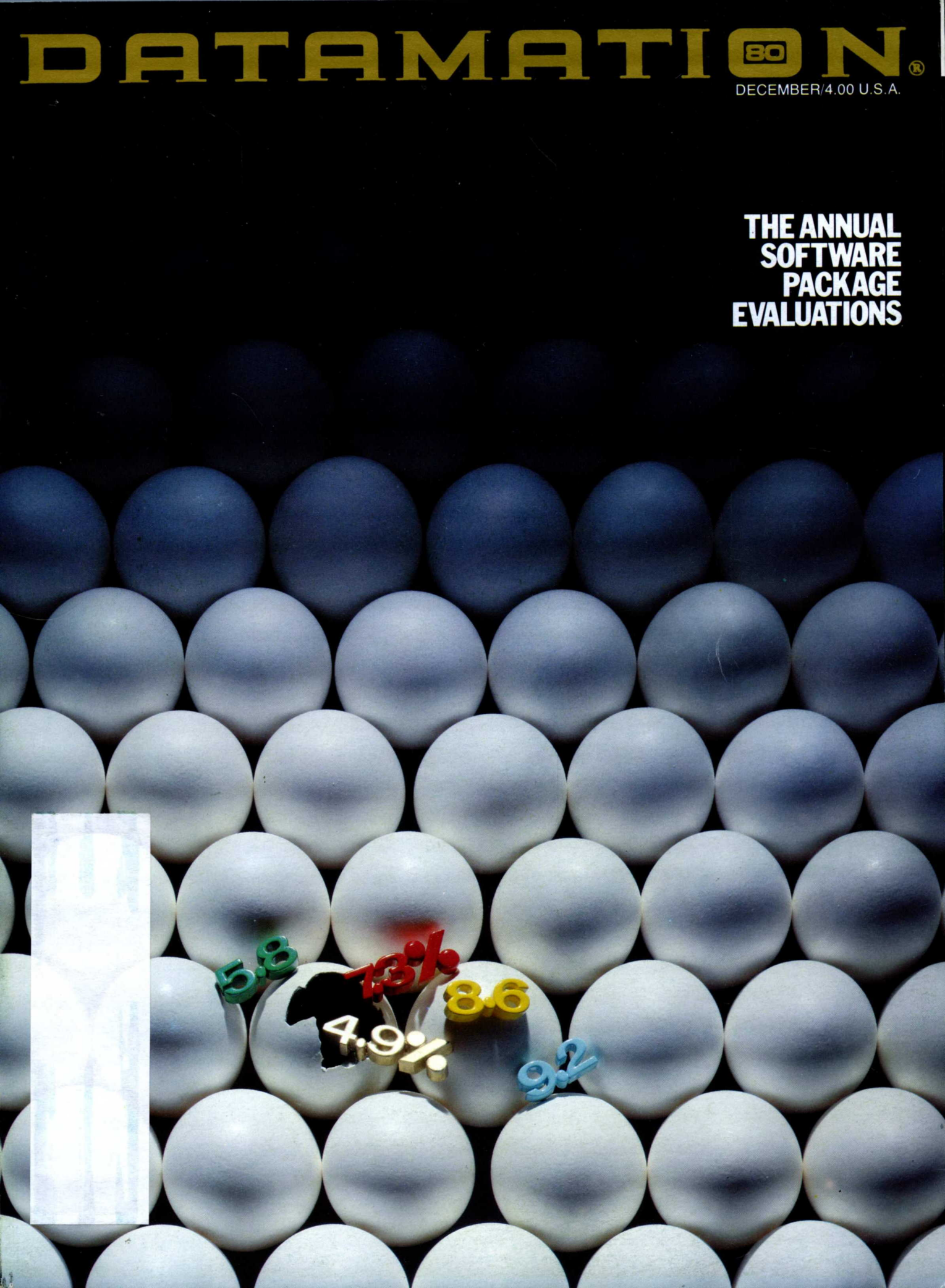
DATAMATION®
DECEMBER/4.00 U.S.A.

# THE ANNUAL SOFTWARE PACKAGE EVALUATIONS



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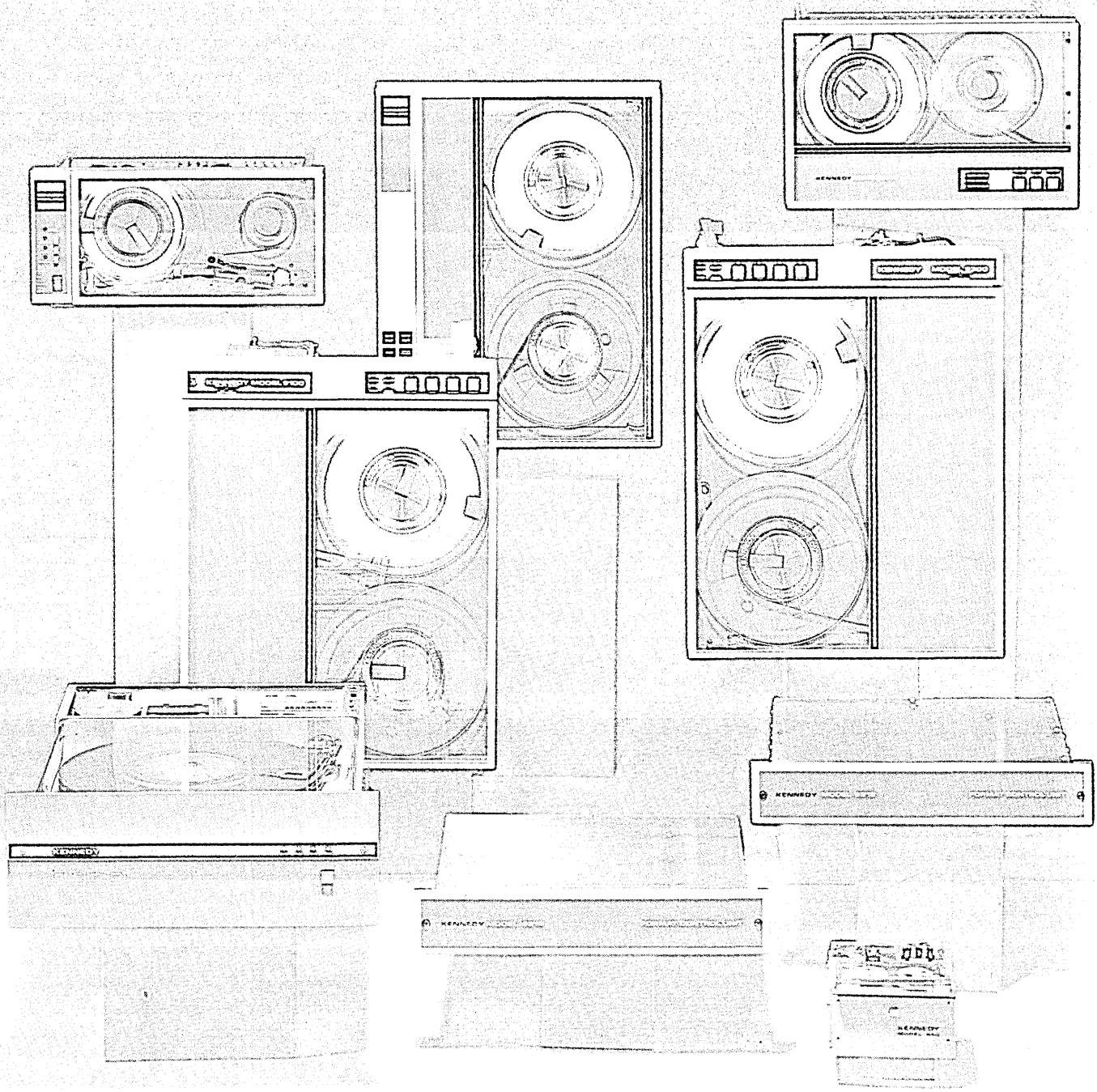

# AM Jacquard Systems

There are good investments and bad ones, too. Some pay big dividends, others don't. Our AM Jacquard J100 multi-function computer system is the best investment you'll ever make when it comes to automating your office. It offers high dividends and solid returns where cutting costs and increasing productivity are concerned. You can bank on it.

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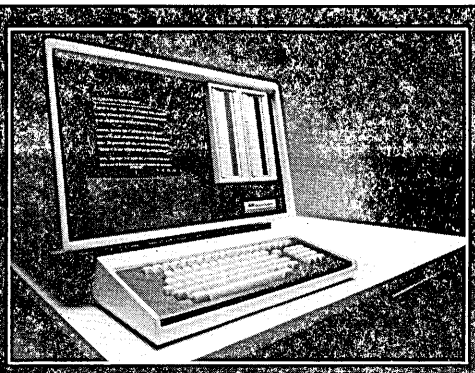

the J325 laser-based OCR device, J324 mag card reader and even a power typing station.

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# Arrow is ...
# Telcon's Ambassador terminals

portable technology

**TELCON AMBASSADOR TERMINALS CAPABILITIES CHART**

| Ambassador | MODEL NUMBER | BUILT-IN WORD PROCESSING EDITOR | KEYBOARD SELECTABLE DATA TRANSMISSION RATES/MODE | KEYBOARD SELECTABLE BAUD LEVELS | BUILT-IN CASSETTE DRIVE | BUILT-IN 40 COLUMN PRINTER | POWER | OPERATING TEMPERATURES |
|---|---|---|---|---|---|---|---|---|
| I | VCS 200 | YES | 45.5-4800 plus 30 CPS COUPLER | 5,6,7,8 ASCII | YES | 40 | 40-400 HZ 80-260 VAC | 20° to 120°F -13° to 50° C |
| II | VCS202 | YES | SAME | SAME | YES | 80 | SAME | SAME |
| III | VCS203 | NO | 110-9600 plus 30 CPS COUPLER | 7-8 ASCII | NO | NONE | SAME | SAME |
| IV | VCS204 | NO | SAME | SAME | NO | 80 | SAME | SAME |

**Arrow offers nationwide availability and customized service of Telcon's rugged Ambassador series of portable CRT terminals.**

The Ambassador family combines a typewriter-style keyboard, video displays and text editing features that incorporate state-of-the-art technology with real economy and sophisticated design. When you need quick, versatile, reliable communications in the field; Telcon's Ambassador models I through IV are ideally suited with a variety of practical options including magnetic cassette storage and/or built-in printers. Data or text can be entered and stored in the terminal for remote access, or communicated to a host computer via public or private communications networks. Similar bureau terminals are also available.

The Ambassador III, pictured above, is at the top of Arrow's best seller list with Telcon's own mounting system which eliminates shock impact resulting from severe temperature changes and rough handling.

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VOLUME 26 NUMBER 12
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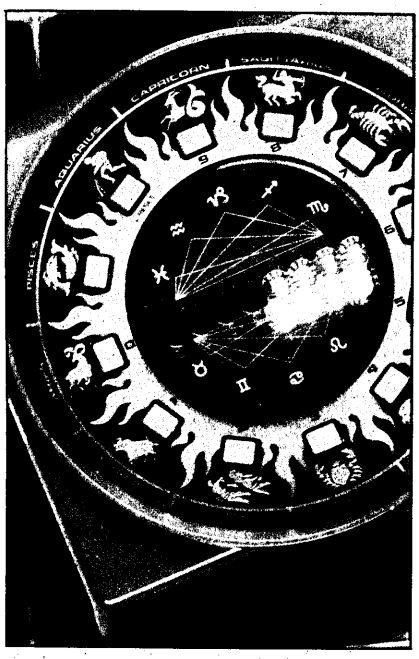



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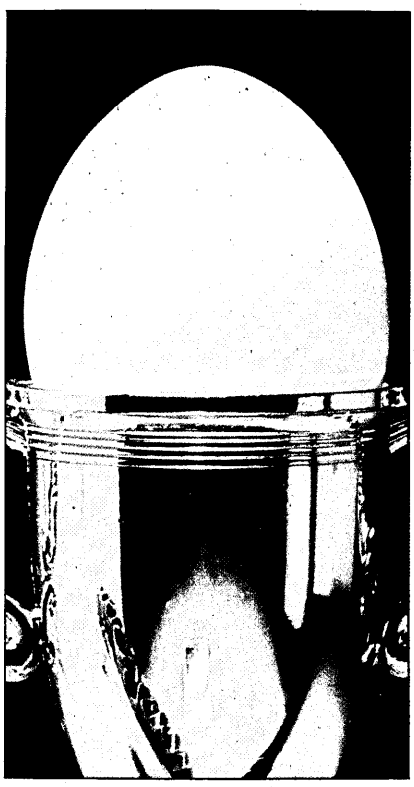


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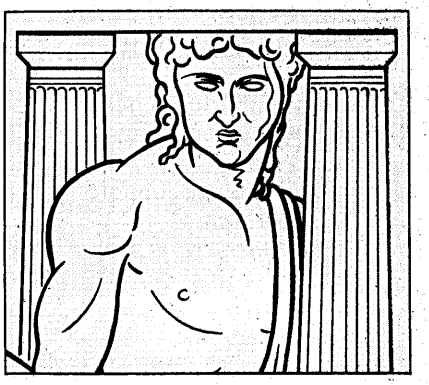


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COVER PHOTOGRAPH BY STEVE COOPER

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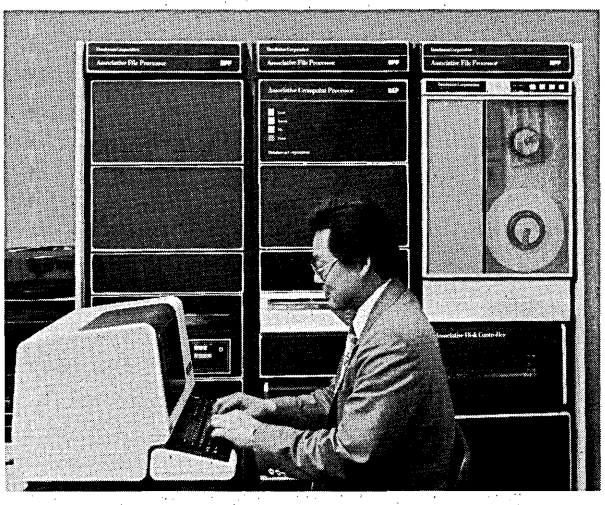

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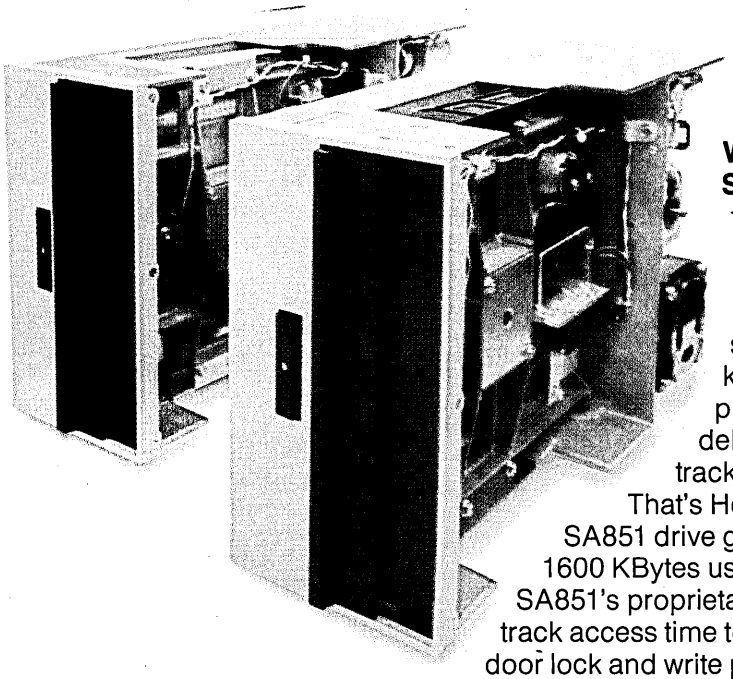

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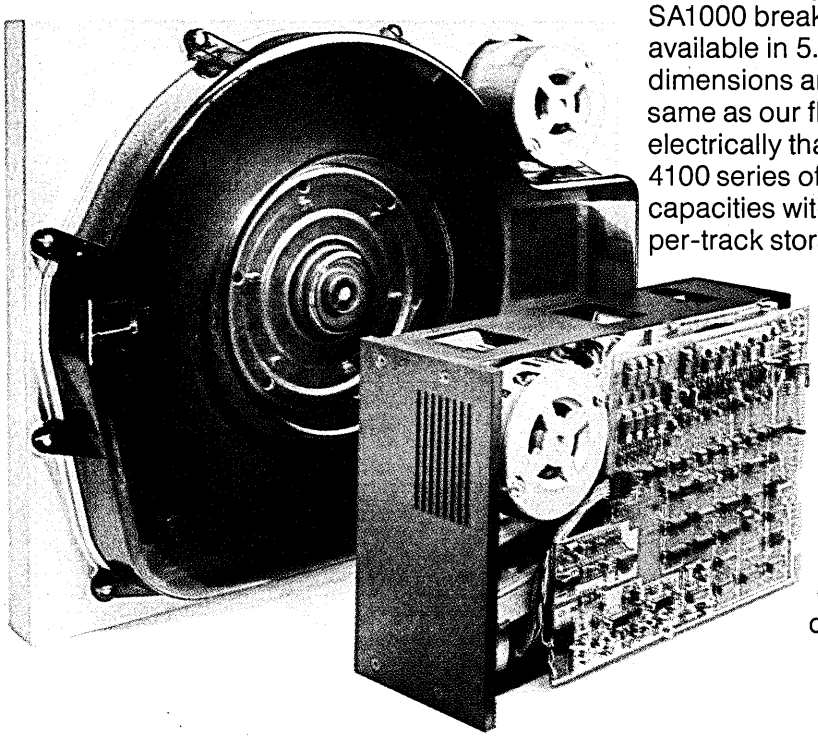

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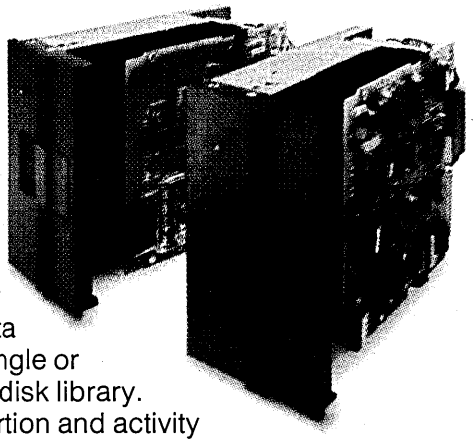

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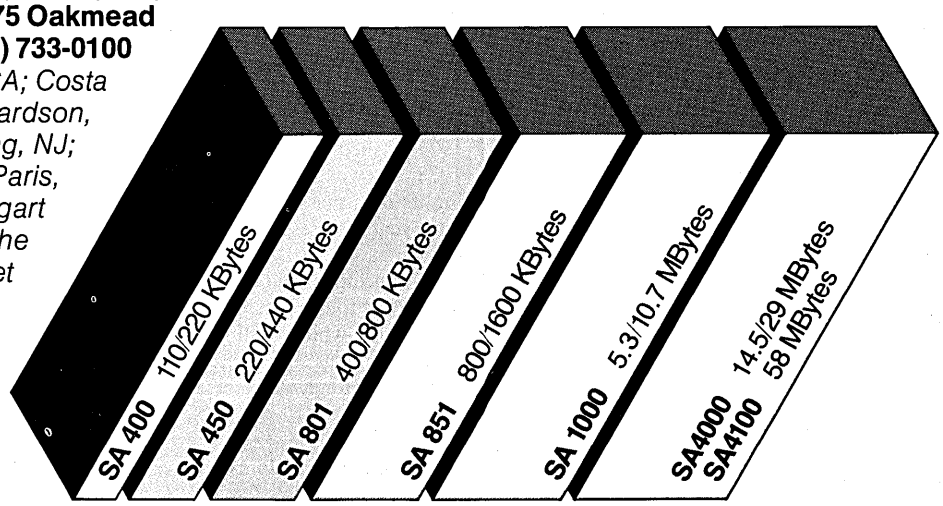


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# LOOKING BACK

## NOVEMBER/DECEMBER 1960

Control Data Corp. was very busy during the fall and early winter months of 1960. The company was active in court, at the bargaining table, and in sales. After announcing it had doubled sales and nearly doubled earnings in its third fiscal year, CDC answered a Sperry Rand complaint and filed a counterclaim, negotiated an agreement with NCR, and continued to sell computers at a good pace. The Sperry lawsuit against CDC, instituted in April of '58, alleged that CDC used trade secrets to produce competitive equipment and had illegally contacted Sperry customers. William C. Norris, CDC president, denied the charges and filed the counterclaim, stating that Sperry owed him $17,000 in outstanding wages. Sources close to the battle expected it to be resolved in 1961. The NCR agreement specified that CDC would supply NCR with a variation of its 160 computer for use with NCR's dp line in financial and retailing applications; the 160 was to become part of NCR's banking package. Both companies planned to market the computer internationally in all fields of record keeping. The other half of the agreement was that NCR provide CDC with high-speed printers, card readers, and other peripheral equipment.

## DECEMBER 1970

"Industry soothsayers" who had predicted the unveiling of IBM's fourth generation for 1975 pushed back the date until 1977 or 1978. They expected IBM to continue holding its own marketplace for about another three years by presenting 360 enhancements —such as the 370. The two- to three-year delay was influenced in part by the GE "cop out." GE's fourth generation was due in the early '70s—which would have forced IBM's hand. With GE's computer operations absorbed by Honeywell, there was even less competition.

*

When he addressed the Northeast Electronics Research and Engineering Meeting (NEREM) in Boston, Dr. Edward M. Bennett, former president of Viatron Computer Systems Corp., revealed some of his secrets for raising venture capital. He referred to his methods as "hustling a buck." A few hints bestowed upon his NEREM audience:

"Raising money is very much like running for office. You have to put a campaign together.

"The business plan you prepare must be a lie . . . . But it must be a detailed and precise lie rather than a vague and general lie.

"If you promise enough risk, loss, and catastrophe, the financier will begin to wonder whether you're hiding something from him.

"Go public as fast as you can.

"It is truly more fun to spend someone else's money than your own.

"You can start small, stay small, and die small . . . . Or start big, get big, and die big."

At the time of Bennett's Boston talk, Viatron had not yet died, but it was in trouble and fending off numerous creditors. Viatron had started big, and was getting very big when the money ran out. Subsequently, Bennett was relieved of his duties, and the company struggled to make a comeback.

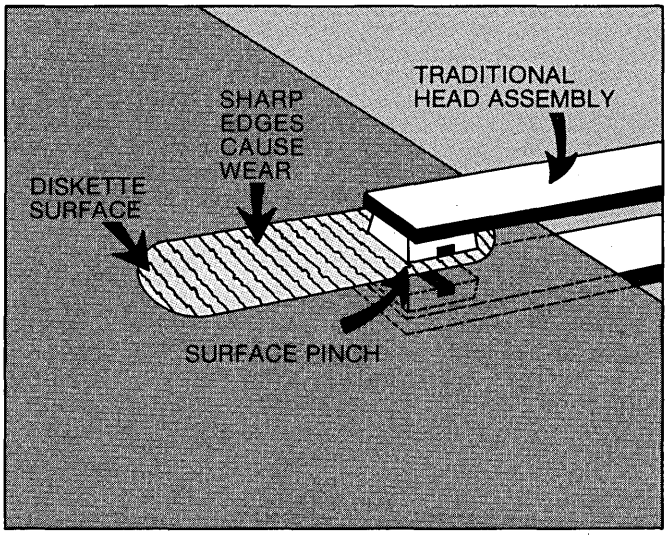
*

One of a long line of official announcements, Britain's International Computers Ltd. (ICL) declared it was definitely coming to the U.S. as an entity named International Computers (USA) Ltd. The locations specified for the British landing of 1970 were Garden City, Long Island, N.Y.; and Madison Avenue, Manhattan. While continuing to promote oem sales, the subsidiary stated it would provide "technical liaison with American suppliers," and that it had no plans to sell ICL computers "at this time."

**—Deborah Sojka**

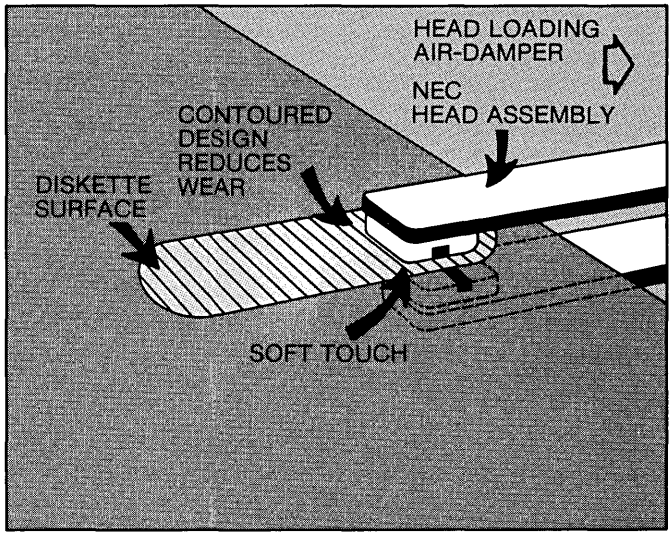
# Introducing the NEC Soft-Touch.™

## Other diskette drives




*Dual-sided diskette drives require contact of both heads with the media to read or write. This causes head wear and a pinching action that deforms, mars and scratches the media surface, shortening head and media life.*

## NEC diskette drive




*The NEC "Soft-Touch" drive uses advance-contour head design and a unique air-damper to load heads. These features smooth and cushion the contact of head with media surface, nearly doubling the life of both the heads and the recording media.*

## The industry's newest 1.6MB diskette drive. With twice the MTBF. Twice the media life.

NEC product superiority is now available in dual-sided double-density eight-inch diskette drives. Our new Model FD 1160 "Soft-Touch" flexible disk drive offers reliability and cost-of-ownership advantages that far exceed industry standards.

**Media life.** The "Soft-Touch" drive uses a unique air-damped head-loading system that virtually eliminates pinching, scoring and scratching of the diskette media. The result: media life of more than 6 million passes, nearly double that offered by other suppliers.

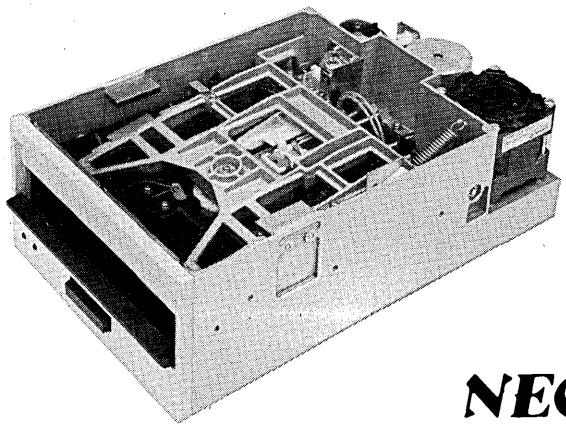
**Head wear.** An advanced design ceramic read/write head assures maximum signal transfer efficiency while drastically reducing head wear and media chafing.

**Reliability.** Most diskette drives average about 8,000 hours MTBF, with perhaps a component or two rated higher. The NEC "Soft-Touch" drive has a 15,000-hour MTBF *on the entire drive.*

**Compatibility.** The FD 1160 model is data compatible, electronically compatible and dimensionally compatible with industry-standard single- and dual-density drives. You can use it immediately in place of the older drives you use now.

**Availability.** The NEC "Soft-Touch" drive is available right now. Not as a prototype, but as a field-proven drive with over 20,000 installations worldwide.

Find out for yourself. Call Jack Flynn today on the NEC "Soft-Touch" action phone at 617-862-3120 to order your evaluation unit.



NEC

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Eastern Office: 36 Washington Street, Wellesley, MA 02181, (617) 431-1140
Central Office: 3400 South Dixie Drive, Dayton, OH 45439, (513) 294-6254
West Coast Office: 8939 S. Sepulveda Blvd., Los Angeles, CA 90045 (213) 670-7346
Southern Office: 2945 Flowers Road South, Atlanta, GA 30341 (404) 458-7014

**CIRCLE 9 ON READER CARD**

# ASM2 versus the Space Disruptors

Monsters are cute except when they are messing around with your data. ASM2 was the *first* automated space management system to control the antics of those little beasties.

With the new Release 2.5 ASM2, completely rewritten documentation; simplified installation; improved reporting facilities; RSVP—a powerful data set preprocessing facility; DASD space billing; expanded VSAM support; and interfaces to other significant software packages such as TLMS, TMS, SPF, RACF and ACF2 (Access Control Facility—also marketed by The Cambridge Systems Group, natch) and ongoing enhancements we make *at no extra charge* to users, monsters are finding they no longer have uncontrolled access to data storage devices at the computer sites that have ASM2, and customers are finding out why ASM2 remains the continued leader in the field.

**Automated**: Archival • Backup/Recovery • Migration • DASD Billing • Reporting • Volume defragmentation • Volume cleanup • Standards enforcement . . . and more

## The Cambridge Systems Group

24275 Elise, Los Altos Hills, California 94022 (415) 941-4558—Telex 357437

Representative: CSG Limited, 7 Cavendish Square, London W1M 9HA, England (01) 580-1222—Telex 299512

CIRCLE 10 ON READER CARD

**It takes true genius to make a complicated subject simple enough a child can understand it.**

| | |
|---|---|
| **The Child:** | Beautiful |
| **The Subject:** | Data Security |
| **The Simplicity:** | Ease of implementation; protection by default; central or decentralized controlled sharing of data; minimum machine and administration overhead; built-in interfaces to other commercial software |
| **The Geniuses:** | Schrager Klemens and Krueger, Inc.<br>The Cambridge Systems Group, Inc.<br>CSG Limited (A representative of The Cambridge Systems Group) |

## The Cambridge Systems Group, Inc.

24275 Elise, Los Altos Hills, California 94022 (415) 941-4558 • Telex 357437

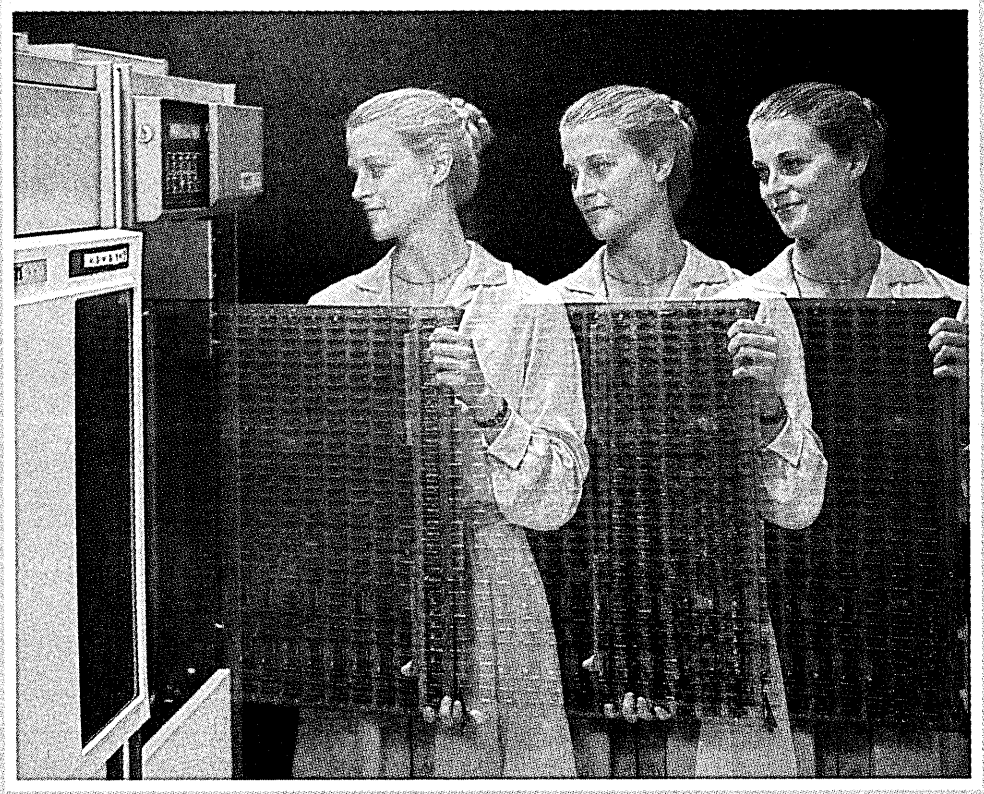
## CSG Limited (A representative of The Cambridge Systems Group)

7 Cavendish Square, London W1M 9HA, U.K. (01) 580-1222 • Telex 299512

**CIRCLE 11 ON READER CARD**

# BTI 8000 32-bit multiprocessor system

# Now you can grow by plugging in resources instead of changing computers



Finally, there's a computer system that lets you grow by plugging in resources, instead of by changing models — the BTI 8000.

The secret is Variable Resource Architecture (VRA): a flexible mix of hardware resources controlled by a single, self-regulating operating system.

Hardware resources consist of multiple processors, memories, and input-output channels operating in parallel without the complex internal networking normally associated with such arrangements. The result is mainframe performance at substantially lower costs, plus unequalled flexibility.

You can tailor the BTI 8000 to serve over 200 on-line, interactive users. Or to handle large batch loads. Or to do a lot of each.

Furthermore, you can vary processing capability over a *tenfold range* by merely adding or deleting hardware modules. Differences in configuration are invisible to user software, and no reprogramming or recompilation is required.

Key features of each BTI 8000 system include:

- From one to eight 32-bit CPUs controlled and coordinated by one shared operating system.
- Up to 16 megabytes of main memory.
- Fail soft architecture.
- Secure multi-user operations.
- Demand-paged virtual memory.
- Simultaneous use of ANS COBOL 74, ANS FORTRAN 77, PASCAL/8000, and BASIC/8000.

As for reliability and support, they're established BTI traditions, proven by over 2,500 other BTI computers operating in the U.S., Canada and Europe. For full details about the BTI 8000, contact the BTI office nearest you.

**BTI**
**COMPUTER SYSTEMS**

Corporate Offices: 870 West Maude Avenue, Sunnyvale, CA (408) 733-1122 Regional Offices: Piscataway, NJ (201) 457-0600; Palatine, IL (312) 397-9190; Dallas, TX (214) 630-2431; Sunnyvale, CA (408) 733-1122. 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 12 ON READER CARD**

# LOOK AHEAD

**MCGILL ON HOLD?**

There's speculation aplenty about Arch McGill, AT&T's vp of business marketing, who made no secret about his desire to head Baby Bell, the unborn unregulated subsidiary that was given instead to AT&T vice chairman of the board James E. Olsen. Datacom insiders say McGill's unorthodox moves in opening the Telephone's new frontier continue to needle the old Bell-shaped management which wants to send in its trusty settlers. "They want to move into the future by turning back the clock," remarks one of the cowboys; "but I think we're winning." "Winning" means putting the mother's information handling and communications processing train on a fast, unregulated, competitive track. However current odds run on McGill's chances, not to worry about Arch: his management contract has a long time to run, he had a hefty budget increase for '81, and he's had plenty of interested action from bigtime competitors. Also, industry watchers fear the implications of an AT&T without McGill: "He's been the bridge to innovative technology; his absence would slow the rate at which AT&T would move into the information systems business, and would affect its ability to offer price/function competitive products," mourns one source.

**PROMISES FROM HONEYWELL**

Honeywell will this month announce 10 new DPS 6 systems, including two 32-bit machines -- the DPS 6/96 and DPS 6/92 -- fully compatible and upgradeable from the top five 16-bit DPS systems. HIS salesmen promise 100% improvement on the horsepower of the old Level 6 at 15% more cost.

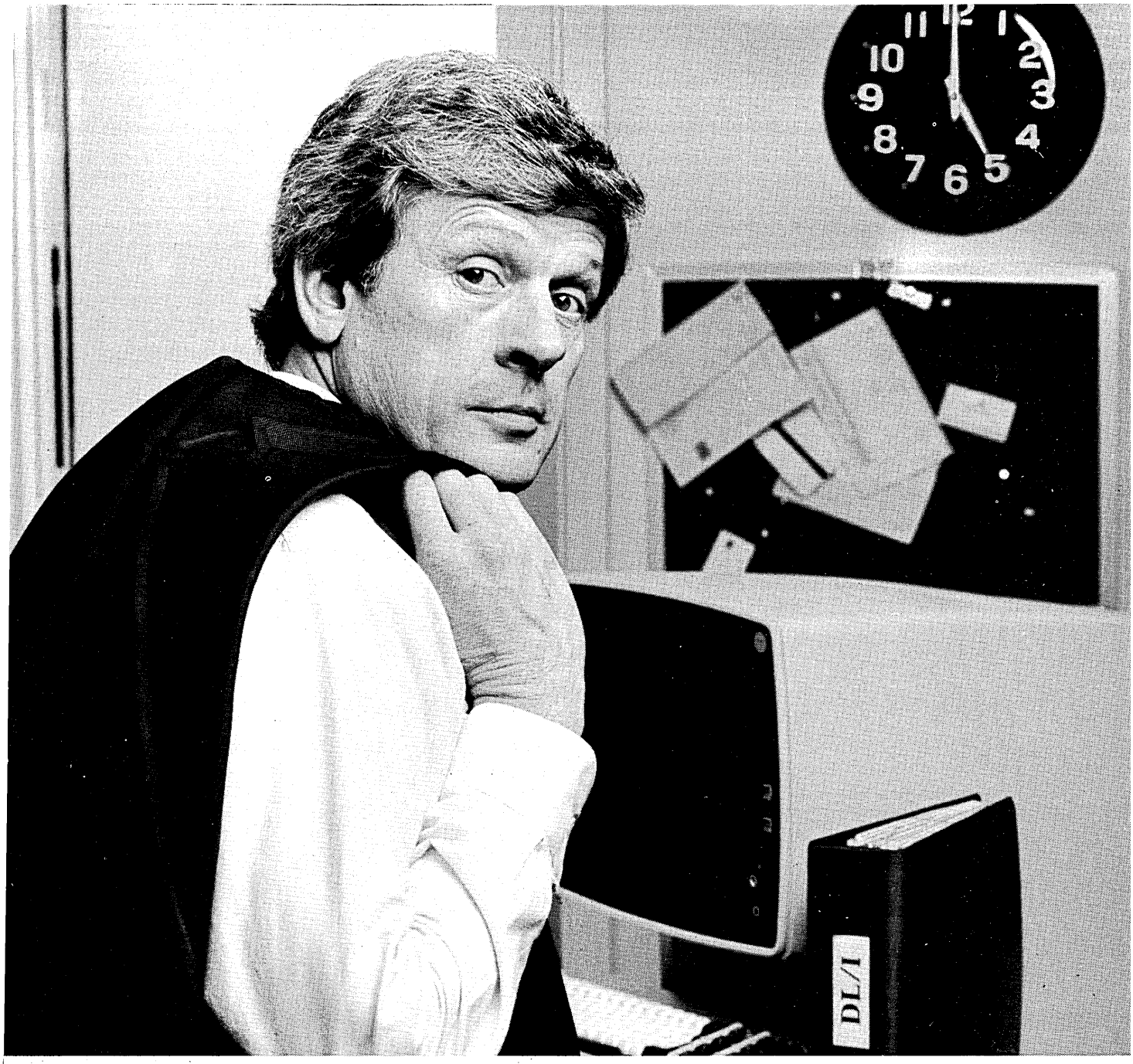
Honeywell is also backing into the office systems market with a word processing package, offered for MOD 400 and MOD 200 GCOS-6 operating systems, and a new bundled DPS 6 "administrative system" offering wp, document distribution, and file transfer.

**NEW FROM NETWORK SYSTEMS**

Network Systems Corp., which claims to have installed more local data network equipment than any other vendor, will upgrade its line soon. Up to now, the Minneapolis company has concentrated on high-volume cpu-to-cpu bulk data transfer needs of users with its Hyperchannel. But next year it will introduce the Hyperbus, which will handle terminal-to-cpu data transfers and will offer direct competition for the Xerox Ethernet. The new product will make it possible to interface "any terminal to any cpu," according to company sources. A later version may ultimately connect

# LOOK AHEAD

| | |
|---|---|
| | "any terminal to any terminal" if current development efforts are successful. The Hyperbus will have a gateway to interconnect with the Hyperchannel, perhaps through a 3270-type terminal controller which would act like a front-end to the Hyperchannel. |
| A CACHE TO THE 3880 | Rumor is that selected customers are getting an IBM RPQ to put a cache inside the 3880 disk controller. The cache buffers data going to and from the attached disks. |
| WANGWRITER VS. DISPLAYWRITER | Wang's response to IBM's Displaywriter will reportedly be delivered before IBM's shipment date. The Wangwriter, with a 12 inch diagonal crt, detachable keyboard, dual-sided double diskette minidrive, will have a 20 cps daisywheel printer in a floorstanding module. The Wangwriter is supported by the Z80 microprocessor and is priced at about $7,500. Announcement is scheduled for this month, delivery in January. |
| B&B TO CHALLENGE BGS | Boole & Babbage of Sunnyvale will soon announce a deal by which it will market PSI's Questor package for computer capacity planning, putting B&B's extensive national sales network behind what may be the first commercial challenge to BGS Systems' Best/One package.<br>BGS, of Waltham, Mass., is expected to announce a new package called Crystal, an analytical tool for speculative system development, which reportedly will allow a user to build and contrast models of planned systems that have not yet been specified beyond basic generalities. |
| CABLE BUS NET DUE OUT OF ICC | Watch for a cable bus network announcement in the next few weeks from International Computing Co., Bethesda, Md. Consisting of a coaxial cable and several bus interface units, the net will interconnect noncompatible terminals and computers. In a related effort, we hear ICC is designing a system for a major financial institution that will allow 40 card readers to communicate with Tandem and DEC computers. Data on the cards will determine routing decisions. The hosts will think they're talking to point-to-point bisync devices; the card readers will actually communicate in the 8A1 protocol. The net will do all conversions. |
| RUMORS AND RAW RANDOM DATA | Sources say IBM's H Series announcement has made it even more obvious that IBM must soon announce a replacement for its hoary front-end processor, the 3705...IBM may soon announce its support for X.25, even as it resists pressure to allow X.25 connections within the IBM family of systems. |

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**CIRCLE 14 ON READER CARD**

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# UCC Reliability Plus: At last, a way to get vendor attention to your hardware failure problems.

Because, with UCC Reliability Plus, the facts about hardware failure come through loud and clear. Every day ... and every month.

UCC Reliability Plus is the only software package that can give you the ammunition you need to improve vendor responsiveness to hardware failure. Because it tells you:

- what hardware failed.
- why it failed.
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- how often it should fail ... based on comparative monthly reports from over 500 other shops like yours.
- how often the competitive vendor's hardware fails ... based on performance in those other 500 shops.

