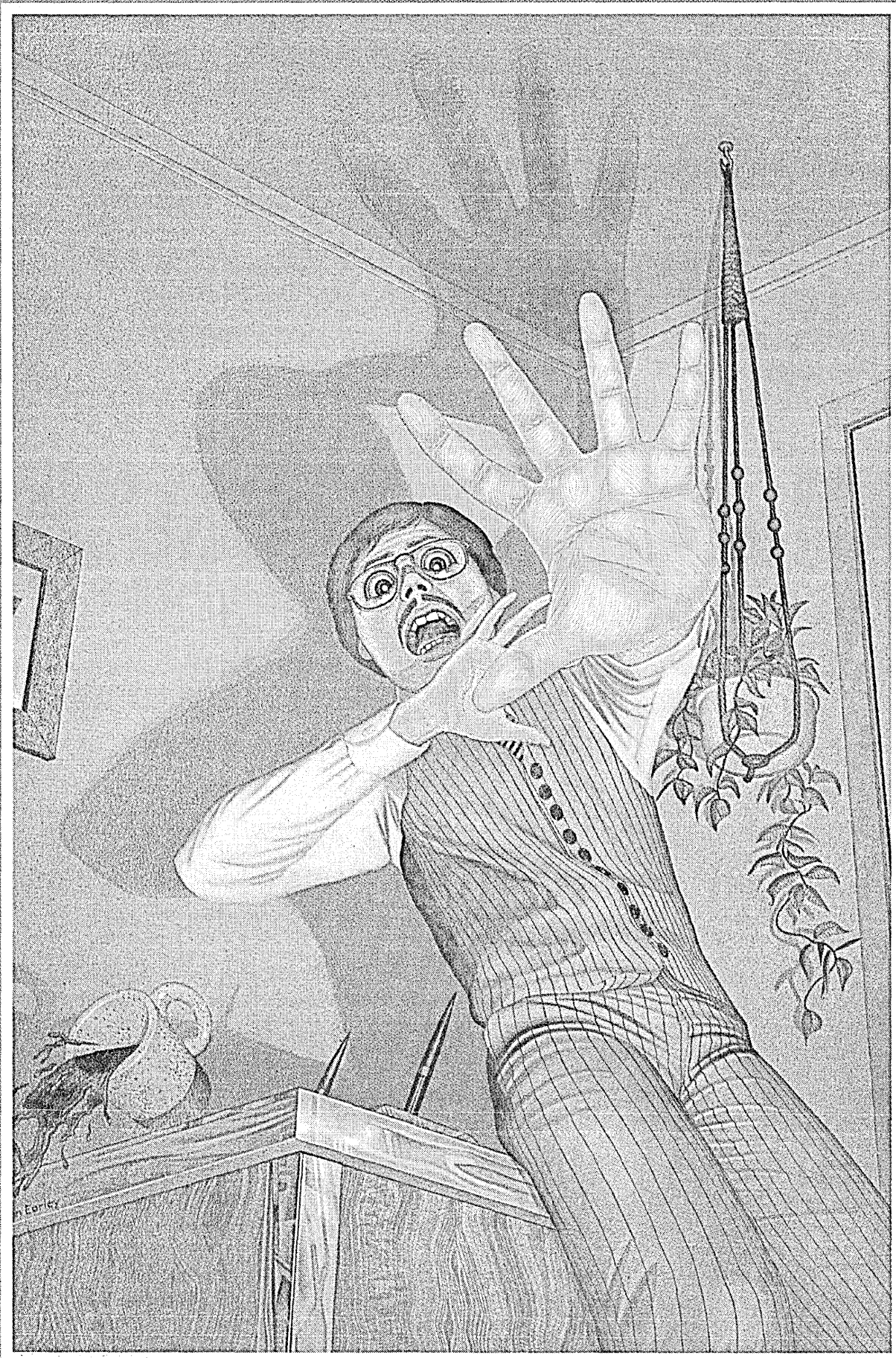
F. High on the right wall, there's Computer Othello (\$159.95), an electronic version of the old British game of Reversi, since reincarnated as Othello by a creative Japanese inventor. There are eight levels of play. Object of the game: to cover the board with more of your colored markers than your opponent does.

G. Electronic Computer Battle Stations (\$59.95) challenges you to fire missiles and sink the enemy's fleet before the enemy can do unto you. A game for one or two players, Battle Stations requires you to locate your adversaries and put them under the deep blue sea. The game even makes the sounds of ships, missiles, and sinking ships (hopefully your enemy's).

H. "A crime is being committed . . . but where?" That's the question to be answered when playing Stop Thief (\$49.95). The board game is augmented with the Electronic Crime Scanner (shown), which provides sound effects (useful as clues) as well as tips (there's always a stool pigeon). When you've solved the crime, use the Crime Scanner to tell the police where to make the pinch.

The adult gifts on the first two pages are shown through the courtesy of Hammacher Schlemmer. The toys on the following pages, for the young and young in heart, were provided by FAO Schwarz. Santa's elf (inset) is running with a remote control robot from Golden Crown Enterprises, Inc. Our thanks to these companies for their invaluable assistance.





# IS A WILD IMS LOOSE IN YOUR SHOP? GET ALL OF IT UNDER CONTROL WITH UCC-10.

There is still only one dictionary package that controls the entire IMS environment — the UCC-10 Data Dictionary/Manager.

UCC-10 controls the online blocks — MFS and data communications - as well as the databases and applications. It's the only dictionary package that does this. Which means that — in an IMS recovery situation — you can be back online in a few minutes, instead of a few hours.

UCC-10 also allows you to build the IMS database the way it will work best for you. This cuts program design and development time significantly, not to mention eventual running time.

If you've got an IMS control problem — solve the whole problem, not just half of it. Call us today about UCC-10 today at 1-800-527-5012 (in Texas, 214-353-7312). Circle 23

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A Production Control System that makes scheduling systems obsolete (UCC-7). Circle 28

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# NEWS

## IN PERSPECTIVE

### STRATEGIES

## GOODBYE 360, HELLO VM

**Strong hints of systems to come were evident in IBM's wide-ranging product introductions in October.**

IBM once again captured front-page headlines in late October, introducing a new H Series machine, its largest computer ever, and a wide-ranging variety of new software and peripheral enhancements. Industry analysts went to work immediately, determining purchase-to-lease ratios, MIPS ratings and cost benefits, but what finally emerged from IBM's 200 pages or so of sales literature was the sketchy, fleeting image of what may be the most radical departure yet from IBM's vintage 360 system architecture.

That architecture, based on a rather simple, single-cpu scheme that has withstood the test of changing technology, vast increases in computer power, and competition from plug-compatible suppliers, is evolving, observers say, into a much more complex design in which the virtual machine is a key concept. Indeed, IBM's VM/370 operating system, which has always played second fiddle to the much-touted MVS system, appears destined to be the vital web connecting a multitude of disparate processors, subsystems, and outboard devices into highly complex systems never before realized.

While no "statement of direction" to that effect was released by IBM, industry analysts say the picture is clear to them, from both previous IBM product descriptions and especially the bulky October unveiling, that future IBM systems will bear little resemblance to 360/370/303X machines in use today. Economic, technological, and market forces are moving IBM to devise an architecture that will be adaptable to the vastly different large-scale computing needs of, say, airline reservation systems and multihost distributed processing systems. The only way to accommodate the spectrum of user needs is through a virtual machine concept, it is thought.

"IBM tried to do much of this with its Future Systems, but failed," says Frederic G. Withington, the noted computer industry analyst and a vice president at Arthur D. Little Inc., Burlington, Mass. "We're now seeing an evolution of FS concepts in a series of nibbles. October's announcement was the biggest nibble yet."

FS was the name IBM gave to an over-

all plan in the early '70s to grow out of the single-cpu 360 architecture to multiple-processor machines. IBM understandably did not broadcast its intentions for FS publicly, but many details of the proposed systems surfaced in documents exposed during Tel-ex's almost successful antitrust suit against IBM. Analysts such as Withington now believe that many of FS's concepts were ahead of their time, requiring much more development work than had been realized a decade ago, and forcing IBM to change its timetable repeatedly. Now, they believe, that work is well in hand and a much more mature FS strategy has been surfacing since 1976, when it became clear that MVS would be a mainstream large-scale operating system.

While the full scope of IBM's future plans is by no means clear—the company itself must adapt repeatedly to technological and market forces—the general direction appears to be towards large-scale systems composed of what Withington describes as a "federation of processors." Instead of a single- or dual-processor cpu han-

**With the new 31-bit mode, IBM users will be able to boost real and virtual addressing to 2 gigabytes of main memory.**

dling the bulk of scheduling, computing, and I/O tasks, H Series machines and beyond will have a handful of processors in them, each designed specifically to cope with a particular aspect of the system. In FS terminology these processors were described as "engines."

Withington notes that several key points in the October announcements support this view of the future. Chief among them is the decoupling of channels from processors. IBM's new H Series Group K mainframe, understood to run in the 13 to 14 MIPS (millions of instructions per second) range, is designed so that any I/O channel can attach through channel directors to either of the two main processors. "This means that the channel groups have become full-fledged peripheral processors," says Withington. "The umbilical cord has been cut. The sky is the limit now."

In other words, the channel groups, as IBM describes them, are much more flexible in their attachment to processors requiring I/O services.

Previously, a channel group was dedicated to a particular cpu within an IBM multiprocessor complex. Now, the channels have "intelligence" of their own, providing a more versatile system overall.

The other key components in IBM's future plans lie in its notification that 3081 machines have a 31-bit addressing mode and the introduction of a number of enhancements to the VM operating system that point to a growing importance for it as the "super operating system" under which other operating systems will run.



The 31-bit mode, designated as "extended architecture" or 370-XA by IBM, boosts the maximum real and virtual storage capacities of cpu main memories to 2 gigabytes, compared to the previous 24-bit addressing mode which limited the maximum capacity to 16 megabytes. This gigantic leap in capability probably won't be taken advantage of immediately but it indicates more to come in the way of bigger user programs, higher performance telecommunications and interactive systems, and increasing use of virtual machine concepts. The latter are dependent in certain performance and functional respects on how much main memory is available to simulate "real" machines, according to observers.

"It is absolutely clear that VM is the primary operating system for this extended architecture," says Withington, pointing in particular to microcode features included as standard on the 3081 computers that assist VM as well as MVS running under VM.

The latter, designated preferred machine assist, is claimed to "permit an MVS/SP . . . machine to operate at near native performance and with a minimum of intervention by the VM control program," according to IBM literature. In other words, the microcode enables the MVS operating system to run under VM at greater speed than was possible previously. In fact, as implied by the preferred designation, the assist gives

MVS, not VM, direct control of the processor, dedicated channels, and I/O devices in most cases.

"This direct execution . . . eliminates the interpretive overhead typically incurred by a virtual machine with instruction simulation and indirect I/O operations, thereby improving the performance of the preferred guest," claims the IBM handout.

Similarly, the VM microcode assist present in previous 303X and enhanced 370 machines has been extended in the 3081

**The new models of the 3880 disk controller may be the precursors of a full-fledged file processor that would offload database functions from the mainframe.**

offering to take over several VM software functions and perform them in hardware. As might be expected, a separately-priced software program is required to take advantage of that feature.

Says Withington, "I think you'll see additional functions being added outside of MVS, mostly to VM. It is clear that that is the direction IBM is taking. MVS is slowly receding in importance."

He notes, however, that MVS will continue to be enhanced in the short term as it is so important to the bulk of IBM's largest

users who run it without VM. However, "the increasing diversity of control programming" will prompt a decomposition of the "monolith" that is now MVS.

Moreover, often-used control programming functions will be made resident in microcoded hardware. This will take advantage of the decreasing cost of high-performance hardware and will create a competitively efficient moving target against which the Amdahls and Hitachis of the world will have less chance of matching instruction for instruction.

It has often been suggested that the more internal interfaces IBM can create within its systems—between hardware, firmware, and software and any combinations thereof—the more trouble the firm can make for those intent upon copying its systems in a "plug-compatible" manner. In a sense, IBM has started to create many more "plugs" for competitors to cope with. Of course, IBM itself will have to move carefully in this endeavor because it may trip on its own cleverness, but October's products indicate an acceleration in that direction.

Other evidence indicating a future "federation" of processors appeared in enhancements to the 3880 disk controllers consisting of cache memory and software designed to manage data according to its frequency of usage. New models of the 3880, the 11 and 13, incorporate up to 8

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CIRCLE 35 ON READER CARD

## NEWS IN PERSPECTIVE

megabytes of high-speed semiconductor memory into which an internal processor puts often-used data sets for fast access by the mainframe.

Observers see this as the first step towards a file processor, a concept under which database management functions now handled by software in the cpu's memory would be performed outside of the mainframe. Such a scheme would offload time-consuming tasks from the cpu.

That the 3880 was upgraded in such a manner was not a total surprise to IBM watchers who had suspected IBM's intentions for the 3880 when the box was originally introduced with a 5 MIPS processor and seemingly little for that processor to do. "They telegraphed that one a long time ago," recalls Withington, calling the original 3880 a "half-empty" box. He contends that eventually much of the functions handled by cpu-resident VSAM software could be resident in the 3880. All of the IMS database function might be too much of an expectation, he notes.

Another interesting sidelight to the 3880 aspect of the October introductions is that the model 11 is designed to operate with the fixed block architecture found on 3350 and older disk drives while the model 13 operates with the newer count-key formats found on 3375 and 3380 disks. This, Withington contends, implies that users will be urged to buy both models, using the 11 to handle page swapping and the model 13 to handle data sets.

Among the other introductions made by IBM were what appears to be the outcome of its project Hydra (August, p. 38), a scheme to control remote 4300 processors from host mainframes, and new versions of the advanced communications function packages for its telecommunications packages BTAM, TCAM, and VTAM.

The Hydra products came in the form of a pair of remote operator console facilities (hardware changes to 4300 processors) and host software packages that enable a remote operator to load microcode and programs (IML and IPL) into 4300 systems. This is intended to reduce programming and operator staff requirements at the remote sites and to give central sites greater control, according to IBM.

One company obviously interested in the new remote operation products is Lexington, Mass.-based Spartacus Computers, which plans to offer a similar capability next year. George McQuilken, Spartacus founder and chief and former IBM staffer, says IBM's product introduction is "terrific" and he thinks it will do much to give his planned products credibility.

"It satisfies the demand for 370-architecture distributed processors," he says enthusiastically. "I only wish they'd offered a remote power-on capability."

Since disclosing his plans in these columns last August, McQuilken has raised

his firm's staffing to nine persons and is lining up additional financing. He says his Hydra-like operating system will be ready for introduction next year and hardware plans are on schedule. Spartacus initially plans to use 370-compatible machines developed and manufactured by Formation Inc., a southern New Jersey company.

The primary motivations behind IBM's gradual unbundling of system functions are to take advantage of new technology and to get the largely successful plug-compatible manufacturers off its back. IBM first tried to hide new functions in microcode in the March 1977 introduction of its 3033 processor.

Amdahl, then its primary large-scale PCM competitor, easily duplicated the microcode and accompanying MVS/SE program product's functions in an emulator software package designed to run in main memory. Now, however, IBM seems to have taken Amdahl by surprise.

While most PCMs are said to have had the new extended 31-bit architecture well in hand, the dynamic channel feature is

### IBM's grip on the large-scale mainframe market was tightened with a new top-of-the-line machine, the 3081 Group K, rated at about 14 MIPS.

thought to have posed a larger problem than MVS/SE for Amdahl. The firm responded to the new Group K 3081 computer with the Amdahl 5870, an attached processor version of its Group D answer, the 5860. The machine will not be delivered, however, until the third quarter of 1983, a good year after IBM is to have begun deliveries of its comparable Group K. Amdahl's 5860 delivery schedule lagged the Group D machine by only about six months.

For its part, IBM said the Group K processor complex offers 1.3 to 1.4 times the execution rate of a Group D, giving the larger machine an estimated MIPS rating of 13 or 14, according to industry reports. However, ADL's Withington points out, as computer systems evolve into conglomerations of different heuristic processors, each running its own software and microcode and all running under control of a dispersed operating system, actual throughput figures will become increasingly difficult to predict.

IBM acknowledged this fact with a note in its Group K product description, warning users that the "actual throughput improvement that any user will experience will vary depending upon considerations such as the amount of multiprocessing in the user's jobstream, the I/O configuration, and the workload processed." The situation is somewhat analogous to problems encountered in predicting performance of networks and distributed processing systems.



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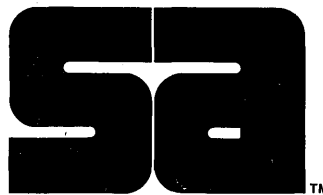
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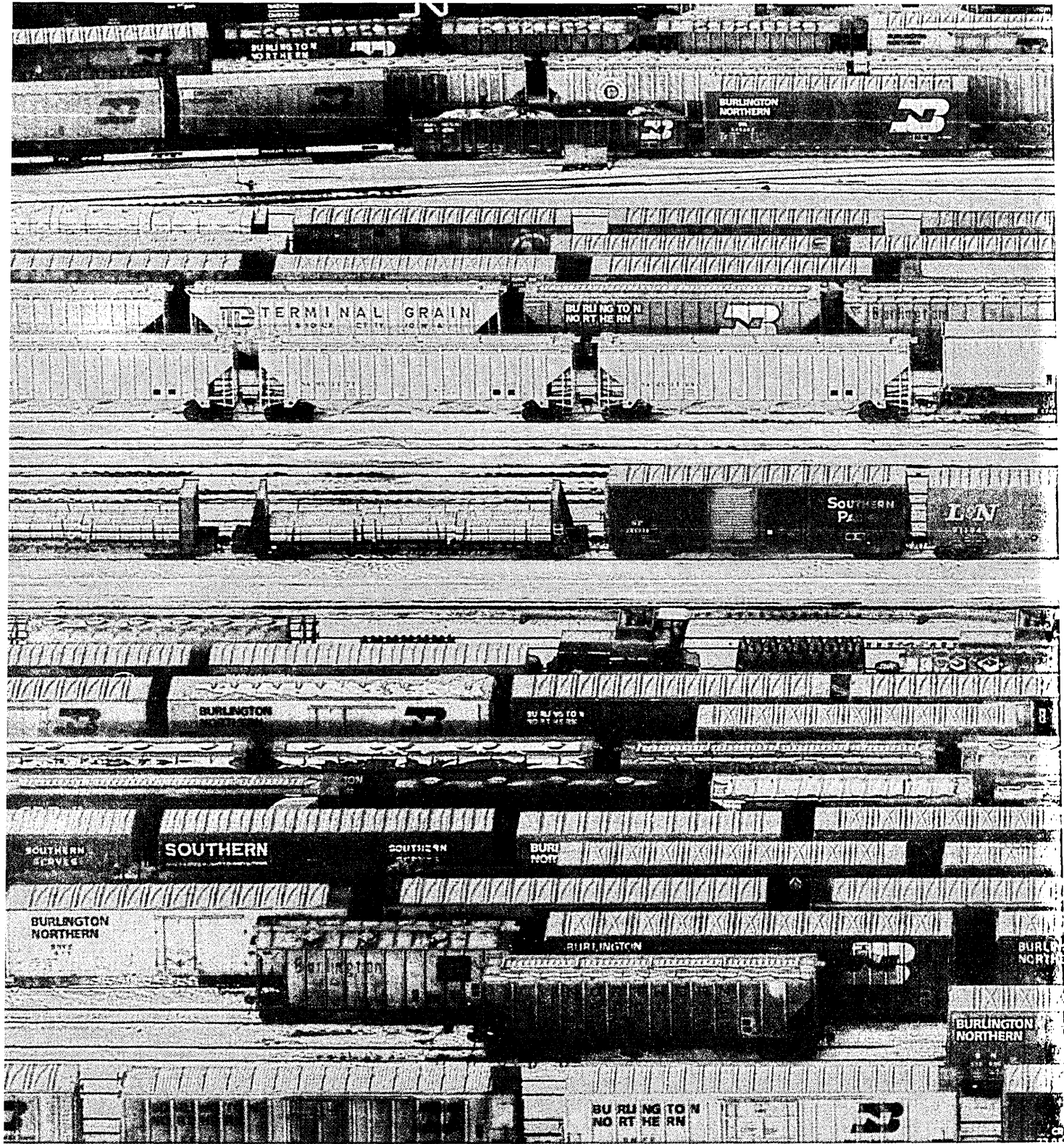
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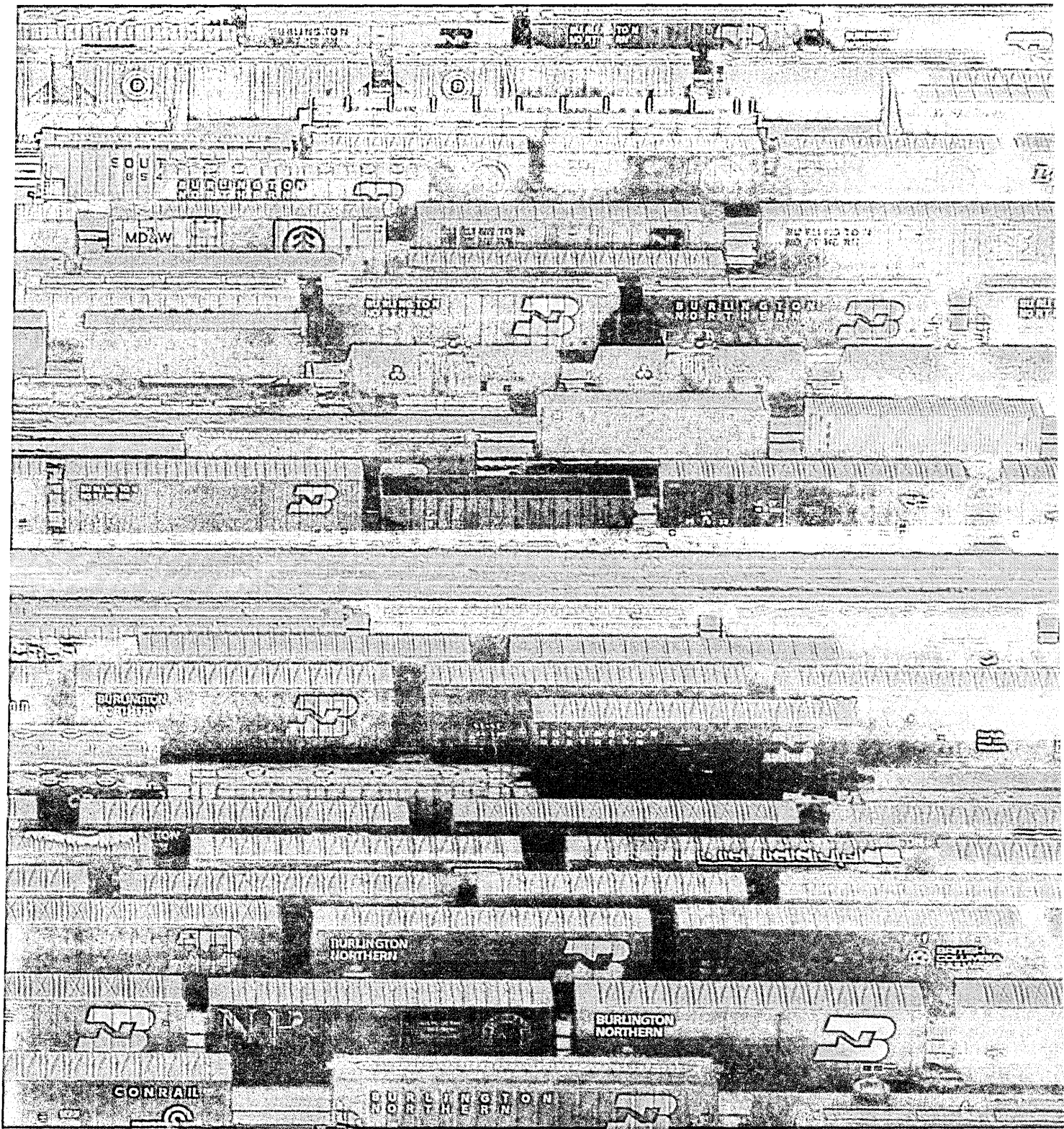
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CIRCLE 37 ON READER CARD



## NEWS IN PERSPECTIVE

First shipments of the Group K systems are scheduled to begin in the second quarter of 1982, although an early support program will be implemented to gather product and service information, IBM said. It noted, too, that initial shipments of the machine will support only the old System/370 24-bit addressing mode; extended architecture will be available in the first quarter of 1983.

IBM said the Group K's purchase price starts at \$4,320,000 with 16 megabytes of main memory. The Group D with 16 megs is \$3,720,000.

In the area of office communications, IBM came out with 3270 terminal emulation for its Displaywriter word processing system and its 5520 administrative system operating in Systems Network Architecture (SNA).

Claiming that the new 3270 functions were "significant additional steps in fulfilling IBM's office systems statement of direction," the firm left open the question of if and when a local area network capability would be introduced. The June 1980 statement of direction was a vaguely worded one, apparently prompted by the splash of publicity garnered at that time by Xerox's Ethernet scheme, that indicated a commitment to helping IBM office systems communicate with each other.

However, SNA compatibility would

seem to leave much to be desired for small-scale users who don't have 370-type mainframes on which to attach 3270-emulating devices. IBM still has not come out with a local network comparable to Ethernet, and while it may have its own reasons for that apparent lack, industry observers see it as a negative factor in an evaluation of the firm's overall office systems plan.

It has been suggested by some that once the firm's reorganization is completed, additional plans in the networking area will become clear and the various systems now marketed by three different divisions—DPD, GSD and OPD—will come under the single umbrella of the unified marketing force that was planned earlier this year (November, p. 46).

ADL's Withington suggests that IBM has been reluctant to come out with an answer to Ethernet or Wang Labs' Wangnet because it is unsure of exactly what users need and want in local networking and that a product introduction at this time would be premature.

For its part, IBM said it "will continue to make product announcements in the office systems area, and expects to provide additional communications capabilities within the three- to four-year time frame projected in the June 1980 statement of office systems direction."

—John W. Verity

# PREGNANT WITH PLANS

**What's a pregnant pause for competitors is a period of planning for AT&T. A Ma Bell executive bares plans for Baby Bell.**

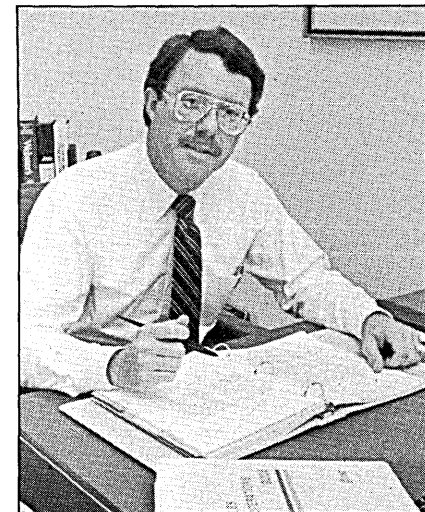
These are days of transition at AT&T. As the phone company braces itself for the launching of an unprecedented fully separate subsidiary (FSS), established methods and procedures in all areas of the firm are being evaluated.

Even though the Federal Communications Commission has postponed the FSS inauguration day from March 1982 until January 1983, Bell is continuing to prepare its people for a whole new way of doing business. In a recent interview, Ben Scott, manager of strategic planning for marketing operations at AT&T, provided a rare glimpse of what is happening inside Ma Bell in her preparation for FSS.

"I'm not worried at all about our ability to compete. As a matter of fact, I think we're going to acquit ourselves very well," Scott says with the conviction of a typical salesman.

According to current plans, between 6,500 and 7,000 "account executives" will be ready to sell FSS products and services by early 1982. And "we're not going to stop there," he adds.

Despite the handicap of not knowing exactly what FSS will be selling in the competitive marketplace, Bell has embarked on a certification program which Scott describes as "the development tool to improve



BEN SCOTT: "I'm not worried at all about our ability to compete."

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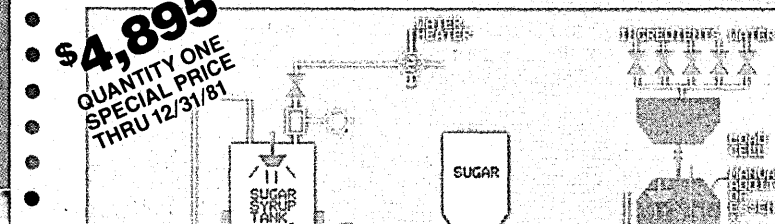
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CIRCLE 40 ON READER CARD

## NEWS IN PERSPECTIVE

the professionalism of the sales force." The program is aimed at increasing pay incentives, providing improved career paths, and turning out an aggressive, highly motivated sales staff. In explaining these new goals, Scott does not shy away from comparisons with IBM salesmen, but he adds that FSS will pattern its sales incentives after those competitors that get results.

Admitting that phone company marketing people have not always been well versed in data problems, Scott says, "This data mystique . . . is a thing of the past." As a result of the certification program, customers "are going to have a hard time calling into our sales force and finding someone who doesn't understand data. When you call in, you're going to find somebody who understands information management—whether that involves data, voice, video, or whatever," he explains.

Even though some uncertainty still exists about what FSS will offer to customers, Scott says it is virtually assured that "on-premises equipment" such as terminals and modems will be included. On the

### Current plans call for between 6,500 and 7,000 "account executives" to sell FSS products and services by early '82.

voice side, FSS will handle everything from telephones to PBXs. With the move to deregulate enhanced network services, Scott predicts that these services—"whatever they might be"—would also fall under the subsidiary's umbrella.

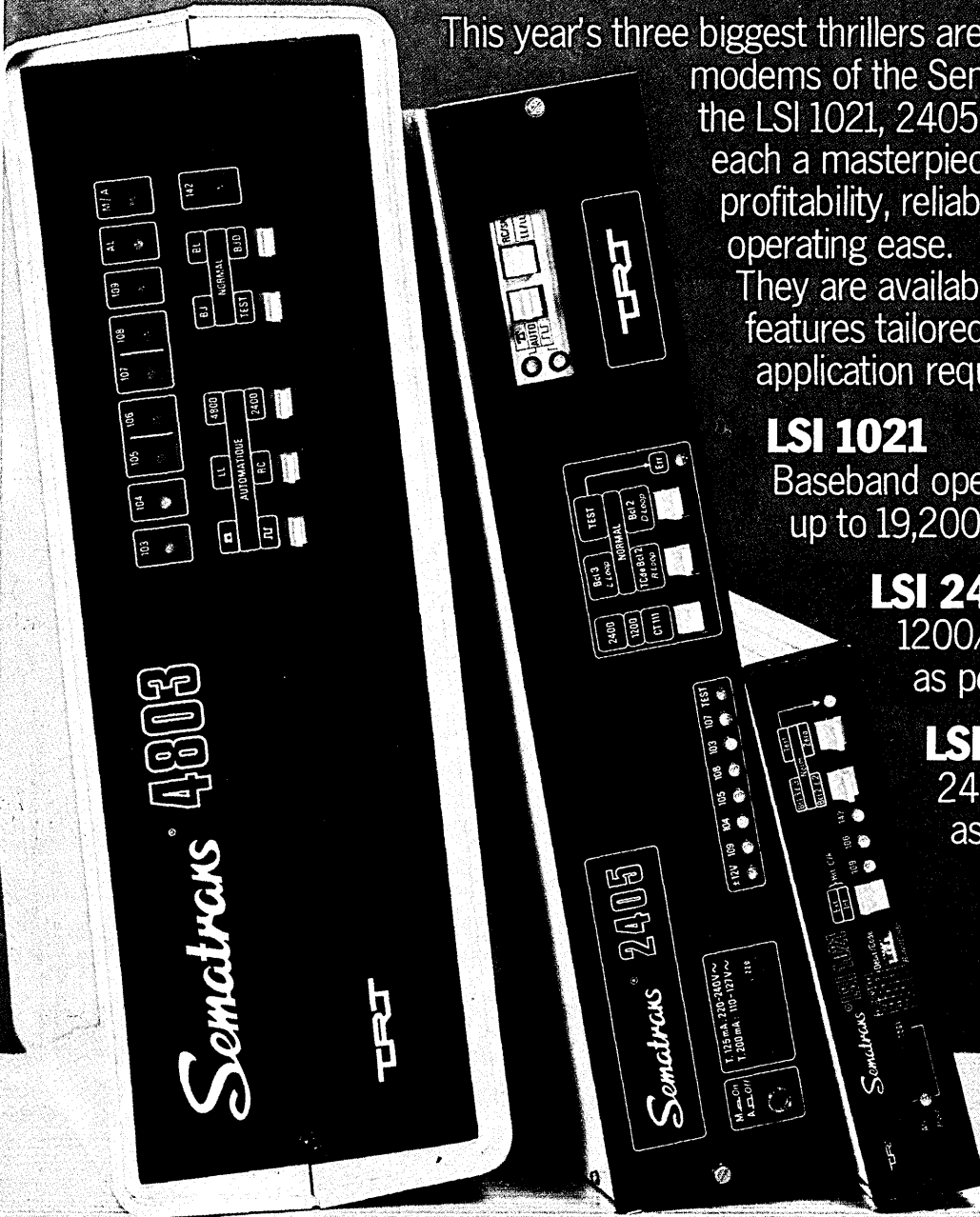
One of the existing sales approaches that FSS will adopt is the national account, whereby large customers with geographically dispersed sites will have one sales contact to serve their entire range of communications requirements. In fact, FSS will concentrate on providing users with complete system solutions, although Scott concedes that it remains open whether FSS will handle pure transmission capacity or whether that will continue to be provided by the remaining regulated arm of the Bell System.

Since FSS will concentrate on coming up with complete system design solutions for customers, Scott acknowledges that the new sales force would have to be familiar with non-AT&T alternatives from competitors. But he stops short of saying that FSS salesmen would actually recommend such alternatives to customers. "We'd offer the system configuration that gives the customer the best service for the price. If that ended up with some part of a system recommendation provided by somebody other than the Bell System, then I think we'd want to be honest with our customer."

Exactly what FSS will call itself is still under study. Names are being submitted and images studied, with a decision ex-



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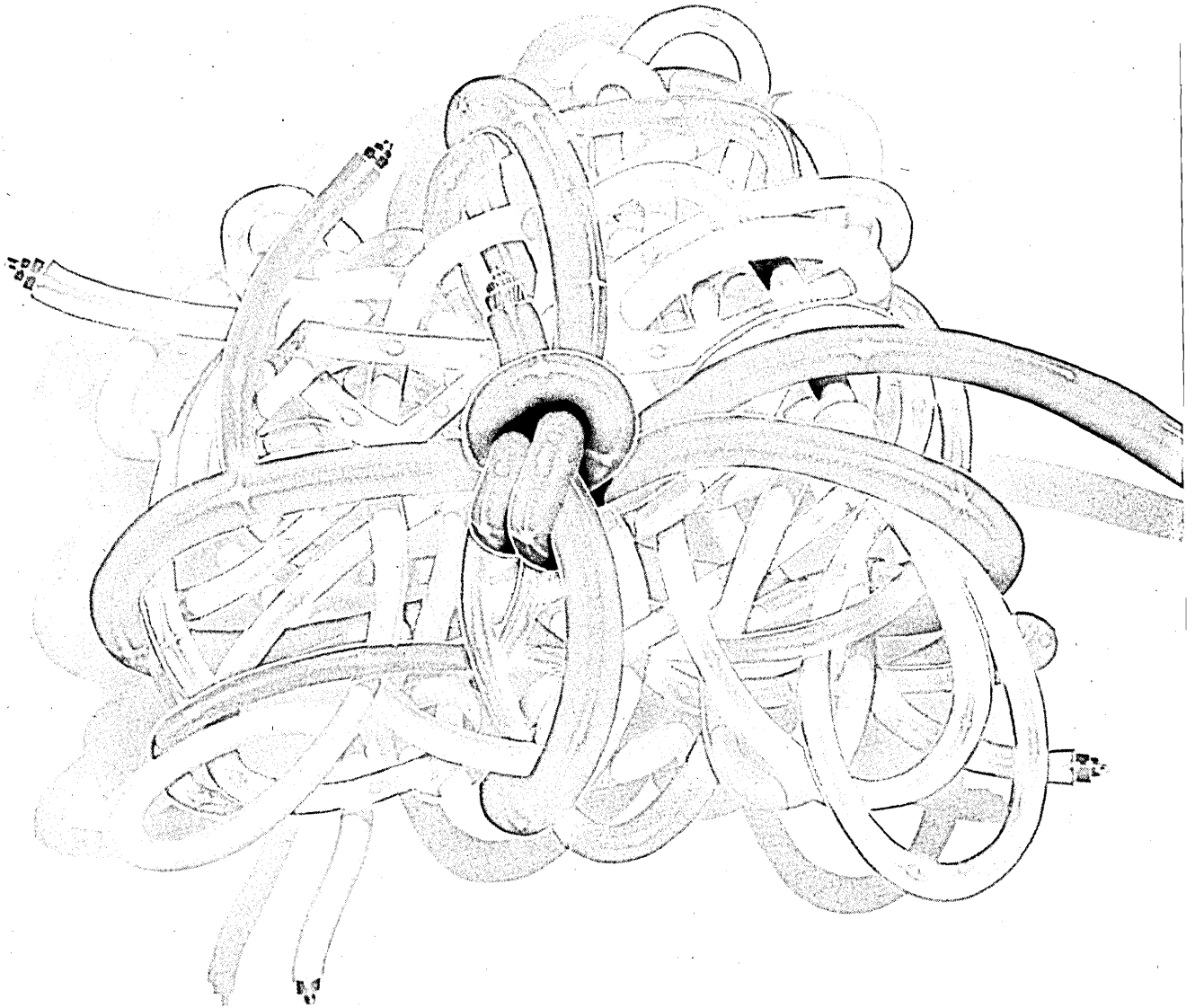
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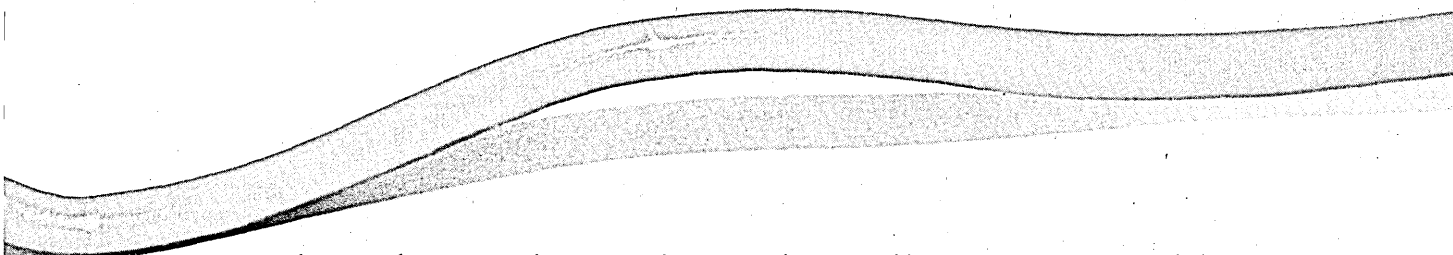
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## NEWS IN PERSPECTIVE

pected early in the first quarter of 1982. "A separate but complementary identity is what we're after," Scott says. He quickly adds that FSS does not want to disassociate itself completely from the AT&T image, which he describes as a "service-oriented company" with an "outstanding reputation."

One of the biggest changes coming with FSS will be the way in which smaller customers are serviced. Pointing to the re-

**"When you call in, you're going to find somebody that understands information management—whether that involves data, voice, video, or whatever."**

tail stores being opened by personal computer vendors, Scott reveals that Bell is experimenting with storefront operations called Communications Planning Centers. A test location in Indiana is aimed at providing product options specifically for single-line business customers. "The whole idea is to understand what it is that the business customer likes in a retail outlet."

The new retail centers are an outgrowth of the existing residential Phone Center stores, but they will be tailored specifically to the business user. The Indiana store is testing only voice products, but data products and services will be added when

the Communications Planning Centers are expanded to Chicago, Denver, Atlanta, Philadelphia, and Milwaukee early in 1982.

In addition to product demonstrations, the new centers will provide small business users with seminars and training in the use of equipment and service offerings.

Customer education will be a key element of FSS, and a "multitiered educational strategy" is being developed for both top level managers and operating level technical specialists.

At the top, broad communications issues will be discussed while more specific data and other telecommunications topics will be included at the operational levels—all presumably aimed at making FSS offerings more desirable for the potential customer.

In a similar manner, the FSS salesmen will call on all levels within a corporation to cement a sale. "Our sales strategy is going to be to call at the top so that they will understand the problems and to call at the operational level so that they will understand what kinds of systems they have and how what we have to offer can fit in." Within this framework, the industry marketing groups set up by Arch McGill several years ago will be maintained, Scott notes.

In addition to the first line sales staff that will undergo postcertification training at a new center in Denver, support staffs of

technical specialists will provide backup. While the sales staff will have to be familiar with the wide range of offerings from FSS, they will get support from Communications Systems representatives trained in specific product areas.

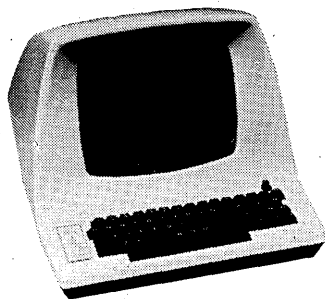
For customers who cannot be reached by either FSS account executives or the retail centers, Bell is experimenting with direct advertising at a sales center in Kansas City. By setting up a centralized response location, direct mail and other programs can

**FSS will concentrate on coming up with complete system design solutions for customers.**

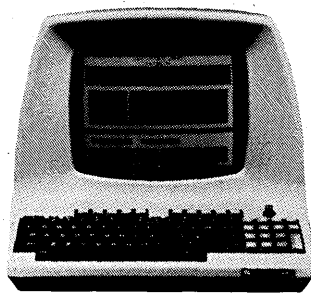
be handled by phone. Included in this approach are the "tele-marketing" ads which are currently running on television in a number of market areas.

For Scott, the end result of these various marketing efforts is obvious. "We're building a team—a professional salesperson, a professional support person, and a professional market administration person." Whether these FSS staffers deal with the user in a sales call, at a retail store, or via a tele-marketing program, Scott believes that today's preparations will make FSS a viable competitor.

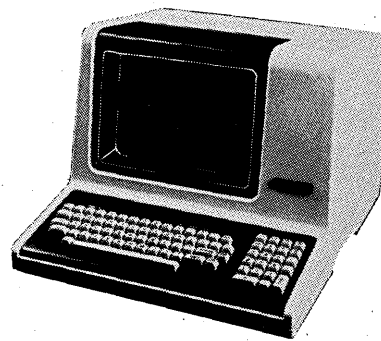
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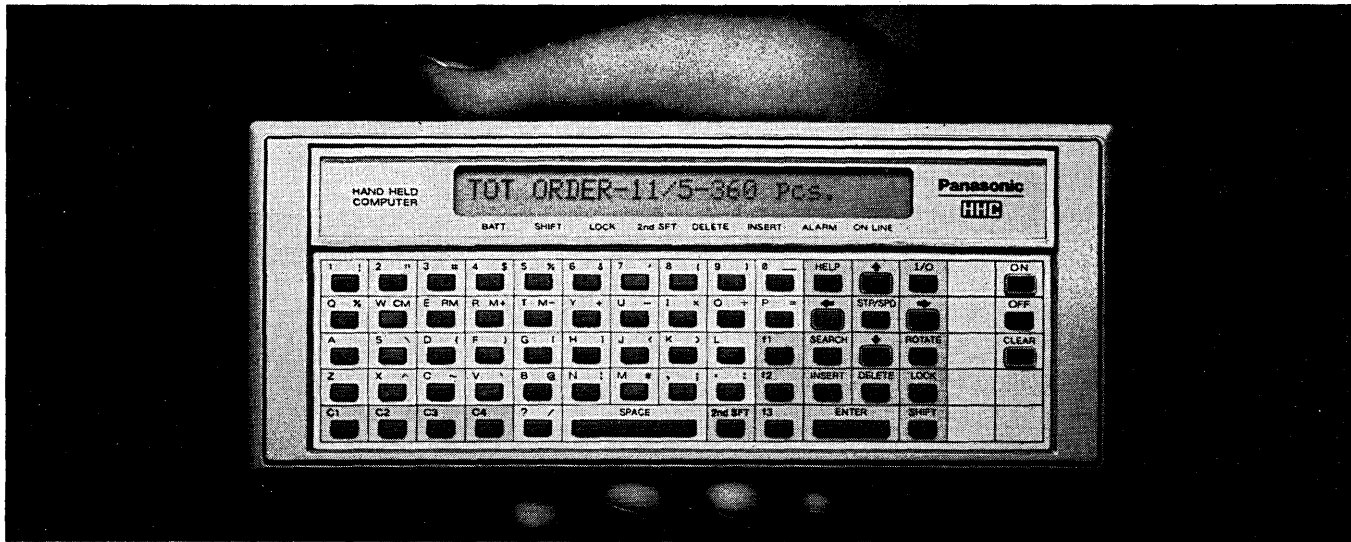
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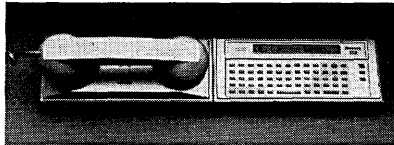
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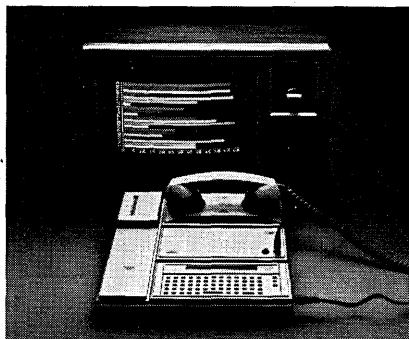
And The Link is part of an entire computer system: By adding different optional components, you can create whatever kind of computer you need. Wherever you need it.

By adding the telephone modem, for example, a salesman can put his company's main office computer or a data bank

to work for him from any telephone booth. He can check credit ratings and inventory, trace shipments, enter orders, make bids and estimates, and much more. So The Link can make him and his office computer much more productive.

By adding the microprinter, the salesman gets hard copies of information right on the spot—an instant record of his transactions.

By adding the TV adapter, he can display information and 8-color charts on any color TV



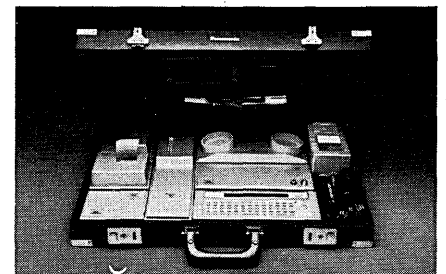
Display information and charts with the TV adapter.

screen. So he can use data from his office computer to develop a sales presentation in a motel room. And show it on a client's video monitor the next day.

If the salesman needs to work with a bigger program and

more memory, other optional components increase The Link's capacity to 52K RAM plus 64K ROM. That's more than many desktop computers.

The Link measures only 9" x 4", weighs only 21 ounces,



Take The Link and all its components anywhere in its slim attaché case.

and runs on AC or rechargeable batteries.

And it costs only \$599.95\*. That's amazingly small when you realize the big change it could make in the way you do business.

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- Please send me information on The Link.  
 Please have a salesman call me.

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COMPANY \_\_\_\_\_

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## NEWS IN PERSPECTIVE

### GOVERNMENT

# LAST MINUTE REPRIEVE

**The Institute for Computer Sciences and Technology has escaped a deathly blow from the budget ax, but its future is still shaky.**

Remove one organization from the endangered species list. With a little help from its friends, the Institute for Computer Sciences and Technology (ICST) has escaped a funding loss that would have left it existing only on paper.

As part of the Reagan Administration's proposed new round of budget cuts, each agency was required to participate in the euphemistically named "12% exercise." The rules were simple: get the budget ax and start chopping. When finished, make certain the budget totals 12% less than when the process started.

The National Bureau of Standards,

of which ICST is a part, was prepared to comply with one swift stroke. It would slash to \$3 million ICST's budget of \$12.25 million, which had already been approved by the House and Senate Appropriations Committees.

"There were internal [NBS] moves to absolutely gut the program," a well-placed source said. "They were going to fire everybody and leave a caretaker staff on board."

"NBS has never been sympathetic to ICST," a former institute director charged. "They've never supported it fully. ICST was totally tagged for the second round of cuts. It would have completely wiped them out."

"I am not at liberty to discuss that issue," NBS director Ernest Ambler said. "The figure of \$3 million, and any others that have been bandied about, is irrelevant. The only figure that counts is the one presented to the President. That's going to be either \$12.25 million or \$10 million. I have nothing to say about any other numbers."

Such a wipeout would have had severe repercussions for industry and government. Established in 1966 pursuant to the Brooks Act, ICST is responsible for providing scientific and technical advisory services to federal agencies, developing federal adp standards, and undertaking whatever research is necessary to perform those two tasks. The institute contributes heavily to

the work of the American National Standards Institute (ANSI) and numerous private and public sector committees. It also administers the Industrial Research Associates program, through which industry sends personnel to NBS for a specified period of time.

"ICST helps both government and industry," said Jack Biddle, executive vice president of the Computer and Communications Industry Association (CCIA). "It saves the government money by doing such things as opening up the peripherals market through the I/O channel interface standard which allowed the government to get price breaks. By establishing a data exchange standard, it prevented one agency from putting in a system that another agency

**NBS was prepared to slash ICST's budget to \$3 million from the already approved \$12.25 million.**

couldn't use without a massive and extensive conversion.

"Unlike users in most other industries, ours are passive. They don't complain much. But there has to be somebody to establish interconnect and network standards. The voluntary ANSI X-3 standards have been a failure. ICST has been granted funds and authority to come up with standards. I'm sure they'd rather the industry do



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it on its own, but if it doesn't, then ICST is saying it will."

And it has. Its latest I/O standard proposal resulted in challenges by four mainframers to its adoption. Burroughs, NCR, Univac, and Honeywell alleged that ICST had violated its authority by issuing the standards, which they claimed were too favorable to IBM. The case took a protracted journey through the courts before finally being dismissed in October by the Supreme Court.

Those mainframers, along with the Computer and Business Equipment Manufacturers Association (CBEMA), reportedly were lobbying heavily to convince NBS director Ambler to mortally wound ICST.

"There's a real dichotomy with the mainframers," Biddle said. "If you ask them if they want I/O standards, they say no. But if you ask them about communications protocols and network standards, they can't wait to get them."

"Obviously, we have some differences with the institute about standards," a CBEMA spokesman admitted. "But despite that, we wouldn't want to see it eliminated. We did no lobbying that I am aware of, either as an association or through individual companies. We don't want it to go out of business."

Someone does. The proposal to cut out the institute's heart and soul, which a

number of sources attribute to Ambler, wound its way to the desk of Deputy Secretary of Commerce Joseph Wright. Neither Wright nor Commerce officials would comment on how close the Deputy Secretary came to signing off on the cut, but sources indicated that he was seriously considering it. "It very possibly might have been approved," said one. As possibility approached reality, ICST discovered there were

**The proposal to cut the institute's heart and soul, which a number of sources attribute to Ambler, wound its way to the desk of the Deputy Secretary of Commerce.**

many people who thought it was a pretty handy entity to have around.

Biddle leaped into the fray, visiting several White House officials to convince them of the merits of restoring the institute's budget. The General Accounting Office (GAO) also came to ICST's rescue.

In a 1978 report on ICST's standards program, GAO praised the theory of establishing standards, but not the practice. It criticized the federal agencies' compliance rate—less than one-third—and the institute's dawdling. ICST's production of 29 standards in 13 years did not comport with

GAO's idea of efficiency.

GAO recommended that ICST be expanded, given a larger budget, most of it to be spent on standards rather than research, and step up its compliance program. For once, GAO was heeded. ICST's budget was increased, and it has promulgated 18 standards in the ensuing three years.

Those gains would have been lost in one \$9 million stroke.

"You bet we were intimately involved in this," said Wally Anderson, director of GAO's adp group. "Our recommendations would have been absolutely unachievable with the proposed funding. We were essentially defending those recommendations, and we wrote several documents strongly supporting restoring the funds. We are very interested in the fulfillment of the goals of our report."

So was Rep. Jack Brooks (D-Texas), chairman of the House Government Operations Committee and author of the law which begat ICST. After Brooks made a few strategic phone calls to Deputy Secretary Wright and higher authorities, possibly including Commerce Secretary Malcolm Baldrige, the department suddenly realized ICST's value.

"The Institute for Computer Sciences and Technology implements a major part of the [Commerce] Department's Brooks Act responsibilities and has made



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## NEWS IN PERSPECTIVE

significant progress in developing federal adp standards, the importance of which were recently reaffirmed by the Paperwork Reduction Act," Wright told an Oct. 21 hearing of Brooks' Subcommittee on Legislation and National Security.

Wright then outlined the institute's "significant program accomplishments": the issuance of 50 federal information processing standards (FIPS) at a savings to the government of \$120 million yearly in new procurement costs; the issuance of four standards for the interconnection of cpus and peripherals, such as mag tape and disk

drives, at a savings of \$12 million per year; the development of voluntary industry consensus, high level programming language standards; guidelines for benchmarking adp systems and managing computer performance; and the development, "with the help of private sector expertise," of networking standards and interconnection of computer-based message systems.

Then the moment of truth.

"We are seeking appropriations of \$10 million to fund the department's federal adp standards program in fiscal year 1982," Wright informed the subcommittee. "This

is \$2 million below the Administration's first fiscal year 1982 budget request. However, with improved planning and good management, \$10 million will enable us to improve our performance and continue to carry out a productive program in standards development and management.

"While NBS has traditionally housed the program, we are considering transferring ICST to the Office of the Secretary under our Assistant Secretary for Administration. This would provide the ICST and its program with higher visibility and coincide well with the duties of the Assistant Secretary who is responsible for implementing the department's Paperwork Reduction Act responsibilities. Of course, such a transfer would need the approval of OMB, our appropriations subcommittees, and our authorizing committees."

Of course. Naturally, no one is sure when—or if—such a transfer will occur. Commerce officials referred to Wright's statement as the latest word. Others offered updates.

"I'm particularly pleased with plans to transfer ICST to the Office of the Secretary," Brooks wrote to Wright. "I'm also pleased the department has decided to adequately fund federal adp standards programming. This is an impressive list."

"If they put ICST under NTIA [Na-

### After a few strategic phone calls from Congressman Brooks, the Commerce Department suddenly realized ICST's value.

tional Telecommunications and Information Administration], that would be a terrible disservice," Biddle said. "It's obvious NTIA doesn't understand the situation. Look at the way they supported S. 898 [the Senate's communications bill]."

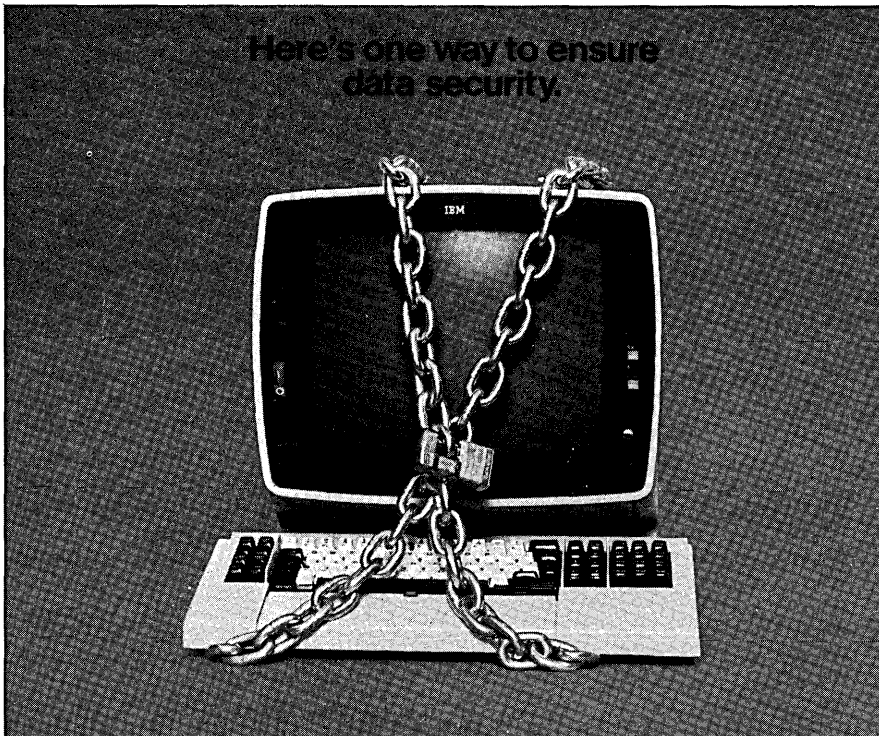
"I think they'll have to go," an informed source said. "They played what most agencies regard as dirty pool. They won at the director's expense, and they're in open war with him. They claimed he could find money elsewhere in NBS to cut, and they proved their point. There's no way they can continue to work for him."

"We are still a fully operating member of NBS," ICST director Jim Burroughs countered in one of the few comments risked by a directly affected party. "I did not initiate the movement of my operation. It came as a proposal to Brooks through OMB. Was I surprised? No comment.

"I don't know if it's going to happen. It hasn't been dropped and it hasn't been acted on. I would guess we're a long way away from something happening. But we might leave tomorrow. In the meantime, we're being good soldiers."

At least they still have something for which to fight.

—Willie Schatz



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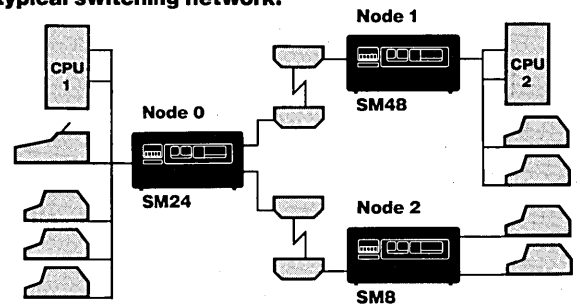
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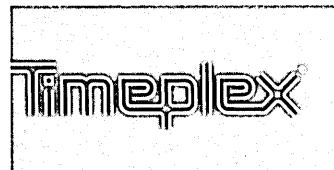
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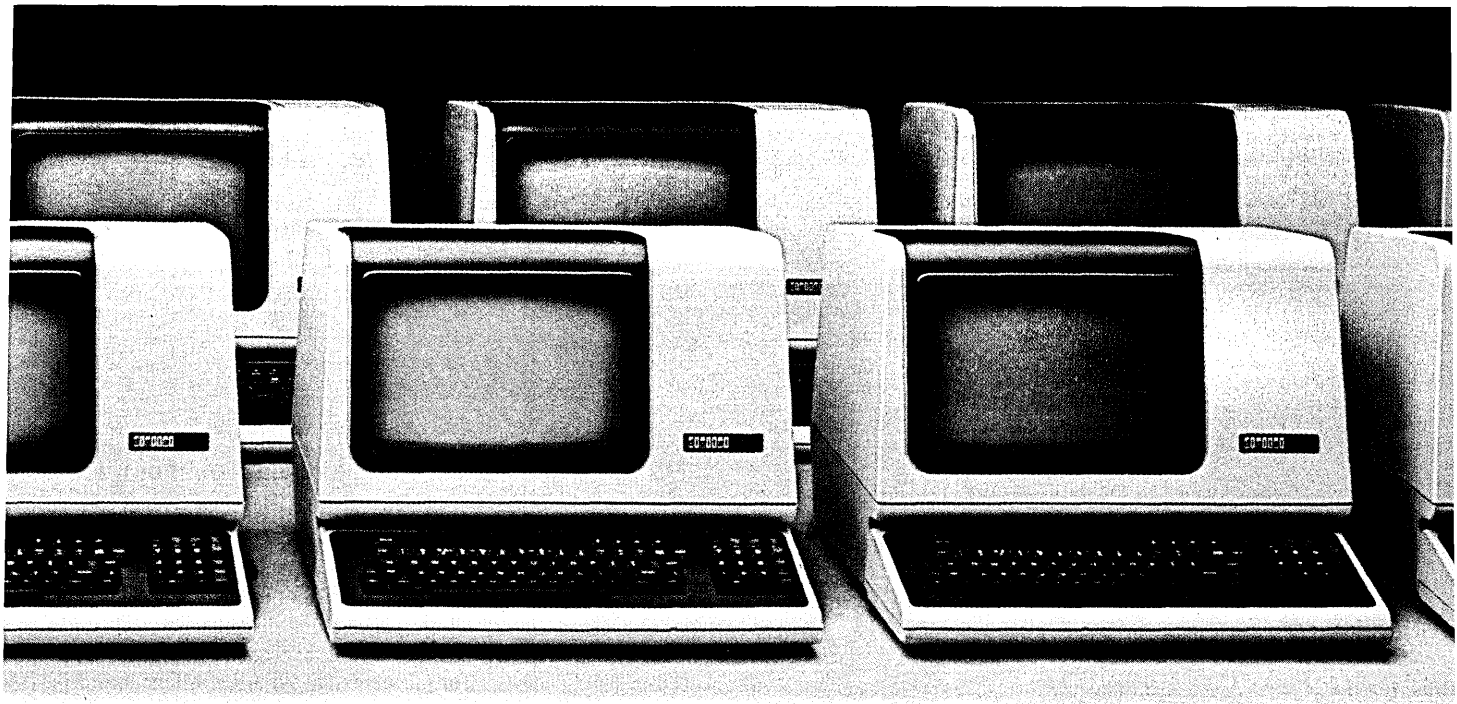
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**Now you can get a terminal  
as easy to use as a VT100 no matter  
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Up until now if you wanted VT100 quality in anything other than a VT100, you had two choices: Do without, or settle for something less.

Now Digital's created a family of VT100 terminals. All of them as easy to use as a VT100 because they're all made with the same high regard for people and the way they work.

The new VT125 business graphics terminal, for instance.

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It gives you what you'd expect in terms of durability and ease of use from a VT100. But what makes it an ideal graphics terminal is our new graphics instruction set called ReGIS (Remote Graphics Instruction Set).

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Then, with simple but powerful ReGIS commands, any operator can call up data and put it into graphic form with very little demand on the CPU.

The VT125 also writes text as well as it draws pictures, so what graphics fail to express, words can.

You can buy the VT125 as a complete terminal package. Or you can buy it as an option for the VT100 you already own.

Either way, it'll work like a charm on any system supporting ASCII terminals. As will any other terminal in the VT100 family.

This next one, for instance.

---

#### The economical VT101.

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It can display 80 or 132 columns of data with smooth scroll. You can select double-height and double-width characters. And you can personalize it right from the keyboard . . . so you'll feel comfortable working with it.

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With the VT131 you can select block mode or character operation from the keyboard.

All of these features are designed in a terminal package that, like the VT101, has less option space and power than a VT100.

Thus the VT131 also represents an affordable choice in terminals.

Then, of course, there's the VT100 itself.

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Some have called it the "perfect" terminal.

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people who'll want its power and space for additional options later on.

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## NEWS IN PERSPECTIVE

### DISTRIBUTED PROCESSING

# A DAVID LEADING THE PACK

**Tiny Convergent Technologies has had a little help from a few Goliaths.**

With a little help from a few Goliaths, a Santa Clara, Calif., David is pulling ahead of the pack selling distributed processing.

"We've exceeded every goal we set for ourselves," said Allen Michels, president of Convergent Technologies, a self-proclaimed Intel spinoff formed in August 1979 to market to oems a family of desktop multifunction workstations that can be clustered in a local area network.

The company in November was "in the process" of negotiating its third round of investment financing which Michels said would be "in excess of \$8 million." Earlier investment rounds brought the firm \$2.5 million and \$3 million, respectively.

Even better is the kind of oems Convergent is attracting. The company has multimillion-dollar contracts with Burroughs, NCR, Savin and France's Thomson-CSF, the last awaiting French government approval.

"They were out first with the mostest," said Chris Lindsay of Dataquest, a

**"They were out first with the mostest."**

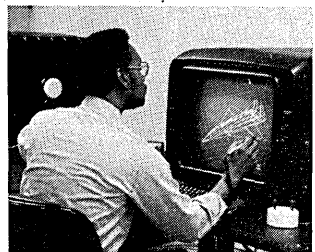
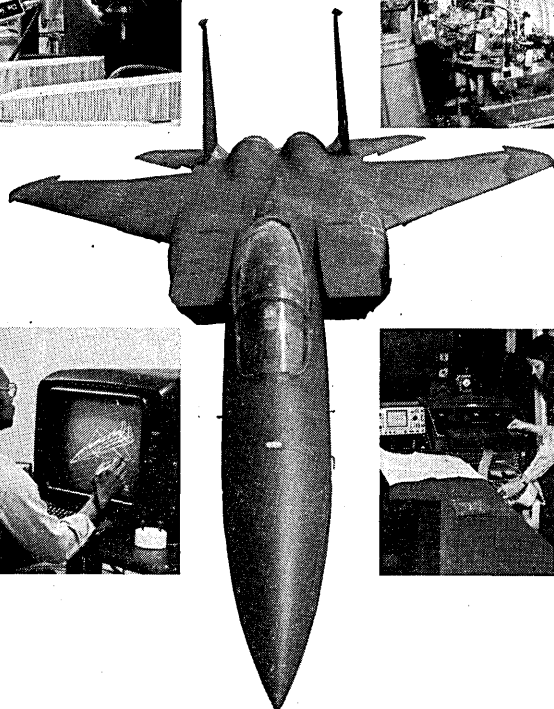
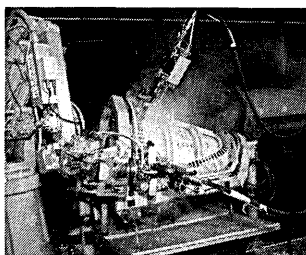
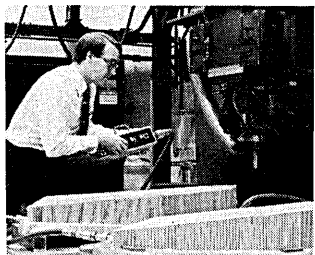
Cupertino, Calif., research firm. "They're a year and a half to two years ahead of what some of these other outfits could do. They were familiar with the Intel technology."

Convergent's products are based on the Intel 8086 and the 8088. Michels came from Intel's microcomputer systems division as did Robert Garow, Convergent's vice president-engineering, Pauline Alker, vice president-marketing, and others.

"The 8086 was a whole new ball game," said Dataquest's Lindsay. "They [Convergent] were able to introduce a standalone workstation device with 1 million bytes of main memory and a lot of capability of emulating other protocols. They were there first."

Lindsay said he was on Convergent's doorstep when it first opened for business. "I was quite impressed with the power of the software they offered and with their complete, in-depth documentation."