*And it tells your hardware vendor, the same thing. Every month.*

UCC Reliability Plus gives the user and the vendor the facts about hardware reliability. So you can stop squabbling about downtime and start doing something productive about it.

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And, while you're at it, ask us about:

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# CALENDAR

## DECEMBER

### Computer Networking Symposium, December 10-11, Gaithersburg, Maryland.

The symposium highlights computer networking and covers protocol applications, distributed data bases, and local networks. Contact Harry Hayman, IEEE, P.O. Box 639, Silver Spring, MD 20901, (301) 589-3386.

## JANUARY

### Winter Conference of the Optical Character Recognition (OCR) Users Association, January 11-14, Atlanta.

"OCR—The Benefits Are Today" is the theme of this four-day conference. The conference features sessions on OCR applications in health care, remittance processing, government, retail, general data entry management, etc. Contact OCR Users Assn., 10 Banta Pl., Hackensack. NJ 07601, (201) 343-4935.

### Telecommunications/China '81, January 17-25, Peking.

The second of its kind, this exhibition is limited entirely to U.S. companies; it introduces American products in China and explains the products' uses. Contact Expoconsul, a Division of Clapp & Poliak, Inc., Princeton-Windsor Office Park, P.O. Box 277, Princeton Junction, NJ 08550, (609) 448-3200.

### P.A.T.H. Conference, January 19-22, Dallas.

The Bank Administration Institute sponsors this conference on Productivity through Automation, Technology, and Human Resources. Contact Alice M. Moore, P.O. Box 500, 303 S. Northwest Highway, Park Ridge, IL 60068, (312) 693-7300.

### HISSG Winter Seminar, January 20-23, Long Beach, California.

The theme for the Hospital Information Systems Sharing Groups seminar is "Cost Containment—The Legislative and Voluntary Aspects and Their Effect on Hospital Information Systems." Contact W.V. Rosqvist, Hospital Information Systems Sharing Group, 2415 South 2300 West, Salt Lake City, UT 84119, (801) 972-6099.

## FEBRUARY

### International Solid State Circuit Conference, February 18-20, New York City.

The ISSCC is sponsored by the IEEE and is currently running in its 28th year. Contact Lewis Winner, 201 Almeria Ave., Box 343788, Coral Gables, FL 33134, (305) 446-8193-4.

### COMPCON Spring '81, February 23-26, San Francisco.

The theme for the spring conference is VSLI and its future effects on design systems. Contact Harry Hayman, IEEE, P.O. Box 639, Silver Spring, MD 20901, (301) 589-3386.

### CSC '81, February 23-26, St. Louis.

The ACM sponsors this computer science conference. Contact John W. Hamblen, University of Missouri-Rolla, Computer Science Dept., Rolla, MO 65401, (314) 341-4491.

### NEPCON West '81, February 24-26, Anaheim.

The conference is directed toward all persons involved in the manufacture and test of printed circuits, multilayers, microelectronic circuitry, semiconductors, and other devices. Contact Industrial & Scientific Conference Management, Inc., 222 West Adams St., Chicago, IL 60606, (312) 263-4866.

## MARCH

### Fifth International Conference on Software Engineering, March 9-12, San Diego.

The ACM sponsors this one. Contact Seymour Jeffrey, Director, Center for Programming Sciences & Technology, National Bureau of Standards, Washington, DC 20234, (301) 921-3531.

### PRODUX 2000, March 11-13, New York City.

PRODUX consists of two separate shows—Business & Personal Computer Sales—Expo '81, and the 1981 New York Business Show. Contact George Pachter, PRODUX 2000, Inc., Roosevelt Blvd. & Mascher St., Philadelphia, PA 19102.

### Fourteenth Annual Simulation Symposium, March 18-20, Tampa, Florida.

Part of Simulation Week, March 16-20, the symposium is sponsored by the IEEE, ACM, SCS, and IMAC. Contact Alexander Kran, IBM, B/300-40E, East Fishkill Facility, Hopewell Junction, NY 12533, (914) 897-2121 X 7142.

### Office Automation Conference, March 23-25, Houston.

The major conference for users and designers of electronic office equipment, the OAC is produced yearly by AFIPS. Contact AFIPS, 1815 North Lynn St., Arlington, VA 22209, (703) 558-3620.

### Interface '81, March 30-April 2, Las Vegas.

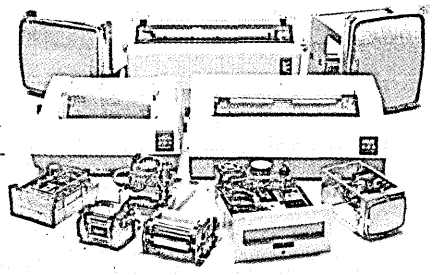
This is the second largest U.S. computer show and exposition devoted to data communications, distributed data processing, and networking. Contact The Interface Group, 160 Speen St., Framingham, MA 01701, (617) 879-4502.

A whole world. Because our parent company, C. Itoh Co., Ltd. (pronounced "C. Eetoe") is a multinational organization with resources and subsidiaries located in every corner of the globe.

As C. Itoh Electronics, Inc., we're fortunate to be part of this international network. It lets us seek out quality materials and technologies wherever they can be found. And for a company that specializes in computer peripherals for the OEM, that's just as important as price or the capability to deliver.

Today, we're offering the latest designs in dot matrix and daisy wheel printers, card readers, CRT monitors, floppy disk drives, and a lot more.

We're also seeing to it that our OEM customers get all the support they need. The engineering support to solve their system integration problems. Plus complete documentation and a service network that operates repair and refurbishment stations nationwide.

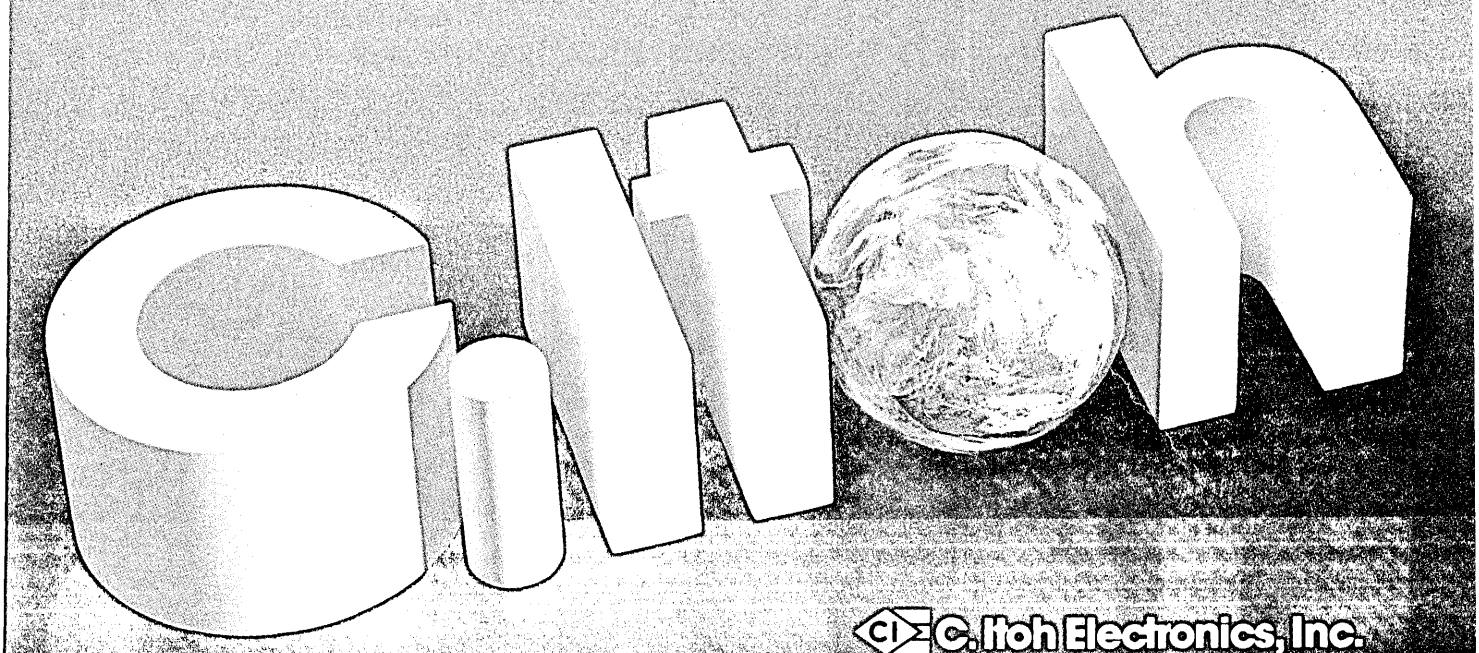


So when you deal with us, you can be sure you're doing business with people who are dedicated to the OEM. And a company whose parent organization has been around since 1858.

Our goal? To become the best OEM peripheral source in the country. Because with all our international connections, we haven't forgotten what our motto promises: One world of quality.

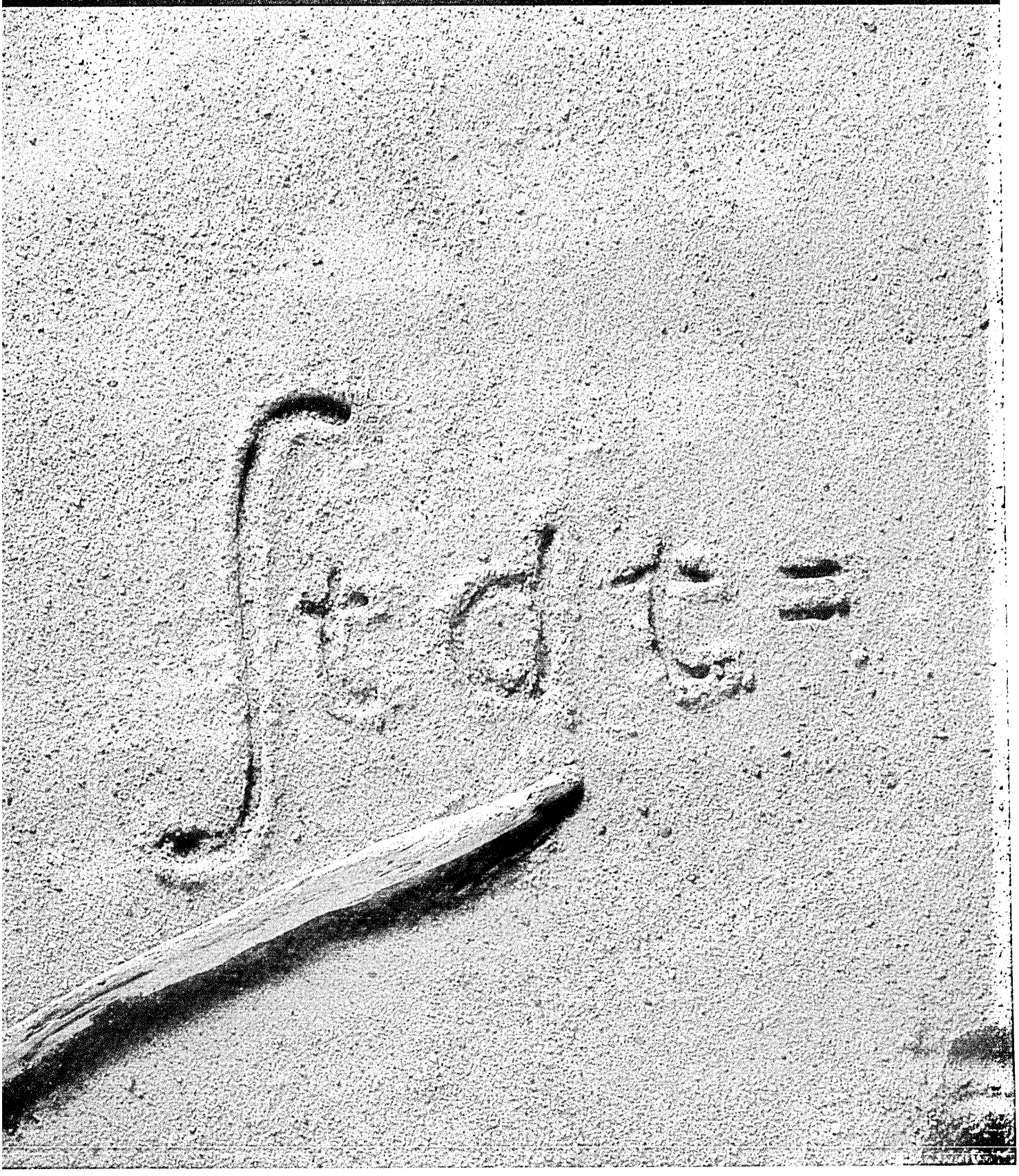
For information on our product lines for the OEM computer systems manufacturer, contact C. Itoh Electronics, Inc., 5301 Beethoven St., Los Angeles, CA 90066, Tel. (213) 390-7778; Midwestern Regional Office: 240 East Lake St., Suite 301-A, Addison, Illinois 60101, Tel. (312) 941-1310; Eastern Regional Office: 666 Third Avenue, New York, NY 10017; Tel. (212) 682-0420.

# A world of quality.




CIRCLE 25 ON READER CARD

# Integrated Communications.



# The Beginning.

Today marks the beginning of a new era in information transportation. The beginning of "Integrated Communications."

It means that, now, you can eliminate the problems that go hand in hand with increasing the communications capability of your DP network.

Or word processing network.

Or any network that involves transmitting information, even voice conversations, from one place to another.

These problems can't be solved simply by adding more lines and equipment, or just using what your computer vendor provides.

They call for a total network approach. One that addresses all the problems of integrating resources, and simplifies the task of obtaining precisely the network you need.

Integrated Communications, from Codex.

## A Sum of Capabilities

Integrated Communications is comprised of three flexible system capabilities that let you build a whole network from a carefully balanced, compatible mix of equipment. For capturing, transporting, and controlling the transfer of all types of information, from virtually any source.

The EXCHANGE system capability lets you input and receive information, offering powerful intelligent terminals and voice digitizers to handle your needs for both data and voice. COMMAND provides all the tools for complete network management and centralized control. And TRANSPORT ensures the reliable transmission of information, wherever you want it to go.

Although these all tie together to create a total communications network, you can start with just one piece of equipment.

And you can plug it right into your existing network, with any CPU, and grow from there. Codex has already addressed the problems of integration and compatibility, so that you don't have to.

## A Total Network Solution

Now, with Integrated Communications, you can deal with one company to tailor the network that's just right for your operation. So that all the pieces you select not only work well together, they complement each other. For greater economy, improved efficiency, easier operation.

And, of course, the single company is Codex. Which, if the name doesn't already say it all, means that you're getting the best possible equipment, the best possible service and support. In more than 40 countries worldwide.

## Extending Beyond the Computer

Integrated Communications. It's the result of merging all the elements of communications—plus the capacity for simultaneous voice and data transmission—in a way that lets you make the most of your resources. Eliminating the last minute surprises that compromise your network, as well as your ability to manage it.

And it's backed by the same custom network design and systems engineering assistance, installation, maintenance, and full training that people have come to expect from Codex, a world leader in communications technology.

It all adds up to the total network solution that, beginning today, should be a part of your future.

Write or call for more information.

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CIRCLE 26 ON READER CARD

# Meet the first family of compatible computers.

The Prime 50 Series is the first family of 32-bit computers to feature total compatibility. It's a unique feature. And if you intend to grow, you won't want to be without it.

**No growing pains.** Compatibility is a word we don't use loosely. It applies across the line to every computer system we make.

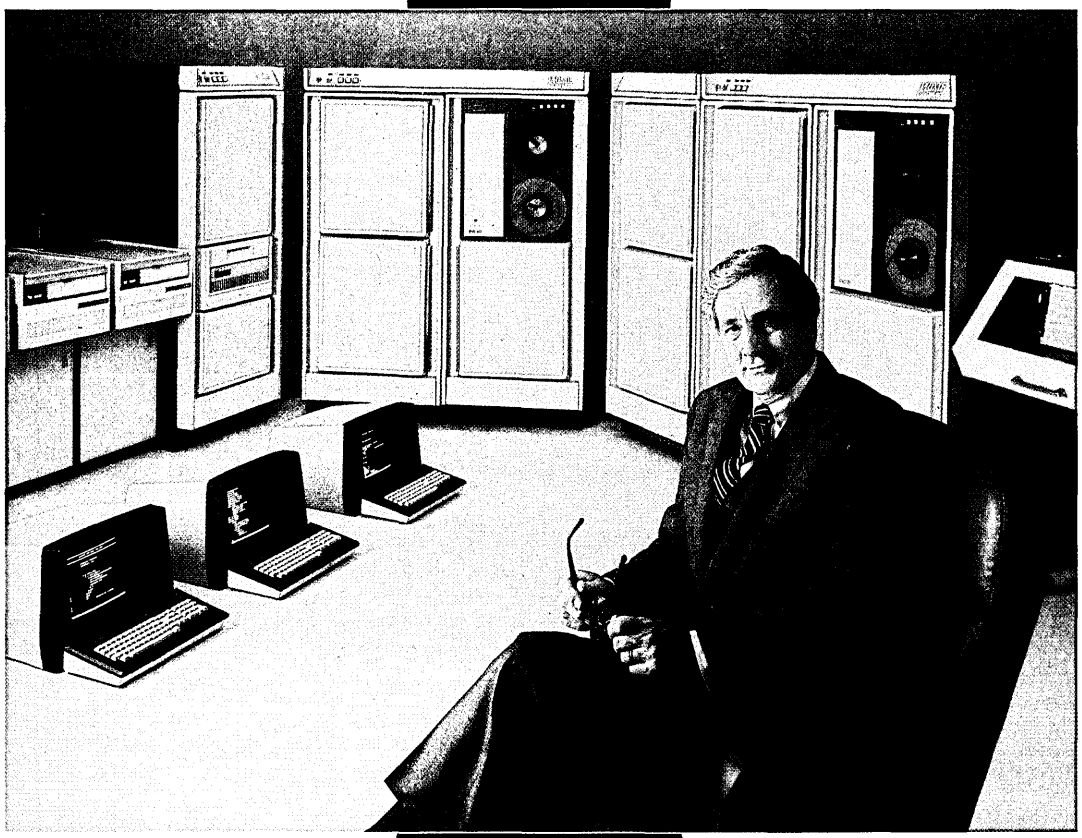
In fact, all Prime computers use the same operating system, the same file structure, and the same communication system. So no matter what level system you start with, you can easily and economically expand capacity by upgrading your current system or adding another member of the family.

**First and foremost.** Prime means first. And we've had a lot of them. We were first with a family of compatible 32-bit computers. First to put mainframe capabilities – like large on-line disk storage and DBMS – on a mini. First with a single operating system and a common file structure across an entire product line. First with virtual memory on a mini. And first to open an X.25 transatlantic communications link.

At Prime, being first has become a habit.

**Meet the family.** In a time when the relationship between price and performance has become vitally important, you should make it a point to meet our family. In the U.S., write Prime Park, MS 15-60, Natick, Massachusetts 01760. In Europe, write Prime Europe, 6 Lampton Road, Hounslow, Middlesex, TW3 1JL, England, Tel: 01-570-8555.

**PRIME**
**Computer**



**CIRCLE 27 ON READER CARD**

# LETTERS

## MISSING MODULES

Re: Manufacturing Survey (Oct., p. 101), in the listing, you did not identify which financial modules are integrated with each system, or even if there are some. Admittedly, it can be argued that an integrated general ledger is not part of a manufacturing system, and therefore, it is not pertinent in defining it. However, in real life, the prospective user of such a manufacturing package in the small- and medium-sized company typically demands this capability.

The manufacturing managers of this prospective user are likely to be more highly trained in the "big picture," more urgent about the financial impact of every decision, more comfortable with operating system statements, and obliged to keep one eye on these reports at all times.

It follows that these critical documents must relate with actual plant operation. Labor distribution must relate to payroll. Job costing has to draw from accounts payable. Inventory reevaluation has to integrate with general ledger—now—not just to be posted at the end of the year.

Actually, a large portion of the data in every one of the functions must feed directly and immediately from manufacturing operations if the results are to be judged valid and of current use to line management.

On the broader scale, I strongly applaud the contributions DATAMATION makes to the dp industry as a whole, and specifically to the many of us involved in manufacturing.

E.R. FARRELL
Manager, National Marketing
Anacomp
Escom Division
Bellevue, Washington

*We agree with your point. In this particular survey, the struggle to include financial modules in the manufacturing package listings was lost on the battlefield of variable definitions and limited space—Ed.*

## CHIP CHANGE

Re: "Only a Circuit Card Away" (News in Perspective, Sept., p. 96), I would like to add that the Burroughs computer which was field-upgraded by changing one circuit card was probably a B2500 which was upgraded to a B3500. The change would have involved removing a part (the frequency division chip) on the clock card to allow the processor to run twice as fast, thereby giving the customer the distinction of paying more for less hardware. Ah, but if only all upgrades could be as easy.

HARVEY SCHOENMAN
Ass't Vice President
Technical Support
Financial Accounting Services, Inc.
Pittsburgh, Pennsylvania

## CAVEAT SPORTO

Re: "Computer Crime" (News in Perspective, Sept., p. 82), Jack Bologna missed what may be the primary reason many individuals are motivated to try their hands at computer theft; i.e., to simply see if it can be done. The technical challenge to beat the system at its own game is a perfectly acceptable exercise in many educational and industrial environments. What starts out as a game ends up as a crime—player beware!

JIM SAMUELSON
Manager, Customer Relations
Data General Corp.
El Segundo, California

## DIVORCE & DP

Re: "Marriage: DP Style" (Sept., p. 184), I have been separated for nearly two years after being married for 19 years and being in data processing for 18 years. I agree with John Van Zwieten's conclusion, "People first need to be aware of stress and how they react to it. . . ."

The most happy and productive period of my life has been the last six months. During this time, I have concentrated exclusively on the physical, emotional, social, and spiritual aspects of life. . . . I am now ready to again go into the business world as a dp consultant.

ELLIOTT B. LERNER
Efficient Business Systems
Palo Alto, California

I am a female dper in a stressful, busy, often hectic work environment, but my philosophy is as follows: My *life* is more than my *work*; my *work* is more than my *job*.

It's foolproof! If people do not follow the philosophy and are instead either workaholics or money hungry, then they undoubtedly deserve what they get . . . but it's too bad (as always) for the kids.

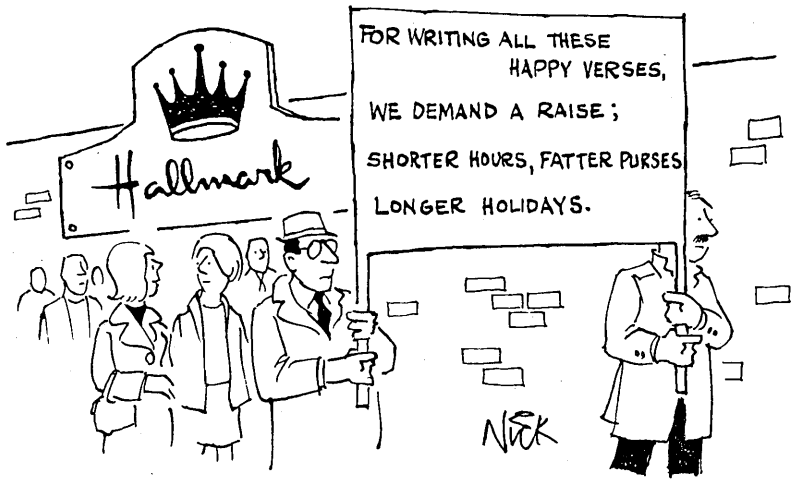
MARIANNE HAYWARD
Arlington, Virginia

## ANOTHER UTOPIA

Re: In Focus, "Toffler Talks of Tomorrow" (Sept., p. 36), it is disappointing to have Toffler talk of tomorrow while he clings to the past. What is there about gainful employment that makes it a *sine qua non* to him and his "electronic cottage," or in more traditional workplaces?

Unlike Toffler, I prefer that we organize so that the necessary work gets done, the resulting pie divided up using a mechanism different from the one now prevalent. For example:

1. Suppose there are 100 million




CARTOON BY NICK HOBART

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workers. Let each be capable of one unit of production per year. Let all of them be employed. Then, total production is 100 million units per year.

2. Of the 100 million workers, let 4% be unemployed. Each of the employed is capable of 1.1 units of production per year. Then, total production is 105.6 million units per year.

3. Of the 100 million workers, half are unemployed. Each of the employed is capable of 20 units of production per year. Then, total production is 1,000 million units per year.

I prefer the third scenario, believing it possible and desirable to devise an acceptable means of determining who will work, and for how long; when the work will be done; and how the resulting products and services will be apportioned and distributed.

ROBERT M. GORDON
Irvine, California

## THE BRASS RAIL

Re: Look Ahead (Sept., p. 14), the story on GTE said "the brass at GTE" had told GTE Communications Network Systems to "shape up" by October. No such edict has been issued.

A second statement claimed that our Communications Network Systems unit "lost $25 million in its last quarter." This, too, is incorrect. The CNS loss for the second quarter, as reported by GTE on July 17, was $5.9 million.

GTE has made a strong commitment to the market for data transmission and private communications systems and services. The second-quarter loss reported by CNS reflects the continuing acceleration of marketing and product-development expenditures required to assure GTE of major participation in this market.

ALFRED C. VIEBRANZ
Senior Vice President
Corporate Communications
General Telephone & Electronics
Stamford, Connecticut

*We regret the error in reporting the quarterly loss. As for the rest of the Look Ahead item, we stand by our story.—Ed.*

## HARDCORE HUMOR

Re: "Hardcore Hardware" (Forum, Sept., p. 266), I would certainly appreciate more comic relief of this excellent caliber. In a recent pilgrimage back to England, I was struck by the popularity of *The Hitchhiker's Guide to the Galaxy*. I find a certain similarity between the vein of humor of this book and that of Mr. Kogut, and therefore conclude that Kogut shares Douglas Adams' view of the world . . .

A. POJUNER
New York, New York

## ERAT LEAVES THE SHIP

Re: Crossword (Sept., p. 262), item One Down contains a not-too-successful, I'm afraid, venture into the Greek grammar.

The third person singular form of the Greek verb "ero," meaning "to fall in love," is "era" and not "erat" as indicated, unless you are referring to the Latin verb "erro," meaning to "to err," whose respective form is indeed "errat," with a double "r," however.

OTTO LAMBROPOULOS
Systems Service Manager
NCR
Athens, Greece

*Mr.Burke replies: The Latin verb was indeed intended, and we cleverly managed "erro" by spelling it wrong.*

## CORRECTION

Re: "Programming Personals" (Letters, Sept., p. 28), thanks for publishing part of my letter, but that gratuitous "from" (paragraph two, line three) unfortunately reversed the point I was trying to make.

RICHARD C. VANDERBURGH
Dayton, Ohio

*We apologize for the totally unintentional typing error—Ed.*


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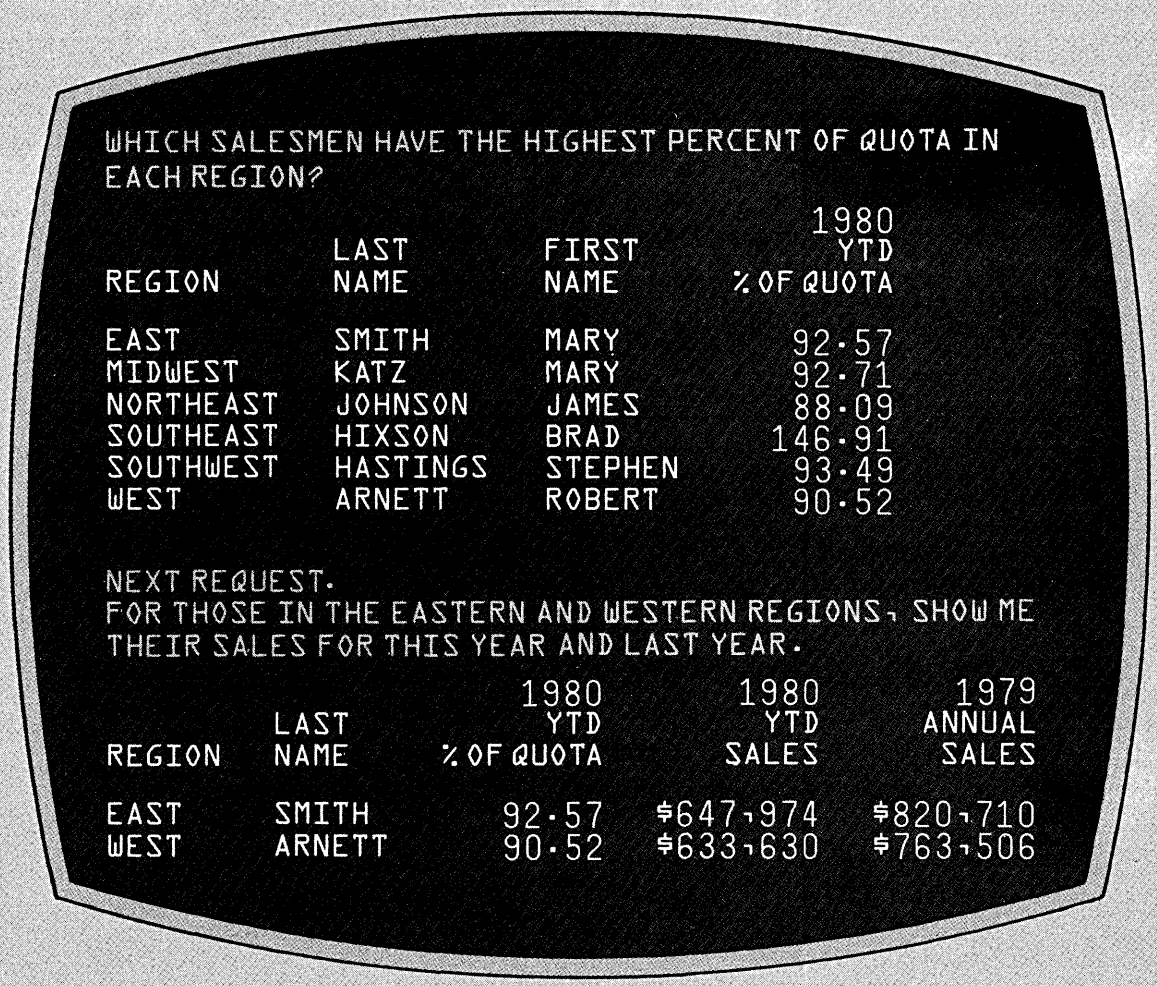


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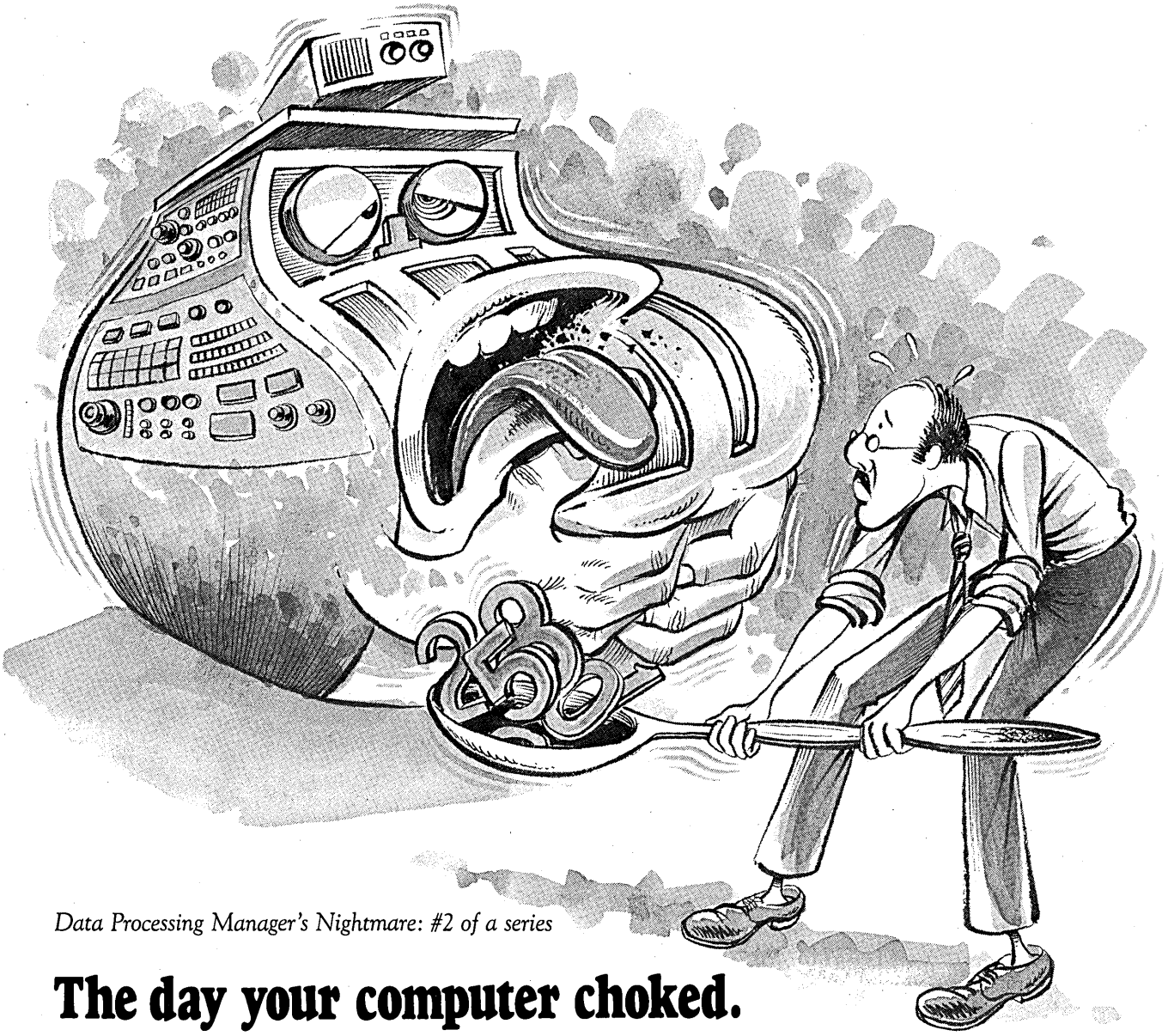

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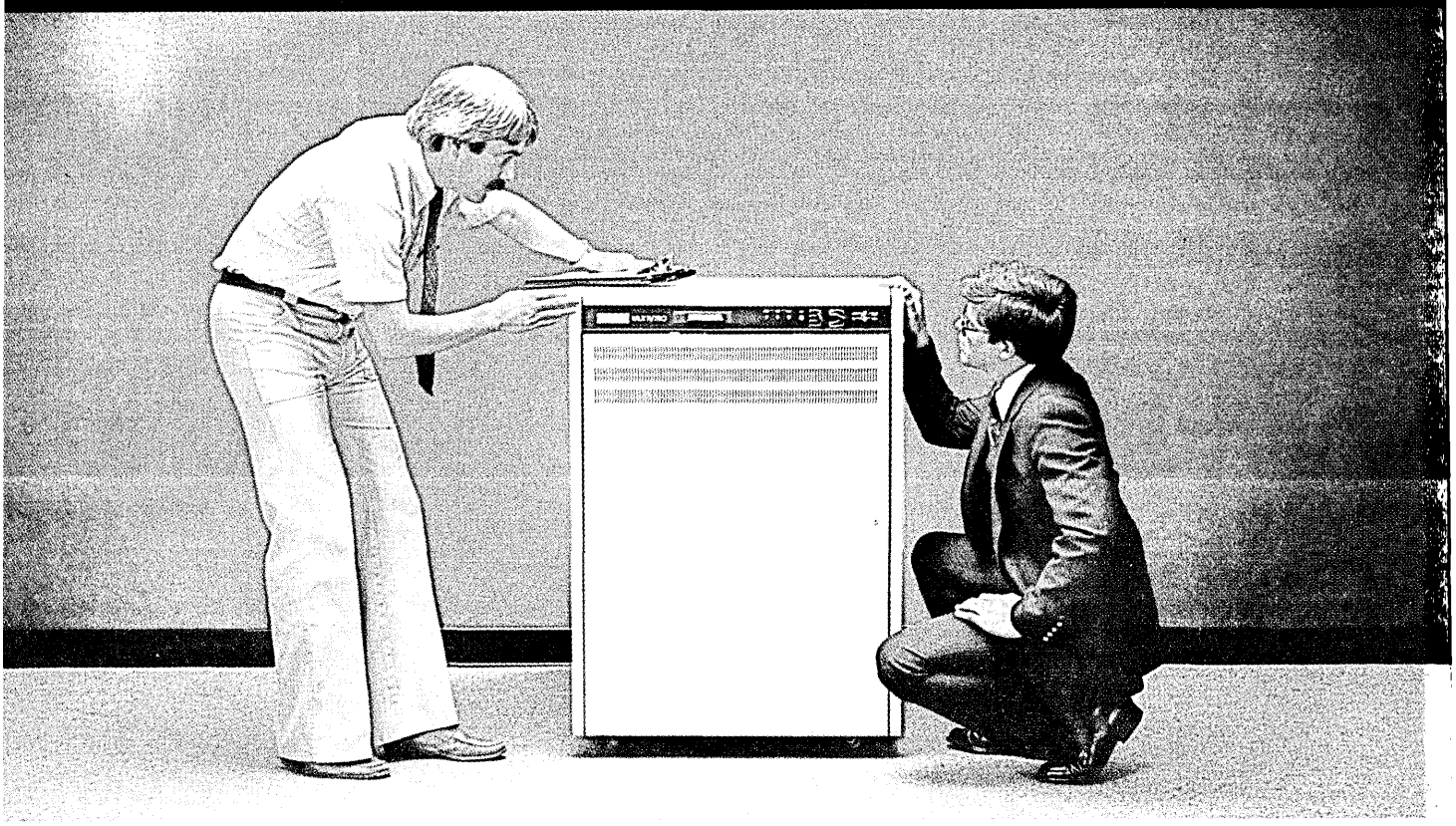

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The VAX-11/750, from Digital Equipment Corporation, is so much computer for so little money, it will literally change the way you think about computers.

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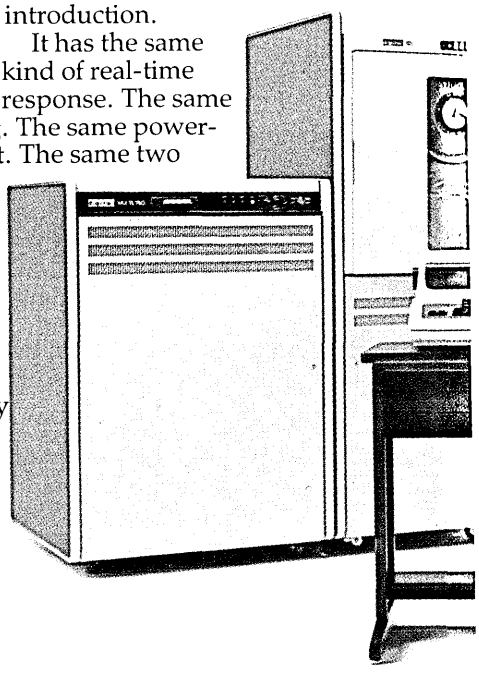
Despite its size and price, the VAX-11/750 is *totally* software compatible with the larger, faster VAX-11/780 — the computer that has been setting performance standards ever since its introduction.

It has the same kind of real-time response. The same 32-bit addressing. The same powerful instruction set. The same two billion bytes of user program space.



And the VAX-11/750 runs the same VAX/VMS™ Performance Software, already proven in thousands of VAX-11/780 applications.

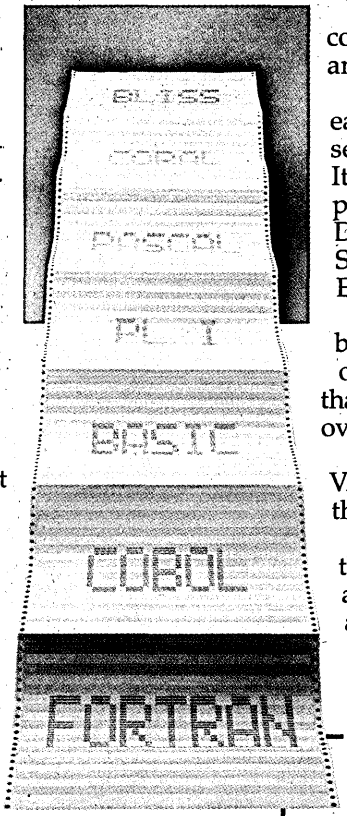
You get an

# VAX-11/750.

optimizing FORTRAN that is a full ANSI 77 implementation. A high-speed COBOL based on current and anticipated ANSI standards. A PL/I in the same performance class as VAX FORTRAN. Plus highly interactive BASIC, PASCAL, CORAL and BLISS.

Because the VAX-11/750 offers total family compatibility with the VAX-11/780, you can run all your application programs on either system. Using the same data management facilities that include sequential, random and multikey ISAM. FMS for screen formatting. DATATRIEVE for query and report writing.

And to make system performance complete, Digital is introducing its own RM80 Winchester disks, the latest in mass storage technology.



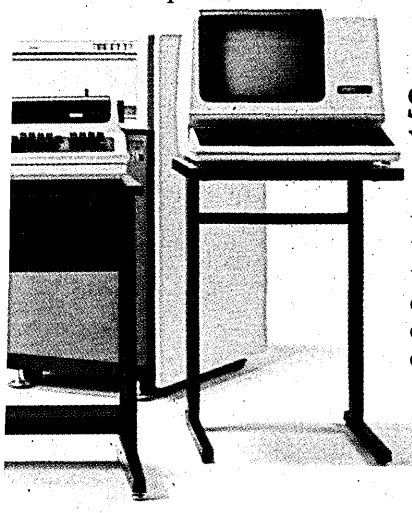

## Distributed VAX power.

The VAX-11/750, combined with Digital's commitment to network leadership, adds a new dimension to distributed processing.

You can use the VAX-11/780 for centralized program development, and then run your applications on strategically located 11/750s.

You can link VAX computers together using DECnet™ networking software.

You can even build one comprehensive, corporate-wide network that includes PDP-11s, VAXes, Digital's large DECSYSTEMs, and your own corporate mainframe.



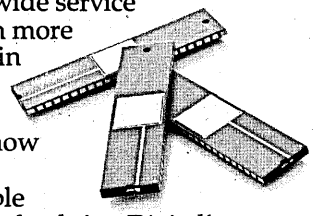
All working together and sharing resources.

## State-of-the-art VAX reliability.

The VAX-11/750 is the industry's first 32-bit "minicomputer" designed with custom LSI gate array circuits. This advanced circuitry means fewer components, lower power consumption, easier maintenance, and higher overall reliability.

In fact, the VAX-11/750 is one of the easiest computers to maintain and service that has ever been developed. It can even be diagnosed over telephone lines from Digital's Remote Diagnostic Center in Colorado Springs and from two centers in Europe.

And VAX computers are supported by Digital's worldwide service organization, with more than 14,000 people in over 400 offices.



Imagine. The VAX computer is now the VAX family.

Now more people than ever can afford to bring Digital's architecture of the 80's into their applications.

The VAX-11/750.

It will change the way you think about computers.

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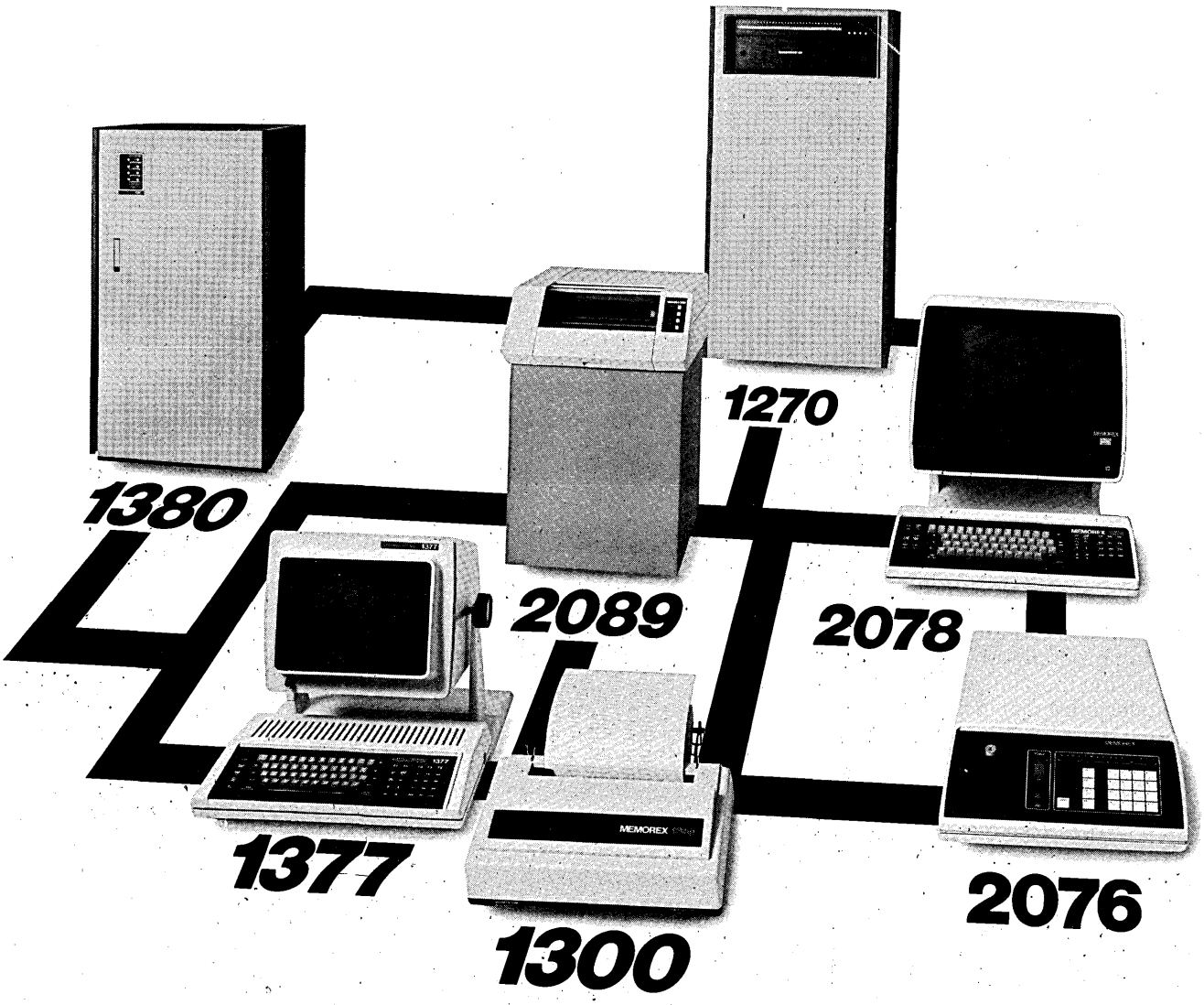


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And remember: when Memorex raises a product family, we combine our years of experience with expertise targeted on the technology of tomorrow. To find out all of the specifics on each member of the Memorex family, call Laurie McNeil at (408) 996-9000. Or write: Memorex Communications, 18922 Forge Drive, Cupertino, CA 95014.

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**CIRCLE 30 ON READER CARD**

John L. Kirkley, Editor

# EDITOR'S READOUT

## A GOLDEN AGE

"A golden age for packaged software."

That's how Ted Withington characterizes the years ahead for the independent software products industry in his overview article on page 131.

Withington, one of the most knowledgeable and objective analysts of the industry, is not given to wild enthusiasms or overblown rhetoric. In his article he notes a 44% increase in the annual growth rate of the software and services companies from 1977 to 1979 and predicts, "Much more growth is likely. The users are ready for it, and the vendors are ready for it."

For further corroboration that packaged software's halcyon days are here, turn to Larry Welke's article on page 127. Welke, who founded International Computer Programs, Inc., back in 1966, has played a significant role in helping the industry grow. The independent software products industry grossed $25 million a year; this year, Welke predicts, it will record sales of nearly $1.4 billion.

Withington's allusion to gold is appropriate; more than a few millionaires have been nurtured in this fertile ground.

DATAMATION has been tracking this sector from its embryonic stages to what we could now characterize as its lusty adolescence. Five years ago, as its growth began to accelerate, we published our first annual survey of software packages.

In that survey, author Daniel J. Tanner of Datapro comments, "For a while software vendors seemed to be dying off as quickly as new ones were born to replace them. A potential buyer of software had to wonder whether the vendor would even be around to support the product. Technical support and documentation were often sketchy and in some cases nonexistent . . . But those days are gone." The package industry was beginning to take off.

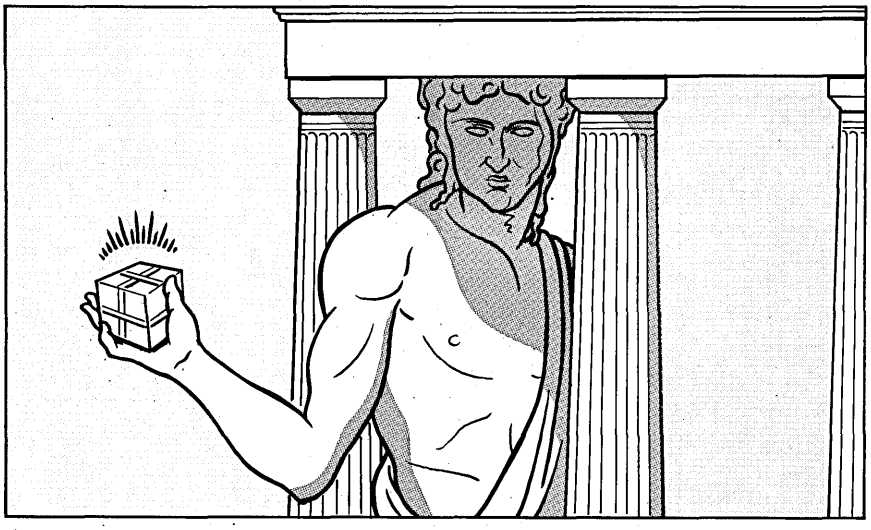


ILLUSTRATION BY RON LIEBERMAN

And as the industry has grown, the DATAMATION software survey has also grown and changed. Like all extensive surveys, it has had its share of problems: the very number of new product offerings has made it impossible for the survey to be all-inclusive. It also became apparent that our sampling techniques needed sharpening.

This year we are fortunate to have worked with a new research firm, Data Decisions, in the preparation of our sixth annual survey. Several improvements over past surveys have been included in this year's effort. First, a more rigorous statistical approach was used to obtain a representative survey sample. This, combined with follow-up interviews, yielded a total of 2,373 questionnaires from 2,164 sites, a net response of 47%. A 10-point rating scale allowed the users to be more precise in their responses to the characteristics of each package.

Another plus is that only related software packages are compared; it doesn't make too much sense to put a data base management package head-to-head with a general ledger offering. The user ratings are presented in bar chart form for easy visual interpretation.

Not that this year's survey is perfect, but we feel that Data Decisions' approach is a significant improvement in methodology and validity.

Because we recognize the growing importance of software packages, and of the software and services industry in general, you'll continue to see increased coverage of this sector in future issues of DATAMATION.

After all, there's nothing like being smack dab in the middle of a golden age. We must just remember, as Withington so soberly points out, ". . . no golden age lasts forever."

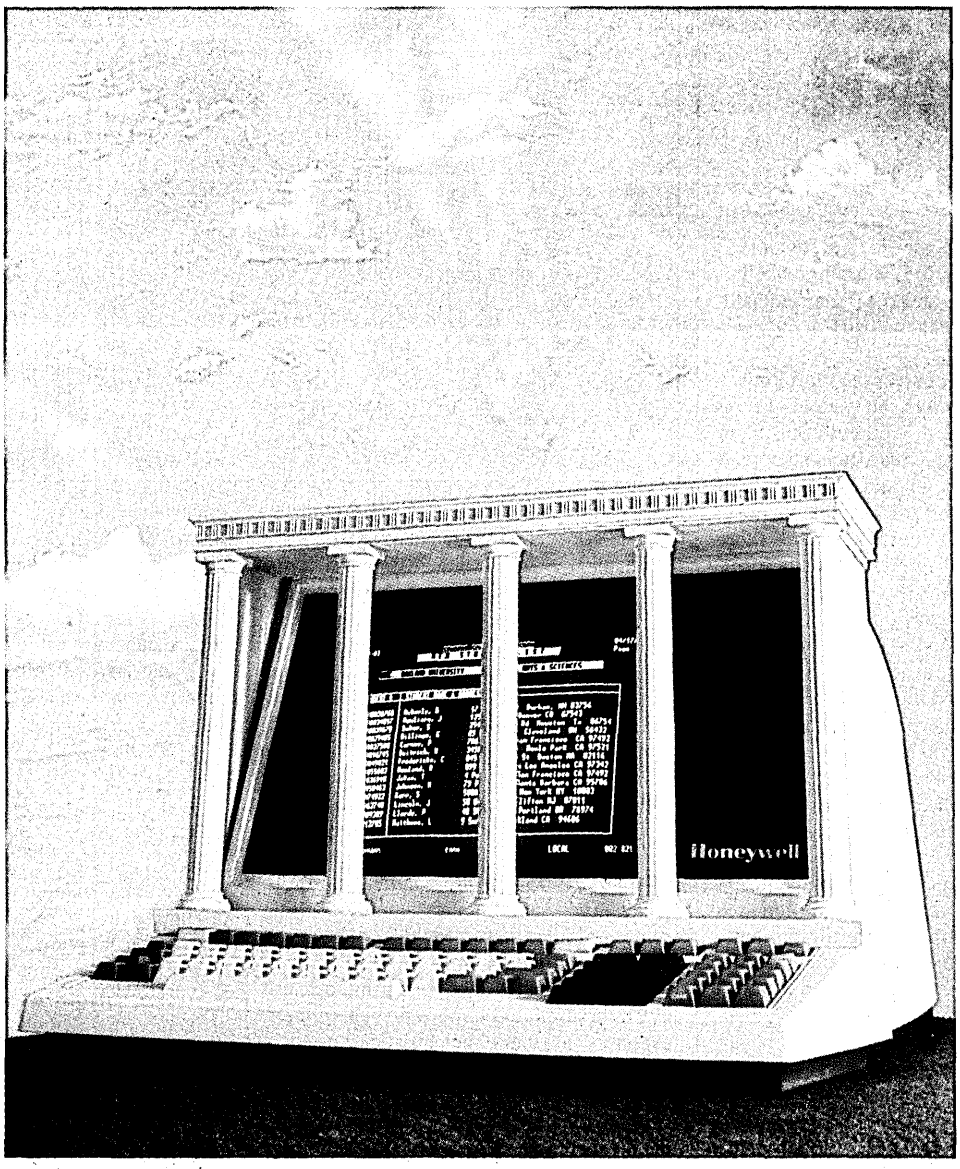
## THE JAPANESE CHALLENGE

NCR's outspoken chairman, William S. Anderson, gave an address, as part of the ITT Key Issues lecture series at the University of Notre Dame, that we think is worth taking the time to read, whether or not you agree with his views. Here are a few excerpts to give you the flavor:

- *No other country has yet devised so many disincentives to innovation and productivity in such a short period of time.*
- *So far as R&D is concerned, we are like the farmer who every year sets aside a smaller amount of seed corn for the next year's crop and then wonders why his production is falling off.*
- *The dilemma facing America today transcends the issue of meeting the Japanese economic challenge—important as that issue is. The Japanese challenge is but the tip of the iceberg.*

Copies of Anderson's address are available from NCR, Corporate Communications, 1700 S. Patterson Blvd., Dayton, OH 45479. ✻

# COMPUTER CUM LAUDE.



# At Oakland University, our Level 68/DPS is used for everything but French Club breakfasts.

Michigan's Oakland University wanted its computer system to be open to everyone – particularly students.

So they installed our Level 68/DPS.

Equipped with a powerful Multics operating system, the computer is available to students 16 hours a day.

And not just computer students.

A large percentage of *all* Oakland students use the system in their course work.

Processing power can be tapped right in the classroom. Or through more than 70 terminals scattered across campus.

The system is easy to use. And its applications are many. Students and faculty use it to aid in research and simulation. To prepare theses. And to organize information.

Because the Level 68/DPS is an interactive system, administrators and secretaries can also benefit by it.

Naturally, with so many people using the computer, security is essential.

But thanks to extensive safeguards built into the Multics operating system, security can be maintained without lessening the computer's availability.

All in all, Oakland's Level 68/DPS is working out very well.

Most Oakland students will graduate with the ability to use a computer. A necessary skill in our increasingly technological society.

There's a lesson here.

What could be more appropriate for *any* university than distributed computer power that's easily accessible and easy to use?

For more information on the Level 68/DPS and the Multics operating system, write Honeywell, 200 Smith Street (MS 487) Waltham, Massachusetts 02154.

**Honeywell**

CIRCLE 35 ON READER CARD

IN FOCUS

# MAN MEETS MACHINE

Face it. Everywhere you turn today, there's a computer lurking. It may not say IBM or DEC on the skin, but scratch just about anything, from your microwave oven to the fuel system in your new car, and you'll almost certainly find digital logic. This year, you may even find some of these electronic entertainments under your Christmas tree. You just can't hide.

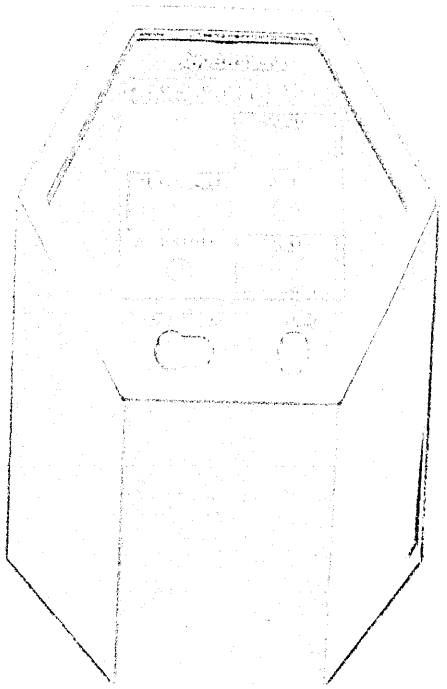
The Electronic Decision Maker ($24.95) from Epoch Playthings answers those bothersome yes-or-no questions, both at work and at home. "Will the modifications to the payroll system be on time?" Ask the Decision Maker. "Can I borrow the car Friday night?" Consult the computer.

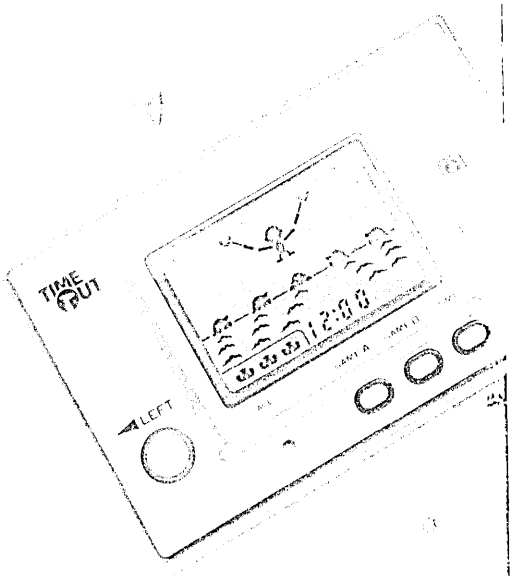
For questions involving money, career, love, travel, friends, family, spirit, or creativity, the Mattel Electronics Horoscope Computer ($75) brings you its interpretation of the stars. In addition to making predictions for a given day, the Horoscope Computer forecasts the compatibility between two people.

Already beaten all your poker-playing friends out of their Christmas bonuses? Keep in practice with Entex Electronic Poker ($62.95), a handheld game of five-card draw. Bet, draw, fold—as your cards dictate—and the machine will keep track of your winnings (or losses).

With Tomy's Blip ($18.95) you can play against a friend or the machine. Press the "serve" button to let loose with the ball (an LED), your opponent must act fast to return the ball to your side of the court.

The Electronic Exterminator ($59.95) from Mego puts you in the position of fending off sharks. You won't find an on/off switch on this one. When you tire of being shark bait, the Exterminator keeps things lively by automatically taking the little man's side as he battles off sharks on the LCD display.





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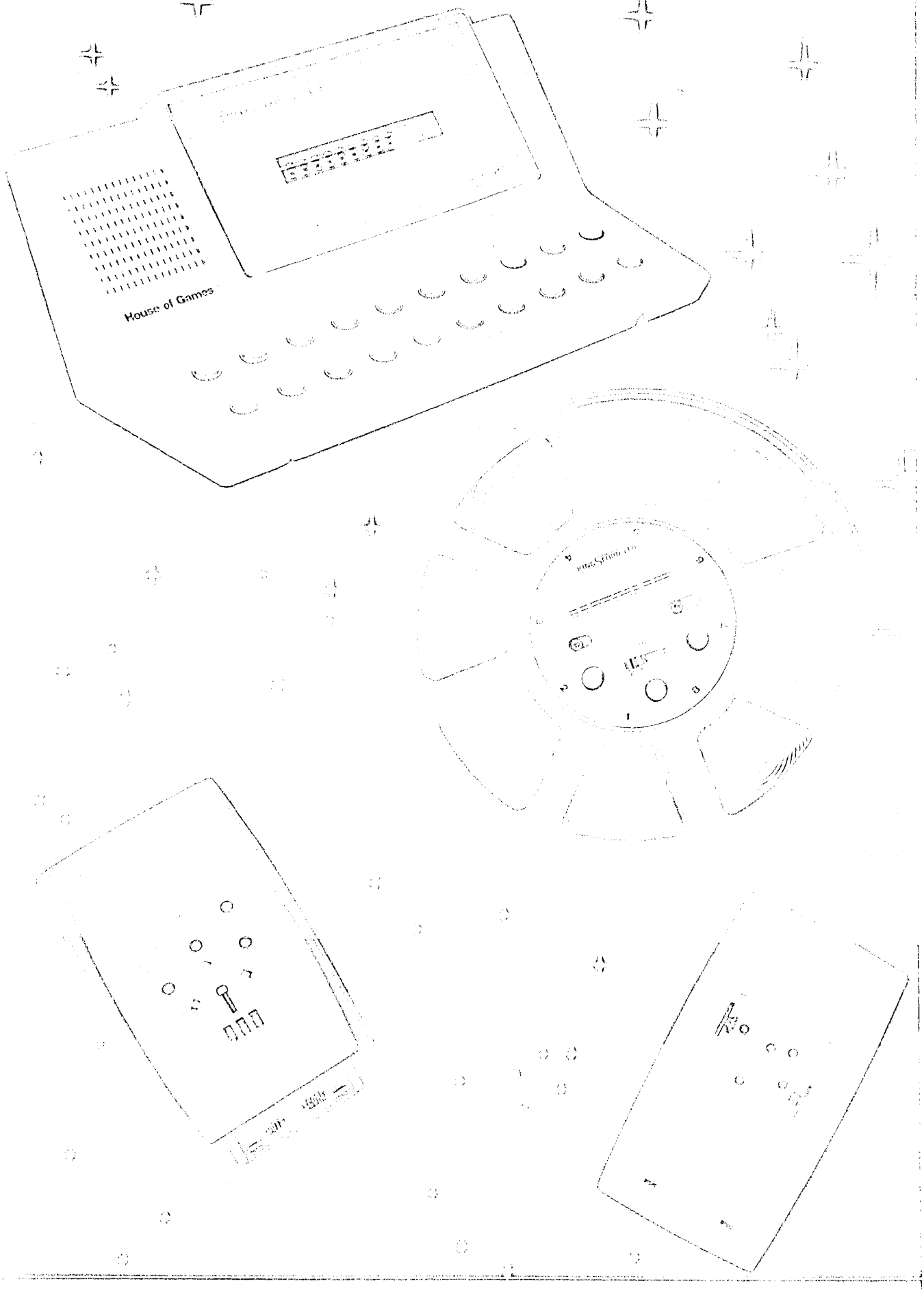
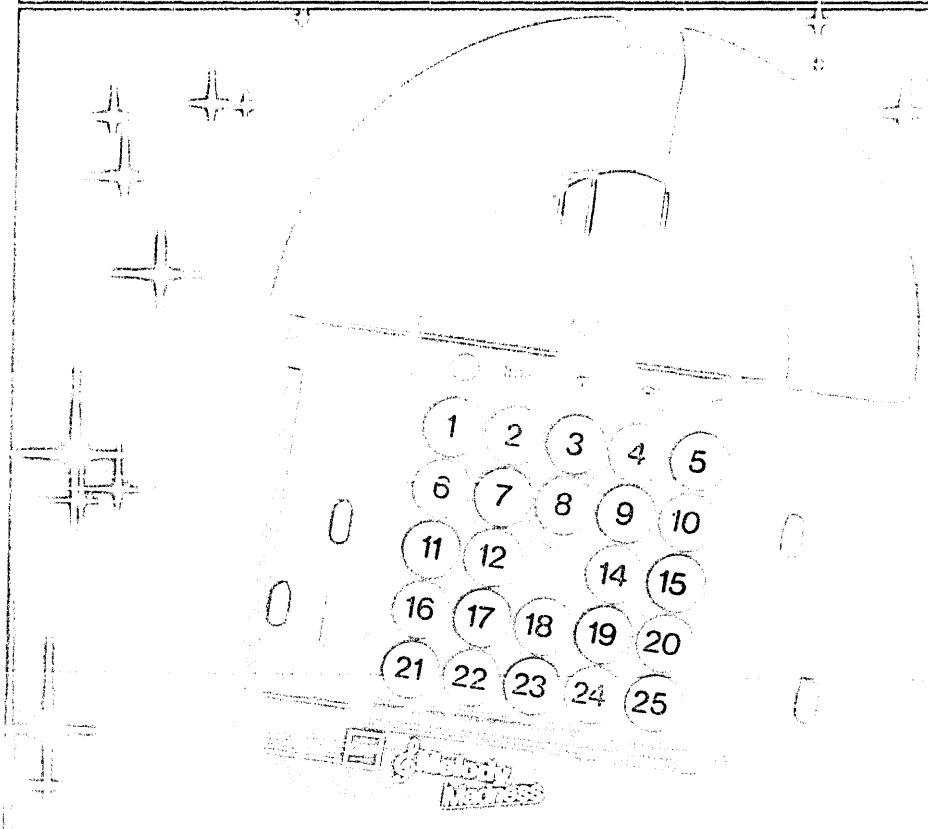
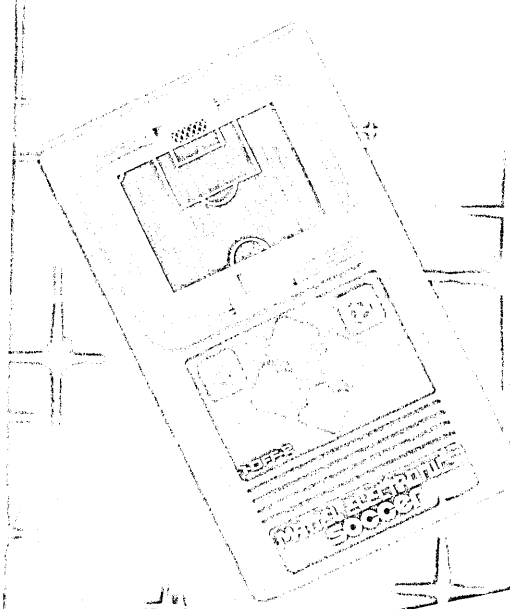
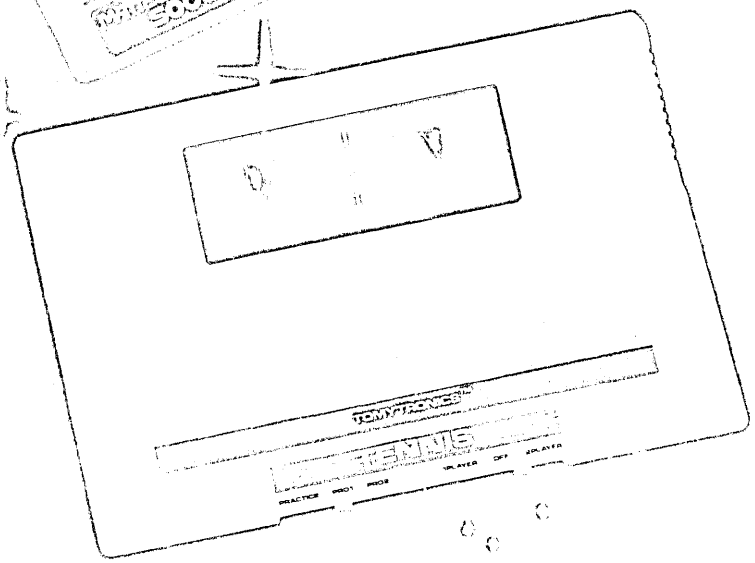

House of Games




House of Games Electronic Game Machine 2 ($69.95) plays five games —Shooting Gallery, Black Jack, Grand Prix, Code Hunter and Sub Hunt. Each game includes its own set of electronic sound effects.

Melody Madness ($45) is both a game and a musical instrument. Match the machine's melody and it plays its winner's tune and lights its lights; make a mistake or take too long and the machine will razz you. It's made by CAF Viewmaster Electronic Products.

Mattel Electronics Soccer lets you battle your way downfield against computer opponents determined to stop your goal. The pocket-sized game has a game clock, digital scoring and sound effects including an official's whistle and a victory sound played after goals.

Tomytronic Electronic Tennis ($59.95) can be played by one or two players at user-selected skill levels. Scoring follows tennis conventions; faults and double faults occur randomly on the serve.

Bandai Electronics offers both Football and Baseball in pocket-sized packages. Make a home run or strike out, complete a bomb or get sacked. Either of the $12.95 games can be played by one or two.

Match Me ($49.95) challenges you to repeat the ever-lengthening random signals. From one to eight players can be mesmerized by Match Me's lights, sounds and music. From Kingsford Ltd.

*Special thanks to one of the most famous stores in the world, F.A.O. Schwarz, purveyors of toys since 1862, for the loan of the dozen toys shown here.*

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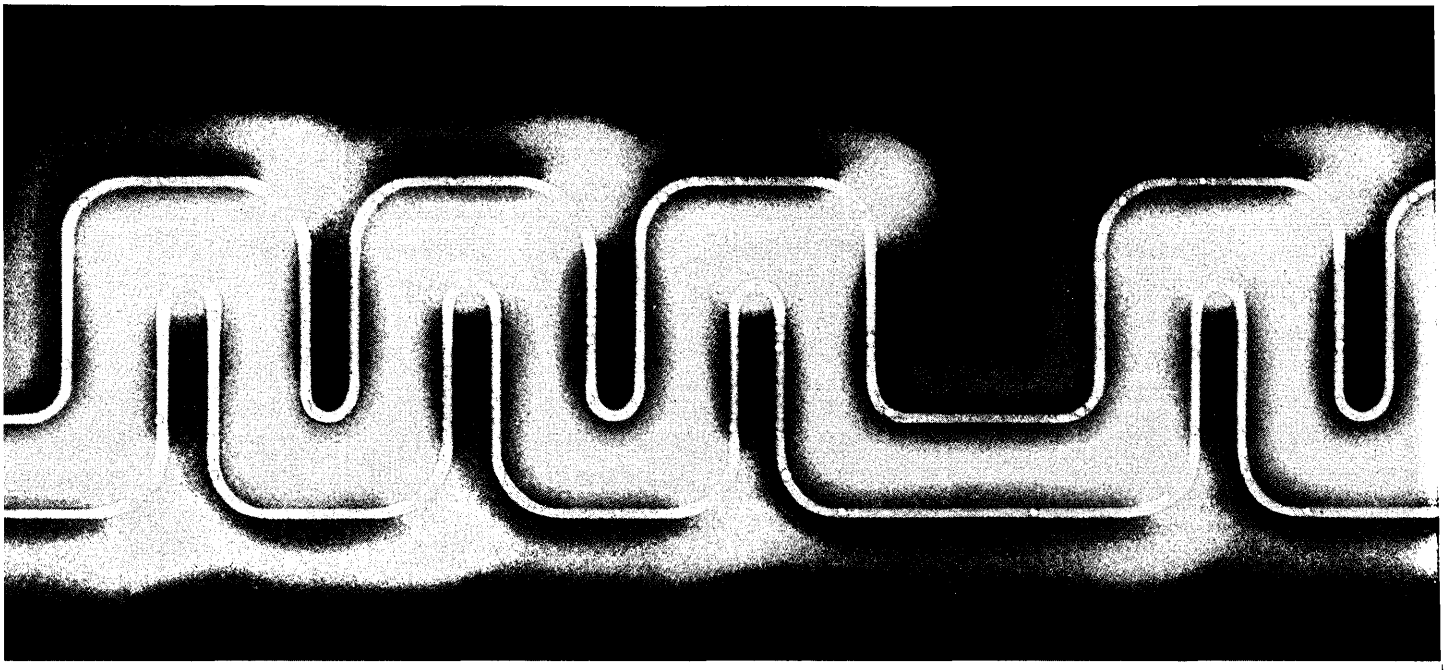
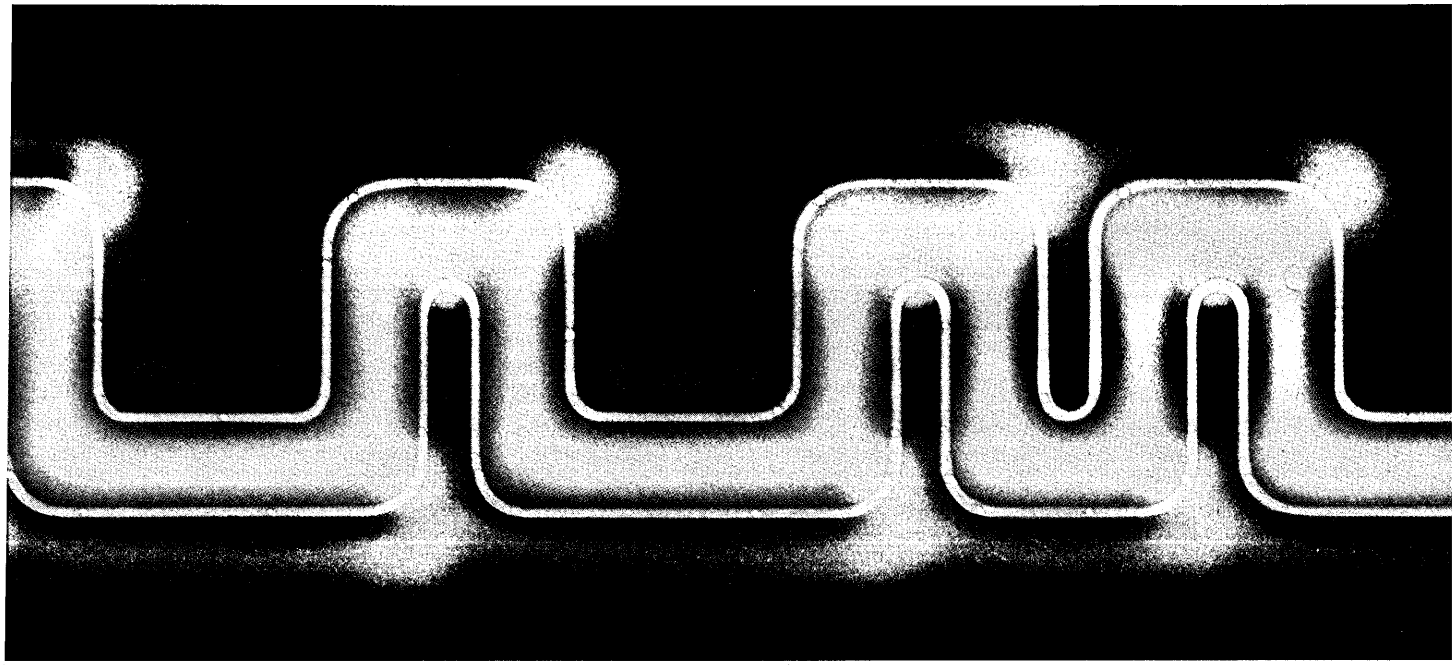
If you want to buy something for yourself—anything from an electronic chess game to a personal computer—you have many options. Perhaps the best way to see what's available is to make the rounds of calculator boutiques, specialty electronics shops and personal computer dealers. It would take us more than these four pages to scratch the surface of just the personal computer market. Our suggestion: pay visits to several stores to cover as many products as possible. Remember, it isn't the hardware that counts, but rather the available software. As Portia Isaacson once said, "After determining the software available for a given personal computer, the next most important consideration is the color of the cabinet."

—Bill Musgrave



# Information management's expanding vistas.



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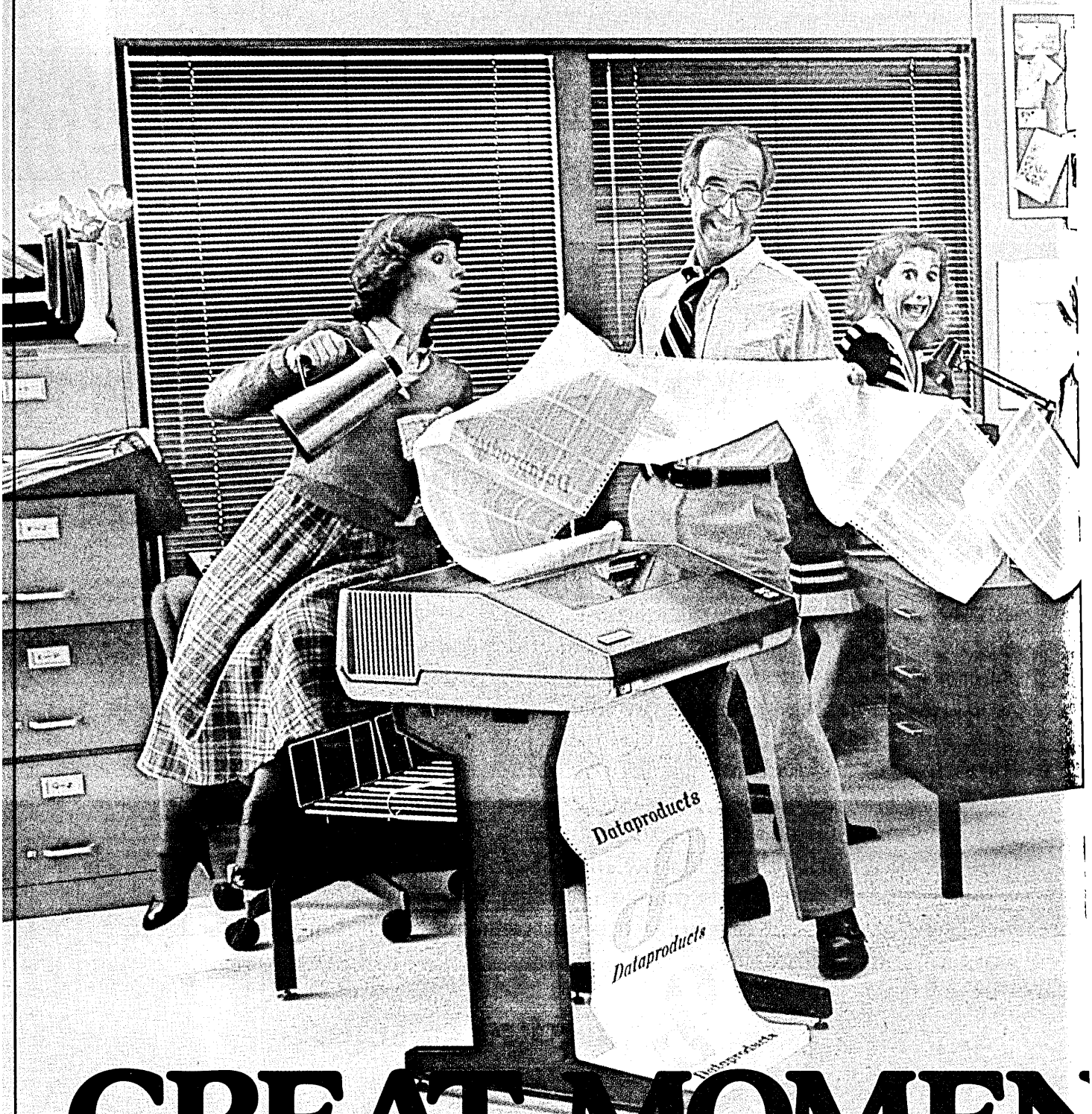


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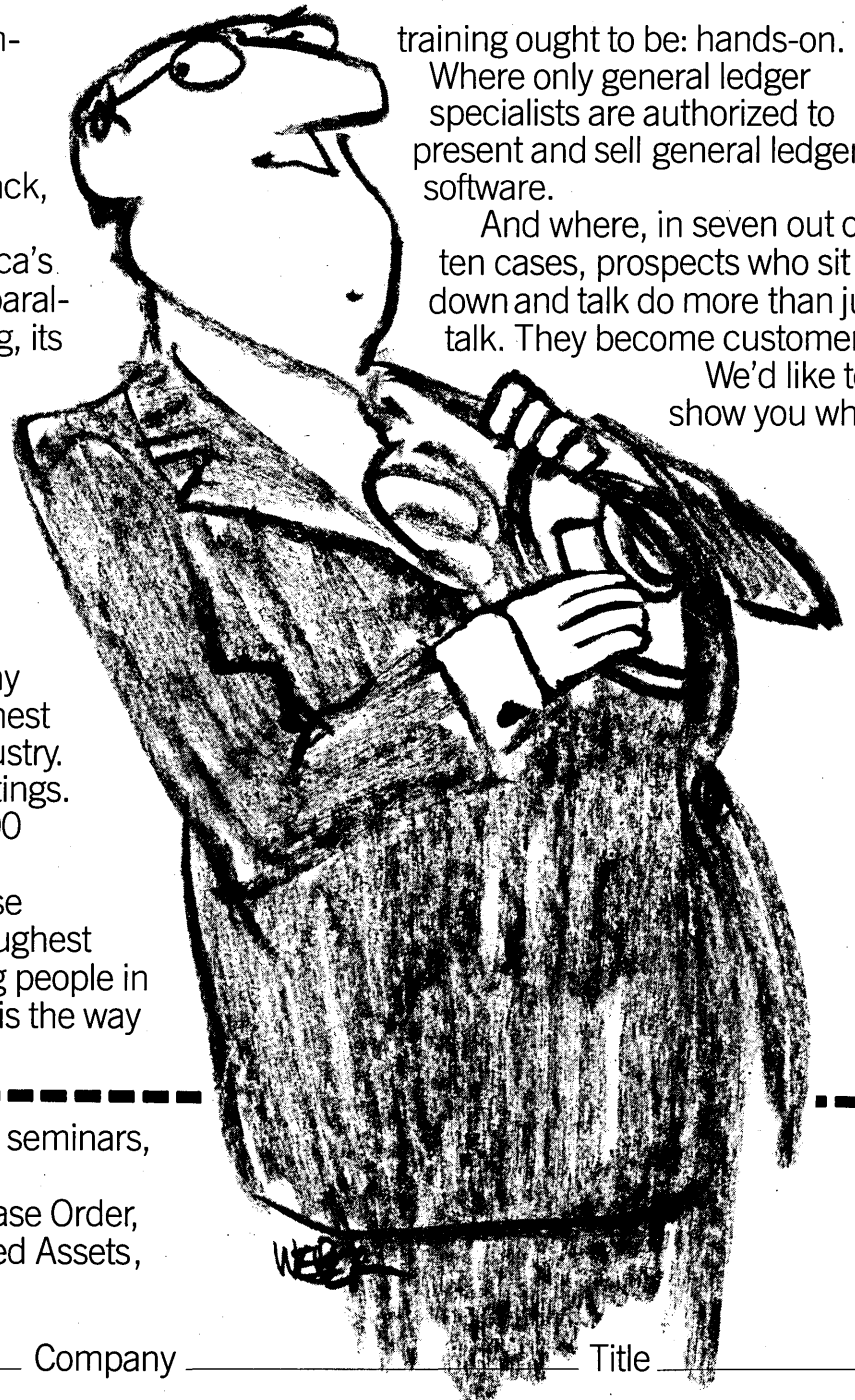

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MAINFRAMES

# IBM MAKES ITS MOVE

## Whether or not it's a piece of H, it's a major announcement.

Months of rumors of an imminent H Series announcement culminated on Wednesday, Nov. 12, when IBM announced its 3081 Processor Complex, said to be twice as powerful as a 3033, or roughly 9 MIPS. While it contains significant innovations, the 3081 is essentially a blocking maneuver at the high end, where IBM faces increasing competition from Amdahl and the Japanese, according to Frederic G. Withington, vp of Arthur D. Little. "You only had to look at Amdahl's third quarter report to see this machine coming," Withington says. Amdahl's third quarter was up 27%, falling only several hundred thousand dollars short of the $100 million mark.

Ulric Weil, vp at Morgan Stanley, disagrees on the question of timing: "No PCM competition affected the announcement date, but rather, IBM had production and manufacturing problems with the machine. They brought it out as quickly as they could. It was delayed much longer than most people expected."