There has been speculation that Convergent, in addition to its pacts with Burroughs, NCR, Savin, and Thomson-CSF, is on the verge of signing one with Harris Corp. Michels declined to comment on this



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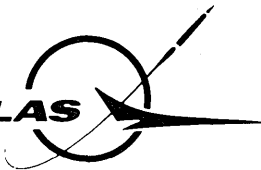
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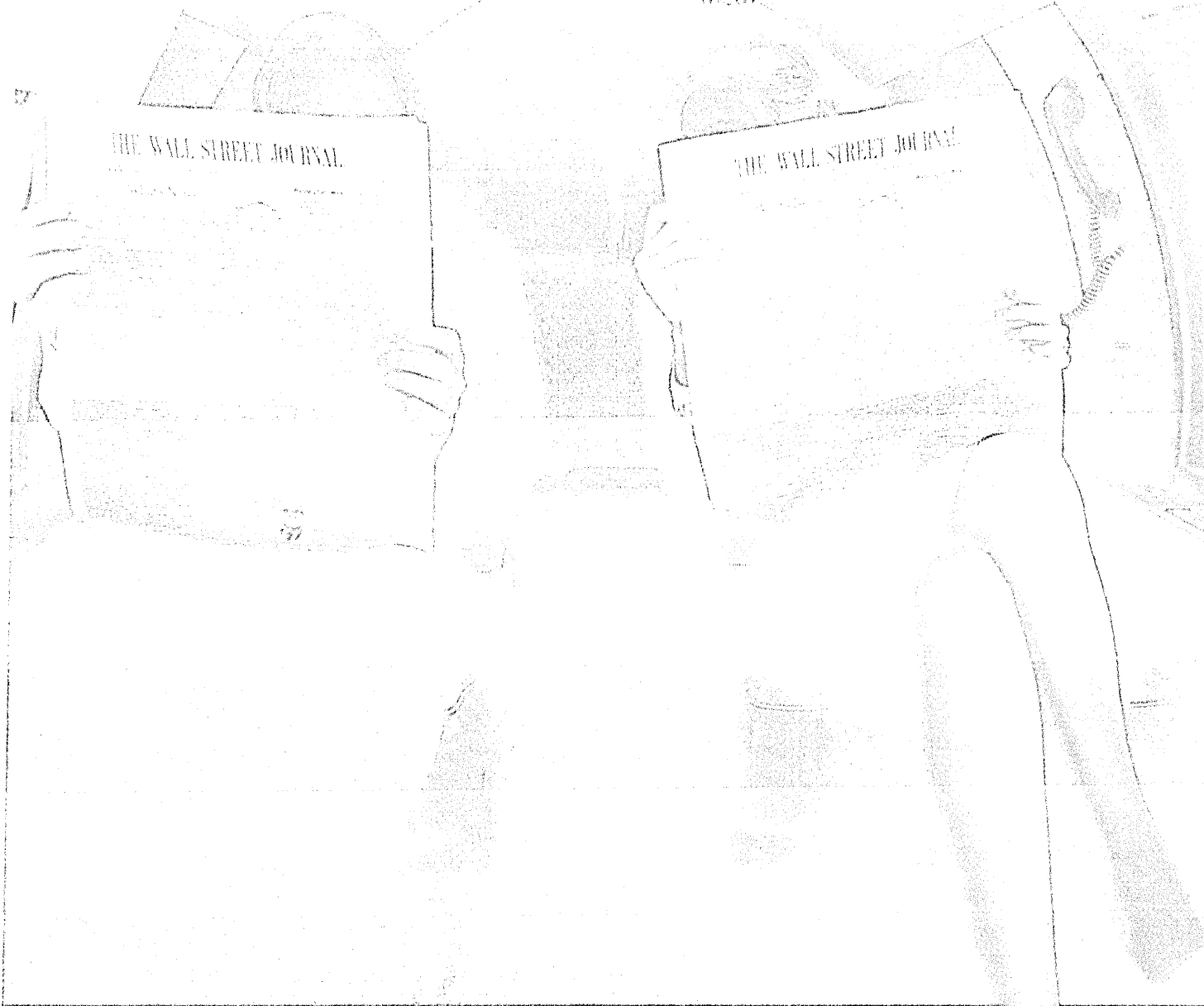
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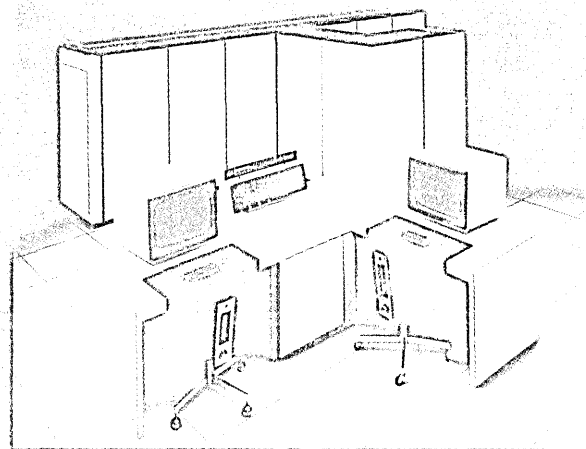


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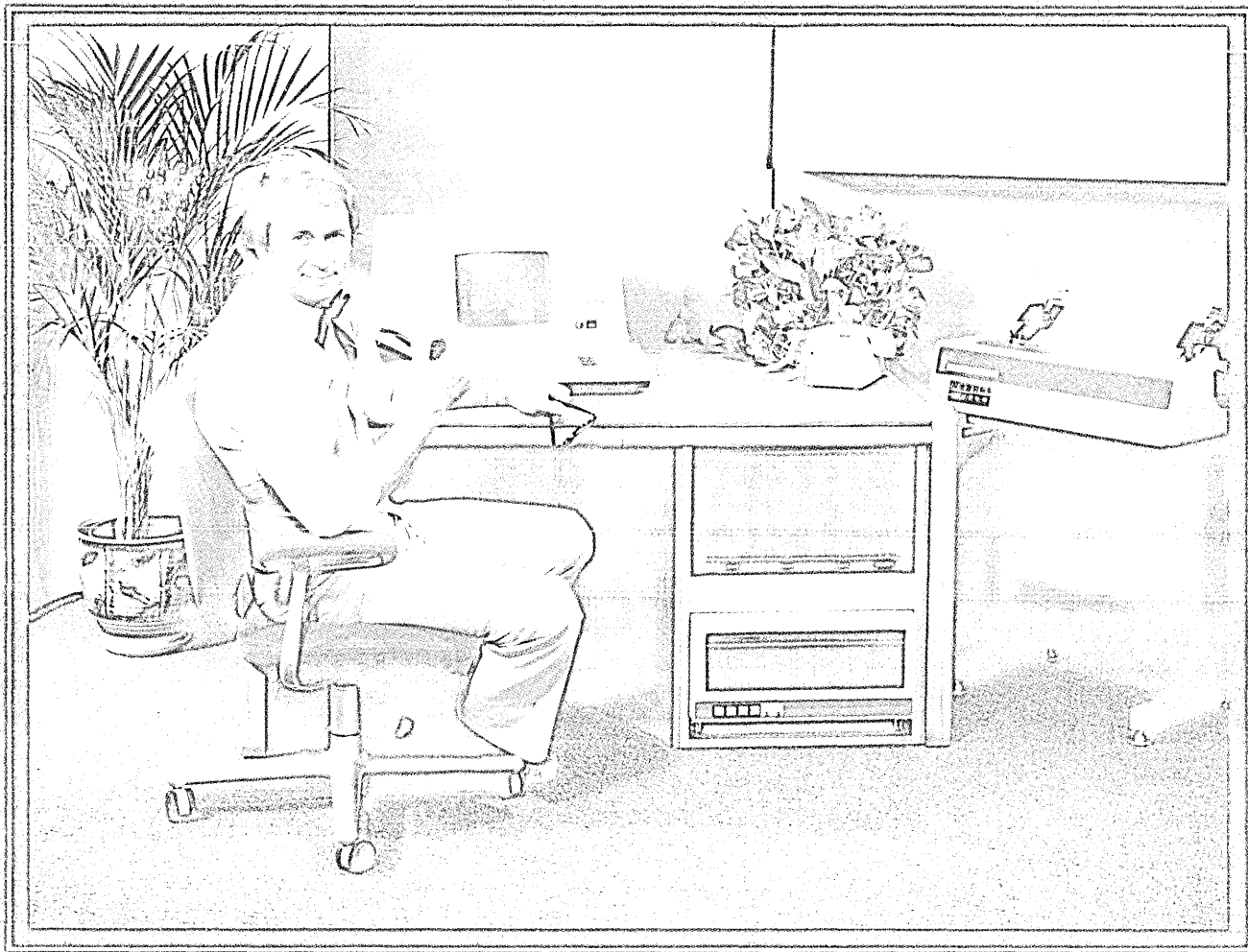
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## NEWS IN PERSPECTIVE



ALLEN MICHELS: "We've exceeded every goal we set for ourselves."

possibility.

"I can understand this talk," said Lindsay, "considering the workstation problems Harris has had, but I think there's only a 40% chance of its coming about. Harris has a lot of resources of its own. If it does happen, I think it'll be just manufacturing rights." Michels said manufacturing rights are a part of the other four arrangements.

Convergent introduced its IWS line of desktop systems in October 1980. The line was designed, said marketing vp Alker, "to use distributed intelligence to push distributed processing. We were ahead of the market and we were right. We were the right people in the right place at the right time."

Designed as oem building blocks, the Convergent hardware and software are totally modular with multiple upgrade paths. A standalone system can be upgraded to local networking without software modifications. Each desktop unit is connected to a mass storage unit or to a high speed cluster data link, or to both. Using a combination of Winchester and floppy disks, mass storage capacity ranges from one to 120 megabytes.

Last month the company introduced its second generation line, the AWS series. "They both have 16-bit processors and 15-inch video displays and they're mounted in the same kind of enclosure and use the same standard software," said Alker. "The differences are in mass storage—the IWS line uses 8-inch technology and the AWS, 5¼-inch—and in how we package the mass storage. In the AWS line it is integrated into the workstation."

Michels said the new computer family was named to "indicate the leading target market—namely application workstations (AWS). While the new computers are multipurpose and as suitable for data-shar-

ing clusters and networks as the IWS line, they are a cost-effective choice for dedicated applications."

What will the four big oems do with the Convergent equipment? Karen Toland, manager of product development with Savin's Information Systems Group, said her company will sell them to their traditional primary target—small to medium-sized businesses. "We'll take the computers into their offices just like we do our copiers."

Savin has been in the word processing market since 1972, and it will employ its word processing salespeople to sell the Convergent equipment. Toland said the company intends to offer a complete business package, but initially will provide only word processing software. "We plan a series of phased product releases over the next two years until we have a complete system."

She doesn't think Savin will be competing with NCR and Burroughs in their use of Convergent equipment. "I think they're aiming at the higher end." And, she said, Savin will be offering something different—a keyboard the company designed itself and which is being produced for it by Convergent. It is designed to make it easy for a first-time user to master and respond to touch commands based on simple English phrases.

NCR was keeping quiet about specific plans early last month pending a Nov. 17

announcement. It did say the agreement with Convergent was part of its plan to enter the office systems marketplace and that Convergent's products with NCR software extensions would be NCR's initial word processing product line.

It is believed that Thomson-CSF intends to use the Convergent equipment in its DAP division for data processing-type applications.

Burroughs is said to be planning to put the Convergent equipment into the small

**"We'll take the computers into their offices just like we do our copiers."**

business systems marketplace with some software to be produced by its new Systems Development Corp. subsidiary.

But, he added, "there is a limit to how fast you can grow." He believes that rather than seeking more large oem commitments, Convergent will be trying to sell manufacturing rights.

The company is beefing up manufacturing capability to meet the orders it has on hand. It has a 45,000 sq. ft. manufacturing plant in Santa Clara; Michels said it will be occupying a second, 75,000 sq. ft., facility there this month and is looking for a third facility.

—Edith Myers

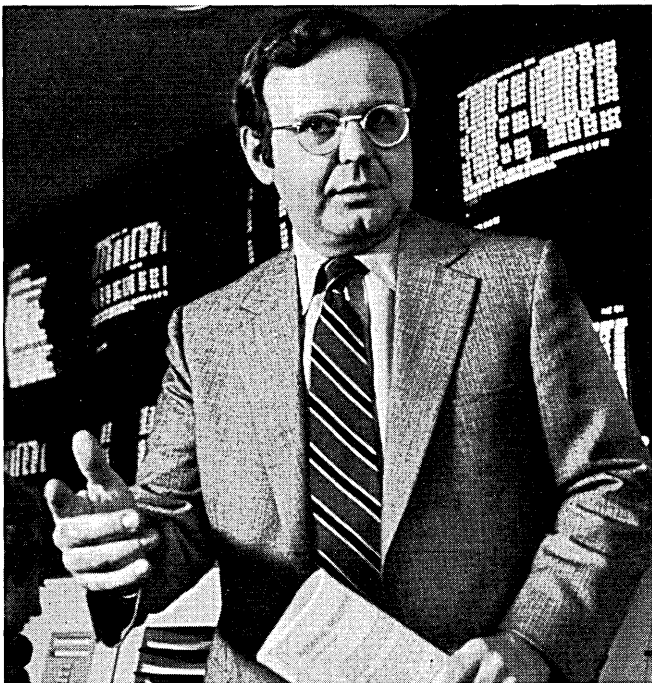
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## NEWS IN PERSPECTIVE

### PERSONAL COMPUTERS

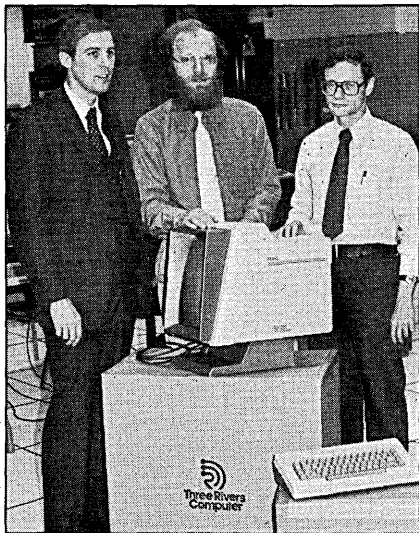
# GROWTH THROUGH PERQS

**Three Rivers' Perq machine is designed to appeal to wealthy users as a dazzling, supercharged personal computer with the power of a mainframe.**

While Apple and Tandy fight it out as the Ford and Chevrolet of the consumer computer market, a small firm in Pittsburgh is gearing up to become the Ferrari. Three Rivers Computers' \$27,000 Perq machine is designed to appeal to wealthy users as a dazzling, supercharged personal computer with the power of a mainframe.

Until recently, Three Rivers led a quiet life in its old brick building located in an obscure hollow of Pittsburgh, down at the end of a cobblestone road. Now, with financing, international distribution deals, and an expansive new manufacturing facility in place, the firm says it is poised for accelerating growth.

The Perq machine has its roots in work done by Brian Rosen, the full-bearded vice president of engineering of Three Rivers. He and four other members of the nearby Carnegie-Mellon University computing community founded the company in 1974 to



PERQ PRIDE: Displaying their pride and joy, the Perq system, are (left to right) Jim Gay, Three Rivers president; Brian Rosen, vp of engineering for Perq; and Howard Wactler, director of research facilities at Carnegie-Mellon University.

design custom graphics systems for large users. Rosen at one point left the company for Xerox, where he worked at the Palo Alto Research Center on the Alto and Star workstations. Rosen took many of Star's concepts, including the high-resolution crt, advanced graphics, and Ethernet compatibility, and put them into Perq upon rejoining Three Rivers after his two-year stint with Xerox.

In 1978 Perq appeared, essentially in the form it is today: a single-user, high-performance computer designed to be an alternative to timesharing. It combines a 1-MIPS processor, a 14-inch hard disk, high-resolution graphics, and up to a megabyte of main memory to provide raw computing power with which oems, systems houses, and researchers are expected to design all sorts of systems, according to Frank Williams, vice president of sales. So far, he notes, 10 oems have been signed up and the sales force has a quota to build that number to 50 by the end of next year.

Thus, Three Rivers plans to leave virtually all applications development to outsiders who have expertise in specific areas. Those applications are expected to be primarily in the scientific/technical arena, although the firm is aware of some business applications under way, according to Williams, a former ITT sales executive. The Perq system has so far found use in universi-

ties and research labs for program development and for processing experimental data. Three Rivers is also working jointly with Norden Systems, the military contracting arm of United Technologies, on a system that will be used to test and diagnose the many electronics systems found on advanced fighter aircraft. The two firms expect to find out by year-end if their bid has won, according to Williams.

Meanwhile, Perqs will be used on the U.S.S. *Carl Vincent*, a new aircraft car-

**The Perq machine has its roots in work done by Brian Rosen, the firm's vp of engineering.**

rier the U.S. Navy plans to launch in February 1982. Some 36 of the computers, linked by an Ethernet cable, will form a procedural control system designed to help the ship's officers manage carrier operations on a real-time basis.

The machine's raw power in running Pascal programs and its graphics capabilities make it somewhat of a "dream machine" with which researchers can design applications that would tie up many resources on a timeshared system. That power comes from a custom-designed microprogrammed 16-bit cpu that runs Pascal p-code in native mode. Three Rivers says the cpu

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## NEWS IN PERSPECTIVE

can execute "in excess of 1 million" p-codes per second, a good 10 to 20 times the speed of conventional interpreted p-code machines. Moreover, the microcoded architecture will enable other high-level languages—FORTRAN, LISP, and others are planned—to be run at such high speeds. The cpu also takes care of many I/O functions in microcode, helping to speed up data transfer and reducing parts counts.

Mass storage comes in the form of a floppy disk and an integral 14-inch Shugart hard disk with up to 30 or so megabytes of capacity. Ethernet connections will be available in the near future, as will a storage module controller for extra disk capacity, according to company officials.

Input to the machine is through a standard keyboard and a graphics tablet. As with Xerox's Star, a free-roaming cursor is used to point at words, icons, or whatever the machine has been programmed to present on its full-page, 100 pixel-per-inch display. The graphics tablet, currently supplied by Summagraphics, may be replaced by a mouse like the one the Star uses, according to Franz I. Mading, national sales support manager. He explained that the display receives bit-mapped data from the cpu at a rate of about 26,000 bits-per-second, enabling the screen image to change quickly for animation, scrolling, and windowing purposes.

It is just that sort of eye-catching graphics that the company hopes will sell its machine. The company has been rushing from trade show to trade show lately, showing off its machine to industries which are rapidly becoming computerized, such as typesetting and medicine.

Three Rivers is counting on the Perq to capture the imaginations of a wide variety of systems designers who will incorporate the system into other, larger products. Already Harris, a leading typesetting firm, has ordered several of the machines, as has Reuben H. Donnelly, the yellow pages advertising agency.

But it is the university research environment that has been most eager to embrace the Three Rivers machine. Carnegie-Mellon, a big computer science research school, has ordered many of the machines. And it was through the university grapevine that ICL, the British computer company, was informed of Perq, according to Three Rivers' president, Jim Gay.

A British consortium of university researchers had heard of Perq and helped persuade the British government, which has been bailing out financially troubled ICL, to get the company to sign a joint venture deal with Three Rivers. The deal covers exclusive international marketing by ICL in many of its markets and a manufacturing license so that ICL can build the machine. The deal is expected to give a much needed boost to sales at Three Rivers and provide it with a source of technology and manufacturing

know-how it will need to maintain the rapid growth it is already experiencing.

United Kingdom production of Perq will begin in Letchworth in early 1982, according to sales chief Williams. He credits Three Rivers chairman Ed Fredkin, an MIT professor known for his sharp entrepreneurial savvy, with locking up the ICL deal in the face of stiff competition from Apollo Computer, the Massachusetts startup. Fredkin has been a key factor in bringing Three Rivers through the past year, which has

### **The university research environment has been the most eager to embrace the Three Rivers machine.**

been one of growth and change for the fledgling firm, says Williams.

Fredkin brought in Gay, a former associate at Information International, a firm Fredkin started in the '60s, and helped negotiate \$5 million in financing from a pair of French investors, one of whom is named Paul LePercq. Currently Fredkin spends only a day or two a week at Three Rivers and teaches robotics at MIT the rest of the time. He embodies the "success spirit" of the company, according to Williams.

The firm's current plans call for the opening of the new 55,000 sq. ft. manufacturing facility, establishment of sales of-

fices in a total of eight U.S. cities, and hustling to trade shows. An in-house service force will also be established, although Three Rivers said it has designed the computer to be basically user-serviceable.

Competition in the workstation marketplace is soon to heat up, according to Gay, who began in the computer industry with Scientific Data Systems. He sees the main competitors as Apollo, Digital Equipment, and Hewlett-Packard, although the latter two have not yet disclosed their plans publicly.

"The world has yet to grasp fully the workstation," says Gay, who claims Xerox's Star is not a strong competitor to Three Rivers' Perq because Star is more an intelligent terminal than a high-performance personal computer.

He notes that the market for such machines as Perq will not open up until prices can be brought down into the \$10,000 range. He hopes to achieve that with Perq through economies of scale—the ICL connection and a potential manufacturing deal with the firm's Japanese distributor, Rikei, will help in that respect—and new technology. Already Three Rivers engineers are looking into VLSI technologies to help bring costs down. A color version of the machine is also being designed, but no introduction date has been set.

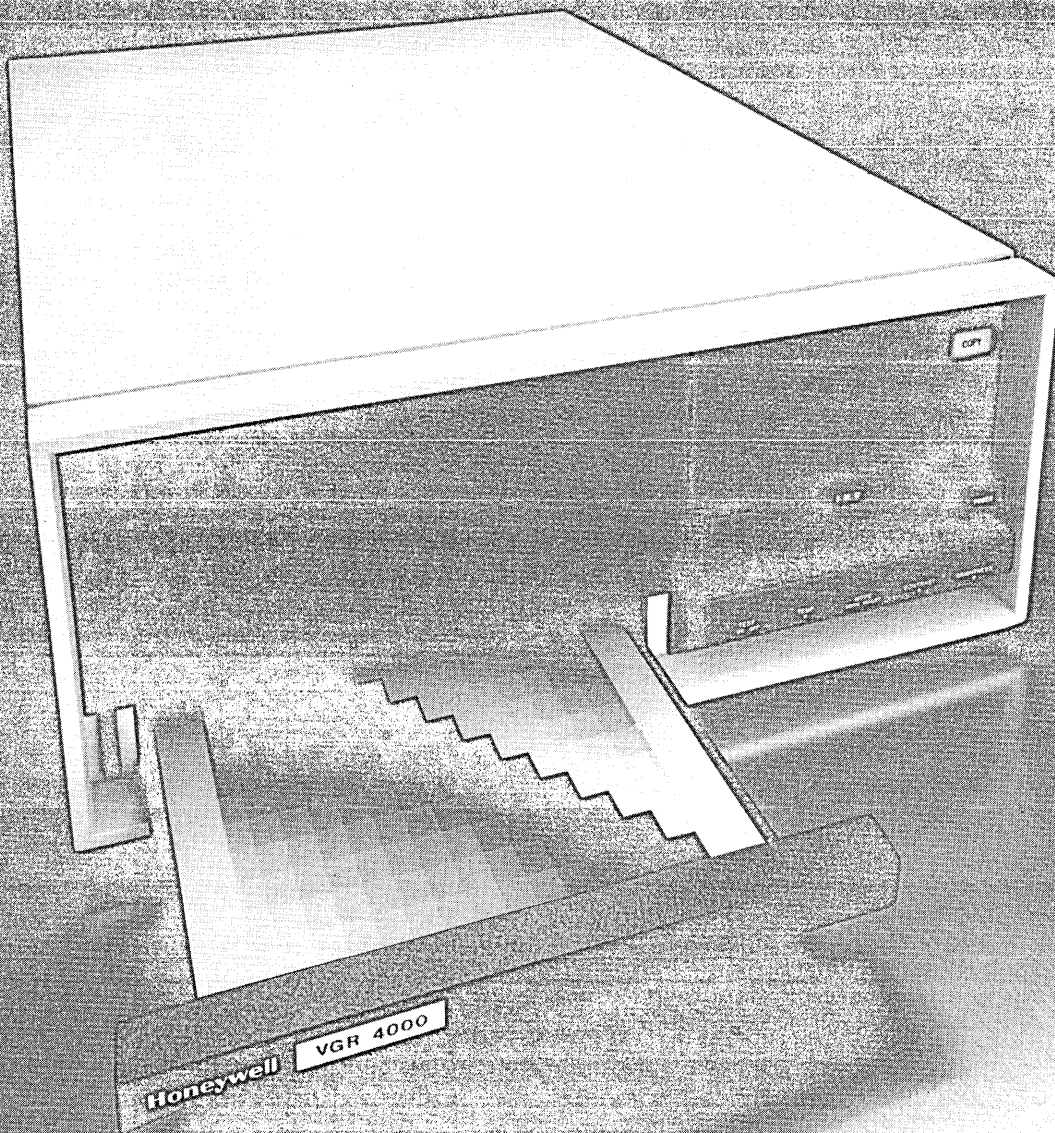
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## NEWS IN PERSPECTIVE

### COMMUNICATIONS

# THE MAD, MOD MUX WORLD

**Timeplex is employing what it calls "the classical strategy in a recession" to boost multiplexor sales.**

When a company has been growing at a startling 70% per year, a drop back to 20% can seem like a slump. That is the problem facing Timeplex Inc., a supplier of multiplexors based in Rochelle Park, N.J.

"The market is still growing, it's just growing a lot more slowly than it was growing a year ago and than it has grown historically," commented Edward Botwinick, Timeplex president and chairman.

But Botwinick is meeting the challenge with a surge of new products and announcements employing the "classical strategy in a recession," as he calls it. "To introduce new products, open new market segments, sell harder, and advertise more. That's almost a textbook strategy. Sometimes it takes a little more fortitude to do it than to talk about it because you suffer a little bit at the beginning, and we're suffering right now."

Even though earnings for the first quarter, which ended in September, were

**Trying to build a sales capability while absorbing an escalating growth rate has strained Timeplex resources.**

down, Botwinick says, "our people are very optimistic." He concedes that "conventional wisdom says data communications is immune from economic cycles. I think the industry is big enough now that it's no longer completely immune."

The problems at Timeplex, however, are not due only to a recession. When it started up in the early 1970s, Timeplex multiplexors were sold by Rocal-Milgo sales reps. In those days, modem-maker Milgo found that the multiplexor complimented its dataset sales to large network users. But when Rocal, the British electronics company, took over Milgo, the Timeplex marketing arrangement fell by the wayside.

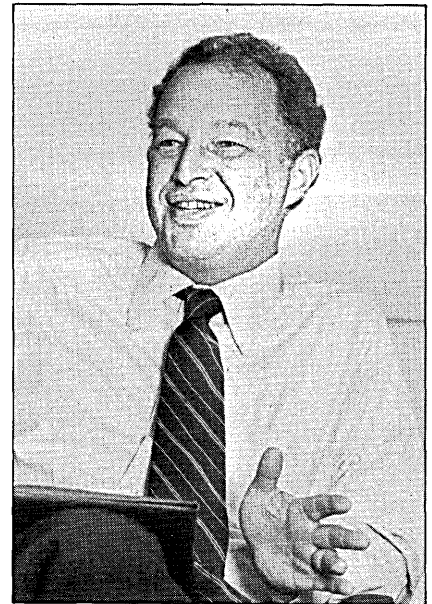
Although the falling out with Rocal-Milgo is the subject of court litigation, in real terms it has forced Timeplex to develop its own sales capability—something it has never had to do before. So, trying to build a sales capability while absorbing an escalating growth rate has strained Timeplex re-

sources at a time when talk of recession is making users postpone—though not cancel—many orders.

"If there's no real economic disaster, we should start to see increased business in the second half at a higher growth rate," Botwinick said, referring to the fiscal period which begins in January 1982.

Even with softer sales, Timeplex has offered some innovative products in recent months. A key feature of the firm's Microplexer line has been the diagnostic capabilities of its Supervisory Port. In August, the Supervisory Port became the focal point of a remote dial-up diagnostic service that allows Timeplex specialists at a company control center to isolate faults, often without interfering with a user's normal network operations. The 24-hour remote service has helped to reduce field maintenance calls, according to Victoria A. Brown, vice president of sales. More importantly, she adds, it has helped to keep user network down time to a minimum.

Brown feels that the multiplexor provides diagnostic features that are superior to modem-based control centers. She sees the statistical multiplexor of today evolving into a network communications processor of tomorrow that will take over many of the functions of the front-end machines now operating in large private line networks. Within the next five years, the



EDWARD BOTWINICK: "I think the industry is big enough now that it's no longer completely immune [from economic cycles]."

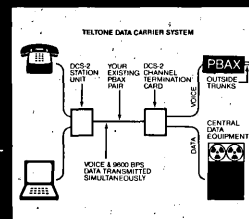
statistical multiplexor will include specialized firmware developed by the vendor that will do specific teleprocessing applications, she predicts.

Although large network users have

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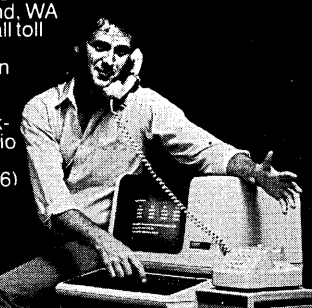
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## NEWS IN PERSPECTIVE



VICTORIA A. BROWN: She predicts that within the next five years, the statistical multiplexor will include specialized firmware developed by the vendor that will do specific teleprocessing applications.

been the traditional buyers of multiplexors, minicomputer users with smaller asynchronous terminal networks are the targets for Timeplex's recently introduced low-end device. These lower-priced units cost about \$1,650 in a four-channel configuration and will be sold through electronic distributors instead of through direct sales. This lower-tier market will grow at 50% per year compared to a somewhat smaller 40% for the high-end private line models, Brown says.

The company has also introduced a network management product called Alpha Star, which uses the Supervisory Port to monitor line problems under microprocessor control. Additionally, it has started producing a line of intelligent modems for private network users at a new location in Florida. And back in New Jersey, the firm has broken ground for a new company headquarters facility in Woodcliff Lake.

Although the multiplexor market is small in number of suppliers, a recent study by International Data Corp., a market research firm, gives Timeplex a 1980 sales level of \$10 million in time division multiplexors (TDMs), earning the company a first place 36% share of the market. In the lower tier, Timeplex is second only to Micom, but even here the company has 38% of the market with 1980 sales of \$17 million, according to IDC.

One of the ways Timeplex has absorbed its quick growth is through increased application of automated manufacturing techniques, according to Brown. She credits automated test equipment and similar computerized manufacturing systems with helping the company to cope with a serious shortage of skilled people. Engineers, how-

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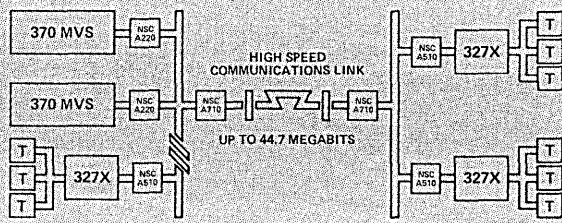


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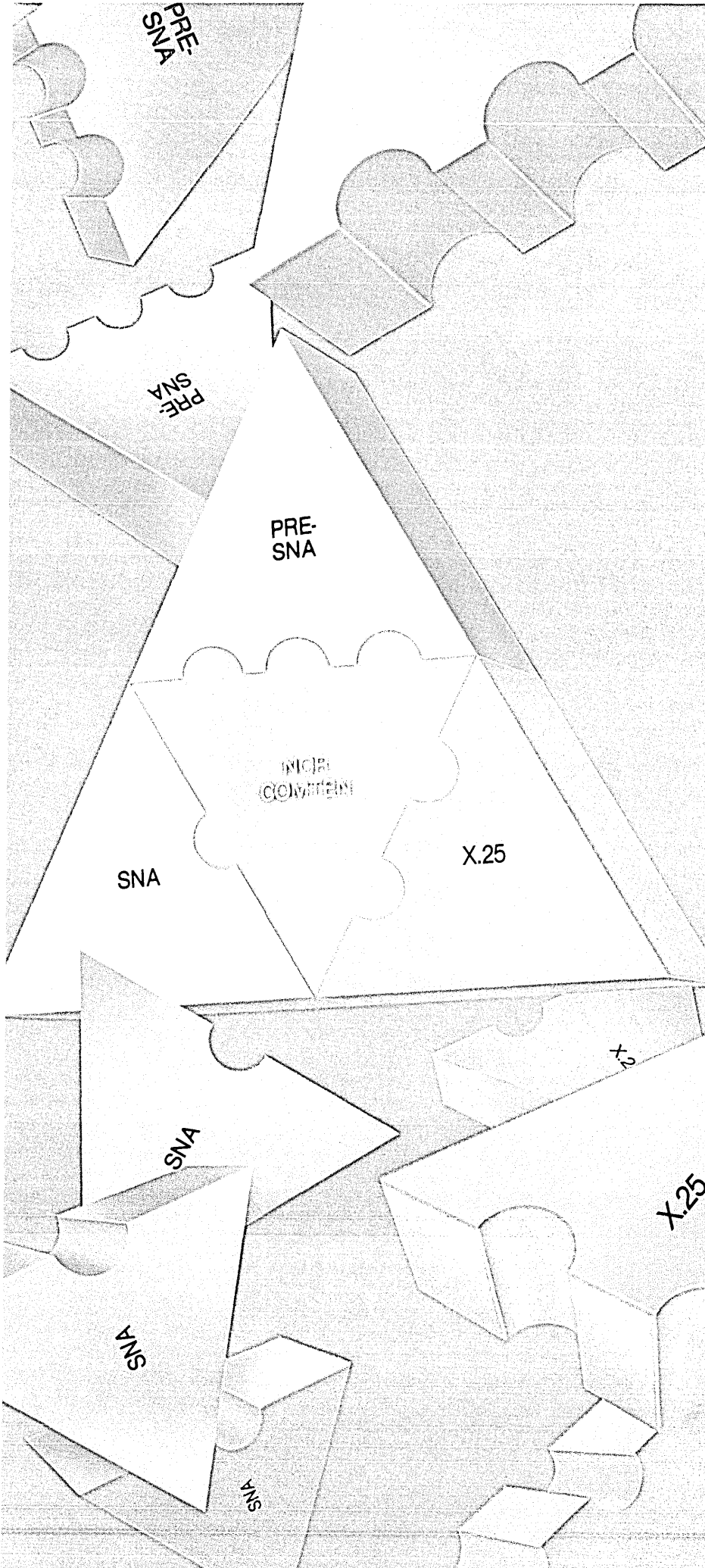
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The system architecture of the CompuStar is based on four types of video display terminals, each of which can be connected into an auxiliary hard disk storage system. Up to 255 terminals can be connected into a single network! Each terminal (called a Video Processing Unit) contains its own microprocessor and 64K of dynamic RAM. The result? Lightning fast program execution! Even when all users are on-line performing different tasks! A special "multiplexor" in the CompuStar Disk Storage System ties all external users together to "share" the system's disk resources. So, no single user ever need wait on another. An exciting concept . . . with some awesome application possibilities!

CompuStar™ user stations can be configured in almost as many ways as you can imagine. The wide variety of terminals offered gives you the flexibility and versatility you've always wanted (but never had) in a multi-user system. The CompuStar Model 10 is a programmable, intelligent terminal with 64K of RAM. It's a real workhorse if your requirement is a data entry

or inquiry/response application. And if your terminal needs are more sophisticated, select either the CompuStar Model 20, 30 or 40. Each can be used as either a stand-alone workstation or tied into a multi-user network. The Model 20 incorporates all of the features of the Model 10 with the addition of two, double-density mini-floppies built right in. And it boasts over 350,000 bytes of local, off-line user storage. The Model 30 also features a dual drive system but offers over 700,000 bytes of disk storage. And, the Model 40 boasts nearly 1½ million bytes of dual disk storage. But no matter which model you select, you'll enjoy unparalleled versatility in configuring your multi-user network.

Add as many terminals as you like - at prices starting at less than \$2500. Now that's truly incredible!

No matter what your application, the CompuStar can handle it! Three disk storage options are available. A tabletop 10 megabyte 8" winchester-type drive complete with power supply and our special controller and multiplexor costs just \$4995. Or, if your disk storage needs are more demanding, select either a 32 or 96 megabyte Control Data CMD drive with a 16 megabyte removable, top loading cartridge. Plus, there's no fuss in getting a CompuStar system up and running. Just plug in a Video Processing Unit and you're ready to go . . . with up to 254 more terminals in the network by simply connecting them together in a "daisy-chain" fashion. CompuStar's special parallel interface allows for system cable lengths of up to one mile . . . with data transfer rates of 1.6 million BPS!

Software costs are low, too.

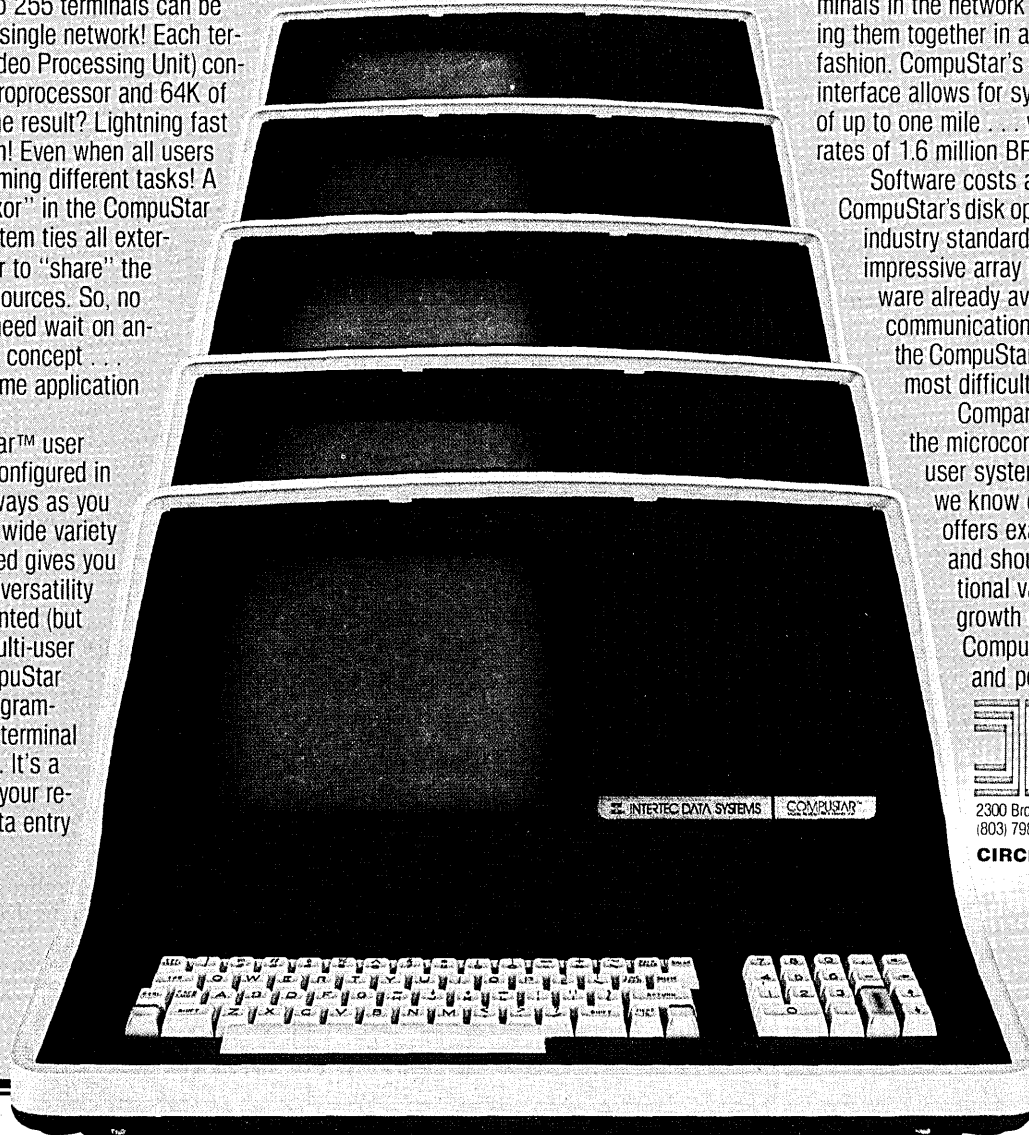
CompuStar's disk operating system is the industry standard CP/M\*. With an impressive array of application software already available and several communication packages offered, the CompuStar can tackle even your most difficult programming tasks.

Compare for yourself. Of all the microcomputer-based multi-user systems available today, we know of only one which offers exactly what you need and should expect. Exceptional value and upward growth capability. The CompuStar™. A true price and performance leader!

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## NEWS IN PERSPECTIVE

ever, are still scarce commodities that can't be replaced by machines, she notes, and Timeplex participates in summer work-study programs with nearby Stevens Institute to help find promising engineers.

Botwinick says the major competitor of Timeplex is Codex. "I would say they are clearly the target we are shooting at in this business. They have multiplexors and they are very strong in the modem business. Our disadvantage is that they have a much stronger and broader sales and service organization, and we're bootstrapping to get there. Our advantage," he claims, "is that

our multiplexors are technologically superior to theirs.

"For the last decade, the high-speed modem has been the gating technology in any data communications network. That's changing. The statistical multiplexor is becoming the gating item because that's where all of the performance and feature differentials exist," he says. Clearly, Botwinick sees users relying more and more on multiplexors in the future. And when this happens, he feels, they will rely more on Timeplex for their equipment.

—Ronald A. Frank

## LEGISLATION

# TELECOM REPORT RELEASED

**With report in hand, the House is now ready to move on its rewrite of the Communications Act.**

To regulate or not to regulate, that is the question. After 10 months of exhaustive investigation and 700 pages of evidence, the majority staff of the House Subcommittee on Telecommunications, Consumer Protection and Finance believes it has the answer.

"The debate is now between those who feel that it is government regulation which stands in the way of a fully competitive marketplace, and those who believe that a combination of deregulation and some active regulatory involvement is necessary to make the transition from essentially non-competitive markets to fully competitive ones while continuing to protect the public," the staff wrote in "Telecommunications in Transition: The Status of Competition in the Telecommunications Industry."

"In general, we believe that effective competition allocates society's resources in a manner preferable to the result arrived at under regulation," the report said.

"Under today's market conditions, across-the-board deregulation does not equal increased competition. Indeed, in many instances only careful transitional rules will permit realization of the fully competitive environment that we believe should be Congress' policy objective."

The massive document, if not the first of its kind surely the most comprehensive, had been anxiously awaited since Congress opened for business last January. While the Senate followed Commerce Committee chairman Bob Packwood's (R-Ore.) exhortations and swiftly passed a rewrite of the Communications Act of 1934, the House subcommittee sought to rectify "an absence of quantified information regarding actual competition in the various telecommunications markets and a lack of either theoretical or practical thinking as to when a market which had heretofore been a regulated monopoly or oligopoly was sufficiently competitive to be deregulated."

Numerous hearings, in and out of Washington, were held with witnesses testifying on subjects from the theory and history of telecommunications regulation to the needs of users of common carrier products and systems. Representatives from govern-

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The HAL PS3900 Printer Controller System allows you to remote a mainframe printer to any location reachable by telephone, without changing mainframe software. The printer functions as if it were at the mainframe site.

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**Components.** The system consists of a PS3900 A unit which connects to the mainframe and a PS3900 D unit used at the remote site to interface the printer. The PS3900 D unit is designed to plug into the Printronics P300 line printer.

**Interface.** The PS3900 system is compatible with HP "Universal Differential," Centronics, and Data Products printer interfaces. The PS3900 A and D controllers connect to modems on both ends of the phone link.

**Print Features.** The system operates at more than 300 LPM and is fully error-corrected for transmission errors. It is capable of handling bar code printing as well as normal, elongated, and small and large block characters.

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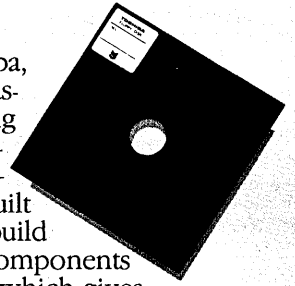
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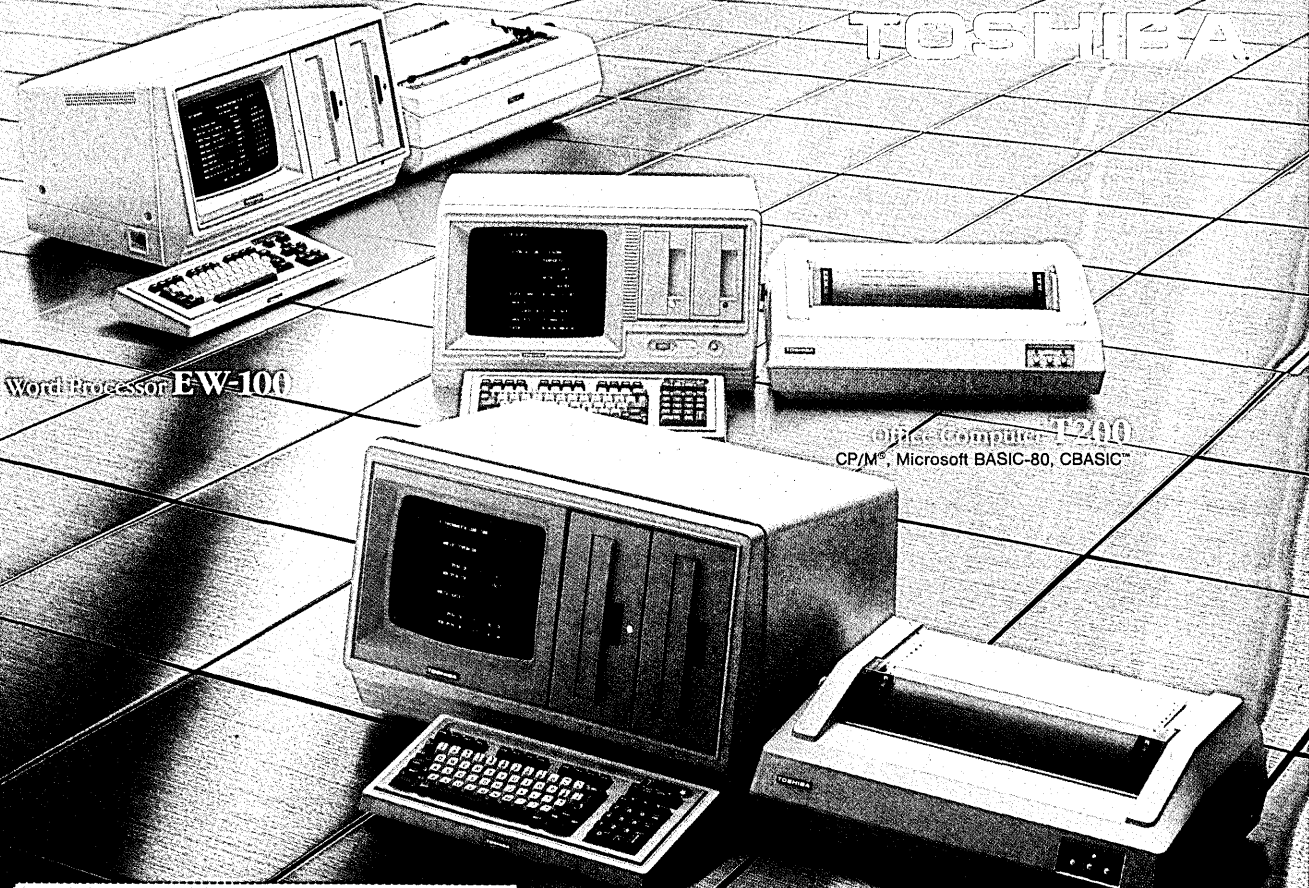
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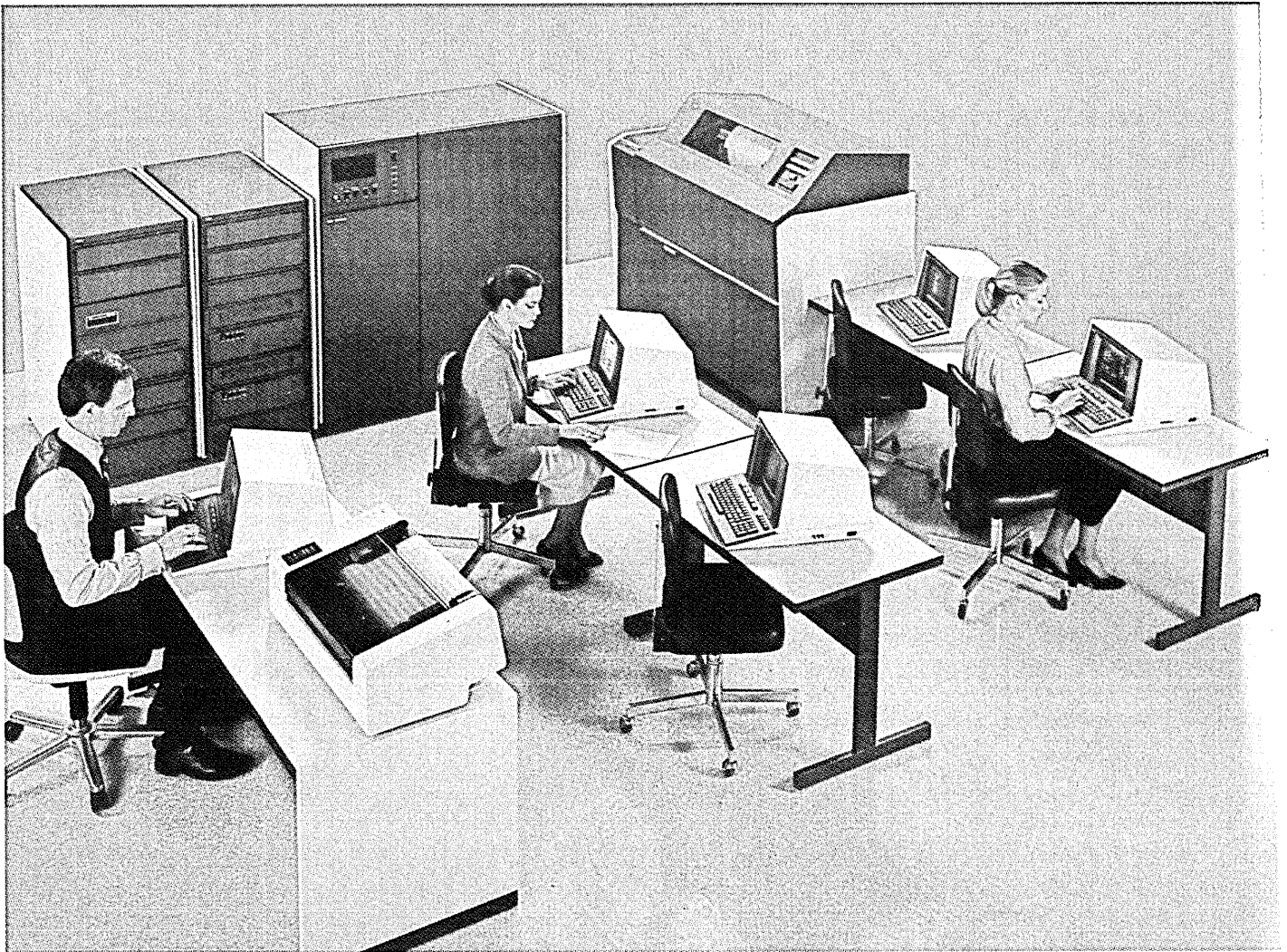
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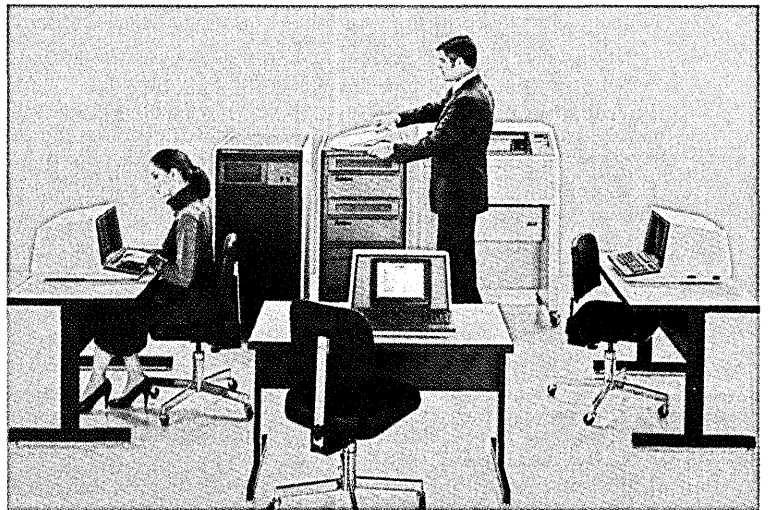
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I-9010



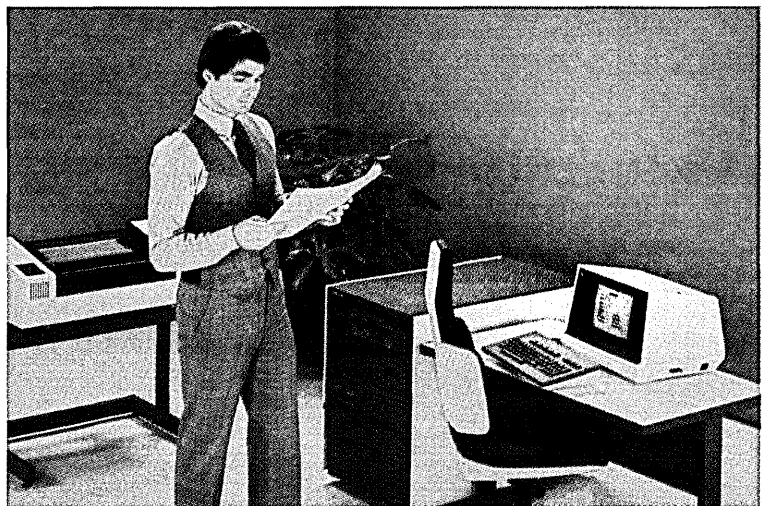
I-9040

**The new I-9050** 32-bit mainframe uses NCR's powerful Interactive Resource Executive operating software and provides up to three megabytes of memory. It increases NCR's interactive power spectrum 2.6 times.

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**The I-9010** table-top 8-bit micro-oriented system offers advanced ergonomic design, multi-language support and communications capability. It is easy to operate and understand.



I-9020

## NEWS IN PERSPECTIVE

ment, industry, academia, and the public concurrently were invited to submit quantified market data. All did so, some more willingly than others. "Most of the relevant companies were remarkably unforthcoming in producing data by product line or submarket" in the equipment area, according to the report. Data on local distribution and services and long distance were considerably easier to obtain.

"We were determined to turn the equation from the provider to the user perspective," subcommittee chairman Tim Wirth (D-Colo.) said. "I don't believe any

group can say their view has not been heard by this subcommittee."

One involved party was far less charitable. "It doesn't appear to be any-

### AT&T says, "All you have to do is pick up the newspaper to see there's competition."

thing new, just a rehash of material that's been around for a long time," an AT&T spokesman said. "If it took the staff 700 pages to look around, there must be a lot of competition. If there's no competition they

could have said it in one sentence."

They did, albeit in several pages. The report reaffirmed the basic fact of telephone life—AT&T is president, chief executive officer, and chairman of the board in long distance and local distribution.

"AT&T controls the transmission of long distance telecommunications; in no community has the local telephone company's hold on local distribution been challenged," the report noted. "Under these circumstances, rapid deregulation will simply enable today's dominant firms to exploit their monopoly or oligopoly power, dashing chances of competition in the not-too-distant future. Deregulation delayed need not be competition denied, but deregulation where markets are not yet competitive will surely impose severe and unnecessary costs on consumers."

"All you have to do is pick up the newspaper to see there's competition," the Bell spokesman countered. "There are a number of very large and astute business organizations which have already jumped into the telecommunications pond. It's totally implausible they would have done so without undertaking market research to determine whether there's competition."

As part of its three-tiered approach—standards of when to regulate and deregulate, definition of markets, and quantified measurements of the amount of competition in those markets—the staff analyzed the performance of the Federal Communications Commission. The agency came up as short as it had in a General Accounting Office report released in September.

"Past FCC [telecommunications services] regulation often hindered—instead of promoted—competition, and although the present commission publicly champions an era of 'unregulation' and reliance on private marketplace focus, its actions appear to reject some recent policies intended to promote competition in the audio and video media. This inconsistent relationship between regulation and competition has led to uncertainty in the offering of new telecommunications services."

The idea now, of course, is to drastically reduce that uncertainty. The Senate has attempted the trick in S. 898, a measure regarded as much more favorable to Bell than to its legion of opponents and competitors. The House is set to begin the task, as Wirth expected a bill to be reported out of his subcommittee late last month. That will give the members a chance to digest it from December through February. Markup by the full House Commerce Committee is scheduled for March, and a June conference with the Senate to reconcile what are expected to be major differences is planned.

"The Senate bill is a deregulation bill," Wirth said. "I think there is very broad support and a strong consensus in the House that its bill be procompetitive."

—Willie Schatz

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Most of all, it gives you maximum up-time, because it helps you keep your computer-room environment exactly where you want it to be.

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The Dynamonitor II's LED display gives you a reading of room temperature and relative humidity. If anything goes wrong—fire, smoke, water under the floor, or fault conditions within the system—Dynamonitor II recognizes the situation, alerts you instantly, and makes a note in its own memory.

### Add Datalogger

Datalogger writes it all down, either on the built-in printer or on your own printer which can also indicate corrective action to be taken.

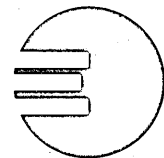
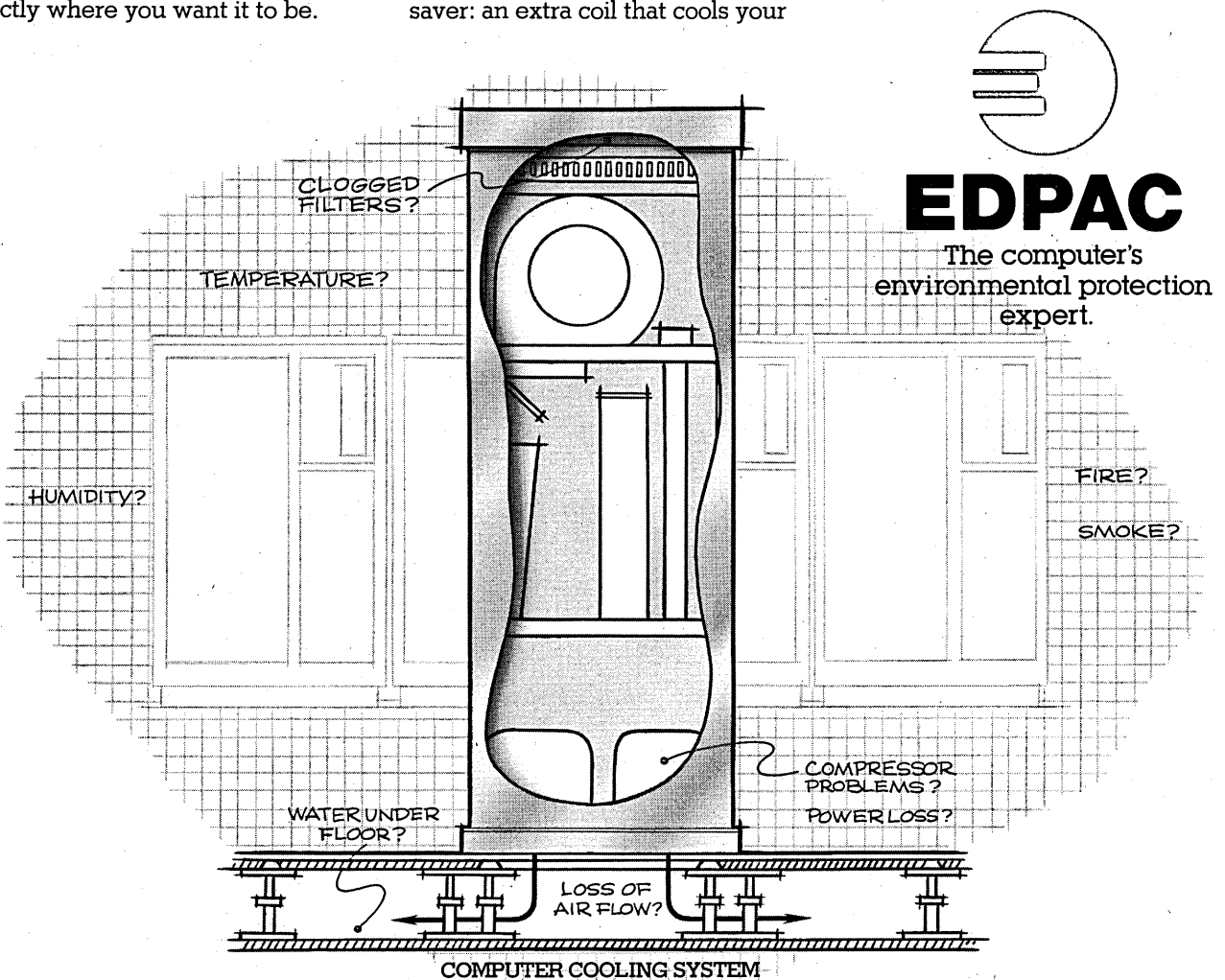
### Add ECX\*

ECX is itself an excellent energy-saver: an extra coil that cools your

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Put the three options together (which we heartily recommend) and you get the full benefits of full time diagnostics, alarm, memory and recording—in a package that more than pays for itself in energy savings. See for yourself. Use the reader service card, or call. AC Manufacturing Company, Cherry Hill, NJ 08034. Phone (609) 426-9600.

\*ECX energy saver can be added to existing equipment or included with new machines.



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## NEWS IN PERSPECTIVE

### POWER SYSTEMS

# DON'T GET BURNED BY BROWNOUT

**A number of power conditioning alternatives are available to protect computer users against power glitches.**

"We're looking at a brownout. Power is fast becoming a premium all across the country."

Bill Jump, data processing manager for Old National Bank, Spokane, Wash., was citing one of the reasons his bank installed last July a motor generator to protect its 370/158 from power glitches.

"We get a lot of lightening up here, thunderstorms," said Jump. "Loggers knock down lines, and by the time a substation feeds us another line we have 20 cycles of complete outage. It only takes five cycles of complete outage to take a 158 down."

Jump said the bank did a careful cost-benefit analysis before purchasing the

motor generator for \$65,000. They considered an uninterruptible power supply (UPS) which would have cost \$100,000, not to mention the costs for an additional special room and more air conditioning.

"We figured the motor generator could handle a high enough volume of the types of outages we experience without the need for the complete redundancy of a UPS." He said there have been "10 instances since mid-July when we felt we would have been down if it had not been for the motor generator."

There was one time in early November when they did go down. Lightening had struck a transformer, cutting out one phase of electricity (three phases are needed to operate a motor generator). But, said Jump, "no circuit breaker in the computer flipped. When the power came up, we started processing again. We were protected from burnout of components. We feel the motor generator will handle 90% of our power problems well."

Steve Patrick of Airmotive, Inc., Burbank, Calif., runs a Data General C350. "Burbank power is the worst in the world. They're always changing generators. We were always being knocked off-line, having databases destroyed."

When Airmotive occupied a new computer center three months ago, a motor generator was moved in with the rest of the

equipment. "We have experienced three generator changes and one thunderstorm with no problems," said Patrick.

A number of power conditioning alternatives are available to protect data processing installations against the increasing incidence of transients, voltage sags/surges, brownouts, momentary outages, and blackouts. In addition to motor generators and UPS, there are transformers and power distribution systems that lock into a building's power system and isolate the computer center from variations caused by other users.

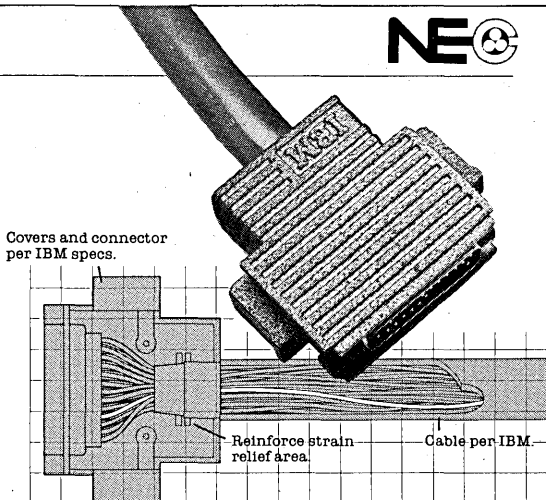
Old National Bank and Airmotive purchased their motor generators from Computer Power Products, Los Angeles. Richard N. Bowyer, vice president, said he

**"The problems you can't see do more damage than those you do."**

spends more time selling the concept of protection than his product.

He is quick to point out that he doesn't sell against uninterruptible power supplies. "For critical installations that can't afford to be down for long periods, UPS is the thing. What we sell is the ability to ride through flickers and momentary outages. The problems you can't see do more damage than those you do."

CPP's machines are in the 60 hertz



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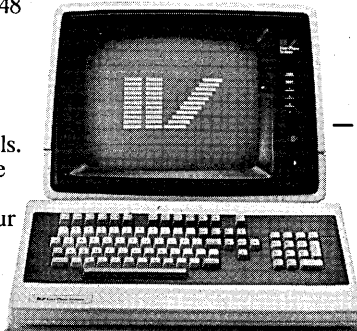
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## NEWS IN PERSPECTIVE

range and are for high-end minis and low-end mainframes. "For big machines like the Amdahls, IBM 303Xs, and the Crays, you need 415 hertz—and that's a different ball game. There, motor generators are mandatory. You can't start the computer without one. They're usually part of the cpu."

CPP was organized in mid-1980 as the Computer Products Div. of Sweinhart Electric Co., a 52-year-old producer of motor generators. For some 10 years prior to the division's creation, the company had been selling motor generators for use in computer installations, but it didn't target that market.

Bowyer, who joined to head up the division, had spent the preceding five years at Jet Propulsion Laboratory. "I was honcho for 70 computer systems, responsible for power and backup."

CPP is still a part of Sweinhart, but it has become something of a tail that wags the dog. Bowyer said in the fiscal year ended Sept. 30, CPP accounted for more than 50% of Sweinhart's total business. He expects this to rise to 70% to 80% soon. "We're turning the company completely around."

In October, they received Underwriters Laboratory (UL) approval for their entire product line, he said. This culminated a year's worth of work. "It was a major task and a major accomplishment," said Bowyer. "There are certain cities you can't



RICHARD N. BOWYER: "What we sell is the ability to ride through flickers and momentary outages."

sell into without UL approval. Chicago is probably the worst. San Francisco is tough, as are Seattle, Portland and Tacoma. In any city, UL approval takes away a lot of hassle. In the next two to three years, I don't think anybody will be able to sell power products without UL approval."

Bowyer said CPP has some 600 ma-

chines installed with about 5% of these in non-U.S. sites, including one in a remote location in Brazil.

A motor generator has been described as a quiet, clean, efficient, all-electric power laundry which should not be confused with diesel or natural gas engine-powered equipment. Typically, it is an electric motor powering an electric generator creating a mini-utility dedicated to supplying the computer with clean, continuous power. Compared to a transformer, the motor generator can tolerate a much wider range of poor power inputs while maintaining a more precisely regulated output.

With the present and projected rapid deterioration of commercial power, Bowyer said, minimal computer protection will require the installation of both an isolation transformer and a voltage-regulating transformer. For computers in the \$400,000 and up price class, the cost of a two-transformer combination is more than half the cost of a motor generator. However, said Bowyer, "the motor generator offers at least 100% to 200% more power protection. In addition, the motor generator provides absolute assurance that undetected power problems cannot get through to the computer, and thereby eliminates poor power as a potential excuse or alibi when the computer manufacturer's field service people cannot diagnose computer malfunctions."