Regardless of IBM's motivations concerning the timing of the announcement, the Gray Giant's marketing strategy seems to be sell, sell, sell. A 3081 selling for $3,720,000 leases for $93,000 a month over four years, for a purchase to lease ratio of 40 to 1. As further incentive, IBM cut maintenance charges by 5% to 15% for most 370s and 303X processors; selected software maintenance prices also dropped by as much as 30%.

"I didn't expect that IBM would cut maintenance prices," Weil says. "It's astonishing, in view of the fact that maintenance costs are pushed up considerably by inflation. It is a direct reflection on how much IBM wants a customer to purchase a machine rather than lease one."

At the same time it announced the 3081, specced at having twice the performance of a 3033, IBM also announced the 3033 Model Group S, with about half the speed of a full-blown 3033. "That 'S' stands for 'SELL,' " according to Hesh Wiener, publisher of the *Computer and Communications Buyer* newsletter. "That machine has a purchase to lease ratio somewhere between 17 and 18. That really doesn't leave a customer with much choice—the 3033S begs to be purchased." IBM quotes a $1,135,000 purchase price for a 3033S that leases for $63,645 per month over four years.

With general availability of the 3081 given as the fourth quarter of 1981, the competition has time to react. National Advanced Systems, National Semiconductor's resurrection of the fallen Itel, announced its 10 MIPS AS9000 in September. David Martin, executive vp at NAS, says that company is prepared to answer IBM's moves. Looking back to when the E Series was announced, Martin points out that customers were so impressed with the price/performance ratio that many underestimated the effect of long delivery lead times.

In Sunnyvale, Amdahl chairman E.R. White said, "The company is currently evaluating the specifics of the IBM announcements." Amdahl, at the time of IBM's announcement, was delivering documentation and other informational material to its field organizations in preparation for a major announcement the next week. "On Tuesday, Nov. 18 in North America, and Nov. 19 in Europe, Amdahl will announce a new 370-compatible large scale computer system with the intention of maintaining Amdahl's leadership in product innovation, technology, and price performance," White said.

"The H has twice the price/performance of the 3033," says Weil. "Some expected it, and some think it's too aggressive a move on the part of IBM. There's no real consensus—it just depends on the level of expectation. The competitors appear unruffled. They have, with the long delivery schedule, 18 months to get their houses in order. They won't really be tested until then."

**With general availability of the 3081 given as the fourth quarter of 1981, the competition has time to react.**

What did IBM announce that Wednesday morning? Was it really H? "Absolutely," says Weil. "It's the 10 MIPS machine we expected to fit on top of the 3033AP 8 MIPS machine. In the next six to nine months, we'll see more models."

Perhaps H, like the Future System we all awaited in the early '70s, is little more than a name. IBM will neither confirm nor deny that the 3081 is a part of the H Series.

The 3081 falls short of A.D. Little's concept of H as explained by Withington (see following story). He sees the 3081 as a retread—souped up and fine tuned, but a retread nonetheless. "The next step is further off into the future," according to Withington. "It's more powerful, and more 'different.' "

Still, the 3081 seems to be a more pronounced evolutionary step beyond the current IBM line when compared to the differences between a 370 and a 303X.

For instance, the 3081 contains two identical processors, each with its own set of channels. IBM calls this arrangement "dyadic processors," with the two sharing main memory and functioning much like an MP or AP. A separate processor, the 3082 Process Controller, handles the coordination of the dyadic processors. These processors partially fulfill Withington's vision of H. The two dyadic processors form the 3081 cpu, processing user code under the system's control program. While the two processors, each cycling at 26nsec, provide high performance, they can also improve availability, since either processor can assume the other's load if the need arises.

IBM would have preferred to get its 9 MIPS out of a single processor, in the opinion of David Morgenthaler II, vp at Amdahl. Indeed, a rumor circulating in the Northeast the day after IBM's announcement held that each of the dyadic processors has the potential of reaching 9 MIPS.

Technologically, IBM has taken a step forward. The 3081 contains IBM's densest logic packaging to date, with more than 3/4 million logic circuits occupying about four cubic feet within the 3081 Processor Complex. Integrated circuits are packaged in logic modules containing as many as 118 ICs. Using its bipolar master slice technology, IBM customizes the ICs to contain as many as 704 circuits each; each five-inch-square by two-inch-deep logic module contains up to 45,000 circuits—about as many as you will find in a 370/148.

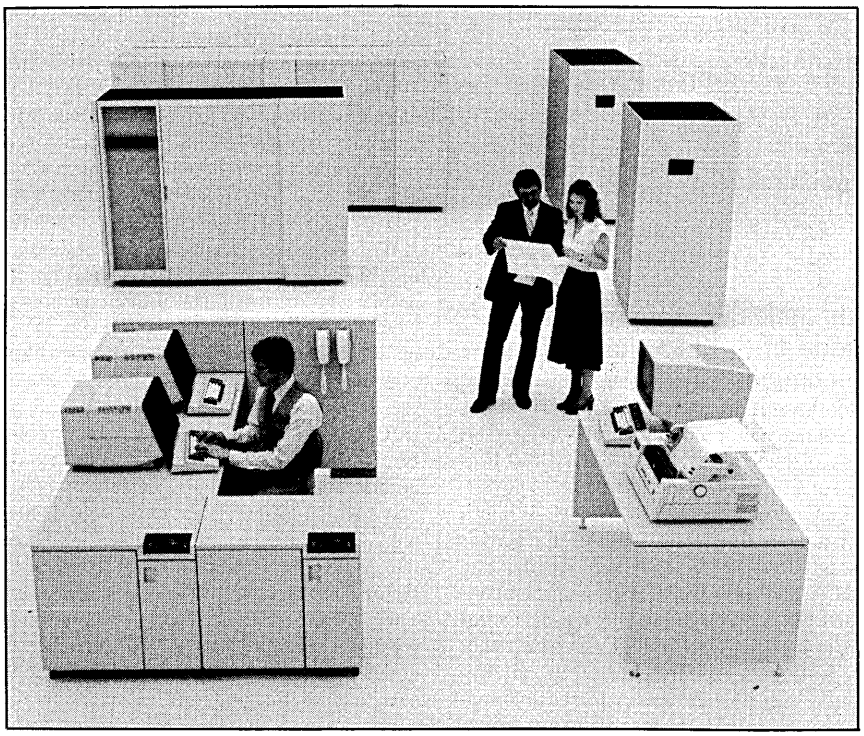
This dense packaging presents cooling problems, which IBM attacks by installing metal pistons in each logic module. These pistons press lightly against the ICs, conducting the heat away to a metal plate, which in turn is cooled by a circulating chilled water system.

**IBM will neither confirm nor deny that the 3081 is a part of the H Series.**

The 3081 cooling system was originally developed for the unrealized Future System [FS] of the early '70s, according to Amdahl's Morgenthaler, who adds the 3081 is the first machine to use technology left over from FS.

At first glance, the 3081 doesn't appear to be a radical departure from the 370. Twenty-year IBM veteran Jack Hart, now director of information industry technical services for IDC, notes that IBM describes the 3081 as the largest processor in the 370 family. Like Withington, Hart expected H to be a more radical departure from the 370. "The 3081 appears to be the last incarnation of the 370 architecture," Hart says.

It certainly does seem to be big, in a 370 way. The 3081, as of announcement day, can support up to 32MB of real memory (concurrently, IBM announced an increase in memory capacity for larger 3033s and APs, from 16MB to 24MB). And the 3081 has quite a few channels—16 or 24 integrated channels, all with 3MBps data streaming capability. That gives the new machine a maximum aggregate data rate of 72MBps.



NEW IBM 3081 PROCESSOR COMPLEX, as shown in this design model, offers internal performance about twice that of a 3033.

To keep things running, IBM has enhanced MVS/SP Release 1 to support the 3081 and the 819MB 3375 DASD. Also VM/SP Release 1 has been enhanced for the 3081. MVS/SP Release 3 is enhanced to support main memory to 32MB in 3081 Processor Complexes and 3033 multiprocessors, and 24MB on the 3033 processor and attached processor. Release 3 includes all the functions of the previously announced Release 2, and is said to yield a 6% to 12% performance increase for 3033s with the Extension feature. Modifications of the MVS/SP Global Resource Serialization function enhance Release 3 reconfiguration and recovery facilities, providing such functions as automatic reconfiguration in the event of a channel failure.

MVS/SP Release 1 of Job Entry System 2 (JES2) or JES3 licenses for $1,375 per month; MVS/SP JES2 Release 3 goes for $1,475 per month, and MVS/SP JES3 Release 3 is $1,800 per month.

Beginning in the first quarter, IBM will use its toll-free telephone support center as the first level of software support for MVS and related licensed programs. MVS users also can get electronic distribution of programming modifications by using a new feature of IBM's Information System program product.

The Distributed Systems License Option, originally introduced for 8100 Information System sites, is being extended to include many MVS-related program products. The DSLO plan can reduce the cost of using program products for customers managing multiple systems from a central location.

**—Bill Musgrave**

# WHITHER H?

**There are clues as to the technological direction IBM will take with its next major evolutionary system.**

*Shortly before IBM's November 12 announcement, we asked Arthur D. Little vp Frederic G. Withington to sketch his views on IBM's current direction. Throughout the conversation both DATAMATION and Withington referred to IBM's next major evolutionary step as the H Series. Since IBM doesn't acknowledge its internal product code names, we've retained that terminology, rather than change every reference to H to "IBM's next major evolutionary system," or some such label.*

In the early '70s we all eagerly awaited IBM's introduction of FS—Future System. Today, we await the H Series; with the falling cost of hardware and the rising cost of personnel, we desperately need a system that can address our increasing reliance on dp and reduce the difficulty of inte-

grating computers into our organizational structures.

Giving odds on when H will come to market would give Jimmy the Greek a migraine. With IBM's technological prowess, working prototypes are probably already locked in the back rooms of some of its R&D facilities. The decision to announce is, as always, in the hands of market planners, not engineers.

**"It's not a certainty that anything we've seen to date will actually become a part of H, but the parts will be trickling out over the next couple of years."**

There are, however, clues as to the technological direction IBM will take with the H Series. Withington, a veteran IBM watcher, foresees H as a "completely new architectural departure from the 360 architecture from which IBM has not significantly deviated since 1964." Withington's concept of H is as a wideband bus interconnecting a variety of microcoded, buffered, specialized processors, each performing various system functions. "One of these is a supervisory processor, one is certainly a file processor, and another certainly is a communications processor. Then applications processors plug into the bus. These will cover many environments, including the standard defined by the 360 architecture. H high-level language processors for FORTRAN and COBOL are other likely modules. So, there is no 'computer' anymore; rather there are a lot of computers, scattered about as functional modules, all communicating through a standard message format under control of the supervisor."

With all these modules, each tailored for its special function, an image of a room full of interconnected black boxes emerges. But Withington hastens to paint a slightly different picture. "Basically, what I'm talking about is all in one box. What I want to do is get a lot of transactions, say 1,000 a second, processed through a data base, so the speed is critical. The bus is extremely fast and the line lengths are short. Something like a bunch of plug-in boards on a rack, with a fiber optic bundle running around the rack. Of course for processes that are not speed critical for example, a COBOL processor for system development, a separate box connected by cable might suffice; conceivably today's 4341 with a different microcode might serve."

Will H really have a fiber optic bus? "Definitely," says Withington. "That isn't even a secret anymore. I've heard an IBM product vp say 'Of course, fiber optic bundles are the way to do buses. How else? There's no longer any engineering hangup; there was a problem with tapping off a bus carring signals, but that's been solved. Let me add that these are short buses for extremely high-speed intermodule communication. When I need to talk to something far away, I'll go through my front-end communications module onto an Ethernet-like bus, an 8100 bus, or a common carrier." (The 3081 contains no fiber optic components, according to an IBM spokesman.)

The question still remains: when will H debut? There's some speculation that it already has, at least in a piecemeal, interim manner. "The 4341 could be an interim step, a relatively low-speed applications or language processor perhaps," says Withington. "It's microcoded; give it a new shot of microcode, the right interface to the H-bus and maybe some buffering—that's a potential applications processor. The 3380 DASD and 3880 controller—especially with the data streaming feature—could be quite useful in a data base processor. It's not a certainty that anything we've seen to date will actually become a part of H, but the parts will be trickling out over the next couple of years, and finally, maybe three years from now, we'll see the announcement of the system center, and the world will learn that the products they've been buying are all modules of H."

With the amorphous nature of the H series (as foreseen by Withington), it's next to impossible to predict a meaningful price/performance curve for comparison with today's monolithic systems. "It would be difficult," Withington states, "because the universal measure today is MIPS, and there won't be IPS anymore. Everything will be transaction throughput. I could say, maybe, that this new machine will process your order entry transactions at a cost 20% better, and with a 100% increase in capacity, but in terms of comparing a box of modules to a 3033—there just isn't any way.

We're getting closer to considering the true functionality of the system, rather than worrying about how many times the clock ticks. H won't necessarily be cheap, it will be wasteful of the hardware, full of microcode and a lot of program products the user will have to pay for. "The conservative thing to say is that the bottomline seen by the user ought to be about the same as today's—maybe better, but probably about the same. But H will be infinitely easier to use—self-organizing, modular, redundant—good things the user will value highly. The advantages of component cost reductions will be thrown away in favor of end-user virtues."

**The Tinkertoy concept of the H Series leads to the question of just what blocks will be available.**

A system to help beat the people problems is needed. "A perfect case is in front of us now, with the System/38. You have to pay about $170,000 for it, and its throughput could be equaled by a mini in the $50K to $70K price range," Withington says.

"The difference is ease of use. Will users buy the S/38 knowing they can get the same throughput at half the price? You bet they will, because the programmers go away. Take the principles of the S/38, put a bus in the middle, and you're talking about the H."

The Tinkertoy concept of the announced H Series—a set of building blocks that can plug into one another in virtually unlimited permutations to suit the system builder—leads us to the question of just what blocks will be available. A supervisory processor, a communications front-end and a data base back-end seem certain as does a 360 type applications processor to maintain compatibility with the existing base. After all, 16 years ago IBM promised that it would never again put customers through the conversion trauma experienced by 7090 users moving into the 360.

But with the various system building blocks essentially isolated from each other, and communicating over a high-speed bus using a standard message format, functional modules—except perhaps the supervisor—have no need to know about the entire system configuration. For instance, a communications front-end processor handling a number of on-line terminals need only know how to format and address messages going to the bus—where the message goes next is not the front-end's concern.

**An entirely new breed of plug-compatible manufacturers may emerge in this new environment.**

Since modules are functionally isolated, there is no reason why entirely new special purpose modules can't be designed and incorporated within the architecture; an image processor, an array processor, a speech recognition processor, or whatever, could become a building block, as long as it properly formatted its messages and interfaced to the bus.

An entirely new breed of plug-compatible manufacturers may emerge in this environment. IBM may be opening its own Pandora's box: outsiders may identify needs and offer bus-compatible solutions before IBM. Perhaps this new breed of PCM will survive only in special markets too small to warrant IBM's attention, or perhaps they'll come up with a big winner and force IBM to play catch-up.

We hope we won't see a repeat of the early travails of the plug-compatible peripheral makers. IBM will probably try to keep its interface secure and make extensive use of microcode in the process, yet, for its own benefit, it won't be able to alter the standard to any great degree.

**—Bill Musgrave**

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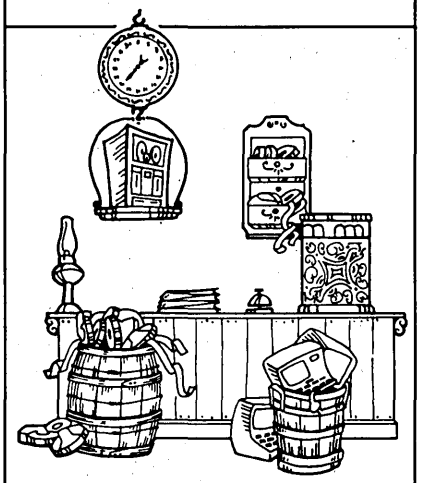

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# HP TAKES OFFICE PLUNGE

**The new HP 2680 laser printer is a striking departure from any Hewlett-Packard peripheral of the past.**

In retrospect, it seems inevitable that remote processors in a distributed environment would be applied initially to financial applications, data entry, and to order processing, ideally working with data bases sited locally or at corporate headquarters. And one could also see the need for processing capabilities in the manufacturing and laboratory environments. What next? The office.

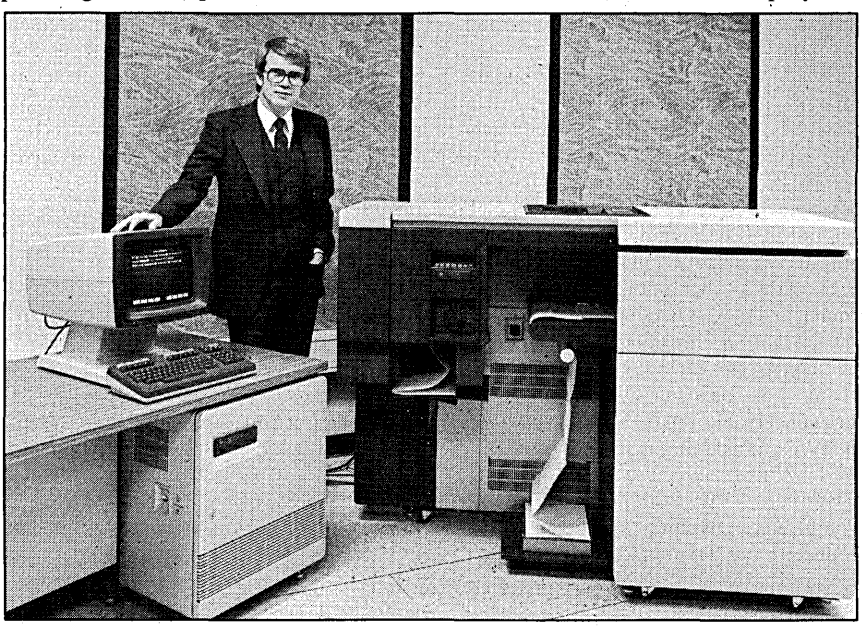
Making that move this month is Hewlett-Packard, which earlier had introduced software for business graphics applications and for text and document processing. Now the company has debuted a home-grown laser printer, secretly developed at its Boise, Idaho, division, as well as a smaller printer with output of word-processing quality. Says Ed McCracken, general manager of HP's General Systems Div., these products, "plus our strategic direction, are oriented toward adding office applications to our distributed data processing machines."

The company will supply its users with distributed systems networking, providing for the integration of a customer's dp, manufacturing, and office systems. Not only does this include HP boxes talking to HP boxes, but also HP systems linked interactively to IBM mainframes in a 3270-like environment. But the announcements this month also include a commitment by HP to IBM's SNA and to the European X.25 packet switching standard. Both are deemed to be long-term directions for the Cupertino, Calif., company.

But the kicker in the entire package of announcements is an industry first—a guaranteed up time service, a feature that should appeal to those responsible for the operation of systems at remote locations. The optional feature applies to a new top-of-the-line HP 3000 Series 44 processor, disk and tape drives that go with it, and certain terminals. "We think we build enough quality into our computer products to guarantee their up time at 99%," says McCracken. If up time on the equipment is anything less than that, the service fee is waived. Is that the level of reliability being experienced today by HP users?

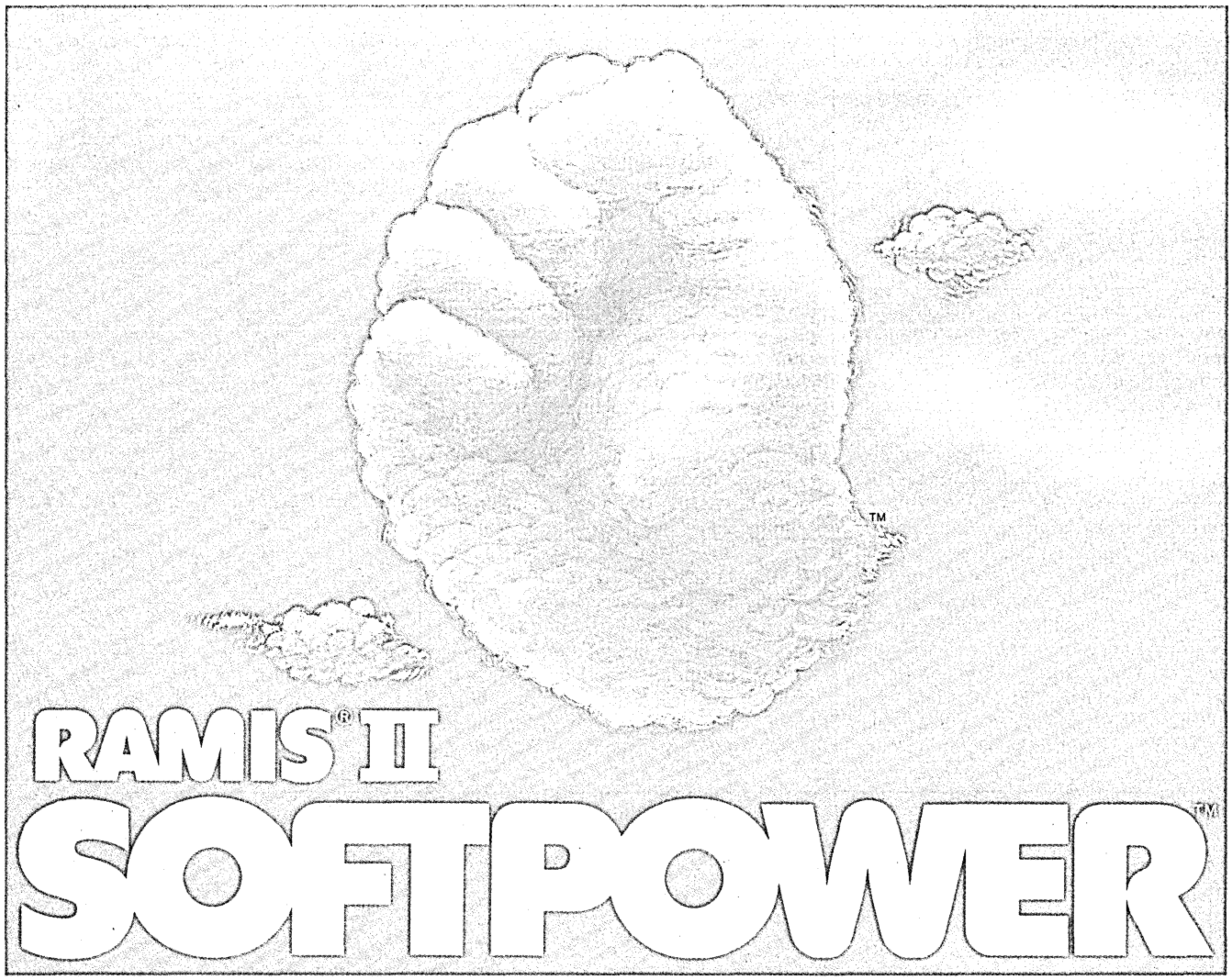
"We're getting there," says Dick Anderson, general manager, Data Systems Div. "That's a big part of why we've been so concerned about the quality of semiconductor memory." At recent speaking engagements, Anderson has cited the results of tests at HP that purportedly show semiconductor memory chips from Japan to be of a higher quality than those produced by American vendors. The new Series 44, which uses 16K chips, supports up to 4 MB. "And those memory chips right away dominate the reliability of the product, because there are so many of them," he adds.

The new Series 44 processor is twice as fast as the Series III, previously the top of the HP 3000 line, and is priced only 5% higher. And what makes the 99% up time believable is that the company has



ED McCRACKEN shows off the new HP 3000 Series 44 processor (left) and the new HP 2680 laser printer.

# Most installations have a 2-3 year backlog of unimplemented applications

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priced its hardware maintenance for the 44 at only 50% of that for the Series III, which has not been an unreliable machine. As a percentage of processor price, the annual maintenance price for the 44 is less than 4%, while it's more than 8% for the Series III comparably configured.

This lower fee becomes impressive when one considers the increased cost of

**The new Series 44 processor is twice as fast as the Series III and is priced only 5% higher.**

labor and transportation for the CE, combined with an improved price-performance level for the hardware. It highlights the importance of using technology to increase the mean time between failures of a product and to reduce the mean time to repair. Says Anderson, "That's the key. If you can push out the time between failures, then the costs will come down dramatically." But if a vendor is unable to harness technology to achieve this, he adds, then labor costs "will eat you alive."

Looking at the products unveiled this month by HP, although a new computer is always interesting, one can hardly turn away from the HP 2680 laser printer. It is not only a striking departure from any HP peripheral of the past but also slops over into the office environment in interesting ways. The device, priced at $108,500, prints at 45 pages a minute, which comes out to about 3,000 lpm. The 8½ × 11-inch page is called people-sized, designed to contrast it with traditional printout pages that don't belong on the desks of executives.

With a resolution of 180 dots per inch, the 2680 does not approach word processing quality, but its capabilities in producing business graphics should attract a large following. The machine can store 32 individual business forms as well as 32 character sets. For an additional $1,500, there are two software packages for forms design and for positioning graphic elements on a page. So it becomes possible to sit at a graphics terminal and design forms and character sets, and then combine them with data provided by a program string.

Now that HP has this capability, a laser printer that operates on the Xerographic process, can an office copier be far behind? Boise Div. marketing manager Bill Murphy denies that a copier is in their future, insisting instead that the printer copies what's in a data base. To that extent, says Murphy, it obviates the need for some of the copying in the office; indeed, someone at Boise has dubbed the 2680 the Uncopier.

The ability to produce something that also exists as preprinted forms can be beneficial and a money saver. Says Murphy, "At our installation in Boise, we had 13 preprinted forms that we can now eliminate . . . . In many installations, that alone would justify the machine." He adds, however, that for the machine to be economical the user must run more than 50,000 pages a month. The maximum comes to about 400,000 a month. Above that volume, one might be better off with a high-speed printer, such as the IBM 3800, Xerox 9700, or the Honeywell Page Printer.

**—Edward K. Yasaki**

TECHNOLOGY

# DATABASE MACHINE FLAP

Cambex

**Software AG's new machine is called "revolutionary" by the company, "unnecessary" by the competition.**

"This machine has proved so elusive that it was like searching for computing's Holy Grail."

This was the buildup to the first of

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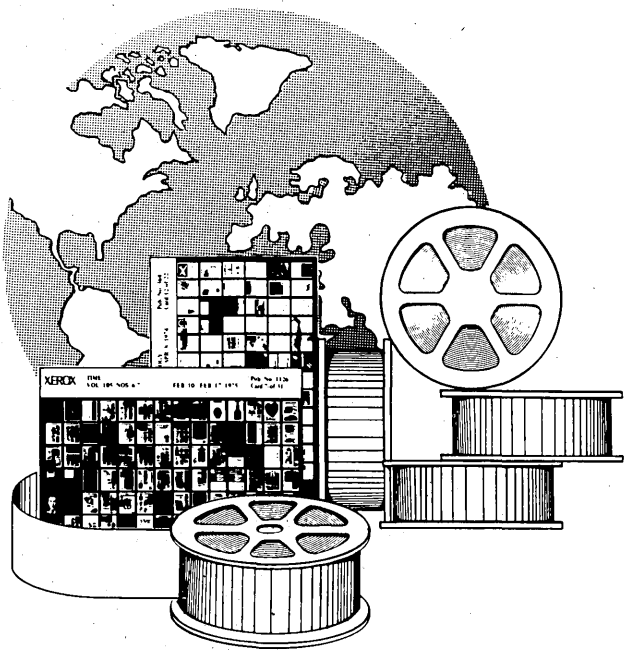

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several big claims by a U.S. software company for its "revolutionary" new machine—a machine that it says could turn database technology on its head and change the whole industry.

The company, Software AG of Reston, Va., called its new offering the world's first "commercially practical Database Machine" at its recent U.S. debut in New York. Software AG's president, John Norris Maguire, says the machine is the fruit of over eight years of software development, both in Germany and the U.S.

"Some experts said it couldn't be built; others, that it was far down the road. But it's here now," said Maguire.

Maguire called it the machine that IBM hasn't the motivation to build, because it offers such cost and flexibility advantages over the big new mainframes that the Armonk giant wants to sell.

He claimed that the new Database Machine does away with expensive upgrades to 3033s and offers the same alternative at one-tenth the cost. As well as hurting IBM's mainframe sales, Software AG expects to blunt demand for the giant's aging database management software, IMS.

Says Maguire: "We've succeeded in stripping the database management software [DBMS] from an IBM host and running it in its own back-end machine. As well as communicating freely with the host, it can act as a mainframe in its own right."

Maguire claimed that rather than losing performance, the DBMS is now more productive and easier to use. "But the main thing is that the host is now uncluttered and free to handle the backlog of jobs that has piled up."

So far, IBM's big users have had to handle this overload by upgrading their existing mainframes or by buying bigger and more powerful machines such as the $3 million to $4 million 3033, Maguire explained.

Users do not have to pay this kind of money, Software AG says. Its plug-compatible equivalent will work with any IBM 360, 370 or 4300 for $300,000 to $400,000. "As well as connecting to an unlimited number of IBM hosts" says Maguire," one host can link with many Database Machines."

The big payoff from all of this, says the company, is that when the DBMS is disengaged from the host and put in the Database Machine, 60% of the host computer's time is freed to do other things. In addition, the company claims that DBMS throughput is increased by 25%.

With all these benefits to be gained, why has this type of machine proved so elusive? Why has no one built it until now?

"It has only become possible because of the unique architectural makeup of our popular database software, ADABAS," boasted Maguire. When this DBMS package is added to powerful new microcoded hardware from Cambex (formerly Cambridge Memories) and a special communications system to link the IBM host, the Database Machine becomes a reality, Maguire said.

But according to Software AG's competition, there is one solid reason why this type of machine has not been built for commercial applications. "There is just no market for it," says Cullinane Corp. senior vice president Robert Goldman.

"We built the original prototype back-end database machine in 1976, and it's still being used privately by four U.S. defense agencies," Goldman said. The system links Cullinane's fast-selling database package, IDMS, in a back-end DEC PDP-11 to an IBM host 370, he explained.

**Some experts think that IBM might release its own database machine based on a 4341 Group 2 processor.**

Goldman said this arrangement isn't altogether satisfactory. "So in 1978 we rewrote IDMS for use on IBM PCM hardware at the back end as well." By the beginning of 1979 the company was scouring the market for the right PCM hardware for IDMS. Cullinane formed Database Machines Inc. and sank $100,000 into a study of whether IBM's users were eager for such a machine. At the same time, Cullinane had found its PCM—National Semiconductor. An oem deal for a new IBM 370/138 level machine (known within National Semiconductor as the System 400, say sources) was worked out. But then IBM dropped its bombshell—the price-crunching 4300 series. These small to medium mainframes, selling for as low as $65,000 or $70,000, promised to do a better job at a lower price, said Goldman. The System 400 was scrapped.

"Four years ago there was economic justification for a Software AG-type database machine," Goldman stressed. "But today you might as well put your DBMS on a low-priced 4300 if you want to strip it out and talk to the host."

Cullinane now offers a $25,000 software package that allows users to do this. "Together with a $70,000 IBM 4300 and IDMS, you can have a basic back-end database machine for around $100,000 to $200,000," Goldman claims. Cullinane says it has five or six IBM users currently doing this. "But no IBM user we've talked to has shown any inclination to buy a bigger package."

Observers point out that the Software AG approach calls for more. You have to add such things as disks, a tape drive and controller, a printer, and a console to enter commands—all of which drive up the basic cpu cost.

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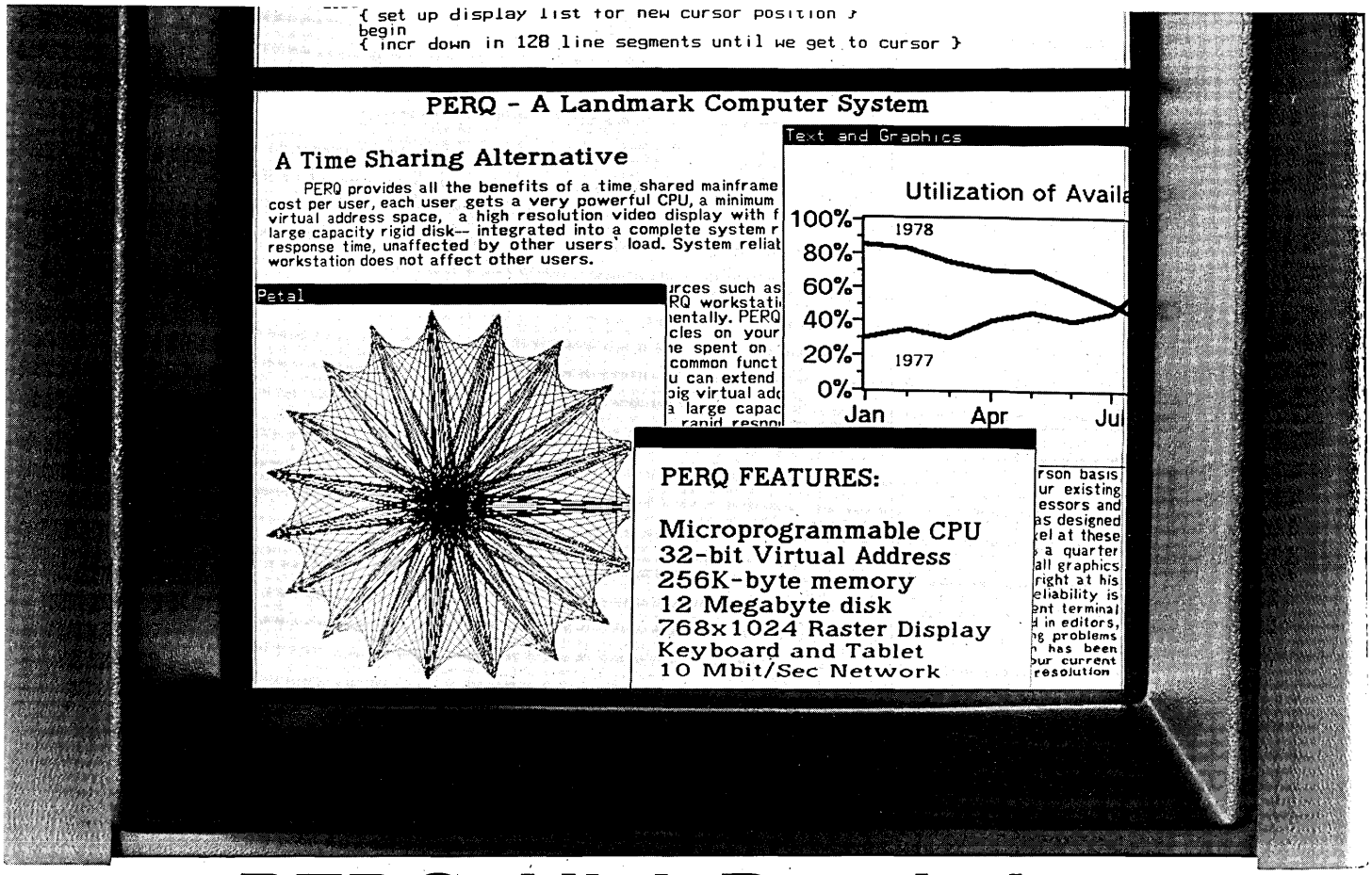


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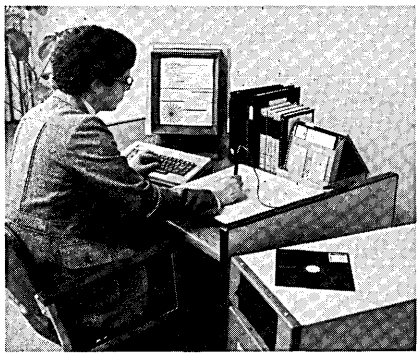

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ware AG claims, there is no doubt that some of IBM's larger users may be seduced, say the experts.

The competition concedes that several of Software AG's claims are likely to be true: "There's no reason why you shouldn't use multiple IBM hosts with the new Database Machine, or multiple Database Machines with IBM hosts," said one database supplier.

Nor does the competition doubt that you can use up to eight copies of ADABAS on one Database Machine, or use the machine as a reserve mainframe if the host goes down.

Some claims, though possibly true, must be taken on trust. Among these are the promised six- to nine-month availability for the machine, 200,000 database calls a second, and a 25% throughput increase in ADABAS.

But the company's major claim of a 60% saving in host cpu time was attacked by everyone, and most vociferously by Goldman. "The only way you could get a figure like that," he said, "is if 90% of the host's application was the database software alone."

Experts tend to agree. Says one leading database consultant: "Normally only 30% to 40% of the host's time would be tied up with the DBMS." Based on this estimate, he figured that a database machine would tend to free the host by about 30% at most. When you disengage the DBMS from the host and put it in the back-end processor, you then must generate new cpu cycles to handle communications software and recovery software. Running that additional software cuts into the savings in cpu time.

Software AG says its figures come from an unnamed West German banking user in Dusseldorf and two additional test sites in Germany. All operate under IBM's VS/1 executive.

The experts point out that this whole database machine approach would be redundant anyway if IBM brought out its long-awaited relational database software, System R. But Software AG's Maguire says that talks with the IBM project director convinced him that IBM is unable to do this.

"They can't make System R work," said Maguire flatly. "After refining it in tests on the 3033 over the past 2½ years," he explained, "they've still only come up with one-fifth the performance of IMS."

Maguire added that the bridge had now been burned between IMS and System R, and that a database machine was the only logical alternative.

Though IBM denies scrapping System R, the database suppliers tend to agree with Maguire's assessment. But many of them think that IBM has started to develop a new relational software system.

"Still, we won't see this until you have content addressable file on IBM machines," says top Arthur D. Little analyst Frederic Withington. In the meantime, Withington and other consultants think that IBM might release its own database machine based on a 4341 Group 2 processor. This is likely to prove more acceptable to IBM's users than the Software AG system, say experts. Their reasoning is that IBM's big users won't want to go to foreign hardware (with Cambex), another cpu, and a dual cpu environment. At best this would only be a temporary solution, they say.

**Software AG claims that when the DBMS is disengaged from the host and put in the Database Machine, 60% of the host's time is freed.**

But if Maguire is right about IBM's lack of motivation to introduce such a database machine, Software AG might have breathing room to establish credibility. The marketing edge generated by a focus on ADABAS alone might be worth the effort. According to Frost and Sullivan, IBM with its two DBMS offerings, DL/1 and IMS, Cullinane with IDMS, and Software AG with ADABAS are the leading players in a booming market that is expected to be worth $1 billion by 1987. And that's just for the database software. IBM may be forced to act to protect its position as top of this select league, say observers.

One final claim from Software AG could backfire on the company. Maguire has made a big effort to address the crucial area of support for the new systems. Though his company is a pure software outfit, he has taken the unusual step of guaranteeing on-site support for 2½ years on demand for the hardware and software, plus round-the-clock remote diagnostics. The combination of Cambridge Memories (coming back from bankruptcy as Cambex with 370/158 level hardware) and a software company with no experience maintaining hardware might be more than IBM's seasoned 3033 users would want to gamble on, says Software AG's competition.

Whatever the outcome, many observers—including Software AG's competitors—are grateful to the company for bringing a lot of excitement to a traditionally staid area. There is also the feeling that that same competition is a trifle envious of Software AG's "packaging coup."

But when all is said and done, the sober warning from the experts is not to take Software AG's resplendent new offering too seriously for the time being.

They may have found their Holy Grail, but there is a big suspicion in the industry that it could have more than a few holes in it.

**—Ralph Emmett**


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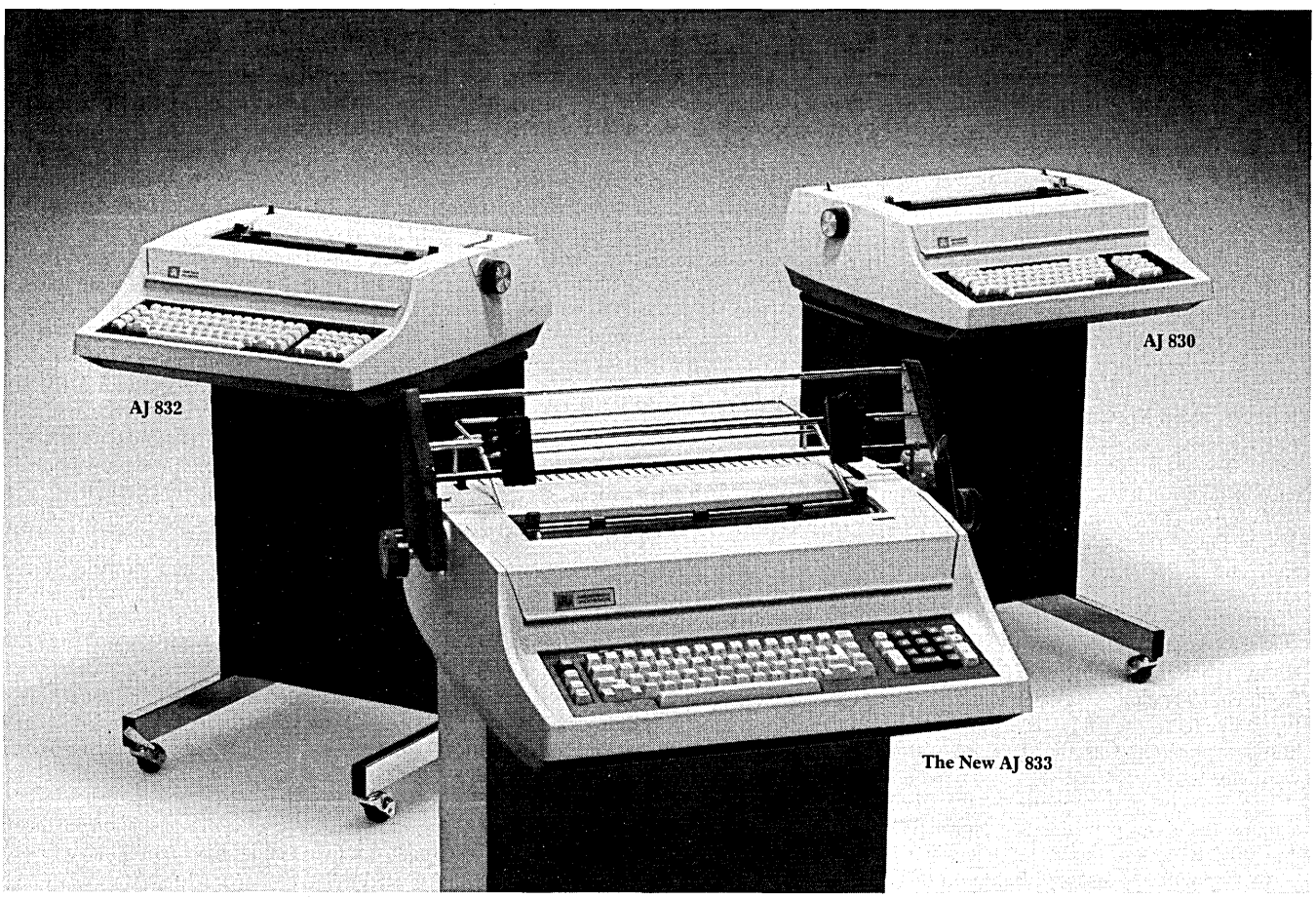


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# CDC EMERGING STRATEGY

## Control Data's introduction of Micro-Plato sparked speculation about the company's future plans.

Control Data Corp.'s recent introduction of Micro-Plato, a microprocessor version of Plato, CDC's on-line, computer-based educational system, drew considerable attention, since it seemed to restructure the economics of computer-assisted training and education. But many Wall Street analysts seemed more interested in how CDC's expanded Plato offerings fit within the huge new retail store-and-office network CDC has been creating.

Plato, the fruit of CDC's 18 years' investment in computer-based education and "courseware" development for academic and industrial students, may play an important role in CDC's retail marketing. (Already Plato instruction modules are used for introduction and training on CDC systems and software sold.) CDC chairman William C. Norris, as flamboyantly quotable as ever in the unveiling of Micro-Plato, claimed CDC had invested a gargantuan $600 million developing Plato and learning how to market it. He then went on to describe Plato as the future flagship for the corporation.

Norris predicted that the 1980s would see educational applications evolve to become CDC's largest single profit center —the largest services market for the computer industry as a whole.

It was the sort of statement that has tagged Norris as a visionary executive in this industry—a statement that is perhaps plausible but virtually unprovable, one that reflects a sense of societal need rather than what the technology might most flashily offer. It was the same kind of long-term perspective that aided Norris as he positioned CDC to become primarily identified with computer service functions in the early 1970s.

CDC's strategic moves seemed to presage the rapid shift of cost and profit potential from hardware to software; the computer as a utility, valued for its serviceable applications rather than its bells and whistles; the evolution of alternatives delivery systems; the trends toward software usage pricing. "It's all served to validate a lot of the things [Norris] was telling us 10 years ago," says Kidder Peabody analyst William Easterbrook.

Like many industry observers, Easterbrook sees CDC's plunge into the retail environment as the coalescence of CDC's sprawling array of specialized data services: separate service agencies offering things like computer-based employment references, transaction functions for brokerages, credit verification, loan processing, technology transfer exchanges, even a national automated box office service, Ticketron. All of these specialized services fall under the broad umbrella of the traditional scientific, engineering, and business data processing services offered through Cybernet and SBC, Control Data's Service Bureau Company.

In October, CDC opened the first of its newest retail outlets, the CDC Business Center, with plans for 20 stores by year-end and 100 or more by the end of 1981. While a number of computer industry vendors have launched experimental ventures in retail system sales, CDC has made a major commitment. "People don't seem to realize the extent of their [CDC's] investment," says Easterbrook, "tens of millions already, $100 million within a very few years."

CDC Business Centers will complement the already impressive storefront presence of the corporation. CDC is a $3.3 billion company that drew $900 million in 1979 revenues from its Commercial Credit Co., a finance and insurance subsidiary with over 500 U.S. offices. (Twelve of the CDC Business Centers to be opened this year will be managed independently by the Commercial Credit group; these shops will offer Plato and other service subscriptions, but probably not the small business systems offered by the more dp-oriented staff of the Business Centers managed by other CDC groups.

Last year, $2.4 billion, the bulk of CDC's revenues, came from these other groups: the peripheral and oem products group (40%), the computer systems group (20%), and the service bureau and its specialized agencies, including the educational services group (40%). Analysts generally agree that CDC's educational services, the Plato marketing group, will this year collect about $80 million revenues, but will on balance lose $20 million because of CDC's policy of corporate investment in the courseware, the actual student-oriented material in things like math, airline pilot training, geology, or whatever.

**CDC's plunge into the retail environment is eyed as the coalescence of its sprawling array of specialized data services.**

CDC's Norris recently said the cor-

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poration planned to bring Plato into the black in 1982 for at least one quarter, and that 1983 was targeted as the year in which Plato volume would allow both courseware reinvestment and a modest full-year profit. Plato now has about 7,000 hours of educational and industrial training courses on hand, according to CDC vp for education Thomas Miller, and the company hopes to add another 2,000 hours this year. Seldom has an investment looked more attractive, notes Donald Blitzer, the inventor of the Plato system. A University of Illinois professor, Blitzer directs the university's Computer-Based Education Research Laboratory (CBERL) at Urbana, Ill., now the prime developer for Plato system software under contract with CDC. CDC could have turned the business profitable at any time, he notes; common sense demands continued courseware investment at this time.

"A lot of people think of the cost of computer-based education in terms of the capital investment in the terminal equipment," says Blitzer. "From a systems point of view, that's just silly." Even today, he said, "we probably underestimate the ratio between the software and hardware dollar in Plato when we put it at 4 to 1. It's moving very quickly toward 10, or 20, or 30 to 1.

"In other words, soon you can practically give away the hardware and still have a secure profit base," said Blitzer. "And yet the hardware is what people think about when they talk of costs." He said the education market is full of naive users who will try to save $500 on a terminal, only to end up a few years later paying another $20,000 for courseware needs they didn't even explore when they first purchased the system.

Of course, he explained, Plato's system software—the Cyber-based operating system—has a range of functionality that even now extends far beyond the narrow courseware delivery and lesson management tasks CDC presently offers on Plato. The university's CBERL, under contract with CDC for system development, works with a version of Plato that is everything CDC markets, plus much more: graphics, simulation and modeling, advanced networking and communications, a full dp support system.

**CDC has already announced plans to offer hardware from other small computer manufacturers in many of its Business Centers.**

"CDC certainly has a much narrower view of Plato than we do," notes Jack Stifle, principal research engineer at CBERL, "but then they know a lot more about marketing than we do." With Plato, adds Stifle, even now CDC has an "incredibly elegant highway" right into the heart of the communications business.

CDC has already announced that it will offer hardware from other small computer manufacturers in many of its business centers. The company announced plans to sell Ohio Scientific's microprocessor-based small business system, and it is soon expected to announce an agreement with Data General Corp. to offer DG's largest Nova 4 system, the Nova 4X, as a front-end processor and standalone system. Both systems, and perhaps others, will be offered with Control Data's applications software, and both could be useful in holding on to customers who have either outgrown the CDC service bureau or simply want local standalone processing.

In addition to the announced Z80-B Micro-Plato system, CDC is expected to offer Micro-Plato courseware for the Ohio Scientific systems (and perhaps even the Atari 400 and 800 models for which CDC provides maintenance and some software). That will likely be followed by a Nova-based Plato cluster that would allow for more off-line functionality than the micro-based systems permit, according to independent sources.

Plato, both on-line to CDC's Cyber-based service network and in the more


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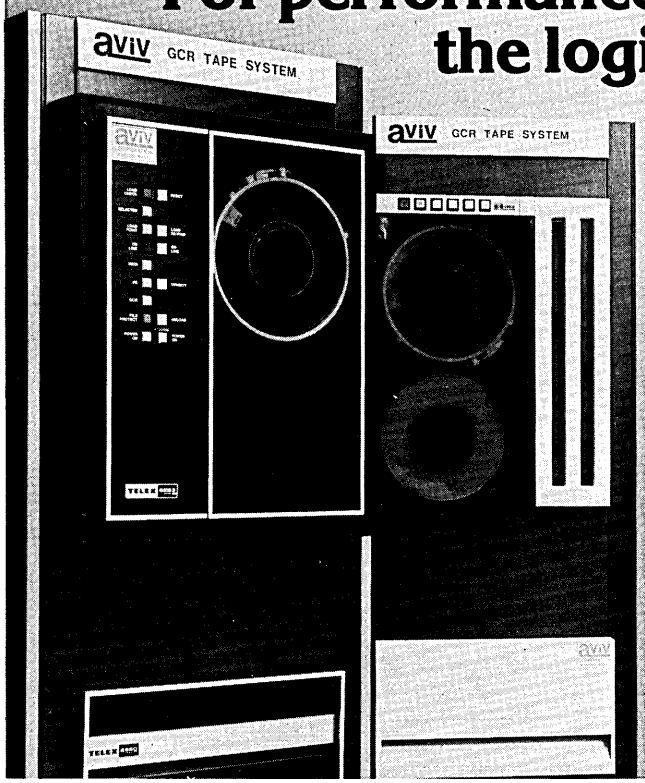


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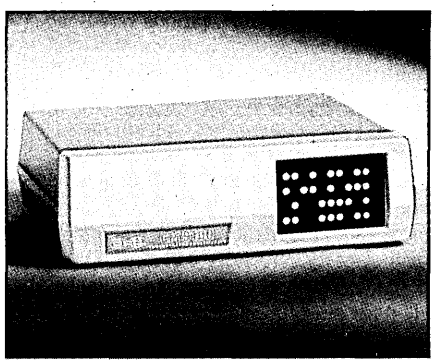

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**CIRCLE 48 ON READER CARD**

limited tutorial and drill Micro-Plato, will be offered by an independent sales force, through the Business Centers and through CDC's extensive and expanding system of student training offices, the Learning Centers, 89 of which have been established across the country. CDC's Norris has said he expects to have perhaps 800 Learning Centers established by 1985. The 37 Control Data Institutes, the CDC training schools for programmers and computer technicians, also use Plato. The CDC business and technology centers, where startup, high-tech small businesses lease space and share common facilities, will also offer Plato facilities. (The first business and technology center, in St. Paul, Minn., has been "very successful," and three others are now planned.)

**The company plans to bring Plato into the black in 1982. The following year is targeted for full-year profit.**

The retail boom is a very major effort within CDC, and the Plato training systems seem intrinsic to the corporate plans. "There is no question that computer-based education has come into its own," says Paine Webber analyst Sanford Garrett. "It's a major growth opportunity in every way, manner, and form—and what CDC has that no one else has is an enormous investment, perhaps $60 million to $100 million net, in the courseware development over the past five years, an enormous investment, very difficult for others to match today."

Although CDC spokesmen argue that outsiders must view the various retail and educational ventures individually—"as separate pieces of cloth, not a whole fabric" —it's difficult to find industry observers who don't expect more synergy among the many tentacles of CDC. Control Data's early understanding of industry trends enabled it to become the first independent mainframer to offer an IBM-compatible mainframe, and the same ability to identify with the application system rather than the hardware has made it the first computer vendor to offer a multivendor cpu line in a retail store.

Most of these developments pull together in a very attractive way, notes Easterbrook of Kidder Peabody. "The retail stores will capitalize on one of their major strengths, their oem business. And to the extent that CDC is an oem supplier—and 35% of their revenues come from oem peripherals—the retail offices protect that income. Now they'll get the business whether it's in the traditional oem-systems house channel or whether it comes in through the retail stores."

**—Vin McLellan**

GOVERNMENT

# GOOD NEWS IN FED. ADP

**New regs out of GSA this month could cut down on time and costs of federal adp buys.**

The principle of caveat vendor which so often characterizes govenment has just been dealt a body blow.

With new requirements effective this month, the General Services Administration (GSA) is taking several steps towards improving vendors' abilities to slash the interminable red tape accompanying any sale of adp equipment to the government. In this case, one cut is worth three or four light years because GSA is offering an attractive alternative to current application procedures for adp equipment and services used by federal agencies.

Pursuant to the Brooks Act of 1965, GSA is currently responsible for reviewing all agency purchases of equipment and services over $300,000. The proposed revi-


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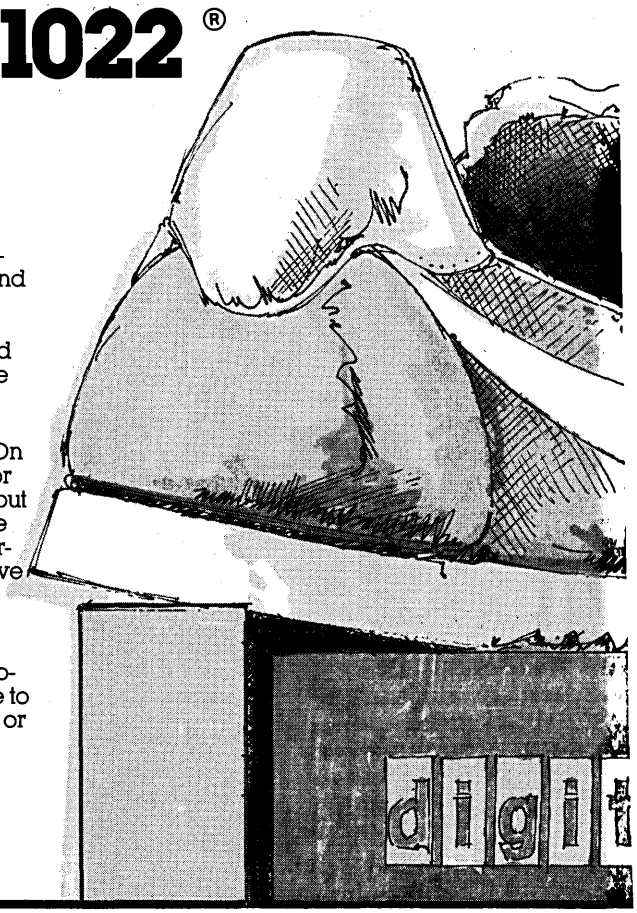

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**Software House** The Data Base

sions, which have the enthusiastic support of GSA Administrator Rowland Freeman III, will raise the ceiling to $500,000 and extensively streamline the review procedure for such purchases. The current review ceiling of $50,000 for a sole-source contract will remain in effect.

"The agencies feel that GSA demands too much from them in order to procure adp," explained Bob Coyer, assistant commissioner of the Automated Data and Telecommunications Services' Office of Policy and Planning and the main man behind the revisions. "They think they have to submit too much substantiation and justification to us and feel it's enough if their own management buys off on it. We think that's all well and good, but the agency might not be aware of other contracts we may have, or might be naive in its intrepretation of the federal procurement regulation, so that the government doesn't get the lowest possible price.

"The ones that are well versed in buying get annoyed at the delay. And invariably GSA approves what they came in with anyway," Coyer adds.

That approval is required to be given within 20 days of receipt of the request. If the request is a Category I (extensions, waivers or amendments), Category II (fully competitive, justified sole-source), or Category III (limited or no competition with a large dollar value), chances are excellent it will beat the statute of limitations. If it's a Category IV (major system, high visibility), chances are nil that it will be approved within the time limit. Of 391 delegations of procurement authority issued by GSA in FY '80, 68% were for purchases between $10,000 and $1 million; 32% were for purchases over $1 million.

So while GSA fiddles, agencies and vendors burn.

"When we hold it up for more than 20 days, it's to require more information," Coyer explained. "It irritates the agencies because most of the time it's not really necessary and the solution is predetermined anyway. It's perceived as no more than a drill. And I'm sure a three- or four-week delay drives the vendors crazy."

**Under the new requirements, decisions on adp buys must be made within 10 days.**

"That really is a problem for us," admitted Bob Huberfeld, federal marketing manager for Digital Equipment Corp. "The delays are very, very costly for us."

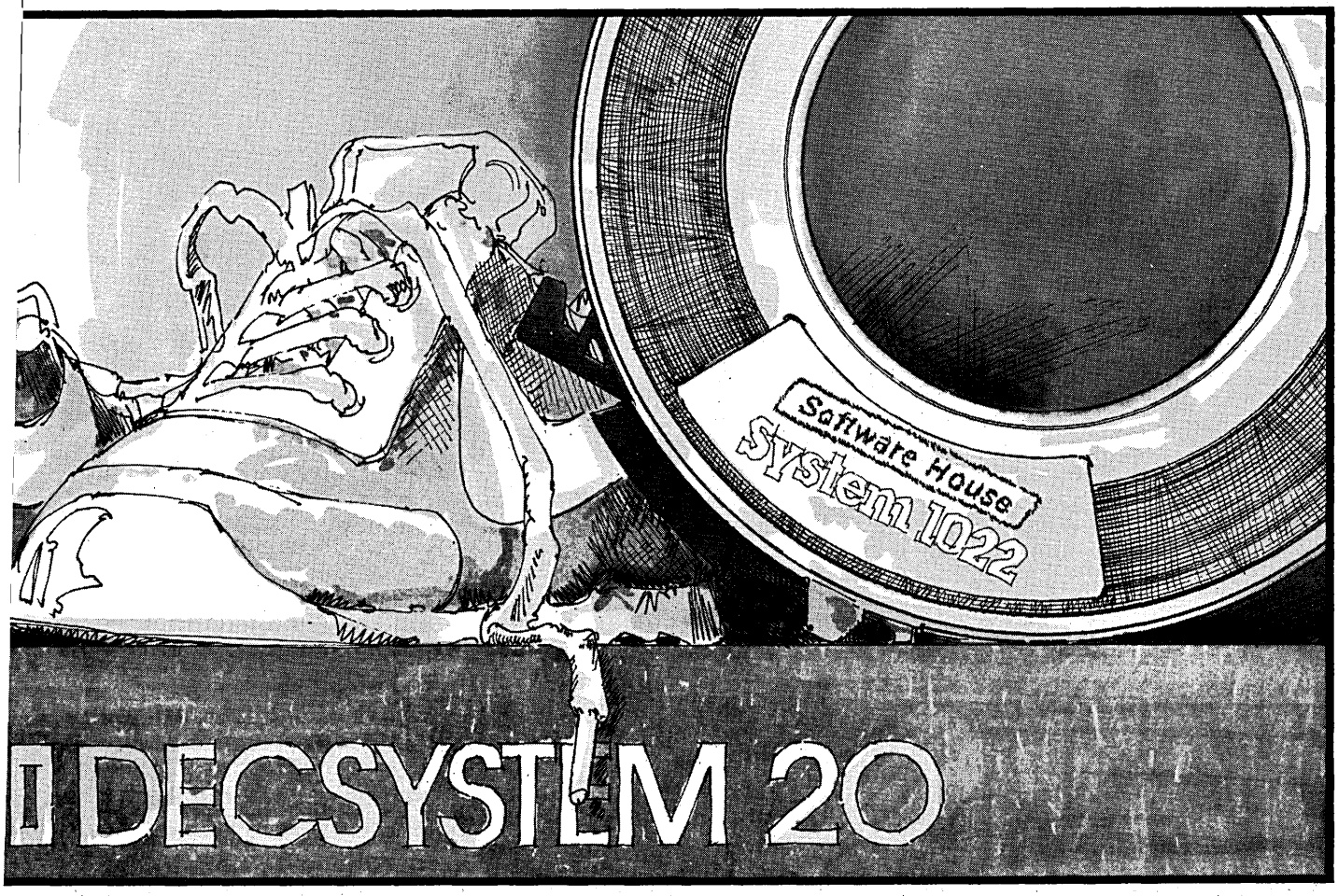
Not to worry. If the word is followed, 20-day approvals will be a thing of the past. Under the new requirements, analyses are planned to take no longer than 10 days. Responsibilities for sole-source acquisition strategies will really and truly have to be issued and documented by the agencies, not GSA. Additionally, GSA will indicate that at some future time it may return to examine an agency's procurement files.

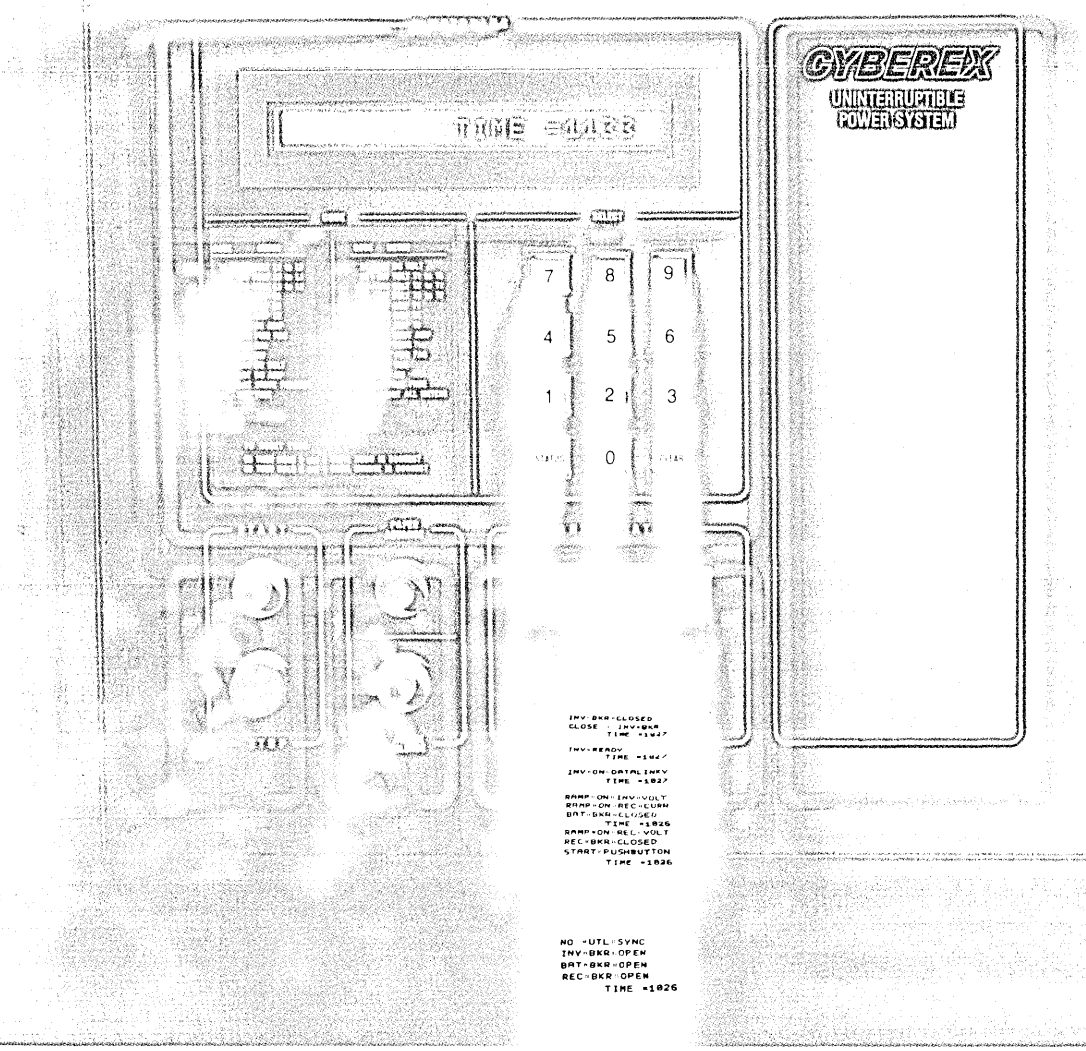
Even more significant is that as GSA finds agencies performing more and more within the intent of the new system, it can raise the ceiling for a particular agency. It may give the Department of Interior, for example, a blanket delegation for purchases up to $5 million. It may also totally remove the procurement authority of the Department of Commerce, if it should perform below minimal standards, and force that agency to get GSA approval for pocket calculators. The ultimate goal is as much agency autonomy as possible.

"I think this is going to make the vendors happier because they will finally understand how GSA operates," Coyer said. "The approval process now is too vague to give them an idea as to how we pass judgment on things. They shouldn't worry that a potential order is going to be canceled through a GSA decision. The potential for agency autonomy should appeal to them."

Does it ever.

"We're definitely in favor of it," said Fred Ikenberry, manager of industrial marketing for Sperry Univac. "We welcome $500,000 and would like it to go to



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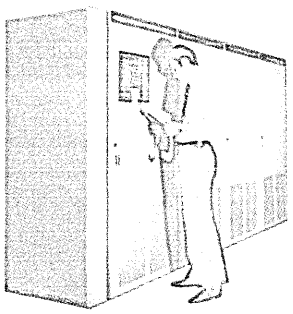

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**CIRCLE 51 ON READER CARD**

$1 million. So would a lot of others, but Congressman Brooks would never stand for it. It's a good move because it's getting away from regulation.

"The risk, of course, is that there's more selling on the user level. But we'll take the chance."

So will others.

"You're never really sure what they're going to do until it comes out," DEC's Huberfeld said. "Even though you're talking to them, you don't know what's going to happen until it occurs. If in fact [the new plan] is what's going to happen, I think the industry is very much in favor of it. Raising the limit seems a particularly appropriate thing to do."

"It should make life easier by reducing the delay in federal procurement," agreed Jack Biddle, president of the Computer and Communications Industry Association (CCIA). "Many of our members have increased their government business and found it profitable. Several are making it a large part of their future planning."

**The ultimate goal is as much agency autonomy as possible.**

But before those companies and others start dancing in the streets, another caveat may be in order. The revisions are optional for six months, after which time GSA will review them to see if they lived up to expectations. Following that procedure, the regulations become mandatory.

"There's going to be no significant difference for a while," Coyer said. "It's going to take time for the vendors to adjust their marketing strategies and the agencies to alter their acquisition procedures. But we hope this is going to enhance the agencies' planning process." Which, ipso facto, should simultaneously enhance those of vendors. But, in government as in life, there are no guarantees.

"One of the fears in the process," DEC's Huberfeld admitted, "is that GSA is forcing the agencies to create a GSA-type environment within themselves. When GSA pulls out of that environment, what's going to happen? What are we buying here? The agency may sit on a contract longer than GSA did.

"They also need to give clear directions to the contracting officers as to what to do. They're too often confused now. If you're going to raise the limit, you better make sure they know exactly what's expected. When a bureaucrat is faced with a new question, the tendency is not to do anything. That's the safest way out."

"There's no question that contracting officers are divided too thinly over too much material," CCIA's Biddle said. "The success of the new system is going to depend on their degree of sophistication. As long as the agencies openly compete for procurements, things will be fine. It's decisions such as the incumbent getting an extension without the government checking to see if new technology has developed that cause problems."

**"There's no question that contracting officers are divided too thinly over too much material."**

Those difficulties won't vanish in a month or six months or a year. But with the agencies, GSA, and industry agreeing that a change had to be made, it represents a significant departure from past practice. In the federal government, that's tantamount to a revolution.

"We have jurisdiction over more than 50 agencies," Coyer said. "We don't feel we have more knowledge than all of them, and in some cases we have far less about their specific needs than they do. It's a staggering amount of paperwork, and in many cases we were just rubber-stamping what we received. This new system should make it easier for everyone, particularly the vendors."

It might even be a pleasure doing business with the government.

**—Willie Schatz**


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PERSONAL COMPUTERS

# TANDY HAS NEW FOCUS

**Tandy's target is to offer electronic options for everything from banking to education—all via home computers.**

Tandy Corporation, the evolving computer giant, will next year pioneer a new concept in personal computers—the "convenience" system.

The move is the first part of a new program from the Texas-based company and its newly appointed chief executive, John V. Roach. It is aimed at consolidating Tandy's lead in low-cost computers and generating the first mass market for the home user under the noses of established giants such as IBM and Texas Instruments.

The new system concept picks off areas of public interaction where the individual is inconvenienced or put out in any way, and offers him the electronic option to handle things more comfortably from his home.

The first point of irritation that Tandy has begun to focus on is banking. A deal with a Tennessee banking group and the CompuServe time-sharing network now offers the nation's first bank-at-home service on personal computers.

But this is just the beginning. Tandy is also actively seeking new partners to plug the customer in his home into other services, executives say. Early areas of penetration for "convenience" systems will be electronic mail and education, say Tandy insiders. One other major application at this early stage could be the buying and ordering of food and other goods from home computers. The theory goes that supermarkets and big stores, like banks, would welcome the chance to have less staff tied up at the point-of-sale, and would welcome such development as a productivity tool.

So far home computers have been purchased largely for playing games. Charles Phillips, senior vice president at Tandy's Radio Shack division, says that in an effort to take the home user further and expand the market, his communications options have to be expanded. This is what each new plug-in service does. Each new service is just one strand, says Phillips. Pretty soon the strands become a communications web as the user does more with his system and becomes more experienced. And, like the spider, the user in the center hungers to trap more food (computing power) with his web. And the web grows.

Phillips explained that homeowners aren't going to rush out to buy personal computers. This is why the new Radio Shack offering has a two-layer approach. The first, or starter layer, offers a simple videotex terminal that works with any domestic tv and telephone to interact with a data base or information source. This gets the user communicating. In the case of the banking application (with Tandy's first partner, United American Bank, Knoxville), the link allows users to pay bills, apply for loans, monitor their ever-changing financial profile, and use a sophisticated bookkeeping service. Later, the user will be able to more into such things as writing letters, investing money, and getting paid—all electronically.

**Most dp experts agree that at $798 with monitor, Tandy's new Color Computer is very aggressively priced.**

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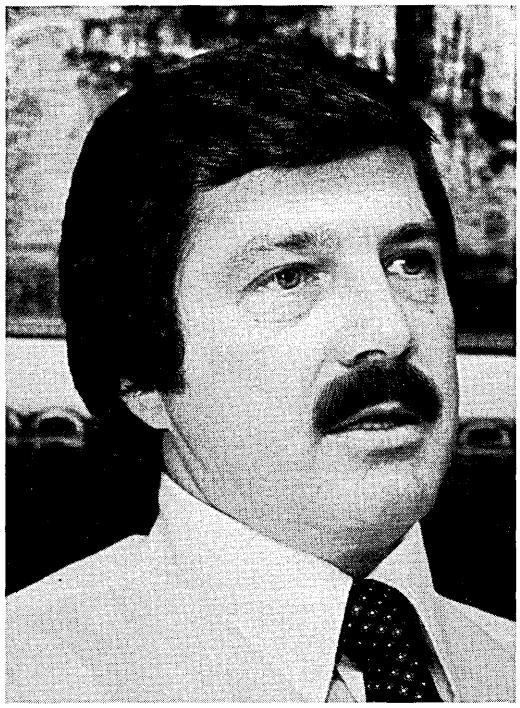

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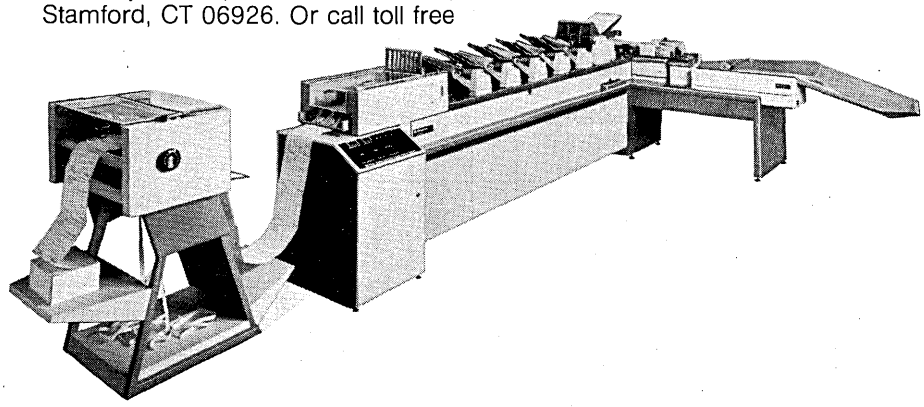

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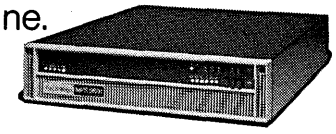

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Once the user feels the urge to do more processing in his home, he can move to the next layer—the TRS-80 Color Computer. At this level, processing power, storage, high-level languages, and communications software enter the picture. If the user wants, he can start at this level.

If all this sounds a bit pat, it's because it is. Tandy admits that it needs more than a communications highway with the outside world to make the market for home computers take off. Ultimately, price, availability, and support for these systems will be the deciding factors.

**As Radio Shack steps up into the big league, it is clearly on a collision course with IBM.**

Most dp experts agree that at $798 with monitor, Tandy's new Color Computer is very aggressively priced—especially as it links to any tv set, to modems and printers, offers videotex, extended BASIC, and the possibility of 24K of RAM. Tandy's vp of manufacturing, Jon Shirley, said that following a joint venture with Datapoint, the Color Computer would also get disk capability—"probably in the second quarter of next year."

Experts agree that this kind of response will keep Radio Shack as the low-price leader. But the feeling is that the price of a home computer with even more power and functionality than the Color Computer will have to fall well below $500 before the market bites in a big way.

Now that the market is being "primed," the fight for customer base has begun in earnest. In just three short years, Tandy has created a base of well over 200,000 users. Though estimates vary, some say this could represent between 30% and 50% of all computers sold under $10,000. So far, Radio Shack's main competition has come from the Apple and Commodore Pet personal computers. Already the semiconductor giant, Texas Instruments, has made a half-hearted attempt to enter the market with a "high-priced" home computer for some $1,400 (with monitor). The company is expected to try again with a cheaper alternative and with viewdata-type terminals, sources claim.

But it is the more-than-passing attention of IBM to Tandy's mercurial rise that is likely to worry new chief Roach most of all. Roach has been the guiding light in Radio Shack's transformation to a computer company. The first TRS-80 computer was sold in 1977. Last year Roach and entourage drummed up some $175 million of computer sales, or about 12.5% of Radio Shack's total business. Next year that figure could top 20% on total projected sales of $1.6 billion by the electronics group.

Tandy has shown itself eager to capitalize on its computer growth by making Roach its new head. But now, as Radio Shack steps up into the big league, it is clearly on a collision course with IBM.

Observers explain that Tandy's best buffer against the might of IBM is its own customer base. And one way to boost this base is to rent as well as sell systems. Renting at low cost is a key element in the new "convenience" systems. The new videotex terminal, used with the customer's own color tv as a display, costs $15 a month. The Color Computer with its own display costs $25 a month.

In the case of the banking application, subscribers to the service (who must be account holders) obtain certificates from the bank. They then take the certificates to any Radio Shack store, pick up the computer, and take it home. Billing is handled by the bank.

**The company's continuing philosophy is to make only what it knows it can sell through its ubiquitous outlets.**

According to one estimate within Tandy, the company could place over 20,000 new terminals and computers by the end of next year as customers of other banks join the plan. In addition, at least 20% of Radio Shack's current 200,000-plus base is expected to buy the new videotex software package for their computers, which are mostly being used in small business applications.

All of this momentum gives Tandy's Radio Shack a great chance to set the early standard. Phillips stressed that Radio Shack had a big advantage over other competitors that would come from the dp industry "who weren't used to consumer selling." He added that as a manufacturer, buyer, and retailer combined, Radio Shack also has an edge over companies that are accustomed to consumer selling.

One big ace is Radio Shack's unequaled number of store outlets—approaching 8,000 worldwide—that next year will be augmented by new centers selling just computer systems. Apple, on the other hand, still has the problem of selling via distributors.

But the picture for Radio Shack isn't all rosy. Shirley pointed out that the company's advantage is slowly being eroded as its evolving user base presses for more computing power, peripherals, and most important of all, software. In these domains, the company has little or no experience.

As it is, Radio Shack has less overall control of its "complete" computer system than it would wish. And this could eventually be reflected in the price. Shirley said that the company makes more than 50% of the complete system (the element it controls), but is heavily dependent on others for semi-

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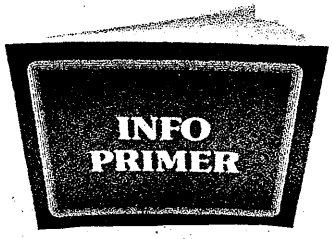


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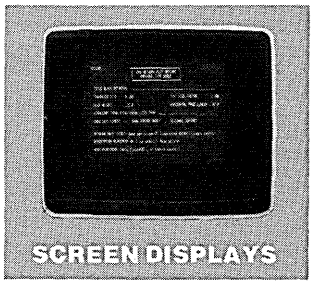


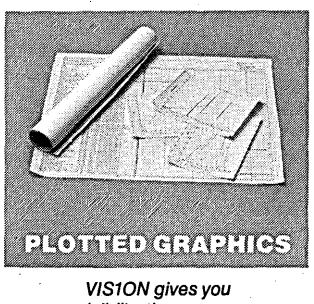


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conductor chips, peripherals, and software.

"We'll certainly never start to manufacture chips," said Shirley. "We'll continue to buy from multiple sources, and that way maintain flexibility."

But the company has not counted out any of the other areas for future manufacturing. One approach is to joint venture on development and manufacture, as it is doing with Datapoint on disks.

"We'll always look in the U.S. first for partners," said Shirley, "but if we can't find what we want, we'll look overseas." The company will certainly do this for new printers. "We've found the abilities and attitudes of U.S. companies in this area to be very poor," he said.

But the company's continuing philosophy is to make only those things it knows it can sell through its ubiquitous outlets. "To do otherwise would be foolish," said Shirley. Already the company has the beginnings of a complex computer architecture. Along with the Color Computer, which is turning into a communications front-end, it has its top of the line Model II business system, which starts at $3,500.

Even if the company artificially imposed the Model II as the ceiling to its line, its users' demands, particularly for new software and more cpu cycles, could force it out of its comfortable selling pattern and place it in a vulnerable position.

If this happens, and it seems likely, the company could become a victim of its own success at generating a mass market for small computers.

"The company would be playing into IBM's hands," notes one industry consultant. "After the audience is warmed up, the big star would come on and grab all the applause."

**—Ralph Emmett**

WORLD TRADE

# FREE TRADE FRACAS

## Recent government dp buys in Germany smack of preferential purchasing policies, U.S. vendors charge.

U.S. vendors and Department of Commerce officials are worried that the largest and last major European market paying at least lip service to the principle of free trade in dp goods may be revising its policies.

The last bastion of European free trade is the German Federal Republic. It is by far Europe's largest market and, until recently, its administration had never openly applied government pressure to shut out foreign suppliers.

But the nation's official open purchasing policy has seemed a little shaky this year. Two U.S. suppliers, Burroughs and Univac, both encountered administration pressure to buy German—after both had seemed to gain clear contract wins on technical grounds.

The Burroughs case seemed such a flagrant breach of free trade, and possibly even of German law, that the U.S. Embassy's commercial department in Bonn has taken a close interest, under the watchful eye of Washington. "We're worried that it represents a change in [German] government policy," a U.S. Embassy source in Bonn told DATAMATION.

The Japanese, French, British, and the Brazilians have already bolstered their own dp industries by directing that public procurement of computer equipment should go to domestic manufacturers. It is estimated that the government market in Japan buys 95% of its dp wares from Japanese manufacturers. The French managed to reduce IBM's share of government orders from 55% to 23% between 1970 and 1979 via a Draconian "buy French" policy. And the U.K. government recently put off a deci-


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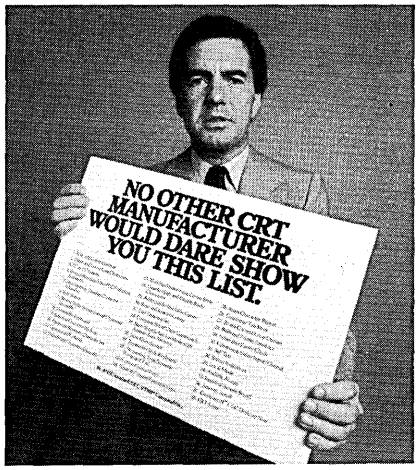


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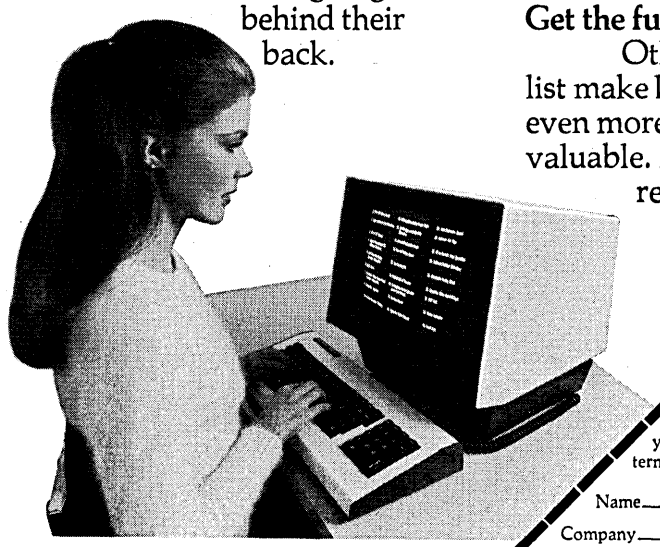

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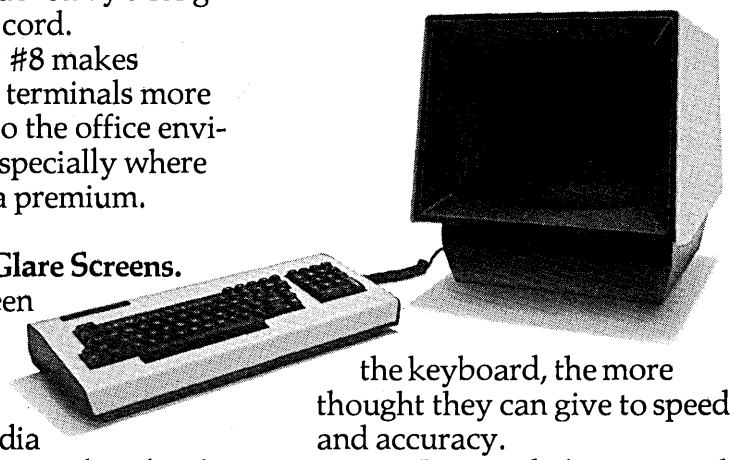

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sion on a huge computer system for its Internal Revenue Service because its tax authorities wanted to buy IBM instead of ICL.

Ironically enough, Europeans vehemently claim that the U.S. is at least as guilty as Europe, citing a 1933 "buy American" act—backed up by a "buy American mindset," says a French administration official. But German companies like Siemens and Nixdorf Computer have never seemed to benefit from an official "buy German" policy—till now.

The Burroughs case involved a proposal to equip the University of Bremen with a large computer system, which would be 85% paid for by the federal government and 15% by state authorities. Burroughs appeared to win the order for a 7800 system worth around $5.5 million.

Burroughs actually flew the 7800 into Bremen one year ago. But the university then refused to accept it, and Burroughs eventually moved the machine from the university into storage. This fall, Burroughs began legal action and sued the university for about $5.5 million.

What actually happened to make the university change its mind is a matter of dispute. Dr. Hans H. Donth, a former Siemens employee and now head of the Science and Technology Ministry's dp division, admits the government intervened. "But only because we wanted to get our money's worth," he says.