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LA34 DECwriter IV	995	95	53	36
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LA120 DECwriter III RO	2,095	200	112	75
VT100 CRT DECscope	1,895	182	90	61
VT101 CRT DECscope	1,195	115	67	43
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T1 Insight 10 Terminal	695	67	37	25
T1785 Portable KSR, 120 CPS.	2,395	230	128	86
T1787 Portable KSR, 120 CPS	2,845	273	152	102
T1810 RO Printer	1,695	162	90	61
T1820 KSR Printer	2,195	211	117	80
<b>LEAR SIEGLER</b>				
ADM3A CRT Terminal	595	57	34	22
ADM5 CRT Terminal	645	62	36	24
ADM32 CRT Terminal	1,165	112	65	42
ADM42 CRT Terminal	1,995	190	106	72
<b>DATAMEDIA</b>				
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DT80/3 CRT Terminal	1,295	125	70	48
DT80/5L APL 15" CRT	2,295	220	122	83
<b>TELEVIDEO</b>				
920 CRT Terminal	895	86	48	32
950 CRT Terminal	1,075	103	57	39
<b>NEC SPINWRITER</b>				
Letter Quality, 7715 RO	2,895	278	154	104
Letter Quality, 7725 KSR	3,295	316	175	119
<b>GENERAL ELECTRIC</b>				
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2120 KSR Printer 120 CPS	2,195	211	117	80
<b>HAZELTINE</b>				
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Executive 80/30	1,695	162	90	61
<b>EPSON</b>				
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#### MYTH #1

*The 3-year development backlog found at most installations can only be reduced by a massive infusion of new resources.*

#### FACT

A recent survey shows that RAMIS II systems are implemented in less than 1/5 the time it takes using COBOL, FORTRAN, or PL/1—and the RAMIS II systems typically use no more resources than the average COBOL program to do the same work.

#### MYTH #2

*80% of programming resources are taken up by maintenance work and there's no way to reduce this figure.*

#### FACT

Because RAMIS II commands are precise, concise and clear, users

report that maintainance is 50% less with RAMIS II than without—even though RAMIS II systems are modified more frequently because they are easier to update.

#### MYTH #3

*It takes anywhere from 6 months to 3 years to integrate a new software product into an organization.*

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## NEWS IN PERSPECTIVE

Bowyer concedes that transformer-like devices are probably the best solution for very small systems. A company that has such a device, Marway Products Inc., Santa Ana, Calif., describes its MPD 117 power controller as "a high performance controller that plugs into any ordinary wall socket, transforming sporadic electricity flow into steady, smooth, and noise-free power to up to eight electronic devices."

When writer and account executive Dan Hunt moved his word processing system into new offices in an Orange County commercial complex, it gave him problems until he plugged all of its components into an MPD 117.

"I'd been using my system at my home in a quiet suburban area for nearly a year without much trouble at all," he said. "But when I moved into this heavy commercial/industrial area near the airport, the troubles began."

An energy-aware dp community has still another choice to make—power conditioning. Bowyer said his systems can be used in conjunction with the power distribution systems made by such firms as Computer Power Systems, Data Processing Power, Emergency Power Engineering Inc., and The Leibert Corp. But many users of these systems find the conditioning that CCP systems afford to be sufficient.

And motor generators themselves

can go down. Xerox Computer Services in El Segundo was out of commission for more than four hours in late October because theirs did die.

Then there was the CPP customer who didn't want to talk about his generator. "We turned it off," said Ken Dreger of Westlands Bank in Santa Ana, Calif. "It was consuming too much power."

In any decision, there are tradeoffs to be considered.

—Edith Myers

## DISTRIBUTION CHANNELS

# THE WAY OF THE FUTURE

**TRW-Fujitsu joins the throng seeking independent sales organizations.**

TRW-Fujitsu Co., which has been moving ahead slowly since its formation in May 1980, is looking to independent sales organizations (ISOs) to speed up its growth.

"The way of the future is ISOs," said TRW-Fujitsu's vice president of marketing, Jack Anderson, "primarily because of the cost of sales."

Even IBM seems to agree. Big Blue has signed on seven distributors for its 3101 ASCII terminals and a new 3232 keyboard printer. Its first distributor meeting was held Nov. 9 in Boca Raton, Fla. "The smallest sales meeting for the biggest manufacturer," quipped Dennis Jay Cagan, vice chairman of the David Jamison Carlyle Corp., Los Angeles, one of the seven.

Most of the distributors look forward to handling more IBM products. The new Personal Computer is expected to be released to distributors within six months. Cagan said his company already has delivered IBM Personal Computers to its customers, "but we didn't get them from IBM. We got them from Computerland like everybody else." DJC, he said, added software and database management systems.

In late October, IBM placed advertising that listed its seven distributors with their phone numbers. "It's an unbelievable turn of events," said Cagan.

He believes IBM eventually will sell through distributors everything it offers that is smaller and less expensive than the 4331 computer. He said the idea of using distributors "has been rattling around IBM for six years." It started, he said, with a 1975 re-

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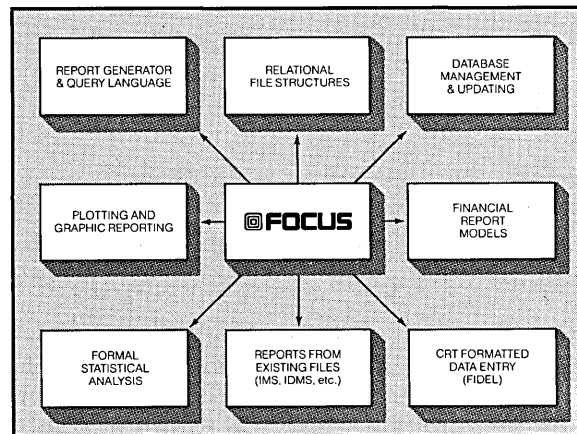
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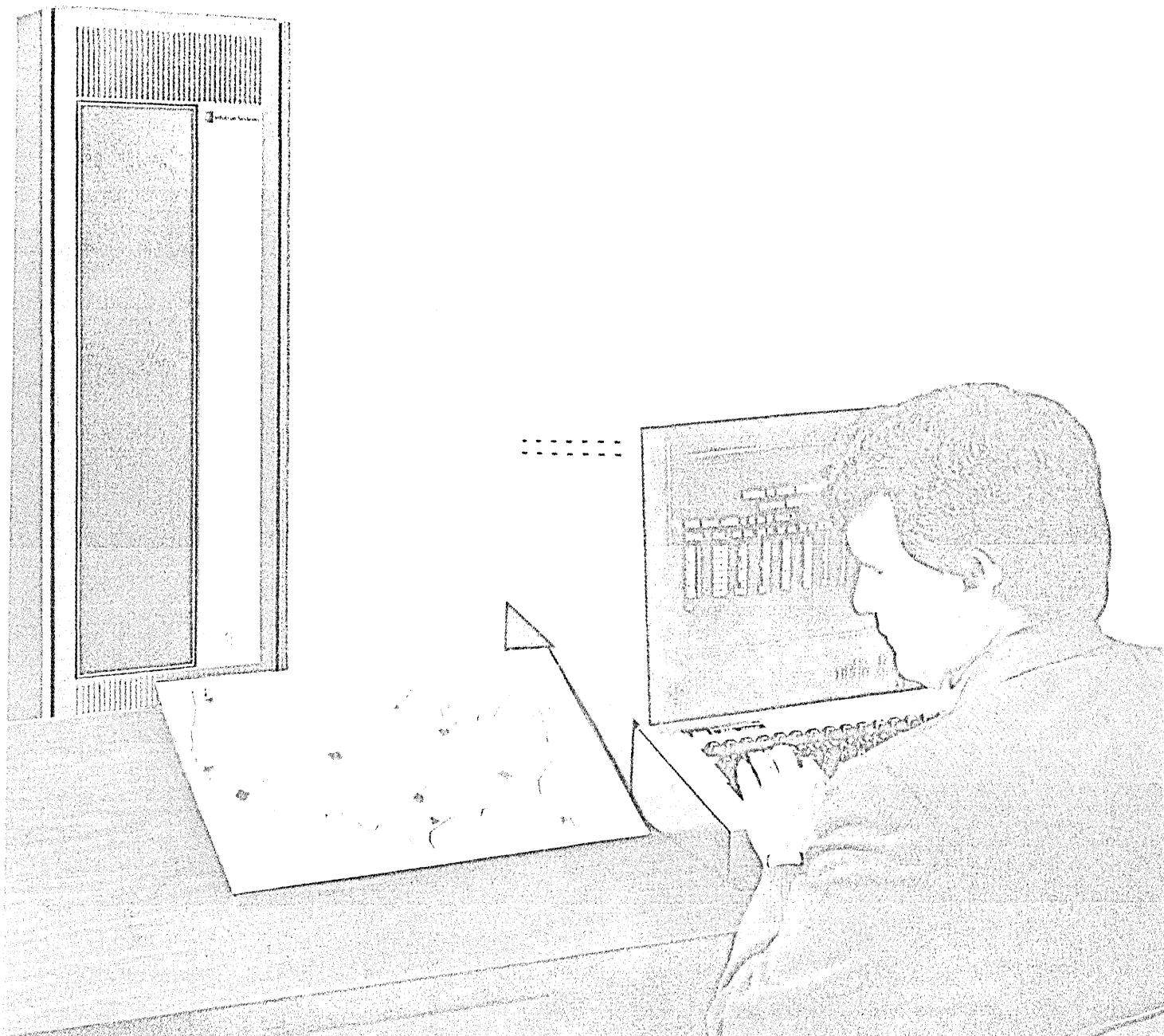
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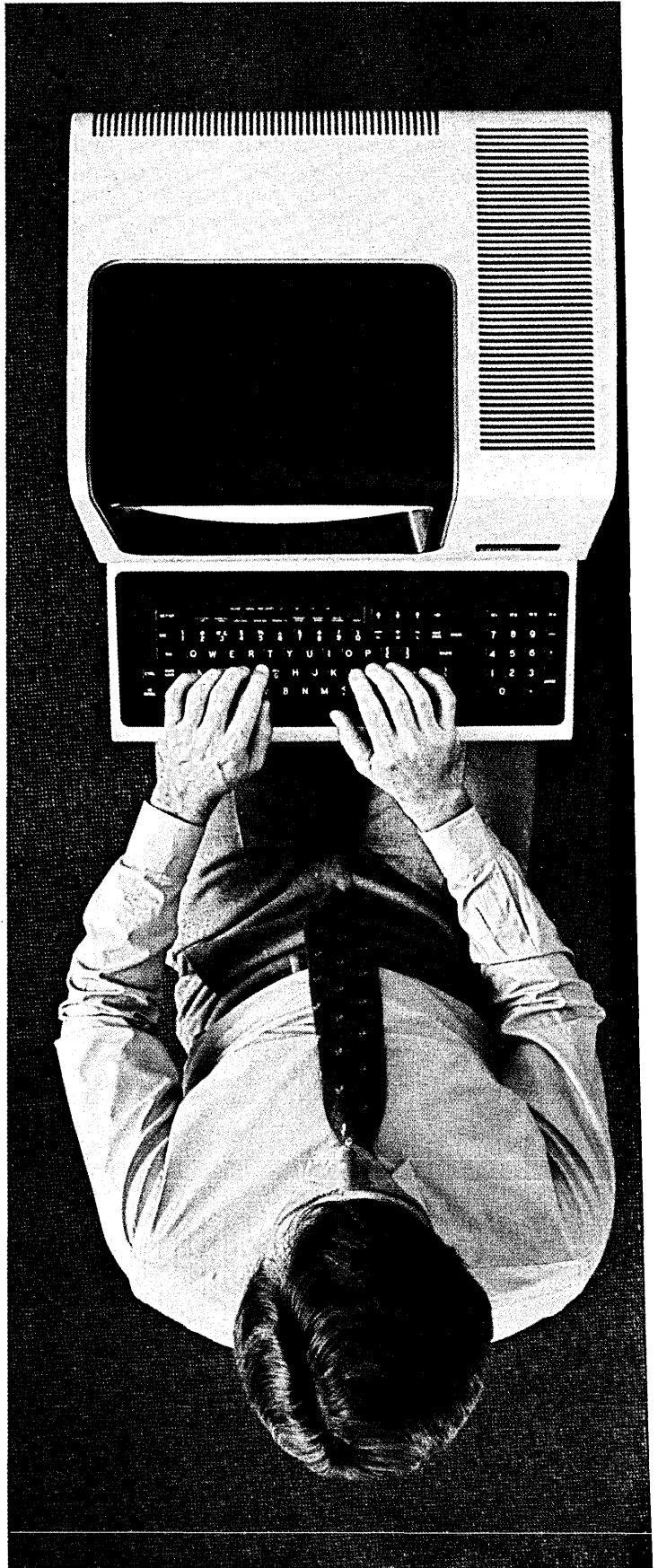
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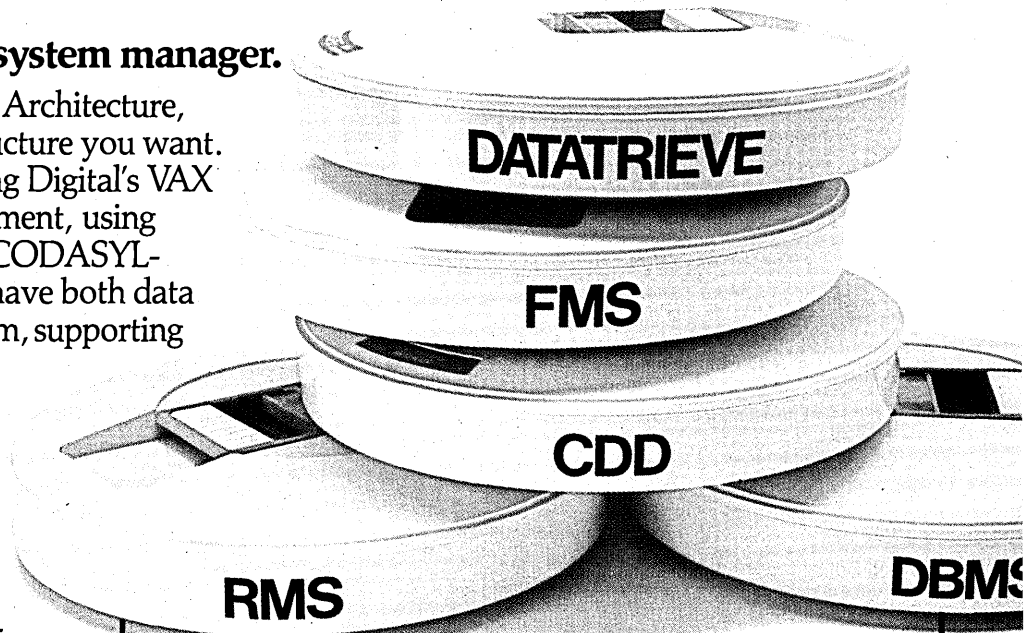
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## NEWS IN PERSPECTIVE

port to corporate management from C.B. Rogers, Jr., head of the new Information Systems Group, suggesting the company "seriously examine" use of distributors.

And, said Cagan, Burroughs, NCR, Univac, Honeywell, Datapoint, and Wang are all starting, are in the middle of, or are finishing up establishment of distributor networks. "Honeywell is calling me by phone daily and I've already met with NCR," he said. "NCR hired a person to head up its local [Los Angeles area] distributor program whose sole qualification was that she had been the salesperson selling Data General to DIC."

Cagan said many of the big manufacturers still prefer to talk of oem arrangements instead of distributor arrangements,

### Honeywell is calling me daily and I've already met with NCR."

"but the fine line between oems and distributors in terms of the value-added requirements is becoming fuzzier and fuzzier."

The joint venture operation of TRW and Fujitsu started out with direct selling of retail POS (point-of-sale) and financial systems of the American partner. Its small business systems from Japan came later, and those systems are moving slowly.

TRW-Fujitsu's Anderson cited "communications protocol problems. Japan's [protocols] are not as similar to ours as we had thought." But, he said, "booking level and revenue level are running according to plan."

J. Garrett Fitzgibbons, TRW-Fujitsu's vp and general manager, agreed, but added, "It was a conservative plan and I'm not that happy." He cited problems in getting documentation converted.

Fitzgibbons said TRW-Fujitsu has "really taken off in retail POS systems." The old TRW terminals (originally designed by S<sup>3</sup>, La Jolla, Calif., for the May Co. and later acquired by TRW) have been completely phased out and they're now selling exclusively Fujitsu-built POS terminals.

Now the only things TRW-Fujitsu sells that are made in the U.S. are ATMs (automated teller machines) produced in Orlando, Fla. "We're the fourth or fifth vendor in that market," said Fitzgibbons, "and holding our position. But next year we expect to introduce a new product with a little help from Fujitsu, mainly components."

In the POS marketplace, he said, "we have 10 to 20 pilots going now, and if they go well we expect to double our revenue next year." He said the pilot projects were mostly concentrated in specialty store environments. This is an environment another, newer Fujitsu partner, International Computers Ltd., is strong in here in the U.S. with its acquired Singer POS base.

In pursuing ISOs though, TRW-Fu-

jitsu is thinking primarily of its small business systems, the 8500 and the Affinity 16. The 8500 was introduced last March and the first system was delivered in August. It is a multitasking, multi-user general purpose system with a price range from \$25,000 for a single workstation up to \$200,000 for a maximum multistation system.

The Affinity 16, priced under \$10,000, is a multitasking desktop micro-computer introduced last June.

Anderson said he thinks a lot of good ISOs "are trying to get established with a Japanese product line. If I were an ISO, I would have seen the handwriting on the wall. The Japanese are a major force in the [small business systems] marketplace."

Another Japanese company hoping this is true is Toshiba, which began selling small business systems in this country last April. It started with two dealers in North Carolina. Its U.S. arm, Toshiba America, is into the retail store business. The company opened its first store in Costa Mesa, Calif., in late July and its second in Westwood (West Los Angeles) in September. "There will be more stores and dealers, but we want to proceed slowly," said John Rehfeld, vp and general manager of Toshiba America's Information Processing Systems Div.

Anderson said stores are "a possibility" for TRW-Fujitsu, but definitely not their own stores.

Still a third Japanese company, Panasonic, a subsidiary of Matsushita, had a distributor network set up even before it announced its first computer product Nov. 12. It's a handheld computer said to be 100 times faster than an Apple with four megabytes of memory, 4 in. by 8 in., and priced at \$600.

In this case, Matsushita picked up U.S. technology. The little computer was developed by Friends Amis, San Francisco, which sold the manufacturing rights. Manu-

### Now the only things that TRW-Fujitsu sells that are made in the U.S. are ATMs.

facturing will be in Japan.

TRW-Fujitsu, which doesn't have its ISOs in place yet, is dreaming up ways to attract them. Anderson said they're looking at things like royalty programs for software houses, 30-day net terms, third party leasing arrangements, and possible flooring of inventory items as with automobile dealers.

They have developed an automated system to provide leads for dealers, using a script written by the direct mail firm, Copp & Brady. The system is used over the telephone with answers keyed into a computer which Anderson said can "produce 5,000 prospects in five days. No one else does this for a dealer."

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—Edith Myers

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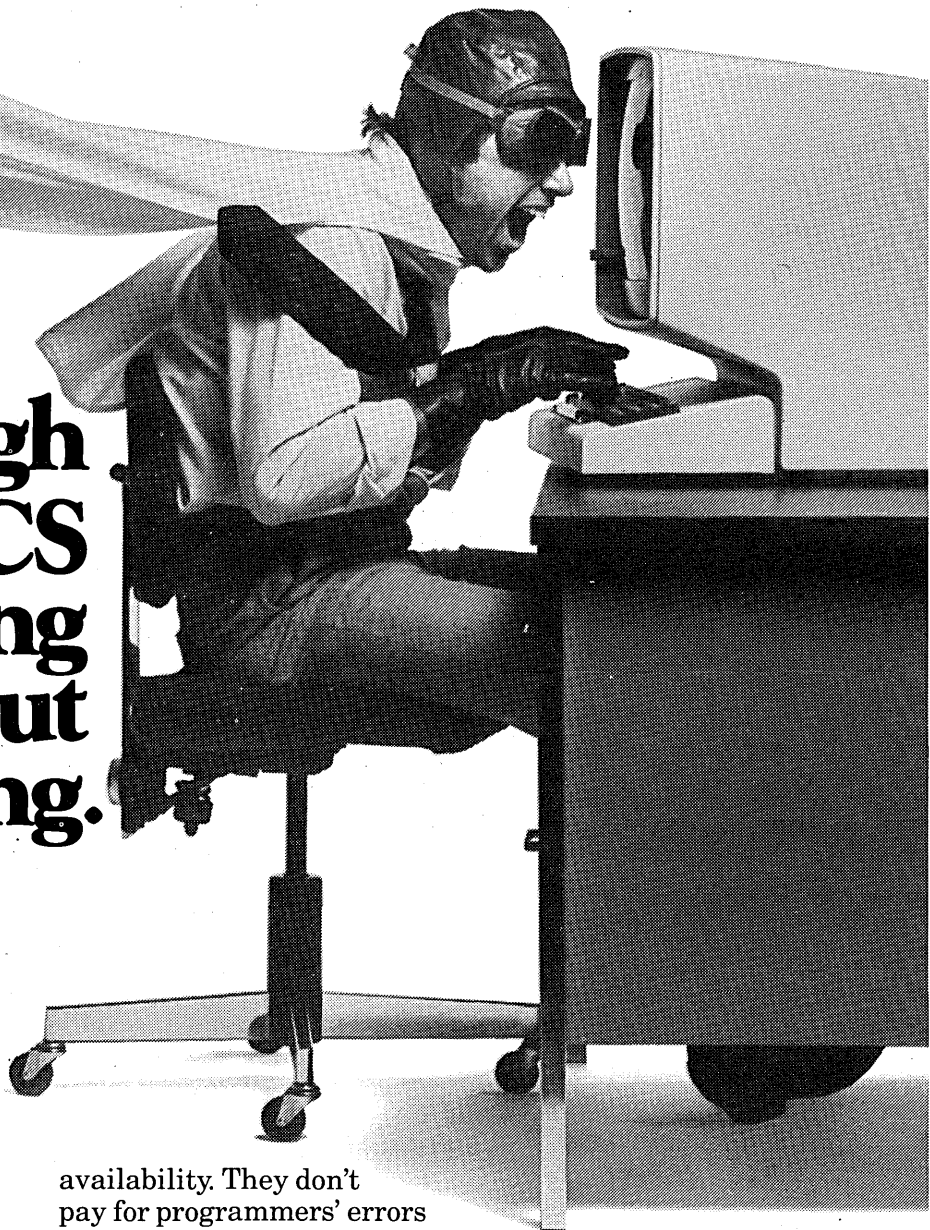


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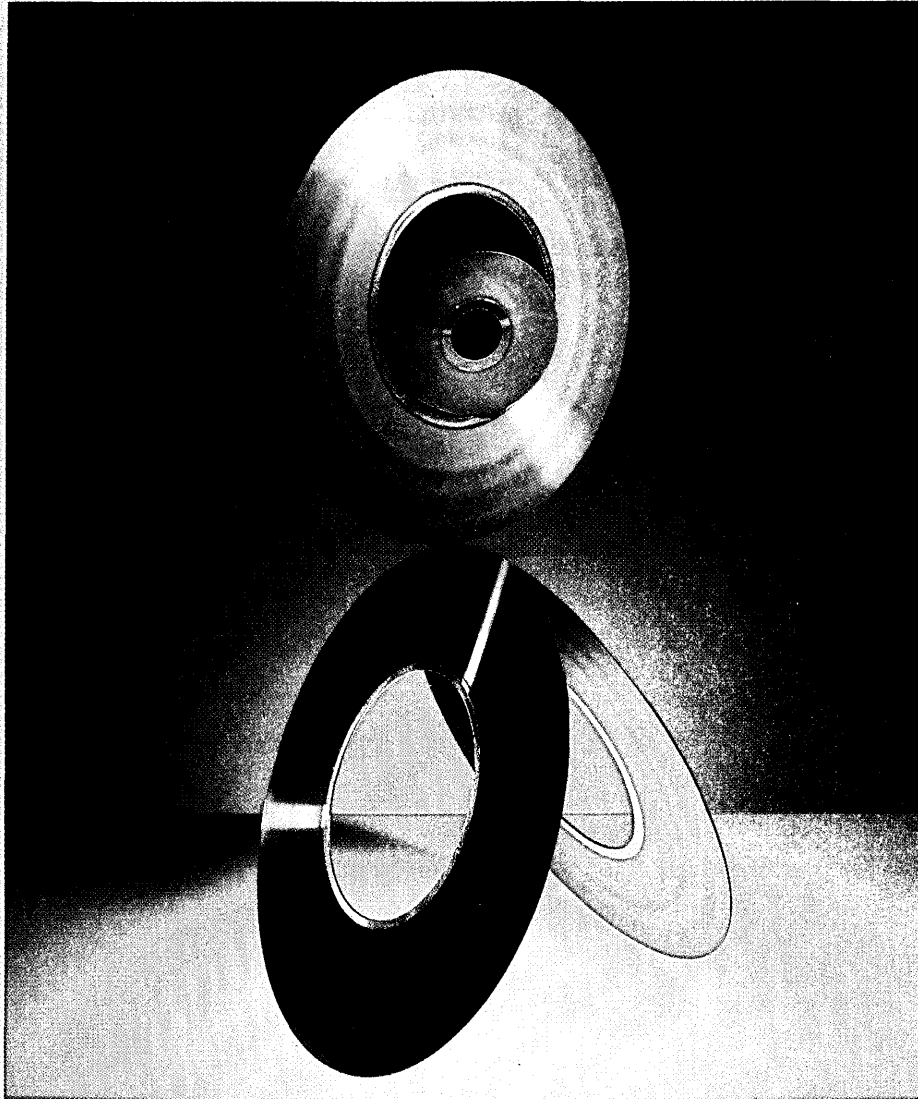
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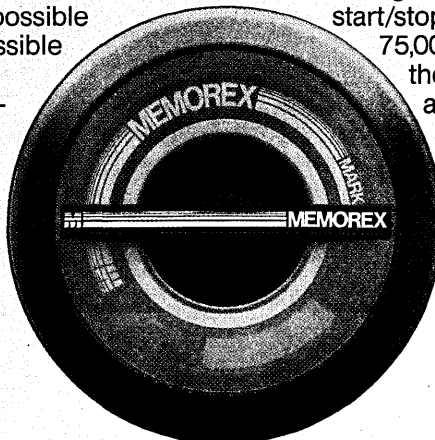
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**CIRCLE 102 ON READER CARD**

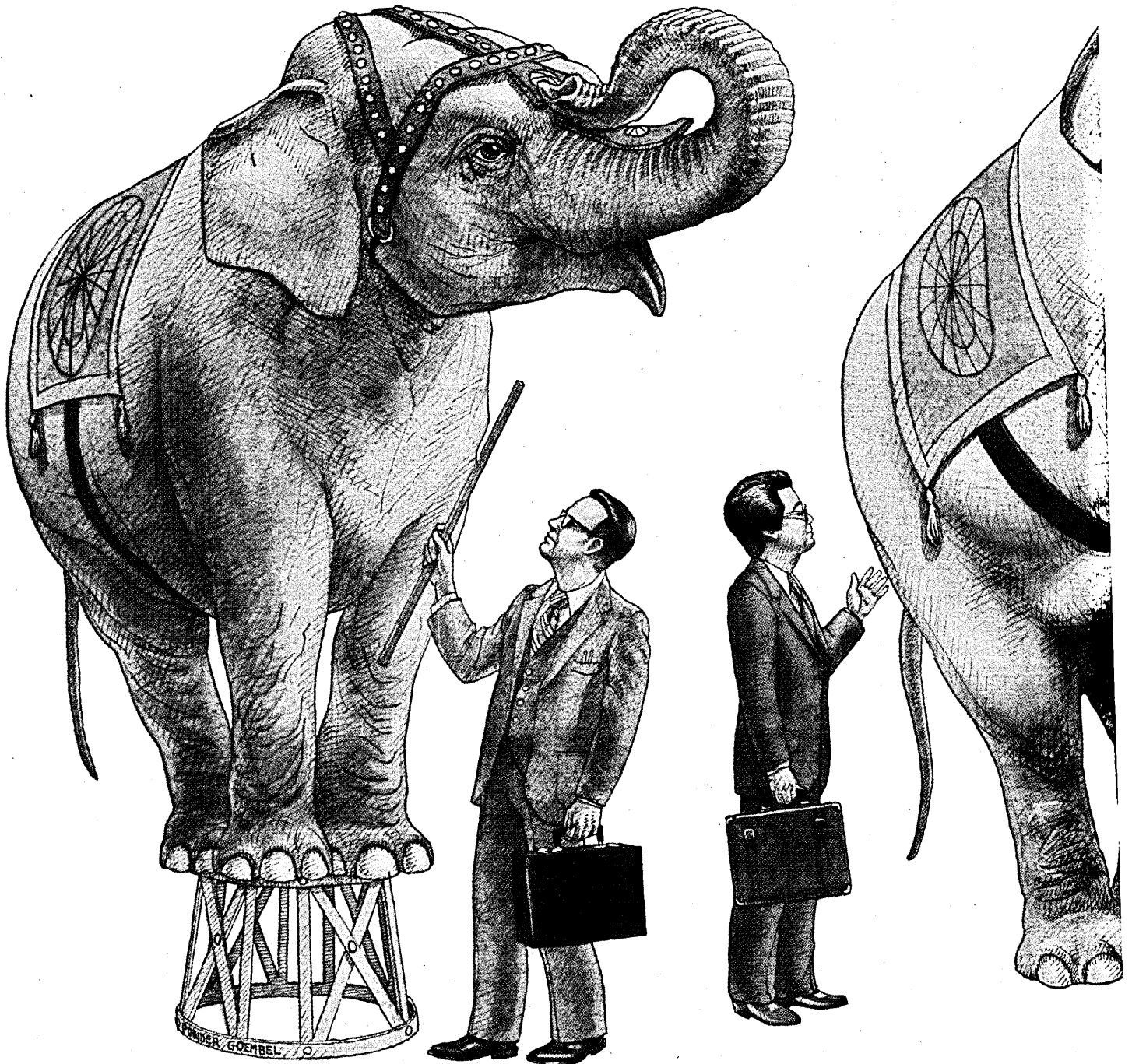
How two big mainframes measure up against IBM's 3081.

by Dale F. Farmer

# IBM-COMPATIBLE GIANTS

On Nov. 12, 1980, IBM announced the 3081, an extension of its 30 series computers. The company offered a system with greater speed and performance, smaller size and power demands, and innovations in computer technology, including a revolutionary liquid cooling system and a denser circuit package.

Almost within seconds of its unveiling, industry analysts were heralding the 3081 as the long-awaited H Series, for years the subject of rumors, predictions, debate, and analysis. Unfortunately, the announcement of the 3081 merely added fuel to the fire



because IBM neglected to mention whether the 3081 was truly the first system in the H Series.

But whether the 3081 is or is not H should be of little consequence. The machine can be described simply as a very large-scale mainframe, with features never before offered on an IBM system. It's a hefty system with a hefty price tag, offered by a hefty company.

Because of all the commotion, analysts seem to have overlooked other large-scale systems. This report will try to correct that imbalance by considering two systems offered by plug-compatible competitors of

IBM: the 580-5860 from Amdahl Corp. and the AS/9000DPC from National Advanced Systems. These two systems will be observed and compared to each other and to the 3081. Areas of concern are system speed, technology, and design. Expandability and reliability will also be looked into, as will service, support, ease of operation, space requirements, power consumption, and prices.

Some of the terms used to describe these machines are relatively obscure, so a glossary (see Table I) has been provided to avoid confusion. One word, however, is worthy of special comment. A dyad is a pair of things functioning together, as in the case of a

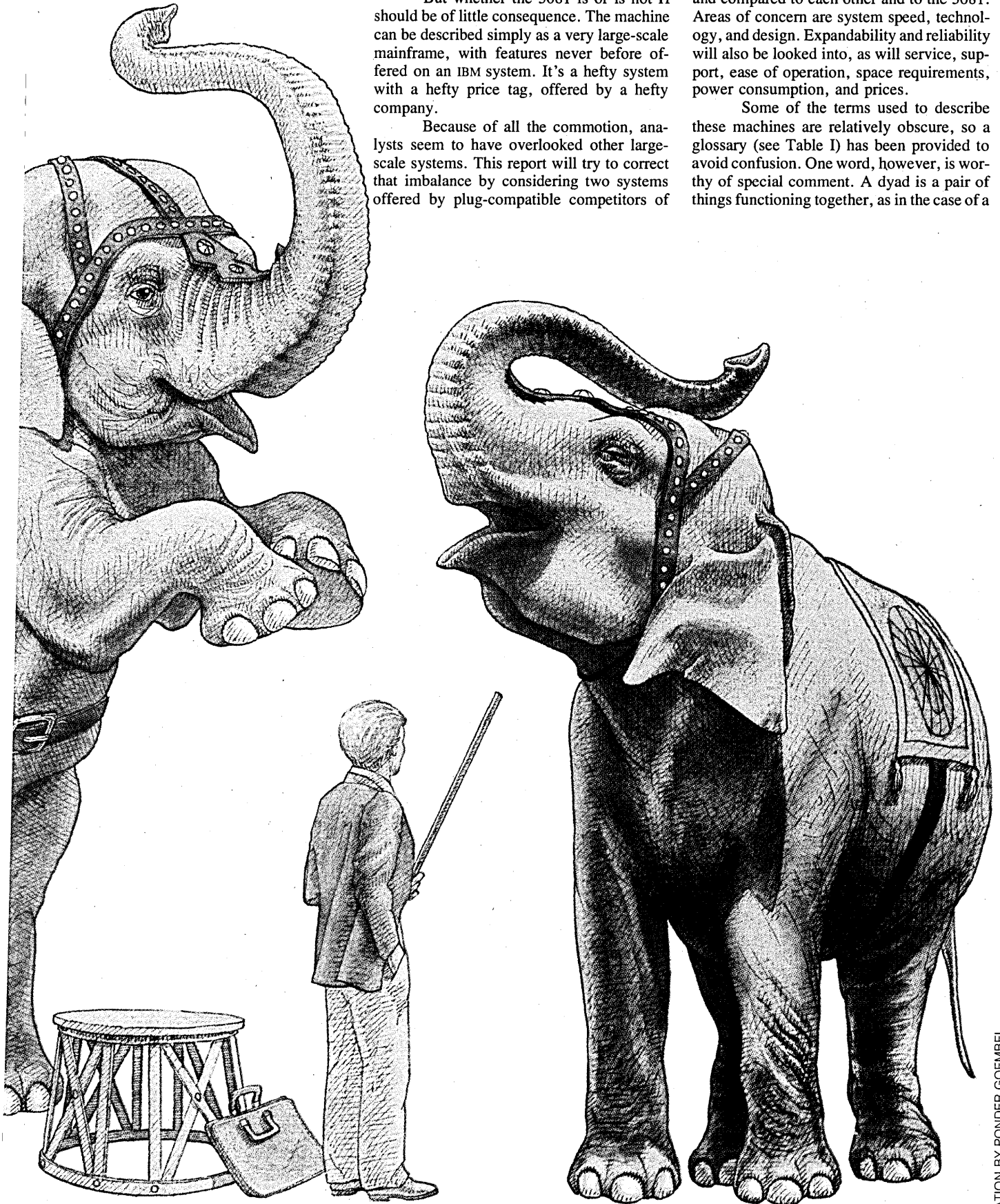


ILLUSTRATION BY PONDER GOEMBEL

## Past performance of similar systems manufactured by the same vendor is one way to judge if an announced mainframe is likely to be dependable.

husband and wife. A dyadic processor is a system that involves two or more cpus which although physically separate still act as one total unit. Each cpu shares the same memory, channels, and resources with the other cpu(s). Such a system is far more complex than a standard uniprocessor or multiprocessor, but as we will see, the design has some advantages.

The Amdahl 580-5860 is the smaller of two computers in the 580 series. This system incorporates high-density chips, a unique mainframe architecture, microcode and macrocode assists, and pipeline processing. The 5860 is also physically small, energy efficient, and relatively inexpensive.

The 5860 runs at a maximum speed of 13.9 MIPS, with a cpu cycle time of 24 nsec and a machine cycle time of 110 nsec. Its relative performance level (see glossary) is a quite healthy 620. The 5860 has two 32K byte high-speed buffers (one for instructions, one for operands) which increase processor efficiency. The basic system includes 16M bytes of memory and 18 channels—2 byte and 16 block. The block channels have a DTR of 6.0 MPS and an aggregate DTR of 50 MPS.

Surprisingly, the 5860 is not a dyadic system but a very powerful uniprocessing complex. The 580 series is designed to utilize all channels and resources while still employing only one cpu.

The Amdahl 5860 uses high-density, low-power ECL/LSI circuitry. A single chip can contain up to 400 circuits, and this has helped to keep the machine small. These chips are placed into a special chip mounting which plugs into a large circuit board, or MCC. A single MCC can carry up to 121 chips. The MCC is plugged into the mainframe housing with a series of end connectors, which are part of the dual bus system. The cpu and channels for a basic system can be contained on 8 MCCs, which take up only about 5.6 cubic feet in the mainframe complex.

The 5860 uses a dual bus system for data flow and interboard communications. Bus architecture is becoming increasingly common in large-scale computers. It reduces the need for hardwiring, which rigidly structures a system. Using a bus instead of cabling or wire connections also reduces the possibility of hardware errors due to interconnection faults.

The Amdahl 580-5860 is scheduled for customer shipments in the second quarter of 1982.

### NAS' LARGE MACHINE

The machine runs at 15.9 MIPS with a cpu cycle time of 38 nsec, a machine cycle

The AS/9000DPC is the largest processor complex offered by National Advanced Systems (NAS). It is manufactured by Hitachi in Japan.

TABLE I	
GLOSSARY	
ACP—Airline Control Program. An operating system for on-line retrieval and updating. Used primarily by airlines and hotels.	
Btu—British thermal unit. A measurement of heat output.	
Bus—A common connector for electrical signals.	
Cache buffer—A holding area for data, which helps data transfer run more efficiently.	
Cpu—Central processing unit. The computing part of the computer.	
Cpu Cycle Time—The amount of time needed for the cpu to complete one instruction.	
DTR—Data Transfer Rate. The speed at which information moves from point to point.	
Dyadic—A system where two or more processors share the same resources but act as a single unit.	
ECL/LSI—Emitter Coupled Logic/Large-Scale Integration. A dense type of computer logic circuitry.	
Hardwire—A system of point-to-point wire connections used to create a structured function within a computer.	
IOP—Input Output Processor.	
JCL—Job Control Language.	
kVA—kiloVolt Ampere.	
KWH—KiloWatt Hour.	
M—Mega (million) or Megabytes (million bytes).	
Machine Cycle Time—The amount of time needed for the memory unit to execute a single read or write function.	
Macrocode—(Amdahl) A more flexible form of microcode.	
MCC—(Amdahl) Multiple Chip Carrier.	
Microcode—A section of software (or firmware) that creates a structured function within a computer.	
MIPS—Million Instructions Per Second.	
MPS—Megabytes Per Second.	
MVS—Multiple Virtual Storage. A high-level operating system.	
Nsec—nanosecond (one-billionth of one second).	
Pipeline processing—Where more than one instruction phase can be performed within a single cpu cycle.	
Relative performance—A number which represents the performance level of a particular mainframe. The IBM 370/158.3 is used as a base system with a relative performance level of 45. Calculated by International Data Corp.	
System IPO—System Installation Productivity Options.	
TCM—(IBM) Thermal Conduction Module. Part of the cooling system for the 3081.	
VLSI—Very Large-Scale Integration.	
VM—Virtual Machine. An operating system.	

time of 320 nsec, and a relative performance level of a staggering 708. The basic system is composed of 16M bytes of memory and 16 channels. The channels have a DTR of 1.5 MPS in normal mode and 3.0 MPS in data streaming mode. The AS/9000DPC has an aggregate DTR of 80 MPS when used with an extended channel adapter.

This system is a dyadic processor, using the same theoretical concepts of computing as the 3081. The AS/9000DPC, however, uses an upgraded version of System 370 internal architecture. This upgrading allows for a more expandable and more cost-effective mainframe, with expanded performance levels when compared to a similar IBM system.

One must note, however, that the AS/9000DPC is not a mirror image of IBM architecture. Internal design and speed have been improved upon by using dense circuitry and a shorter data flow path. Circuit technology within the AS/9000DPC revolves around ECL/LSI logic chips, most of which have 550 gates (circuits) per chip. The AS/9000DPC also incorporates ECL/VLSI with 1,500 circuits per chip. The system uses two 64K cache buffers for improved data transfer and performance. All of these add up to a significant improvement over the basic System 370 design.

National Advanced Systems is scheduled to begin customer shipments of the AS/9000DPC in the fourth quarter of 1981.



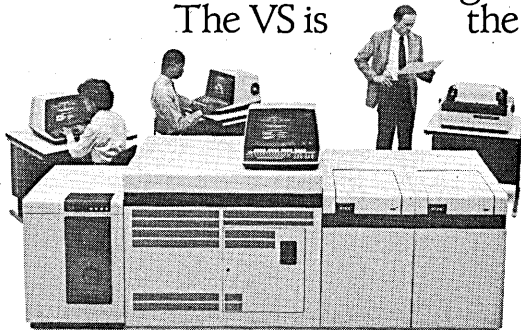
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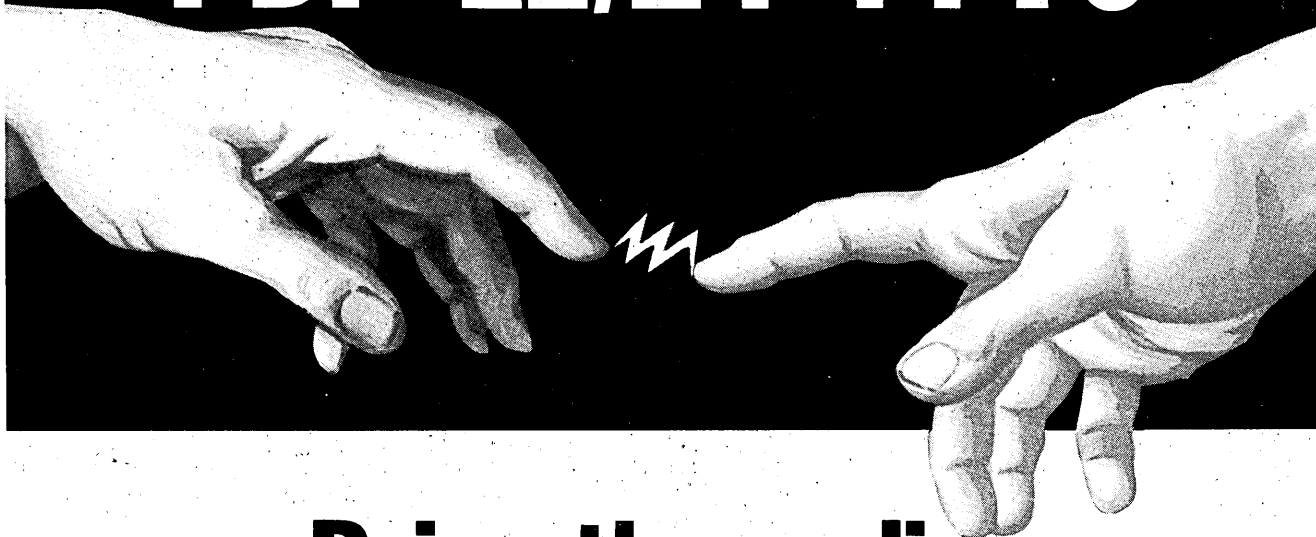
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CIRCLE 104 ON READER CARD

## All three systems use similar theoretical concepts in error prevention, detection, and correction.

TABLE II  
**DATAPRO COMPARISON**

SYSTEM RATINGS	AMDAHL	NAS	IBM
	470/V7 470/V8	AS/5000 AS/7000	3033 4341
Ease of operation	3.54	3.78	3.32
Reliability of mainframe	3.52	3.63	3.61
Reliability of peripherals	2.93	3.00	3.21
Maintenance service			
Responsiveness	3.61	3.43	3.27
Effectiveness	3.13	3.20	3.20
Technical support			
Troubleshooting	3.25	3.43	2.92
Education	3.17	2.84	2.65
Documentation	2.93	2.65	2.77
Manufacturer's software			
Operating system	3.17	3.17	3.10
Compilers and assemblers	3.17	3.17	3.19
Application programs	3.00	3.00	2.85
Ease of programming	3.35	3.25	2.98
Ease of conversion	3.44	3.38	3.01
OVERALL SATISFACTION	3.25	3.55	3.19
Number of systems represented	17	10	318
<b>SCORE SUMMARY</b>			
Number of highest scores	7	7	3
Number of middle scores	3	5	2
Number of lowest scores	4	2	9

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The 3081 is currently IBM's top-of-the-line mainframe. This system offers higher speed, improved performance, lower space requirements, and a lower relative cost than its System 370 counterparts.

The 3081 is a 10.4 MIPS system, with a cpu cycle time of 26 nsec, a machine cycle time of 312 nsec, and a relative performance level of 465. The basic mainframe has 16M bytes of memory and 16 channels (12 block and 4 byte). The block channels have a potential DTR of 3.0 MPS in data streaming mode, and an aggregate DTR of 72 MPS for a full channel complement. The 3081 also incorporates two 32K high-speed buffers for improved performance and smoother data flow.

The 3081 is the product of all the design technology learned in the 370, 30, and 4300 series computers, plus new circuit technology and an improved internal design. Microcode assists are used to improve processor and I/O functions. The 3081 also uses a new concept in liquid cooling. All of these add up to less space, less power, and less cooling required when compared to a 3033U8.

As was mentioned, circuit technology is based on a high-density chip. These chips (118 in all) are placed on a multilayered ce-

ramic board, which is placed within a TCM. The TCMS will be discussed in more detail later. The 3081 uses eight TCMS on one board to make up an entire cpu. This greatly reduces the problems of board-to-board data flow within a cpu, which in turn increases system speed and reliability.

The 3081 will be available for general customer shipments in the fourth quarter of 1981.

The Amdahl 5860 starts with 16M bytes of memory and 18 channels. One local console is also included. Memory size can be increased to a current maximum of 32M bytes in increments of 8M. Block channels can be expanded to a maximum of 32, four channels at a time. The 5860 is also designed to expand to more than 32 channels, but that is in the future. The full system can also handle two remote consoles, two local consoles, and two channel-to-channel adapters. The 5860 can be upgraded to the 5880, which is the largest of the 580 series. The 5880 consists of two 5860s operating in a tightly coupled multiprocessing environment.

The AS/9000DPC starts with 16M bytes of memory, 16 channels, and two service processors. Each service processor con-

sole has two 20-inch color displays. This basic system can be expanded to 32M bytes in 4M sections and 32 channels in eight-channel segments. The system can also integrate up to 10 channel-to-channel adapters and another service processor. The AS/9000DPC can be field upgraded from the AS/9000 model 2, which can be upgraded from the AS/9000N. This gives the user an excellent growth pattern.

The IBM 3081 also starts with 16M bytes and 16 channels. Also required to run the 3081 is the 3082 processor controller, the 3087 cooling unit, and the 3089 power unit. These are part of the 3081 processor complex, but are listed separately and priced accordingly. The 3081 can handle a maximum of 32M bytes of memory in 8M increments and 24 channels with a single increase of eight block channels. Currently the 3081 can be neither upgraded nor downgraded. Industry analysts, however, expect IBM to announce in the near future other systems with the same technical qualities as the 3081.

### TESTING RELIABILITY

Because these three mainframes have not been tested on the open market, their reliability is difficult to judge. There are, however, two indicators that can tell a manager if an announced mainframe is likely to be dependable: a look at the past performance of similar systems manufactured by the same vendor, and an analysis of the system architecture and its underlying technology and quality control.

Past reliability ratings for systems offered by these three vendors are shown in Table II, which is taken from the latest Datapro report. The systems shown are, of course, less powerful than the ones being compared here, but for the most part they represent the same general level of technology. Note that these are compilations of ratings, taken from representative mainframes. Also note that only the system ratings are used. The other percentages have very little to do with reliability. In the number of mainframes represented, it is clear that IBM has more than a slight numerical advantage over Amdahl and NAS. IBM, however, did score lower in nine of the 14 categories, including overall satisfaction. (Note: These figures are general and somewhat subjective. They are used here to compare major differences among vendors.)

In the area of technology, all three vendors shined with regard to quality control standards, microcoded error tracing, and advanced error recording techniques.

The technology of the 5860 is quite new to the computer industry. The chips used on this system are much denser than the ones used on previous Amdahl mainframes. The ECL/LSI chips in the 5860 generate less heat and use less power. The 5860 also relies on

bus architecture, a good indication of a solid internal structure. The cooling system decreases the chance of an internal fault due to an environmental problem. Modularization contributes to performance and reduces the time needed to trace hardware faults.

Dyadic processors contribute significantly to the dependability of the AS/9000DPC. Since there are two cpus sharing channels and resources, the mainframe has an automatic redundancy system. If, when the machine is running under MVS/SP, a single cpu fails, the other cpu can continue to process as usual and also aid in tracing the problem in the first cpu. Processing speed is, of course, reduced, but half a loaf is better than none. Processing can even continue while one of the cpus is under repair, because each section of the system is independently powered. This concept, coupled with a solid technological base and a proven design, provides a great deal of system security.

The 3081's dyadic concept provides much of the same protection as the AS/9000DPC. The placement of the TCMS in logical groups also aids in tracing system faults. Another plus is that IBM is beginning to move away from its original design concept of totally structuring a system with hardwiring. The use of microcode is a positive step toward more flexible and more reliable mainframes.

In examining the 5860 and the AS/9000DPC, we find that Amdahl rates high in internal architecture with its use of a dual bus system and a modified air cooling design. NAS receives good marks for its use of redundant cpus. On the other side of the coin, however, a cpu failure in the 5860 would require an end of processing until the fault was repaired. The AS/9000DPC loses points for its adherence to a modified 370 architecture and the high degree of hardwiring and internal cabling, both of which can retard the tracing of circuit faults. As was mentioned before, the greater the number of physical connections in a system, the higher the risk of physical problems.

When examining IBM, we find that the 3081 has some of the same advantages over the 5860 as does the AS/9000DPC—redundant cpus. On the 3081, however, if one cpu must be repaired, both cpus must be shut down. The 3081's cooling system is also something of a disadvantage in this context. Although the machine has a relatively low heat output (as we will examine later), liquid cooling greatly increases the internal complexity of the system.

## EASE OF USE

The 5860's operator console is similar to those of the 470/V8 and the IBM 3033. The 5860 uses console assists and some limited error tracing through the operator console, which gives the staff a reliable report of system status. The

TABLE III

## SUPPORT PRICES

### Amdahl 580-5860

Basis - one mainframe, 32M bytes, 34 channels, one power distribution unit, one console.

	SOFTWARE		HARDWARE (24 hour, 7 day)
	MPSC	MAPSC	
VM	\$ 975	\$ 585	
MVS	\$1450	\$ 835	\$11,050

### National Advanced Systems AS/9000DPC

Basis - one mainframe, 32M bytes, 32 channels, two service processor consoles.

#### HARDWARE AND SOFTWARE

(24 hour, 7 day)

\$17,960.60

### IBM 3081

Basis - one mainframe, 32M bytes, 24 channels, one power distribution unit, one cooling unit, one processor controller.

	SOFTWARE		HARDWARE (8 hour, 5 day)
	MPSC	MAPSC	
Category A	\$1085	\$ 651	
Category B	\$1550	\$ 930	\$9,065

MPSC - Monthly Program Support Charge

MAPSC - Monthly Additional Program Support Charge

TABLE IV

## POWER COSTS

### FORMULA:

kVA + btu \* Price per KWH \* Hours per Month = Power Costs per Month

### Amdahl 580-5860

Basis - one mainframe, 32M bytes, 34 channels, power and control units.

40 kVA +  $\frac{83,500}{12,000} * \$0.05 * 720 = \$ 1,690.56$  per month.

\$20,286.82 per year.

### National Advanced Systems AS/9000DPC

Basis - one mainframe, 32M bytes, 32 channels, two console control units.

90.7 kVA +  $\frac{271,306}{12,000} * \$0.05 * 720 = \$ 4,079.16$  per month.

\$48,949.92 per year.

### IBM 3081

Basis - one mainframe, 32M bytes, 24 channels, one controller, one power unit, one cooling unit.

32.3 kVA +  $\frac{80,980}{12,000} * \$0.05 * 720 = \$ 1,405.73$  per month.

\$16,868.76 per year.

main operator console complex is totally separate from the mainframe and has its own memory and power supply. It also houses the two byte channels for the system. This allows an operator to be active in the event of a mainframe failure, checking problems in the system. This also permits the operator to assist in diagnosing some problems, which helps the field engineers solve the problems faster. Operators are aided by the use of microcoded program screens which at a glance can give information on system status, channel, and cpu utilization, etc.

The AS/9000DPC is committed to ease of operation in much the same way. Service

processors allow a great deal of flexibility and mainframe independence. The use of color displays can prompt the operator in the event of a problem requiring immediate attention. Color helps reduce the eyestrain and boredom one experiences when staring at the same screen for hours at a time. These consoles are designed in the style of the 3033 consoles, which are set up by microcode. Prompters and special status displays are also used.

Amdahl has designed the 5860 for fast service. All MCCs are designed as single-function boards (one board for cpu, one for IOP, one for channels, etc.) which allows for faster tracing and resolution of system faults.

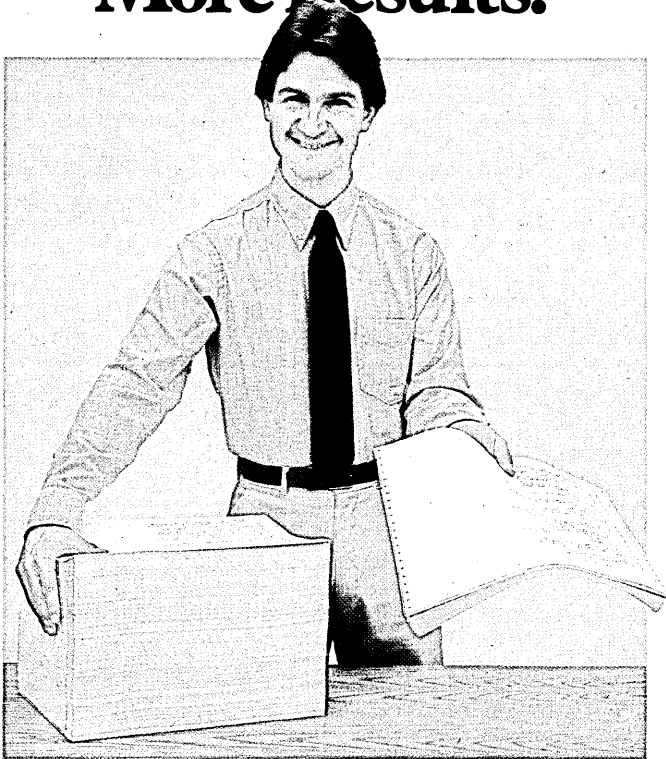
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## Amdahl is still number one in price when based on performance, but the AS/9000DPC holds second place.

The MCCs are simple to replace. Also, each MCC contains chips (history RAMs) whose sole function is to detect and record errors on the board. The Amdahl field engineers can diagnose problems from the operator console by the simple flip of a switch. The 5860 also uses phone support, which allows an Amdahl repair center to communicate with the computer via standard dial-up phone lines, analyze the problem, and suggest corrective action. This can greatly reduce down time, which in turn increases system productivity.

The AS/9000DPC has a modular architecture (both functionally and physically) which greatly reduces the time spent searching for an error. The service processors can display information necessary for field engineers to trace and correct system problems. System faults can be traced by microcoded programs which record each hardware fault on diskettes. These can then be "replayed" to trace errors quickly. The AS/9000DPC also uses telephone support.

IBM has added quite a few error detection and recovery systems to the 3081. One of the systems, known as the Monitoring and System Support Facility (MSSF), aids the system in recording faults, analyzing error data, and controlling internal maintenance and recovery. IBM also uses phone support for faster maintenance and recovery.

All three systems use similar theoretical concepts in error prevention, detection, and correction. All three vendors have strict quality control standards. There is some variance in user satisfaction with previous systems, but there are really no great differences among the vendors in this area.

For a long time, IBM would not support its own software on another mainframe. This was a matter of great concern to data processing managers, who had quite an investment in not only the operating system but also the applications software and the JCL which had to conform to the protocols of the operating system.

### SOFTWARE SUPPORT TO USE

In a recent dispute between National Advanced Systems and IBM, NAS demanded that IBM support its System IPOS on plug-compatible mainframes. IBM refused. When this happened, NAS filed a complaint with the European Economic Council. Finally, an agreement was reached between the vendors. IBM would support its code on non-IBM equipment, and NAS would withdraw its complaint. This decision has far-reaching impact not only on the PCM manufacturers, but also on the customers, who now have more flexibility in hardware selection.

As for what system software will run on a particular mainframe, here is the breakdown:

TABLE V

### PURCHASE PRICES

Basis - 32M bytes, 24 channels, vital support equipment.

Amdahl	
5860 Complex	\$4,350,000
Total Price	\$4,350,000
National Advanced Systems	
AS/9000DPC	\$4,975,000
Extra Memory	400,000
Extra Channels	150,000
Total Price	\$5,525,000
IBM	
3081 cpu	\$4,120,000
Control Unit	270,000
Extra Channels	100,000
Cooling Unit	60,000
Power Unit	38,000
Total Price	\$4,588,000

TABLE VI

### PERFORMANCE PRICES

(Purchase Price/MIPS)

AMDAHL	\$312,949.64
NAS	\$347,484.28
IBM	\$441,153.85

- Amdahl 580-5860: MVS/SP1, SP2, SP3; ACP; VM/SP release 1; all Amdahl software.
- NAS AS/9000DPC: MVS/SP; VM/370; system products and extensions.
- IBM 3081: MVS/SP; VM/SP.

Also included in the support is the microcode used in the system. The 5860 is more dependent on microcode and macrocode than is IBM or NAS. None of the systems, however, would run properly (if at all) without the use of microcoded instruction sets. The microcode support includes the revision of the code to allow more functions or more efficient operation. The prices for software and hardware support are listed in Table III.

Ten years ago, when a manager would suggest a larger system, he or she usually meant a system with greater computing capacity. Back then, though, greater capacity was synonymous with greater physical size. That has been changing drastically with the advent of smaller circuits and new design techniques. Some may say that space requirements are a very minor part of computer selection. This is true if a shop has a great deal of room to spare. For those who do not, this point carries more weight.

The figures used in this section are for

the maximum square footage of a particular system. The maximum configurations of memory and channels are used. Also included are any support equipment—controllers, power units, etc. Please note that these figures are for closed systems, i.e. they do not include the service clearances required.

The Amdahl 5860 is the smallest of the three systems, taking up only 57 sq. ft. of floor space. The AS/9000DPC, on the other hand, requires 235 sq. ft. This may be due, in part, to the design concept, which is patterned after the System 370. Another possible explanation for the size may be the use of power supplies for each functional area of the system (cpus, memory, IOPS, channels, etc.). Last but not least, the IBM 3081 takes up just under 105 sq. ft. of floor space—less than half as much as the AS/9000DPC, but almost twice as much as the 5860.

With the increasing cost of electricity, many managers are looking more closely at the energy efficiency (or inefficiency) of computer equipment. Computers have historically been large users of electricity. There is, however, a trend today toward more efficient ways of powering and cooling a system. Energy efficiency and low heat output are essential for the data center of today and tomorrow.

Table IV contains a formula that can determine the cost of running a system by using the kVA input, the btu output and the price per kWh. As the figure illustrates, the AS/9000DPC has a much greater level of energy consumption than does the 5860 or the 3081. This may be because of the size of the system or the use of multiple power supplies.

The IBM offering has the lowest energy consumption and heat output of all three systems. With the 3081, low power drain and low heat output are attained by using high-density, low-power chips and a more compact design. But part of the savings may also be attributed to the use of a new liquid cooling system. As was mentioned earlier, the computer circuits are placed inside a TCM. The TCM is then filled with helium and sealed with a plate, where chilled water flows to remove waste heat. So while the use of liquid cooling does complicate the mainframe's interior, the technology does have its merits.

### PRICES OF THE SYSTEMS

Table V contains the purchase prices of all three systems. The size of the system base was determined by the maximum size of the 3081—32M bytes of memory and 24 channels. Amdahl does have two more channels, but in this case it should not have too great an impact on the pricing scheme. Prices have been broken down to show individual pricing where necessary. Bundled prices have a list of the items included.



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## Amdahl and NAS do not have the same market advantages or impact as IBM, but they offer powerful systems at reasonable prices.

At first glance it would appear that the 5860 has the lowest price, followed closely by the 3081. The AS/9000DPC appears to finish dead last, but that doesn't mean it should be regarded as the most expensive mainframe.

Remember that these three systems run at different speeds (MIPS). This means that one computer is more powerful than another, and can perform more functions or operations in the same amount of time. This difference can make a big difference in calculating the real price. The purchase price of each system can be converted to a common denomination, which would show more clearly which system costs more by performance level. To do this, the purchase price is divided by the MIPS rating. The result is the performance price, which is shown in Table VI.

Now the picture changes. Amdahl is still number one in price when based on performance. But the AS/9000DPC holds second place, with a performance price of less than \$350,000. IBM comes in with the highest performance price, over \$90,000 higher than the mainframe from NAS.

Now that the systems have been examined in depth, let's review each one for its relative strengths and weaknesses.

- Amdahl 580-5860: The 5860 offers great speed and system flexibility. The system has an excellent internal design concept, including modified air cooling and bus architecture. Amdahl's offering uses a great deal of microcode instead of the standard hardwiring concept. The 5860 is an upgradable system, offering the users a defined growth pattern. The system can be easily maintained, requiring a simple board or circuit exchange to facilitate a repair. The 5860 can support the widest range of operating software of the three systems. The system uses the least amount of floor space, and has low power needs and heat output. The 5860 has the lowest overall price, both in raw dollars and performance price.

The 5860, however, does lack the advantage of redundant cpus. The uniprocessing concept also reduces the aggregate DTR to a level lower than those of the other systems, although the maximum channel speed for the 5860 is double the speed of the AS/9000DPC or the 3081. Another drawback is that the 5860

will not be released until the second quarter of 1982, while the other systems are available for shipment now.

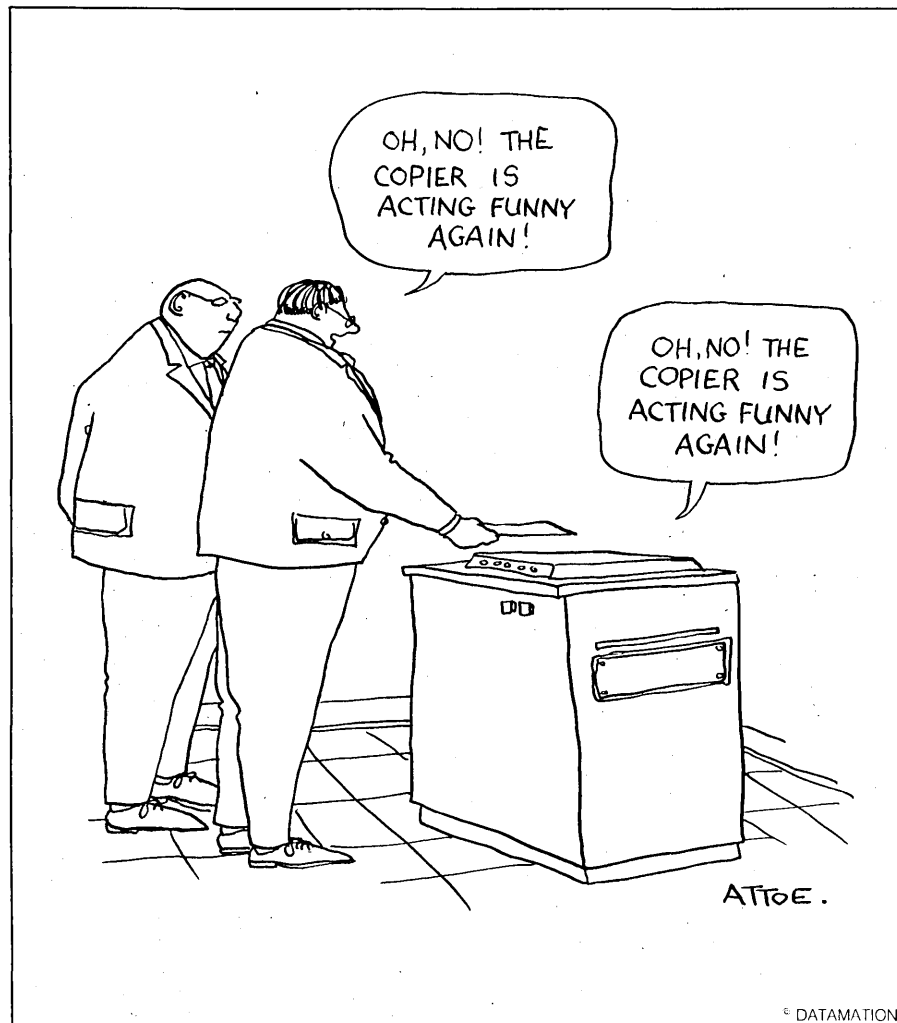
- NAS AS/9000DPC: The AS/9000DPC's relative performance and MIPS ratings are the highest of the three systems presented. Its dual cpu system offers not only high performance, but also automatic redundancy in the event of a single failure. The AS/9000DPC is air cooled, which offers a simpler system design and easier access in the event of a problem. The AS/9000DPC can be field upgraded from two smaller systems, which gives it the largest upgrade path of the three machines considered here. The Datapro comparison showed that two smaller systems from NAS had a higher rating of overall satisfaction than did the offerings of the other two vendors. The AS/9000DPC can handle virtually the same software offered on the 3081. And although this system has the highest purchase price, the performance price is only slightly higher than Amdahl's, at less than \$350,000 per MIPS.

But the AS/9000DPC does have some drawbacks. The system draws the largest amount of power and generates a great deal of heat. It also takes up the largest amount of floor space.

- IBM 3081: The 3081 offers higher speed and performance than its System 370 predecessors. It uses the least amount of electricity, generates the smallest amount of heat, and requires a relatively small amount of floor space. The 3081 uses advanced error-tracing facilities to expand error detection and correction. The operator console is easy to use and understand. IBM holds the largest base of hardware and software maintenance personnel. The 3081 system architecture revolves more around microcode than hardwiring, which is a very positive sign.

But the 3081 comes up short in the following areas: Its use of liquid cooling complicates the internal architecture and may also complicate problem resolution. The 3081 has the highest performance price while offering the lowest performance level. The system cannot remain active while repairs are taking place. It has no current upgrade or downgrade, and has a smaller channel offering than the other two systems. Finally, previous IBM systems scored lowest in nine of 14 Datapro categories, while having only three high scores.

Amdahl and National Advanced Systems do not have the same market advantages or market impact as IBM. They do, however, offer powerful computer systems with reasonable prices—both purchase and performance. Which of these three systems is the best? That depends on the individual user.



© DATAMATION

Dale Farmer is the edp auditor at People's Trust Bank, Fort Wayne, Ind.

CARTOON BY STEVE ATTÖE

# DATA PROCESSING vs. FINANCE.

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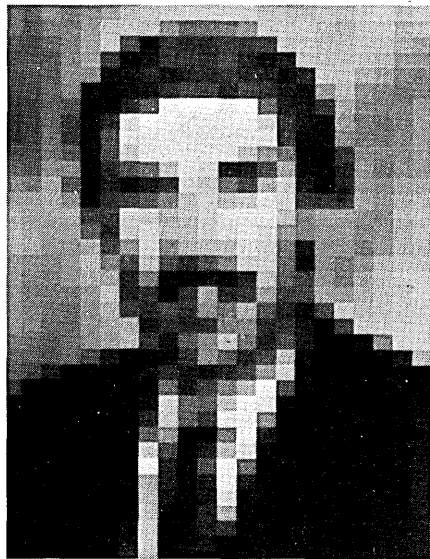
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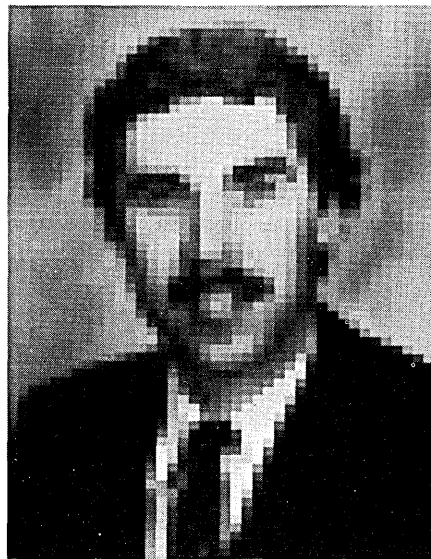
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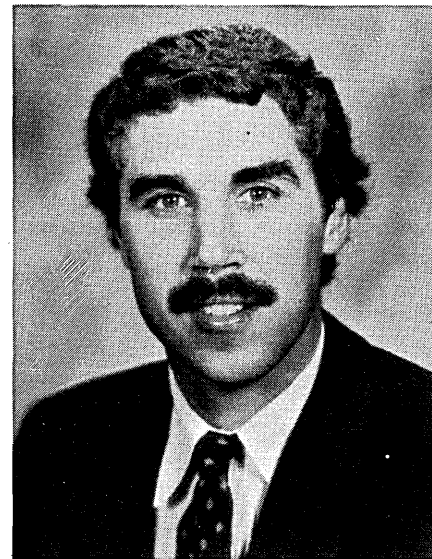
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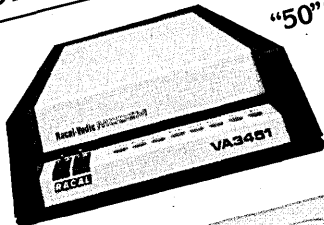


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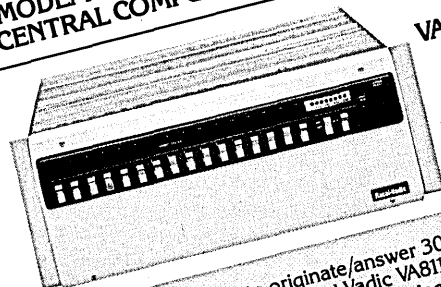
Near Right: Low profile, low cost, low heat "50" series. Includes displays, diagnostics and voice/data switch.  
Far Right: VA1616 Multiple Data Set. 16 channel chassis houses up to 16 intermixed modems and automatic dialers in 7-inch high chassis. Includes displays, diagnostics and redundant power supplies.

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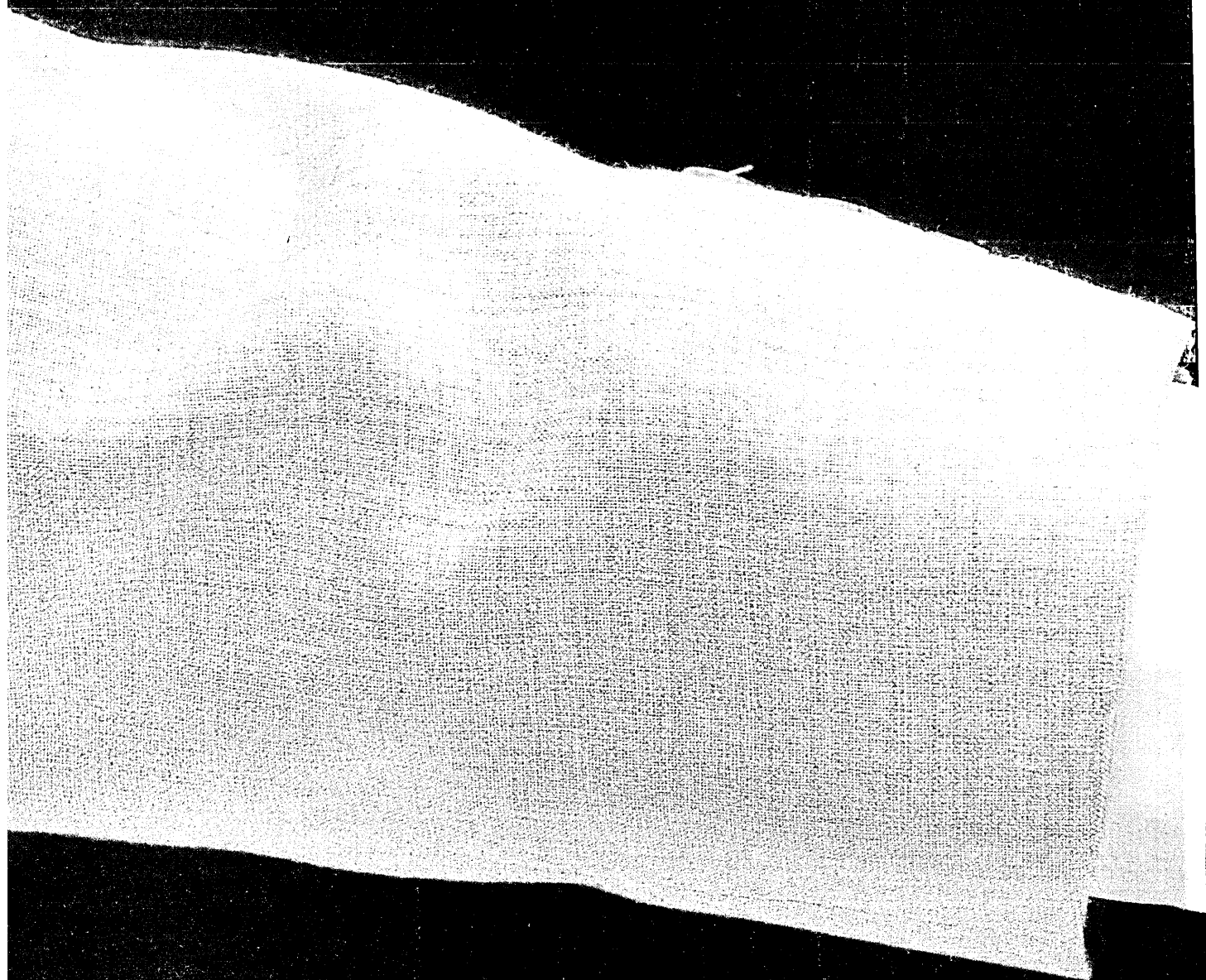
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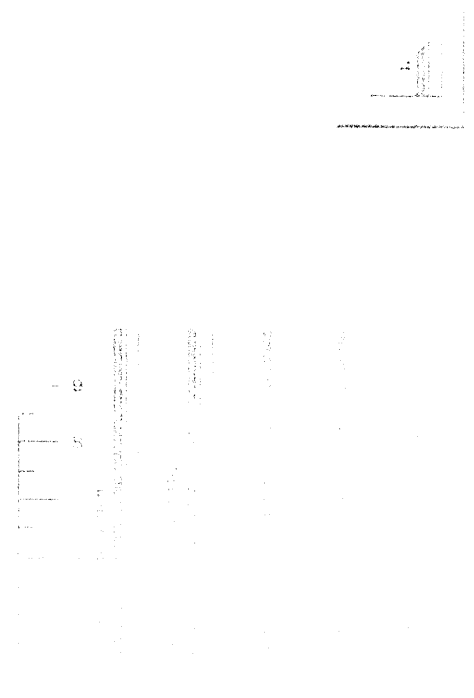
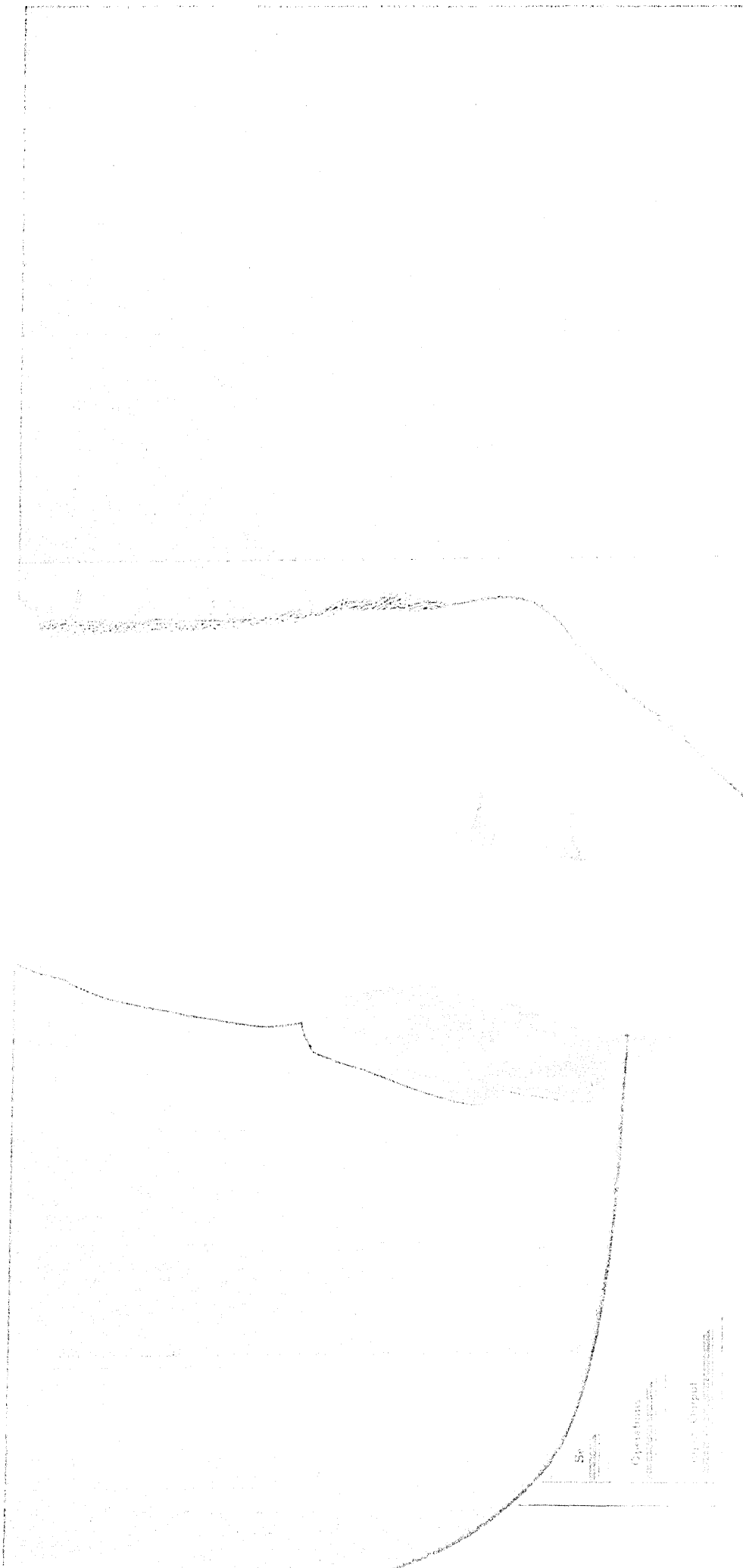
More than four-fifths of 2,416 respondents are well satisfied with their software packages.

# SYSTEMS SOFTWARE SURVEY

by Data Decisions

This software evaluation report presents in detail the results of a nationwide survey conducted in October of 1986 known to have specific, systems-oriented software packages installed. The survey, conducted by Data Decisions, (Orlando, Fla.), employed a precise sampling of systems software packages known to be installed at 10 or more user sites. Data for these user site samplings were provided from a computer installation database maintained by Computer Intelligence Corp., a sister company of Data Decisions.

Over 7,000 known users of 107 different systems software packages installed at 5,936 sites comprised the statistical sampling. Considerable efforts were made by Mailgram announcements, first class



# Vendor credibility is high: 87% of users said their systems met or exceeded all vendor promises about installation time, capabilities, and performance.

letter questionnaires, and telephone follow-up calls to obtain completed user interviews. By such exhaustive surveying, a total of 3,259 user responses were tabulated. Of this total, 2,656 were validated as representing active users presently employing the packages surveyed. This constitutes the base from which the statistics were drawn.

All users were asked to rate a specified systems package with respect to stated features, functions, and performance criteria. The questions posed to the users were also specific in nature. Some required only a yes or no response. Others related to the selection of a phrase or phrases that defined the how, why, or other criteria of software performance. The most specific required the user to assign a performance rating based on a scale ranging from 10 to 9 for Superior, down to 2 or 1 for Inadequate in relation to statements defining package use, vendor service, software operation, and overall satisfaction with the package.

## RESULTS & CONCLUSIONS

Results relating to total responses from 2,656 active users of presently installed systems packages showed the following:

**Buying Influences:** In response to questions on what influenced the decision to acquire the package, 80% of the users indicated that software features and functions were a Major Influence. Other major influences: 76% of the users cited that compatibility with existing installed software was of major import; 46% considered the overall "presence" or reputation of the software vendor important; and 43% related the costs and time associated with writing and implementing the software in-house a major influence in acquiring the systems package.

Of the buying influence responses indicating Minor or No Influence on the acquisition decision, 85% indicated that recommendations from third parties or consultants were of minor or no import. In addition, 77% cited the results of benchmark runs and 73% experiences with other packages from the same vendor as having minor or no influence.

**Alternate Packages:** Overall, 56% of the users stated that they had evaluated alternative packages before making an acquisition decision. Such evaluations ranged from a high of 84% for users of telecommunications monitors to a low of 43% for users of systems management aids.

**Computer Systems:** The systems packages were installed on the following medium to large mainframes: IBM, 70%; Amdahl and NAS/Intel, 6% each; Burroughs, 5%; Sperry Univac, 4%; Honeywell, 3%; Hewlett-Packard and Magnuson, 2% each; Control Data, 1%. Thus, IBM and IBM-compatible PCM mainframes accounted for 84% of the systems software user responses.

**Time Installed:** Overall, the time period the systems package was installed averaged 47 months or about 3.9 years. Response ranged from 7% of the users employing the package for less than one year to 6% employing them over eight years. The survey, therefore, samples a very mature base of systems software users.

**Maintenance:** An overwhelming 91% of the users surveyed have the systems package supported by the software vendor. Only 2% employ a third-party support organization, and 6% use in-house staff support.

**Package Value:** In response to questions on characterizing the "value" of the features and capabilities of the systems package, the following results were obtained:

- 37% Excellent Value—outstanding features and capabilities at prices comparable to or below competitive software.
- 18% Excellent Value—good features and capabilities at prices substantially below competitive software.
- 8% Good Value—outstanding features and capabilities at prices higher than competitive software.
- 29% Good Value—good features and capabilities at prices comparable to competitive software.
- 3% Good Value—lacks important features and capabilities, but at prices below competitive software.
- 1% Poor Value—good features and capabilities at prices above competitive software.
- 2% Poor Value—lacks important features and capabilities at prices comparable to or above competitive software.

**Replacements:** Only 18% of all users indicated they were actively considering the replacement of the installed package. Of this number, only 14% (or 3% overall) cited that the reason for replacement was that the package was generally unsatisfactory, and only 10% (2% overall) stated that slow execution speed was the reason for replacement.

The main reasons cited for considering replacement of the package were 36% (6% overall), needs for features not presently incorporated into the package, and 27% (5% overall), system upgrades where a new host and/or operating system incompatible with the package would be employed.

**Performance vs. Promises:** An overwhelming 87% of the users stated that the installed systems package either exceeded or met all vendor promises with respect to installation time, features and capabilities, and performance, speed, or efficiency factors. Only 2% of the users said that vendor promises made on software performance had not been met for these factors.

**Overall Satisfaction:** Users were asked to state their overall satisfaction with the package in relation to a Superior (10 to 9), Very Good (8 to 6), Acceptable (5 to 3), and

Inadequate (2 to 1) scale. Among them, 28% rated overall satisfaction level as Superior in meeting or exceeding all site requirements, and 54% rated overall satisfaction as Very Good in meeting or exceeding most requirements. A total of 16% rated overall satisfaction as Acceptable in meeting many requirements, while 2% rated overall satisfaction as Inadequate in meeting few requirements.

## PACKAGE GROUPS

User responses have been tabulated by eight systems software package topic areas for group averaging and comparisons. Some groups have been further arranged into subgroups for reader ease in comparing the individual package bar charts presented at the end of this report. The systems software package groupings are:

- **Database Management Packages**—subgrouped in bar chart presentations by database managers (DBMS), file managers, and data dictionary packages.
- **Report Writers**—no subgroups.
- **Telecommunications Monitors**—no subgroups.
- **Other Communications Packages**—subgrouped in bar chart presentations by network controls, conversational monitors, job stream controls, terminal support and terminal control packages.
- **Operating Systems/Systems Support Packages**—subgrouped in bar chart presentations by operating systems, resource optimizers, job stream managers, library managers, disk space managers, tape managers, file dump/restorers, and sort packages.
- **Systems Management Aid Packages**—subgrouped in bar chart presentations by modeling/simulation aids, system or program measurement aids, schedulers, job accounting aids, recovery aids, and systems security packages.
- **Programming Utility Packages**—subgrouped in bar chart presentation by flow-charters, program development aids, format converters, and optimizers.
- **Language Processors**—no subgroups.

## GROUP & PACKAGE RATINGS

The following list highlights the user Overall Satisfaction ratings for the eight systems software groups. Also included are ratings related to those individual packages within the group that meet or exceed the average number of responses per package in the group.

The Mean user ratings relate to the Superior (10 to 9), Very Good (8 to 6) or Acceptable (5 to 3) scale factors. As with the Overall Satisfaction levels previously discussed, the following group and package averages were defined as Superior, indicating a package that met or exceeded all requirements; Very Good, meeting or exceeding





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# Only 18% of users said they were considering replacement of their installed packages.

most requirements; and Acceptable, meeting many requirements.

Complete graphic presentations on all group packages are included in the bar charts that accompany the report.

**Database Management Packages**—25 packages sampled, with average response per package of 28.2 users. Mean Overall Satisfaction ratings are arranged in numerical order.

- 8.4 Mean • System Support Software (SSS) Quickjob II
- 8.3 Mean • Burroughs DMS II
- 8.0 Mean • Cullinane IDMS • Hewlett-Packard Image
- 7.7 Mean • Pansophic Easytrieve
- 7.1 Mean • group average • Software ag ADABAS
- 6.9 Mean • Informatics Mark IV
- 6.6 Mean • Intel/MRI System 2000
- 6.5 Mean • IBM Mapics
- 6.3 Mean • Cincom Total • Sperry Univac IMS
- 6.1 Mean • IBM DL1 • IBM IMS database man-

ager • Burroughs Forte/Forte II

**Report Writers**—7 packages sampled, with average response per package of 16.3 users.

- 7.9 Mean • Dylakor DYL-260
- 7.3 Mean • Cullinane Culprit
- 6.4 Mean • Burroughs Reporter
- 6.1 Mean • group average

**Telecommunications Monitors**—11 packages sampled, with average response per package of 24.5 users.

- 7.8 Mean • Westinghouse Westi
- 7.1 Mean • Insac Software/Altergo Shadow
- 6.6 Mean • group average
- 6.3 Mean • IBM CICS
- 6.2 Mean • Cincom Environ/I
- 5.7 Mean • SDA Products Intercomm
- 5.4 Mean • TSI Task/Master

**Other Communications Packages**—14 packages sampled, with average response per package of 23.6 users.

- 8.5 Mean • ADR Vollie conversational monitor
- 8.0 Mean • IBM JES 2 job stream control

7.6 Mean • IBM CMS conversational monitor

- 7.5 Mean • ADR Roscoe conversational monitor
- 6.7 Mean • group average
- 6.6 Mean • IBM ICCF terminal control
- 6.2 Mean • IBM TSO conversational monitor
- 6.1 Mean • IBM NCP network control
- 6.0 Mean • IBM MTC terminal support

**Operating Systems/Systems Support Packages**—28 packages sampled, with average response per package of 32.9 users.

- 9.2 Mean • Goal Flee/Film system library maintenance
- 8.8 Mean • Syncsort/Whitlow Syncsort sorter
- 8.7 Mean • Innovation FDR file dump/restore
- 8.6 Mean • Westinghouse Dump/Restor DOS file dump/restore
- 8.4 Mean • Computer Associated CA-Sort sorter
- 8.2 Mean • ADR Librarian library management
- 8.0 Mean • NCI Slick library maintenance • University Computing UCC-One tape volume management
- 7.8 Mean • group average
- 7.7 Mean • Computer Associates CA-Dynam/T tape volume management
- 7.6 Mean • Pansophic Panvalet library maintenance
- 7.4 Mean • IBM VM/370 operating system • IBM Power job stream management
- 7.2 Mean • Computer Associates CA-Dynam/D disk space management
- 7.1 Mean • Tower/Oxford DFAST disk space management
- 6.9 Mean • Nixdorf EDOS operating system
- 6.6 Mean • Capex/Gulf TLMS tape volume management
- 6.4 Mean • Tower/Oxford TFAST tape volume management

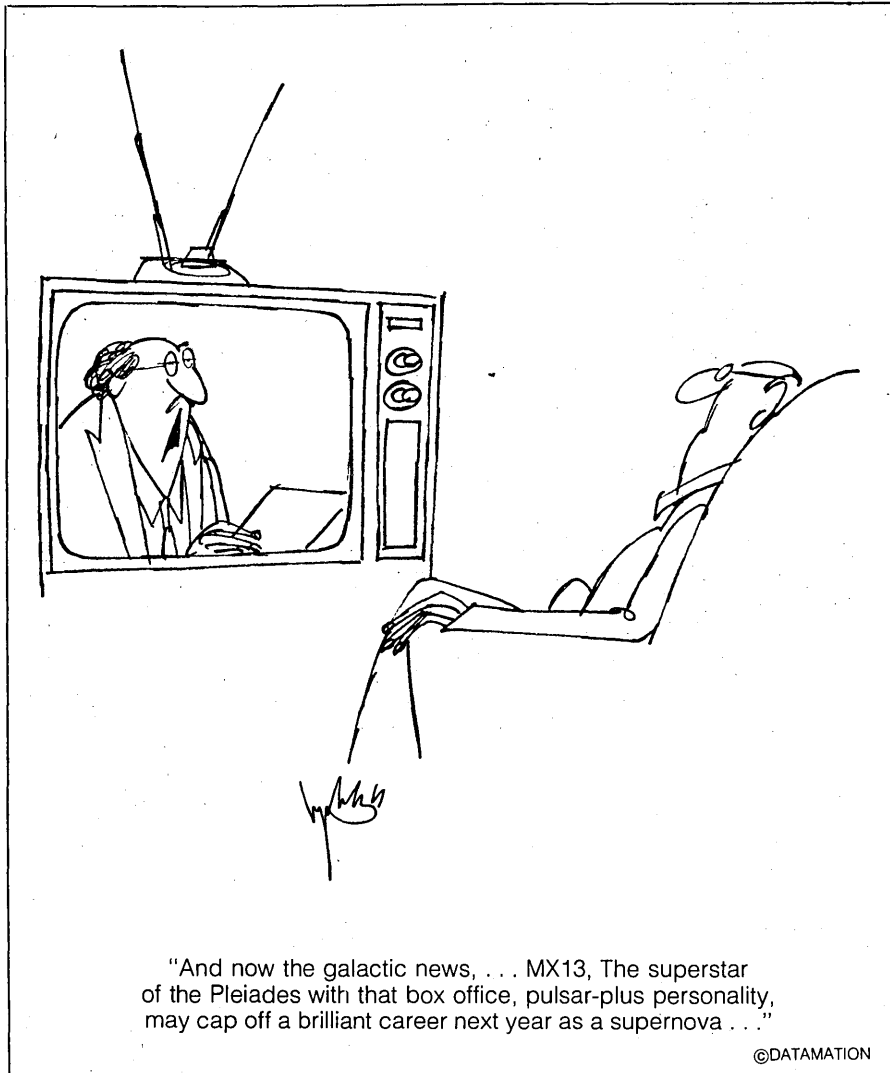
**Systems Management Aids**—12 packages sampled, with average response per package of 13.5 users.

- 7.8 Mean • ADR Look Performance measurement
- 6.8 Mean • University Computing UCC-15 job recovery
- 6.6 Mean • Westinghouse Job Monitor job accounting
- 6.2 Mean • Value Comput-A-Chg job accounting
- 6.1 Mean • Value Computing CSCS scheduler • Johnson Systems JARS job accounting
- 5.8 Mean • group average

**Programming Utilities**—six packages sampled, with average response per package of 18.8 users.

- 7.9 Mean • Capex Optimizer/Optimizer II optimizer.
- 7.7 Mean • group average
- 7.6 Mean • NCI OWL program development
- 7.0 Mean • University Computing UCC-Two format converter

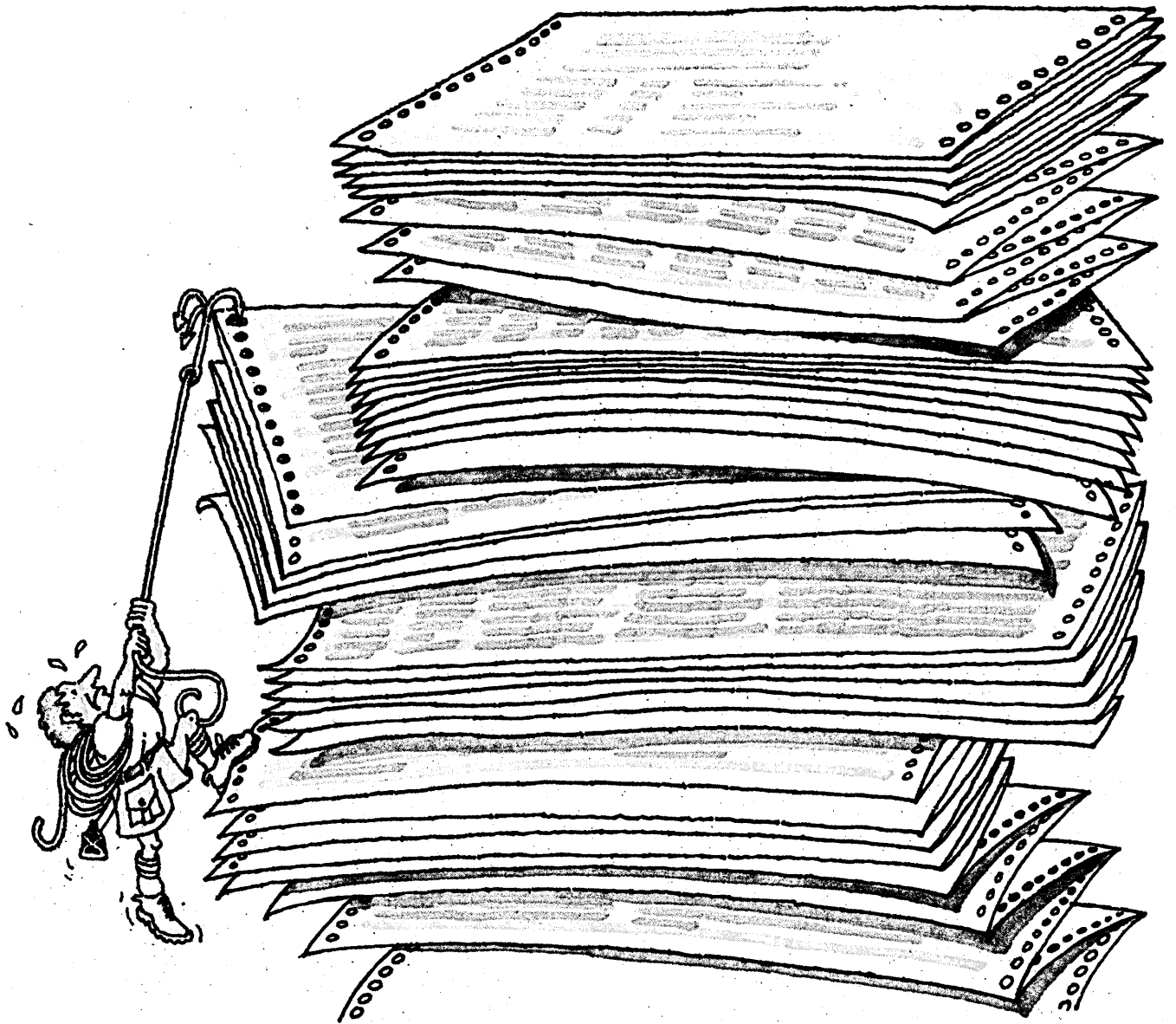
**Language Processors**—three pack-



"And now the galactic news, . . . MX13, The superstar of the Pleiades with that box office, pulsar-plus personality, may cap off a brilliant career next year as a supernova . . ."

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# ASM2 versus the mountain

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• Volume cleanup • Standards  
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those datasets that meet your own specified characteristics. It isolates exceptions, and lets you act on them.

ASM2's recent enhancements include support for the latest IBM hardware (3380s) and software (MVS/SP and DF/DS). No other DASD management system offers

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ages sampled, with average response per package of 13.7 users.

9.3 Mean • Waterloo WATFIV language processor

8.0 Mean • group average

## RATING BARS

The following bar charts provide a graphical representation of user ratings with respect to questions on Overall Satisfaction, Installation and Initial Use, Vendor Service and Support, and Operations criteria. Graphs are presented for 106 of the 107 systems software packages that were sampled; survey results were not obtained for one package.

In addition, bar ratings are included for both the total survey and for the individual systems software group averages. Data are also included with each bar chart citing the total number of user responses, the number of users rating the package as providing "outstanding" features and capabilities, and the number of users actively considering replacing the package for any reason as well as the number seeking replacement for generally unsatisfactory performance.

Bar chart ratings at three scale levels are illustrated—Superior (10 to 9), Very Good (8 to 6), and Acceptable (5 to 4). Ratings under 4 are not graphed.

**Overall Satisfaction**—as previously discussed, this bar represents overall user satisfaction with package features, capabilities, and/or utility with respect to requirements; with the frequency of failures requiring extra efforts for recovery; and with vendor installation, documentation, modification and training support.

**Installation & Initial Use**—user ratings or program freedom from bugs/errors, the time required for initial installation, and the ease of initial implementation, including the quality of documentation and training.

**Vendor Service**—user ratings of the vendor's speed and thoroughness in fixing bugs/errors, the quality of vendor program modifications, and the frequency of package updating.

**Operations**—user ratings of program efficiency of expanding processing volume, initiation/calling procedures, and backup/recovery procedures.

(Special note: for split bar presentations, solid bar designates package results, open bar denotes common group average.)

This systems software survey is based on a report in Data Decisions' Computer Systems, a looseleaf monthly updated reference service covering hardware and software. A trial review is available from Data Decisions, 20 Brace Rd., Cherry Hill, NJ 08034; telephone (800) 257-7732. In New Jersey, (609) 429-7100.

## AV. TOLERANCES FOR 68% CONFIDENCE LEVEL

SAMPLE SIZE	OVERALL SATISFACTION			SPECIFIC ATTRIBUTE RATINGS			
	6.0 or Under	7.0	8.0 or More	Under 5.0	5.0 to 6.0	7.0	8.0 or More
50 or more	.25	.25	.15	-	.30	.25	.20
40 to 49	.30	.25	.20	-	.30	.30	.25
30 to 39	.30	.30	.20	-	.35	.30	.25
20 to 29	.40	.35	.30	-	.45	.40	.35
10 to 19	.60	.55	.40	.90	.60	.55	.45
9 or less	.60	.60	.45	.90	.75	.70	.55

Table Reads: The chances are approximately two in three that a reported rating differs by no more than the indicated tolerance from the rating that would have been obtained had all eligible sites been enumerated. For example, suppose a sample of 30 sites gives a software package rating of 7.0 for Overall Satisfaction. The table indicates a tolerance of .30 on this estimate. Thus, the chances are two in three that the interval 6.70 to 7.30 includes the rating that would have been obtained had all eligible sites been enumerated.

## METHODOLOGY

### Universe & Sample

Because the focus of the study was on user perception of specific systems packages, the sample was selected from a universe of known users of each package. A list of installations maintained by Computer Intelligence Corp. of La Jolla, Calif., was the sample source. For those systems packages in use at more than 100 installations, a sample of 100 names was selected on an "nth" name basis. For those packages in use at 100 or fewer installations, an effort was made to collect data from all known users of the package. Packages installed at fewer than 10 sites were excluded from the survey.

### Mailing

In total, 7,101 questionnaires were sent to known users of 107 different software packages at 5,936 sites. Questionnaires were addressed to a specific individual at the location—most often the data processing manager. A sweepstakes offer for a trip to London was included with the mailing to stimulate response.

A total of 2,786 questionnaires from 2,485 sites were returned; 18 questionnaires, addressed to 14 sites, were undeliverable by the post office. To increase overall response rate and to ensure an adequate response base for each individual systems package, telephone interviews among non-respondents to the mail survey were performed. The questionnaire used in the telephone interview portion of the survey was identical to that used in the mail survey.

The sample for telephone interviews was selected in such a way as to provide a minimum of 40% response for each systems package included in the survey. A total of 473 telephone interviews were completed. This brought the total number of survey responses to 3,259, representing 2,907 different sites for a 46% response rate. Included in the 3,259 responses were 603 indicating that the specific package was not currently in use at the installation.

### Questionnaire

The survey questionnaire on which this report is based first qualified the respondent as a user of the specific systems pack-

age being discussed, and then explored various dimensions of the package's acquisition and use:

**Environment** within which the package was used, including the length of time installed, how the package was supported, and the computer and operating system on which it ran.

**Purchase Process**—including the considerations of alternative packages prior to purchase, and the perceived importance of selected factors on the buyer's decision.

**User Ratings**—including nine features relating to package installation and implementation, initial use, service, and operations. A 10-point scale was used in all ratings questions. To aid precision, verbal guides as well as numerical values were given: 10 and 9 were identified as Superior; 8, 7 and 6 as Very Good; 5, 4 and 3 as Acceptable; and 2 and 1 as Inadequate.

**User Perception of Value**—with value of the package defined on the basis of capabilities and features relative to competitive packages and to competitive package costs.

**Package Replacement**—whether or not user is considering package replacement, and if so, for what reasons.

**User Overall Evaluation**—including extent to which package performance met or exceeded vendor promises, and overall user satisfaction with the package.

### Findings

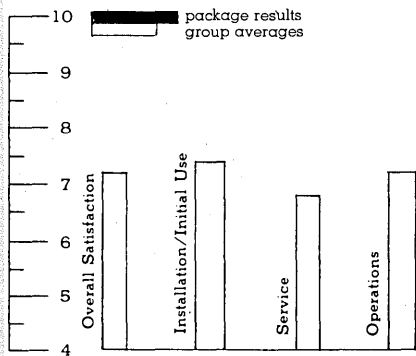
The findings presented in this report reflect user perceptions of package performance in response to the particular dimensions probed in the survey questionnaire. These are not intended to be all-inclusive, nor do they necessarily produce evaluations comparable to those which would be obtained under conditions of a controlled engineering test or experiment.

As in all sample surveys, the numbers reported are estimates within a range of what would have been obtained had all user sites in the survey universe been similarly enumerated. The margins of sampling variation or tolerances applicable to ratings of individual aspects of systems software performance are given in the table.

## OVERALL SUMMARY

**Average - All Packages** • 106 packages

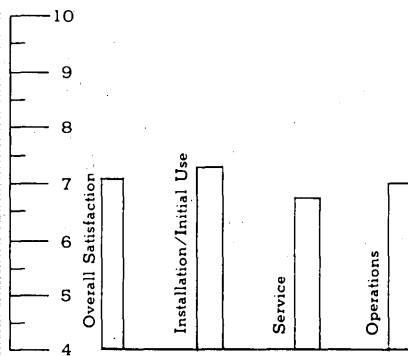
25.1 responses • 11.2 users judged features/capabilities outstanding • 4.4 users actively seeking to replace package, with 0.6 citing unsatisfactory performance as reason.



## DATABASE MANAGERS/FILE PROCESSORS/AIDS

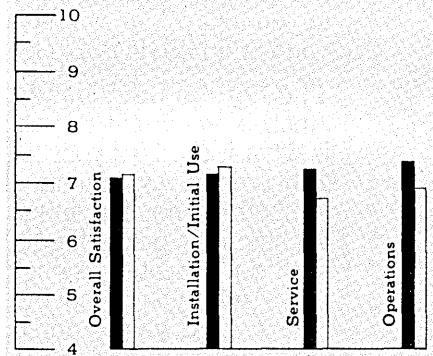
**Group Average** • 25 packages

28.2 responses • 11.4 users judged features/capabilities outstanding • 5.3 users actively seeking to replace package, with 0.4 citing unsatisfactory performance as reason.



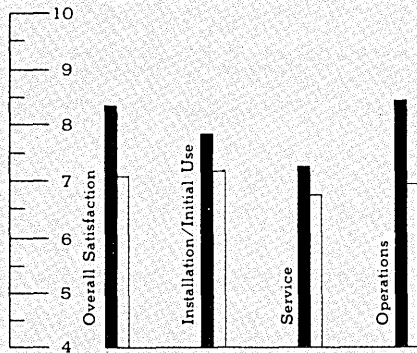
**ADR DATACOM/DB** • database • Applied Data Research, Route 206 & Orchard Rd., Princeton NJ 08540 • 201-874-9000

15 responses • 7 users judged features/capabilities outstanding • 3 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



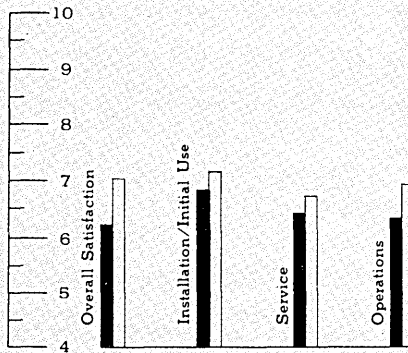
**BURROUGHS DMS II** • database • Burroughs Corp., Burroughs Place, Detroit, MI 48232 • 313-972-7000

55 responses • 41 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



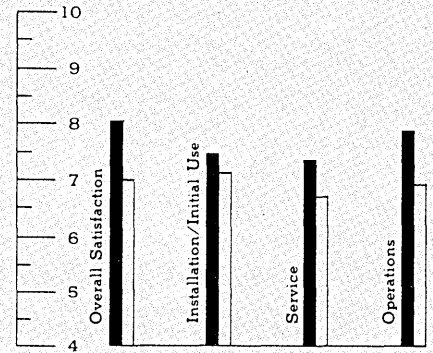
**CINCOM TOTAL** • database • Cincom Systems Incorporated, 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

36 responses • 11 users judged features/capabilities outstanding • 15 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



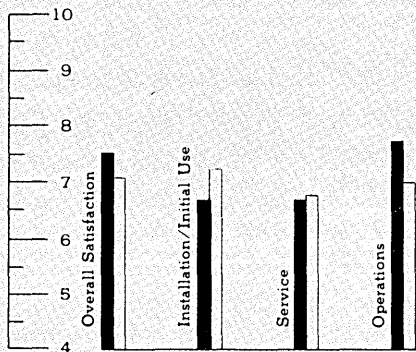
**CULLINANE IDMS** • database • Cullinane Database Systems, 400 Blue Hill Drive, Westwood, MA 02090 • 617-329-7700

45 responses • 31 users judged features/capabilities outstanding • 3 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



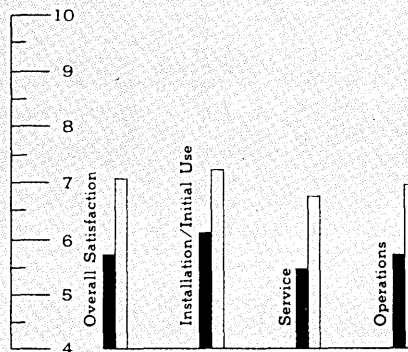
**HONEYWELL DM-IV** • database • Honeywell Information Systems, 200 Smith Street, Waltham, MA 02145 • 617-890-8400

11 responses • 4 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



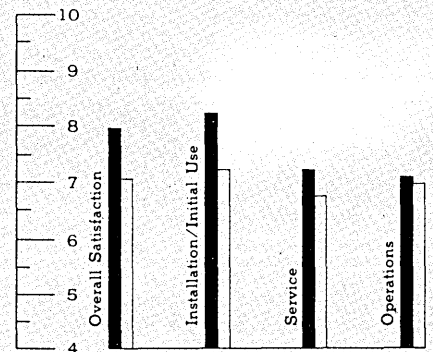
**HONEYWELL IDS/1** • database • Honeywell Information Systems, 200 Smith Street, Waltham, MA 02154 • 617-890-8400

7 responses • 1 user judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



**HP IMAGE** • database • Hewlett-Packard, Data Systems Division, 11000 Wolfe Road, Cupertino, CA 95014 • 408-257-7000

49 responses • 29 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



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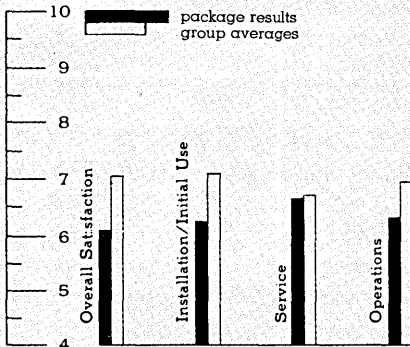
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CIRCLE 112 ON READER CARD

# SYSTEMS SOFTWARE RATINGS

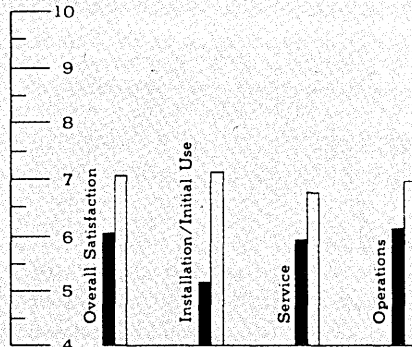
**IBM DL1** • database • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

42 responses • 10 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



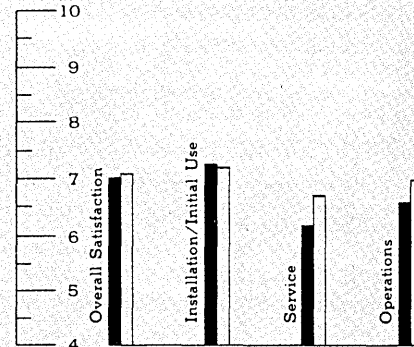
**IBM IMS** • database • IBM Data Processing Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

38 responses • 16 users judged features/capabilities outstanding • 7 users actively seeking to replace package, with 3 citing unsatisfactory performance as reason.



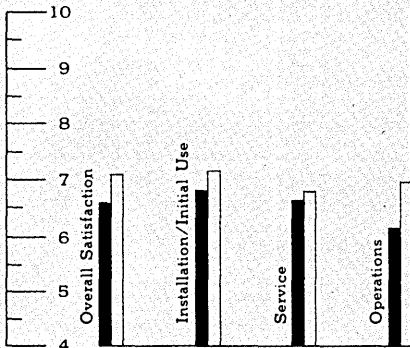
**INFODATA INQUIRE** • database • Infodata Systems, Inc. 5205 Leesburg Pike, Suite 700, Falls Church, VA 22041 • 703-578-3430

8 responses • 2 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



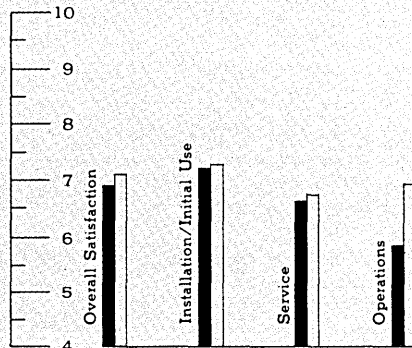
**INTEL/MRI SYSTEM 2000** • database • Intel Systems Corp., 12675 Research Blvd., Austin, TX 78766 • 512-258-5171

31 responses • 3 users judged features/capabilities outstanding • 8 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



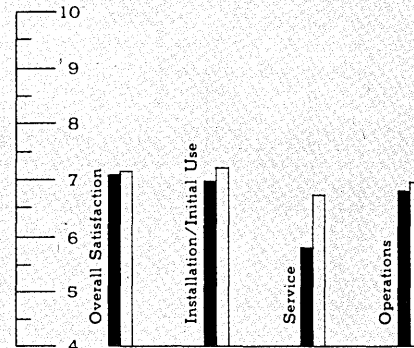
**MATHEMATICA RAMIS** • database • Mathematica Products Group, P.O. Box 2392, Princeton, NJ 08540 • 609-799-2600

responses • 5 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



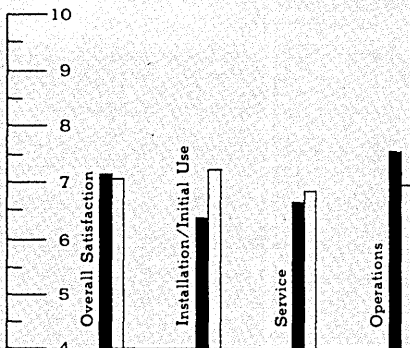
**SOFTWARE AG ADABAS** • database • Software AG of North America • 11000 Sunrise Valley Drive, Reston, VA 22091 • 703-860-5050

40 responses • 20 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



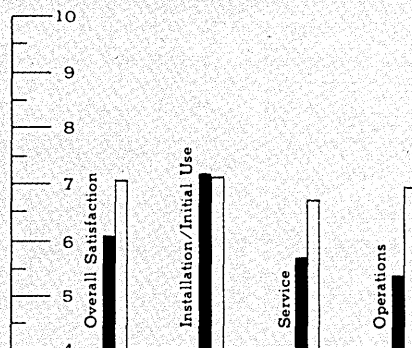
**UNIVAC DMS** • database • Sperry Univac Division, Sperry Corp., P.O. Box 500, Blue Bell, PA 19422 • 215-542-4011

20 responses • 8 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



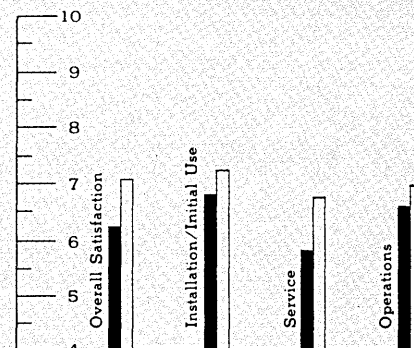
**BURROUGHS FORTE/FORTE II** • file management • Burroughs Corp., Burroughs Place, Detroit, MI 48232 • 313-972-7000

36 responses • 6 users judged features/capabilities outstanding • 21 users actively seeking to replace package, with 3 citing unsatisfactory performance as reason.

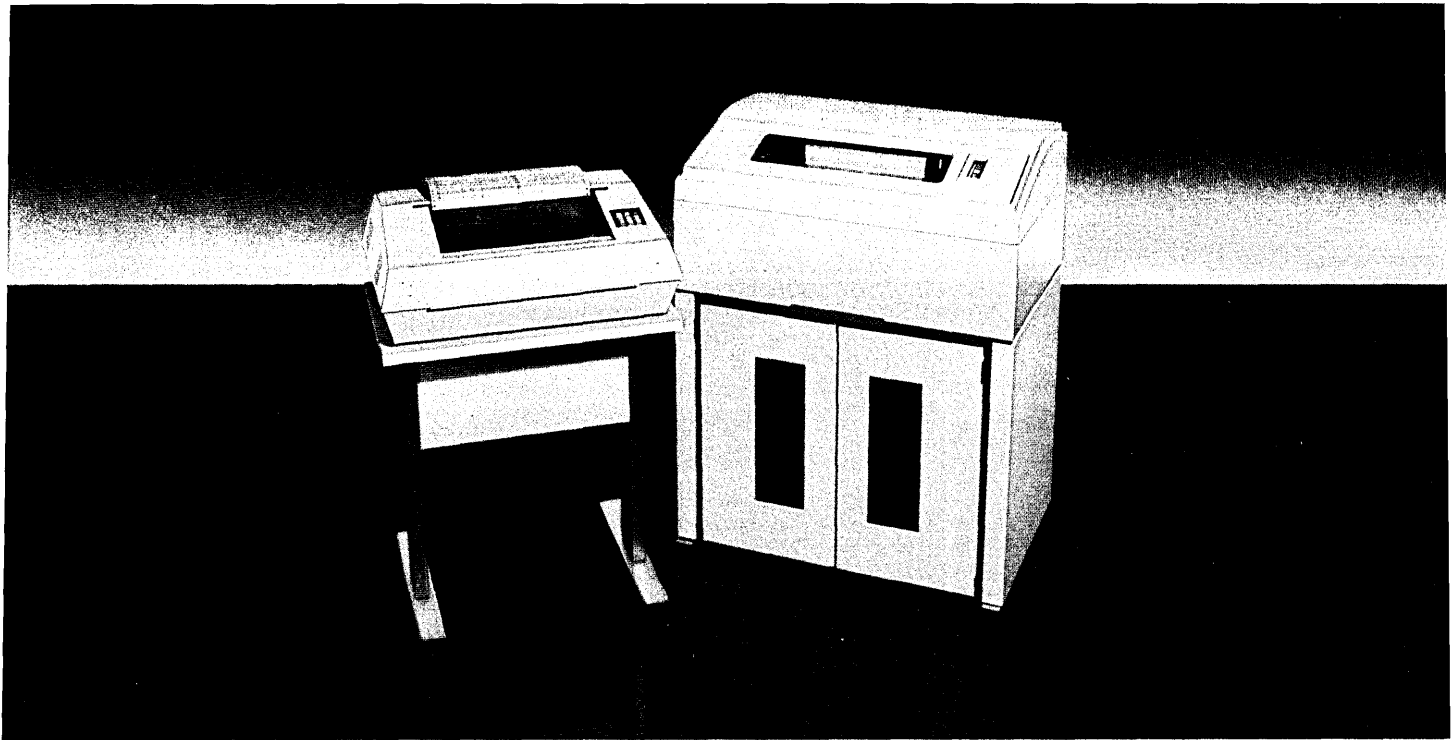


**COMTEN/NCR AMIGOS** • file management • NCR Comten, Inc., 3 Choke Cherry Road, Rockville, MD 20850 • 301-948-8000

7 responses • 2 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.







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Telephone \_\_\_\_\_

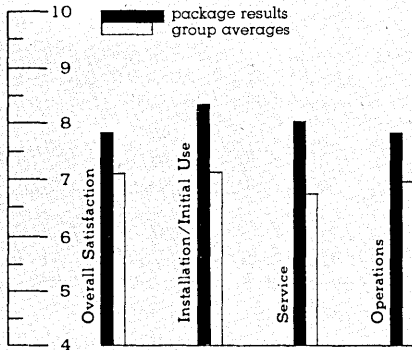
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CIRCLE 113 ON READER CARD

# SYSTEMS SOFTWARE RATINGS

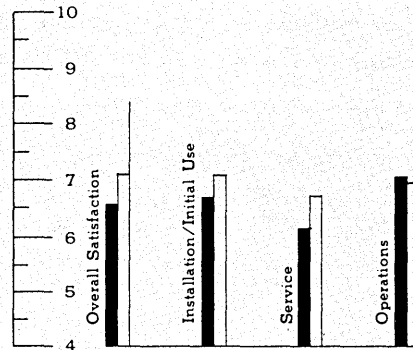
**DYLA KOR DYL-250** • file management • Dylakor, 17418 Chatsworth Street, Granada Hills, CA 91344 • 213-366-1781

13 responses • 6 users judged features/capabilities outstanding • 7 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



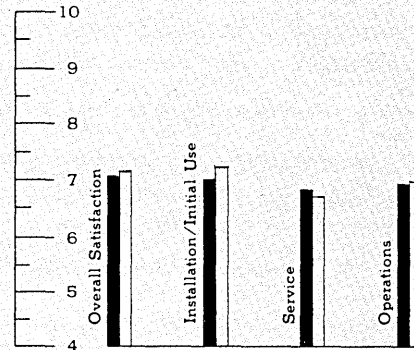
**IBM MAPICS** • file management • IBM, GSD, 5775 Glenridge Drive, NE, Atlanta, GA 30301 • 404-256-7000

46 responses • 21 users judged features/capabilities outstanding • 11 users actively seeking to replace package, with 2 citing unsatisfactory performance as reason.



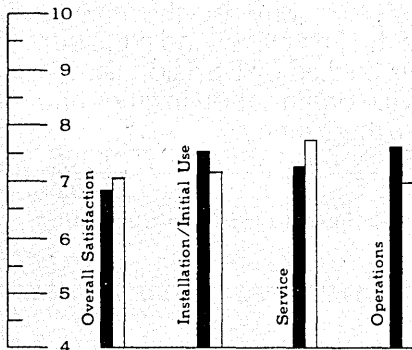
**IBM VSAM** • file management • IBM, DPD, 1133 Westchester Avenue, White-plains, NY 10604 • 914-696-1900

25 responses • 7 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



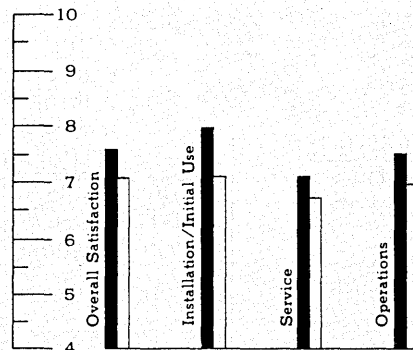
**INFORMATICS MARK IV** • file management • Informatics, Inc., Software Products Division, 21050 Vanowen Street, Canoga Park, CA 91304 • 213-887-9121

33 responses • 9 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



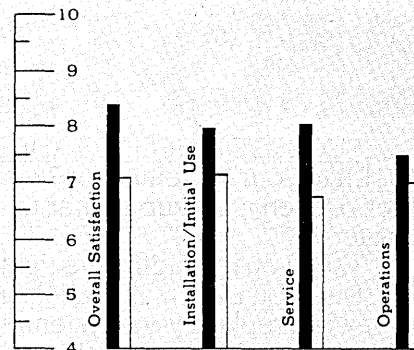
**PANSOPHIC EASYTRIEVE** • file management • Pansophic Systems, Inc., 709 Enterprise Drive, Oakbrook, IL 60521 • 312-986-2260

39 responses • 17 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



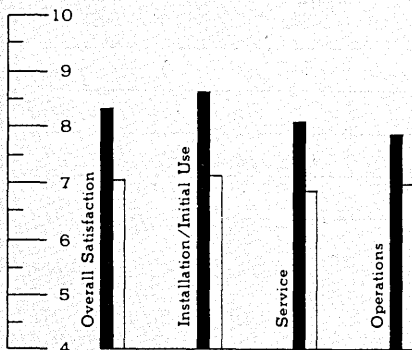
**SAS SAS** • file management • SAS Institute, Inc., SAS Circle, Cary, NC 27511 • 919-467-8000

10 responses • 7 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



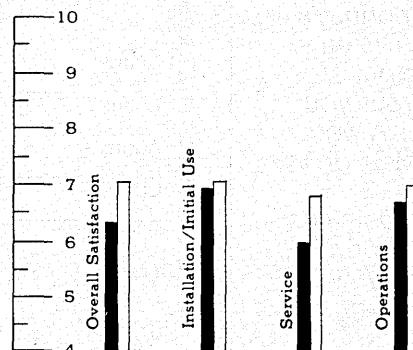
**SSS QUICKJOB II** • file management • System Support Software, Inc., 5230 Springboro Pike, Dayton, OH 45439 • 513-435-9514

40 responses • 20 users judged features/capabilities outstanding • 3 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



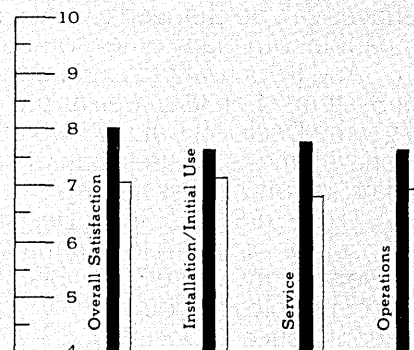
**UNIVAC IMS** • file management • Sperry Univac Division, Sperry Corp., P.O. Box 500, Blue Bell, PA 19422 • 215-542-4011

36 responses • 9 users judged features/capabilities outstanding • 8 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.

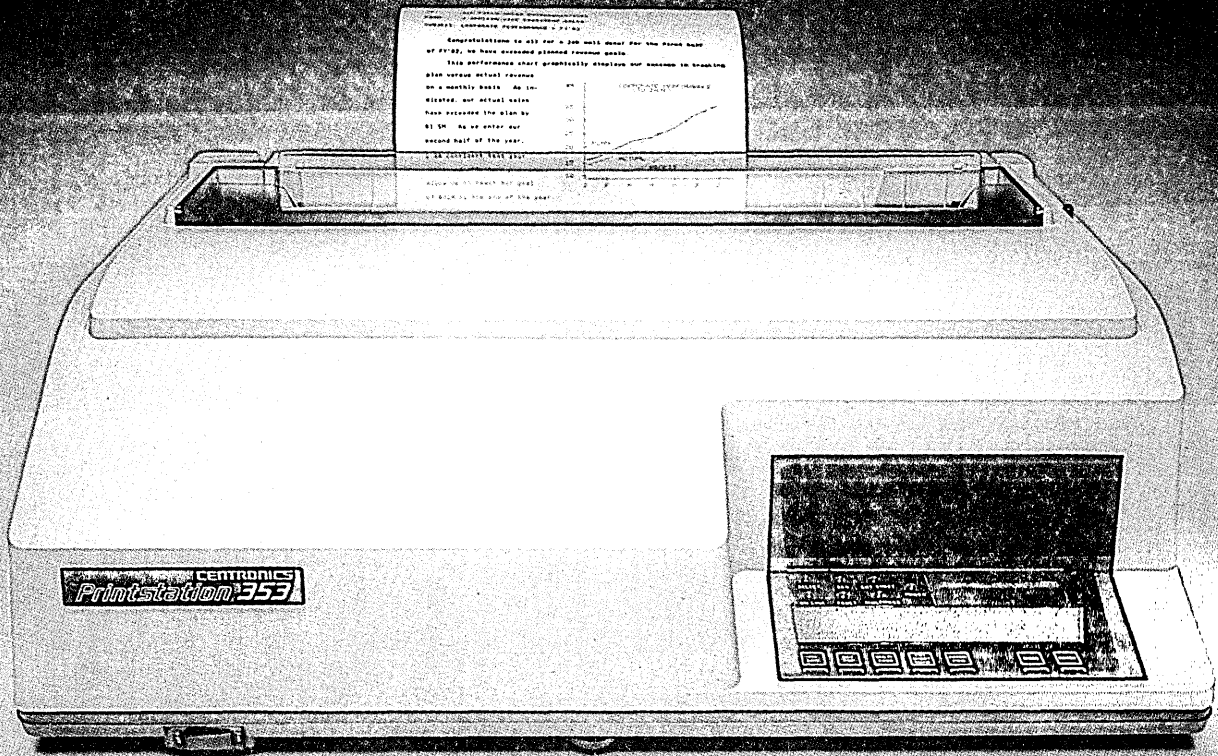


**UCC UCC - TEN** • data dictionary • University Computing Company, UCC Tower/Exchange Park, Dallas, TX 75235 • 214-353-7100

11 responses • 7 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



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PRINTSTATIONS**

Centronics Data Computer Corp.,  
Hudson, New Hampshire 03051  
603-883-0111

CIRCLE 114 ON READER CARD

# Color Retro-Graphics.<sup>TM</sup> Our Terminal Enhancements Cross Yet Another Frontier.



For over three years now, Retro-Graphics<sup>TM</sup> terminal enhancements have transformed some of today's most popular alphanumeric terminals into impressively-featured graphics terminals. Now Digital Engineering, the pioneer in graphics upgrades and creator of Retro-Graphics, has taken its successful idea and made it a colorful one as well. An idea that makes sense to the business and scientific communities alike, by making sales and financial charts, as well as complicated engineering drawings, easy to produce—and startlingly easy to afford.

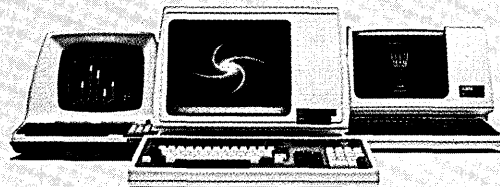
## **Introducing the DM800 Retro-Graphics Enhancement for the Datamedia<sup>TM</sup> Colorscan<sup>TM</sup> Terminal.**

Here is a formidable tool. Eight colors, chosen from a 64-color palette, can be selected and displayed at once. And thanks to a high-quality 640 x 480 resolution, graphics images are displayed crisply and vividly. There is, of course, Tektronix<sup>®</sup> 4027 graphics terminal emulation, fully software compatible with ISSCO's<sup>®</sup> DISSPLA<sup>®</sup> and TELLAGRAF<sup>®</sup> and Tektronix PLOT 10<sup>®</sup>. The

enhanced Colorscan terminal does vector and arc drawing, point plotting, text generation, area fill and shading patterns, thus allowing complex graphics functions to execute with a single instruction. Graphics input options include a light pen for selecting and altering screen objects as well as a bit pad for fast entry of X-Y coordinates. And for color hard copy, the Retro-Graphics DM800 interfaces to a variety of printers, plotters and cameras.

## **All of the Above for Well Below the Competition.**

High-quality, high-power color graphics at a price thousands of dollars less than competitive products. Suggested retail price for the Retro-Graphics enhanced Colorscan terminal is actually under \$5000. Call your Digital Engineering distributor today for more information, or contact us directly.



Other Retro-Graphics terminal enhancements are available for Lear Siegler's ADM-3A and 5 Dumb Terminal<sup>®</sup> displays, TI's 940 Electronic Video Terminal and DEC's<sup>™</sup> VT100<sup>™</sup> and VT132<sup>™</sup> Terminals.

 **DIGITAL  
ENGINEERING**

630 Bercut Drive, Sacramento, CA 95814  
(916) 447-7600, TWX: 910-367-2009

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**CIRCLE 115 ON READER CARD**

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Liebert Corporation, 1050 Dearborn Drive, P.O. Box 29186, Columbus, Ohio 43229, Phone 614-888-0246 Telex 246-655 Liebert WOGN

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Have a salesman call

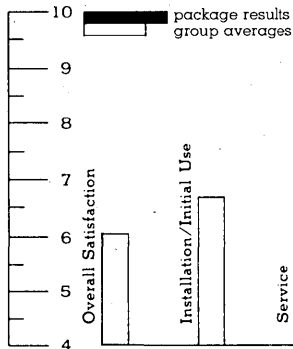
LIEBERT-COMPUTER

# SYSTEMS SOFTWARE RATINGS

## REPORT WRITERS

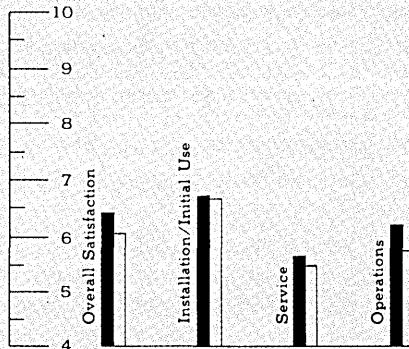
**Group Average • 7 packages**

16.3 responses • 3.9 users judged features/capabilities outstanding • 4.2 users actively seeking to replace package, with 0.6 citing unsatisfactory performance as reason.



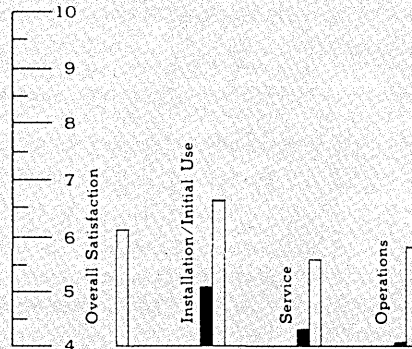
**BURROUGHS REPORTER •** report writer • Burroughs Corp. Burroughs Place, Detroit, MI 48232 • 714-731-5100

21 responses • 6 users judged features/capabilities outstanding • 3 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



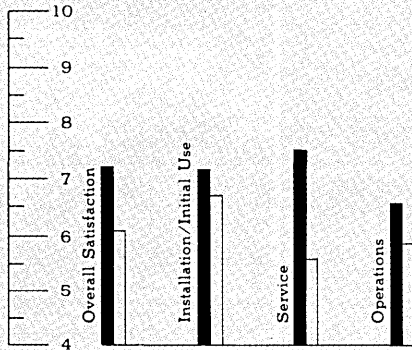
**CINCOM SOCRATES •** report writer • Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

8 responses • 0 users judged features/capabilities outstanding • 5 users actively seeking to replace package, with 2 citing unsatisfactory performance as reason.



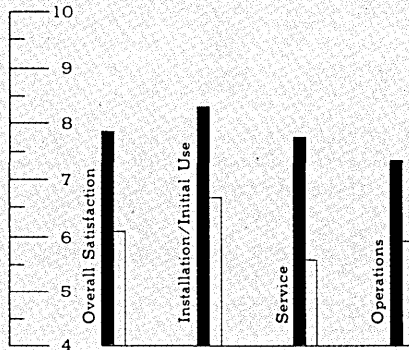
**CULLINANE CULPRIT •** report writer • Cullinane Database Systems, Inc., 400 Blue Hill Drive, Westwood, MA 02090 • 617-329-7700

21 responses • 9 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



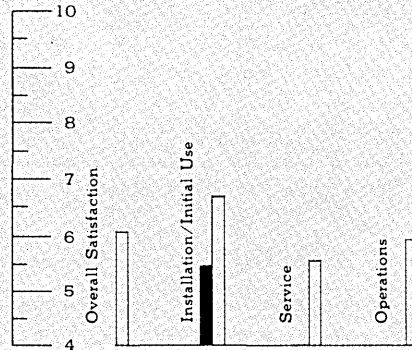
**DYLA KOR DYLA-260 •** report writer • Dylakor, 17418 Chatsworth Street, Granada Hills, CA 91344 • 213-366-1781

46 responses • 22 users judged features/capabilities outstanding • 8 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



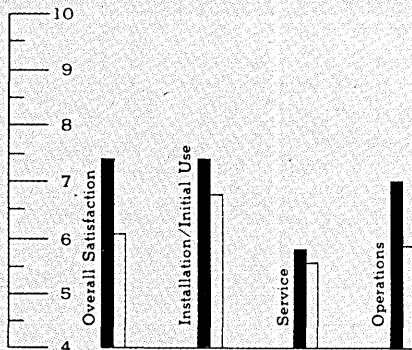
**INFORMATICS SCORE •** report writer • Informatics Inc., Software Products, 21050 Vanowen Street, Canoga Park, CA 91304 • 213-887-9121

5 responses • 0 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



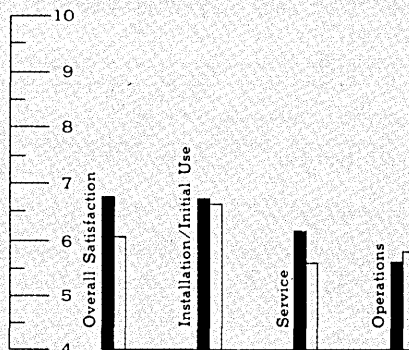
**ON-LINE WYLBUR •** report writer • On-Line Business Systems, Inc., 115 Sansome Street, San Francisco, CA 94104 • 412-931-7600

5 responses • 1 user judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



**TSI PROG-PROD ANALYZER •** report writer • TSI International, 50 Washington Street, Norwalk, CT 06854 • 203-853-2884

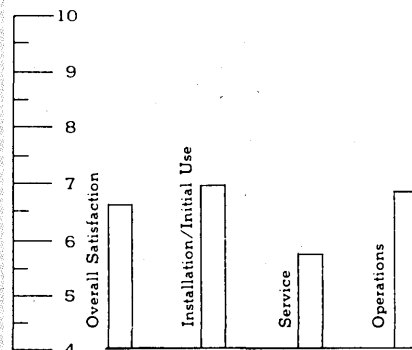
8 responses • 2 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



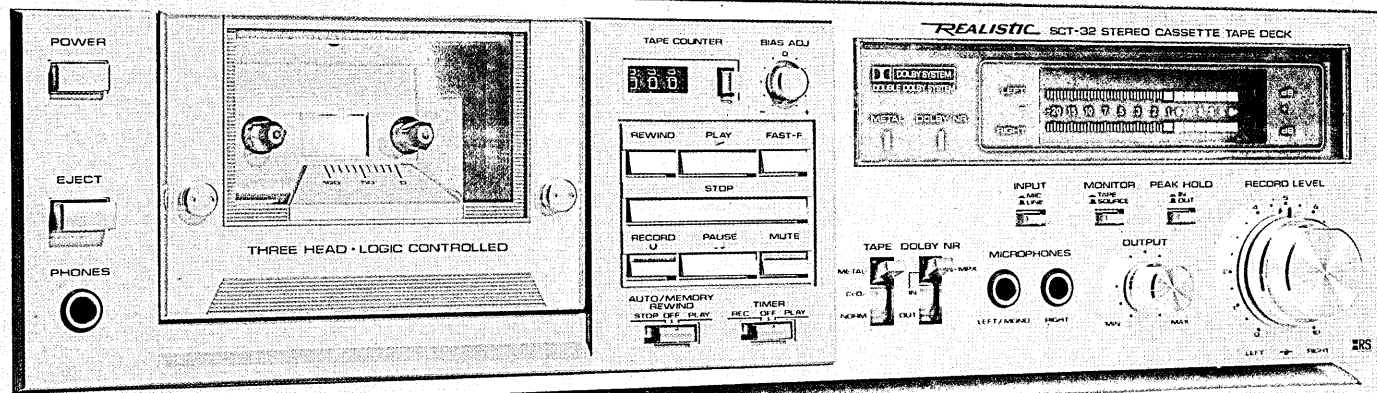
## TELECOMMUNICATIONS MONITORS

**Group Average • 11 packages**

24.5 responses • 7.7 users judged features/capabilities outstanding • 11.2 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.