Initially, the story goes, Burroughs "oversold" its system, proposing a machine which was twice as powerful as needed and a little more expensive, but with a better cost/performance ratio than the other proposals offered. So Burroughs got the initial recommendation, and was assured it had the order. Then, because the university was going for a larger system than that which had figured in the request for proposals, Siemens managed to argue successfully that it could resubmit a bid.

**Siemens undercut the Univac bid for the Munich airport system with what observers say is an unrealistically low price.**

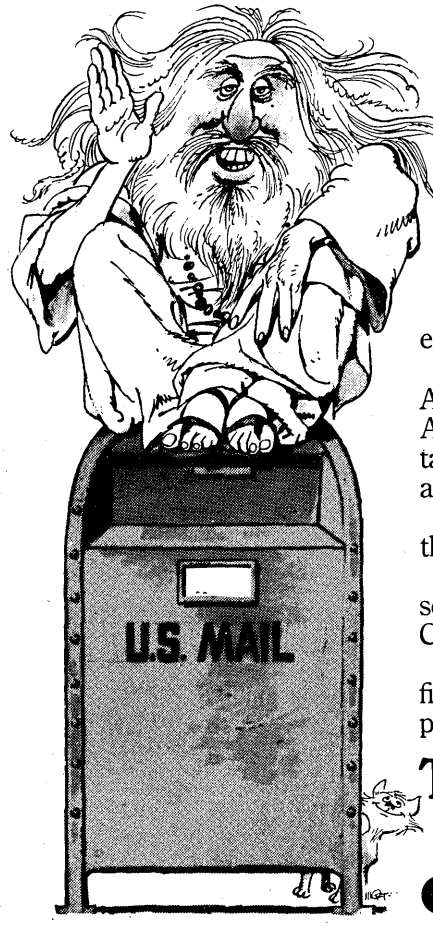
Siemens' new offer was a Fujitsu 7800 IBM-compatible system, which Siemens sells under license. The two-machine proposal—a 7880 and a 7865—is ready for immediate delivery, says Siemens.

Burroughs' local management is incensed at this reversal. The lawsuit is aimed at compensating the company not only for the lost order, but also for the storage costs of its 7800. "They're taking the risk of paying for the Siemens computer and for the Burroughs system," said a Burroughs source. (A parallel case in France between Cii-Honeywell Bull and Univac ended with a similar costly solution.)

"For the first time, the German federal government is saying that we cannot honor their business agreements which have been signed because they will only buy German," the Burroughs source said.

While the Burroughs suit goes to court, Univac has a less clear-cut case. The public sector-controlled Munich airport, which is being expanded, called for proposals to increase its dp capacity. In summer 1979, Siemens, Univac, IBM, and Cii-HB submitted proposals. The technical recommendation went to Univac, which claims to have installed 50 similar systems worldwide.

But then Siemens undercut the Univac bid with what observers and Univac say is an unrealistically low price, and a price achievable only because of German government funding doled out to Siemens. The German company, anxious to get experience in airport systems—and knowing of a number of other proposals coming up, for example, in Frankfurt and in the Third World—agreed to guarantee 99.99% availability, with a penalty almost the equivalent of the system purchase price. Siemens also threw into the deal 15 high-level technical personnel for two years to help with the installation.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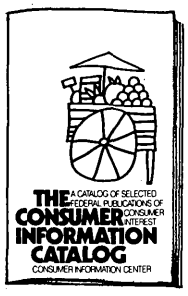


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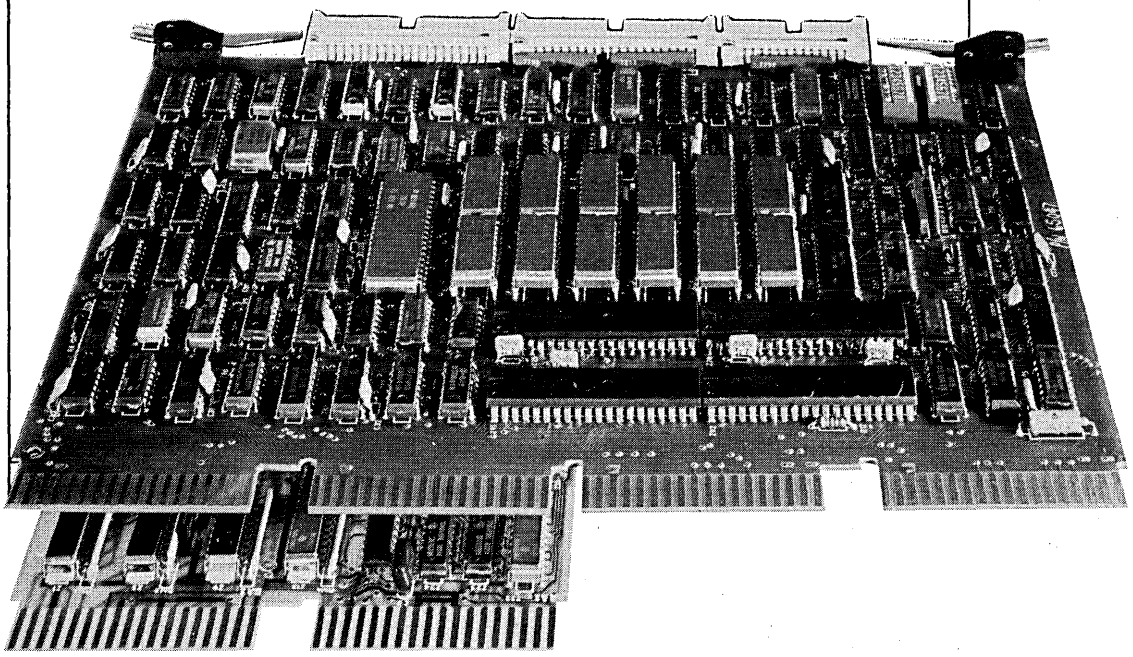

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**CIRCLE 66 ON READER CARD**

## NEWS IN PERSPECTIVE

Suspicious that public sector pressure was brought to bear on the airport, Univac also complains bitterly that the Univac machine would be built in Germany, while the Siemens offering will come from Japan. Siemens replies that 75% added value will come from work done in Germany. But, retorts a U.S. source, "that's just for their profit margins and the translation of the manuals."

Another grievance of Univac is one that has frequently come up in the cutthroat business involving large system tenderings. "A proposal costs about $54,000. U.S. manufacturers may become unwilling to submit proposals if they don't think they have a fair chance of success," said a Univac spokesman. IBM has used the same argument in the past, in the U.K. at least.

**It's an expensive business preparing proposals, particularly if the order is already earmarked for a domestic firm.**

One French company echoed Univac's sentiment that it is an expensive business preparing proposals if the order is already earmarked for a German firm. "They used to bring us in just to lower the Siemens price," the company's president told DATAMATION. The pragmatic solution this company came up with was to join rather than beat the Germans. "We never got any [public sector] business in Germany till we teamed up with [Company X]," he said, anxious lest the disclosure of the German company's identity spoil a business relationship.

Whatever the outcome of the Burroughs and Univac affairs, they have triggered off a spate of accusations that German vendors like Siemens and Nixdorf have always benefited from a low profile public sector purchasing policy. Said Univac: "It has been going on for years." A major U.K. supplier added, "We've always had the impression that there has been an undercover policy for years." A German commentator notes, "Siemens has such a powerful lobby that it never needed official government backing."

Under the new international trade regulations coming into effect at the beginning of next year, the only way of carrying on a preferential purchasing policy will be "undercover." That there are ways of doing this is not doubted by any international businessman or official.

Siemens, meanwhile, is out for a fair crack of the whip. Until recently, the German government actually had less German vendor supplied systems installed than the private sector.

"In no other country is the ordering of computers by public authorities so free," declares Siemens dp division head Dr. Anton Peisl. "All we want is an equality of opportunity for German computers," he maintains.

**—Andrew Lloyd**

COMMUNICATIONS

# COMTEN BEFORE & AFTER

**Since its acquisition by NCR, Comten has a different—but not diminished—role.**

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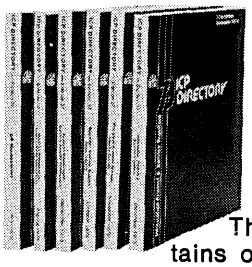


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ible, while at the same time offering users expanded features on their networks.

Most front-end communications processors, those highly specialized computers that operate much like traffic cops between data networks and mainframe centers, are supplied by mainframe vendors as part of their data communications equipment. But over the years, a few independent suppliers—such as Comten—have offered front-ends that provide features which go well beyond the basic capabilities of the processors from the cpu makers.

Now it appears that NCR Comten Inc. has taken on the dual role of helping NCR expand its datacom capabilities, while at the same time continuing its own role as an independent supplier. While the two positions may seem contradictory, they make sense to Paul D. Byrns, vice president of systems development and a 12-year Comten veteran.

"Our fundamental thrust is to find solutions to user problems, recognizing that IBM exists and recognizing that they have significant force. It is to the user's benefit, and thereby ours, to provide him an easy way to work with and take advantage of IBM systems and our systems together," Byrns explained during a recent interview. "The use of our Communications Networking System [CNS] products never required the user to give up IBM interconnectivity or compatibility. We could have done it as an alternative to IBM, but instead we said the user can interconnect to IBM, maintain the network, and in addition will be able to use other facilities."

While Comten will continue to provide compatible interconnection to IBM Systems Network Architecture (SNA) networks, it will also give users the ability to utilize public data networks.

Although Byrns agrees generally that IBM will have to come up with a succes-

**"The main problem with an SNA-type network structure is that it goes a long way toward precluding mixed vendor environments, thereby precluding the competition of new technologies."**

sor to its 370X line, he does not believe that suppliers like Comten must wait for specific opportunities since there are so many products and capabilities that are needed in the networking area.

Acknowledging that many users have regarded Comten as a front-end vendor, Byrns said he sees the company as a communications network supplier, offering front-ends, remote concentrators, multiplexors, modems, plus the necessary related services such as software, simulation, and performance measurement. "This means a communications envelope which really takes in everything from the terminal side to the host access method and all those products in between—with the exception of becoming a common carrier," he said.

Some of these capabilities were available as part of the recent alliance with NCR, he said, adding that Comten is "jointly developing with other divisions a series of new diagnostic modems that will be part of the overall structure." This series will probably be introduced in late 1981, he indicated. Already available are 1,200 bit/sec lower-speed Bell-compatible modems that are part of the NCR product line.

Comten's front-end business really is divided into four types of machines, according to Byrns. These include the IBM 270X emulation-based systems; the CNS processors which give users the ability to interconnect multiple data centers; the IBM Advanced Communications Facility (ACF) compatible product; and a newer product called data switching systems, which will give users the ability to run networks independent of a host mainframe. Under this latter concept, the network will maintain control of facilities and operate independent of the large central mainframe. He compared this with the evolution of the IBM 8100 under SNA, although Comten is plan-

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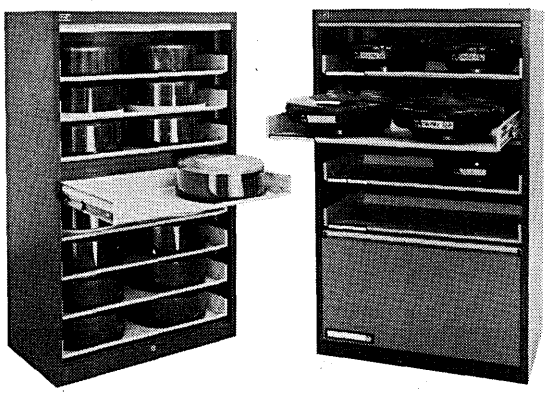

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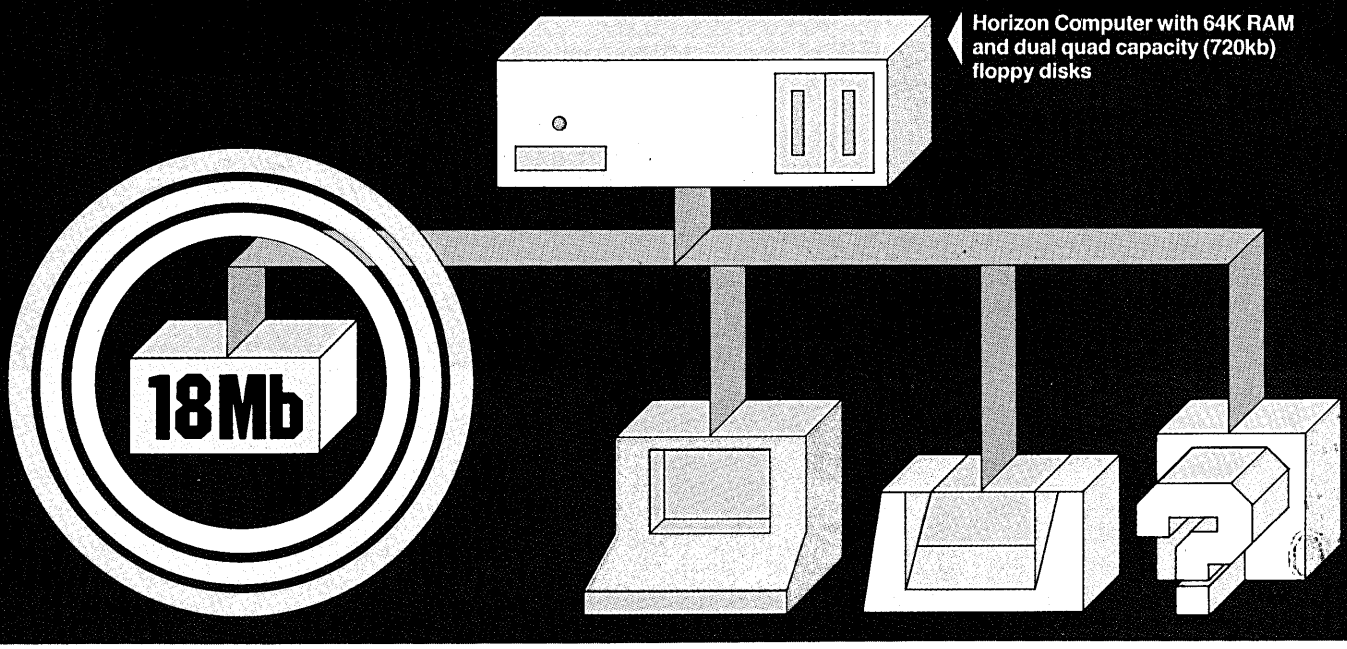


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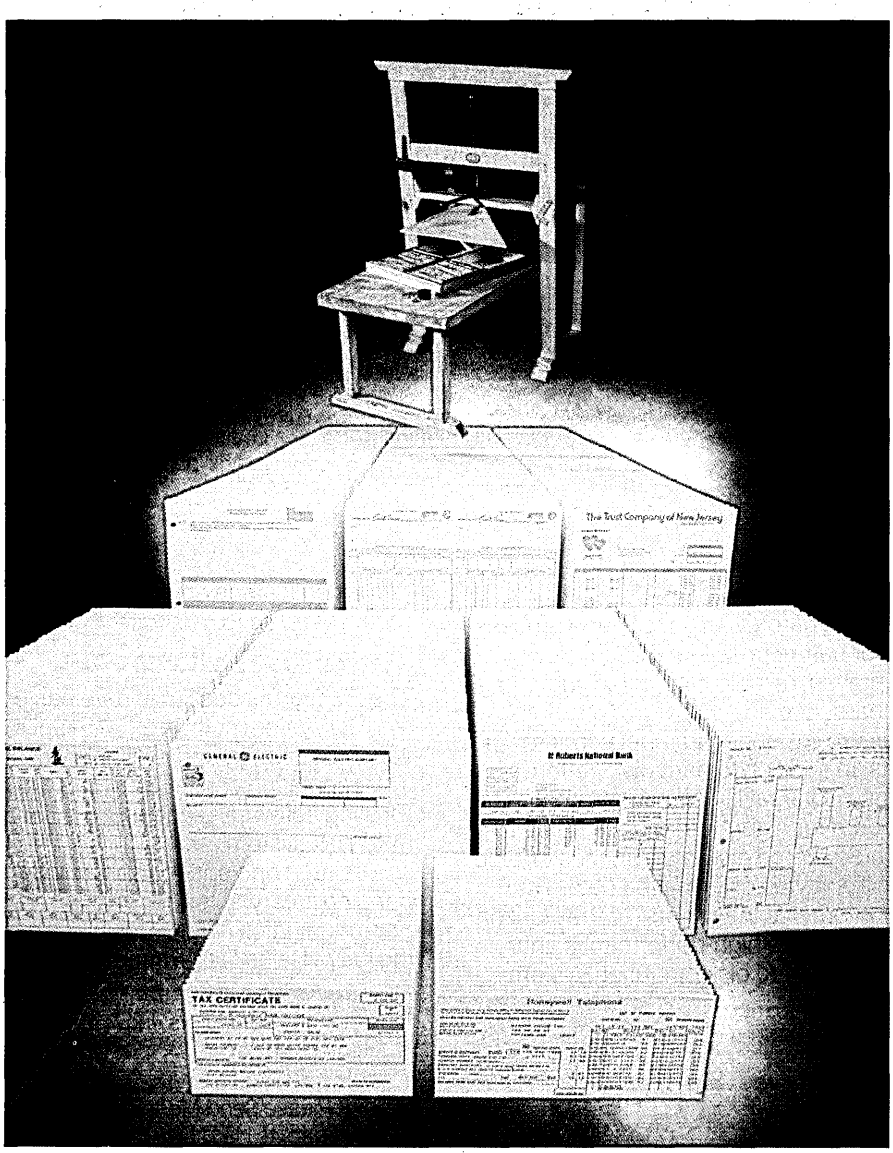

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ning "a number of differences" to that approach.

From a networking standpoint, Byrns said, five approaches are recognized today within the data communications industry. These include:

- a circuit-switched net that has high performance, high bandpass, and flexible routing,
- an "accept-and-forward" system that's similar to CNS and SNA. Here, buffering is accomplished within the network and then data is forwarded by time multiplexed techniques,
- X.25 based systems that are "partial store-and-forward" nets,
- store-and-forward systems that are suited for electronic mail, facsimile, and different rate structures and types of transmission,
- datagram, which provides a system to send a standard message in a standard way and is a "poor man's electronic mail."

Each of these approaches will continue to exist, and Comten intends to support all five because no one technique is a clear winner over the others, Byrns said. The main factors in user selection are what the user wants to achieve and what the user can afford.

Today within the Bell System, much of the communications takes place over circuit-switched facilities, but this is beyond the reach of the user primarily because "unregulated vendors such as IBM and Comten have not provided effective software packages to use these circuit-switching systems." Comten intends to provide this type of software in the near future, Byrns revealed. The advantages of X.21 circuit-switched networks are evident in the new Scandanavian Nordic and West German data networks.

**Comten sees itself not as just a front-end vendor, but as a communications network supplier.**

Returning to the Comten philosophy of providing multiple networking approaches, Byrns said great damage can be done if one network design precludes the interconnection of different vendor products. "The main problem that I see with an SNA-type network structure is that it goes a long way toward precluding mixed vendor environments, thereby precluding the competition of new technologies." Recent IBM statements that the company will support both X.25 and X.21 were made by technical spokesmen, and Byrns said he would like to see that implemented by the IBM marketing divisions to get a clearer indication of how much flexibility there really will be within the SNA environment.

Network users should have the option of staying with traditional private line approaches or using public data nets such as Tymnet or Telenet. In addition, the user should be able to integrate satellite services where they fit. And all of these should be accomplished without obsoleting software and hardware investments already in place. "That is our primary development challenge," Byrns said.

"We say that there is a community of interests that we belong to. This community of interests is represented by organizations such as IBM, AT&T, ITT, and the [foreign] PTTs. Our objective is to be able to work effectively with the offerings of these major organizations as a contributor—not to provide a unique alternative. In that manner, I think eveybody can benefit," Byrns concluded.

**—Ronald A. Frank**

LITIGATION

# ORDER IN THE COURT

**What's inherently wrong in litigating big court cases is examined by Tom Barr.**

After more than a decade in court, one of the principal problems in *U.S. v. IBM* is that there is still "no meaningful definition of the issues" in the legal contest.

That's the opinion of Thomas Barr, lead attorney for IBM in its mammoth antitrust case with the U.S. government. In a bitter but methodical assessment of the problems inherent in the litigation of large cases, published recently by the American College of Trial Lawyers, Barr, a partner in the New York firm of Cravath, Swaine & Moore, denounced "most document production" and most of the 3,000 depositions (over 6,000 pages) taken in connection with IBM's 18 antitrust cases as "a waste of time—confused, misguided and wasteful.

"I think the time has come to admit that the whole concept of discovery, at least as presently applied to big cases, is just wrong," Barr charged. The only way to stop this "senseless abuse of the clients' pocketbooks" is with common sense and tighter and more disciplined court procedures, he said.

"I believe lawyers are honor-bound to stipulate as much as possible," said Barr. "I believe judges should force, and I emphasize the word force, stipulations" or agreements between litigants stating the uncontested factual background for the case.

Barr spoke with ill-concealed anger and frustration—anger that politics should mar the procedural elegance of the law so overtly, so blatantly, as it does in antitrust cases; frustration that the strategic, tactical, and trial talent of the Department of Justice was so sparse as to painfully tangle and prolong the case.

Twenty-five lawyers from the DOJ's Antitrust Division have examined witnesses at the trial, he noted. Only one examined more than five; nine examined only one or two. Seventeen of them graduated from law school after the case started; six of those graduated after the actual trial started. Of the six government lawyers who signed the original complaint, none remain with DOJ, said Barr. Of the 10 lawyers who signed the trial brief, only one junior lawyer remains, and the current lead attorney for the government is the fourth assigned to the case.

"I can't condemn those young lawyers for their lack of experience or knowledge, but I tell you that a series of young lawyers examining or cross-examining their first witness ever with little or no knowledge of a huge record in a highly technical and complicated field can, and has, with a rare exception or two, turned the trial into petty, repetitious, meaningless bedlam. Some of them may be good trial lawyers someday," he said. "Now they are just beginning to learn, and it is the most expensive legal education in history—paid for, of course, by my client and the public."

"Last spring, former Solicitor General Bork called the IBM case the Antitrust Division's Vietnam, and that is what it has become," declared Barr. And the blame for the Division's lack of management and control, for assigning inexperienced lawyers to the case, for letting "a case which could have been tried and over within a year turn into a perpetual discovery machine, belongs" said Barr, squarely on the executives of the Antitrust Division.

"Most of the lawyers I have seen for the last 11 years from the Antitrust Division are inexperienced, underpaid, and totally

**Of the six government lawyers who signed the original complaint, none remain with DOJ.**

imbued with the bunker mentality," said Barr. "They are defensive and self-righteous, convinced that they are crusading knights defending the citadel called 'public interest,' which only they understand. In order for the Antitrust Division to get and keep better lawyers, it must pay them more money. Not a few thousand dollars more, a lot more, two or three times as much as the present incumbents are now paid." When the state doesn't pay them, their professional peers view them as pariahs, politicians manage them, and novices are pitted against pros, what can IBM, any defendant, or the public expect from these Guardians of the Republic?

"Attorney General Civiletti recently said that the Antitrust Division had

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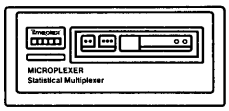


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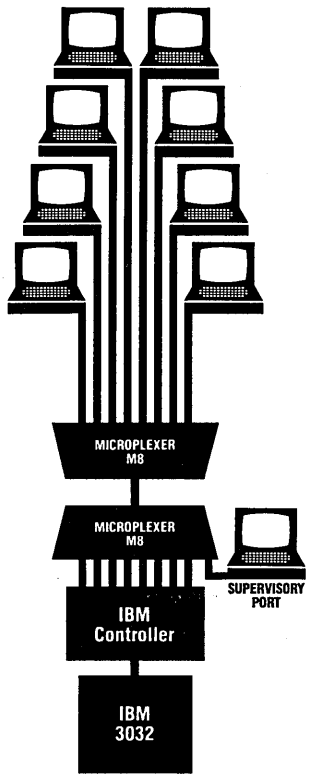


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learned painful lessons from *U.S. v. IBM*. He said, 'Rather than the government laying back waiting for disclosures during trial, in the AT&T case the government has

**"The myth of defense lawyers delaying cases is just that—a myth."**

developed evidence, theories, and provable facts, and entered early 3,000 stipulations and findings of fact prior to the trial.'

"Just ponder that statement for a moment," Barr suggested. "Who ever heard of a plaintiff laying back and waiting for disclosures during trial?"

Big cases are not inherently unmanageable and untriable, he said. Big cases like the major antitrust cases "can be and are tried quickly and well if—but only if—the lawyers and the judge do their jobs properly." And when a big case does get out of hand, he added, "then at least two of the three participants are to blame, and maybe all three.

"The myth of defense lawyers delaying cases is just that—a myth," Barr declared. "Of course, defense lawyers do often stall and procrastinate. So do plaintiffs and so do judges. Plaintiffs do so because they want to settle cases they think they can't win or don't have the heart to try. Judges often, understandably, simply want big cases to go away. There are few districts where a three- to five-month trial doesn't have a devastating effect on case backlog and often on the personal life of the judge as well. But no one of the three can stall a case very long alone.

"It takes at least two, but the two can make a case last forever."

**—Vin McLellan**


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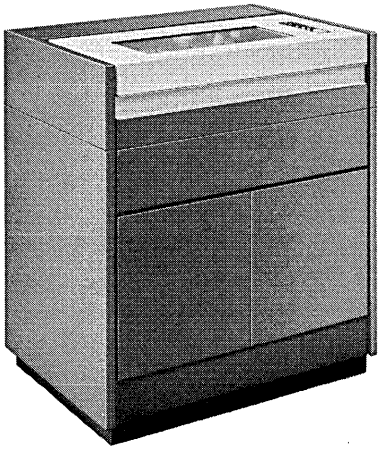

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THE OFFICE

# MESSAGE SYSTEM FLAWS

**People-oriented problems with electronic message systems can turn business friends into mortal enemies.**

It is generally agreed that the emergence of computer message systems into the office environment raises some novel people-oriented problems. Much has been written about the need to make such systems more "friendly" to speed their acceptance by users unaccustomed to dealing with computer-oriented systems.

But one office automation expert believes that people-oriented drawbacks can be overcome with people-oriented applications. While most analysts look for solutions in the technical features, David Farber, professor of Electrical Engineering and Computer Science at the University of Delaware, holds that behavioral patterns in the office are vital to understanding message system implementation.

Farber recognizes that electronic message systems can turn business friends into mortal enemies. In fact, he warned about such consequences at the recent Fifth International Conference on Computer Communication in Atlanta. But such drastic results are by no means inevitable, and the key to avoiding them may be related to the way people communicate.

Specifically, Farber sees business organizations as being "talk-oriented." That is, they are run by people who present themselves well verbally. But when these verbal leaders come up against systems that rely on written expertise, their power is diminished. "People who haven't been very effective as talkers quite often come on and take key positions," he noted.

While such shifts of power are not necessarily bad, most organizations don't

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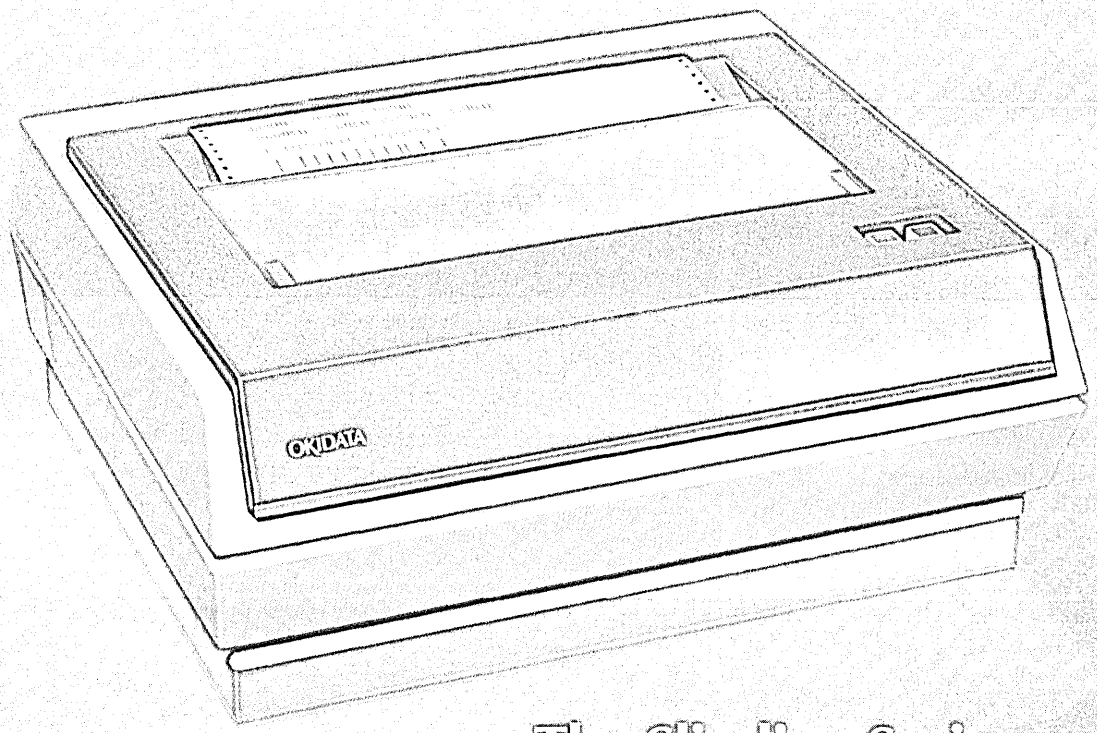


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understand what is happening. Managers see puzzling changes, and are quick to blame the system because it is not friendly enough.

The real cause of these social conflicts can often be traced to the fact that electronic messages essentially have no personality. They cannot express the author's mood, and that often leads to misinterpretation.

But instead of trying to overlay mood and personality onto electronic messages, Farber thinks multiple communication modes can provide an effective solution. He envisions an electronic message displayed on a screen in such a multimedia system. The user is prompted to read points one and two in the usual fashion. Then a note appears cautioning the message recipient to switch to voice mode to get the full impact of points three and four. "Or a light flashes on that says there's a voice message here, and the operator pushes a button and the message comes out on the terminal speaker," he explained.

Multimedia message systems would have the ability to mix voice and text, and in the process they would avoid many of the social problems that now occur. Farber believes that while technically feasible, multimedia message systems are not yet commercially feasible. But he suggests that the time is not far off.

**Electronic messages essentially have no personality.**

Message systems will not stop merely at multimedia approaches. They will be further enhanced with multiservice and multinetwork implementations.

Farber does not minimize the importance of making office message systems easy to use. He recognizes that computer-oriented equipment designers often overlook the need for simple man–machine interfaces. Yet he feels that more can be done to shape our electronic techniques to conform to the way we communicate in the business environment.

"The critical thing in this area is going to be systems that are relevant, that fit the environment. I don't think the winning systems have appeared yet," he said.

Where will these winning systems come from? Farber sees two sources: the communications companies that know how to traditionally interface their services with people-oriented needs, and the computer companies that basically "haven't been very good at [such] interfacing."

Obviously some of the present providers of computer message systems will turn out to be winners. Still, Farber says he probably has "more faith in the traditional carriers. . . . The telephone companies have their problems, but they tend to look at things with an eye towards people."

**—Ronald A. Frank**

## BENCHMARKS

**GOINGS-ON AT STC:** Storage Technology Corp. and Documation Inc. have signed an agreement and plan of reorganization providing for the merger of Documation into STC. Terms of the proposed merger call for Documation stockholders to receive 0.85 of a share of STC common stock for each outstanding share of Documation, of which 0.72 of a share of Storage Tech common stock will be distributed to Documation stockholders when the merger occurs. The balance of 0.13 of a share of Storage Tech common stock will be deposited and held in an escrow account to cover undisclosed and contingent liabilities of Documation. All agreements are subject to Documation stockholders' approval, and upon completion of the acquisition, Documation will operate as an STC subsidiary.

Several days after the merger announcement, STC president Jesse Aweida revealed STC's plans to develop a high-performance mainframe computer for the IBM-compatible market—marking the company's initial entry into the central processor market. Certain key STC employees, as well as resources and facilities, will be used in conjunction with a separately owned, independent entity which will be organized to design and develop this new family of processors. Recruitment of additional key members for the development team is under way, and financing of the development entity should begin in early 1981. Storage Tech expects to begin shipments of the new processor in early 1984.

**MIS BUDGET SURVEY:** The Diebold Research Program's 1980 MIS Budget Survey, conducted by The Diebold Group, Inc., indicates that "more and more MIS-related spending is done totally outside the MIS department by people who do not report to MIS management. In typical large corporations, for every dollar spent by the MIS department, an additional 30 cents is spent by the end users on MIS products and services, such as terminals, timesharing, minicomputers, software, and education." Other findings reported in the survey indicate a 16.4% increase in MIS spending in 1980 over 1979; a 9% increase in staff planned in 1980; MIS as a percentage of corporate sales is now 0.96%, down from 1.07% in 1977; and systems people claim 27% of the total MIS budget. Hardware presently accounts for 29% of the total MIS budget. However, if the 10-year trend continues, in another two years the percentage expenditure for systems people will be more than the hardware expenditures, the survey says.

**OLIVETTI TO MARKET SYNTREX:** Syntrex Inc. and Olivetti SpA have signed an agreement giving Olivetti marketing rights to the entire Syntrex modular office automation product line outside the U.S. under the Olivetti name. Olivetti will also have limited marketing rights for some Syntrex products in the U.S. As part of the agreement, Syntrex will incorporate several of Olivetti's office automation peripheral devices into its product line for U.S. sales. Details of the agreement have not been disclosed, but spokesmen for both companies state that it will involve significant numbers of Syntrex and Olivetti products. Daniel Sinnott, Syntrex president, indicated that his company will see revenues of $15 million to $30 million during the next two years from this arrangement. As another part of the agreement, Olivetti has invested $4 million in Syntrex in return for a sizable minority interest. The outcome for users? Syntrex or Olivetti customers can now "start office automation programs with electronic typewriters, expand to display-based workstations, and add advanced clustered system capabilities without risking equipment obsolescence," the companies claim.

**PA SURVEYS VIEWDATA:** PA International, New York, worldwide management consulting firm, has completed a preliminary review of Viewdata developments in the U.S., and plans to conduct a major research study underwritten by a number of American corporations. Here and in Europe, PA uses and provides information to the British Post Office's Prestel Viewdata system. In the U.S., PA is working on the implications and opportunities of Viewdata as an information disseminating medium. The major study will be conducted mainly in the States, but with key input from overseas markets. As a result of its preliminary review, PA found that U.S. Viewdata developments are being aimed primarily for at-home users. However, business and government usage will undoubtedly increase in the future and will dominate market utilization for several years, states PA. The completed study is scheduled for delivery in the summer of '81, and will consist of over 1,500 interviews with Viewdata providers, users, service operators, carriers, equipment manufacturers, governmental agencies, and the media.

**UNIVAC SUPPORTS X.21, X.25:** Sperry Univac has pledged to support the X.21 and X.25 CCITT recommendations. The announcement came upon completion of the company's pilot test phase of selected products with the Canadian Datapac network. In addition, Univac is developing and testing Public Data Network (PDN) interfaces for European, North American, and Japanese networks. Based on business rationale, stability of individual PDN implementations, and the firmness of network specifications, Univac plans a phased implementation of both hardware and software products over the next two years.

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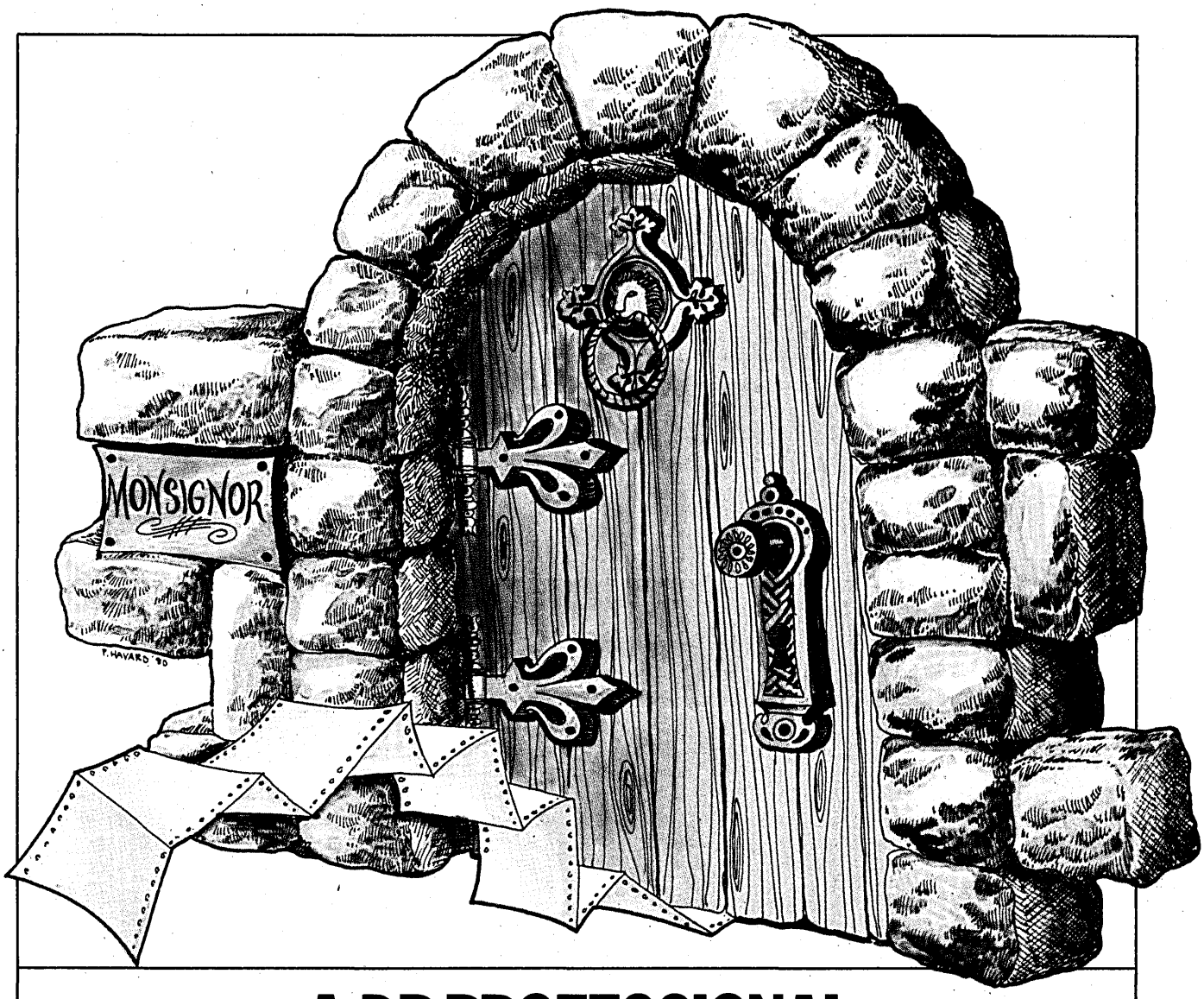


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# OEM America Meets

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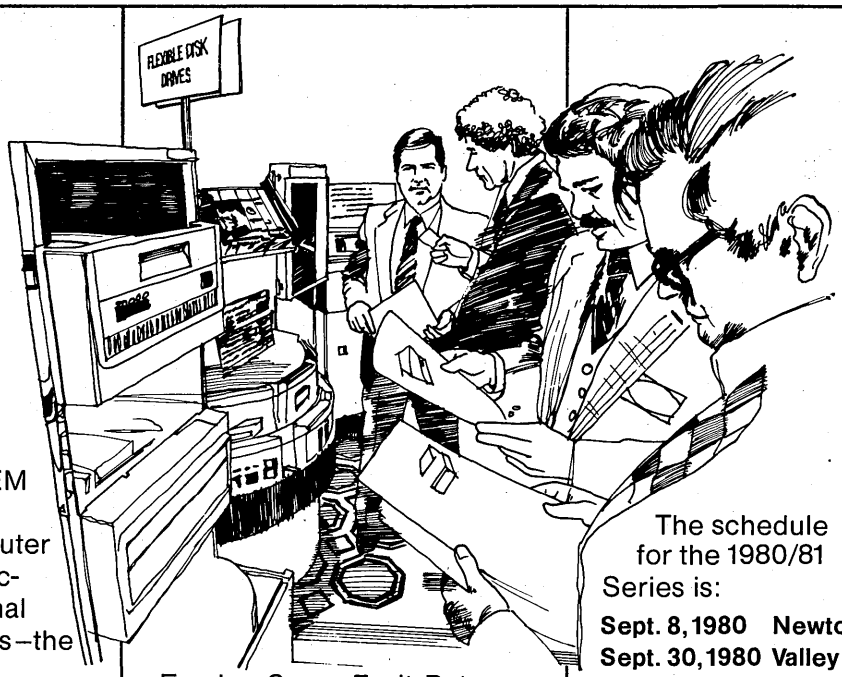


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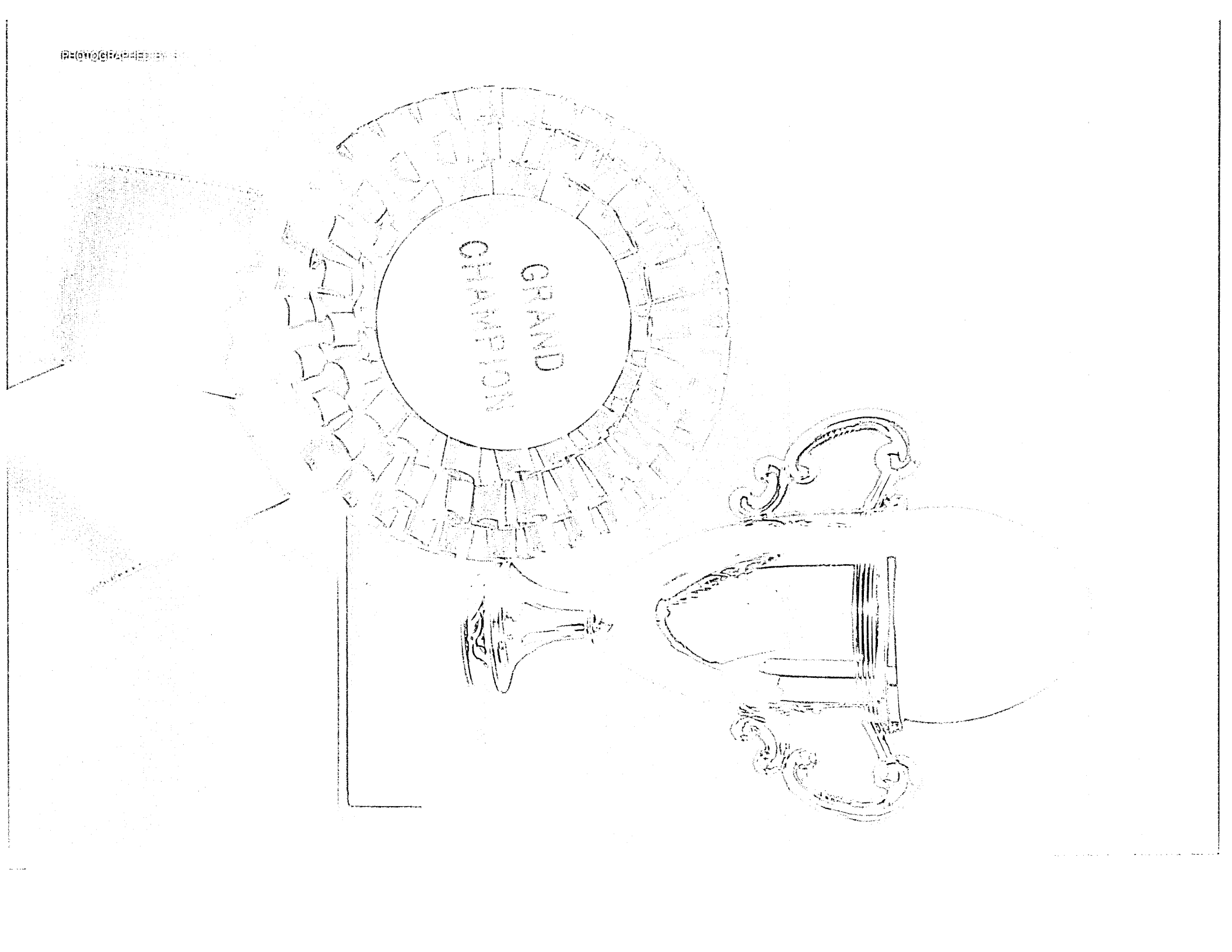
GRAND
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## Ratings of 2,373 users on more than 100 software packages.