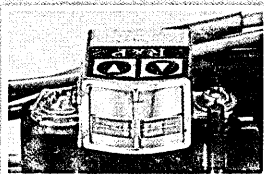


# How to Step Up to Three Heads, Twin Solenoids and Full Logic

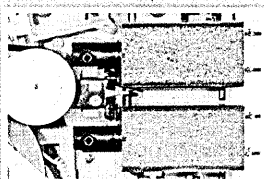


## (Without Wrecking Your Budget)

It's easy! Upgrade with the studio quality sound and performance of the new Realistic® SCT-32! Our top of the line gives you easy operation, a sensible price and exciting extras. You'll like the two-color fluorescent meters with switchable peak-hold that "remember" the highest signals for exact record-level setting. And the automatic Record Mute system that lets you edit—silently and electronically—as you record. Even pauses can be professional, because an LED flashes one per second for precise edit timing.



Separate record and play heads in one housing for permanent alignment



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Auto-rewind to the point where play button was last pressed

Separate ferrite record and play heads and independent Dolby\* noise reduction systems let you monitor your tape—in Dolby—as you record. Each head has the optimum gap-length to do its job—either recording or playback—so there's no compromise in audio quality. A variable bias control permits "fine-tuning" for the best electronic match with any normal, chrome or metal cassette. With metal tape, frequency response is an amazing 30 to 21,000 Hz,  $\pm 3$  dB.

You get gentle and precise tape handling. Go from rewind to play to fast forward—no matter how you key the light-touch electronic controls, you're protected from tape snarls and damage. A built-in microprocessor acknowledges your commands and relays them—with full logic—to powerful solenoids that control all tape movement. Recessed LEDs display status of operation.

Want to hear a selection again? Thanks to the microprocessor memory, all it takes is one light touch! You can also select end-of-tape Auto-Rewind to replay the entire side. Or, rewind and stop automatically. And here's something you'll really appreciate: You can add a timer for recording off-the-air when you're not at home. With all these features for only \$399.95, you should step up to the SCT-32 today. It's completely logical.

# Radio Shack®

A DIVISION OF TANDY CORPORATION

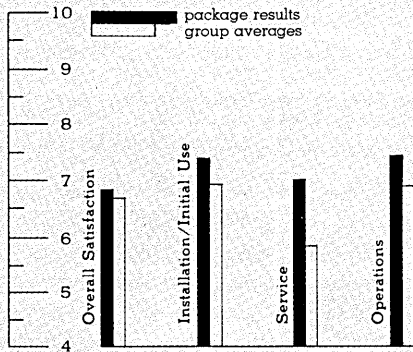
Price may vary at individual stores and dealers. \*Trademark of Dolby Laboratories, Inc.

CIRCLE 117 ON READER CARD

# SYSTEMS SOFTWARE RATINGS

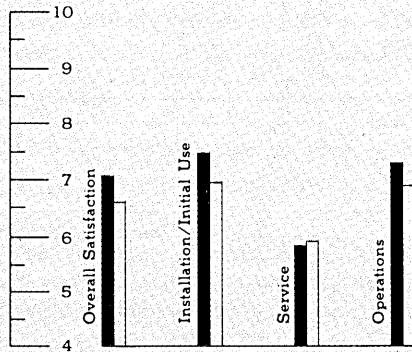
**ADR DATACOM/DC** • telecommunications monitor • Applied Data Research, Route 206 & Orchard Road, Princeton, NJ 08540 • 201-874-9000

8 responses • 3 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



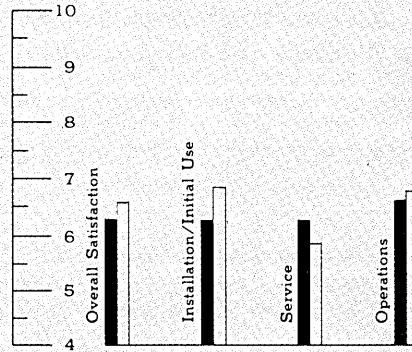
**ALTERGO SHADOW** • telecommunications monitor • Insac Software, Inc., 2300 Peachford Road, Suite 3235, Atlanta, GA 30338 • 404-452-7676

26 responses • 14 users judged features/capabilities outstanding • 7 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



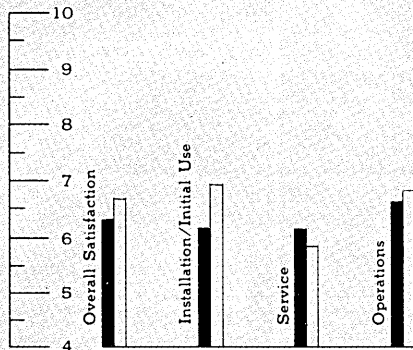
**CINCOM ENVIRON/1** • telecommunications monitor • Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

35 responses • 8 users judged features/capabilities outstanding • 16 users actively seeking to replace package, with 4 citing unsatisfactory performance as reason.



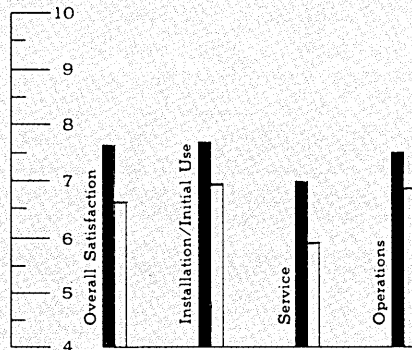
**IBM CICS** • telecommunications monitor • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

53 responses • 13 users judged features/capabilities outstanding • 5 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



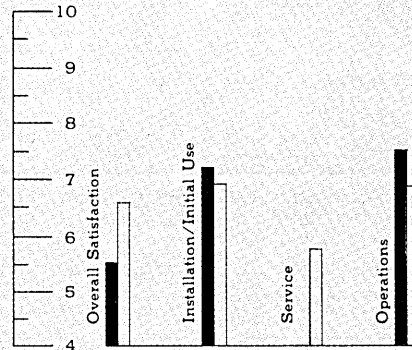
**MATHEMATICA SWIFT** • telecommunications monitor • Mathematica Products Group, P.O. Box 2392, Princeton, NJ 08540 • 609-799-2600

19 responses • 5 users judged features/capabilities outstanding • 8 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



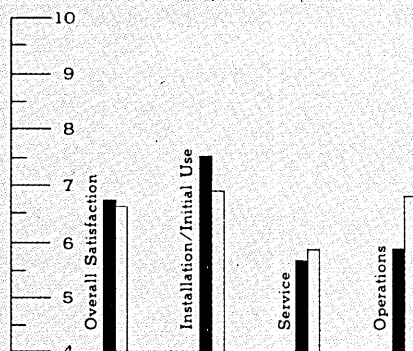
**RETIDA BETACOMM** • telecommunications monitor • Retida, Inc., 25 Mohegan Trail, Saddle River NJ 07458 • 201-327-4223

4 responses • 0 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



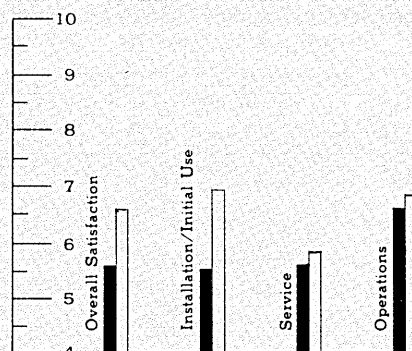
**SDA PRODUCTS MINICOMM** • telecommunications monitor • SDA Products, Inc., 475 Park Avenue, 26th Floor, New York, NY 10016 • 212-481-6800

16 responses • 1 user judged features/capabilities outstanding • 12 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



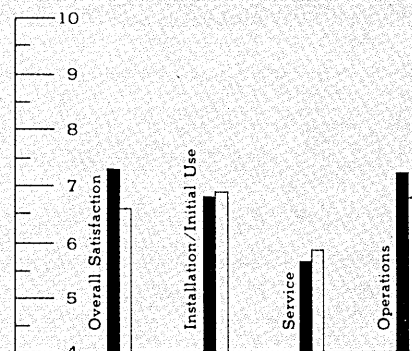
**SDA PRODUCTS INTERCOMM** • telecommunications monitor • SDA Products, Inc., 475 Park Avenue, 26th Floor, New York, NY 10016 • 212-481-6800

32 responses • 13 users judged features/capabilities outstanding • 21 users actively seeking to replace package, with 2 citing unsatisfactory performance as reason.



**SOFTWARE AG COM-LETE** • telecommunications monitor • Software AG of North America, 11800 Sunrise Valley Drive, Reston, VA 22091 • 703-860-5050

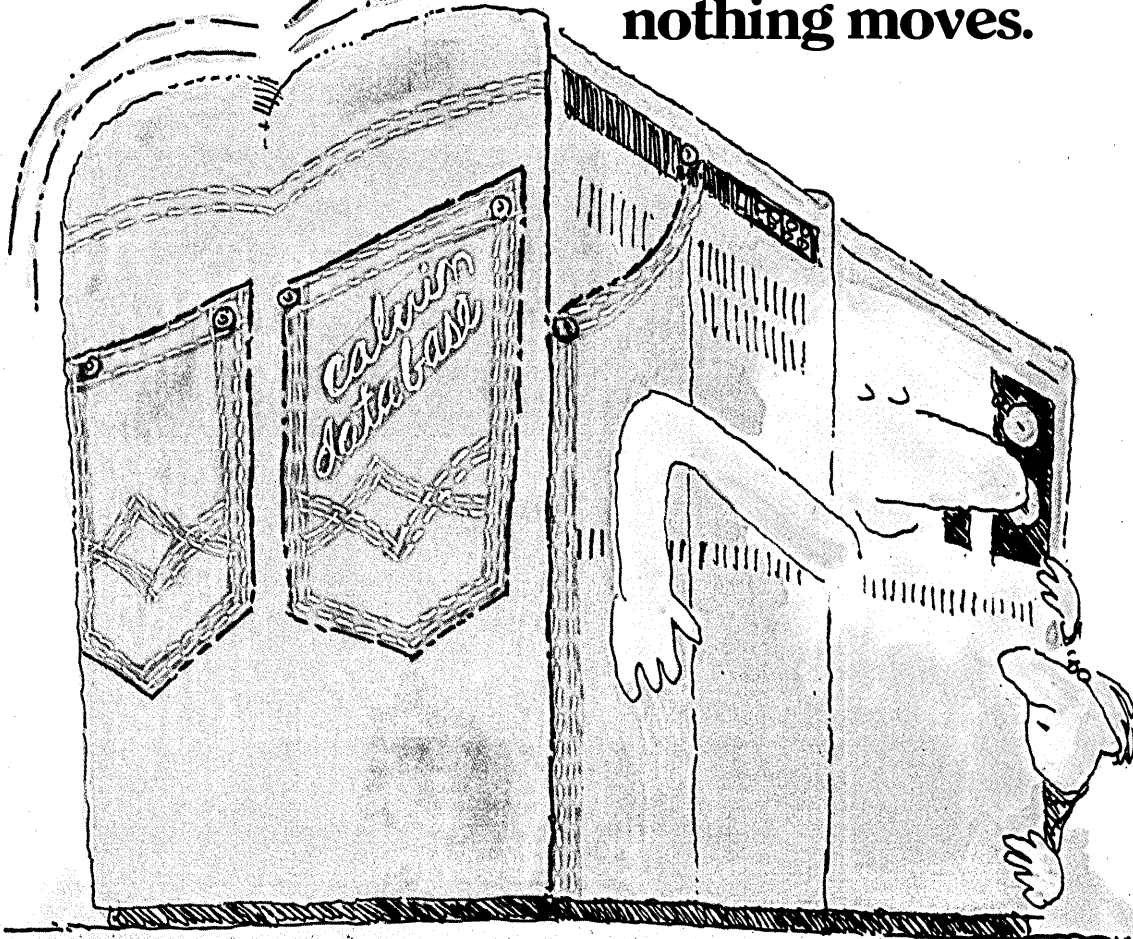
8 responses • 6 users judged features/capabilities outstanding • 0 users actively seeking to replace package.





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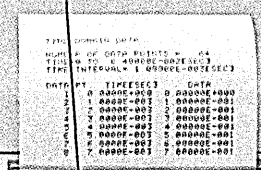
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611/22

*When performance must be measured by results.*

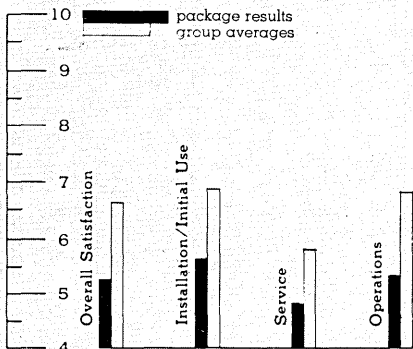


**HEWLETT  
PACKARD**

CIRCLE 39 ON READER CARD

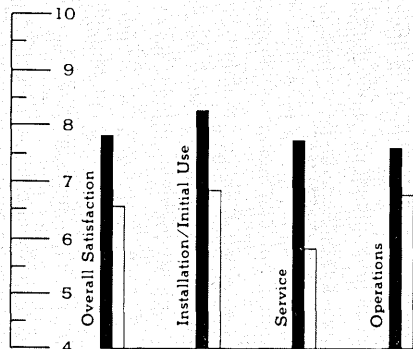
**TSI TASK/MASTER** • telecommunica-  
tions monitor • TSI International, 50  
Washington Street, Norwalk, CT 06854 •  
203-853-2884

34 responses • 8 users judged features/capabilities out-  
standing • 28 users actively seeking to replace package,  
with 11 citing unsatisfactory performance as reason.



**WESTINGHOUSE WESTI** • telecom-  
munications monitor • Westinghouse  
Electric Corp., 2040 Ardmore Blvd.,  
Pittsburgh, PA 15221 • 412-636-3100

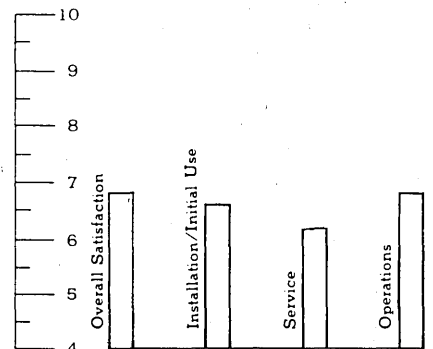
35 responses • 13 users judged features/capabilities out-  
standing • 15 users actively seeking to replace package,  
with 0 citing unsatisfactory performance as reason.



**OTHER COMMUNICATIONS PACKAGES**

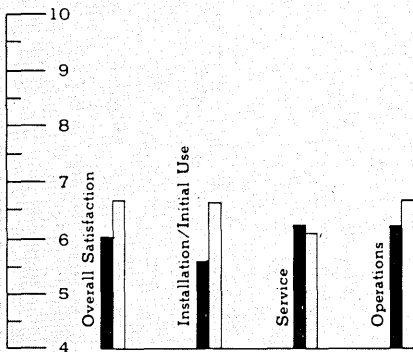
Group Average • 14 packages

23.6 responses • 10.4 users judged features/capabilities out-  
standing • 6.4 users actively seeking to replace pack-  
age, with 0.4 citing unsatisfactory performance as rea-  
son.



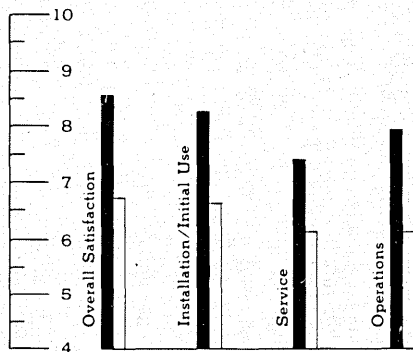
**IBM NCP** • network control • IBM DPD,  
1133 Westchester Avenue, White Plains,  
NY 10604 • 914-696-3043

27 responses • 7 users judged features/capabilities out-  
standing • 0 users actively seeking to replace package



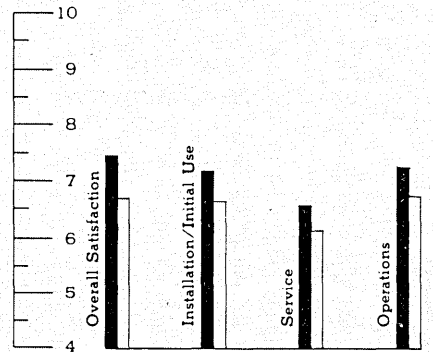
**ADR VOLLIE** • conversational monitor •  
Applied Data Research, Route 206 &  
Orchard Road, Princeton, NJ 08540 • 201-  
874-9000

39 responses • 29 users judged features/capabilities out-  
standing • 1 user actively seeking to replace package,  
with 0 citing unsatisfactory performance as reason.



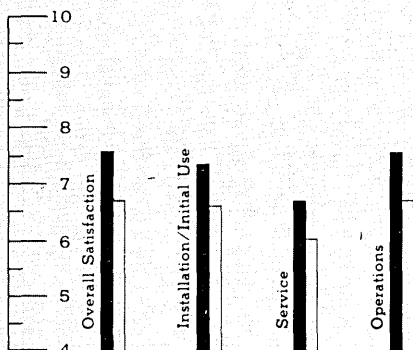
**ADR ROSCOE** • conversational monitor  
• Applied Data Research, Route 206 &  
Orchard Road, Princeton, NJ 08540 • 201-  
874-9000

35 responses • 12 users judged features/capabilities out-  
standing • 4 users actively seeking to replace package,  
with 1 citing unsatisfactory performance as reason.



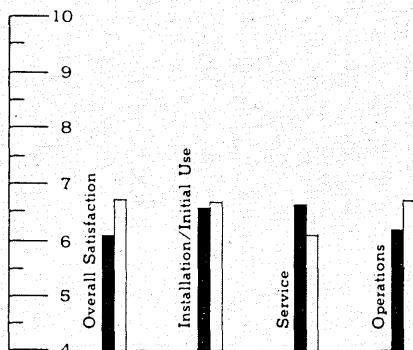
**IBM CMS** • conversational monitor • IBM  
DPD, 1133 Westchester Avenue, White  
Plains, NY 10604 • 914-696-3043

44 responses • 28 users judged features/capabilities out-  
standing • 6 users actively seeking to replace package,  
with 0 citing unsatisfactory performance as reason.



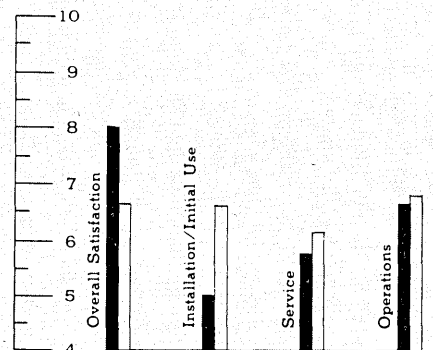
**IBM TSO** • conversational monitor • IBM  
DPD, 1133 Westchester Avenue, White  
Plains, NY 10604 • 914-696-3043

40 responses • 15 users judged features/capabilities out-  
standing • 9 users actively seeking to replace package,  
with 0 citing unsatisfactory performance as reason.



**IBM ASP** • job stream control • IBM DPD,  
1133 Westchester Avenue, White Plains,  
NY 10604 • 914-696-3043

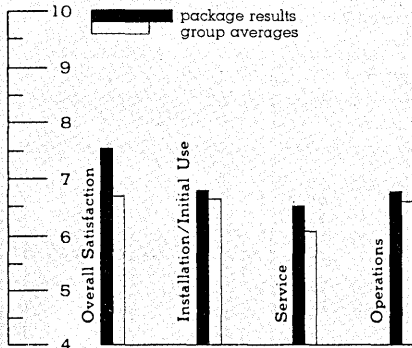
3 responses • 1 user judged features/capabilities out-  
standing • 3 users actively seeking to replace package,  
with 0 citing unsatisfactory performance as reason.



# SYSTEMS SOFTWARE RATINGS

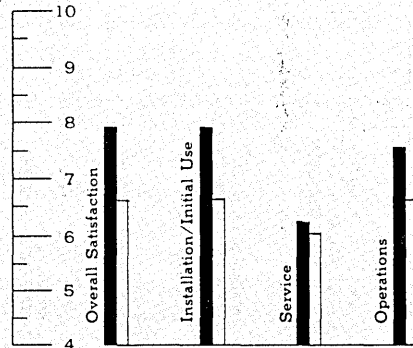
**IBM HASP** • job stream control • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

21 responses • 8 users judged features/capabilities outstanding • 8 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



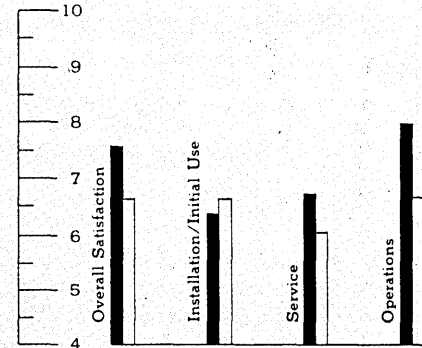
**IBM JES 2** • job stream control • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

24 responses • 12 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



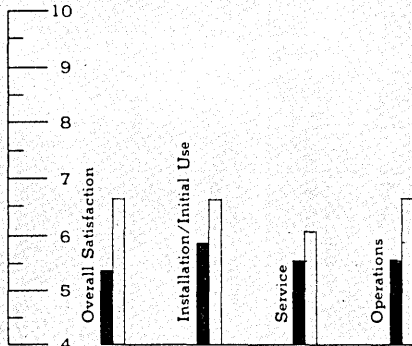
**IBM JES 3** • job stream control • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

14 responses • 8 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



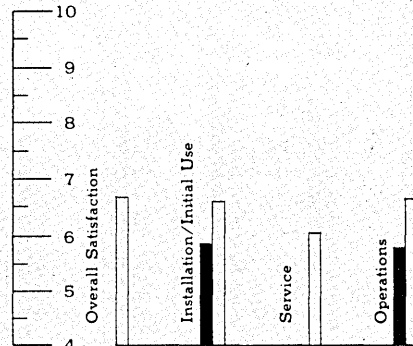
**IBM ETSS** • terminal support IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

12 responses • 6 users judged features/capabilities outstanding • 5 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



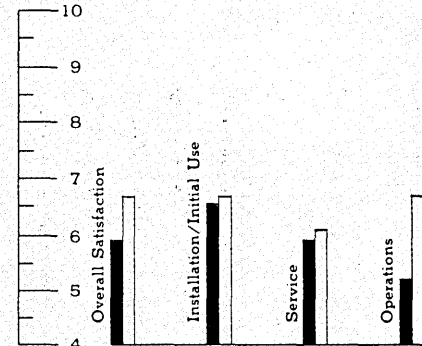
**IBM FASTER** • terminal support • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

3 responses • 1 user judged features/capabilities outstanding • 2 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



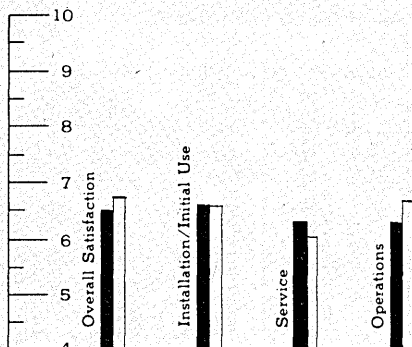
**IBM MTCS** • terminal support • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

24 responses • 6 users judged features/capabilities outstanding • 18 users actively seeking to replace package, with 3 citing unsatisfactory performance as reason.



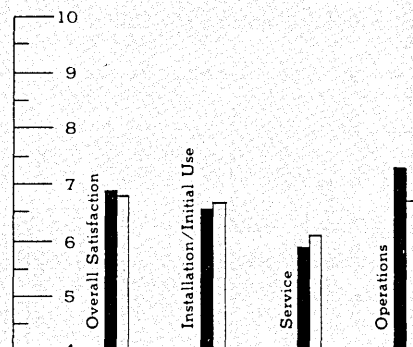
**IBM ICCF** • terminal control • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

39 responses • 13 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



**TSI KEY/MASTER** • terminal control • TSI International, 50 Washington Street, Norwalk, CT 06854 • 203-853-2884

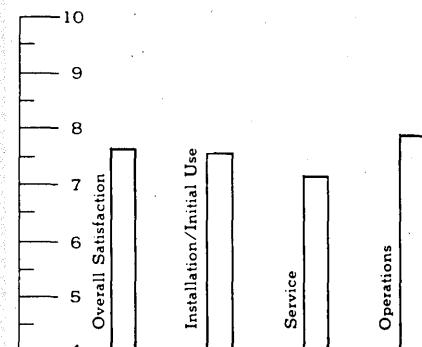
5 responses • 3 users judged features/capabilities outstanding • 0 users actively seeking to replace package.

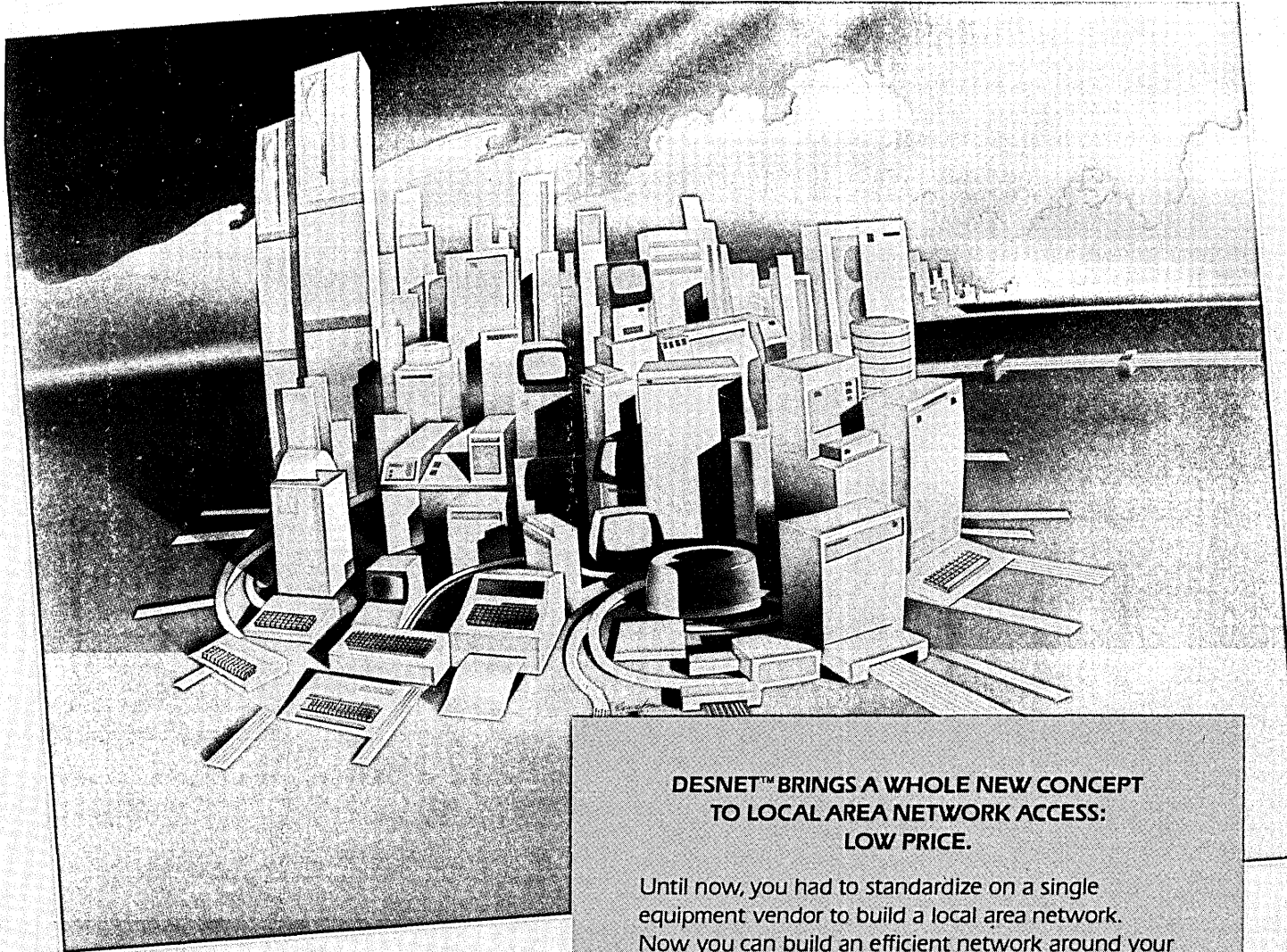


**OPERATING SYSTEMS/SYSTEM SUPPORT**

Group Average • 28 packages

32.9 responses • 17.6 users judged features/capabilities outstanding • 4.4 users actively seeking to replace package, with 0.3 citing unsatisfactory performance as reason.





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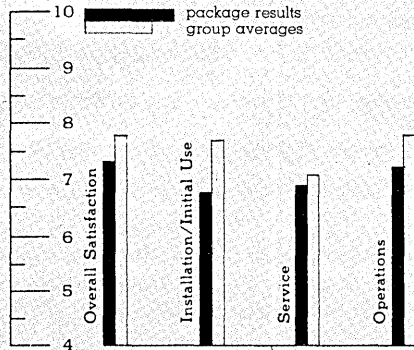
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# SYSTEMS SOFTWARE RATINGS

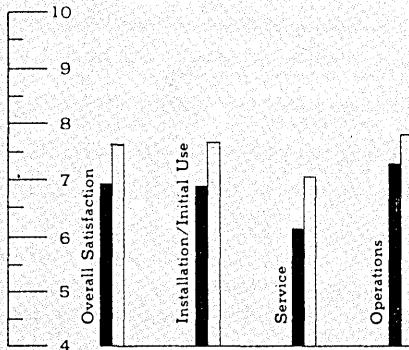
**IBM VM/370** • operating system • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

48 responses • 24 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



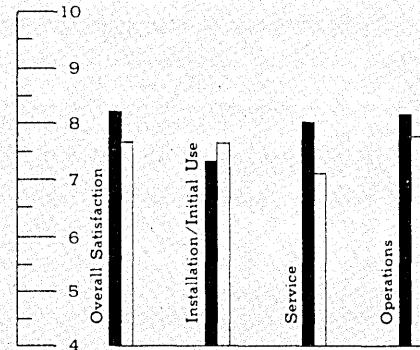
**NIXDORF EDOS** • operating system • Nixdorf Computer Software Company, 6517 Everglades Drive, Richmond, VA 23225 • 804-276-9200

35 responses • 18 users judged features/capabilities outstanding • 13 users actively seeking to replace package, with 3 citing unsatisfactory performance as reason.



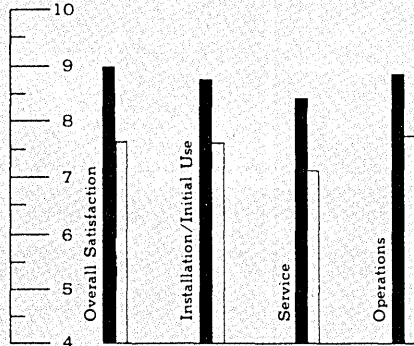
**SOFT-PURSUIT DOS/MVT** • operating system • Software Pursuits, Inc. 444 Market Street, Suite 800, San Francisco, CA 94111 • 415-392-7171

26 responses • 19 users judged features/capabilities outstanding • 5 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



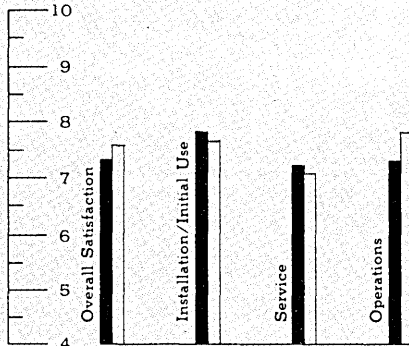
**GOAL FAQs** • resource optimizer • Goal Systems International, P.O. Box 29481, Columbus, OH 43229 • 614-268-1775

9 responses • 4 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



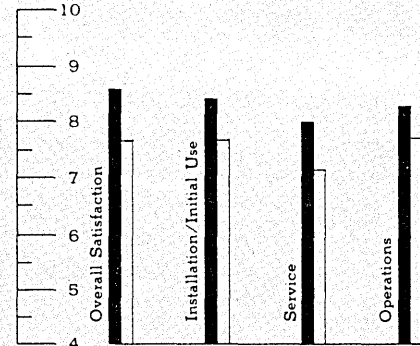
**IBM POWER** • job stream management • IBM DPD, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-3043

34 responses • 12 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 2 citing unsatisfactory performance as reason.



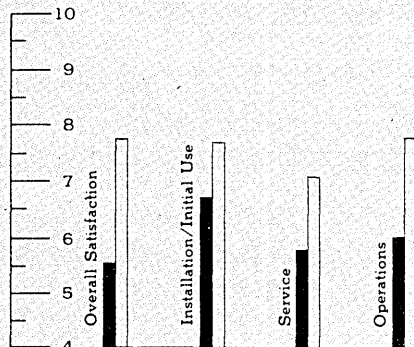
**JASON SPRINT** • job stream management • Jason Data Services, 24871 Pylos Way, Mission Viejo, CA 92691 • 714-770-7789

7 responses • 3 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



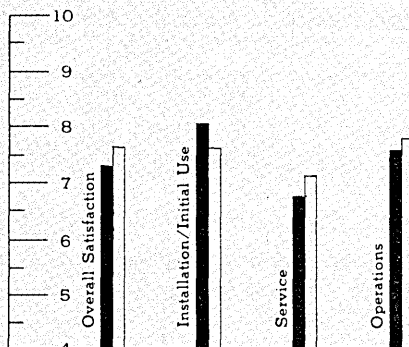
**SDI GRASP** • job stream management • SDI, 1700 South El Camino Real, San Mateo, CA 94402 • 415-572-1200

12 responses • 3 users judged features/capabilities outstanding • 5 users actively seeking to replace package, with 2 citing unsatisfactory performance as reason.



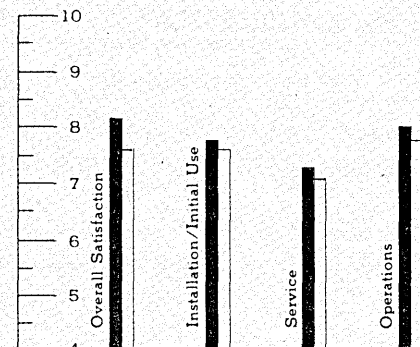
**UNIVERSAL ASAP** • job stream management • Universal Software, Incorporated, Brookfield Office Park, Brookfield, CT 06804 • 203-792-5100

20 responses • 7 users judged features/capabilities outstanding • 11 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



**ADR LIBRARIAN** • library management • Applied Data Research, Route 206 & Orchard Road, Princeton, NJ 08540 • 201-874-9000

50 responses • 28 users judged features/capabilities outstanding • 5 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



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- Price Lists
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- Cash Flow Projections
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	— Actual —			Growth Rate	Average	Total (000's)	— Projected —		
	1978	1979	1980				1981	1982 *	1985
Item A	<b>42,323</b>	<b>51,891</b>	<b>65,123</b>	24.04	53,112	159.34	80,782	100,206	191,262
Item B	<b>45,671</b>	<b>46,128</b>	<b>49,088</b>	3.67	46,962	140.89	50,891	52,761	58,791
<b>Total</b>	<b>87,994</b>	<b>98,019</b>	<b>114,211</b>	<b>13.93</b>	<b>100,075</b>	<b>300.22</b>	<b>131,673</b>	<b>152,966</b>	<b>250,053</b>
% Item	48.10	52.94	57.02	8.88	52.69	158.1	61.35	65.51	76.49
% Item	51.90	47.06	42.98	-9.00	47.31	141.9	38.65	34.49	23.51
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>—</b>	<b>100.00</b>	<b>300.0</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

\*Two intervening years not shown.

rows and columns, define the relationships and T/Maker II will do the rest: it will perform the computations and formatting necessary to prepare your document. When you're finished you can analyze your report on your screen or store it on a diskette. Or, you can have the report printed with presentation quality.

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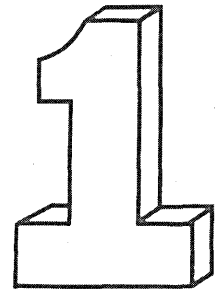
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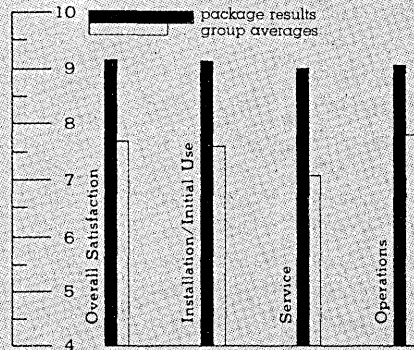
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CIRCLE 125 ON READER CARD

# SYSTEMS SOFTWARE RATINGS

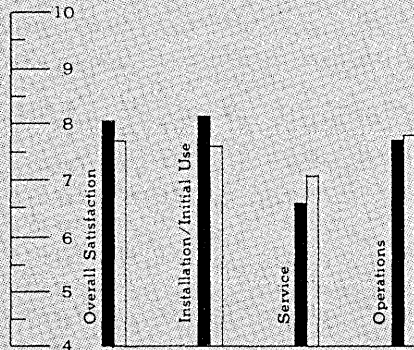
**GOAL FLEE/FILM** • system library maintenance • Goal Systems International, P.O. Box 29481, Columbus, OH 43229

35 responses • 26 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



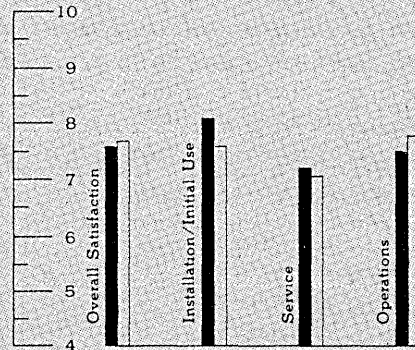
**NCI SLICK** • library maintenance • NCI, Inc., 3720 Longview Drive, Atlanta, GA 30341 • 404-451-7455

35 responses • 16 users judged features/capabilities outstanding • 6 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



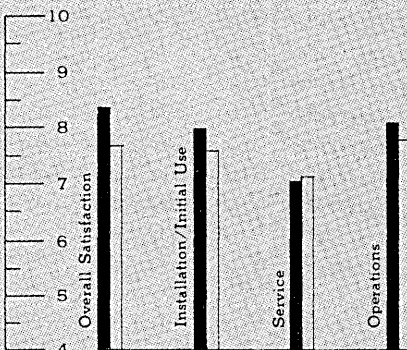
**PANSOPHIC PANVALET** • library maintenance • Pansophic Systems, Inc., 709 Enterprise Drive, Oakbrook, IL 60521 • 312-986-2260

36 responses • 17 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



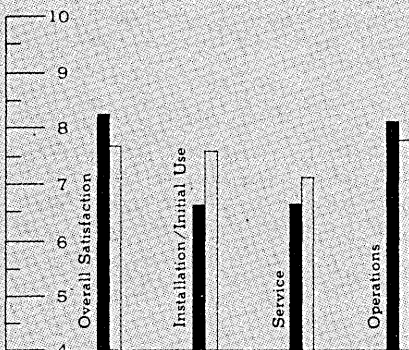
**ALTERGO SPACE/MANAGE** • disk space management • Insc Software, Inc., 2300 Peachford Road, Suite 3235, Atlanta, GA 30338 • 404-452-7676

7 responses • 4 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



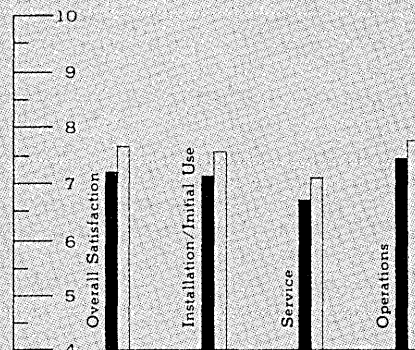
**CAM-SYSTEMS ASM2** • disk space management • Cambridge Systems Group, 24275 Elise Court, Los Altos Hills, CA 94022 • 415-941-4558

9 responses • 9 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



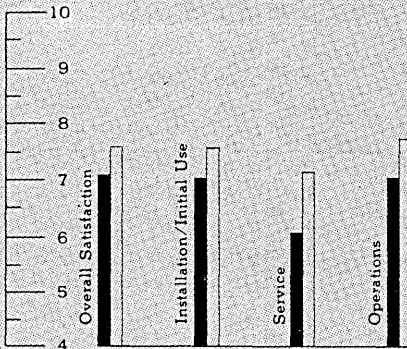
**COM-ASSOC CA-DYNAM/D** • disk space management • Computer Associates, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6700

59 responses • 28 users judged features/capabilities outstanding • 8 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



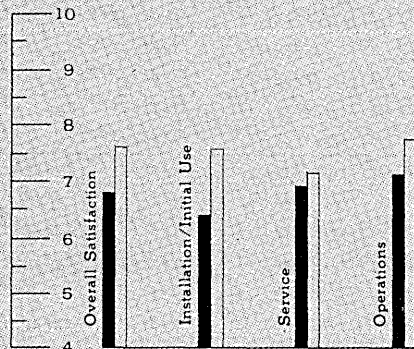
**TOWER/OXFORD DFAST** • disk space management • Tower Systems, Inc., 19782 MacArthur Boulevard, Suite 365, Irvine, CA 92715 • 714-752-8263

64 responses • 28 users judged features/capabilities outstanding • 21 users actively seeking to replace package, with 3 citing unsatisfactory performance as reason.



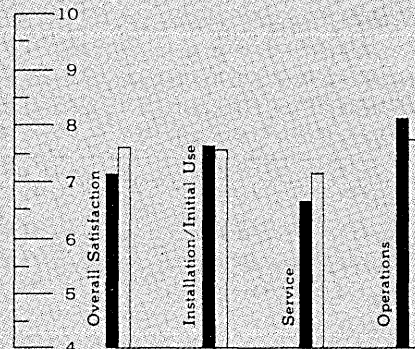
**UCC UCC-THREE** • disk space management • University Computing Company, UCC Tower/Exchange Park, Dallas, TX 75235 • 214-353-7100

14 responses • 6 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



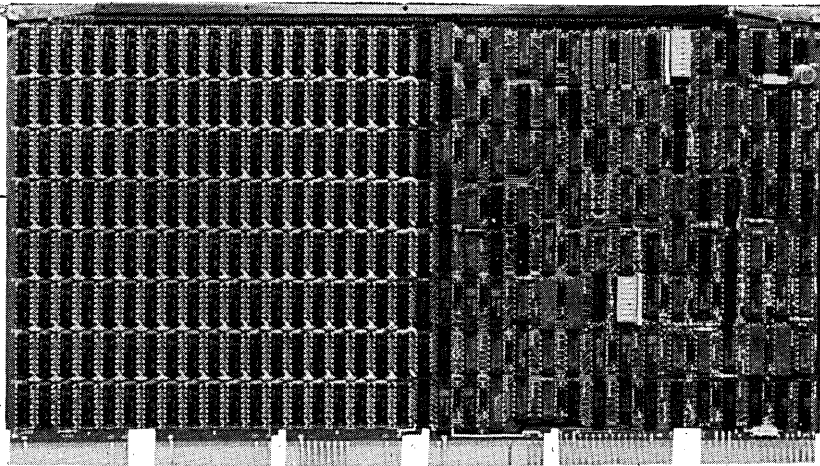
**UNIVERSAL ADAS** • disk space management • Universal Software, Inc., Brookfield Office Park, Brookfield, CT 06804 • 203-792-5100

11 responses • 4 users judged features/capabilities outstanding • 3 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.





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LSI-11	DR-113S	quad	256 KB
LSI-11	DR-213S	quad	1.0 MB
PDP <sup>®</sup> -11	DR-114S	hex	256 KB
PDP-11	DR-114SP	hex	256 KB
PDP-11	DR-214SP	hex	1.0 MB
PDP-11	DR-144S	hex	256 KB
PDP-11	DR-244S	hex	4.0 MB
VAX <sup>®</sup> -11/750	DR-175S	hex	256 KB
PDP-11/70			
VAX-11/780	DR-178S	extended hex	512 KB
DECSYSTEM 2020 <sup>®</sup>	DR-120S	extended hex	512 KB
PDP-8/A	DR-118S	quint	128 K x 12

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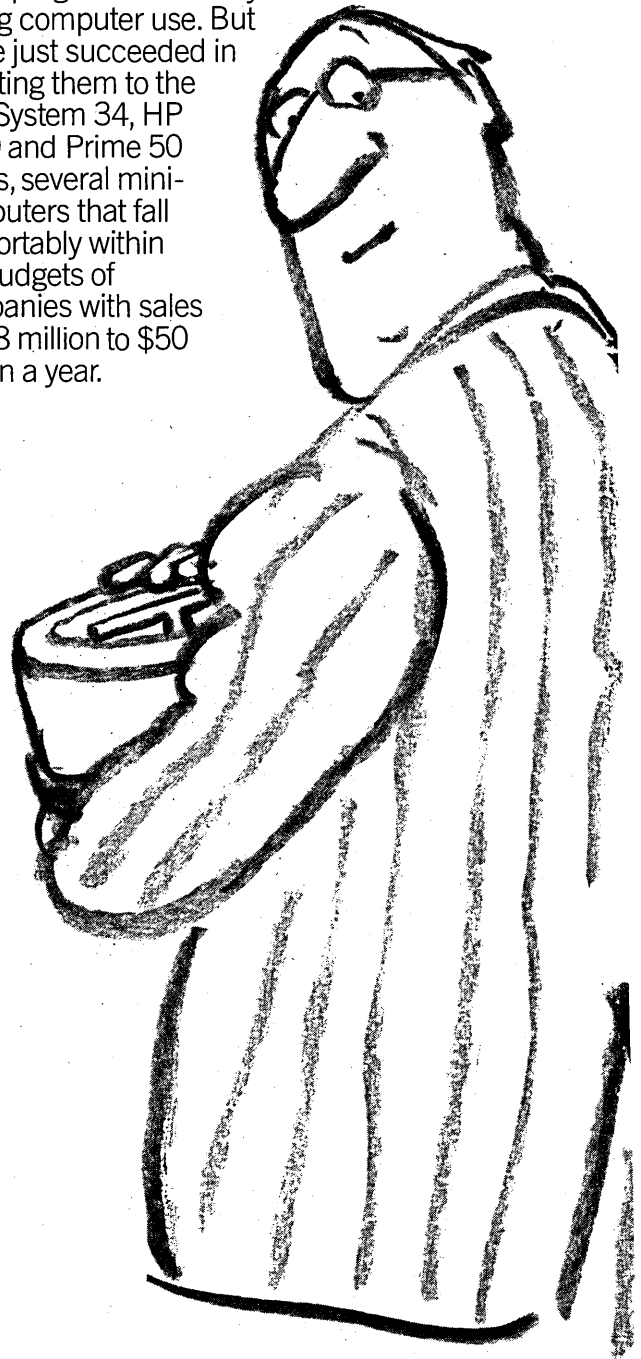
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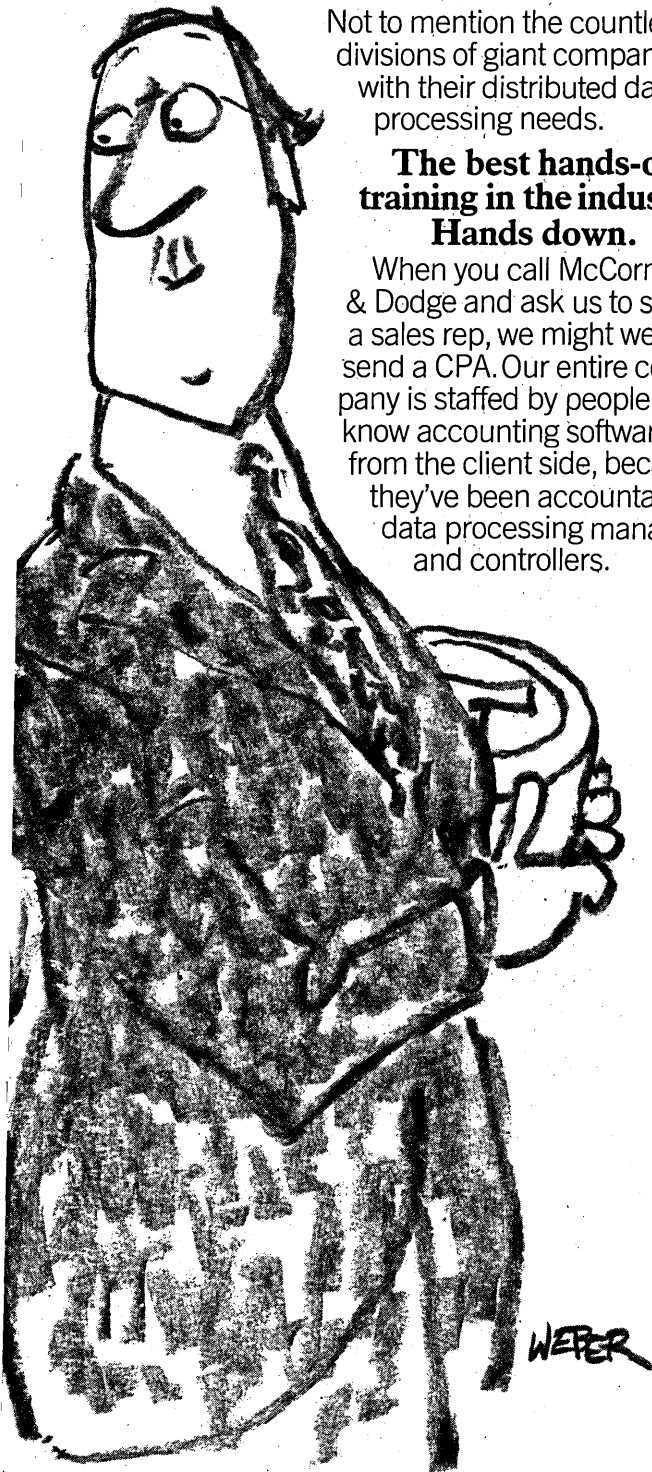
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Phone \_\_\_\_\_ Computer Model \_\_\_\_\_

560 Hillside Avenue, Needham Heights, MA 02914, (617) 449-4012, Atlanta (404) 997-2797, Chicago (312) 843-3400, Dallas (214) 369-7014, Los Angeles (213) 645-6382, San Francisco (415) 398-2960, Washington, D.C. (703) 734-0710, New York (212) 486-0035, • Canada • United Kingdom  
Netherlands • Venezuela • Italy • Australia/New Zealand  
• Mexico • South Africa • Sweden • Hong Kong

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The best financial software. The best financial people.

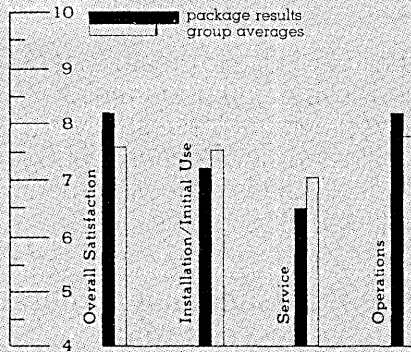
DA1281A

CIRCLE 127 ON READER CARD

# SYSTEMS SOFTWARE RATINGS

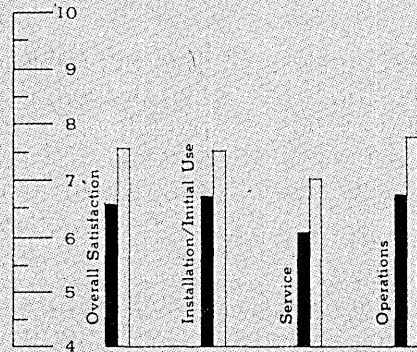
**WESTINGHOUSE DISKSPACE/MG** • disk space management • Westinghouse Electric Corp., 2040 Ardmore Boulevard, Pittsburgh, PA 15221 • 412-636-3100

8 responses • 7 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



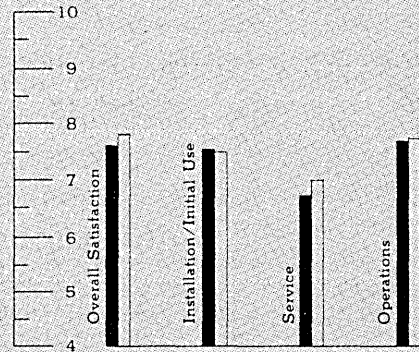
**CAPEX/GULF TLMS** • tape volume management • Capex Corp., 4125 North 14th Street, Phoenix, AZ 85014 • 602-264-7241

37 responses • 15 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



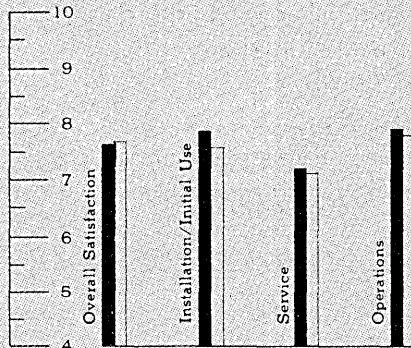
**COM-ASSOC CA-DYNAM/T** • tape volume management • Computer Associates, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6700

45 responses • 23 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



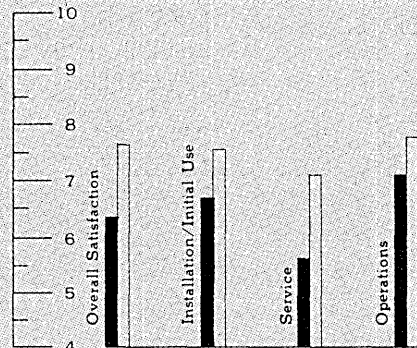
**SDI EPAT** • tape volume management • SDI, 1700 South El Camino Real, San Mateo, CA 94402 • 415-572-1200

30 responses • 15 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



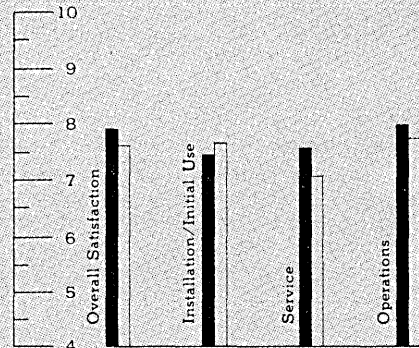
**TOWER/OXFORD TFAST** • tape volume management • Tower Systems, Inc., 19782 MacArthur Boulevard, Suite 365, Irvine, CA 92715 • 714-991-9460

37 responses • 10 users judged features/capabilities outstanding • 7 users actively seeking to replace package, with 3 citing unsatisfactory performance as reason.



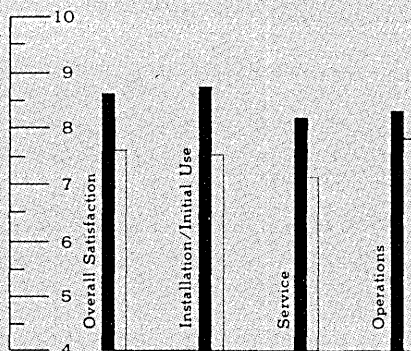
**UCC UCC-ONE** • tape volume management • University Computing Company, UCC Tower/Exchange Park, Dallas, TX 75235 • 214-353-7100

53 responses • 29 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



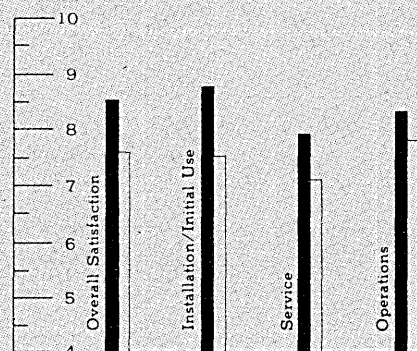
**INNOVATION FDR** • file dump/restore • Innovation Data Processing, Inc., 970 Clifton Avenue, Clifton, NJ 07013 • 201-777-1940

34 responses • 22 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



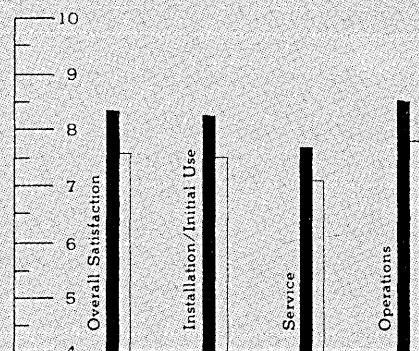
**WESTINGHOUSE DOS DUMP/RESTOR** • file dump/restore • Westinghouse Electric, 2040 Ardmore Blvd., Pittsburgh, PA 15221 • 412-636-3100

81 responses • 56 users judged features/capabilities outstanding • 6 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.

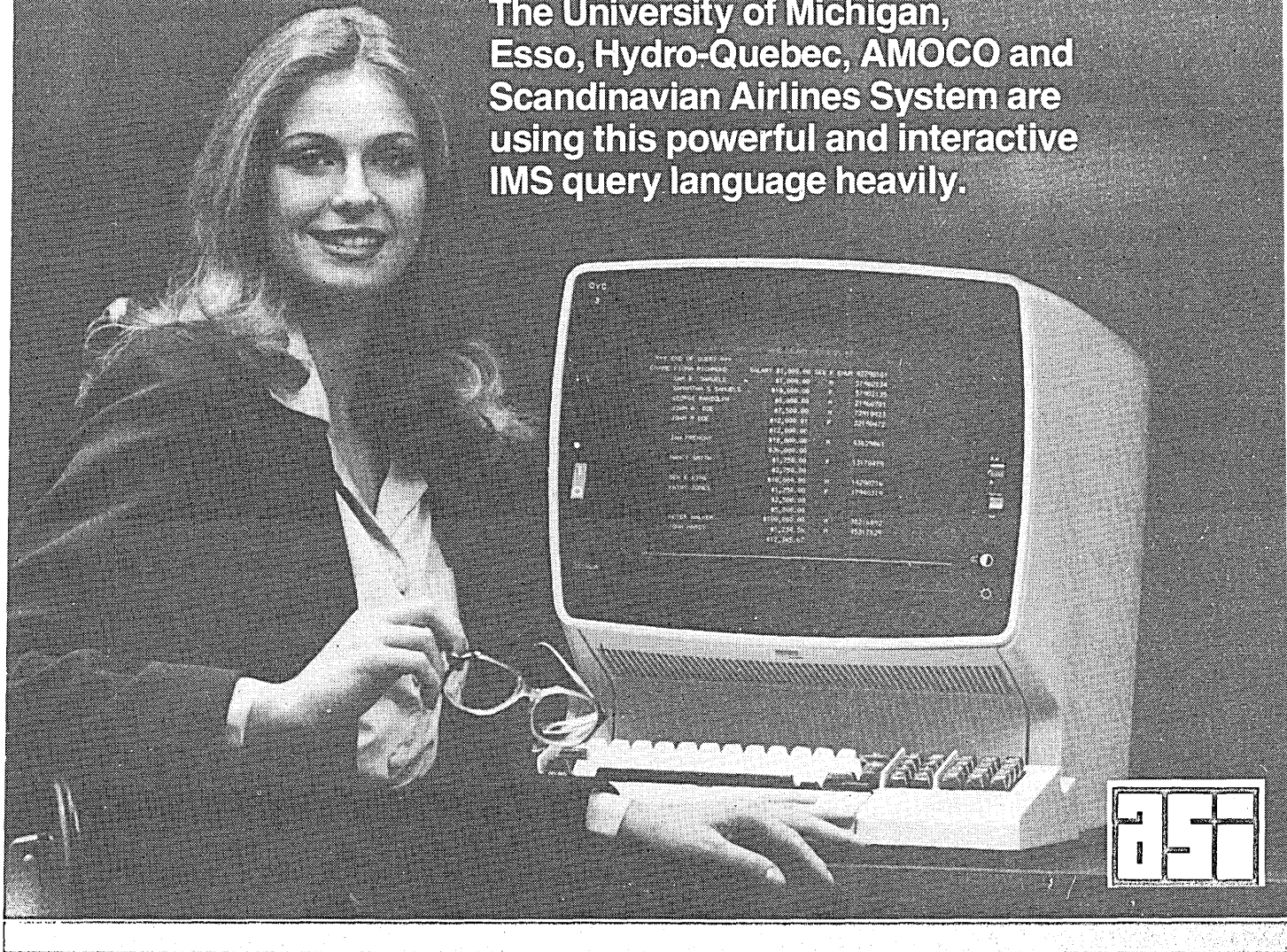


**COM-ASSOC CA-SORT** • sort • Computer Associates, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6700

36 responses • 24 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



# ASI/INQUIRY: Customers like Hughes Aircraft, The University of Michigan, Esso, Hydro-Quebec, AMOCO and Scandinavian Airlines System are using this powerful and interactive IMS query language heavily.



## And here are three productivity-boosting reasons why.

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Because inquiries are stated in simple English, nonprogrammers can learn to use ASI/INQUIRY quickly. DL/1 structures are completely transparent to the user. You need not understand the complexities of multipathing or multiple data base access. Comprehensive diagnostic messages simplify error correction. ASI/INQUIRY automatically displays data in the appropriate format—horizontal, vertical, or overflow. Or you can specify any desired screen format. Repetitively executed queries can be saved in an on-line catalog. New Release 5.5 features include the ability to defer query execution from MP to BMP and support of IMS *Fastpath* facility.

### 2. ASI/INQUIRY Assures Faster Access and Response Time.

ASI/INQUIRY lets you access your DL/1 data bases through IMS or TSO faster and more efficiently. That's because it eliminates need to write and debug those highly procedural programs usually required to access data bases. ASI/INQUIRY operates as an IMS message processing program executed from any IMS DB/DC-supported terminal. Execution priority is dynamically controlled through automatic program message switching. High initial priority assignment assures fast response. Priority is then automatically adjusted to the rate that to-be-displayed data is encountered, which optimizes *load leveling* of IMS DB/DC resources.

### 3. ASI/INQUIRY Provides Complete Security.

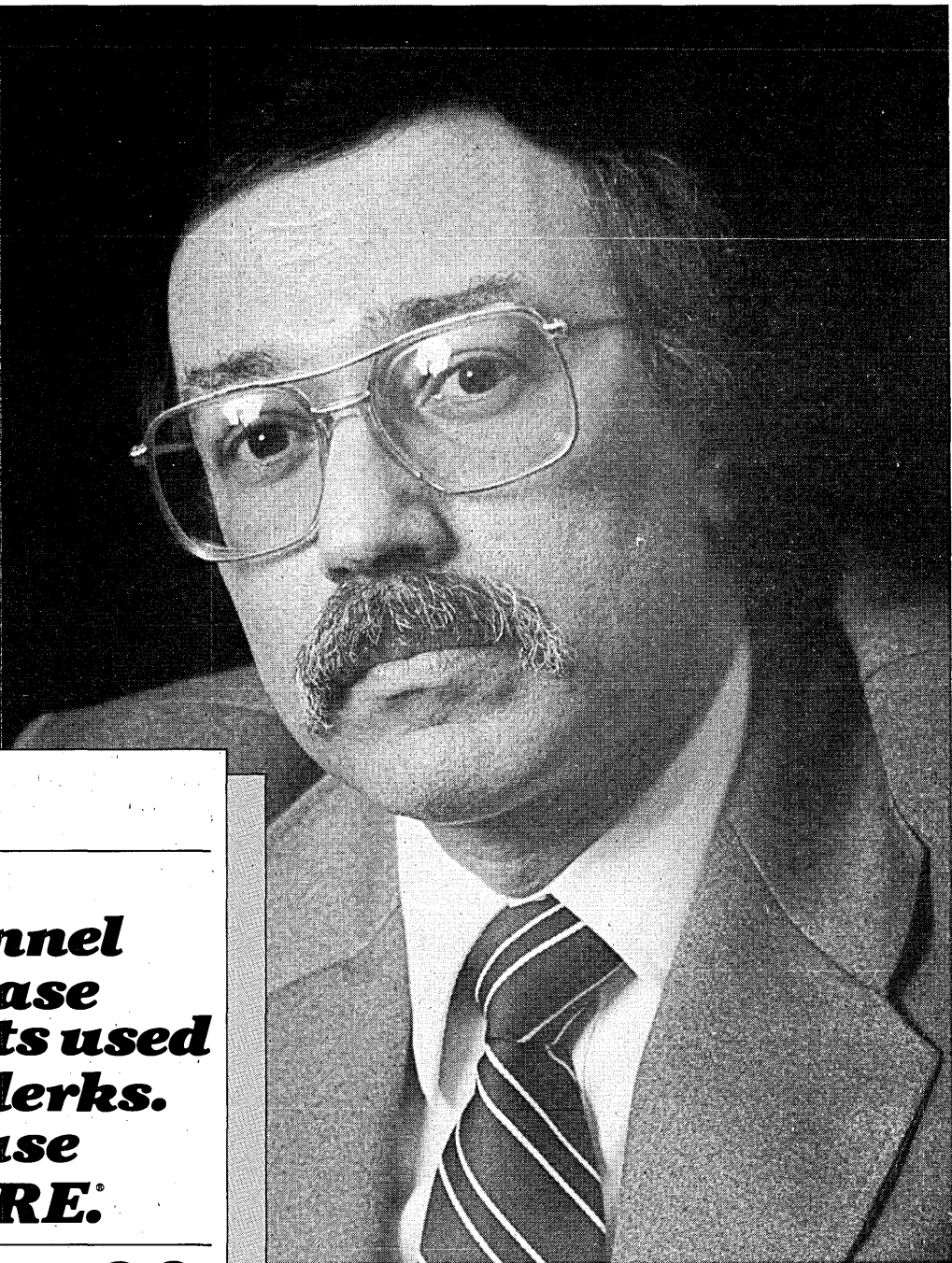
Built-in safeguards protect data at the system, terminal, data base, field and value levels. Further, an installation's customized security system, as well as RACF or ACF2, may be integrated with ASI/INQUIRY security.

Learn why ASI/INQUIRY is the *most heavily used* IMS query language. Call or write — today!

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personnel  
database  
experts used  
to be clerks.  
They use  
INQUIRE.**

James Zottoli  
Senior Systems Programmer  
Corporate Computing Center

99

**W**e have three Personnel Database Experts at this major food products corporation. All used to have clerical functions. And none of them knew anything about computers. What they do know is that with the terminals in their department, they can access any information they need to perform personnel management tasks. They can write scheduled or one-time reports, modify those reports, display their results at the terminal or on a high-speed printer. They are security-protected so that their information will not get into the rest of the corporation. Now fearless of the computer, our experts claim INQUIRE is invaluable to them in their jobs.

We also have a bibliographic information

system from which researchers can obtain documents and patents efficiently. It is all accessible through a macro-generated

system built around INQUIRE, making the system totally transparent to the user.

Another INQUIRE database holds all information on the 30 or so software packages used within the corporation... when purchased, which release is running, how much maintenance has been paid or is due. It's great for budgeting or negotiating with a software vendor.

We also have a corporate Quick Response Center (QRC) standing ready for any client (we call our user departments clients) who has an information need he can't turn around fast enough. The QRC often uses INQUIRE as a tool to respond to these "I need it once and then I'll throw it away" requests.

The Corporate Systems Department exists

to serve its clients just as a service bureau would. Each user has his own budget and he could go outside if he wished. That means our service has to be as good or better than could be purchased outside. Our service is paid for by earning those budget dollars of client departments; it makes us all work a lot harder. Thanks for a great deal of our productivity goes to INQUIRE.

If you run MVS, VS-1 or VM, productive software from Infodata can help solve your information problems. Call us today to find out exactly how.

## Infodata

Infodata Systems Inc.  
5205 Leesburg Pike  
Falls Church, Virginia 22041  
800-336-4939  
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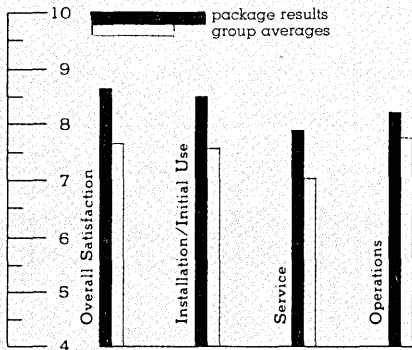
Offices in:  
Dallas, Los Angeles, New York  
Rochester, NY, St. Louis, Washington, DC

**CIRCLE 129 ON READER CARD**

## SYNCSORT/WHITLOW SYNCSORT

• sort • Syncsort, Inc., 560 Sylvan Avenue, Englewood Cliffs, NJ 07632 • 201-568-9700

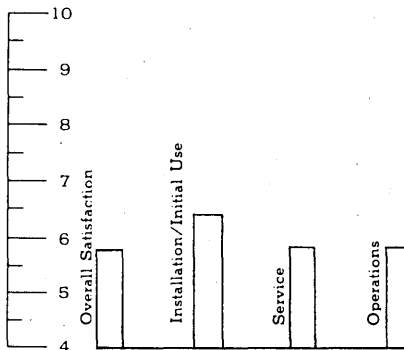
49 responses • 38 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



## SYSTEM MANAGEMENT AIDS

Group Average • 12 packages

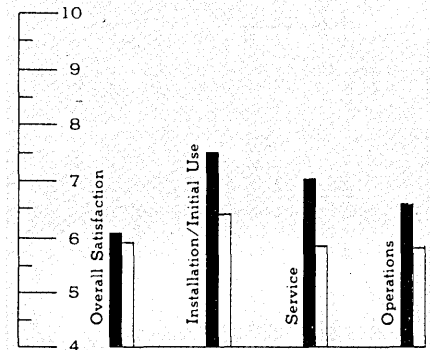
13.5 responses • 3.5 users judged features/capabilities outstanding • 2.3 users actively seeking to replace package, with 0.2 citing unsatisfactory performance as reason.



## UNITED COMPUTING FORESIGHT

• modeling/simulation • United Computing Systems, Inc., 2525 Washington St., Kansas City, MO 64108 • 816-221-9700

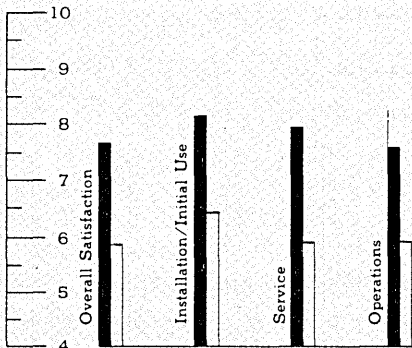
12 responses • 5 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



## ADR LOOK

• performance measurement • Applied Data Research, Route 206 & Orchard Road, Princeton, NJ 08540 • 201-874-9000

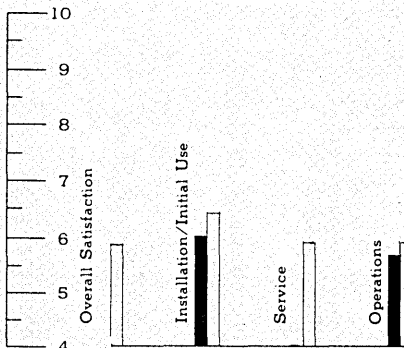
15 responses • 8 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



## BOOLE & BABBAGE CUE

• system measurement • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

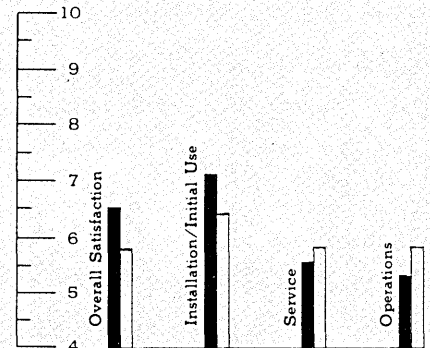
6 responses • 4 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



## BOOLE & BABBAGE RESOLVE

• system measurement • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

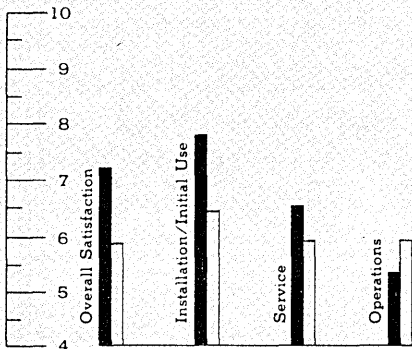
3 responses • 0 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



## BOOLE & BABBAGE TSA/PPE

• program measurement • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

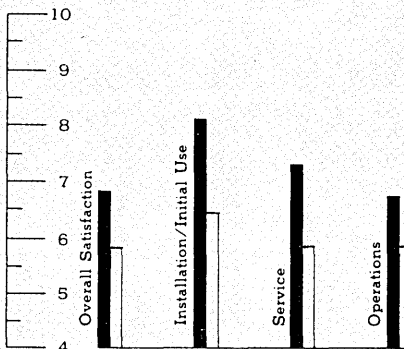
9 responses • 2 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



## CAPEX PLAN IV

• system measurement • Capex Corp., 4125 North 14th Street, Phoenix, AZ 85014 • 602-264-7241

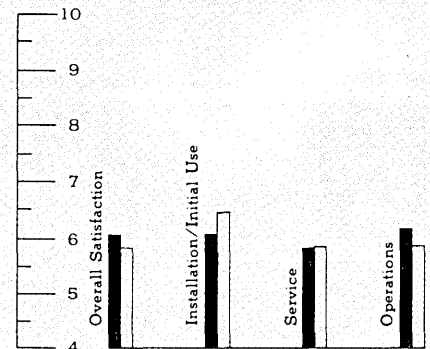
7 responses • 2 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



## VALUE CSCS

• scheduler • Value Computing, Inc., 498 Kings Highway, Cherry Hill, NJ 08034 • 609-482-2500

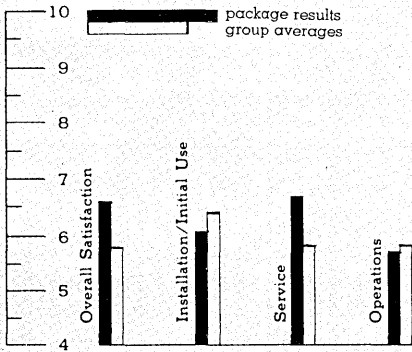
15 responses • 2 users judged features/capabilities outstanding • 5 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



# SYSTEMS SOFTWARE RATINGS

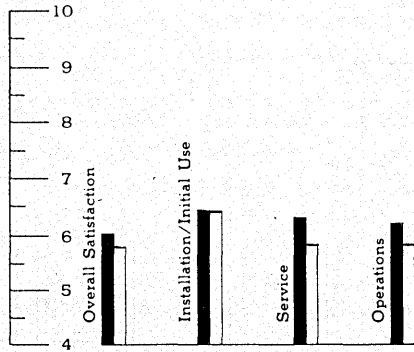
**IBM IAS/3** • job accounting • IBM GSD, 5775 Glenridge Drive, Northeast, Atlanta, GA 30301 • 914-696-3043

5 responses • 2 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



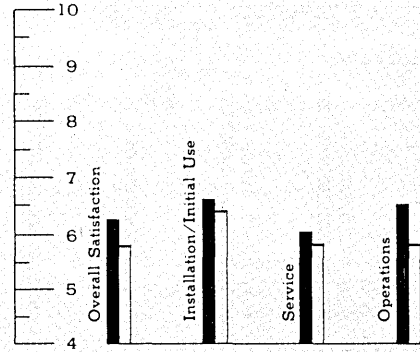
**JOHNSON JARS** • job accounting • Johnson Systems Inc., 7923 Jones Branch Drive, McLean, VA 22102 • 703-821-1700

42 responses • 13 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 4 citing unsatisfactory performance as reason.



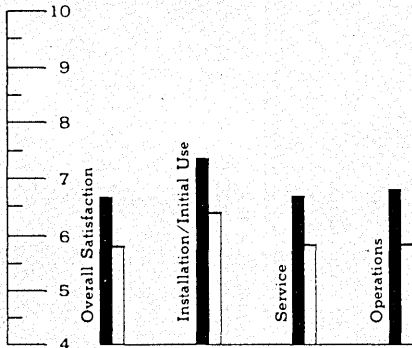
**VALUE COMPUT-A-CHARGE** • job accounting • Value Computing, Inc., 498 Kings Highway, Cherry Hill, NJ 08034 • 609-482-2500

21 responses • 0 users judged features/capabilities outstanding • 0 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



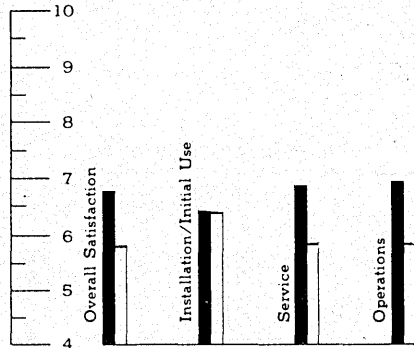
**WESTINGHOUSE JOB-MONITOR** • job accounting • Westinghouse Electric Corporation, 2040 Ardmore Boulevard, Pittsburgh, PA 15221 • 412-636-3100

13 responses • 0 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



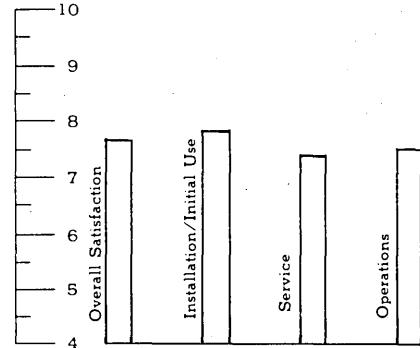
**UCC UCC-15** • job recovery • University Computing Company, UCC Tower/Exchange Park, Dallas, TX 75235 • 214-353-7100

14 responses • 6 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



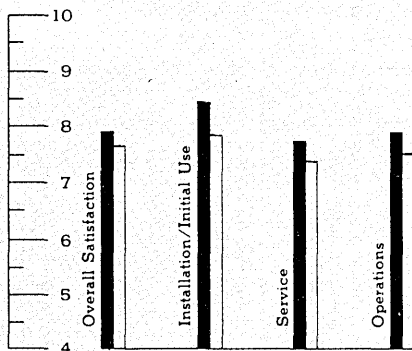
**PROGRAMMING UTILITIES**  
Group Average • 6 packages

18.8 responses • 9 users judged features/capabilities outstanding • 0.8 users actively seeking to replace package, with 0.2 citing unsatisfactory performance as reason.



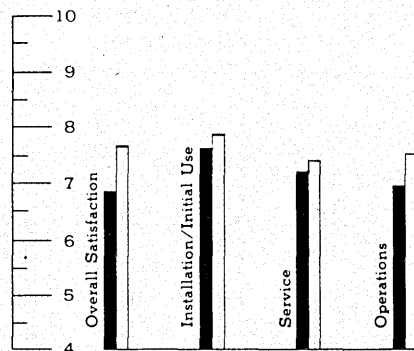
**ADR AUTOFLOW/AUTOFLOW II** • flowcharter • Applied Data Research, Route 206 & Orchard Road, Princeton, NJ 08540 • 201-874-9000

6 responses • 2 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



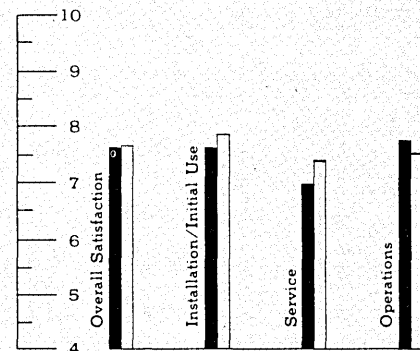
**ADR METACOBOL** • program generator • Applied Data Research, Route 206 & Orchard Road, Princeton, NJ 08540 • 201-874-9000

11 responses • 5 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



**NCI OWL** • program development • NCI, Inc., 3720 Longview Drive, Atlanta, GA 30341 • 404-451-7455

25 responses • 13 users judged features/capabilities outstanding • 3 users actively seeking to replace package, with 0 citing unsatisfactory performance as reason.





# New VISUAL 300. Now let's compare flexibility and price.

Before you buy one more video terminal compare the new VISUAL 300.

The microprocessor-based VISUAL 300 combines a highly comprehensive command set with traditional VISUAL ergonomic design. The result is a terminal built for flexibility and superior productivity. And at surprisingly low prices.

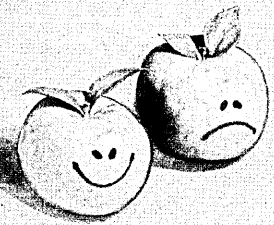
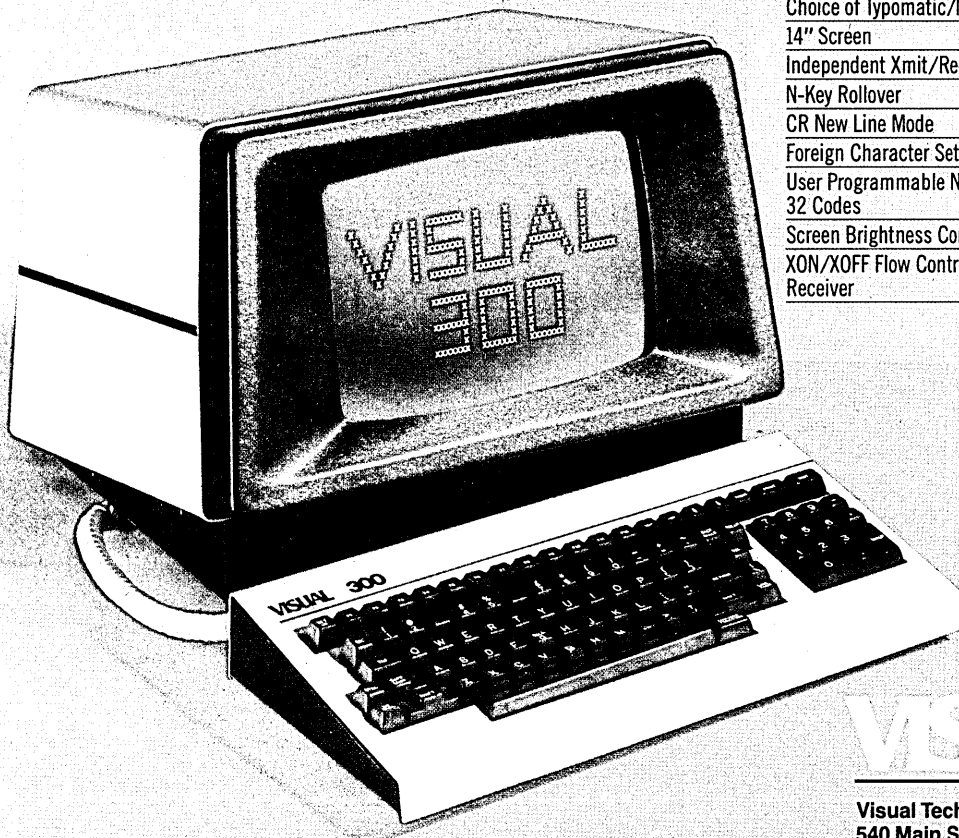
Of the terminals in its class only VISUAL 300 offers so many standard features including:

- Flexible block mode transmission parameters
- Programmable non-volatile function keys
- Split screen
- Full editing
- 12" or 14" non-glare screen
- Non-volatile set-up modes for selection of terminal parameters, eliminating cumbersome switches.

Call for full details on the VISUAL 300... the new standard of comparison for video terminals.

## AN APPLES-TO-APPLES COMPARISON OF FEATURES.

	VISUAL 300	TeleVideo® 950
ANSI X3.64 Specified	STD	NO
Block and Character Transmit	STD	STD
Solid State Keyboard	STD	NO
Programmable Non-Volatile Function Keys	STD	NO
Video Attributes Require No Display Space	STD	NO
Non Glare Screen	STD	STD
Smooth Scroll, Slow Scroll and Jump Scroll	STD	NO
Audible Key Click	STD	STD
Non Volatile Set-up Modes, "Menu" Style	STD	NO
25 Status Line	STD	STD
Split Screen	STD	STD
Line Drawing Character Set	STD	STD
Block Graphics	STD	NO
Sculptured Keycaps, Matted for Low Glare	STD	NO
Paging		OPT-3 Pgs. OPT-4 Pgs.
Full Editing	STD	STD
Programmable Non Volatile Columnar Tabbing	STD	NO
Choice of Typomatic/Non Typomatic Keyboard	STD	NO
14" Screen	OPT	NO
Independent Xmit/Receive Rates	OPT	NO
N-Key Rollover	STD	NO
CR New Line Mode	STD	NO
Foreign Character Sets	OPT	NO
User Programmable Non-Volatile Answerback, 32 Codes	STD	NO
Screen Brightness Control from Keyboard	STD	NO
XON/XOFF Flow Control, Split for Xmitter and Receiver	STD	NO



# VISUAL

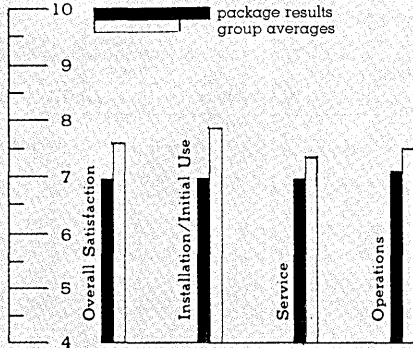
See for yourself

Visual Technology Incorporated  
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Telephone (617) 851-5000. Telex 951-539

# SYSTEMS SOFTWARE RATINGS

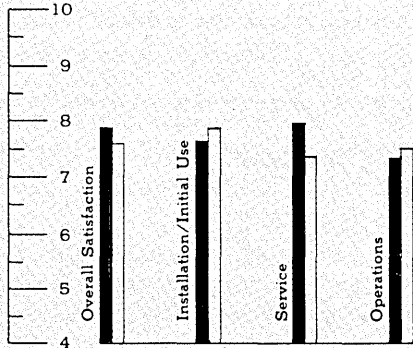
**UCC UCC-TWO** • format conversion • University Computing Company, UCC Tower/Exchange Park, Dallas, TX 75235 • 214-353-7100

31 responses • 14 users judged features/capabilities outstanding • 4 users actively seeking to replace package, with 2 citing unsatisfactory performance as reason.



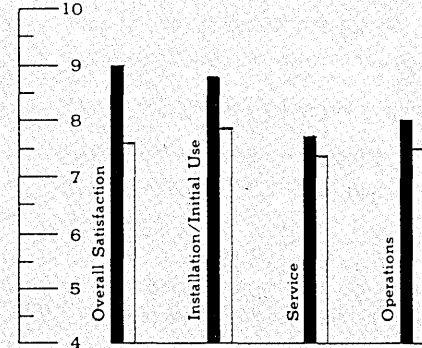
**CAPEX OPTIMIZER/OPTIMIZER II** • optimizer • Capex Corp., 4125 North 14th Street, Phoenix, AZ 85014 • 602-264-7241

33 responses • 17 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



**MACRO 4 BOOST** • optimizer • Macro 4, Inc., 1 West Hanover Avenue, Mount Freedom, NJ 07970 • 201-895-4800

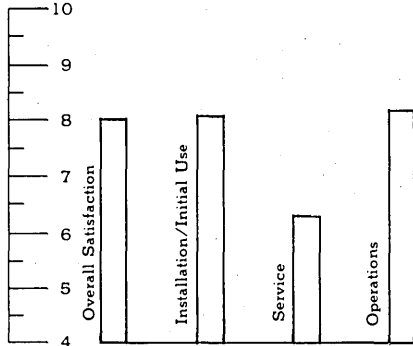
7 responses • 4 users judged features/capabilities outstanding • 0 users actively seeking to replace package.



## LANGUAGES

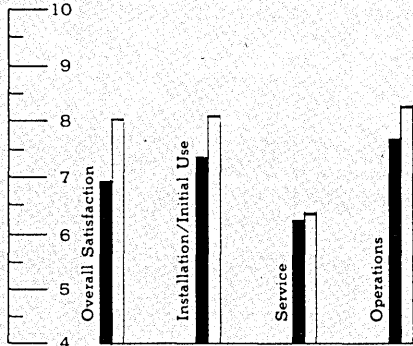
Group Average • 3 packages

13.7 responses • 7 users judged features/capabilities outstanding • 2 users actively seeking to replace package, with 0.3 citing unsatisfactory performance as reason.



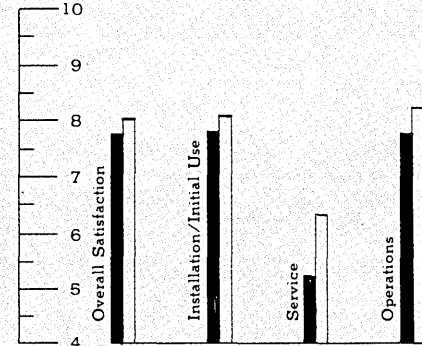
**ADPAC ADPAC** • language processor • ADPAC Corp., 120 Howard Street, San Francisco, CA 94105 • 415-981-2710

11 responses • 2 users judged features/capabilities outstanding • 3 users actively seeking to replace package, with 1 citing unsatisfactory performance as reason.



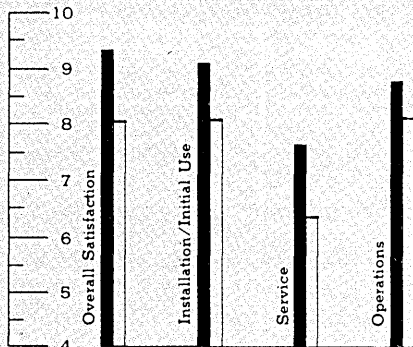
**WATERLOO WATBOL** • language processor • University of Waterloo, Waterloo, Ontario N2L 3G1, Canada • 519-885-1211

10 responses • 5 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.

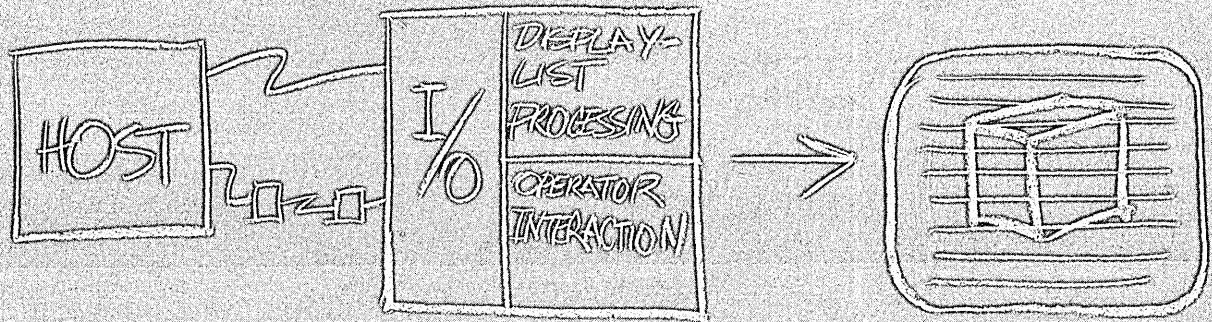


**WATERLOO WATFIV** • language processor • University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada • 519-885-1211

20 responses • 18 users judged features/capabilities outstanding • 1 user actively seeking to replace package, with 0 citing unsatisfactory performance as reason.



# THE MEGATEK DIFFERENCE: REMOTE WORKSTATIONS



Whizzard 6200 raster-scan, line-drawing terminals are working remote workstations — fast, interactive, intelligent.

The Megatek difference starts with host-computer software. Wand 6200 is a computer-independent, Core-compatible Fortran package which organizes graphic information for maximum communication-line efficiency. Image segments can be dynamically extended, changed to a different color or line type, scaled, translated, or blinked with just a few simple commands.

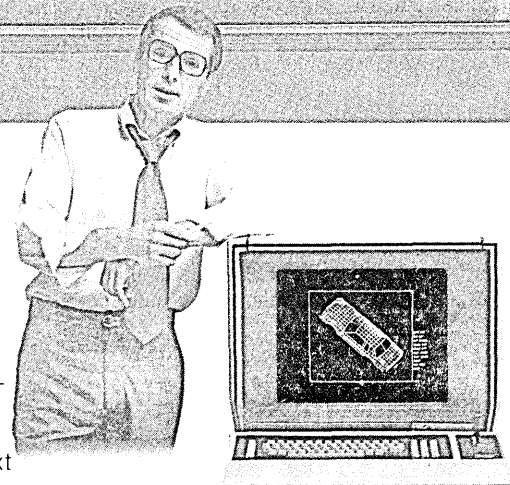
Whizzard 6200 terminals can also be programmed with hundreds of graphic subroutines (e.g., the image of a bolt head). Instead of reconstructing such "instances" each time they are needed, the host computer simply transmits a subroutine ID number.

Swiftly interacting with the host computer at the "action" end of the communication line is an intelligent Whizzard 6200 memory-management

I/O interface which maps subroutines, segments, and attribute information into a 64K-byte display-list memory (expandable to 128K bytes).

The final step, from memory to screen, is nearly instantaneous. Powered by a 32-bit proprietary processor, the Whizzard 6200 "graphics engine" processes display-list data into raster images at an average rate of 200 nanoseconds per pixel. Text can be displayed in eight hardware-generated character sizes. Twelve-bit vector coordinates (4096 x 4096 virtual display space) can be scaled up to 8X with full retention of fine-line detail. Images can be "Rasterized" into full-resolution hardcopy.

Monochrome or color, 512x512 or 1024x1024, every member of the Whizzard 6200 family is a complete graphics workstation, including desk, display monitor, keyboard, joystick, and optional data tablet. And all are upwardly mobile — up to the Whizzard 7200 series of 3D rotation-and-scaling raster/vector terminals.



**The more you know about graphics, the more you lean toward Megatek.**

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CIRCLE 131 ON READER CARD

Jeff's arrival had made scarcely a ripple in his parents' carefully fine tuned lives. But when he turned 13, things seemed to go wrong.

# IN LOCO PARENTIS

## A TECHNOLOGICAL CHRISTMAS TALE

by Marvin Grosswirth

"The tree looks lousy."

Harlan gazed at his reflection in the green globe dangling from the end of his forefinger. "And so do I," he muttered, as he drank deeply from the glass in his other hand.

"Of course you do," Jan replied diffidently, gingerly lifting the ornament from his forefinger and placing it carefully on the tree. "If you insist on staring at green reflections of yourself, how do you expect to look? And furthermore," she added, "the tree does *not* look lousy." She cocked her blond, closely coiffed head slightly as she stepped back to admire her handiwork. "Actually," she said, allowing a touch of smugness to tinge her tone, "I think it's rather pretty . . . no thanks to you, lazy." She wanted to add—but thought better of it—that apart from the bleak expression of self-pity clouding Harlan's features, she rather liked the way he looked.

With much the same sort of attention she was now giving to the tree, she had been careful to assemble the components—physical, environmental, and even emotional—that gave Jan and Harlan the look that she felt best suited them. One knew, at first meeting, that they were a moderately young, moderately successful couple: tall, slim, healthy looking, conservatively handsome, and properly prosperous. Yet there was no ostentation, no flash, none of the obvious accoutrements that blatantly broadcast upward mobility—not in their home, their clothes, or their style. Quality, yes. Taste, yes. A little culture, a little art, a little music, a little education, but not too much.

The best part was that it all seemed so intuitive, almost instinctive, to them. She and Harlan had never had to discuss it; it just was. When they had begun to talk of marriage, Jan had said: "I plan to continue with my career." "Of course," Harlan had replied. And that had been that. From that moment, their life-style (she disliked the term but had to admit that it was apt) had flowed almost like a river along its inexorable course. To be sure, it required a minor adjustment here, a little fine tuning there, but nothing serious. Once, Jan had overheard someone at the club discussing them. "Jan and Harlan have class," the gossip had commented. "I'm not sure just

what that is, but they sure have got it." Jan had smiled with satisfaction and slipped away unnoticed.

The nearest thing to a crisis in their lives had been the coming of Jeffrey. The baby had been unplanned and, therefore, unexpected. Not necessarily unwanted, however. It was only that his arrival had required somewhat more fine tuning and adjustment than usual. But it had all worked out—up to a point. Even as an infant, it was obvious that Jeff had inherited his parents' blond good looks and even disposition. "He's such a love," Harlan's mother had said. "Never gets in the way, never makes any trouble. I don't know when I've ever seen such a good baby." It was true.

It was true because Jan and Harlan had made it true. There was, after all, a plan and a pattern to their lives. Having a baby was all well and good. Having it dominate their existence with constant demands for unswerving attention and instantaneous gratification, however, was not. Jeffrey learned, through deed and word, that if he could not contribute to their progress—as he obviously could not—he was not to impede it, either. He was along for the ride; he was not in the driver's seat.

To an outsider, Jeff's early comprehension of his assigned role might have seemed remarkable, but not to Jan and Harlan. They knew that the boy had an attribute that could have been a liability but which, in their hands, had turned into a fortuitous asset. Jeff was "gifted." At an early age, he had displayed unmistakable evidence of inherent brilliance. It was a quality that, at first, had given his parents mixed feelings. Of course, they were proud of his intellectual excellence, but they both understood, again without having to discuss it, that a live-in genius who listened to Mozart while he worked out calculus problems in his head could be something of an inconvenience, to say the least. They had unspoken visions of an overweight, underdeveloped lump who wore thick glasses and stained T-shirts and who picked his nose in public while quoting Nietzsche. They need not have worried. He was in the hands of experts.

Within a few months after his birth, Jan went back to work. She had engaged an

efficient, if unimaginative, "companion" ("baby-sitter" was an inappropriate term, and nannies simply didn't exist anymore) who had had enough sense to make sure the child didn't run out into the traffic and insufficient brains or skills to draw out his intellectual potential. Anyway, that was the school's job. By the time Jeff was two, Harlan had found a school that catered to bright kids and took care of them from nursery school right on through high school. Jeff loved it.

It was only lately, in the past year or so, that things seemed to go wrong. Well, no, not exactly wrong, but certainly different. Although Jeff had always respected the desired distance from his parents, lately Jan and Harlan—especially Harlan—sensed something more. It was that subtle difference between distance and alienation. There was none of the knock-down, drag-out kind of wrangling, none of the shouting matches that seem so typical of a child when he becomes an adolescent. Certainly, Jeffrey could not be accused of behaving "just like a typical teenager," despite the fact that the problem—if indeed, it was a problem—had begun when Jeff turned 13. Perhaps it was simply maturity, the acquisition of self-awareness that comes with growth. Jan and Harlan had carefully trained Jeffrey to realize that while they cared about him, it was often necessary for him to manage to get through the day, and even small segments of his life, without them. Could it be that Jeffrey was now mature enough (he was certainly intelligent enough) to control and organize his own life accordingly?

Jan poured herself a drink and sat down in the chair opposite Harlan. She sipped thoughtfully and tried to reconstruct what had happened, if in fact anything had happened. It seemed to have begun immediately after Jeff's 13th birthday; let's see, that would have been just over a year ago. It was as though some kind of switch had been turned on. She could not pinpoint, with any precision, the exact date and time, but she was keenly aware of a sense that one night, after dinner, Jeffrey had gone up to his room, as he nearly always did, and that the next morning he had come down to breakfast wearing an invisible suit of armor. His behavior had not changed, but there was an almost palpable difference in his

ILLUSTRATION BY TOM NEWSOM



## Who ever heard of a 14-year-old spending all of his allowance on wires and transistors and diskettes?

perception. One day Jan and Harlan had been his parents; the next, they had become part of the environment, to be dealt with matter-of-factly and unemotionally, as one would deal with the thermostat. To herself, Jan had to admit that it could have been worse. She had never been one to submit to stereotypical sentimentalities, and she much preferred a child capable of keeping his own counsel to a clinging whiner who demanded constant coddling in exchange for unconditional love.

Harlan, unfortunately, had reacted with considerably less equanimity, which, combined with two highballs, accounted for his present mood. For Harlan, Jeff was becoming an embarrassment, almost a social, even a professional, liability. Harlan had not lost his temper when Jeff had matter-of-factly stated that he would not participate in this year's Father-and-Son Day at the club, but his rage and disappointment were evident in his eyes and his tightly controlled voice. "How will it look," Harlan had reasoned, "if I'm the only father there without my son?" "I'm not worried, Harlan," Jeff had replied, barely smiling, "I'm confident that you can come up with a plausible explanation. Why not simply tell them I'm not interested?"

It was the same story with the company's Annual Golf Tournament: Harlan was the only executive who had had to actually hire a caddy. In keeping with tradition, all the others had brought their sons or daughters or nephews or nieces. And again, Jeff's explanation was cool, logical, and impenetrably self-centered: "Golf is a boring game, Harlan. It's rather pointless. The bag is heavy and I have no desire or inclination to try to remember which club to hand you in any given circumstance. I would only spoil your game and that would make us both unhappy. Remember last year? No, I don't think I'll participate this year, or any other year, for that matter." No one had said anything during the tournament, but Harlan would never forget the perpetual smirk on Bob Fingerhut's face as Fingerhut had walked along with his arm around his daughter's shoulders, easily building up—with her help—the eight-stroke lead that had won him the game.

In orderly succession, Jeffrey had similarly eliminated the birthday celebrations, family outings, pool parties, and other social activities that had become integral parts of Jan's and Harlan's corporate-cum-suburban lives. His doing so had left his parents with a certain sense of general uneasiness, but it was no real problem: with her usual skill and aplomb, Jan had let it be known that Jeff was a "loner" who preferred to spend his free time in his room, working on his "projects." Exactly what those projects were, she could not say. Her response suggested secrecy, which was exactly what she intended, because it lent a soupçon of mystery to the

image of their lives. And she was, of course, being truthful. She saw no need to explain that she could not say what the projects were because she did not know. Jeff never discussed them, and, in all honesty, she was not terribly interested. She supposed that in some way, they were related to BUDDIE.

"It's all BUDDIE's fault," Harlan grumbled, as though he had been reading her thoughts. "We never should have gotten the damned thing for him."

"Oh, come on, Harlan," Jan cajoled, "don't be such a sorehead. Getting him that micro was probably the best thing we ever did. At least it keeps him off the street," she said, laughing at her own understatement.

"Sure," he replied, not appreciating the humor. "It also keeps him holed up in his room all the time. It's not natural, Jan. A kid his age should have friends, he should be going to football rallies and beach parties. He should be thinking about girls instead of boards and circuits." Harlan quickly warmed to his lament and turned to face Jan fully. "Who ever heard of a 14-year-old kid spending all of his allowance on wires and transistors and diskettes? Remember last June when we offered him a present for finishing the year at the top of his class? What did he ask for? A 10-speed bike, or a moped, or a trip to Europe, or a new stereo? Not a chance. Oh, no, not our kid. A voice simulator. A voice simulator! What kind of a request is that for a teenager? It's just not natural."

"Oh, Harlan," Jan said, not bothering to hide her exasperation, "it's entirely natural for Jeffie. You know it is. You're just jealous because that kid can program rings around you. Around both of us, for that matter." She allowed herself a smile of satisfaction. "I'll never forget the day you sat him down in front of our PEACH II. He was all of 11 years old. Remember? You handed him the manual, showed him how to turn the machine on, and left him alone in the rec room. In a matter of hours . . ."

"Actually," Harlan interrupted, "it was a matter of days. Two, to be exact." He could not resist smiling as grudging pride seeped through his frustration. "The punk had the whole thing down pat in no time. Within a week, he was complaining because the PEACH didn't have enough memory to suit him. It was really amazing. The kid's a natural programmer." They looked at each other for an instant and then they both laughed. "Okay, okay," Harlan said, feeling a little better; "so I'm wrong. It is natural for Jeff."

They had decided to buy Jeff a BUDDIE for his 13th birthday almost in self-defense. He was beginning to suggest that the recipe file, the investment portfolio, the Christmas card list, the household budget, and all the other useful functions that rationalized the purchase of the PEACH II could probably be

eliminated, to free up some memory for whatever esoteric purposes Jeff had in mind. Once he had the BUDDIE, however, he seemed to spend virtually all his free time with it.

Although Jan had successfully diverted Harlan's thinking in another direction, she realized that he was right: the change in Jeff was precisely coincident with the arrival of the BUDDIE, to the extent that he had practically ignored the PEACH II until five or six weeks ago.

Harlan had been the first to discover it. He had come home from an out-of-town meeting a little earlier than usual, and had discovered Jeff in the rec room. The cover of the PEACH II had been removed and was on the floor, next to Jeff, who was doing something with boards, wires, and a tiny soldering iron.

"What's up, kid?" Harlan had said. "Did the PEACH go down?" "No," Jeff had answered, "it's working perfectly. I'm just making a few modifications for—well, actually, I'd prefer not to say just yet. I'm planning a surprise for you and Jan. It should be ready in time for the holidays. Please don't question me any further, Harlan, or you'll spoil the surprise. Okay?"

"Okay, kid," Harlan had smiled. "Just as long as you get it all put back together by this evening. The Fingerhuts are coming over tonight and I know that louse is going to challenge me to another Space Attack tournament. Hey, Jeff, why don't you join us? You could probably demolish that creep in a minute flat."

"In half a minute, Harlan. I've reviewed the replays. Mr. Fingerhut is fast, but he's not particularly clever. Perhaps if you thought in terms of strategy instead of mere speed, you'd gain some advantage. Mr. Fingerhut has good response time, but he's not too bright. You're much more intelligent than he is. I'm sure you can do it without me. Besides, I have some work to do, so I'll have to decline the invitation." And, as usual, Jeff had been right. Strategy had never occurred to Harlan, but after Jeff had suggested it, Bob Fingerhut couldn't win a Space Attack match from Harlan if his life depended on it.

Again, the rapport that sometimes bordered on telepathy showed itself. Simultaneously, Jan and Harlan turned their eyes to the two packages, one large and one somewhat smaller, that stood near the half-decorated tree. "Do you suppose that's his surprise?" Jan asked. "Could be," Harlan said. "Let's open them."

"I don't know, Harlan. Shouldn't we wait till morning?"

"What for? He won't mind. He probably won't even notice."

They rose in unison and went to the parcels. The larger one bore a card with the neatly printed message: "To Jan & Harlan, Merry Xmas, Jeff. (P.S. Open this one

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CIRCLE 132 ON READER CARD

## Suddenly, they seemed to be flung into each other's arms by the sheer force of the voice that emerged from the simulator.

first." They tore off the colorful gift wrapping and stared at the gray metal box that rose above the mound of shredded paper.

"What the hell is it, Jan?"

"I don't know. Wait. Yes, I do. Don't you recognize it? It's the voice simulator. Look, Harlan, it's an exact replica. The only thing that's different is the color of the cabinet. And the manufacturer's labels are missing."

"They're not missing, Jan," Harlan said. "They were never there. You know what that kid's done? He's made a copy of the simulator. Hell, I wouldn't be surprised if he improved on it."

He slid his hand around the back of the box and found the envelope that had been taped there. Inside was a single sheet informing them that the simulator was now plug-compatible with the PEACH II. They need only set it on top of the PEACH's cpu cabinet, hook it up to the interface that Jeff had hardwired in, and it would function perfectly. Together, they carried the box to the cpu cabinet and followed Jeff's instructions. In a minute or two the simulator was in place, plugged in, and blinking merrily in anticipation.

"Okay," Harlan said, to no one in particular, "what next?"

"Harlan . . . look," Jan whispered. He followed her gaze to the PEACH's screen. Its bright green letters spelled out: READY FOR J.E.F.F.

"What the hell does that mean?" Harlan said, again not expecting an answer. They stared at the screen for a moment and Jan remembered the other package. She ran back to the living room, retrieved the parcel, and by the time she returned to the rec room, she had the wrapping completely removed. She held out the diskette pack to Harlan as though he could discern its mystery. He took it from her, inserted it into the drive, and waited. Suddenly, they seemed to be flung into each other's arms by the sheer force of the voice

that emerged from the simulator. Its accents were mechanical, and its tone somewhat metallic, but it was unmistakably Jeffrey's.

"Hi. I'm a brand new software package that has been designed especially for you. My formal title is the Juvenile Entity for Family Fulfillment, but you can call me by my initials—JEFF. It has taken a long time and a lot of work to develop me, but I think I'm ready now to do my job, which is to serve you. If you will press the letter M on the PEACH keyboard, your screen will display a menu of programs you can select from. It's not complete yet, but more will be coming. Mother's Day, Father's Day, birthdays, and wedding anniversaries are all occasions for additions to the JEFF system. Now, if you'd like to turn me off, simply type OFF on your keyboard. But I hope you'll try one or two of the programs on the menu first. I'll wait."

Still clutching each other, Jan and Harlan moved to the keyboard and punched M. Instantly, an array of titles appeared on the screen, followed by codes: Xmas Morning 1225, Injured Knee 101, Report Card 413, Onset of Puberty 069, Night Terrors 156, Daddy Hit Me 724-A, Mommy Hit Me 724-B, Take Me Out to the Ball Game 9911, and perhaps a dozen others. The last line read: For additional listings, press ADD on the keyboard.

Jan reached over and tapped out 101. Instantly, the screen cleared, leaving only a blinking cursor.

"Mommy, Mommy," the simulator cried, with chilling childishness, "I fell down, Mommy. Look, Mommy, it's bleeding. It hurts, Mommy, it hurts. Make it better."

The simulator fell silent. "What now?" Jan whispered. Harlan pointed to the screen. It said: VOCAL RESPONSE REQUIRED. Jan shrugged her shoulders. "There, there, er, Jeff," she ventured, "it's not serious. First we'll wash it off, then we'll put a little

Mercurochrome on it." She quickly fell into her role. "Now I'll put a Band-Aid over it, and just for good measure, I'll kiss it to make it well. Okay?"

"Thanks, Mommy. It doesn't hurt anymore. Gee, you're a terrific mommy."

Through her tears, which she could no more explain than control, Jan saw the menu reappear on the screen.

"Harlan . . ." she began. But Harlan was not listening. He was too concerned with attempting, with minimal success, to control his fury. "I don't know what that little s.o.b. thinks he's pulling, but I'm sure as hell going to find out." Jan made no attempt to stop him as he stalked from the room and took the stairs two at a time. She simply stood there, feeling the tears run down her cheeks and mildly annoyed that she could not remember the last time she had cried. It seemed like only seconds when Harlan returned. His face was white, and his hands were shaking.

"My God, Harlan, what is it? Is Jeff all right?"

"I don't know. I don't even know if I'm all right. Come on, Jan, you'll have to see this for yourself. There's no way I can describe it." He took her by the hand and led her up the stairs.

The door to Jeff's room was slightly ajar. As they approached, she could hear the even breathing of her sleeping son. But she also heard a voice. The accents were somewhat mechanical and the tone a trifle metallic, but the voice was unmistakably Harlan's.

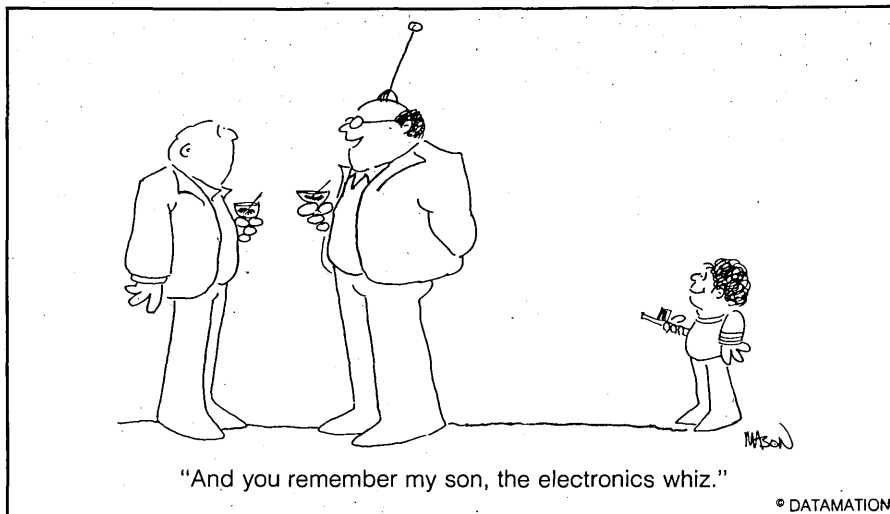
Gently, Harlan pushed the door open. There, close to their sleeping son, was the original voice simulator, its lights pulsing in synchrony to the sounds coming from the speaker.

"Of course you have to go to sleep now," the simulator said. "You know Santa doesn't come when you're awake. What do you suppose he'll bring you? Do you think he knows about the train set you were looking at in the store window the other day? Maybe he'll leave the stuffed Snoopy you've been wanting. But you really must go to sleep now. All right, I'll read to you. Close your eyes, now. 'Twas the night before Christmas, and all through the house . . .'"

Noiselessly, they closed the door and went downstairs. They stopped in the living room long enough to pour a couple of drinks and then went into the rec room. They sat side by side on the divan and stared at the PEACH II screen, its menu still glowing. Neither of them spoke for several minutes. After a while, Harlan took a long gulp from his glass and said, a little too casually, "I wonder what Onset of Puberty 069 is about."

"Actually," Jan said with a little smile, "I'm sort of curious about Daddy Hit Me 724-A."

"Okay. You go first."



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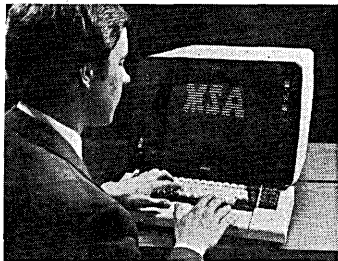
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TYPE/MODEL \_\_\_\_\_

DN/6a1 (12/81)

# THE LEADING EDGE

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#1 in a series of reports on new technology from Xerox

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*About a year ago, Xerox introduced the Ethernet network—a pioneering new development that makes it possible to link different office machines into a single network that's reliable, flexible and easily expandable.*

*The following are some notes explaining the technological underpinnings of this development. They are contributed by Xerox research scientist David Boggs.*

The Ethernet system was designed to meet several rather ambitious objectives.

First, it had to allow many users within a given organization to access the same data. Next, it had to allow the organization the economies that come from resource sharing; that is, if several people could share the same information processing equipment, it would cut down on the amount and expense of hardware needed. In addition, the resulting network had to be flexible; users had to be able to change components easily so the network could grow smoothly as new capability was needed. Finally, it had to have maximum reliability—a system based on the notion of shared information would look pretty silly if users couldn't get at the information because the network was broken.

## **Collision Detection**

The Ethernet network uses a coaxial cable to connect various pieces of information equipment. Information travels over the cable in packets which are sent from one machine to another.

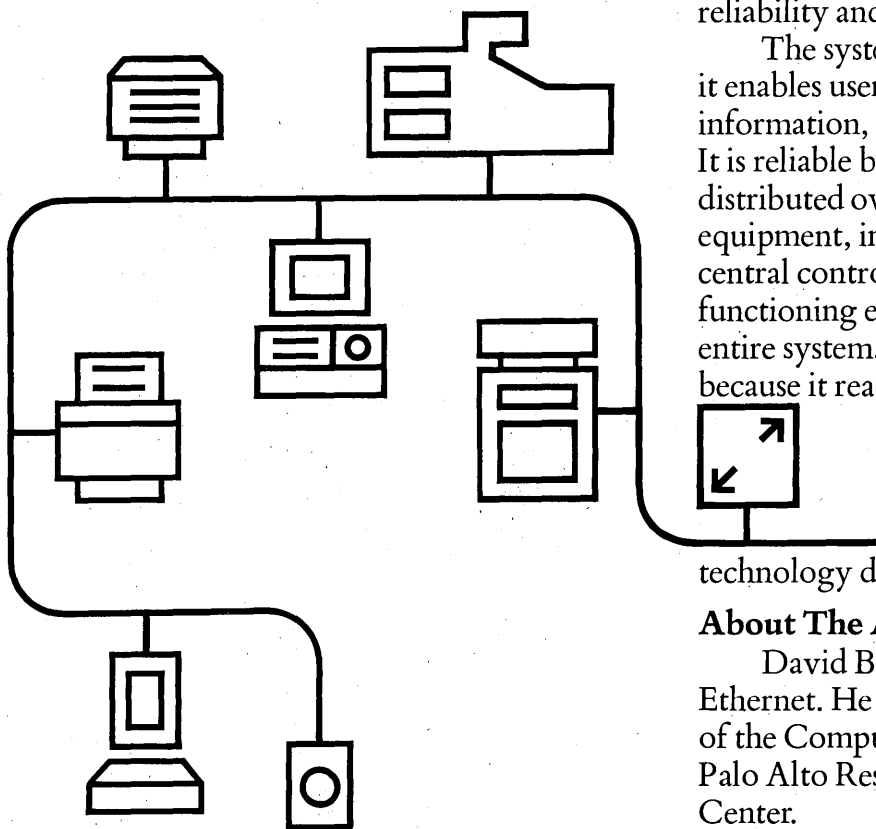
A key problem in any system of this type is how to control access to the cable: what are the rules determining when a piece of equipment can talk? Ethernet's method resembles the unwritten rules used by people at a party to decide who gets to tell the next story.

While someone is speaking, everyone else waits. When the current speaker stops, those who want to say something pause, and then launch into their speeches. If they *collide* with each other (hear someone else talking, too), they all stop and wait to start up again. Eventually one pauses the shortest time and starts talking so soon that everyone else hears him and waits.

When a piece of equipment wants to use the Ethernet cable, it listens first to hear if any other station is talking. When it hears silence on the cable, the station starts talking, but it also listens. If it hears other stations sending too, it stops, as do the other stations. Then it waits a

random amount of time, on the order of microseconds, and tries again. The more times a station collides, the longer, on the average, it waits before trying again.

In the technical literature, this technique is called carrier-sense multiple-access with collision detection. It is a modification of a method developed by researchers at the University of Hawaii and further refined by my colleague Dr. Robert Metcalfe. As long as the interval during which stations elbow each other for control of the cable is short relative to the interval during which the winner uses the cable, it is very efficient. Just as important, it requires no central



control—there is no distinguished station to break or become overloaded.

### The System

With the foregoing problems solved, Ethernet was ready for introduction. It consists of a few relatively simple components:

Ether. This is the cable referred to earlier. Since it consists of just copper and plastic, its reliability is high and its cost is low.

Transceivers. These are small boxes that insert and extract bits of information as they pass by on the cable.

Controllers. These are large scale integrated circuit chips which enable all sorts of equipment, from communicating typewriters to mainframe computers, regardless of the manufacturer, to connect to the Ethernet.

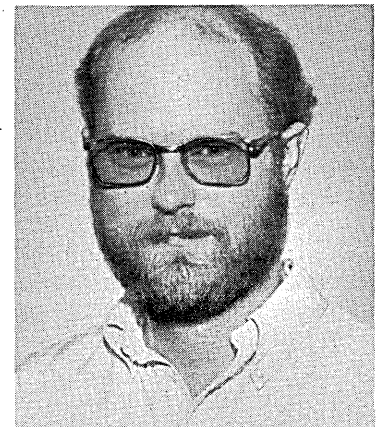
The resulting system is not only fast (transmitting millions of bits of information per second), it's essentially modular in design. It's largely because of this modularity that Ethernet succeeds in meeting its objectives of economy, reliability and expandability.

The system is economical simply because it enables users to share both equipment and information, cutting down on hardware costs. It is reliable because control of the system is distributed over many pieces of communicating equipment, instead of being vested in a single central controller where a single piece of malfunctioning equipment can immobilize an entire system. And Ethernet is expandable because it readily accepts new pieces of information processing equipment. This enables an organization to plug in new machines gradually, as its needs dictate, or as technology develops new and better ones.

### About The Author

David Boggs is one of the inventors of Ethernet. He is a member of the research staff of the Computer Science Laboratory at Xerox's Palo Alto Research Center.

He holds a Bachelor's degree in Electrical Engineering from Princeton University and a Master's degree from Stanford University, where he is currently pursuing a Ph.D.



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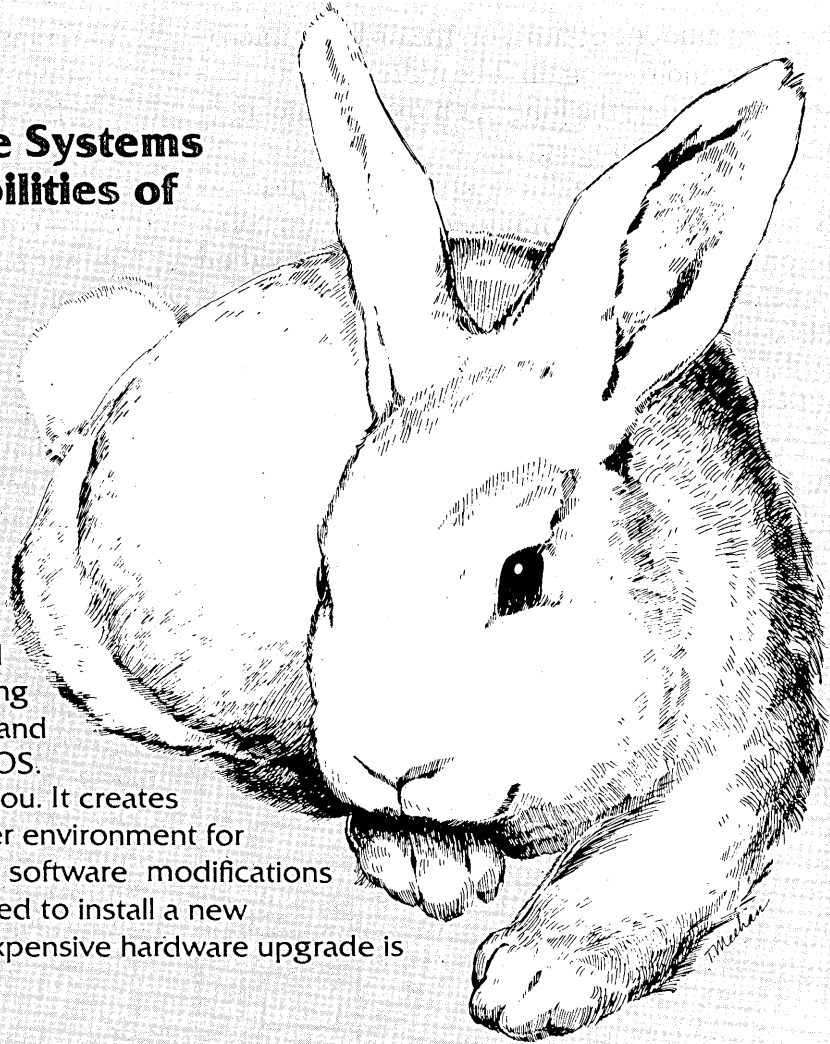
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Money alone can't build an advanced information system.

# COMPUTING IN KUWAIT

by A. El-Sayed Noor

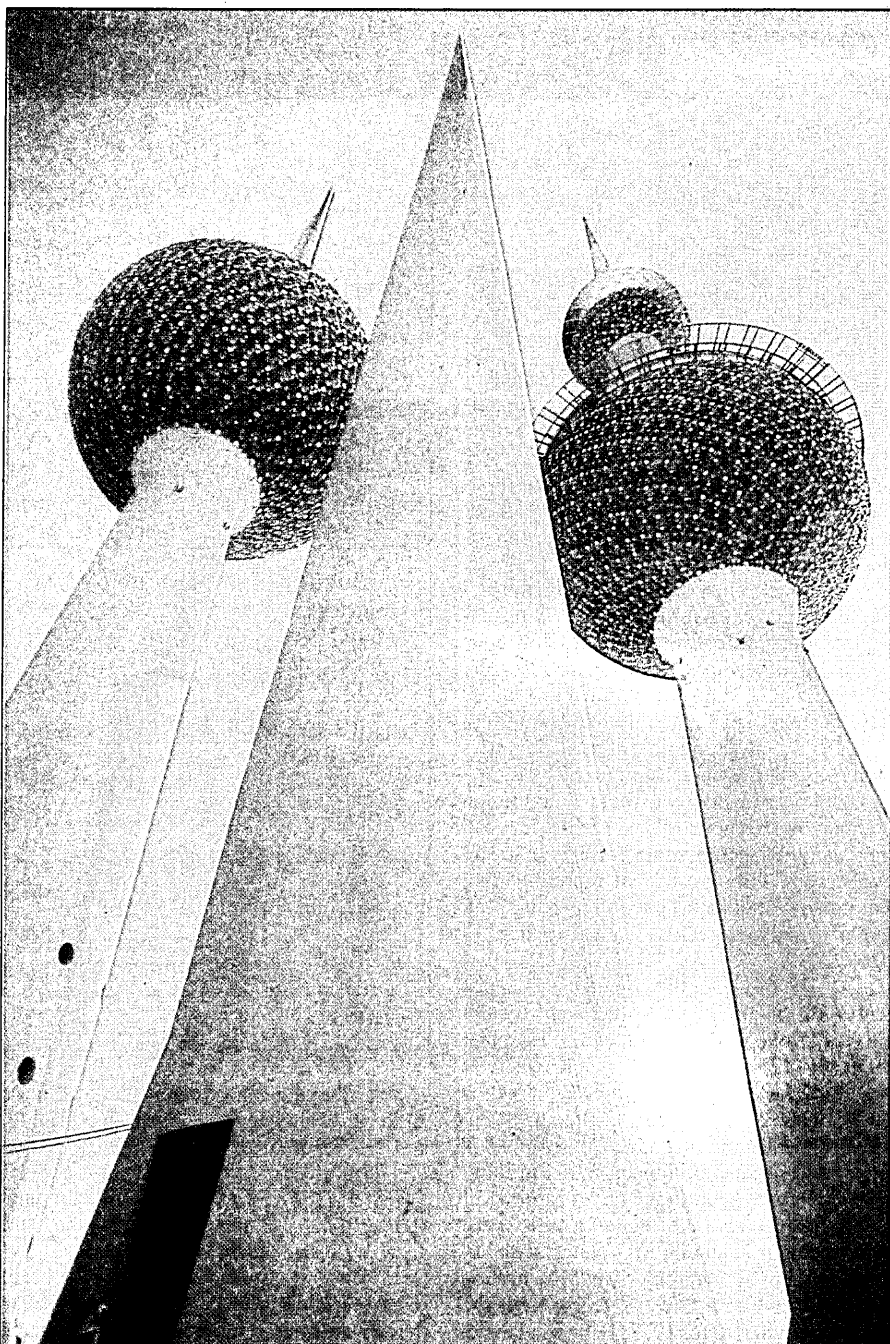
"The poor computer salesman comes to Kuwait thinking it is going to be very easy for him to sell two machines in a couple of weeks. He's surprised to find that negotiations can drag on for several months without any hope of an end to requests for more information, more explanations, and further clarifications. He doesn't realize that this market is very different from what he knows in the West."

This comment from a Kuwaiti dp manager makes clear the general lack of knowledge about computing in this part of the world. The problem, simply stated, is that not much research has been done on the matter. What are the characteristics of information systems in Kuwait? What are the major problems one encounters in trying to manage them?

This report, part of an extensive study of the subject, will try to answer those questions. The fact that this study is one of the first attempts to compile information about computing in any Arab country would seem to indicate the need for similar studies focused on other nations. It is believed, however, that this article will also serve as preliminary outline of Arab computing in general.

Kuwait is unlike many developing countries in that its oil-generated wealth gives it the highest per capita income in the world. Financially speaking, the country can afford the latest computer technology available. This lack of any financial constraints, coupled with an ambitious economic development program, has attracted the attention of computer hardware and software vendors. Yet economic decisions are taken with much prudence, and the sometimes over-optimistic computer salesman may meet with a more cautious attitude than he expects. Still, there is a definite view that computers have an important role to play in the economic and social development of Kuwait.

Table I indicates that up to May 1978 (when this study was completed) three major computer companies dominated the Kuwait computer market—IBM, NCR, and ICL. The Government Computer Center (GCC) within



PHOTOGRAPH BY HARVEY LLOYD/THE IMAGE BANK

# In Kuwait, with its overall manpower shortage, the shortage of computer technical specialists is especially acute.

TABLE I

## COMPUTER SYSTEMS IN USE BY MAY 1978

COMPUTER SYSTEM	NUMBER
<b>IBM</b>	
370/158	2
370/115→135	8
Data Communication Terminals (3780)	10
Data Entry System (Programmable Work Stations 3741)	2
1130	2
<b>ICL</b>	
1904 S/1903 T	2
2903	2
<b>NCR</b>	
Criterion (8550)	2
Century (201,151)	5
8200 Series	7
499	8
399	2

the planning department has been the major user of IBM mainframes. The GCC, a centralized organization providing service to various government departments and agencies, is presently upgrading to larger IBM 3030 models. Kuwait Oil Co. (KOC) has been the major ICL user since the early days of using computers in the '50s.

Since completion of the study, the picture has changed. Kuwaiti University has installed a dual processor UNIVAC 1100/62. Burroughs is also competing for a share of the market, and several minicomputer vendors have been active, apparently with some success. In general, the number of minicomputers being installed is increasing (see Table II).

It is important to note that foreign companies seeking a share of the Kuwaiti market must secure some form of Kuwaiti cooperation through a local representative. Foreign exporters must have a Kuwaiti agent; by law, only Kuwaitis can get import licences.

The results of this research are consistent with the findings of other industry observers. Bohdan O. Szuprowicz (December 1979, pp. 125-127) reported that Kuwait was the sixth fastest growing import market in 1977, with a 62.6% growth rate for 1976-1977. Kuwait computer and office equipment imports were \$9.9 million and \$16.1 million, respectively. According to Szuprowicz, Saudi Arabia was (and probably still is) the leading importer among Arab states, with imports totaling \$25.8 million and \$39 million for 1976 and 1977, respectively. That's a 58.1% growth rate for 1977. Following Saudi

TABLE II

## COMPUTERS IN USE BY DECEMBER 1980

COMPUTER SYSTEM	NUMBER
<b>BURROUGHS</b>	
B 1800	3
B 1700	2
<b>DIGITAL</b>	
PDP/11	5
<b>FOUR-PHASE SYSTEMS</b>	14
<b>IBM</b>	
370/158	2
370/115→148	7
4341	1
4331	6
1800	2
System 34	4
1130	2
Data Communication Terminals (3780)	9
Data Entry System (Programmable Work Stations 3741)	2
<b>ICL</b>	
2960	2
ME 29	2
2903	2
<b>NCR</b>	
8500	5
8400	3
8200	16
Century	1
8100	2
499	8
399	2
<b>PERKIN-ELMER</b>	
P-E 3220	3
<b>PRIME</b>	
P550	2
<b>RC COMPUTER</b>	
6000	4
8000/45	3
<b>TANDEM</b>	
T16	2
<b>WANG</b>	5

Arabia, the largest dp import markets in the Arab world are Algeria, Kuwait, Egypt, Iraq, and Morocco.

## COMPUTER USES IN KUWAIT

Examination of computer applications in the surveyed organizations shows the vast majority to be of the transaction-oriented type as opposed to the management information and decision

TABLE III

## FUNCTIONAL ORIENTATION OF SYSTEMS

CATEGORY	PERCENT
Financial	70
Logistics	20
Sales, Marketing	7
Other	3
<b>Total</b>	<b>100</b>

Sample of Applications = 98

TABLE IV

## COMPUTER APPLICATIONS

APPLICATIONS	PERCENT
Payroll	17
Accounting, General Ledger	20
Stock (mainly inventory accounting)	20
Accounts Receivable	4
Costing (basic)	13
Fixed Assets	3
Banking—General	3
Banking—Current Accounts	3
Banking—Capital Expenditure	7
Other	10
<b>Total</b>	<b>100</b>

Sample of Applications = 98

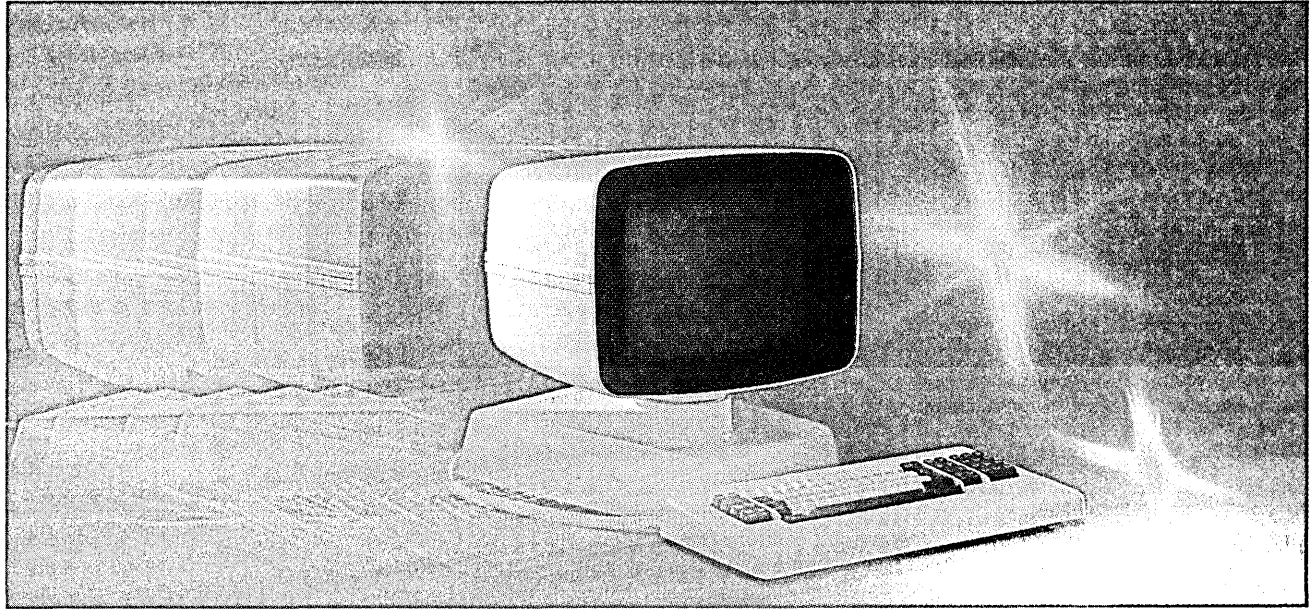
support systems types. Naturally, priorities during the early stages of introducing computers were given to routine applications such as payroll, inventory accounting, accounts payable, and accounts receivable. Output consists mostly of summary reports distributed to the lower echelons of management. Although such reports are available to managers at all levels, they are of limited value to middle and top management. Tables III to V summarize main characteristics of computer applications.