# EVALUATING OFF-THE-SHELF PROGRAMS

The software ratings report presents in detail the results of a nationwide survey of users known to have specific software packages installed. The survey, conducted jointly by Data Decisions and Beta Research, employed a precise sampling of all systems and applications packages known to be installed at four or more locations. Computer Intelligence Corp., a sister company of Data Decisions, provided the total installed base from which the statistical samplings were made. Considerable efforts were made to obtain completed [illegible] of the survey sam- [illegible]

[illegible] responses.

[illegible] grouped these responses by [illegible] major software product areas—Data Management Packages, Communications Packages, Other Systems Packages, and Applications Packages. These major package groupings and their related ratings are further divided into two or more subgroups. The end result of such an arrangement of user responses is that only related software packages are compared with one another.

The following conclusions can be drawn from the survey findings.

*Overall User Satisfaction*—Although there is a spread in the ratings relating to specific packages within the various software product groups, overall, most users expressed a high level of satisfaction with the software and with vendor support.

*Initial Implementation and Overall Satisfaction*—A high level of agreement was observed between Superior ratings on Installation & Initial Use and on Superior ratings pertaining to Overall Satisfaction. If the package can be installed with a minimum of effort and problems, the user tends to be satisfied regardless of minor faults in other features, functions, or performance parameters.

*Replacement Activity*—Overall, only [illegible] of the users responding indicated that they were actively seeking a replacement package. More than half the reasons for re- [illegible]

[illegible] sampled in the [illegible] package features [illegible] during the initial evaluation and purchase cycle. Once the package is acquired and running, interest in seeking replacement software with new or enhanced features fades.

The Overall Satisfaction ratings of packages receiving 15 or more valid user responses are summarized below. The 56 packages that qualify at this response level are first arranged by software product group and subgroup, and then listed in numerical order based on the mean value of their respective Overall Satisfaction ratings. We indicated a rating of 10 to 9 as a Superior designation, 8 to 6 as Very Good, 5 to 4 as Acceptable, and 2 to 1 as Inadequate. User ratings on performance factors relating to these and other packages are presented in following sections of the report.

# SOFTWARE RATINGS

## DATA MANAGEMENT PACKAGES

*DBMS & File Processors Overall Satisfaction Ratings*

8.0 mean • Hewlett-Packard IMAGE
7.9 mean • Cullinane IDMS
7.5 mean • Software AG ADABAS
6.8 mean • Burroughs FORTE
• Cincom TOTAL
• IBM IMS
6.7 mean • Sperry Univac IMS
6.1 mean • IBM DL/1

*Report Writers Overall Satisfaction Ratings*

8.0 mean • Pansophic EASYTRIEVE
7.4 mean • Burroughs REPORTER

## COMMUNICATIONS PACKAGES

*Telecommunications Monitors Overall Satisfaction Ratings*

8.2 mean • Altergo SHADOW
7.9 mean • SDA MINICOM (14 responses)
7.6 mean • ADR DATACOM
• Westinghouse WESTI (13 responses)
7.3 mean • Mathematica MPG SWIFT
6.8 mean • Cincom ENVIRON/1
6.3 mean • Turnkey TASK MASTER
6.2 mean • IBM CICS
5.9 mean • IBM MTCS
5.6 mean • SDA INTERCOM

*Other Communications Packages Overall Satisfaction Ratings*

8.0 mean • ADR ROSCOE
7.3 mean • IBM CMS
7.0 mean • IBM TSO (14 responses)
6.7 mean • IBM NCP
5.8 mean • IBM ETSS

## OTHER SYSTEMS PACKAGES

*Operating Systems/Systems Support Overall Satisfaction Ratings*

8.8 mean • Innovation FDR file dump restore
8.5 mean • Westinghouse DOS UTILITY file dump restore
8.2 mean • Nixdorf/Computer Software EDOS operating system
8.0 mean • Software Pursuits DOS/MVT operating system
7.7 mean • Jason SPRINT spooler
7.1 mean • IBM VM/370 operating system
IBM POWER spooler

*System Management Aids Overall Satisfaction Ratings*

7.6 mean • SDI EPAT tape librarian
7.3 mean • University Computing UCC-15 job recovery/restart
7.1 mean • Tower DFAST disk manager
6.5 mean • Computer Associates JASPER job accounting

*Programming/Utilities Overall Satisfaction Ratings*

9.1 mean • Goal FLEE/FLIM librarian & link editor
• Waterloo WATFIV FORTRAN
8.4 mean • ADR Librarian
8.3 mean • Computer Associates CA-SORT
• IMSL statistical library
• NCI SLICK librarian
8.1 mean • Capex OPTIMIZER

## APPLICATIONS PACKAGES

*Accounting Packages Overall Satisfaction Ratings*

8.2 mean • MSA ALLTAX tax tables
7.3 mean • Software International General Ledger
7.2 mean • Wang PHI-Payroll
6.9 mean • MSA Payroll
6.8 mean • IBM Payroll
6.6 mean • NCR General Ledger
6.1 mean • MSA General Ledger
5.9 mean • NCR Payroll

*Other Applications Packages Overall Satisfaction Ratings*

6.8 mean • Florida Commercial Loan System
6.6 mean • IBM BOMP bill of materials
6.5 mean • IBM EPIC-SOC education package
6.3 mean • HONEYWELL IMS inventory management
6.1 mean • IBM IPIC manufacturing package
6.0 mean • Sperry Univac UNIS manufacturing package
5.9 mean • IBM IRP inventory management
4.9 mean • IBM DBOMP bill of materials

### Buying Influences

Overall, the choices for to this question fell into one of three levels of influence:

*Substantial Influence*—more than 65% of the users felt that specific package features/capabilities and compatibility were major influences.

*Significant Influence*—about 50% of the users felt that cost and/or time to implement the capability internally and the vendor's presence or reputation in the industry were major influences.

*Little Influence*—less than 20% of the users felt that experience with other packages by the same vendor, benchmark runs, and recommendations from a consultant or third party were major influences.

### Alternative Packages

Overall, 45% of all users evaluated alternative packages during the purchase cycle. By related program package product group, the findings were as follows:

*Data Management Packages*—40% of the users considered an average of 2.5 alternative packages.

*Communications Packages*—55% of the users considered an average of 2.2 alternative packages.

*Other Systems Software Packages*—47% of the users considered an average of 1.9 alternative packages.

*Applications Packages*—36% of the users considered an average of 2.2 alternative packages.

### Computer Systems

The software packages cited in the survey were installed on the following medium-to-large mainframes:

IBM mainframes—77%
Burroughs mainframes—5%
NCR and Sperry Univac mainframes—4% each
Honeywell mainframes—3%
Hewlett-Packard and Itel/NAS mainframes—2% each
Amdahl mainframes—1%

### Time Installed

Overall, the time the package has been employed on the system averages 4.2 years for all software surveyed. Individual responses cited periods ranging from two to eight years. The survey, therefore, samples a mature base of software users.

### Maintenance

Overall, 79% of the users surveyed have the software supported by the vendor, 14% employed an in-house staff to maintain the package, and 7% cited either a third party vendor or did not respond.

### Replacements

Only 19% of the users sampled by the survey indicated that they were actively evaluating replacement packages. Specific numbers of users seeking replacements are cited with the individual Package Ratings given elsewhere in the report. Of the reasons stated for seeking replacements, 56% were related to package performance and/or features. System changes accounted for 36%.

### User Assessment of Overall Value

Users were asked to characterize the specific package by a single statement summarizing their assessment of its overall value in comparison with other packages. The users responded as follows:

*Excellent Value*—outstanding features, comparable cost; 37%.

*Good Value*—better features, higher cost; 14%.

*Good Value*—equivalent features, comparable cost; 32%.

*Good Value*—lacked features, lower cost; 8%.

*Poor Value*—equivalent features, higher cost; 2%.

*Poor Value*—lacked features, higher cost; 3%.

### User Overall Statisfaction Level

A separate question asked users to indicate their Overall Satisfaction with the package on a scale of 10 (Superior) to 1 (Inadequate). As might be expected, there was a high level of agreement between the number of users assessing the overall value of the packages as Excellent (see above) and citing Superior as their Overall Satisfaction level for the package—83% of those who gave the package a Superior overall rating also considered it an

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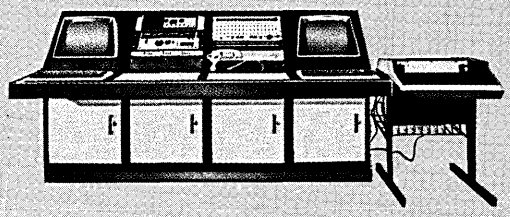

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Excellent value. Particulars on both Overall Value and Overall Satisfaction factors for the specific packages surveyed are given in the following Package Ratings section.

*Rating Bar Graphs*—The bar graphs provide a visual presentation of user ratings at four different levels: 10 to 9 or Superior, 8 to 6 or Very Good, 5 to 4 or Acceptable. Ratings of less than 4 are indicated but not presented. The bar graphs begin at 4 to better show the value ranges.

*Overall Satisfaction*—as previously discussed, this bar represents user appraisal of Overall Satisfaction with the package.

*Installation & Initial Use*—based on responses to questions on the time required for initial implementation; the ease of initial implementation, including the quality of documentation and training; freedom from program bugs and errors; and suitability and adaptability to the installation's needs. A total of 69% of users who rated their package Superior in Overall Satisfaction also rated it Superior on this set of features.

*Service*—based on responses to questions on the speed and thoroughness of the vendor in rectifying bugs and errors; the quality of vendor-supplied program modifications; and the frequency of program updating. Of the users answering Superior to the Overall Satisfaction question, 50% also rated their package Superior on this set of features.

*Operation*—based on responses to questions on backup/checkpoint procedures, recovery from erroneous input, and audit trail procedures, 33% of the users answering Superior to the Overall Satisfaction question also rated their package Superior.

*Input/Output*—based on responses to questions on data entry provisions, the processing of nonstandard transactions, output and report procedures or formats, and the ease of changing I/O formats, 29% of the users answering Superior to the Overall Satisfaction question also rated their package Superior on this set of features.

*Financial applications packages, not fully discussed in this article, will be the theme of the August 1981 issue.*

This article is based on a software ratings report that is part of Data Decisions' new *Computer Systems* information service, a one-stop reference service providing reports on current products. The service is available on a trial basis. For further information: Data Decisions, 20 Brace Road, Cherry Hill, NJ 08034, (800) 257-7732.

Data Decisions was founded in January 1980; its high-level editorial and research staff has experience totaling over 150 years in the dp and dp publishing industries. The publisher is Elizabeth MaKeown; vp of editorial is Fonnie Reagan.

## AVERAGE TOLERANCES FOR 68% CONFIDENCE LEVEL

| | OVERALL SATISFACTION | | | SPECIFIC ATTRIBUTE RATINGS | | | |
|---|---|---|---|---|---|---|---|
| SAMPLE SIZE | 6.0 or Under | 7.0 | 8.0 or More | Under 5.0 | 5.0-6.0 | 7.0 | 8.0 or More |
| 25 or more | .35 | .30 | .25 | .50 | .45 | .40 | .30 |
| 20-24 | .45 | .35 | .30 | .55 | .50 | .45 | .35 |
| 15-19 | .50 | .45 | .40 | .60 | .55 | .50 | .40 |
| 10-14 | .60 | .50 | .45 | .70 | .70 | .65 | .45 |
| 5-0 | .80 | .70 | .65 | .90 | .85 | .80 | .60 |

*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 20 sites gives a software package an Overall Satisfaction rating of 7.0. The table indicates a tolerance of 0.35 on this estimate. Thus, the chances are two in three that the interval 6.65-7.35 includes the rating that would have been obtained had all eligible sites been enumerated.

## METHODOLOGY

**Universe and Sample**

Because the forcus of the study was on user perception of specific packages, the sample was selected from a universe of known users of each package. A list of installations maintained by Computer Intelligence Corp. was the sample source. For those packages in use at more than 50 installations, a sample of 50 names was selected on an every nth name basis. For those packages in use at 50 or fewer installations, an effort was made to collect data from all known users of the package.

**Mailing**

In total, 5,172 questionnaires were sent to known users of 161 different software packages at 4,743 sites. Questionnaires were addressed to a specific individual at the location—most often the data processing manager. A follow-up mailing to nonrespondents was made three weeks after the initial mailing in an effort to maximize the survey response.

A total of 2,373 questionnaires, from 2,164 sites, were returned, for a net response of 47%. (103 questionnaires addressed to 96 sites were undeliverable.) Represented in the 2,373 responses were 114 packages which received five or more responses. Information on these packages is included in this report. A total of 146 responses was received on 11 other packages. There were also 504 response indicating that the specified package is not currently is use at the installation.

**Questionnaire**

The survey questionnaire on which this report is based first qualified the respondent as a user of the specific package being discussed and then explored various dimensions of the package's acquisition and use:

*Environment*—the length of time the package has been installed, how it is supported, and the computer and operating system on which it runs.

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

*Users' Ratings*—14 features were identified relating to package installation and initial use, vendor service, operations and input/output. 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.

*Value*—user's perception of value defined on the basis of the package's capabilities and features relative to competitive packages and to competitive package costs.

*Package Replacement*—whether or not users are considering package replacement and, if so, why.

*Overall Satisfaction*—user's feeling about the package; the same 10-point scale used to rate individual package features was used to measure overall package satisfaction.

**Findings**

The findings presented in this report reflected user perceptions of software 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.

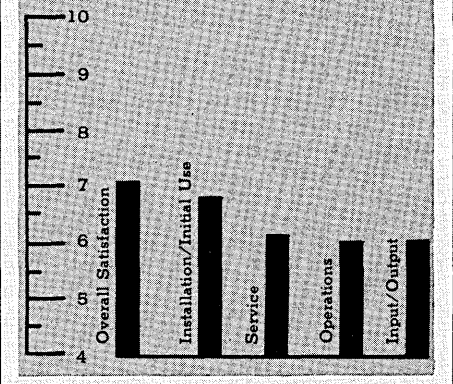
It is recognized that in electing to report on packages receiving as few as five responses, we are providing case study rather than projectable information. We believe, however, that there is value and interest in reporting the perceptions of handfuls of actual users.

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 of tolerances applicable to overall satisfaction ratings, and to ratings of individual aspects of software performance are given in the table.

## ☐ Overall Summary

**Average, All Packages** • 114 packages

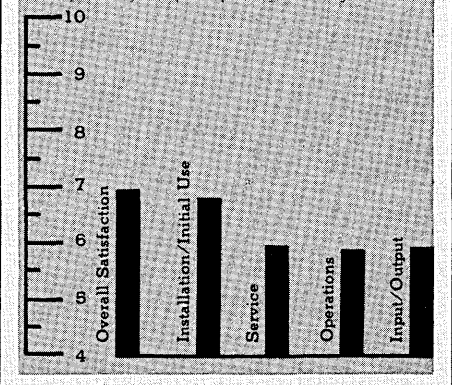
15.1 **responses** • 12.4 users judged features and cost comparable or better than other packages • 2.2 users actively looking to replace package • ratings are below




## ☐ Data Management Software Packages

**Group Averages** • 22 packages

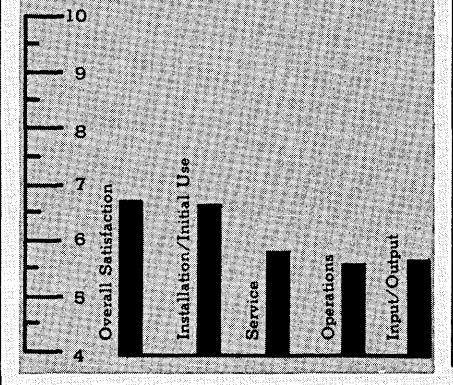
18.0 **response** • 11.6 users judged features/cost comparable or better than other packages • 2.5 users actively looking to replace package • ratings are below




## Database/File Processing/Aids

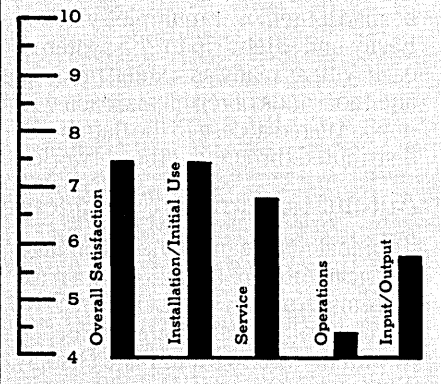
**Subgroup Averages** • 15 packages

16.4 **responses** • 12.7 users judged features/cost comparable or better than other packages • 2.5 users actively looking to replace package • ratings are below



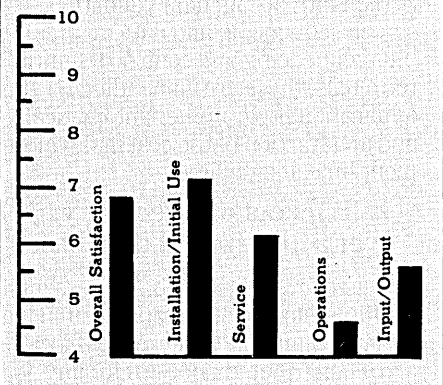

**Burroughs DMS II** • database • Burroughs Corporation, Burroughs Place, Detroit, MI 48232 • 313-972-8068

11 **responses** • 8 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



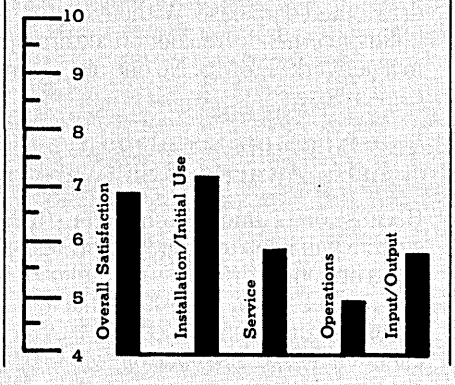

**Burroughs FORTE** • file processing

16 **responses** • 12 users judged features/cost comparable or better than other packages • 10 users actively looking to replace package • ratings are below



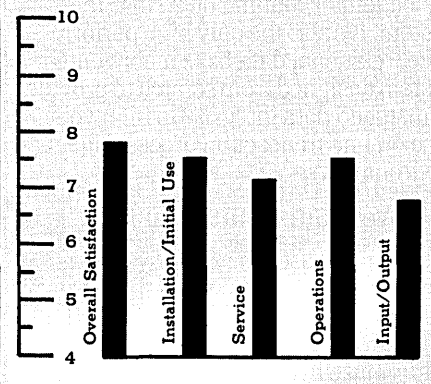

**Cincom TOTAL** • database • Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

23 **responses** • 17 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below



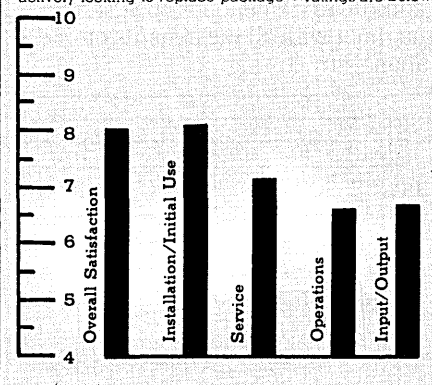

**Cullinane IDMS** • database • Cullinane Corporation, 20 Williams Street, Wellesley, MA 02181 • 617-237-6600

29 **responses** • 29 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



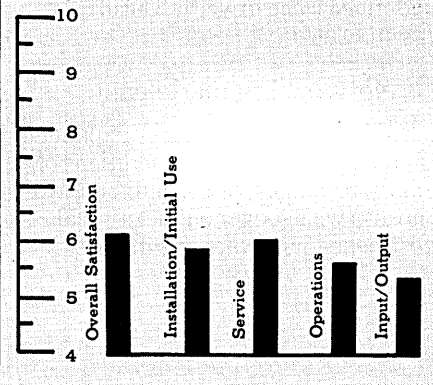

**Hewlett-Packard IMAGE** • database • Hewlett-Packard Company, 1501 Page Mill Road, Palo Alto, CA 94304 • 415-856-1501

28 **responses** • 28 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




**IBM DL/1** • database • IBM, Data Processing Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

22 **responses** • 18 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



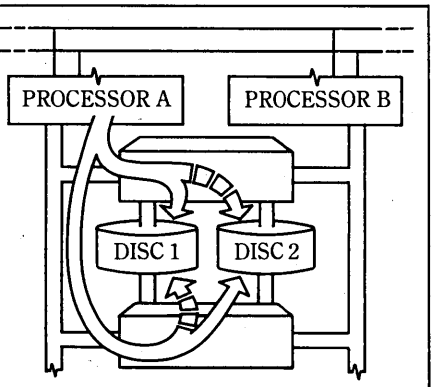
# The World's First NonStop™ DBMS

## Tandem NonStop™ ENCOMPASS

ENCOMPASS is the only DBMS with the benefit of running on a NonStop system. It's also the only high performance, relational data base management system designed from scratch to provide unmatched data integrity in high volume on-line transaction processing environments.

### We made relational fast.

A true data base operating system is the foundation with much of the retrieval techniques designed right in. And the structure of data on disc is optimized to minimize head movement. Memory cache retains most frequently used items in a buffer. In fact, any information in a file that filled a 300M byte disc drive could still be retrieved with an average of one seek. Combined with Tandem's optional mirrored volumes, it all adds up to tremendous speed and throughput with all the benefits of relational structuring.




Mirrored volumes automatically maintain identical copies; write operations occur simultaneously, read operations performed using drive with head closest to data.

### Networking made easy.

Each individual system can be expanded to sixteen processors, with additions of memory, terminals, discs, and there will be no loss whatsoever on the original investment—hardware or software.

The relational nature of ENCOMPASS, along with our networking software, EXPAND, allows a single data base to be distributed over multiple systems. Easily and safely. Up to 255 systems, each with as many as sixteen processors and thousands of terminals, each with unobstructed access to the data base distributed throughout the network.

### Automatic Terminal Management.

Terminal management has been the classic nightmare of on-line data base systems. No more. ENCOMPASS automatically handles support for the Tandem 6520 Multi Page Display, Tandem 6510, and IBM 3270. The Tandem system also supports a variety of communication methods and protocols, including Asynchronous, Bisynchronous, Multipoint, Point to Point, X25 and SDLC.

Screen formatting, data validation, screen sequencing and data mapping, plus sequencing and control of multiple terminals; these are all handled for the application programmer automatically and at a fraction of the cost in development time and dollars.

### Backout and recovery over a distributed data base.

Consistency of the data base is essential. Multiple files must be capable of being updated simultaneously, even if located across distributed nodes. If for any reason a transaction cannot be 100% completed, this is the one system in the world which can un-do it completely. Automatically.

The system will recover each piece of the transaction from everywhere in the distributed data base. Without cost-killing overhead. A major breakthrough in a network, DBMS. No one else even comes close.

### NonStop™ availability in Hardware and Software.

Because of its unique architecture, the system will keep on running without interruption, without loss or duplication of a transaction-in-process even if a failure occurs in any processor, I/O channel, disc or disc controller.

Tandem NonStop™ architecture provides not only this redundancy in hardware, but the software to take advantage of it, utilizing all available resources.

The NonStop™ system ensures that every update is completed to the data base. And with ENCOMPASS DBMS, NonStop™ operation is automatically built into all of your programs.

### On-line's as easy to program as batch.

One key theme behind the performance and reliability of our NonStop™ DBMS, ENCOMPASS, is the ease of use for programmers, systems designers and users.

It's easy to extend the data base, to expand the system to a network, to manipulate the data. And it's easy to add new resources, new hardware, new software, new files. It's easy to provide controls and security. Easy to work with. Easy to repair. And above all, easy to learn.

You don't need to learn a whole new language with the ENCOMPASS system: OPEN, READ, WRITE are the verbs you've been using all along. Industry standard COBOL, FORTRAN, MUMPS and our own transaction-oriented language TAL provide simple interaction between programs and data base.

### The All-ENCOMPASSing DBMS.

And there's still more. In addition to all this, there's a whole host of other features that the ENCOMPASS data base management system will provide. To name just a few:

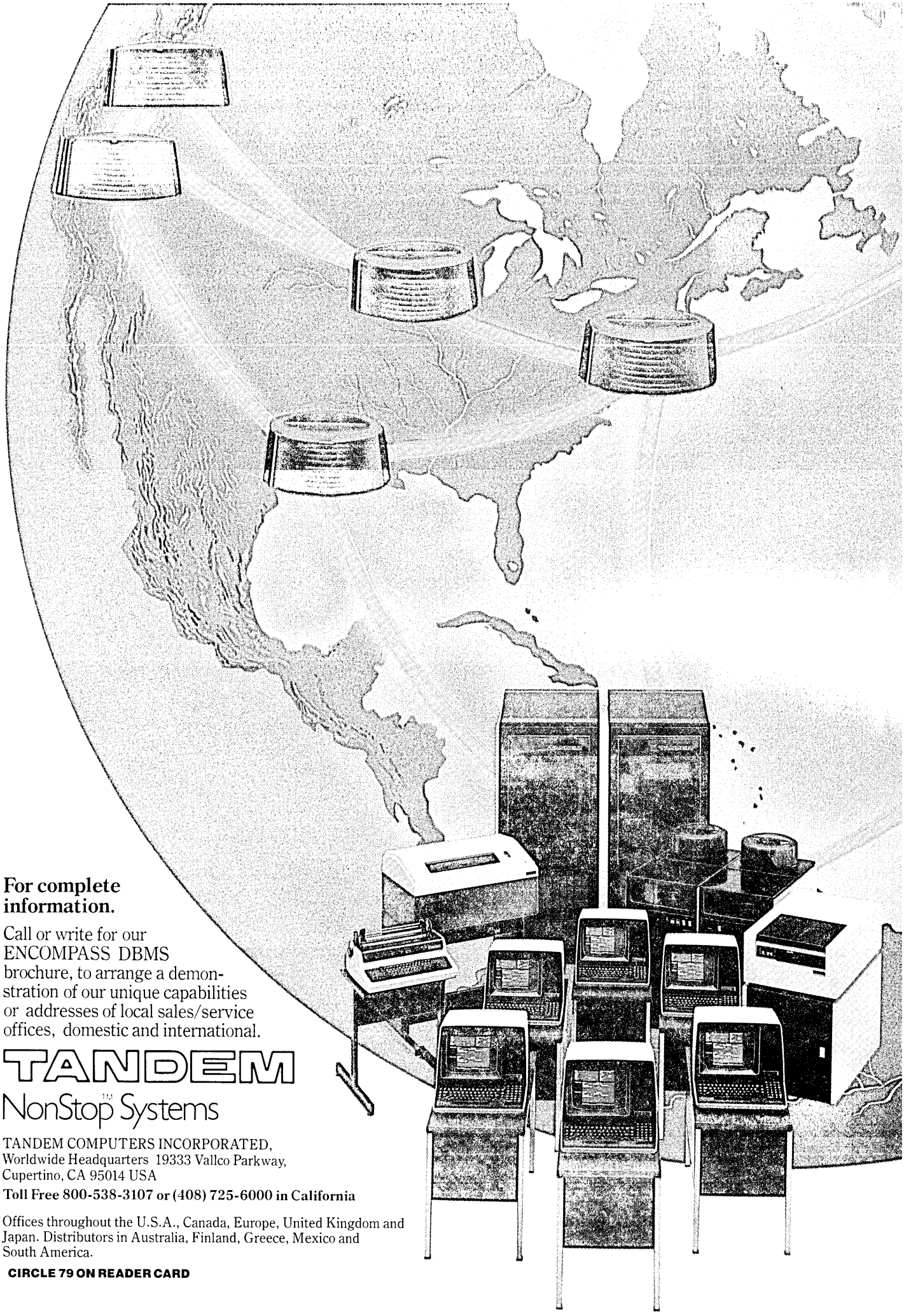
- on-line data base backup
- transparent access to distributed data base
- efficient query-report generation
- dynamic and automatic adjustment to varying transaction loads

All that remains for the user is:

- simple batch type application modules.

What could be simpler?

Tandem, NonStop, ENCOMPASS, and EXPAND are trademarks of Tandem Computers Incorporated



**For complete information.**

Call or write for our ENCOMPASS DBMS brochure, to arrange a demonstration of our unique capabilities or addresses of local sales/service offices, domestic and international.

TANDEM

NonStop™ Systems

TANDEM COMPUTERS INCORPORATED,
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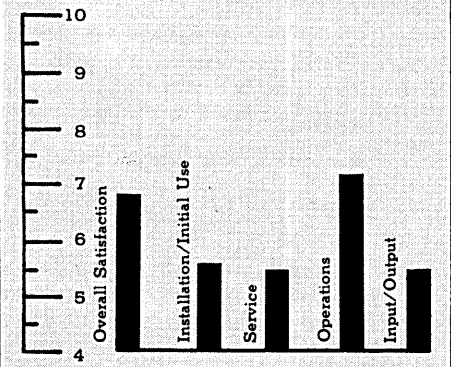
Offices throughout the U.S.A., Canada, Europe, United Kingdom and Japan. Distributors in Australia, Finland, Greece, Mexico and South America.

**CIRCLE 79 ON READER CARD**

# SOFTWARE RATINGS

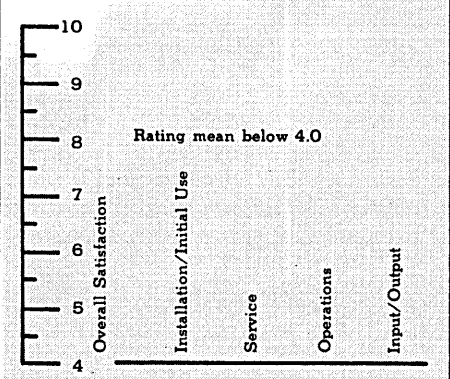
**IBM IMS** • database

15 responses • 13 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



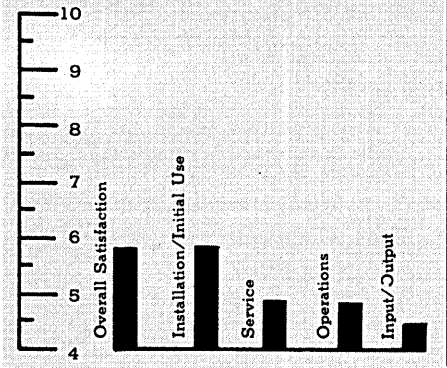

**IBM VANDL** • database

9 responses • 2 users judged features/cost comparable or better than other packages • 7 users actively looking to replace package • ratings are below



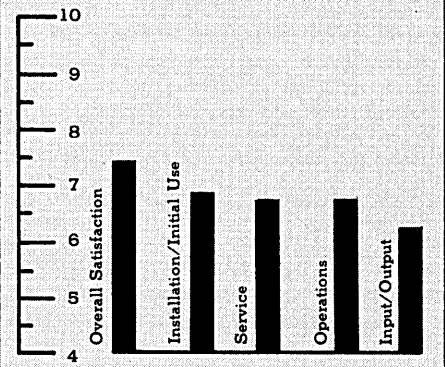

**Informatics MARK IV** • file processing • Informatics, Inc., Software Products Division, 21050 Vanowen Street, Canoga Park, CA 91304 • 213-887-9121

11 responses • 8 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



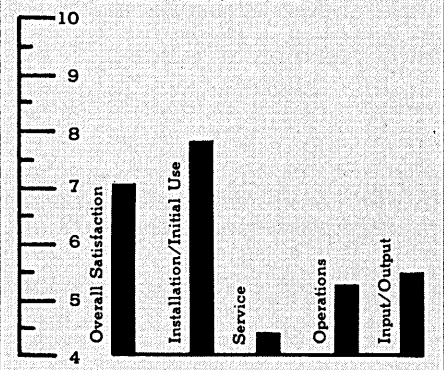

**Intel SYSTEM 2000** • database • Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 • 408-987-7266

9 responses • 8 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



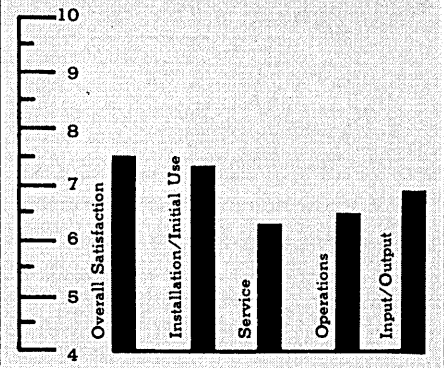

**Mathematica RAMIS II** • database • Mathematica Products Group, Inc., P.O. Box 2392, Princeton, NJ 08540 • 609-799-2600

6 responses • 4 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



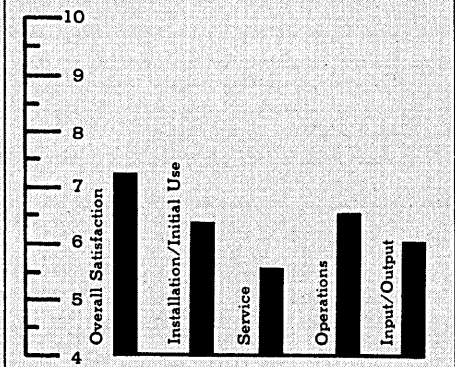

**Software AG ADABAS** • database • Software AG of North America, Inc., 11800 Sunrise Valley Drive, Suite 917, Reston, VA 22091 • 703-860-5050

27 responses • 25 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



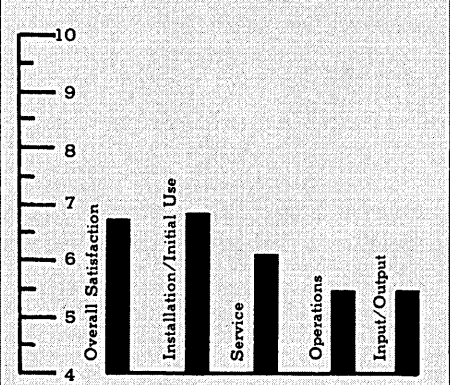

**Sperry Univac DMS** • database • Sperry Univac Division, Sperry Rand Corporation, P.O. Box 500, Blue Bell, PA 19424 • 215-542-4011

6 responses • 5 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



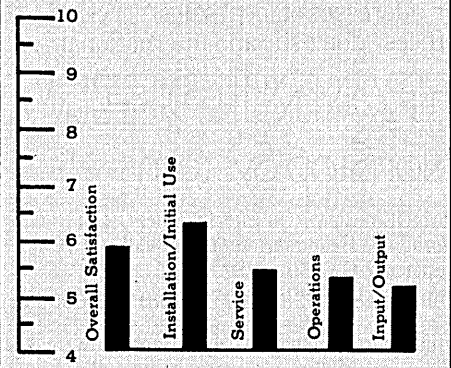

**Sperry Univac IMS** • file processing

25 responses • 19 users judged features/cost comparable or better than other packages • 8 users actively looking to replace package • ratings are below

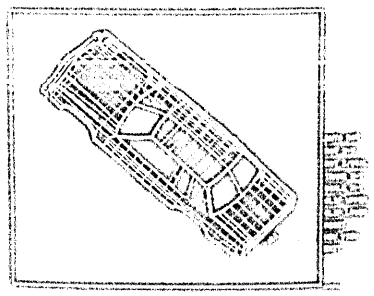



**University Computing UCC-TEN** • data dictionary • University Computing Company, UCC Tower/Exchange Park, Dallas TX 75235 • 214-353-7100

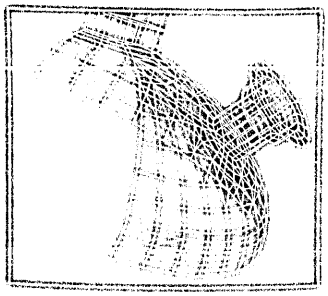
9 responses • 6 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below



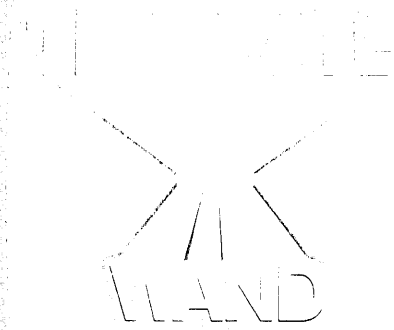
# Freedom of Expression.



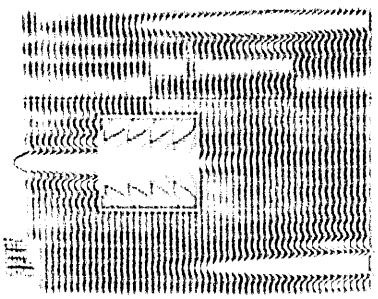
Only Megatek gives you all three: the excitement of dynamic raster color



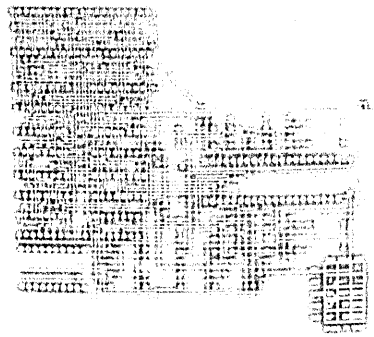
... the precision of 4096 x 4096 high resolution calligraphic Whizzard systems



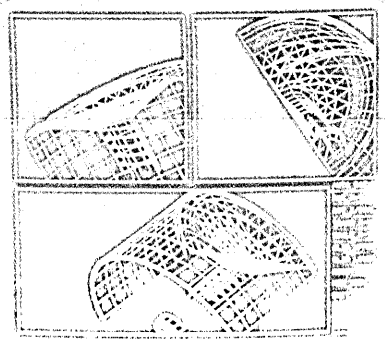
... and user-oriented software to make it easy to implement your application.



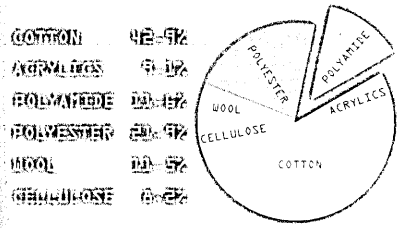
Powerful, real-time dynamics enable you to scan the display then zoom in for added detail.



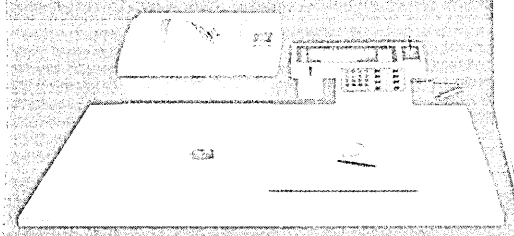
A large virtual display gives you the full picture, with the added information of up to 16 colors at a time.



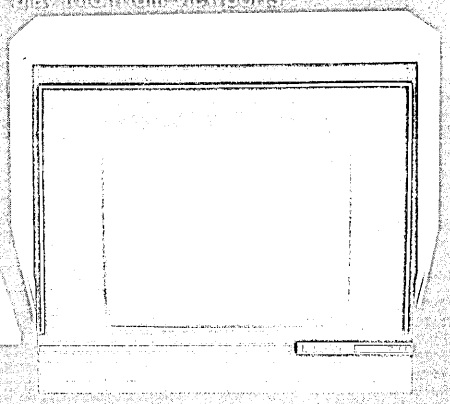
[illegible] view models from any angle and segment the display into multi-viewports.




It all adds up to the capabilities you need to put your ideas into pictures.



And you get freedom of choice too, with intelligent interactive peripherals and modular design for easy expansion.



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Express yourself with a Whizzard computer graphics system and take advantage of our technological innovations. You get system flexibility. Easy to use, ever-expanding software support. Installation, training and service world-wide. And an inside track on the future.