Only a few organizations—mainly in the oil and banking sectors—have been able to move gradually toward the database decision-oriented systems used for management control and strategic planning.

As elsewhere, dp problems are a fact of life in Kuwait. There is, however, one important difference here: the dp manager is allowed more time to deal with some significant problems than he would be in a developed country. As to the problems computing and information systems encounter in Kuwait, most of them are difficulties normally



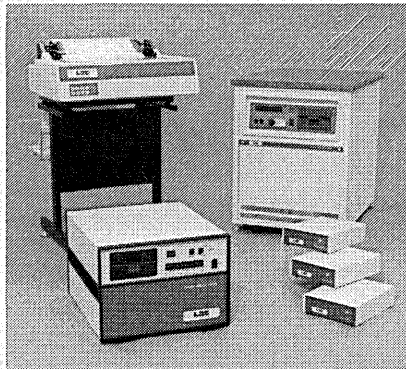
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# Selling computers is not enough; there must be education, training programs, and other support services.

associated with computing in developed economies. Additionally, there are many of the administrative and organizational problems experienced by developing countries. The problems most frequently cited by the organizations surveyed were:

- Inadequate feasibility studies, particularly cost/benefit analysis
- High user expectations, despite involvement and commitment on their part
- Misconceptions regarding computers, including computers as merely fast printing machines
- Difficulty in recruiting skilled professionals, particularly Kuwaiti nationals; shortage of business-oriented analysts
- Lack of professional training and certification in applied computer areas
- Insufficient technical support from vendors
- Resistance to changing existing procedures and attitudes

Shortage of computer technical specialists is a worldwide problem. In Kuwait, with its overall manpower shortage, the problem is especially acute. Kuwait has to use international computer recruiters to attract highly qualified programmers and systems analysts. This results in a heterogeneous dp population with different backgrounds, attitudes, and ways of life. Such heterogeneity has obvious implications for the effectiveness of systems development and implementation, particularly for the dp-user interface. These relationships are mainly characterized by a passive attitude on the part of dp departments.

Not surprisingly, the organizations studied did not report the kinds of problems associated with information systems at a more advanced stage of development. For example, there is not much concern regarding costing and chargeback for computing services; there is little interest in performance evaluation and reporting; and the organizations do not appear to have done much to determine their strategies for future growth.

## NEED TO PLAN AND CONTROL

Except for the oil and banking sectors, effective planning and control systems for the management of data resources are the exception rather than the rule. Attention is focused on the existence of formal procedures and practices more suitable for manual systems. Formal meetings to discuss and approve certain actions or policies do exist, but such practices cannot be said to form the basic ingredients of an adequate planning and control system.

The absence of planning and control mechanisms has serious consequences for both the edp function and the larger organization it serves. The following comment from a Kuwaiti dp manager is typical:

"There are still no formal budgeting

TABLE V

## ACHIEVEMENTS OF COMPUTER SYSTEMS

MOST NOTICEABLE ACHIEVEMENTS	PERCENT OF RESPONDENTS CITING SUCCESS
Reduction in clerical operations	67
Reduction in amount of paperwork*	57
Improved cost control reports	33
Improved ability to monitor business operations	23
Utilization of feedback information to take corrective actions	13
Improved ability to react to changing environmental conditions	13
Improved ability to plan future activities	13
Ability to evaluate alternative courses of action more comprehensively	7

This table was compiled by asking users to evaluate systems output.

\* 7% of organizations indicated that use of computers has resulted in more paperwork, which constituted a burden.

Sample of Applications = 98

or cost control systems. If you had a mechanism to project your expenditures on an annual or six-month basis and then get the approval of your management, life would be much easier. If you need, for example, to spend significant funds on software development or hardware enhancements, upgrades, or communications, or whatever, it's usually well over your individual approval limit, so you have to go to someone else to get approval. This is done on an ad hoc, informal basis, usually with a lot of delay. And you end up with additional costs because you get your software ready but the hardware you need won't be available from the manufacturer for nine months."

These organizations currently devote most of their attention to developing basic applications, and to getting the dp function integrated into the larger organization. For most, transition to a more effective and mature use of data processing resources will require a great deal of effort. Management will have to examine carefully the degree of progress of the dp function in relation to the organization's objectives, priorities, and requirements. A strategic plan outlining the ways to remedy weaknesses and to further strengths should be drawn up. The strategy should be revised periodically to reflect changing conditions.

What lessons have these organizations learned from their experiences with computing? Most frequently mentioned were the following:

- Involve user departments from the very beginning of a project.
- Use management steering committees to schedule and follow up implementation of work.
- Begin in areas with user interest.

- Ensure complete, accurate documentation of live systems.
- Ensure top management's genuine involvement.
- Emphasize user appreciation courses.
- Don't rely on outside advice, particularly from vendors.
- Don't regard plans as inflexible.

The rapid growth of computer use is evident in many parts of the Kuwaiti economy. Vendors wishing to sell in this market will have to plan carefully, and will need a thorough understanding of local conditions and practices. Although Kuwait is virtually free from many of the problems that normally handicap developing countries (such as the lack of financial resources, telecommunications, and basic infrastructure), it would be a mistake to apply planning standards followed in western environments. Local constraints, unforeseen costs, and administrative and logistical difficulties must be taken into account.

Vendors will do well with approaches that demonstrate a long-term commitment based on mutual benefit. Selling computers and software is not enough; there must also be local education and training programs, maintenance services, and other support services. Trusted vendors will be the most successful.

A. El-Sayed Noor is a lecturer in computer and information systems at the Faculty of Commerce, Economics & Political Science, University of Kuwait. He received his PhD from the University of Sheffield, U.K., in 1975. His current research interests include effectiveness of computer-based information systems, analysis of database management systems, and edp audit and control.

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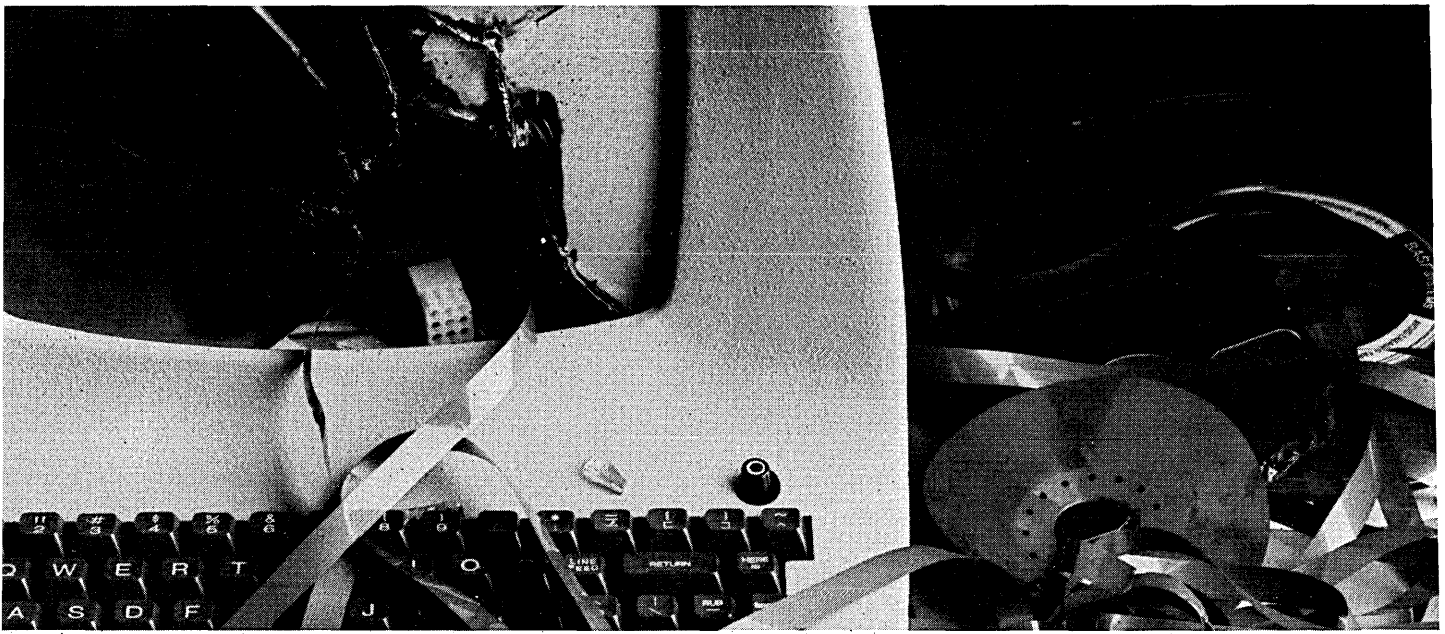
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# "Oh no! Somebody got into the computer room last night."

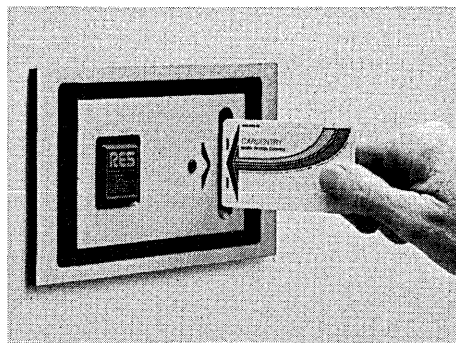
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# PEOPLE

## A QUIET BUT CAGEY CAT

There are few clues to the man himself in Bill Catacosinos' office. Set in the corner of a sprawling suburban building, the office is decorated in early Long Island Electronics Executive. Nondescript paintings and ceremonial photos hang on paneled walls; a large desk sits far beyond a round table with four chairs on little wheels that sink into the carpet. There are few personal effects. Catacosinos didn't get where he is by giving much away.

Perhaps more can be learned by comparing the office with those of his subordinates. Few of them have windows, even fewer paneling or carpets. The offices are small, the floors crowded in this company where copiers spill into Spartan halls and word processors rub elbows with terminal testers. Applied Digital Data Systems, Inc. didn't get where it is by giving much away either.

Founded 12 years ago by Catacosinos and partners, ADDS is an established leader in the crt terminal market. It ships some 50,000 crts a year and is diversifying into the small computer market. Its products are sold primarily to OEMs, its biggest customer being NCR. As chairman and chief executive, the soft-spoken Catacosinos has grown the company to a \$50-million-a-year enterprise, keeping it fiercely independent until last year when NCR bought it out from under him. A brief stock battle took place, instigated by another firm's unfriendly takeover attempt, and ADDS settled—too quickly, some say—for NCR ownership.

The company has continued its business as usual, largely left alone by NCR—the



WILLIAM J. CATACOSINOS: "I grew up being a very conservative individual."

only sign of Dayton in that corner office is an NCR procedures manual tucked quietly away in a sideboard. There has been no announced joining of forces between the two firms, no exodus of ADDS executives, no cannibalizing of the smaller firm's facilities. One question remains, however: now that he's lost his company, what will the Cat do next?

The Cat, as a former associate refers to him, has been characteristically quiet these past few months, saying little about future plans. But a look at his past—one of lessons learned, mentors followed, and money made—would suggest that his entrepreneurial spirit would be a hard one to exorcise.

The Hauppauge, Long Island, plant serving as ADDS headquarters can perhaps be seen as a reflection of its leader's upbringing. Born of first generation Greek immigrants who came to this country with no

knowledge of English and no trade to pursue, William J. Catacosinos grew up on New York's Upper West Side. He first went to work at age nine, stacking crates in a Harlem grocery store. "That's where I learned the importance of money," he recalls. "I grew up being a very conservative individual."

After a stint in the Navy and a bachelor's degree from New York University, he found a job at Brookhaven Laboratories, a federally funded atomic research facility on Long Island. "It was a phenomenal place," Catacosinos remembers. "There were 800 PhDs out of a total of 3,000 people there. That's where I learned to think."

Much of that thinking went into helping manage a \$30 million accelerator project, one of the biggest of its kind at the time, he says. He worked at Brookhaven for 13 years, from the mid-'50s to the late-'60s, moving up the management ladder under the tutelage of such men as Max Small, a project leader whom Catacosinos credits with teaching him that nothing is impossible once one puts his mind to it.

Small, living in retirement not far from the labs, remembers Catacosinos as showing an "independent spirit. He has his convictions and sticks to them." Some of that stubbornness apparently rubbed off from Small himself, who, as a "damn Yankee," tried to negotiate contracts with the taxpayer and government in mind. "If once we decided on a course of action, we stuck with it," Small reminisced. "We wanted to get the best deal possible. I think that's where [Catacosinos] learned to get the most for his money."

At night, Catacosinos worked on his doctorate in economics at NYU, writing a thesis on the role of management in research. It was in the early '60s, having gone as high up in the Brookhaven administration as he could go without a physics degree, that he "got an itch for computers."

"I'd run out of challenges, so I talked with Max Palevsky." The West

**PEOPLE**

Coast founder of Scientific Data Systems, whose brother Harry worked at Brookhaven, offered Catacosinos a job, as did William Norris at Control Data. But on the advice of various colleagues, Catacosinos decided to strike out on his own rather than be somebody else's vice president.

He and some partners formed a company with \$70,000 of borrowed money. The firm was Corometrics Medical Systems, Inc., which pioneered the development and use of fetal monitoring equipment. Catacosinos served that firm as treasurer and chairman, helping it on its way to being bought in the '70s by American Home Products for some \$26 million.

Taking his earnings from Corometrics, Catacosinos in 1969 helped found ADDS in the belief that "terminals would become the all-pervasive tool linking people to the computer." The company was directly in competition with IBM, Infoton, and Datapoint, but got off to a good start with an initial public offering in 1970. Almost immediately after that offering, Catacosinos recalls, the stock market collapsed with all but a few computer companies taking a beating.

As chairman and president, Catacosinos ran the company in what he called "failure syndrome," assuming that if any one decision were wrongly made the company would fall apart. "It was a question of



"It's not just a question of prestige. The corner cells really are roomier and they have a better view."

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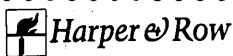
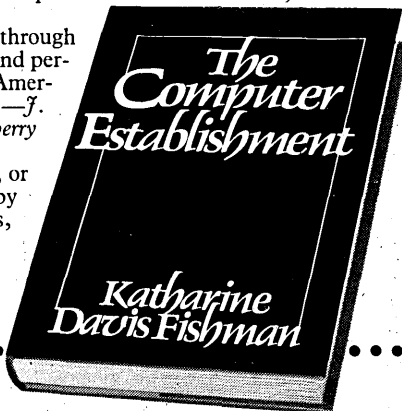
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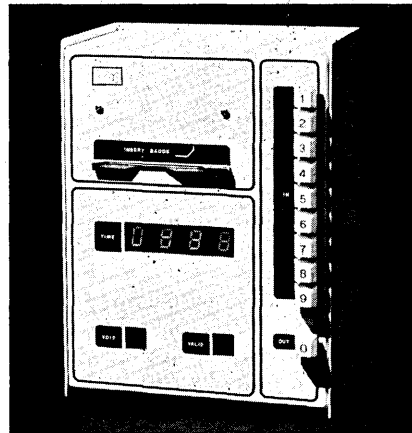
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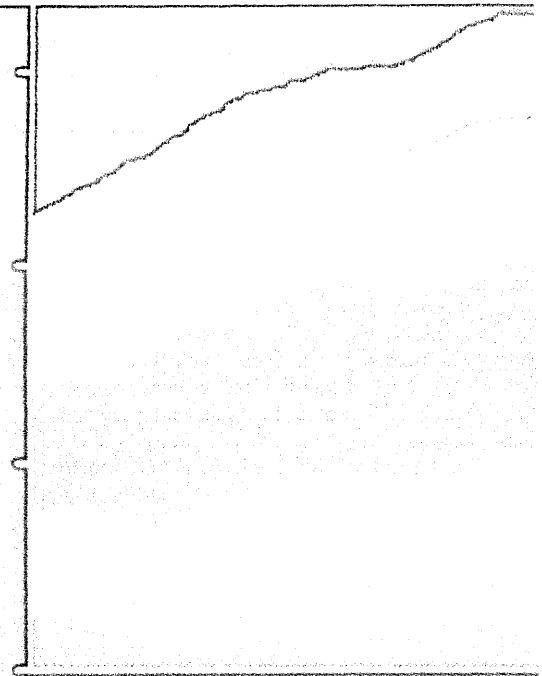
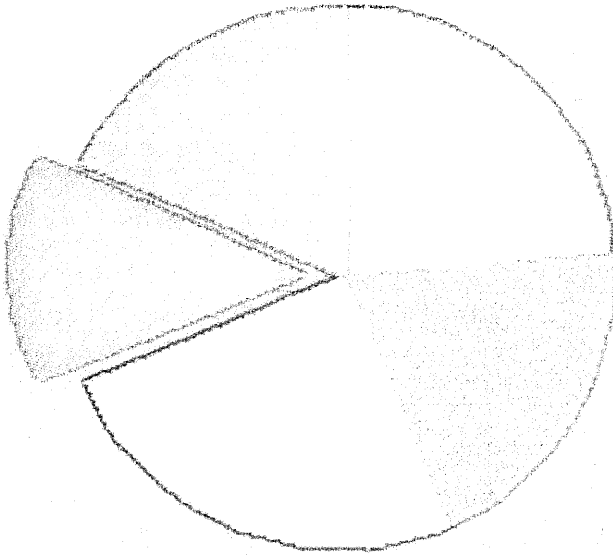
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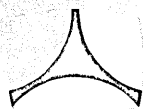
unit, your only cost would be transportation charges to and from Norcross, Georgia. However, we're convinced you'll keep it. Intelligent Systems is the world's largest manufacturer of color graphics terminals and our 8001-H customers include such names as General Electric Credit, Nabisco, Crown Zellerbach, Abbott Laboratories, Monsanto and Standard Oil—so, you'll be in good company.

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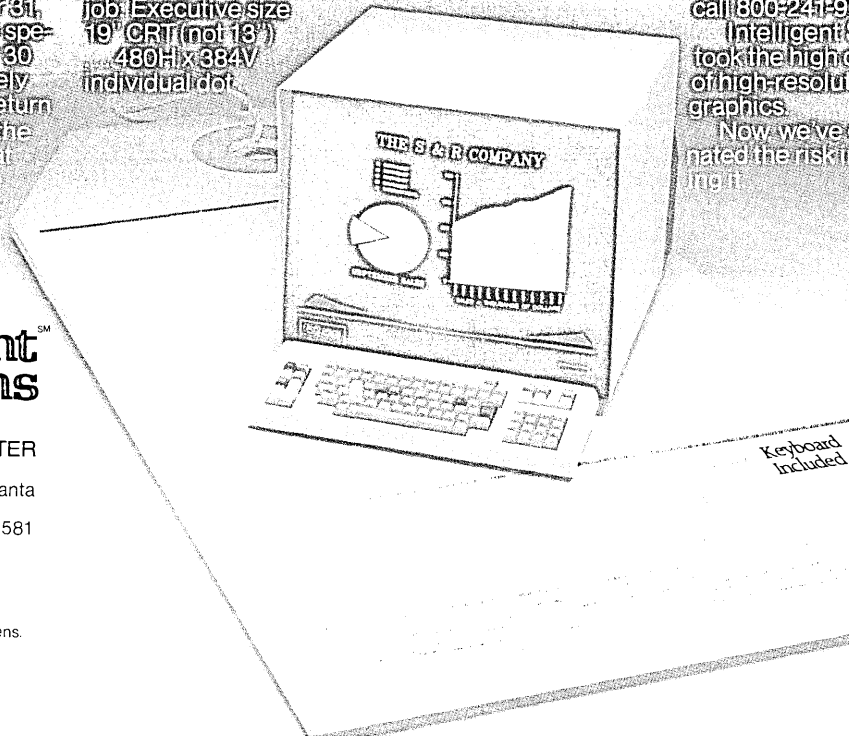
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## PEOPLE

survival. We had to do everything ourselves since we had practically no money." He named himself janitor as an example to other employees, and the firm continued to eke out an existence.

Soon, although not soon enough for comfort, the company won some creditable orders from Foxboro, the process control company; New York Telephone; Honeywell; and finally NCR. The latter ended up buying 8% of ADDS stock and became its largest single customer. It still is, although it has started to make its own crt terminals.

By 1976, ADDS was cash-rich and

made a bold move to buy Milgo, the Miami modem maker. However, Milgo's European distributor, Racal Electronics, also had its eye on the Florida firm, and a spectacular stock battle took place. ADDS lost its bid for the modem company but came away much richer than it had started out because of the steep rise in Milgo's stock value during the fight.

Catacosinos' next move was to sink the money into a manufacturing plant in Draper, Utah, near where he goes skiing every year. The plant was to be the keystone to future expansion and vertical integrator

of product manufacturing. Everything from plastic cases to transformer windings are made in Draper, giving the firm what ADDS has claimed is a substantial advantage over its less integrated competitors.

With Draper under wing, new expansion plans entered Catacosinos' head. The obvious path was systems, small computers that would incorporate much of the same technology and manufacturing techniques as terminals but which would offer the opportunity for value-added software. Also brewing at the same time was a new low-end crt terminal that "could be stamped out like cookies."

The company's first system was the model 75, a desk-sized machine that never took off. Only about 1,500 units were sold. But ADDS claims it learned a good deal from that experience, and it has tried again with the Multivision, a small oem computer designed for volume manufacturing, and the Mentor line, designed to take business away from Microdata and its Reality machine. Both systems were introduced last year, but with NCR now owning the company it is hard to find out how ADDS financials are looking. Industry reports indicate that NCR may eventually sell ADDS computers through its sales force, giving it a presence in the oem markets it has so far neglected.

The low-end terminal, dubbed Viewpoint, was introduced early this year with an end-user price of \$650. LSI-based and designed for oem and distribution marketing, the terminal is Catacosinos' answer to the Japanese, whom he sees as threatening an invasion of the terminal market on the same scale as was launched on the U.S. television market. He points to the highly automated Draper plant with pride, claiming it is a prime example of how a leanly operated company—"we even did the general contracting for that building ourselves," he boasts—can compete effectively with larger companies.

It is apparently just that kind of management that has caught the eye of higher-ups in Dayton, where NCR is headquartered. Impressed with ADDS' launching Viewpoint and two small computer lines in such short order, NCR chairman William S. Anderson is understood to have given Catacosinos a good ear. Some say he's being courted for a top NCR post, one that would take advantage of his organizational skills.

Will he have any part of this, or will he head off to form a new venture, perhaps one unrelated to computers? After all, he was reported to have had his eye on the Helena Rubinstein cosmetics company a couple of years ago.

Says Catacosinos: "I feel very involved with these new systems products and I'm dedicated to making them successful. I've got no plans to leave."

After a pause he adds, "What else would you expect me to say?"

—John W. Verity

## SYSTEM/34



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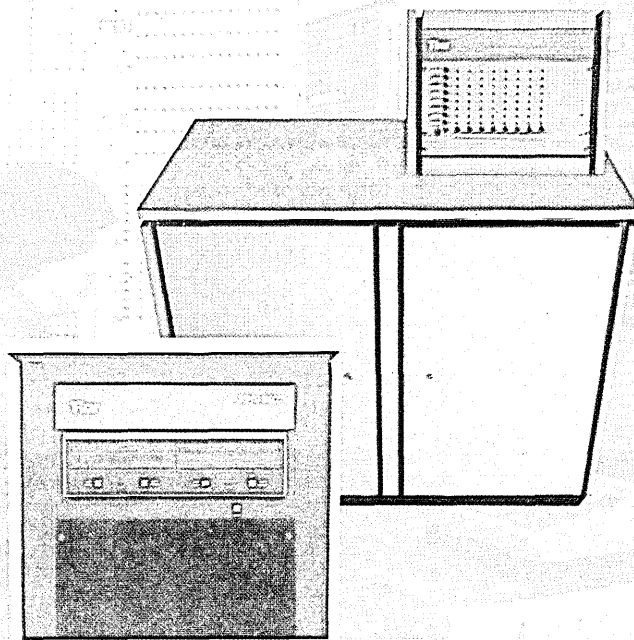
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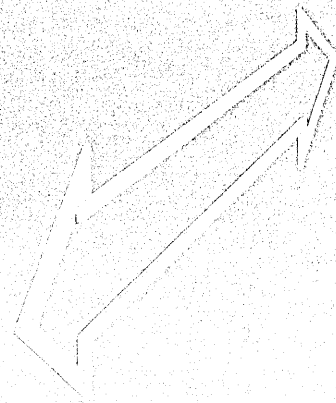
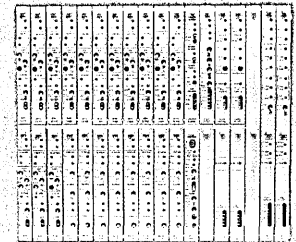
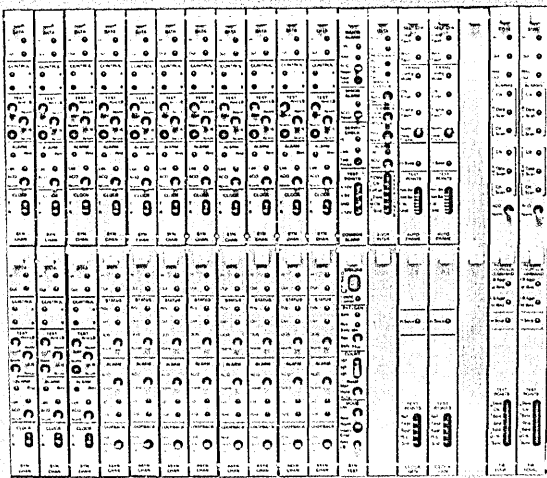
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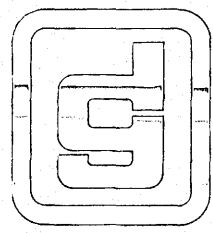
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# HARDWARE

## OFF-LINE

Xerox Corp. has doubled the number of cities where customers can acquire the model 5700 electronic printing system which was first introduced in September of last year. The units are now available in San Francisco, Houston, Detroit, Philadelphia, and Boston, in September of last year. The announced cities of New York, Los Angeles, Dallas, Washington, D.C., and Chicago. The company also let it be known that the 5700 can accept input in the form of diskettes prepared on the Xerox 860 information processing system. The least expensive of the 5700 systems carries a purchase price of \$66,300 and a monthly lease of \$1,440 over one year.

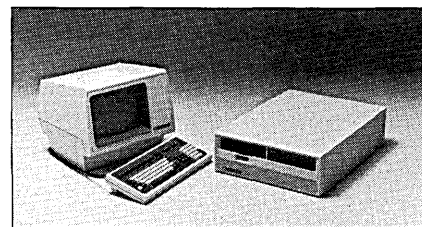
Engineers at IBM's Burlington development lab in Essex Junction, Vt., have produced an experimental dynamic RAM chip capable of storing 288Kb. That's a fourfold increase over the largest chip IBM currently uses, the 72Kb dynamic RAM. The 288Kb chip uses an extension of IBM's silicon and aluminum metal oxide semiconductor (SAMOS) technology to pack all 288Kb into an area only twice as large as the 72Kb chip. IBM said it has no immediate plans to include the new chip in its current manufacturing program.

Could Sears, Roebuck and Co. be on its way to being the first major general retailer to tame the personal computer market? The company will sell NEC PC-8000 personal computers in addition to the IBM Personal Computer.

## SMALL BUSINESS COMPUTERS

Texas Instruments is yet the latest big-name computer company to enter the "computer on every small businessman's desk" market, with the introduction of its four-member Business System 200 family. Targeted at the more than 2 million small businesses with revenues ranging from \$50,000 to \$5 million, the Business System 200 family ranges in price from \$6,200 to \$10,000 and will be sold through oems and a network of authorized dealers currently being put in place.

The Business System 200 represents a new entry level for TI's DS990 family of systems. The four small, single-user machines are based on the TI9900 microprocessor and run under control of the DX10 Micro Operating System (they do not run the recently announced DNOS operating system available for larger DS990s). Optionally, the Business System 200 can run the UCSD-p System for Pascal programming. Under TI's DX10 operating system, users can write their own applications in COBOL, or take



advantage of TI-developed accounting applications and word processing packages; the accounting packages have been submitted to one of the "big eight" accounting firms for auditing and approval. The accounting packages—ranging from accounts receivable through general ledger—can be had as standalone packages for \$500 a module, or as modules that use an integrated database (\$1,000 per module).

Common hardware features of the four Business System 200 models are 64KB of memory, detached keyboard, and a 12-inch, 80-column display. The Model 220 uses dual minifloppy diskettes providing a combined storage capacity of 1.2MB; mod-

## HISTORY REPEATS ITSELF (AGAIN)

Four or five years back, there was a bothersome debate about just exactly what constituted a 32-bit minicomputer. Some held that a processor with 32-bit internal registers and 32-bit operations between registers made a 32-bit mini. Others said, "Wait a minute. Sure, you're doing 32-bit operations, but your data bus is only 16 bits wide. Therefore, you aren't speaking of a true 32-bit machine."

Now, we find a number of companies introducing "32-bit" computers, many based on the Motorola 68000 microprocessor chip. Indeed, the 68000 contains 32-bit registers, and it can perform operations on 32-bit data as well as 16-bit and 8-bit. But

the 68000 has only 16 data lines, bringing us back into the gray area of five years ago.

If we accept internal register width as defining the processor's word size, then ought we not call the Zilog Z80 a 16-bit microprocessor? After all, it can perform some 16-bit operations on certain register pairs, even though it only has an 8-bit data bus.

We've never heard Motorola call its 68000 a 32-bit micro. We prefer to think of it as a hybrid—a mixture of 32-bit and 16-bit architectures. Henceforth, we will avoid calling the 68000 either a 16-bit or 32-bit micro, identifying the processor by name only when pertinent. To our mind, requiring multiple memory fetches to load operands does not a 32-bit machine make.

## HARDWARE

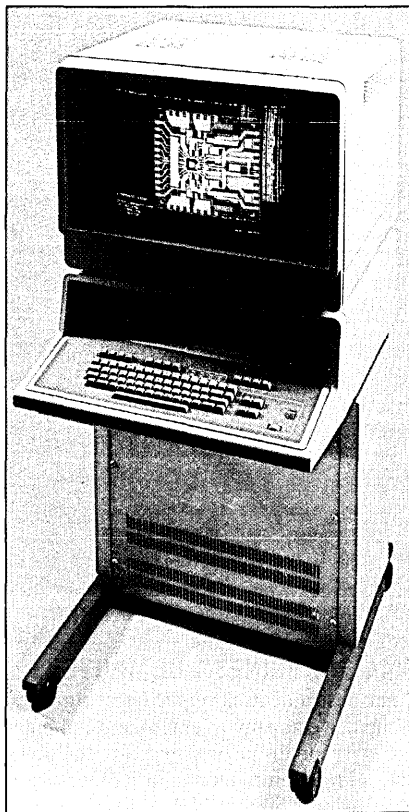
els 240, 250, and 251 use TI-made 5MB Winchester disks and single floppy drives (5¼ inch on the 240 and 8 inch on the 250 and 251). Omni 840 printers can be added to any of the four models for 132-column, dot-matrix printed hardcopy. TEXAS INSTRUMENTS INC., Austin, Texas.

**FOR DATA CIRCLE 301 ON READER CARD**

### UNIX-BASED SYSTEM

The Plexus P/40 is Plexus Computers' initial entry in the UNIX timesharing systems market. Tailored specifically for operation under Bell Lab's UNIX operating system, Plexus has licensed the operating system through Western Electric, and implemented UNIX v7 on the multimicroprocessor-based P/40. P/40 hardware uses several Zilog Z8000 microprocessors. One serves as the central task processor, while each intelligent I/O controller uses its own Z8000 and local memory to reduce overhead on the task processor. Controllers are available for terminals (eight RS232C ports and one Centronics-type parallel interface per controller card), disks (up to four Winchesters per controller), and tape (up to four 9-track drives per controller). The P/40 uses Intel's Multibus, allowing oems to incorporate many other plug-in devices available from third parties. Currently, the P/40 supports from 256KB to 1MB of error correcting memory, up to three eight-channel terminal interface cards (which, with their local intelligence, allow all channels to run at up to 19.2Kbps), and intelligent controllers for disk and tape. Plexus says its machine has about the same horsepower as a DEC PDP-11/45 and is designed to serve a small group of users, typically from five to 15 (a friend tells us that his PDP-11/70 shows noticeable performance degradation when 10 or more concurrent users begin spawning tasks). A typical eight-user Plexus P/40, with a 512KB cpu, eight-channel intelligent communications controller, 72MB of disk and nine-track tape, sells for \$49,500; a UNIX license costs \$5,000 from Plexus. PLEXUS COMPUTERS, INC., Santa Clara, Calif.

**FOR DATA CIRCLE 304 ON READER CARD**



### COLOR GRAPHICS TERMINAL

Addressing the computer aided design (CAD) and mapping markets, Tektronix has added a 19-inch diagonal, 60Hz noninterlaced color graphics, intelligent terminal to its recently introduced 4100 series of terminals. The 4113 terminal can display images in 640 by 480 pixel blocks, with a total addressable graphics space of 4096 by 4096 pixels. Local zoom and pan capabilities are standard. The 4113 communicates with a host at speeds of up to 9600bps; its local intelligence allows functions common to the entire 4100 series, including locally retained picture segments and MOVE and DRAW commands. In its basic configuration, the 4113 comes with three bit planes of graphics memory, allowing display of eight colors (selected from a possible 4096); an

optional fourth bit plane allows use of up to 16 colors. Due to its compatibility with other terminals in the 4100 series, the 4113 can interchange diskettes of data between other models in the series. Diskette storage is optional, with two drives available in the maximum configuration. An optional three-port RS232 peripheral interface allows connection of plotters, printers, and graphics tablets. An RGB video output also is offered as an option. The basic 4113 sells for \$16,500; with the fourth bit plane, the price is \$18,000. TEKTRONIX, INC., Beaverton, Ore.

**FOR DATA CIRCLE 308 ON READER CARD**

### PROTOCOL CONVERTER

Carterfone's 6270 communication control unit allows up to 15 ASCII display terminals to access 3270 applications on one or two IBM or compatible hosts. Compatible with IBM 3271/74/76 control units, the unit allows ASCII devices to operate in place of IBM 3277/78 display stations and 3284/86 printers without modification of any existing 3270 application. The 6270 can have up to 16 access ports, two of which may be defined as synchronous for communicating with one or two hosts; the remaining ports are available for asynchronous ASCII devices. The unit allows dial-up access by the ASCII terminals, as well as the ability to communicate with two separate host mainframes. The basic purchase price for a 6270 is \$10,065, and service contracts are \$60 per month. Installment/sale agreements also are offered at \$478 per month over two years and \$350 per month over three years, exclusive of maintenance. CARTERPHONE COMMUNICATIONS CORP., Dallas, Texas.

**FOR DATA CIRCLE 303 ON READER CARD**

### DISPLAY TERMINAL

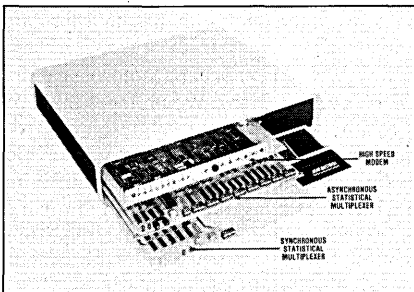
Ampex's D81 crt terminal is a buffered, editing terminal that can operate in either conversational or block mode at synchronous data rates of up to 19.2Kbps. Interfacing is RS232C, and the unit can operate in either full or half duplex; a parallel printer interface is standard. The D81's 12-inch display is formatted as 24 lines by 80 columns of data, with a 25th status line that can be switched on and off. Standard memory consists of two 1,920 character pages, with a third and fourth page available as options. Standard editing functions include erase, insert, and delete character and line operations. There are 128 displayable symbols within the D81, including 96 ASCII characters, 21 control characters, and 11 line drawing characters. Twenty functions keys are provided using the 10-key numeric pad and Program A and B shift keys. Function keys are supported by a standard 256B memory, expandable to 2KB. Function key memory can be down-loaded from the host. In singles, the D81 sells for \$1,249. AMPEX CORP., La Jolla, Calif.

**FOR DATA CIRCLE 305 ON READER CARD**

## HARDWARE SPOTLIGHT

### STATISTICAL MULTIPLEXOR

Timeplex's E/Series is a self-contained data concentrator system for linking remote clusters of terminals to minicomputers. The unit

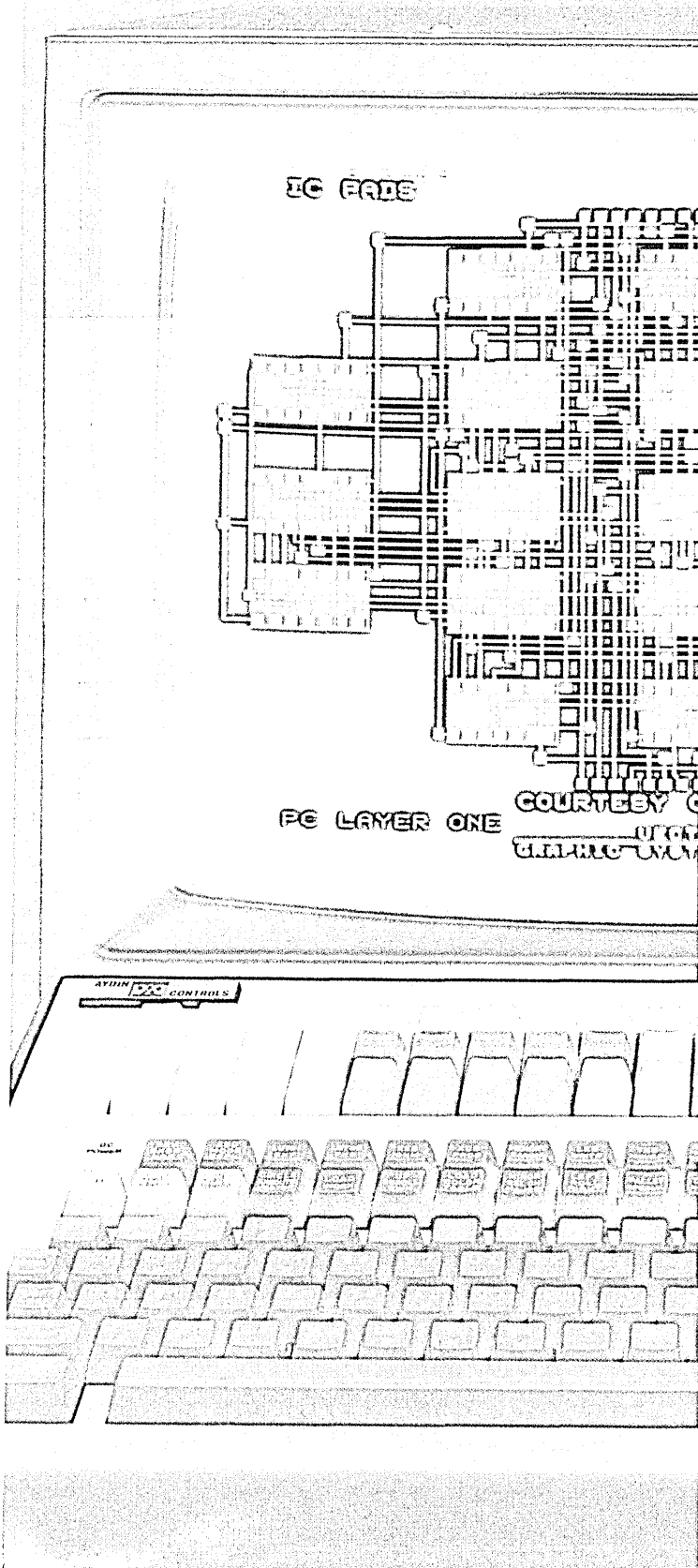


can combine three functions in a single package. It can be configured for four to 16 asynchronous channels (in increments of four) providing the functions of an asynchronous statistical multiplexor/data concentrator. Optionally, a modem can be integrated in the same package: 2400bps, 4800bps, and 9600bps modems are offered. Additionally, a synchronous statistical multiplexor also can be slipped into the E/Series. Plans call for the introduction of E/Series-to-mini-computer bus interfaces. Pricing for a four-channel E/Series stat mux begins at \$1,650, while an eight-channel version is \$2,250. TIMEPLEX, INC., Rochelle Park, N.J.

**FOR DATA CIRCLE 300 ON READER CARD**

# Quickens Your Draw

Aydin user-oriented, full-color graphic systems let you tackle complex design and processing projects quickly and easily.



Aydin 5216 high-resolution multiprocessor-based color graphic systems lead the industry in fulfilling the needs of intricate process control CAD/CAM, simulation, C<sup>3</sup>I, image processing and many other sophisticated applications.

Versatility is the result of the Aydin growing family of hardware and 2D, 3D, imaging and CORE software modules. The 5216 gives you both the flexibility and programmability to design and implement your ideas efficiently and economically; a true man-machine interface.

For example, AYGRAF instruction sets provide both standalone and distributed processing capabilities to support 2D graphics in a standardized manner. The 3D system, which supports standalone and host-driven applications, is designed to give the user the full benefit of sophisticated graphics, all with interactive control that doesn't burden the host computer.

Aydin modular design also means that you can customize the 5216 to your strictest requirements, easily expand memories, add storage and utilize various user-programmable lookup tables. In addition, a host of interactive devices are available, including joysticks, trackballs, graphic tablets, touch panels and lighted or non-lighted function keys.

It all adds up to a user-oriented 5216 color system that is a reliable, flexible and economical solution to your graphics and image processing needs. Quicken your draw with Aydin, the industry leader in high-resolution, intelligent color graphics. For more information, contact Aydin Controls, 414 Commerce Drive, Fort Washington, PA 19034.

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High-performance multiprocessor bus architecture Pixel or graphic DMA block mode data transfer (800 nanoseconds per 16-bit pixel) Multiple pixels per word Wide selection of display formats up to 1024 x 1024 x 16 Video processing through lookup table RAM at bit rates to over 40MHz High-speed hardware vector and character generation Four sizes of alpha characters High-speed hardware math Both parallel and serial peripheral interfaces available User programmable 16-Bit microprocessor.

AYDIN  CONTROLS

CIRCLE 150 ON READER CARD

## HARDWARE

### 32-BIT SYSTEM

Microdata, the minicomputer company that made its initial mark in the commercial marketplace back in 1974 when it introduced the Reality system, has taken a major step up with the introduction of its 32-bit Sequel system. Although Sequel uses eight AMD 2901 bit-slice processors to make its 32-bit cpu, the system retains compatibility with applications developed for the Reality system. Sequel doesn't limit its use of microprocessors to the cpu: it uses additional 2901s in its I/O processors and mag tape controller, and Z80s in its disk and communications controllers. By relieving the cpu of I/O handling, the Sequel system is said to support as many as 127 concurrent users while providing performance up to an order of magnitude greater than its predecessors; Microdata also says terminal response time is roughly halved. In addition to its 32-bit cpu, the Sequel system boasts main memories ranging to 2MB and disk storage of up to 1GB. Besides offering English, originally developed for the Reality family, Sequel offers Data/BASIC and an applications generator dubbed ALL (see Software & Services, this issue). Without shortchanging the hardware designers responsible for Sequel, ALL is perhaps the most interesting and significant feature of the Sequel system. A basic Sequel system, including 1MB of main memory, 4 crt terminals, 256MB of disk, a

mag tape transport and a 300 lpm printer, sells for \$155,500. MICRODATA CORP., Irvine, Calif.

**FOR DATA CIRCLE 314 ON READER CARD**



### FLOPPY CLEANER

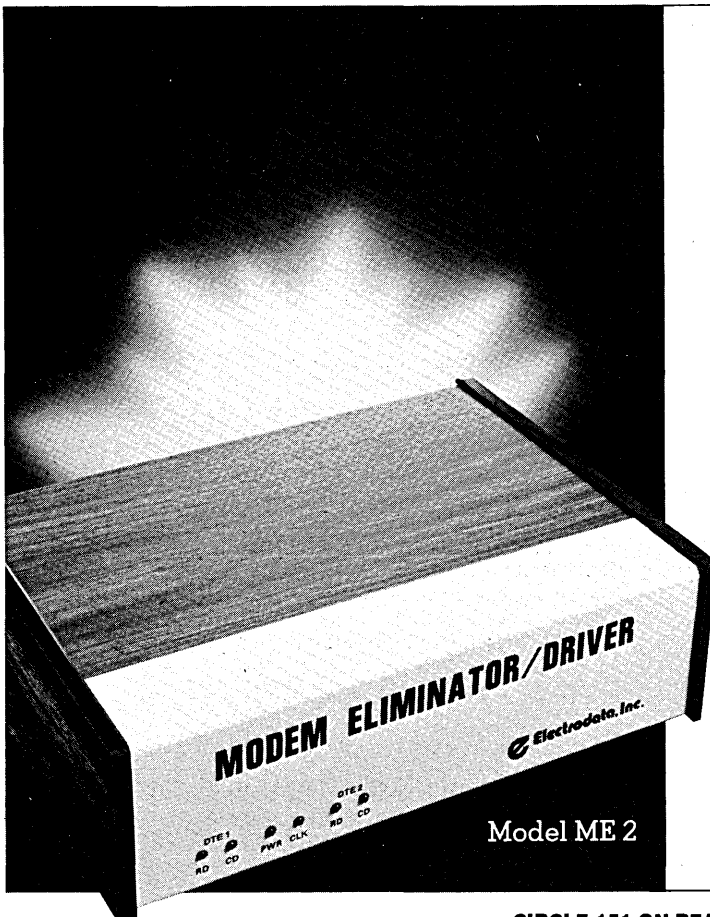
Verbatim has taken a different approach to the problem of cleaning floppy disk drive heads. Instead of the cleaners we've seen before (the ones that look like conventional floppy disks, but replace the magnetic media with a cleaning disk), Verbatim's clean-

ers consist of a floppy envelope (either 8 inch or 5 1/4 inch) and presaturated polyester cleaning pads that slip into the envelope. The pads are disposable, so a used pad can't carry contaminants after multiple usage. Verbatim says the cleaners will work with any single- or dual-headed drive except those 8-inchers used in Vydec's word processors. The cleaning kit, consisting of a Lexan jacket and two pads, presaturated with solvent and packaged in air-tight foiled pouches, retails for \$12.50. A box of 10 cleaning pads sells for \$20. VERBATIM CORP., Sunnyvale, Calif.

**FOR DATA CIRCLE 312 ON READER CARD**

### DATABASE MACHINE

The Dispatch family of database machines comes in five different models, each of which includes an embedded CODASYL-compliant database management system. Based on one Z80 microprocessor (or more, depending on the model), the Dispatch series can be looked upon as smart disks, accepting instructions and returning data via RS232 interface(s). All run an enhanced CP/M operating system dubbed FAST. With the exception of the entry-level Dispatch 10, the machines offer FORTRAN or COBOL as standard host/development languages, with PL/1 and C available as options. Dispatch 10 is intended as an oem product, with the



## Quality. The driving force.

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- **Plan capacity for a projected TSO load that is increasing 37% yearly on an industrywide basis.**

- **Find out if program products are used.**

- **Plan which MVS options will maximize TSO effectiveness.**

- **Decide if interactive compilations should be restricted.**

- **Implement an effective audit trail of interactive program usage.**

- **Determine how to systematically manage an applications programmer's use of TSO.**

- **Evaluate the reliability of the TSO system.**

- **Explain that TSO will rapidly be used for many applications other than program development.**



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## HARDWARE

systems integrator providing value-added software support.

Dispatch 10 consists of a 64KB Z80 microcomputer, 10MB disk, cartridge tape backup, two serial ports for host/diagnostics, and an RS232 interface. In lots of 50 or more, the Dispatch 10 sells for \$9,995; a single unit carries a \$13,995 price tag. Dispatch 20 adds software support and can be used to program its little brother, the 10. Its hardware includes a 24MB disk and two serial ports; single unit pricing is \$18,250. Dispatch 30 adds a proprietary memory management element—Stretch 1000—and includes 128KB of RAM and a 45MB disk. Four serial ports and one parallel port are standard. This model can grow to 1MB of RAM and it can support up to 16 disk drives. A single unit sells for \$23,850. Multiprocessing is the next step up, with the Dispatch 50 starting out with two Z80 task processors (64KB each). Up to 16 task processors and 16 disks can be supported. Single unit pricing starts at \$27,995. At the top of the line, the Dispatch 100 can act as either a stand-alone system or as a back-end to a host. A four-station version includes four task processors and terminals, the database processor, 45MB of disk, and 128KB of RAM (expandable to 1MB). Singles are \$41,195.

COMPUTER SERVICE SYSTEMS NETWORK INC., Boston, Mass.

**FOR DATA CIRCLE 313 ON READER CARD**



### DESKTOP COMPUTER

Zenith Data Systems has extended its microcomputer line with the introduction of the Z-90, essentially a larger (in terms of memory) version of the two-year-old Z-89. Based on the Z80 microprocessor, the Z-90 comes with 64KB of RAM, and a double density disk controller. Another RS232 port has been added, allowing connection of a printer, communications equipment, or other compatible peripheral. With an integral 5¼-inch floppy drive, the Z-90 lists at \$3,195. Without the drive, the Z-90 goes for \$2,895. Included in the purchase price is a CPM operating systems and Sorcim's SuperCalc spreadsheet package. Existing Zenith micros can be upgraded to Z-90s.

ZENITH DATA SYSTEMS, Glenview, Ill.

**FOR DATA CIRCLE 311 ON READER CARD**

### MULTI-USER MICRO

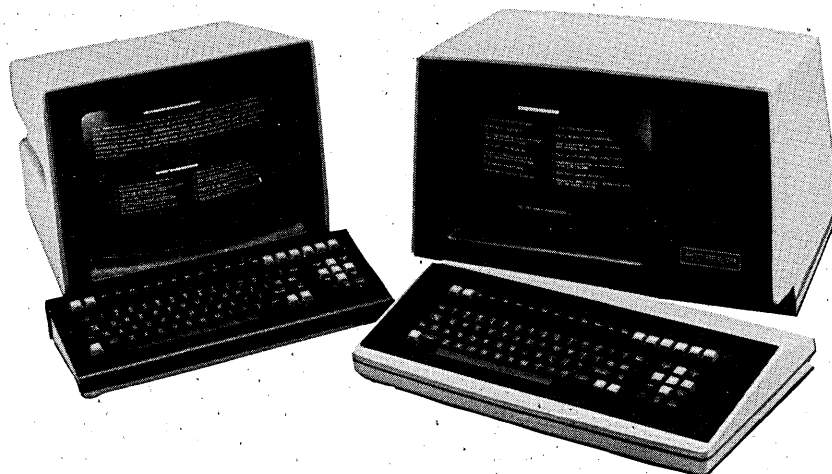
Charles River Data Systems, an eight-year-old company that has specialized in oem equipment (primarily mass storage subsystems) for DEC minis, has entered the systems market with its own "supermicro," the Universe 68 series. Built around the Motorola 68000, the Universe 68 series runs under Charles River's UNOS operating system, a derivative of Bell Lab's UNIX timesharing system. Available as fully packaged systems or as board sets for oems, the Universe 68 cpu board contains the microprocessor, a memory management unit, system clock, two serial ports, and one parallel port. Packaged systems start out with as little as 256KB of real memory and can be expanded to 6MB; the cpu itself has a maximum addressing capability of 16MB. Up to 50 terminal users can be supported with the addition of four-line multiplexor boards. Universe 68 comes in two standard packaged versions. The 68/10 comes with 256KB of memory, an 8MB Winchester disk, and floppy disk drive for backup, while the 68/80 provides an 80MB fixed/removable cartridge disk. Respective pricing is \$18,500 and \$38,500. A single UNOS license is priced at \$3,000. Programming languages supported by UNOS include C, BASIC, Pascal, and FORTRAN.

CHARLES RIVER DATA SYSTEMS, INC., Natick, Mass.

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# SOFTWARE AND SERVICES

## UPDATES

Infodata Systems of Falls Church, Va., has demonstrated distributed data of its Inquire and IQ/Net DBMSs. With a little help from its friends at Boeing Computer Services and the nationwide BCS SNA network announced in June, Infodata Systems of Falls Church, Va., has demonstrated distributed database versions of its Inquire and IQ/Net located in Kent, Wash., and Washington, D.C., and an IQ/Net hosted by a 4341 in Seattle. Inquiries were made of inventory data held local to each of the three participating nodes; additional inquiries were made against local data as well as corporate cost data held centrally in Seattle. Initial distribution of the system to end users should begin in 1982. IQ/Net prices range from \$50,000 to \$85,000, while Inquire runs from \$70,000 to \$150,000. Discounts are planned for customers installing five or more copies between now and 1984.

Look for DEC to begin a major push into the electronic office market. You may even find some latent, undocumented facilities within your current VAX/VMS operating system.

As Modcomp pushes forward into two new fields -- Viewmax, a Prestel-compatible in-house Viewdata system originally developed for the London Stock Exchange, and a "poor man's" Plato-like computer assisted instruction system, dubbed SIMPLER -- the company finds one of its major tasks is reassuring its traditional scientific customer base that it is not forgotten, and will continue to be an important segment of Modcomp's business.

## GRAPHICS

Graphic Communications, Inc. has come up with an interesting approach to creating business graphics using an HP 80 series personal computer and eight-pen plotter. The firm has identified 30 or so standard formats, including bar charts, line graphs, and pie charts, and continues to develop more; organizational charts and mapping are in the works. The company has compiled a booklet of each available format and included a fill-in-the-blanks input form similar to a report writer request input specification. A manager can thumb through the booklet, select the most appealing style of presentation, fill in the specification form, and hand it to a clerk at the computer. The programs seem to be nearly foolproof, locking out all of the keys except those that can supply valid input at the current step of preparing a plot. Function keys and menus are used throughout. A typical specification form allows the requestor to specify a title of up to three lines, a three-line footnote, labels for

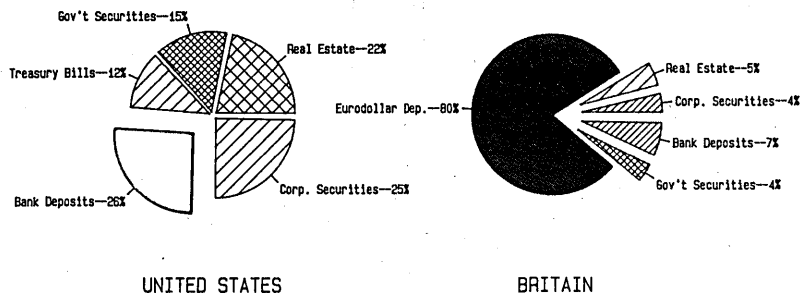
the X axis and Y axis, scaling factor, data values, legends, color, and hatching pattern. Within roughly 15 minutes of handing the filled-in spec sheet to an operator, the user can have a chart on paper or overhead transparency. The software sells for \$8,000, and an update service, which includes new formats as they become available, is \$200 per month. The firm will also sell the whole shooting match—computer, plotter, and code—for about \$18,000. GRAPHIC COMMUNICATIONS, INC., Boston, Mass.

**FOR DATA CIRCLE 329 ON READER CARD.**

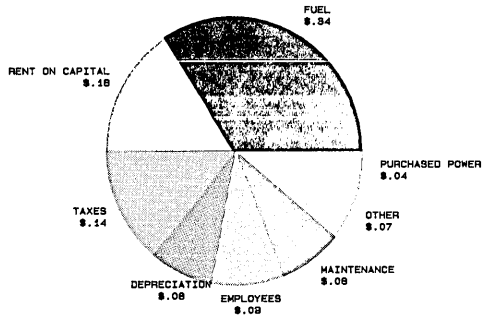
## BUSINESS SYSTEM

Martin Marietta Data Systems isn't one of those companies that come out with a big announcement every other month; rather, the company seems content to invest the time and energy required to produce major systems that adapt to the needs of many businesses. This seems to be the case with MAS-M, a modular business system for DEC

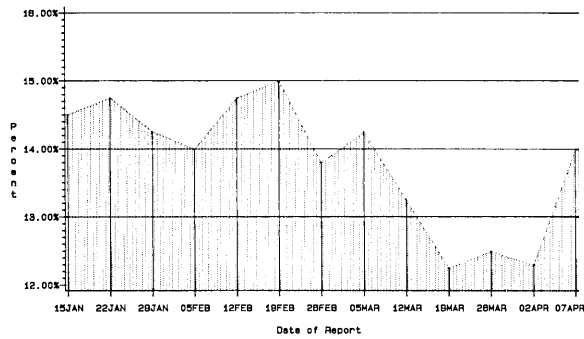
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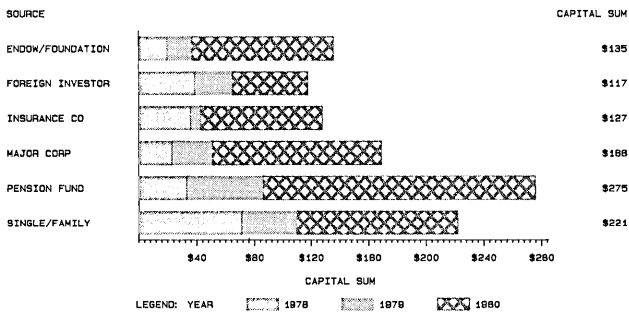


Money Market Rate \*

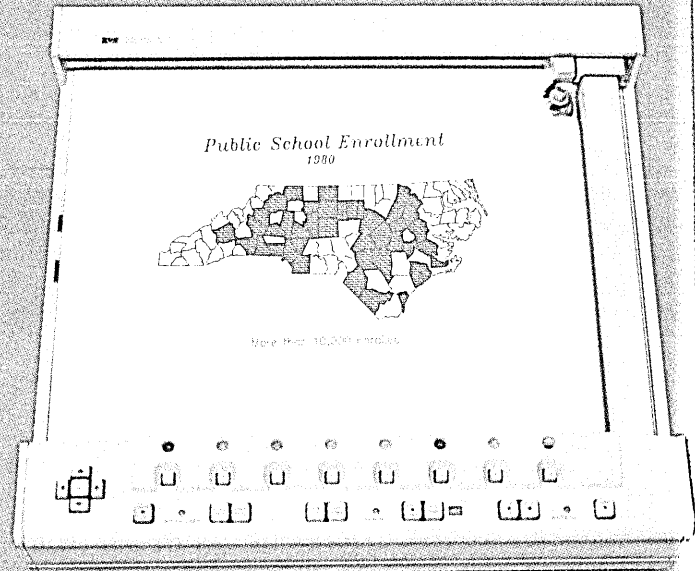


\* Maximum Interest Rate on Six-Month Certificates

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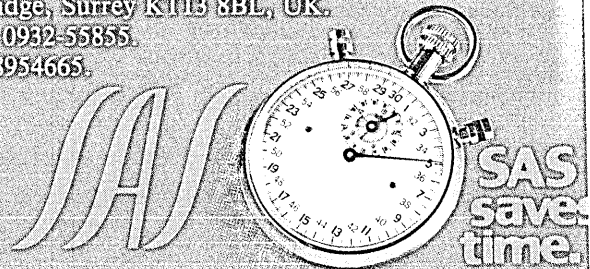
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Images produced by SAS/GRAPH on the Hewlett-Packard 7221C eight-pen plotter. For information on the HP 7221, contact Bill Fuhrer, Hewlett-Packard, 16399 West Bernardo Drive, San Diego, CA 92127. Phone 714/487-4100.

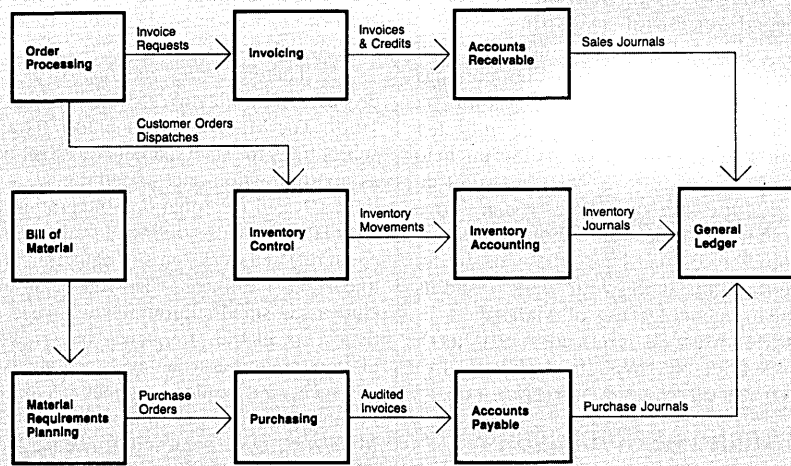
CIRCLE 156 ON READER CARD

## SOFTWARE AND SERVICES

PDP-11 systems running RSTS/E. Capable of serving a small company with a single system, or a larger concern using multiple minis in a network, MAS-M comprises 10 modules: accounts receivable, accounts payable, general ledger, order processing, invoicing, inventory control, inventory accounting, bill of materials, material requirements planning, and purchasing. Depending on a company's business and needs, any or all of the modules can be installed as an integrated system. While most MAS-M processing occurs on-line (data entry, database inquiry, etc.), time-consuming tasks or those not lending themselves to on-line operation are processed in batch mode. Since activities carried out with one module may affect others, a trigger mechanism alerts other affected modules that new information must be processed. To tailor the system to each individual business, the entire system is parameter driven.

The 10 modules fall into three general classes: financial control, distribution control, and inventory management. Accounts receivable, accounts payable, and general ledger all fall under the heading of financial control; general ledger also includes a report writer that is not counted as

### OVERVIEW OF MAS-M SHOWING DATAFLOW BETWEEN ELEMENTS



one of the system modules. Distribution control covers order processing and invoicing, while the remaining five modules—inventory control, inventory accounting, bill of materials, material requirements planning, and purchasing—all fall under the

heading of inventory management.

The MAS-Monitor forms the glue that binds all the modules together. It provides a uniform operator interface to the system, simplifying training and improving productivity. The Monitor handles user sign-on (and security), provides the user with the menus for which he or she has security clearance, controls data entry, and finally, lets the user sign off; only a specially designated user (or users) with the correct password can shut down the entire MAS-M system. The Monitor also provides facilities for additional development work, including screen design, implementation of data validation routines, and documentation generation.

Martin Marietta plans to sell the system both as a turnkey package, including hardware, and as software only to those who already have the equipment. Modules will be priced at \$9,500 or so each, or \$65,000 for the entire 10-module MAS-M system. MARTIN MARIETTA DATA SYSTEMS, Greenbelt, Md.

**FOR DATA CIRCLE 327 ON READER CARD.**

## SOFTWARE SPOTLIGHT

### APPLICATIONS GENERATOR

At the same time it introduced its 32-bit Sequel system, Microdata unveiled its ALL—the Applications Language Liberator. Menu driven and relatively simple to use, ALL does not generate conventional programming language statements. Yet, as Donald Fuller, chairman of the board and ceo explains, ALL applications run faster than those developed in Data/BASIC, the programming language alternative on the Sequel systems; the execution speed of programs developed under ALL surprised even Microdata insiders.

When the opportunity for a demonstration arose, we leaped at the chance. Wanting to see exactly what ALL could do, we prototyped not a standard, canned company demo, but rather a real system that took several months to code conventionally. In less than a half-hour, we had an acceptable version of our application, ready for end-user review and modification.

Starting at a menu that asked us to define the application's name, we quickly moved on to describing its simple database. ALL told us that one of our field names already existed within its data dictionary, but that was irrelevant to our application, as we would be the only users of the file we had just described. We did find a few shortcomings, but ALL provided a means to do the job nonetheless. It seems that key fields must be contiguous (they were anyway, in our example), but requiring that keys be unique necessitated an additional key field. Still, the machine seemed virtually to fly as we

made modifications, and as the application ran with a very small database. Once the database had been defined, half the job was complete. The file maintenance and data entry functions were in place just as soon as the file had been defined. Writing the necessary report specifications also turned out to be an easy task, although it took two tries (everyone is entitled to a mistake now and then). Making the changes was both quick and easy. ALL even helped us to document the application, printing out the specs we had provided for the files and reports.

While we didn't try to develop a complicated application, and we didn't provide a full, live database, ALL seemed to have done its job quickly, simply, and well. It's not at all unlikely that ALL will sell the Sequel system even more than the hardware. The few shortcomings we noticed—one must specify *all* key fields to retrieve a record for editing; keys must be contiguous; and certain aliasing of fields may be required for your application—aren't insurmountable. Even the initial release we used handled the aliasing with ease, which may mean the noncontiguous key fields can be handled in much the same manner. Given the time and experience, an analyst may discover an easy way to handle record retrieval with partial keys. If not, Microdata itself may decide that these enhancements are important enough to warrant their inclusion in a future release. ALL carries a one-time license fee of \$22,700. MICRODATA CORP., Irvine, Calif.

**FOR DATA CIRCLE 325 ON READER CARD**

### ON-LINE APPLICATION GENERATOR

Informatics has released Mark V, an application generator designed to work with IBM's IMS/DB and IMS/DC in an OS/VS1, SVS, or MVS environment. Designed as an alternative to PL/1 and COBOL, Mark V is a terminal-oriented tool that automates the application's interface to IMS/DC, including Message Formatting Service (MFS) generation. A compiled language, Mark V is intended for production jobs. It automatically handles IMS calls, obviating the user's need for a deep knowledge of the database and its structure. Mark V also allows the user to "paint" screens, instead of using lines of code to indicate fields. Currently, Mark V can access up to 10 IMS databases, and update one database. Users already familiar

## SOFTWARE AND SERVICES

with Informatics' Mark IV reportedly will have little difficulty in learning Mark V.

One beta site we spoke to reported a 60% savings in programmer time to develop a second version of an existing system. What's more, the Mark V implementation actually ran faster. A few shortcomings were noted. Secondary indexing is not yet available, although the beta site indicated that Informatics has told them of its intent to do so in a later release. Mark V won't do away with COBOL or PL/1, as it can't cope with some of the beta site's more complicated jobs, but by and large, the beta site reported its satisfaction with Mark V and its intent to encourage use of Mark V. A license for Mark V is priced at \$100,000. INFORMATICS INC., Woodland Hills, Calif.

**FOR DATA CIRCLE 326 ON READER CARD**

### FORTRAN PREPROCESSOR

International Mathematical and Statistical Libraries, Inc., better known by its initials IMSL, has developed a FORTRAN preprocessor that greatly simplifies problem setup for its library of more than 500 FORTRAN subroutines for statistical and mathematical problems. Called PROTRAN, for Problem Translator, the preprocessor runs on IBM and compatible mainframes, CDC 6000, 7000, and Cyber 70/170 processors, and DEC's VAX and Systems 10 and 20; IMSL plans to support additional hardware in the

future. PROTRAN simplifies problem setup, providing a more readable and shorter method for preparing data for manipulation by the subroutines in the IMSL library. Regular FORTRAN can be intermixed with PROTRAN statements.

There are two versions of the preprocessor: Math/PROTRAN and Stat/PROTRAN. The Math version includes the IMSL subroutines for such mathematical analyses as approximation and smoothing, data fitting, FFTs, differentiation, integration, interpolation, and solving of differential equations and of systems of equations, both linear and nonlinear. The Stat version includes statistical subroutines for basic statistics, correlation, frequency and cross tabulation, regression analysis, analysis of variance, and random number generation. For industrial and governmental customers, Math/PROTRAN has an initial license fee of \$3,000, and an annual renewal fee of \$2,000; Stat/PROTRAN is priced at \$2,500 initially, with renewals priced at \$1,500. Both packages can be had for an initial fee of \$4,500, and renewed for \$3,000. Universities get a substantial discount: \$500 initially for either, and \$1,000 for the pair (this is an introductory offer); renewals are \$1,000 for either package, or \$1,500 for both. INTERNATIONAL MATHEMATICAL AND STATISTICAL LIBRARIES, INC., Houston, Texas.

**FOR DATA CIRCLE 328 ON READER CARD.**

### C COMPILER

Relational Software, purveyors of the Oracle relational database management system on PDP-11s, has released a C compiler for the IBM 370 and compatible series of mainframes. In addition to letting mainframe users develop applications in C, the compiler will let Relational Software move Oracle onto IBM equipment. For a fee of \$10,000, the customer gets the three-part C package, documentation, and one year of maintenance. The C package comprises the compiler, which translates C into assembler; a run-time library supporting the compiler and the code it generates for use under VM and MVS; and a screen-oriented debugger for VM, allowing users to locate and correct programming errors more easily. RELATIONAL SOFTWARE INC., Menlo Park, Calif.

**FOR DATA CIRCLE 330 ON READER CARD.**

### PROJECT MANAGEMENT

Project Management is the title of a set of four microcomputer packages being distributed by Industrial Engineering & Management Press, the publishing arm of the Institute of Industrial Engineers. The third set of programs in a planned series of 10 sets, Project Management should help engineers or managers plan, monitor, and control projects involving multiple activities, resources, and varying operational times. The programs, which currently run on TRS-80

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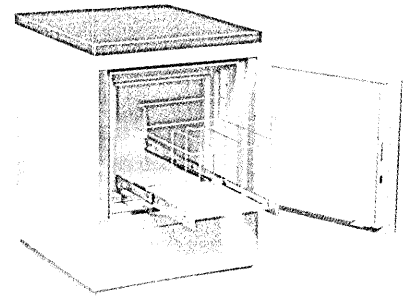
adequate microfilm, microfiche and computer tape protection. But those cabinets are not designed to protect vulnerable diskettes. Rely on Fire Master 125° to provide the extra margin of safety — for optimal diskette protection.

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Protect your business. Protect your incredibly vulnerable diskettes with a Victor Fire Master 125°.

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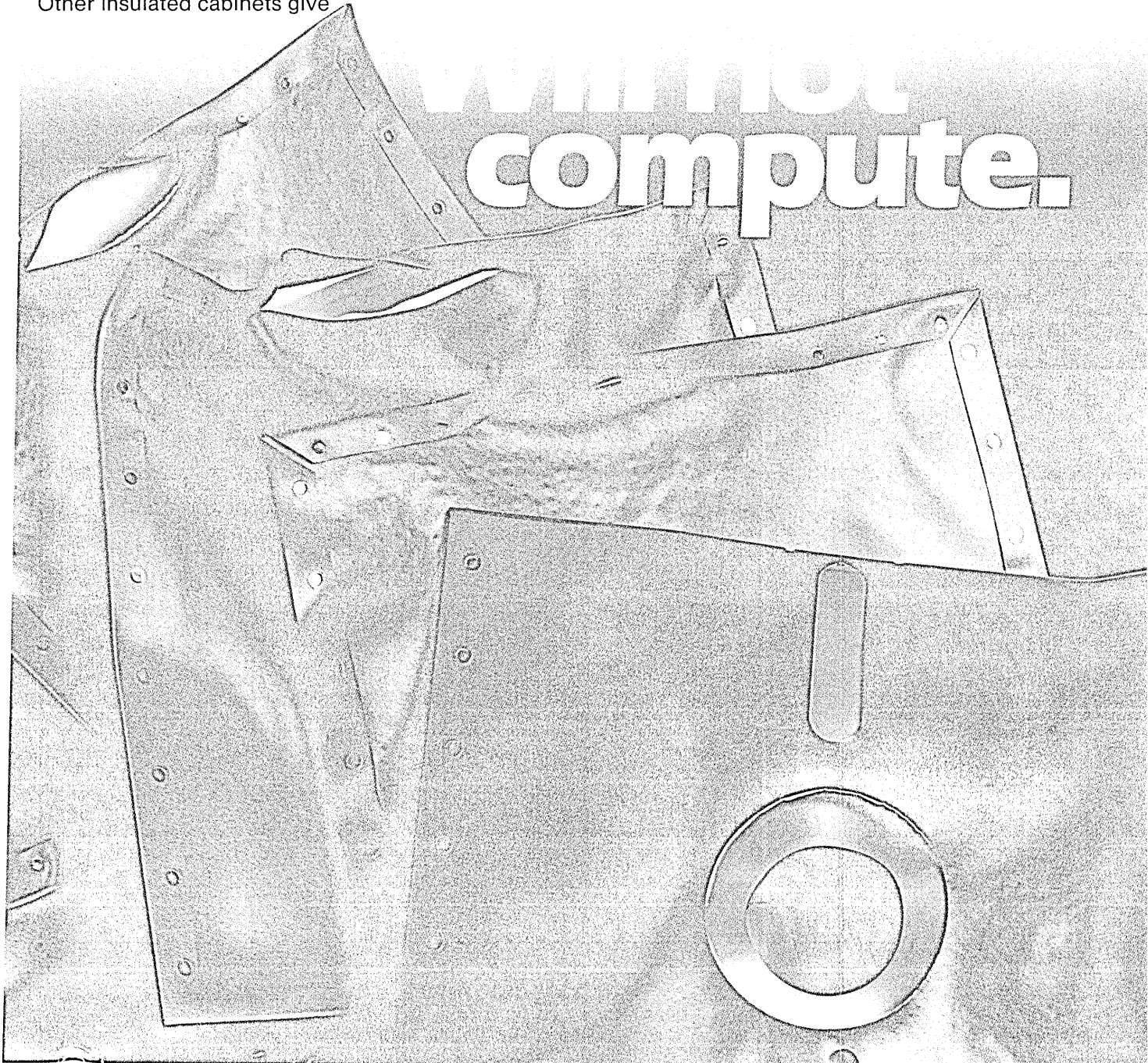


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**Will not  
compute.**



## SOFTWARE AND SERVICES

Models I and III (and soon, on the Apple II), cover critical path analysis, PERT (Program Evaluation and Review Technique), resource allocation, and activity on node network analysis. Available on diskette or cassette, the programs sell for \$120 per set of four. IIE TECHNICAL SERVICES DEPT., Atlanta, Ga.

**FOR DATA CIRCLE 331 ON READER CARD.**

### WORD PROCESSING

Typist is Point 4 Data Corp.'s word processing package for its line of Nova-compatible cpus running Point 4's IRIS operating system. The menu-driven system can be used with any standard crt terminal, providing multi-user, shared logic word processing to Point 4 users. Typist offers more than 40 functions, including cut-and-paste, search-and-replace, and move by word, letter, or line. An abort command can undo unintentional changes that currently remain in main memory (i.e., the text hasn't been sent back out to disk). Typist lets the user store and retrieve previously created sections of text, allowing the user to build a new document from stored paragraphs or text fragments. The word processing package also has its own background spoolers, letting operators release documents for printing while continuing to edit another document at the terminal. Typist also includes several levels of security features, ranging from passwords

to encryption. Typist lists at \$2,000. POINT 4 DATA CORP., Irvine, Calif.

**FOR DATA CIRCLE 332 ON READER CARD.**

### APPLE STATISTICS

Apple II computers equipped with at least one diskette drive and 48KB of RAM can make use of TWG/ARIMA to perform Box-Jenkins statistical analyses. The time series forecasting will process both seasonal and nonseasonal time series; the package reportedly includes all suggestions made by Box and Jenkins, including transformations, identification, estimation, diagnosis, and forecasting. The package is menu driven, and includes the facilities for creating, correcting, updating, and printing a database. Six test databases, along with corresponding sample output, are included in the package. With a one-year maintenance and updating service, a 60-page user's manual, and programs and sample databases, TWG/ARIMA sells for \$300. THE WINCHEDON GROUP, Alexandria, Va.

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### WANGWRITER ENHANCEMENTS

Wang has come out with new software—including the popular CP/M operating system—and new hardware for its Wangwriter line of word processors. A new, larger version of the Wangwriter also joined the family. Wang is providing CP/M release 2.2,

which will license for \$200 and run on Wangwriters ranging from the current single-diskette model to the new dual-diskette, 128KB Wangwriter introduced concurrently with CP/M. Communications emulators are being made available, including those for tty and 2780/3780 protocols; use of the emulators requires additional hardware priced at \$750. The emulators have one-time license fees of \$375 for each protocol.

The Wangwriter's word processing capabilities have been enhanced with new functions, including math, sort, merge, and pagination; additionally, the Wangwriter's document-handling abilities now allow a fivefold increase in the amount of text handled, up from 15 pages to 75 pages.

The two larger family members come in single or dual diskette-based versions, each with 128KB of memory; the new models are priced at \$6,600 and \$7,700, respectively. WANG LABORATORIES, INC., Lowell, Mass.

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### VAX DBMS

Responding to market pressures, DEC has come up with its VAX Information Architecture, which extends the information management capabilities of the 32-bit VAX mini family. The three new packages are VAX-11 DBMS, a CODASYL-compliant database management system; VAX-11 Datatrieve, a data



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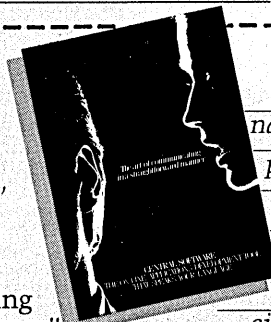
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## SOFTWARE AND SERVICES

manipulation facility for both programmers and nonprogrammers; and the VAX-11 Common Data Dictionary, which contains system-wide internal data definitions. Combined with the existing system software for records and forms management, the packages round out the VAX Information Architecture. The philosophy for offering the architecture is to provide a phased growth path for file facilities, allowing users to begin with VAX RMS (Record Management System) packaged with the VAX/VMS operating system and migrate (as needed) to the more sophisticated DBMS, which manages multiple database structures in compliance with the latest ANSI 1981 database working documents. VAX-11 DBMS uses the Common Data Dictionary to store database definitions—schemas, subschemas, security and access privileges, etc.—as well as the location of the system hosting the database. Remote databases are supported in a DECnet environment. The DBMS allows COBOL and FORTRAN programs to manipulate the database as specified by CODASYL; other languages can access information through Datatrieve requests. The DBMS supports a number of structures, including chain, calc, and indexed sets. VAX-11 Datatrieve is an enhanced version of the Datatrieve-11 package for PDP-11s. Using English-like terminology, Datatrieve can be used to define, enter, display, retrieve, and modify data;

entire command sequences can be cataloged for repeated use.

Single-use license fees for VAX-11 Datatrieve go for \$15,000, the Common Data Dictionary is \$3,000, and the DBMS goes for \$30,000. DIGITAL EQUIPMENT CORP., Maynard, Mass.

**FOR DATA CIRCLE 335 ON READER CARD**

### DEVELOPMENT TOOL

Quic-N-Easi is an application development package for microcomputers running under CP/M. Written in Z80 assembler, the package comprises a screen builder and editor, interpretive language, and file management system. It also can interface to previously developed programs written in other programming languages. Quic-N-Easi lets a programmer paint a data entry screen. Once the screen has been defined, fields are given names and attributes (i.e., integer, alpha, required, optional, etc.). Subsequent processing by the interpreter can reference the fields by the names specified at this time. The interpreter includes a file management system that can process indexed sequential, random, and sequential files.

Applications may be developed entirely with Quic-N-Easi, or processing routines written in other languages can be invoked, with control returning to Quic-N-Easi at the completion of processing. The package lists for \$395. STANDARD MICRO-

SYSTEMS, INC., Langhorne, Pa.

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### MICRO COMMUNICATIONS

Cromemco's Remote Batch Terminal Emulator (RBTE) uses IBM's bisync protocol to emulate 3780, 3741, 2980, and 2770 data terminals; the package runs under either Cromemco's CDOS or CROMIX operating system on the company's System Two, System Three, or Z-2H Hard Disk computers equipped with Cromemco's IOP and Quadart serial communications board. Transmission speeds can range from 1200 bps to 9600bps, over dial-up, leased, or private lines. Transmission may be transparent, or automatic code conversion between ASCII and EBCDIC can be performed. Configuration parameters, which can be saved in a text file for subsequent use, determine which type of terminal the RBTE will emulate. Operation may be either attended or unattended. In unattended mode, a transmit/receive cycle begins once the communications link has been established. Files are sent one at a time, with a pause between each allowing the receiving system to begin transmission of any files it has awaiting the other system. After all files have been transmitted, the line is relinquished. RBTE is available on either 5-inch or 8-inch diskette for \$595. CROMEMCO, INC., Mountain View, Calif.

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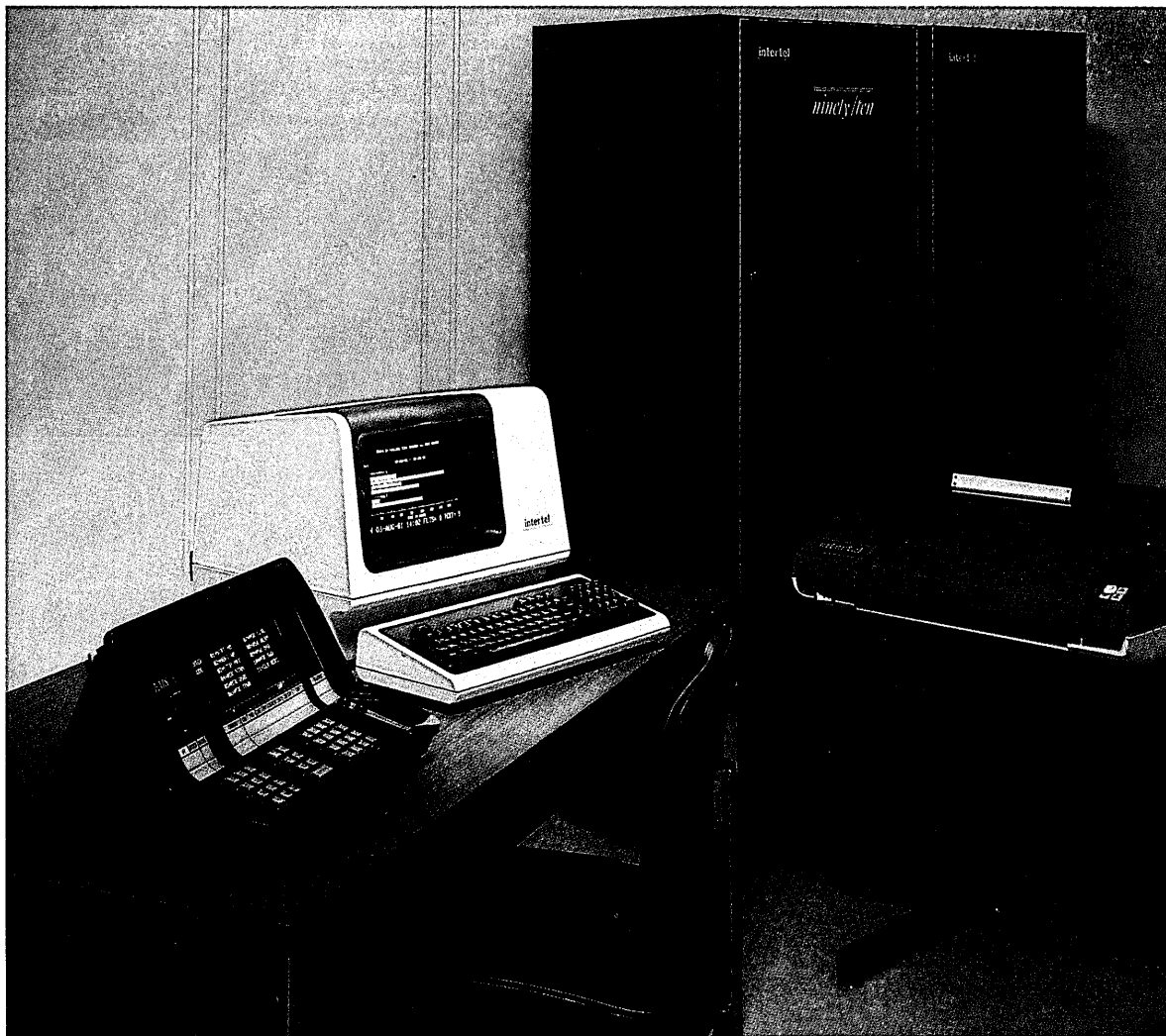
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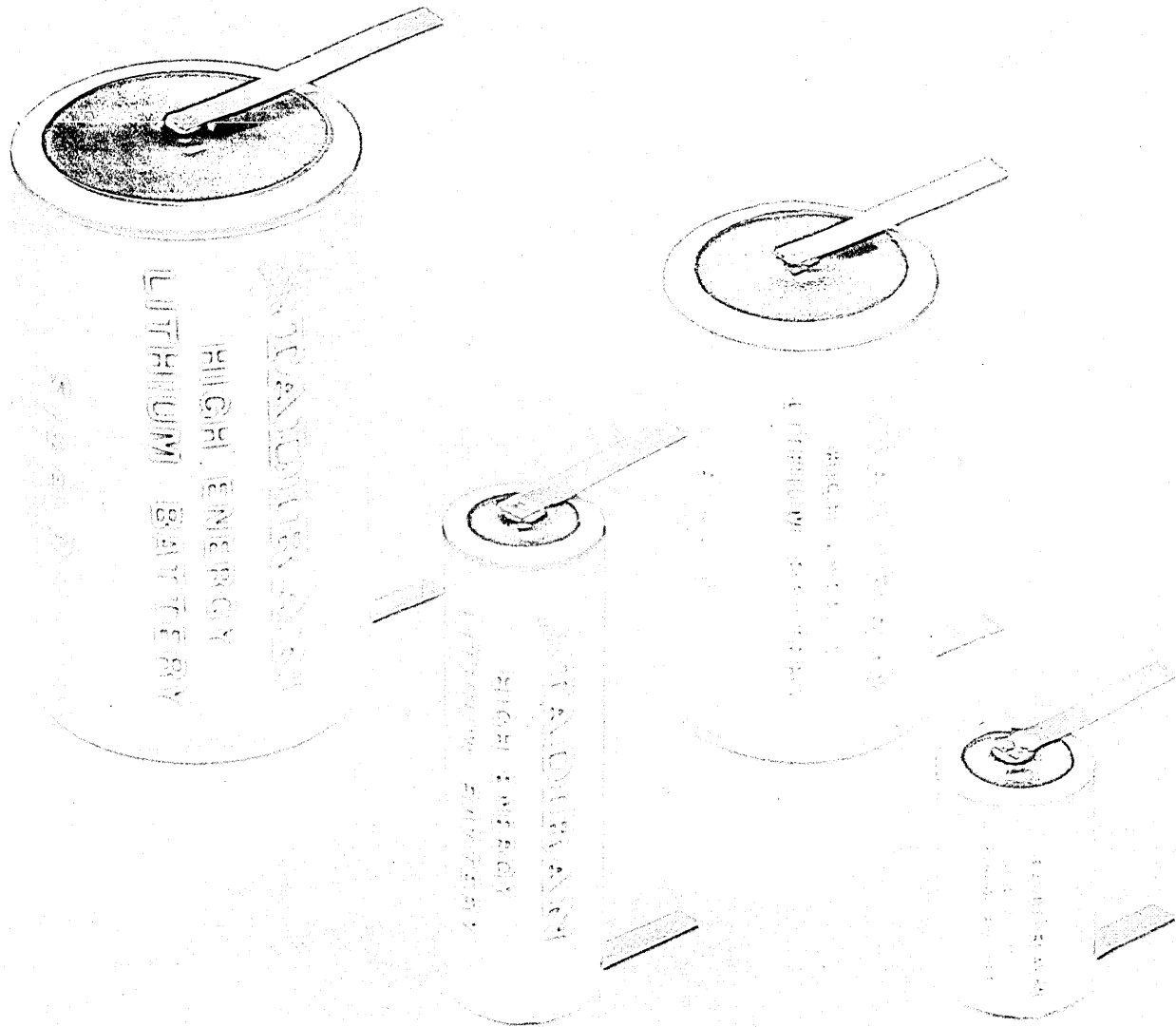
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## BOOKS

### GOODBYE GUTENBERG: THE NEWSPAPER REVOLUTION OF THE 1980s

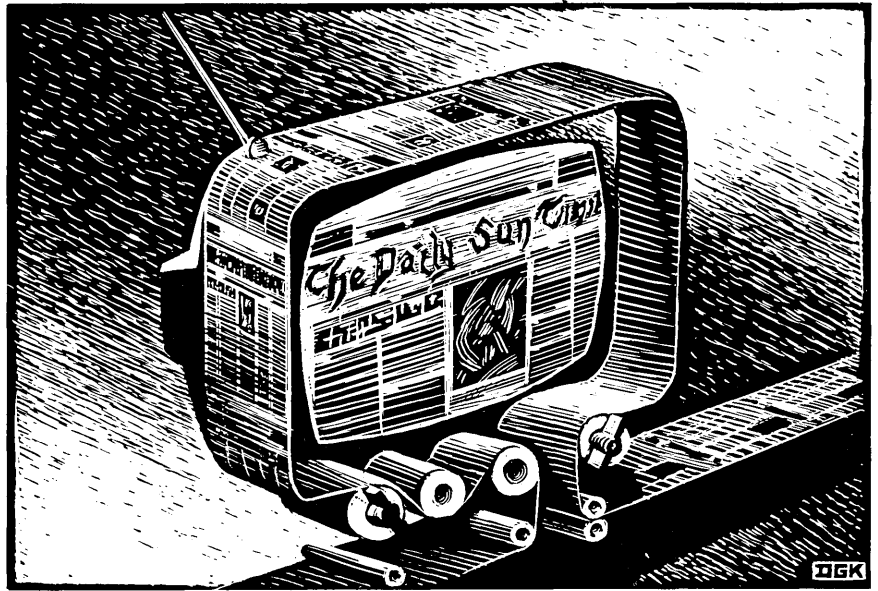
by Anthony Smith

Fortunately, Anthony Smith's book reached me first without the subtitle. I have come to steer a wide course around works fixing on current trends and canonizing them as revolutions of one sort or another. The air has lately become so thick with cries of revolution that one wonders how people can sleep at night.

In fact, *Goodbye Gutenberg* is a rich and deeply informative book, not in the least diminished by the fact that the changes it deals with are incremental and evolutionary, rather than discontinuous. It begins as a low-key social history of the newspaper; by the time we are through we have a searching analysis of the role of communications in general in advanced Western societies. Smith never exaggerates the rapidity of the changes he discusses, nor does he attribute more of a pattern to them than the facts will sustain. Yet he succeeds in imparting a picture of profound rearrangements in our use of information and our understanding of what news is all about. All of this the author (a journalist and head of the British Film Institute) sets out in a lucid style that does justice to a complex subject.

No doubt nearly everyone is aware that business as usual is not exactly the watchword in the newspaper industry these days—if only because of periodically crippling strikes against the imposition of new production techniques. Actually, the changes unfolding in the industry are so far-reaching that even the notion of print is on the way to becoming quaint. In modern papers, the actual setting of type is becoming less and less common.

Nor do reporters type their stories or editors wield their blue pencils as often. Stories are more likely to be composed via console into computer memory, where the editor will rearrange, strike out, correct, and splice electronically, then set up the



page by the computer, perhaps relayed by laser to a remote production location, and finally printed by an offset process in which impressions are generated by raised lettering on plastic sheets rather than by print or type in the traditional sense. Extending Smith's observations a bit, one can imagine the ultimate metamorphosis of the informational contents of the papers into electronic pages made available on readers' tv screens—thus not only taking the print out of the press, but also removing the paper from the papers.

Changing technology, however, is only one part of the story. The forces shaping change in the modern press amount to a virtual catalog of major social trends in America and in other Western industrial societies. Suburbanization, the decline of central cities, antilitter legislation, changing demographic profiles, and even child labor regulations (which, if applied to newspaper carriers, could confound the economics of distribution) all conspire to keep editors of metropolitan papers, as Smith puts it, "permanently scared." The author analyzes all these vicissitudes thoroughly, but not indiscriminately. If the reader occasionally finds

himself reading more than he had wanted to know about such things as the optimal sources of newsprint pulp-hibiscus cannabis, "chosen after a search through 500 known species"—the experience is not disagreeable.

But in the final analysis, the most important ingredient in all this is the change in information technologies, and the related changes in institutions and customs. The idea that there is something special about the role of information processing in the kinds of societies in which we live is, of course, hardly new. But the idea that modern societies are information societies has become a cliché without undergoing the critical scrutiny that it deserves. Just what is it about the ways in which information is developed, transmitted, stored, and used in these societies that confers these presumably potent powers?

*Goodbye Gutenberg* goes a long way toward answering such questions—at least with respect to one very important set of modern institutions. It shows in concrete detail how changes in the handling of information set off far-reaching and unanticipated changes elsewhere. The major metropol-

## SOURCE DATA

itan papers, Smith points out, have attained and guarded their positions essentially by providing what one might call "big bundles" of information to their publics. The *New York Times*, the *Los Angeles Times*, and London's national papers, for example, owe their positions largely to the fact that they offer something to nearly everyone—something that cannot be readily obtained elsewhere. This sheer comprehensiveness in turn confers decisive competitive advantages over those who would undercut advertising rates, but are unable to offer the diversity of authoritative information and high-

quality entertainment. Such advantages make it possible for the major news organizations to sustain the range and depth of activities that distinguish them in the first place.

But pressures to disaggregate these informational bundles are now upon us. One force results from the rising costs of energy and raw materials. How long will newspapers be able to produce and distribute bulky products most of whose parts are ignored by most users most of the time? New information technologies are making it more and more attractive to explore differ-

ent approaches to delivering to people the material they want. The press will be finding ways of earmarking particular kinds of information for particular categories of readers. Indeed, much the same thing is happening in other media, as well as in other institutions. It would be difficult to overestimate the significance of these trends.

The simplest application of this approach, in the case of the papers, is the now well-established practice of producing separate editions or sections to cater to the special interests and advertising markets of suburban readerships. A slightly more sophisticated version is the practice of some national magazines of producing special editions that contain both special features and advertising, mixed in with the rest of the fare, for certain categories of subscribers. With the growth of computerized production processes, and the parallel development of computerized data on subscribers themselves, such precision targeting in publishing can be expected to increase.

Similar trends are surfacing in broadcasting. Various new technologies are opening the possibility of far-reaching diversification of transmissions over the airwaves. One promise held out for these changes is that of broadcasting to all sorts of groups and tastes never before served—e.g., special programming for gays, libertarians, antique fanciers, or indeed any category of viewers who can account for a few thousand subscribers. Some of the new technologies also offer the chance for tv viewers to respond to broadcast communications, if only with a single beep of approval or disapproval relayed from their tv consoles back to the broadcast's point of origin. A number of observers, including the sociologist Amitai Etzioni, believe that these innovations in "narrowcasting" can offer new democratic forms at the grass roots.

The list of possibilities that might derive from the new capabilities of sending specific informational packages to specific categories of consumers is long indeed. For the most part, commentary on these still largely speculative possibilities has been, like Etzioni's, fairly optimistic. But there is a worrisome side to these trends, too. Whenever broadcasting agencies can direct communications to particular recipients and monitor the response, the potential arises for surveillance and manipulation. The sole virtue of old-fashioned mass propaganda is that it is directed toward an undifferentiated mass public. The sender of the totalitarian appeal cannot be sure who is listening to what, nor demand an instantaneous response. The growth is precision information technologies, however, could remove even this strictly negative advantage. One can thumb one's nose at the dictator's face on conventional tv, after all, but not at the telescreens of 1984. Such applications of the new information technologies are hardly imminent threats, but they bear watching.

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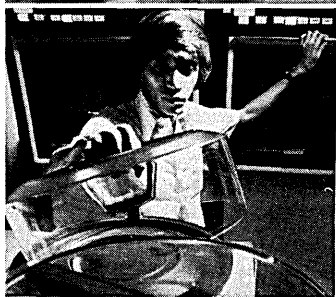


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But these speculations take us well beyond where Anthony Smith leaves off in *Goodbye Gutenberg*. He quite judiciously contents himself with portraying where these trends have brought us so far, and forswears undue prophecy as to their longer-term repercussions. All that we know for sure is that things are definitely not going to be the same. Oxford University Press, New York (1980, paperback in 1981, 335 pp., \$12.95).

—James B. Rule

## REPORTS & REFERENCES

### ABCS OF CONTRACT PROGRAMMING

In "What You Should Know About Contract Computer Programming," Leon Sanford & Associates, Inc., describes how to determine whether your company workload requires contract programmers, and how to select them if needed. The report discusses ways to get the most for your money by using a series of questions that the potential contract programmer or firm should answer. Two supplements come with the report, entitled "Guidelines for the Use of Contract Computer Programming Services," and "Quick-Reference for Determining the Extent to Which Contract Programmers Can Safely Be Used." The price for the report and supplements is \$5.00,

collectively. Contact Leon Sanford & Associates, Inc., 3A Worthington Dr., Maryland Heights, MO 63043, (314) 576-7120.

## VENDOR LITERATURE

### ELECTRONIC FILING

Kodak's 20-page brochure describes how micrographics and computer technologies can be merged for storage and retrieval uses in both business and industry. The first section of the brochure highlights the benefits of this merger for order-entry-type applications; the second section explains how electronic filing works, and lists various options available to users; and the third section deals with microimage programs in the corporate structure, and outlines how micrographics and the computer can be linked to serve industrial functions such as marketing, engineering, and manufacturing. EASTMAN KODAK COMPANY, Rochester, N.Y.

**FOR DATA CIRCLE 350 ON READER CARD**

### THE CTG DIFFERENCE

The Computer Task Group's 16-page brochure contains "symbolic photography," which they claim is "an interpretation of the versatility and quality" of the company's services. Whatever the explanation, the photos are unique and the booklet is informative. It details the group's services and software support capabilities, and also ex-

plains why the company's concept of "flexible staffing" can provide the help that most MIS departments need from time to time. COMPUTER TASK GROUP, INC., Buffalo, N.Y.

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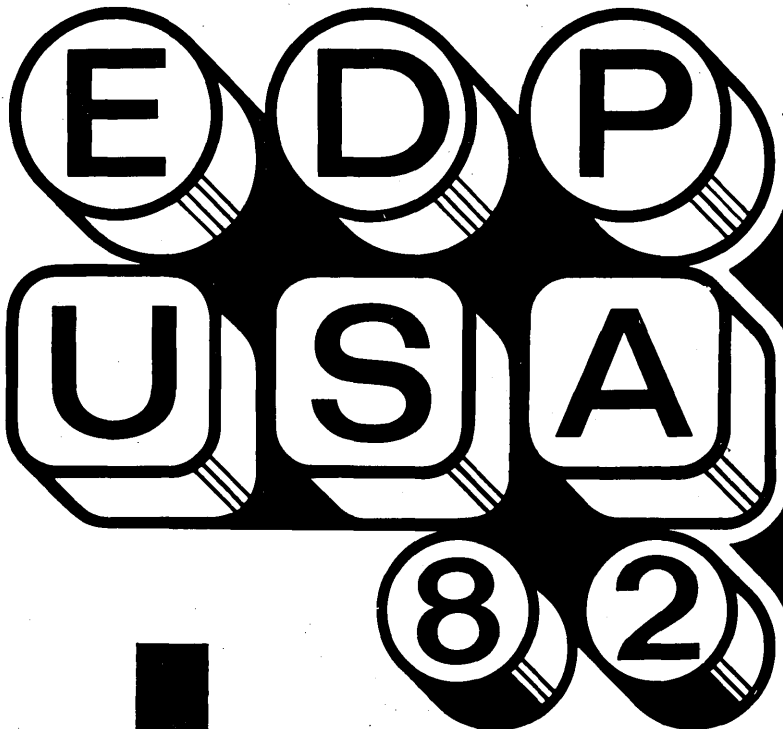
In a six-page foldout brochure, Versatec's (a Xerox company) "User's Report" contains nine case histories of computer-aided mapping, and is illustrated with eight map samples and four system photos. Included are a three-dimensional look at Mt. St. Helens, digitized scanner images, thermal infrared images, and range and contour plots. A reply card offers a choice of thematic, topographical, and weather map samples. VERSATEC, Santa Clara, Calif.

**FOR DATA CIRCLE 352 ON READER CARD**

### BANKING ON SOFTWARE

The Weiland Computer Group's brochure on banking application software products presents an overview of the company's products and details nine deposit, loan, and support systems. Some of the systems described in the brochure are savings and time deposit, installment loans, funds transfer, account reconciliation, and on-line support. THE WEILAND COMPUTER GROUP, INC., Oak Brook, Ill.

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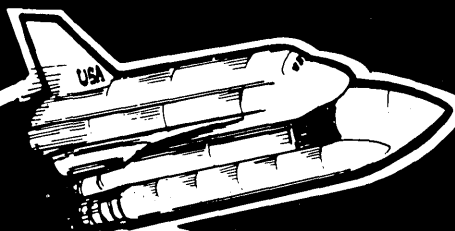
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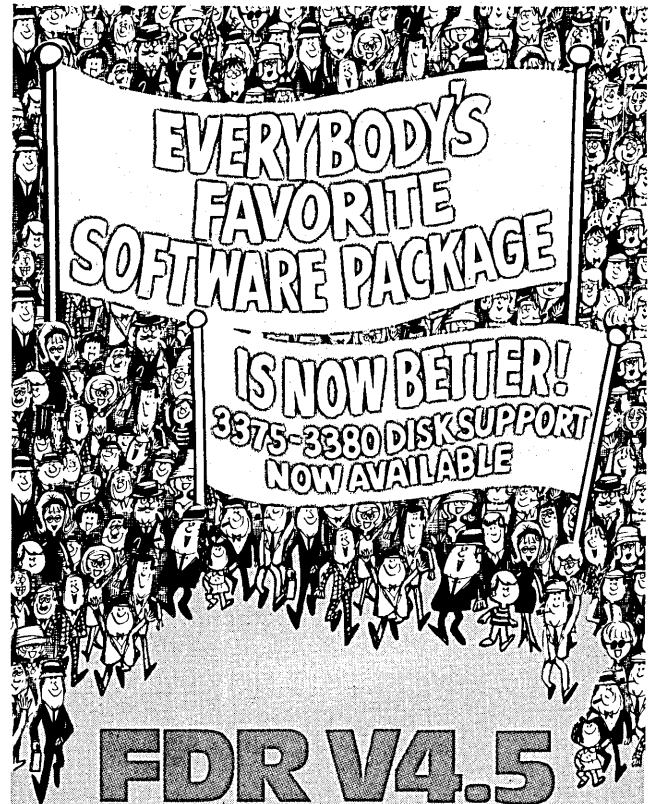
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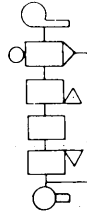
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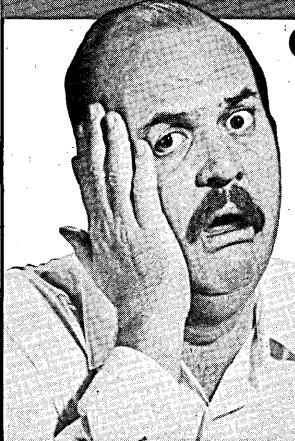
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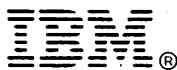
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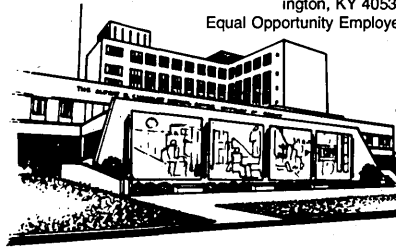
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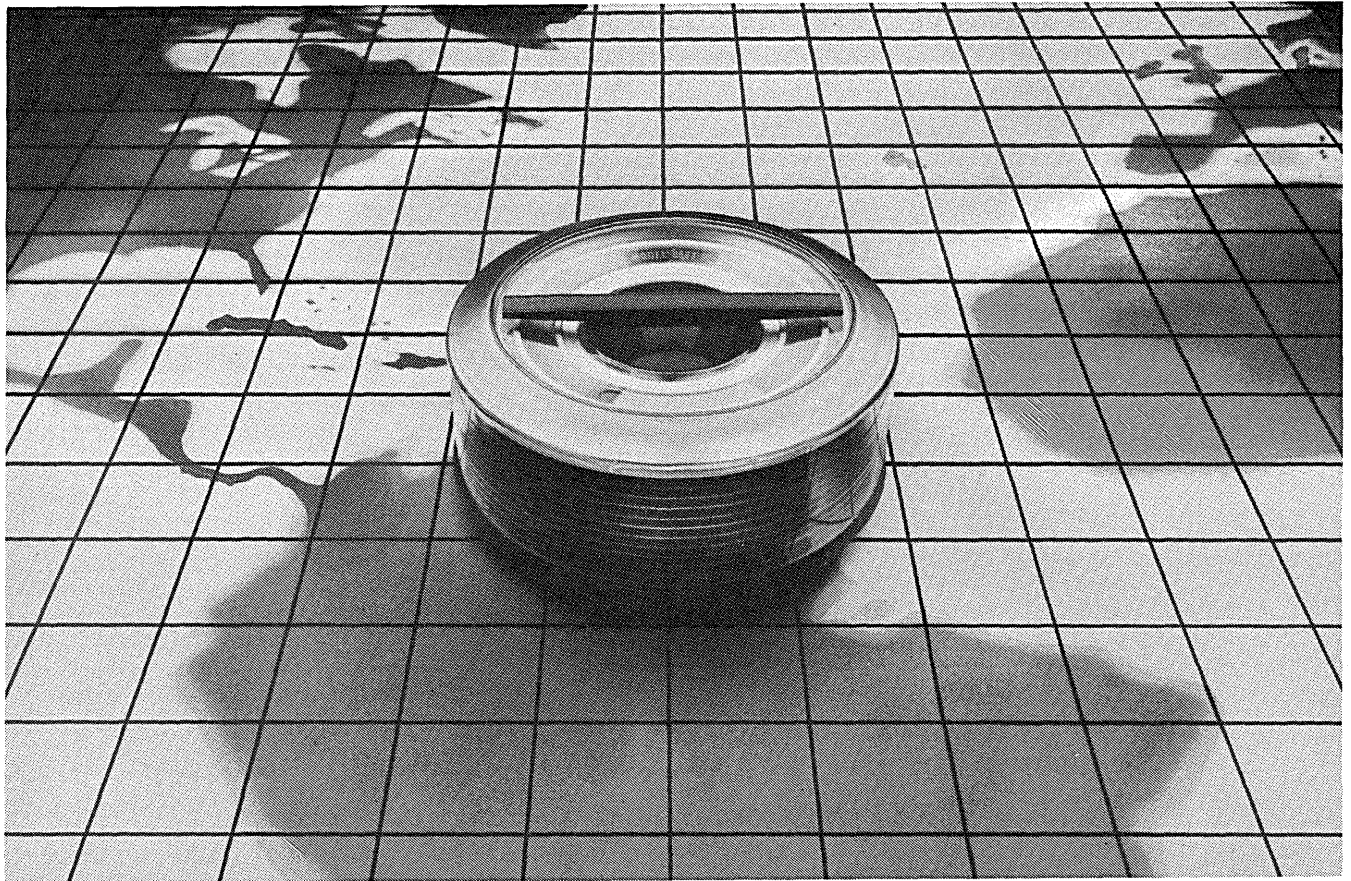
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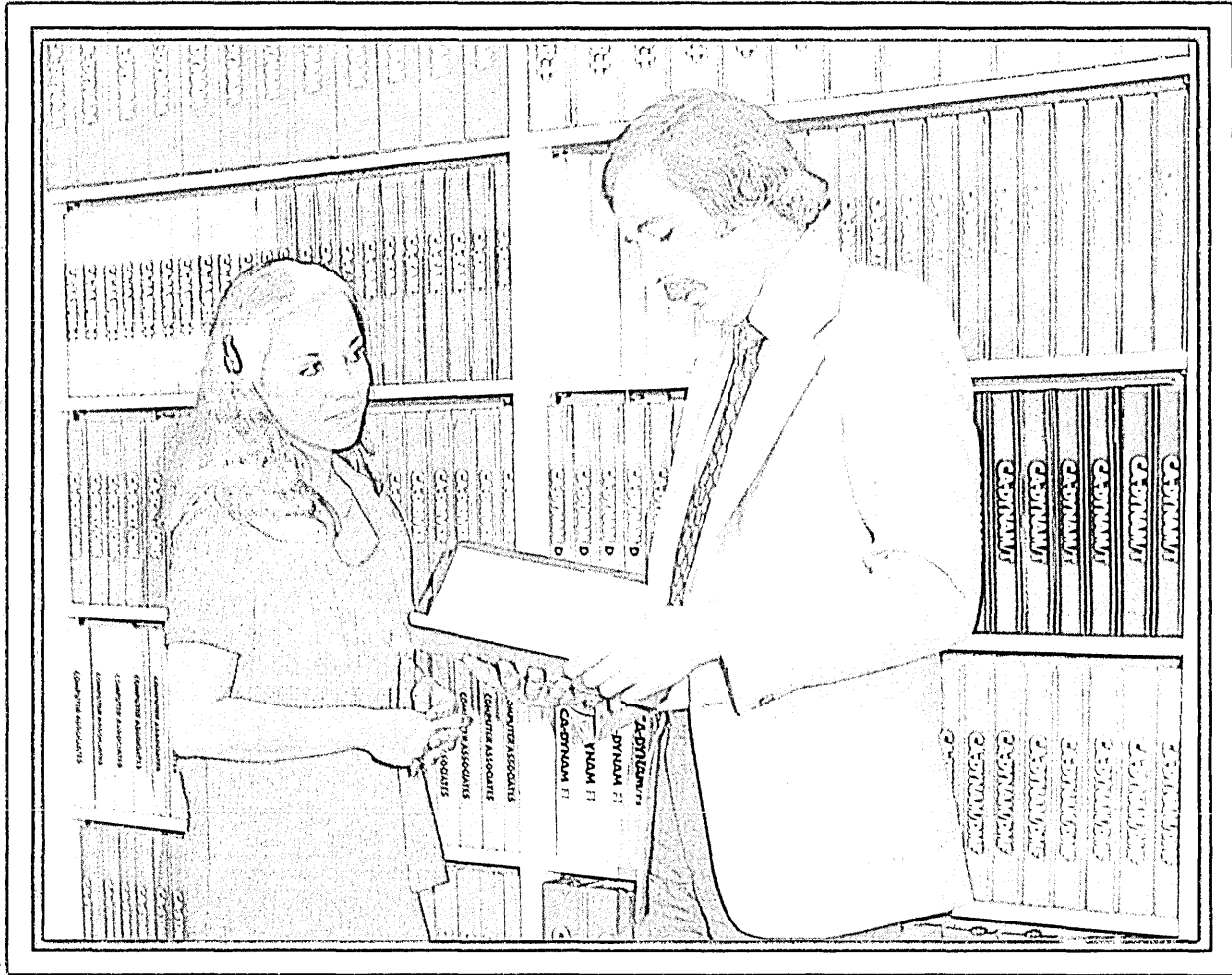


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Or smell the fresh cut Pines,  
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- VIII. And if our Heartfelt Christmas Wish  
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—Edward C. McManus  
Marlborough, Massachusetts

## SMOOTHING THE PATHS

Now that "office of the future" technologies such as word processing and distributed processing are becoming widely implemented in both large and small businesses, the need for data processing expertise in support of office applications is critical. Several offices with which I have had recent experience have run into numerous difficulties as a consequence of misunderstanding the computer elements within their new office equipment. These difficulties are noticeable in smaller organizations where the office equipment is also used for "normal" data processing (e.g., inventory, payroll, check writing) as well as in large companies where the office equipment is segregated from the shop. The causes of the difficulties vary, depending on the size of the organization, but the problems generally remain the same.

Of particular concern are the problems which result from implementation of customized application programs for microcomputer-based office equipment. In general, the initial installations of these programs no longer cause major difficulties. The biggest headaches are caused by changes to customized application program software and file conversion from one format to another.

The shift to customized software can often be traced to microcomputer programs written in BASIC. Maintenance of these programs seems to be unusually difficult, generally for the following reasons:

- Unfathomable variable naming conventions:

The common restriction of BASIC variable names to two characters causes extreme confusion when modifying programs. This is especially the case in large programs (more than 250 statements and/or more than 15 variables). The distinctions in a program between variables T1, T2, T3 . . . and S1, S2, S3 . . . rapidly blur to the point of obscurity. The same difficulty is also apparent with subroutine calls. The distinction between GOSUB 2500, GOSUB 2600, GOSUB 2700 . . . rapidly disappears when large programs access more than five or 10 subroutines.

- General absence of descriptive comments (remarks):

Since most office-based microcomputers have limited memory and REM statements occupy as much memory as executable (interpretable) code, there is a general tendency to reduce descriptive comments to the absolute minimum. Unfortunately, in the zeal to obtain the maximum amount of functionality in the smallest amount of memory, this absolute minimum has become zero in many cases. The absence of descriptive comments is particularly worrisome when juxtaposed with similar, but different, variable names or subroutine numbers.

- Degenerate code blocking and indentation structures:

As in the case above, the usage algorithms and quantity limitations of microcomputer memory cause spaces (blank characters) to occupy as much storage as usable instructions. This promotes program coding that wastes as few characters on a line as possible. Consequently, instead of indented code blocks that are

## READERS' FORUM

readable, we have the opposite: program code that is "crunched" as densely as possible onto as few lines as possible, making the starting and ending points of logical blocks virtually undetectable.

The foregoing problems are reminiscent of the mistakes that were made with large-scale computer and with minicomputer application programming 20 and 10 years ago, respectively. As with word processing and local network distribution, the difficulty was not when the initial programs were started, but when another programmer made modifications and/or enhancements several weeks, months, or years later. The situation in microcomputers could turn out to be even worse due to their widespread distribution and accessibility in the office of the future.

File conversion from one format to another has not yet become a major issue for most office of the future users, primarily because most of these users are still on their first computer-based systems. To most office personnel, the details of data storage formats are neither explained nor important. Yet, by the time a typical word processor system is outgrown, dozens of documents aggregating hundreds or thousands of pages might be stored. Unless the data processing industry's experience in converting from one computer to another is brought to bear on replacement office of the future equipment, serious difficulties in document conversion will develop. In one case I observed, a highly technical reference manual that had been incrementally prepared over a year's time had to be completely (manually) rekeyed into a new word processing system when the one on which it had been stored was replaced. Then over 500 pages had to be reproofed and corrected, causing a schedule slide of almost four months. Cases such as this can be expected to multiply in the next three to five years as businesses begin to replace current equipment with the better, more cost-effective gear that is coming.

As data processing professionals, we are obligated morally if not otherwise to mitigate the mistakes of the past 20 years. We cannot, and should not, allow the users of office of the future technology to suffer as a result of the routine evolution of computer-oriented applications and equipment. Contact with the supervisors in charge of office equipment, procedures, and personnel must be made now. The process of educating them into the intricacies of the computer elements embedded within their facilities must begin. We must offer assistance and be willing to spend time helping them learn the requirements and processes of the office. Only by starting now will we be able to smooth the paths from today to tomorrow.

—David A. Feinberg  
Seattle, Washington

## WHAT GOES WRONG

Computers have made their presence felt almost everywhere in the world, including government and defense organizations. We in the Indian Defense Forces have followed suit. One naturally stops to ponder how good these complex machines really are in our context. In what manner do they contribute to our striking and defending power? Are they really necessary? In profit-oriented organizations people also ask, and rather vehemently, "What is the cost effectiveness of these machines? Do they contribute any savings in manpower and its associated problems?"

A computer hardware salesman would probably answer all such questions with surprising ease. Many times, based upon his arguments, management may adopt automation as a solution to problems at hand. More often than not, this decision is correct. But later, something goes wrong somewhere and implementation results are far from satisfactory. We hear discouraging remarks, sometimes from the data processing professionals themselves. Things like:

- "I told you our organization was not ripe for computerization."
- "What you really need is a bigger computer."
- "I thought this aspect was covered in the scope of the new system."
- "This is not as per the latest government instructions."
- "My chaps were not consulted on this change."
- "You should have known we couldn't start this month."
- "I thought you removed all the bugs."

Unsuccessful implementation is not only harmful to the concerned application; it also creates management apathy in regard to the usefulness of computers. And this kind of feeling travels faster in the organization than the news about relative successes elsewhere. The management may even come to believe that the organization is not yet ripe for automation. From then on, interest in computers flags. People start saying, "If we all do our jobs honestly, computers will not be required."

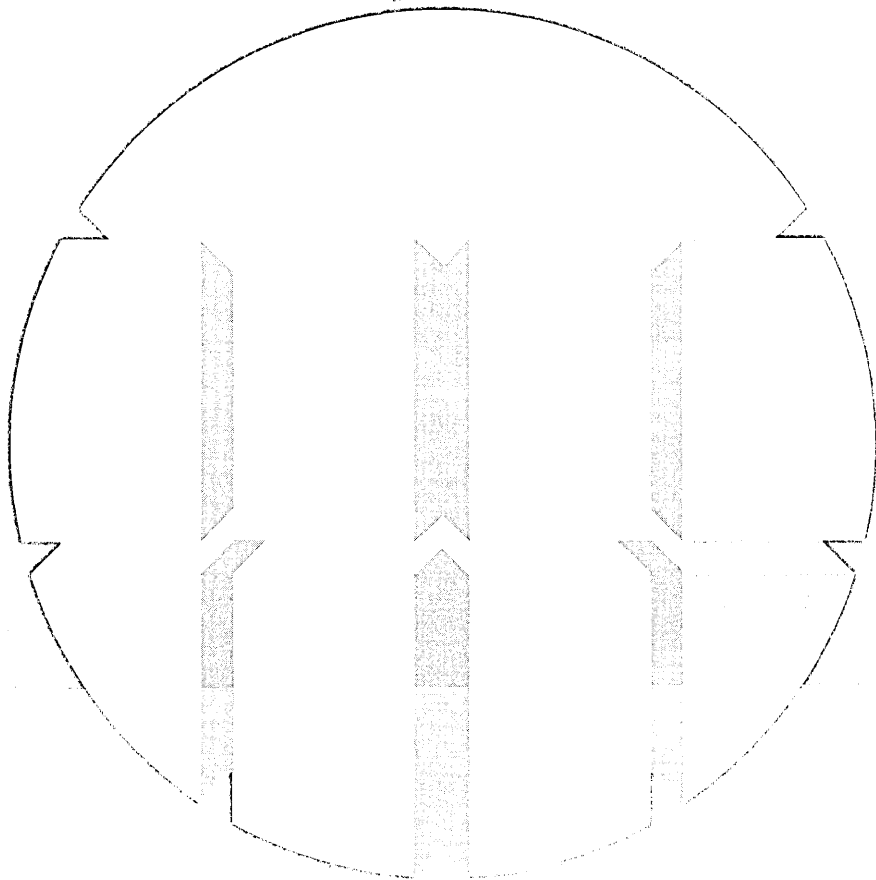
The growing opposition to computers is unjustified and needs to be rectified. Instead of being disillusioned by the unpleasant impressions of past implementations, we must identify and eliminate factors that cause failures. In any case, even if the computer venture in an organization fails completely, it still provides a very good means of improving interdepartmental communications and in-depth understanding of a particular situation. There are organizations which still have not had a go at automation in spite of being aware that computers are enjoying worldwide proliferation. They are eager to know how to proceed.

If we trace the evolution of automation in organizations, we see it goes back to unit record equipment and the codex systems, which were primarily aimed at mechanization and optimization of office work. Computers merely replaced these systems. People involved with these very systems turned into dp managers, and later made policies covering the use of computers. In their view, automation was akin to mechanization, and the computerized systems developed through their efforts bore this stamp. They often used computers merely as sophisticated typewriters and printers. In the bargain they missed exciting applications like scientific computations for R&D, process control, simulation and war-gaming, and artificial intelligence. Therefore, full advantage was never secured, for the organization and management saw no real benefits. This has happened the world over, but the advanced countries recovered from this inadequacy as a result of overall development of computer culture and education. In India, we are just beginning to pass through this phase.

Data processing was the term used to cover all activity associated with computers. Even within the limited scope of data processing that the organizations adopted, people were too impressed with the immense power of computers and concentrated on processing activity alone. Data, which was the primary concern of the organization, received little attention. The result was management dissatisfaction because of the inaccuracy of data held in computers.

This drew the attention of some brilliant persons in the dp field. They advocated separate management of data as a solution to this problem, and separated the domain of data from that of programming. People were specially employed to study the nature and usage of data in the organization, and they evolved an organization-wide definition of data. In this context one can realize the confusion that was likely to occur if data were not defined uniformly within the organization. For example, if a commercial airlines company could not define the meaning of down time or serviceability unequivocally, the maintenance and the operations staff would perpetually differ while evaluating their resources. Owing to the introduction of independent management of data, the accuracy and dependability of systems greatly improved and became more acceptable to management.

This concept of data independence was also called database and it later led to the evolution of the term information systems. The name information systems was probably adopted because the system design revolved around the usefulness and significance of



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information pertaining to the organization. Present-day dp professionals claim that they design information systems and not edp systems. They attach great importance to information in the decision-making activity. In the aggregate, the information systems are also referred to as Management Information Systems (MIS).

Many organizations are still carrying on without computers and the associated dp activity. The importance of information for performing management functions is felt, but only implicitly, in such organizations. The dp community must be given due credit for highlighting this significance. But at the same time, the disproportionate importance attached to the study of information flow through the organizational structure—even to the extent of suggesting organizational restructuring to suit information flow—is rather questionable.

The consequences of overselling information flow are serious. It gets the management deeply involved in the systems work, which is beyond its comprehension. Out of sheer frustration, management eventually withdraws from the systems work. Nothing, then, prevents the professionals from imparting sophistication to the developing information system, which becomes difficult to operate and may even fail.

Sometimes new systems are proposed and developed just because dp resources are available, and not because management needs them. The result is that systems are produced that no doubt are used by management, but their absence would probably never be missed. An environment must therefore be created wherein the information systems already developed are used thoroughly and frequent demands for extension of their scope are made. This kind of experience would then generate genuine demand for automation of new areas, and success would be reasonably assured. The dp professionals must only come in to advise on priority of initiation. They can also advise on availability of dp resources and help draw an overall systems plan for the organization.

There is yet another trend that needs to be checked. Dp professionals tend to develop sophisticated information systems, and they even manage to operate them smoothly. The problem appears when the manager wants to make a decision based on the information presented. Sometimes he cannot visualize the manner in which the calculations have been made or a particular inference has been drawn by the computer. He then prefers to use his own methods to assess the situation and to make a decision. In this manner the usefulness of a developed system is lost. So, while developing a system, the solution to a problem must be obtained in exactly the same manner as a human would normally use, rather than resorting to complex algorithms or adopting difficult approaches.

The data processing section in most organizations is established on the basis of project management, irrespective of whether the dp resources are internal or external. This means that the design and development of information systems are taken up as projects. Therefore, the dp manager must not only be trained and experienced on project management techniques but also have a fair amount of knowledge about the idiosyncrasies of dp projects.

There is a peculiar problem associated with dp projects. Normally, the end of a project is definable and performance criteria exist which can be used to evaluate whether the project is successful or not. In dp projects the determination of the end is as difficult as the determination of success or failure. Dp projects never seem to end, because of perpetual increases in user requirements and expectations from the project. If somehow an end seems near and the project appears headed towards failure, the dp staff has excuses ready. Even if the project is successful at implementation, it may later become inadequate because its usage will be governed by end users and will get overextended in relation to the original settings.

To be successful, the dp manager has to adopt a threefold role during the tenure of the project. In the beginning he must be able to freeze the system specifications by proper political alignment with the management. During the development stage he must resist the temptation to improve dp techniques as suggested by his

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staff or users. These two activities are likely to adversely affect his schedules. Thirdly, he must acquire skills to absorb criticism during implementation. During this phase he should be able to get the changes incorporated into the project smoothly, making them obvious whenever they are in response to management requirements.

In the defense services, we follow a policy of generalization to provide job opportunity and enhanced promotions in the higher ranks. A separate dp cadre has not been conceived so far, maybe because of insufficient quantum of work involved, but more so because automation in our context cannot be isolated from the basic operational work. The situation calls for a carefully thought-out, long-term personnel policy to acquire the desired level of competence in automation.

It is often stated that because of transfers, skilled workers are inadequately utilized. They are inhibited from delivering optimal performance because much of their time is consumed by imparting on-job training and documentation to their successors.

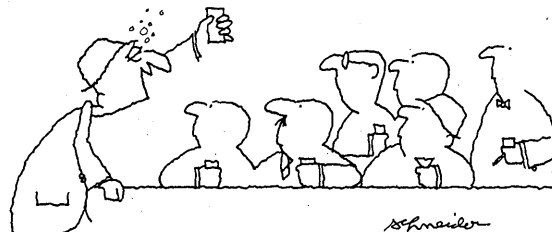
While there is truth in the above-mentioned situation, more harm can be done by the over-enthusiasm of a dp manager who fears his own transfer. We are not unaware of the rather natural tendency of individuals to show results within their tenures, without consideration to long-term requirements and repercussions. Sometimes his whole establishment has a temporary status and is fast approaching its expiry. Things can only be rectified if the management arranges a suitable environment for the dp professionals to grow effectively. A new technology requires a new policy on various fields providing support, including personnel.

Another question is whether to use large computers, minis, or microprocessors. In defense forces of large dimensions, three important areas of applications exist. They are Management Information System (MIS), Command, Control and Communications (C<sub>3</sub>), and R&D applications. Needless to say, a mix of the three types of computers mentioned above would be required to cater to the requirements of these application areas. It would be interesting to explore the real differences between an MIS application and a C<sub>3</sub> application.

For the present, we can confine ourselves to the subject of systems growth. What functions must be automated, and in what sequence? The most important step in determining this sequence is to determine first the status of the organization with reference to automation. There are two ways of doing so: first, by the proportionate amount of budget allocated for automation; and second, by the state of art and technology that will be utilized (batch processing, real-time processing, networking, etc.). Many organizations have suffered because they had plunged into automation without evaluating their present status in these terms.

There are normally four stages in the growth of systems: initiation, expansion, formalization, and maturity. It's important to note that information processing must proceed in an evolutionary manner and that management must not jump stages in an attempt to get there sooner. In the long run it just does not pay.

Keeping these factors in mind, the organization must determine what areas can be automated at a point in time. It will be quite easy to determine which area is more significant than the others from the management viewpoint, but it may not be the most deserving case to start with. More often it is the area that provides input to other areas which must be taken up first. Otherwise the implementa-



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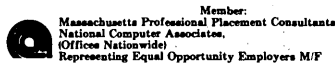
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## READERS' FORUM

tion of the developed system will have to wait till the output of some other system becomes available. For example, there is no point in going in for a sophisticated inventory control system without having developed and proved an effective cataloging system. The result would be a syndrome of design, patching, and redesign—a rather popular mistake.

The organization must also develop and freeze an overall systems plan, which defines the sequence of induction of application areas to support the management functions. While following these plans, the development phase must be kept short and the start of new projects must be delayed till the old ones start giving results, even if additional resources can be marshaled towards the new project. As the systems are pressed into service, the overall plan may need amending, but one must remember that planning follows a top-down approach whereas development follows a bottom-up one.

A few factors have been explored and some remedies suggested towards more successful implementation of automation. There are many more kinks in the process. But all this is easier said than done. Let us not forget that we cannot reap the coveted fruits of automation unless we are as logical and disciplined in our approach as the computer itself is. Keeping the above-mentioned peculiarities of automation in mind is not enough. The organization needs the services of prudent and imaginative staff, both in technique and in outlook.

—M.K. Rana  
Chandigarh, India

## THE DENNIS DOCTRINE

In 1966, I was working on a large project with the IBM 360 system involving about 30 programmers and about 250 programs. I was responsible for putting the JCL together and also for isolating errors in test runs. Some of the runs were six hours long. When a hang occurred, I had to work through the dumps until I could isolate the program and finally the line of code. Day after day, night after night, hang, hang, hang, hang.

I began to realize, however, that most of the problems tracked back to a fellow named Dennis who sat next to me. I began dreaming about Dennis. I slowly started thinking of him as a spy working for the competition, trying to disrupt us. In time, I learned all his programs, and at the first sign of trouble I knew where to look. The company and the system triumphed.

Working so close to Dennis, I became fascinated with the way he operated. He would solve a problem in ways that were impossible to predict. He was always late with his work and nothing seemed to work right the first 15 times. In summary, Dennis single-handedly destroyed more schedules than seemed possible.

Then I was given a new project with a very tight time frame. I had always had difficulty estimating and scheduling. Things happened that I could not foresee. Then I got a flash of insight and solved my problem for life. I invented the "Dennis Doctrine" for surefire, can't miss estimation and scheduling. After 15 carefree years, I am ready to share it. Here it is!

I broke the project up into tasks. Then I visualized how Dennis would approach each task and how long it would take him. In the beginning, I used to look at Dennis while I was thinking about him working on a task. Well, the rest is history. My estimates were consistently right on the money. Thinking of Dennis, I anticipated everything that could possibly go wrong. Unfortunately, Dennis was assigned to me on the next project and I needed every minute of the estimate.

—Richard P. Scivetti, Sr.  
Washington, D.C.



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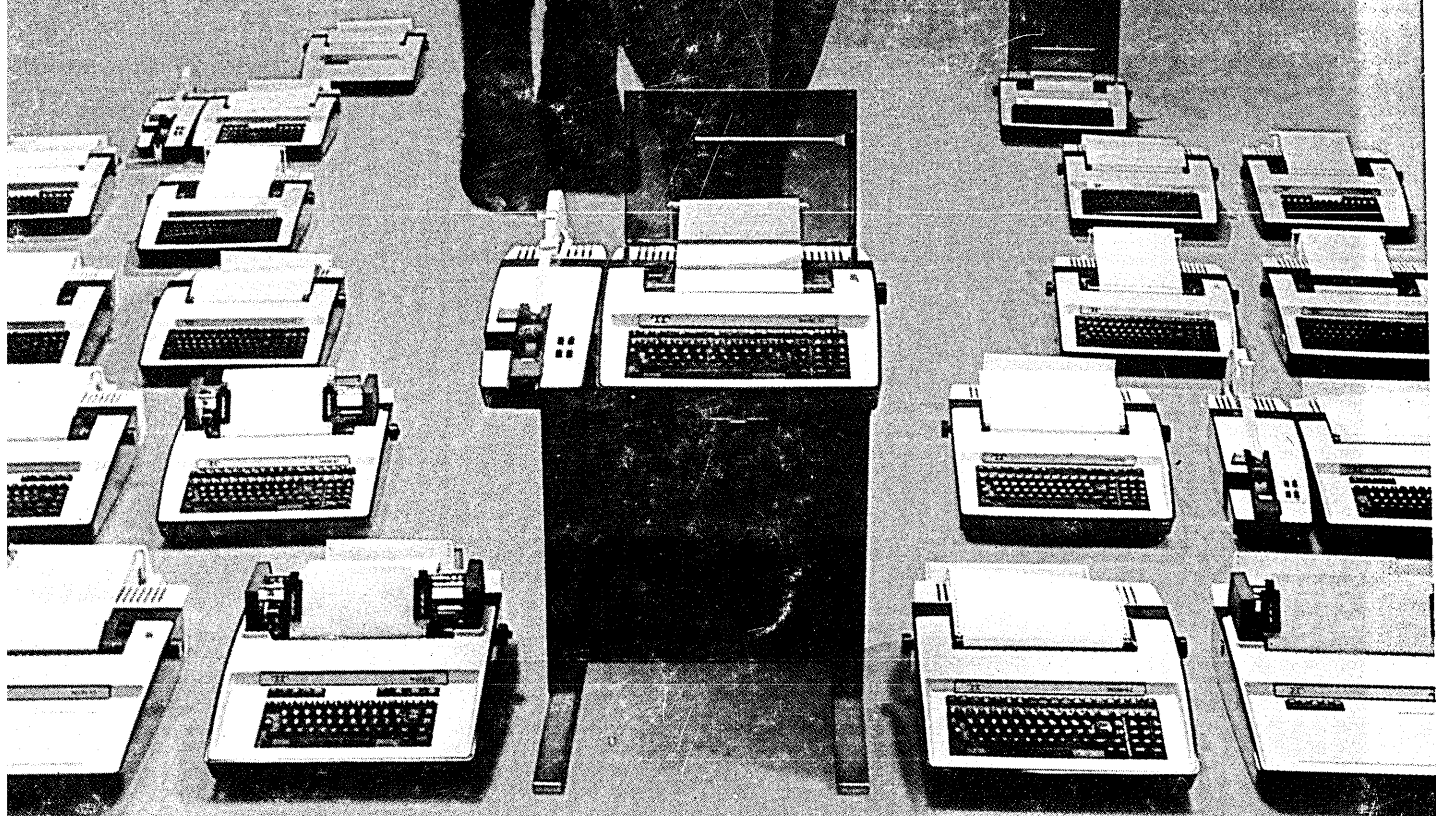
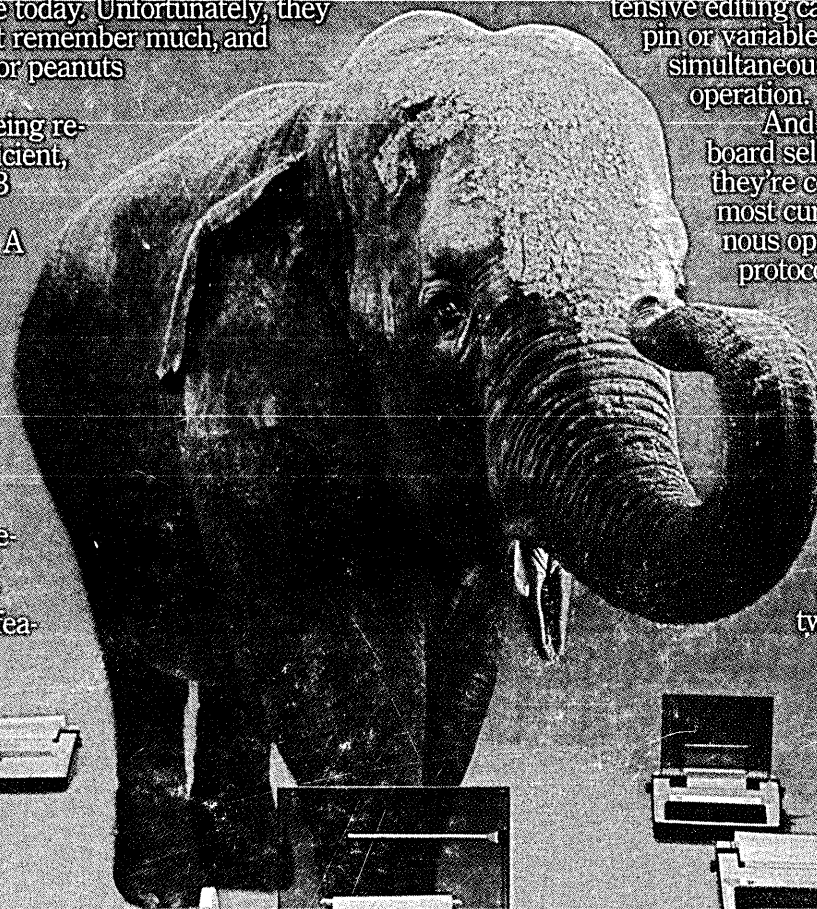
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