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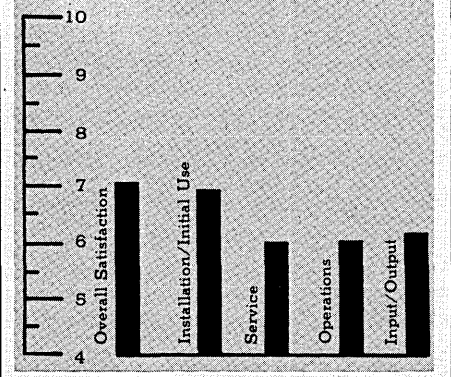
# SOFTWARE RATINGS

## Report Writers

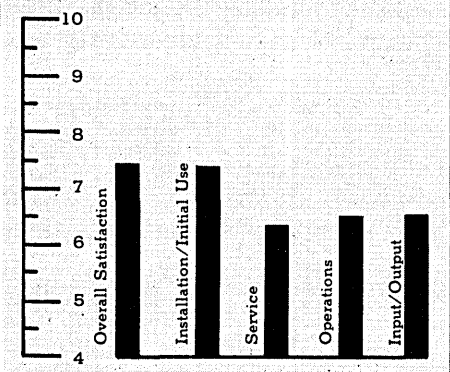
### Subgroup Averages • 7 packages

12.0 responses • 9.3 users judged features/cost comparable or better than other packages • 1.0 users actively looking to replace package • ratings are below



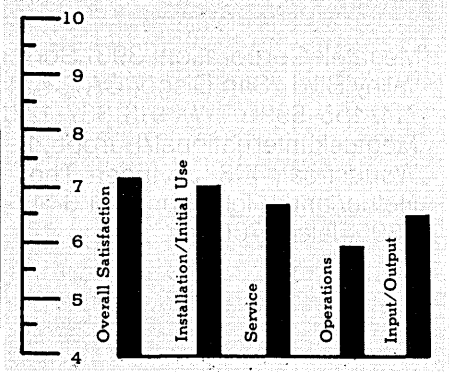

### Burroughs REPORTER • report writer • Burroughs Corporation, Burroughs Place, Detroit, MI 48232 • 313-972-8068

17 responses • 12 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



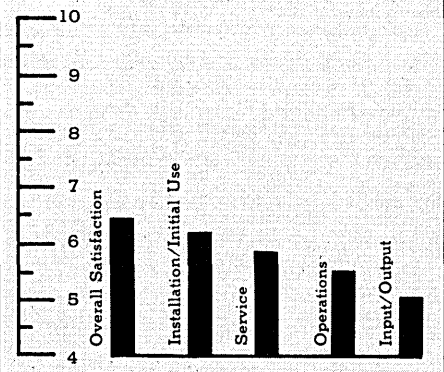

### Cullinane CULPRIT • report writer • Cullinane Corporation, 20 Williams Street, Wellesley, MA 02181 • 617-237-6600

13 responses • 10 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



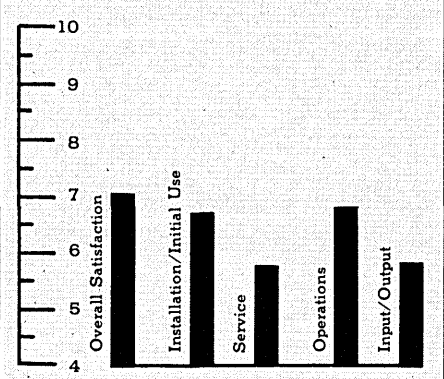

### Dylakor DYL-250 • report writer • Dylakor Software Systems, Inc., 16255 Ventura Boulevard, Encino, CA 91436 • 213-995-0151

10 responses • 7 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



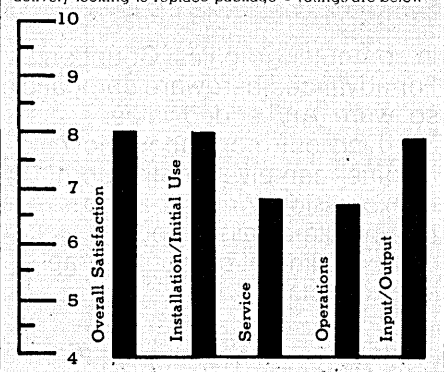

### Dylakor DYL-260 • extended report writer

8 responses • 5 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



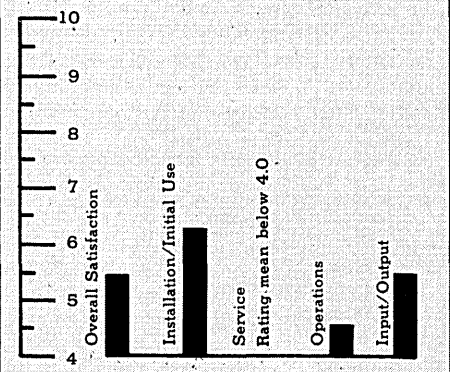

### Pansophic EASYTRIEVE • extended report writer • Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, IL 60521 • 312-986-6000

20 responses • 20 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



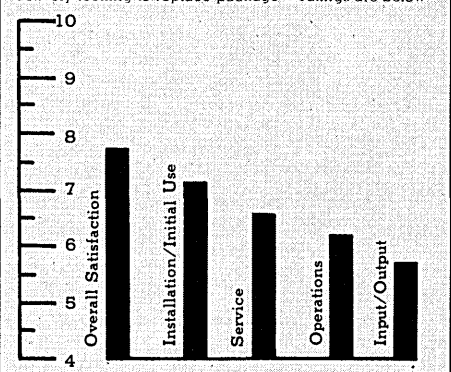

### SDA SCORE • extended report writer • SDA Products, Inc., 475 Park Avenue South, New York, NY 10016 • 212-481-6800

5 responses • 4 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




### System Support QUIK JOB II • extended report writer • System Support Software, Inc., 5230 Springboro Pike, Dayton, OH 45439 • 513-435-9514

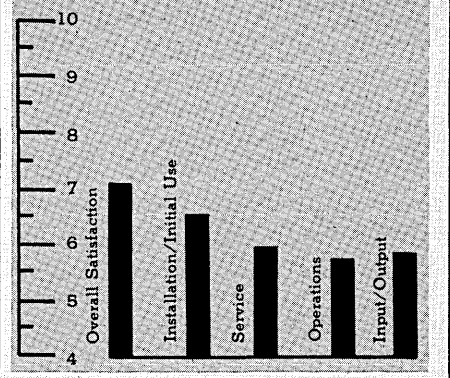
11 responses • 10 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



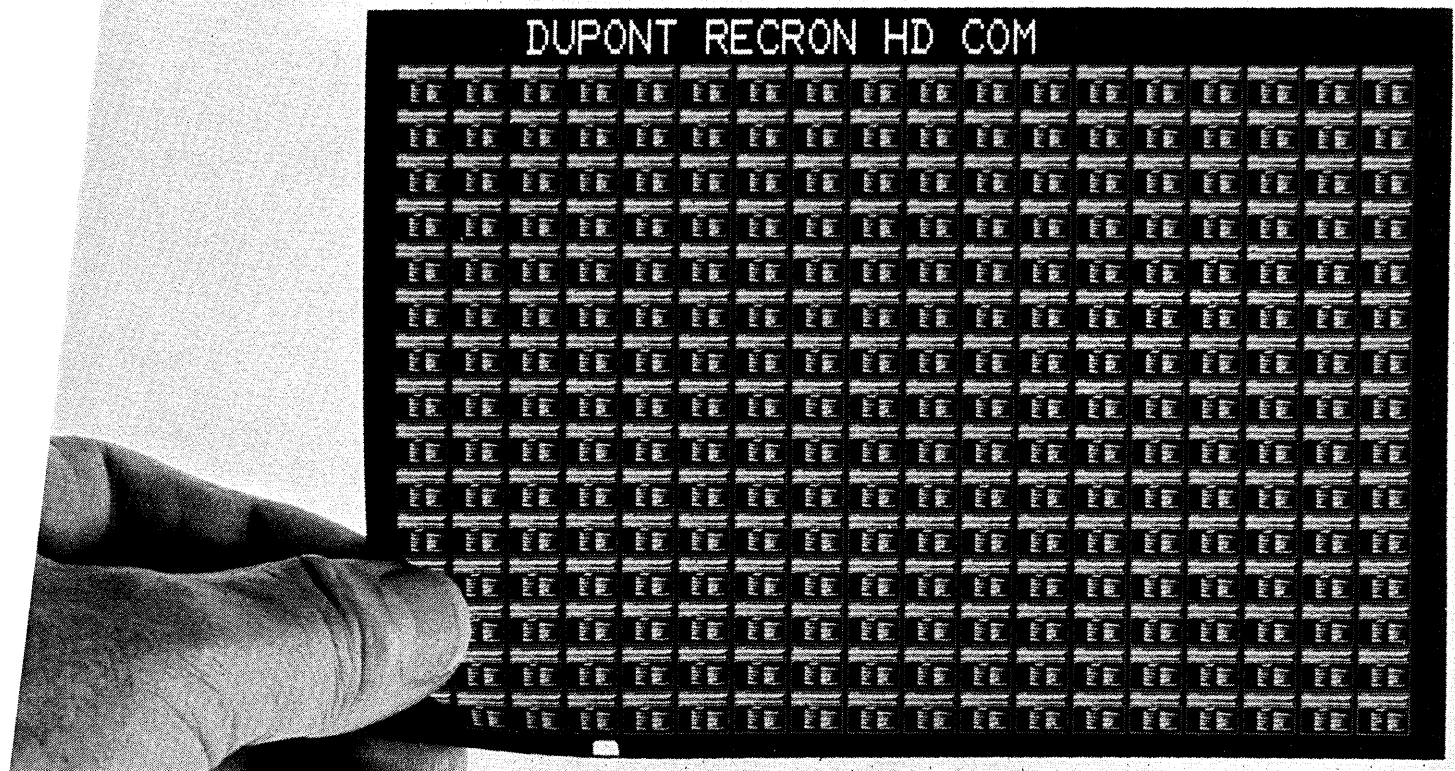

## ☐ Communications Software Packages

### Group Averages • 18 packages

17.7 responses • 14.1 users judged features/cost comparable or better than other packages • 4.1 users actively looking to replace package • ratings are below



# Send for this fiche to see the high quality of DuPont RECRON® High Definition COM silver film.




It has brightness, clarity and sharpness that you can actually see. DuPont RECRON High Definition COM silver film has a new emulsion that produces easy-to-duplicate images in reductions of 42x, 48x and higher. That means more information in less space. Wide processing latitude assures you of excellent results under a variety of conditions.

The film comes on a CRONAR® base protected with a new anti-static treatment. The base is only .004 inch thick, up to 25% thinner than conventional acetate COM films, so you can get more film on a spool and reduce reloading time. This base is really durable and withstands repeated duplication without damage.

RECRON High Definition COM silver film comes backed up with chemicals, processor and a nationwide network of DuPont Technical Representatives to make it all work most economically for you.

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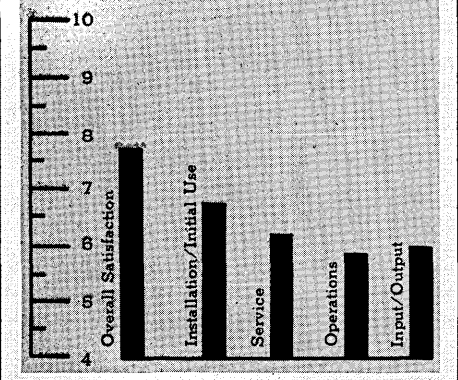
# SOFTWARE RATINGS

## Telecommunications Monitors

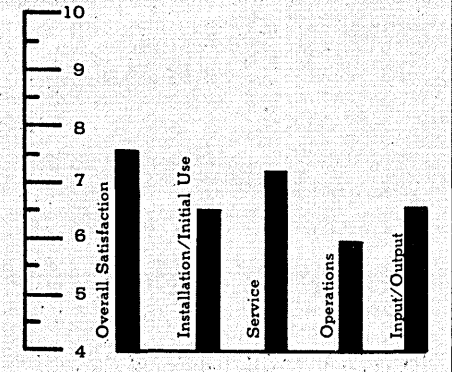
**Subgroup Averages** • 10 packages

20.0 **responses** • 16.2 users judged features/cost comparable or better than other packages • 5.3 users actively looking to replace package • ratings are below



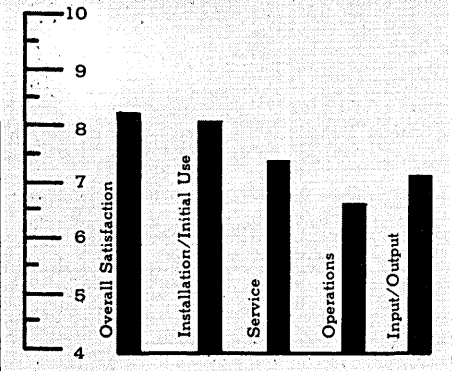

**ADR DATACOM** • telecommunications monitor • Applied Data Research, Inc., 8515 Greenville Avenue, S101, Dallas, TX 75243 • 214-349-3599

18 **responses** • 17 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



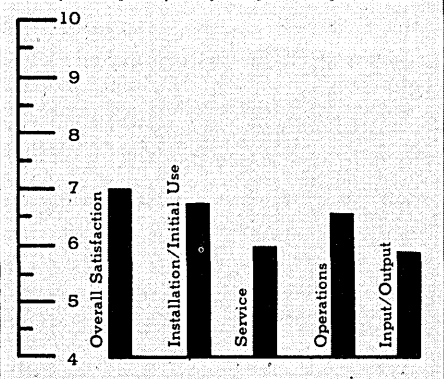

**Altergo SHADOW II** • telecommunications monitor • Altergo Software Inc., Four Faneuil Hall, Boston, MA 02109 • 617-227-5100

22 **responses** • 22 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



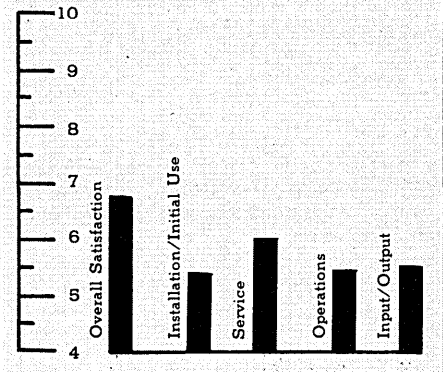

**Cincom ENVIRON/1** • telecommunications monitor • Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

29 **responses** • 24 users judged features/cost comparable or better than other packages • 12 users actively looking to replace package • ratings are below



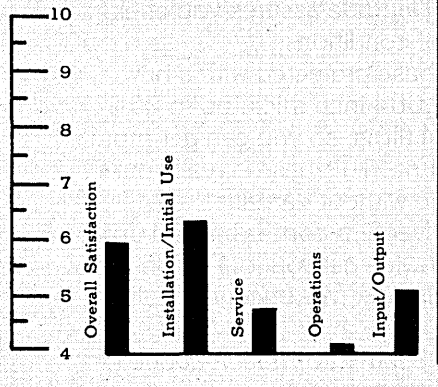

**IBM CICS** • telecommunications monitor • IBM, Data Processing Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

25 **responses** • 20 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



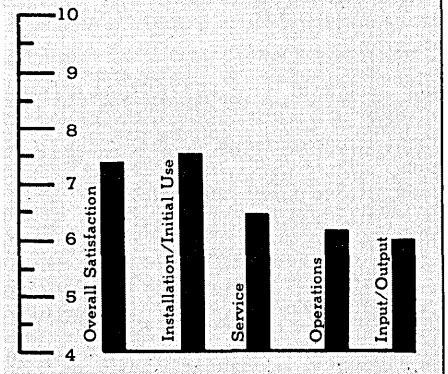

**IBM MTCS (Minimum Teleprocessing Communication System)** • telecommunications monitor

17 **responses** • 5 users judged features/cost comparable or better than other packages • 13 users actively looking to replace package • ratings are below



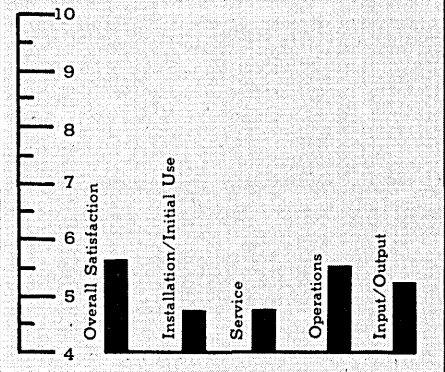

**Mathematica MPG GBASWIFT** • telecommunications monitor • Mathematica Products Group, Inc., P.O. Box 2392, Princeton, NJ 08540 • 609-799-2600

26 **responses** • 22 users judged features/cost comparable or better than other packages • 10 users actively looking to replace package • ratings are below



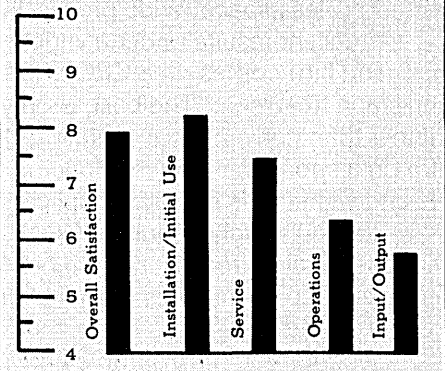

**SDA INTERCOMM** • telecommunications monitor • SDA Products, Inc., 475 Park Avenue South, New York, NY 10016 • 212-481-6800

17 **responses** • 15 users judged features/cost comparable or better than other packages • 5 users actively looking to replace package • ratings are below




**SDA MINICOM** • telecommunications monitor

14 **responses** • 13 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



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**Now, the first practical data base system permits a company to offload over 70% CPU time — and get more than 25% increase in data base performance, too.**

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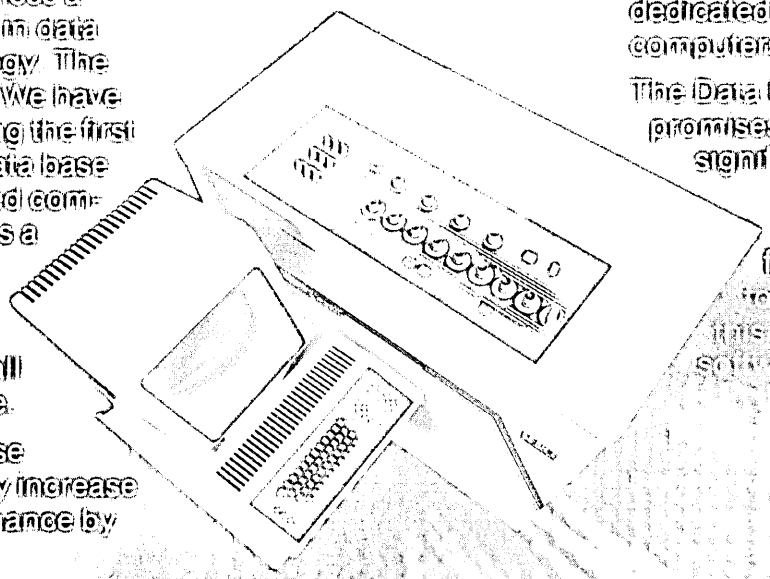
By using The Data Base Machine a company can at last recover valuable CPU resources, while actually increasing data base performance — without the need for expensive computer upgrade.



The Data Base Machine also provides the foundation for the development of a true Distributed Data Processing environment — the creation of networks in which functions are decentralized into easy-to-manage subsystems through dedicated, high performance computers.

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Title _____

Company _____

Address _____

City _____

State _____ Zip ____

Telephone No. _____

Computer _____

Operating System _____

DBMS _____

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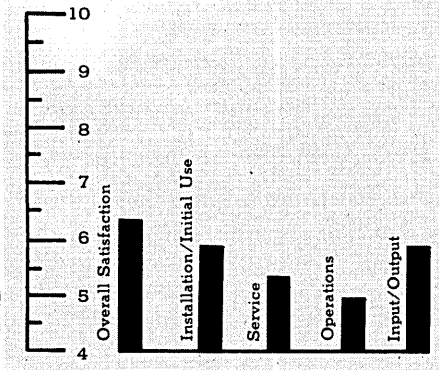
(703) 860-5050

# SOFTWARE RATINGS

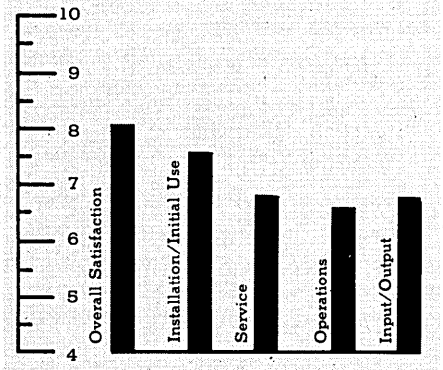
**Turnkey TASK/MASTER** • telecommunications monitor • Turnkey Systems, Inc., 50 Washington Street, S. Norwalk, CT 06854 • 203-853-2884

**19 responses** • 16 users judged features/cost comparable or better than other packages • 10 users actively looking to replace package • ratings are below



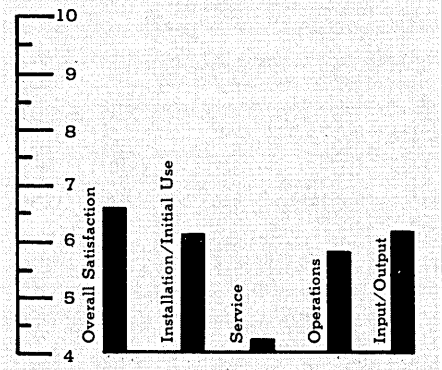

**ADR ROSCOE** • online program development • Applied Data Research, Route 206 Center, CN-8, Princeton, NJ 08540 • 609-924-9100

**23 responses** • 22 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



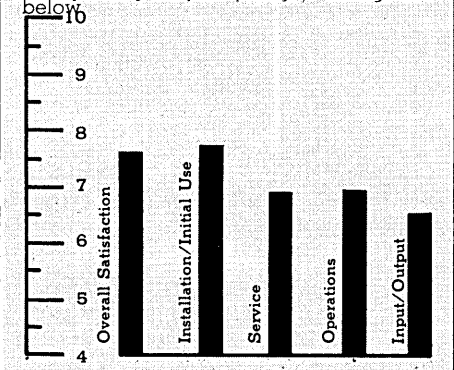

**IBM HASP** • job entry facility

**10 responses** • 7 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below



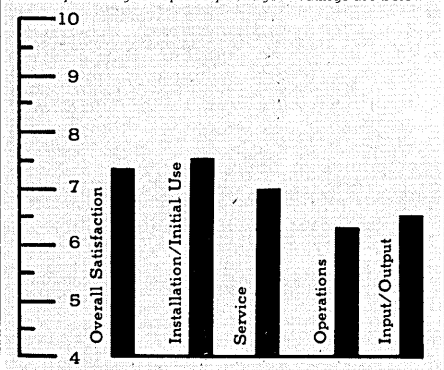

**Westinghouse WESTI** • telecommunications monitor • Westinghouse Electric Company, 2040 Ardmore Boulevard, Pittsburgh, PA 15221 • 412-256-5584

**13 responses** • 13 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



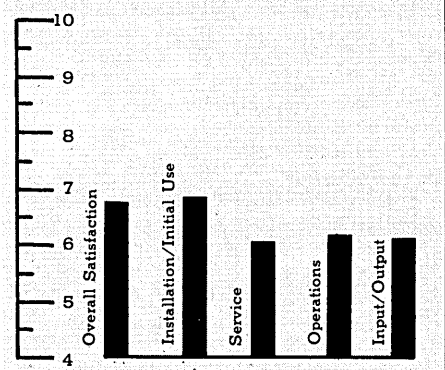

**IBM CMS (Conversational Monitoring)** • time sharing facility • IBM, Data Processing Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

**18 responses** • 17 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below




**IBM JES2** • job entry facility

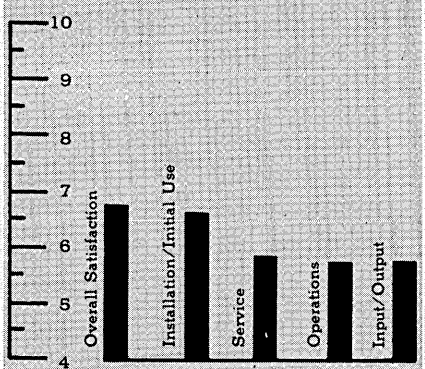
**7 responses** • 5 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




**Other Communications Software**

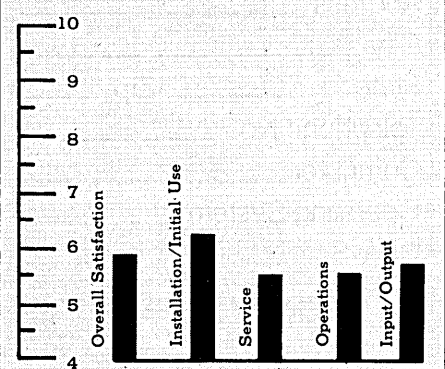
**Subgroup Averages** • 8 packages

**14.8 responses** • 11.5 users judged features/cost comparable or better than other packages • 2.5 users actively looking to replace package • ratings are below



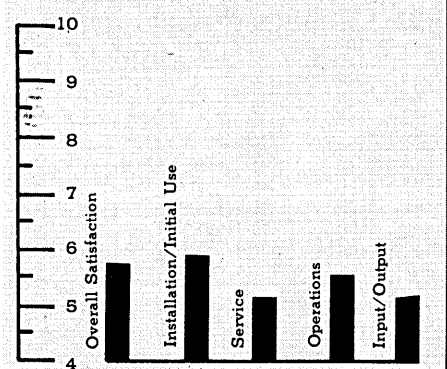

**IBM ETSS (Entry Time Sharing System)** • time sharing facility

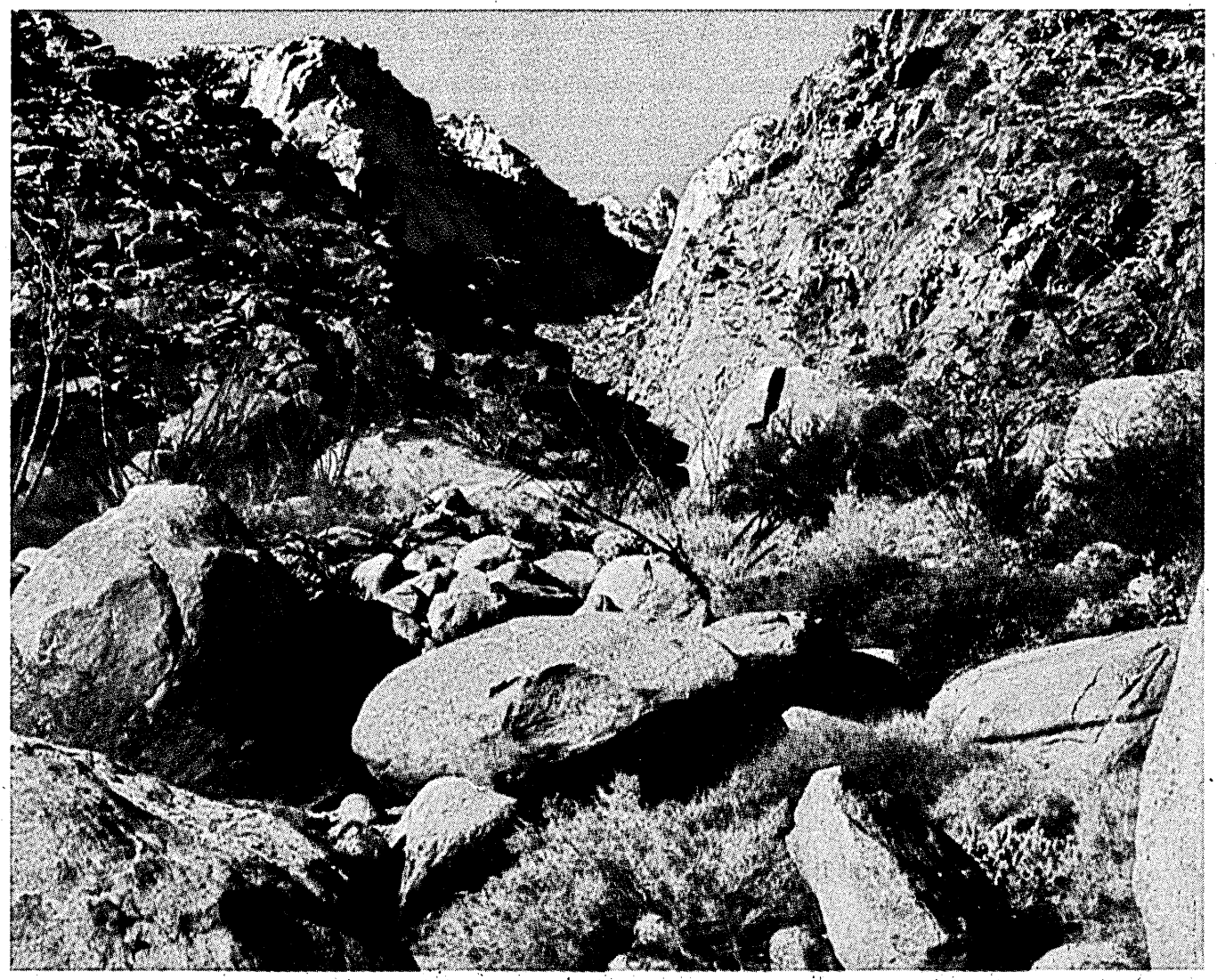
**16 responses** • 10 users judged features/cost comparable or better than other packages • 5 users actively looking to replace package • ratings are below




**IBM JES3** • job entry facility

**9 responses** • 6 users judged features/cost comparable or better than other packages • 5 users actively looking to replace package • ratings are below





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**Nixdorf Computer Software Company**

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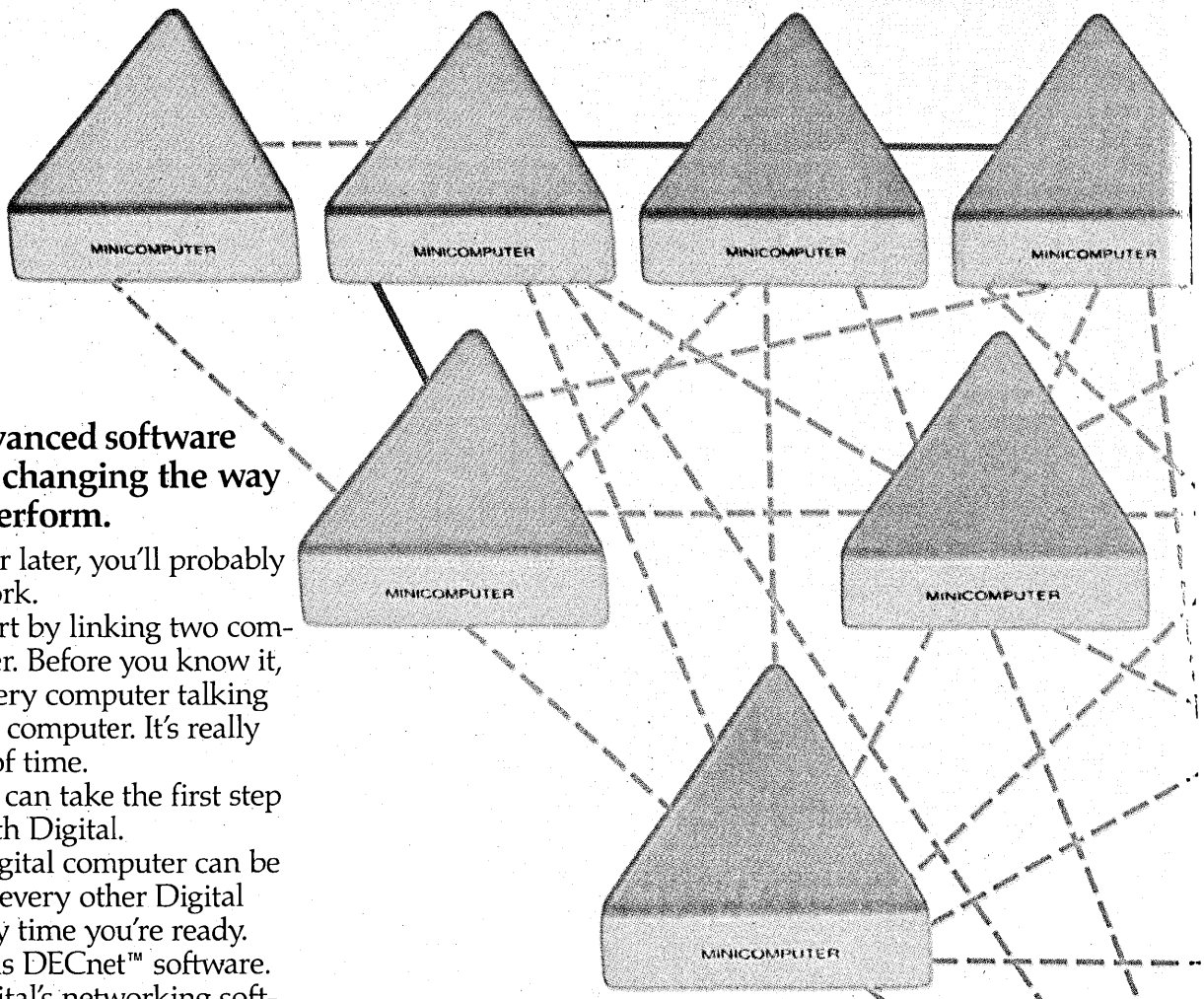
COMPUTER

**CIRCLE 92 ON READER CARD**

# Nobody networks

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Every Digital computer can be networked to every other Digital computer. Any time you're ready. All you need is DECnet™ software.

And Digital's networking software is exceptional. No other vendor can match us for sheer breadth of flexible, cost-effective networking alternatives. Besides standard networking capabilities, consider these Digital options.

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**Enhanced Network Management.** Control is the key to cost savings. DECnet lets you control the use of each communication line. Lets you add new systems to your network whenever you want without shutting down operations.

**Multipoint Communications.** Now one communication line can serve several Digital nodes simultaneously, reducing your line costs considerably.

**Advanced Protocol Emulators.** In addition to supporting Batch BISYNC, Interactive BISYNC, and other standard mainframe communications protocols, Digital offers an advanced SNA protocol emulator, so Digital systems can participate

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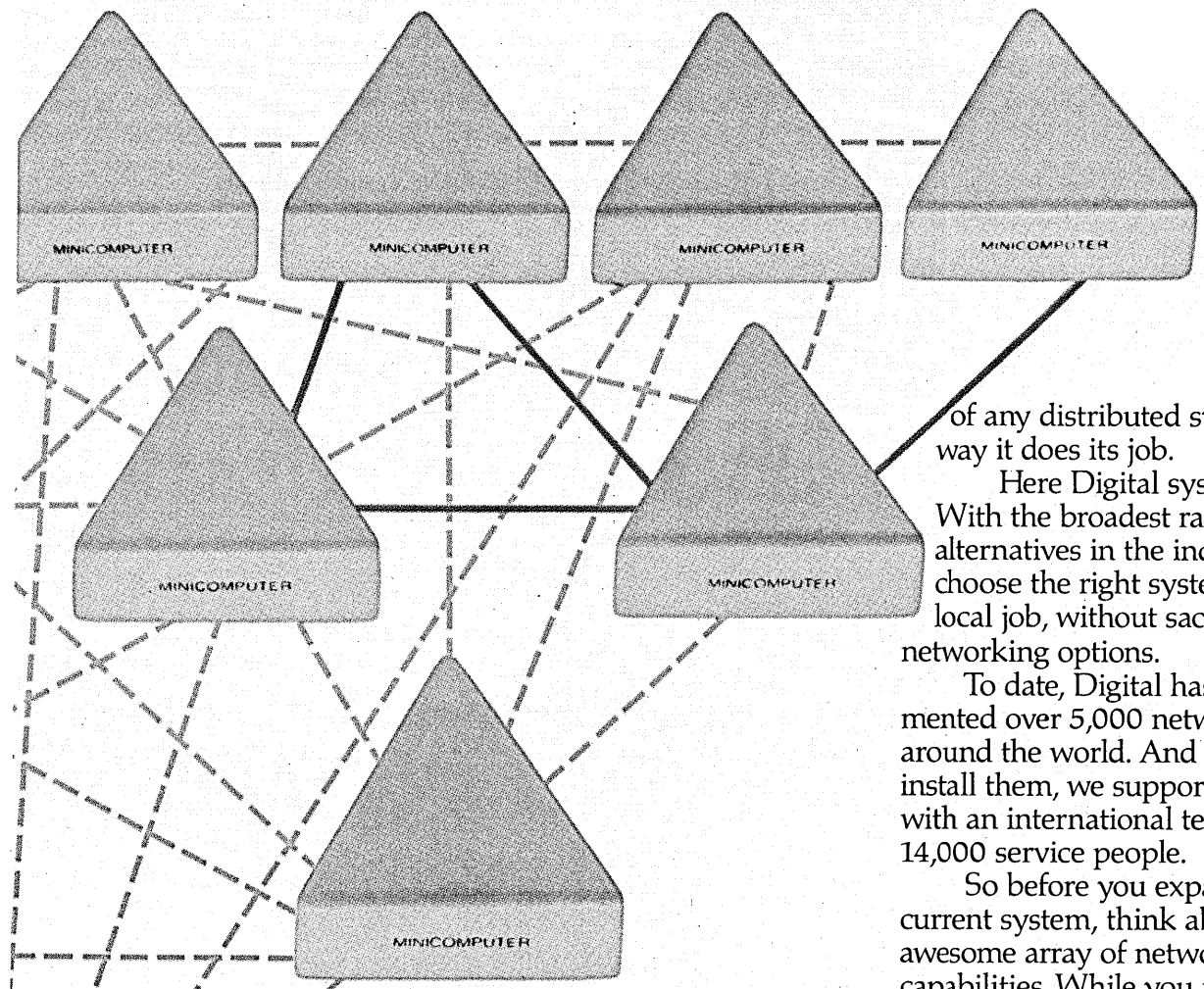


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Of course, a network can only be as effective as the computers within it. After all, most systems only use their networking capability 20 percent of the time. The real test of any distributed system is the way it does its job.

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To date, Digital has implemented over 5,000 network nodes around the world. And we don't just install them, we support them, too, with an international team of over 14,000 service people.

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**Digital Equipment Corporation,** 129 Parker St., Maynard, MA 01754. In Europe: 12 av. des Morgines, 1213 Petit-Lancy/Geneva. In Canada: Digital Equipment of Canada, Ltd.

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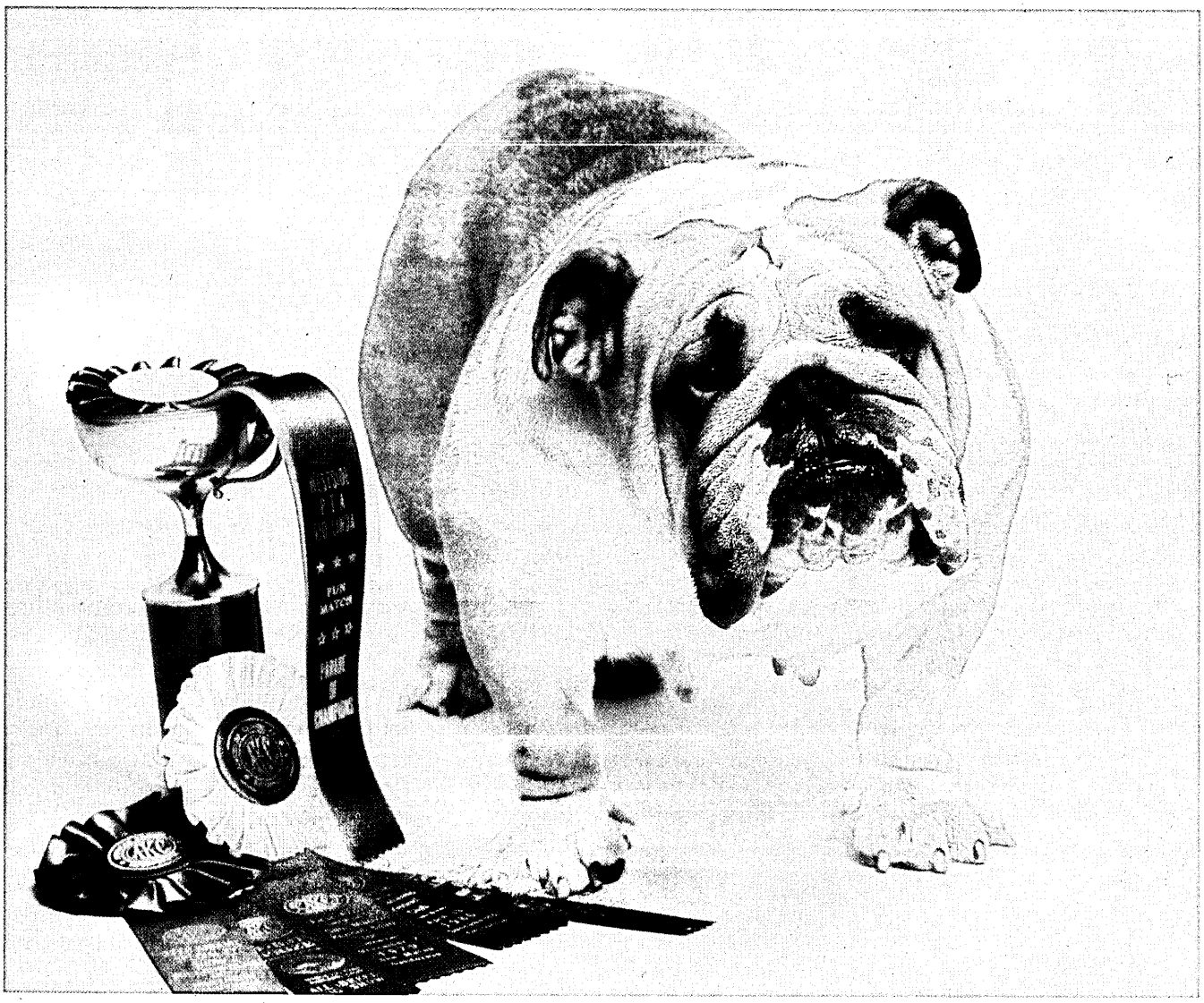

# Success Is A Matter Of Performance

In today's computer environment, systems are so complete . . . and so dynamic . . . that attempts to maintain in-house development of systems software are becoming counter-productive. The fundamental fact, that has been accepted by successful data processing center operations, is that not every center has the capacity to produce each and every software tool that the present expanding hardware utilization allows.

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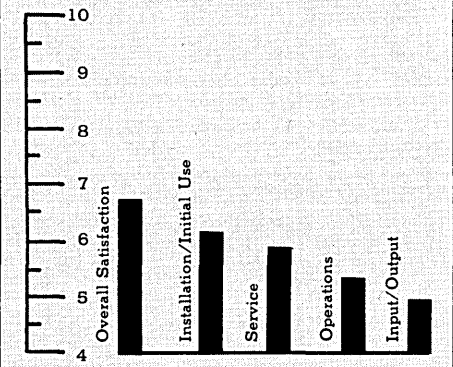
**CIRCLE 93 ON READER CARD**

**IBM NCP** • communications front end control software

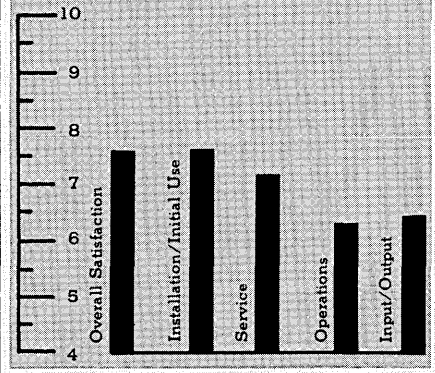
**21 responses** • 19 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below




**Operating Systems/System Support**

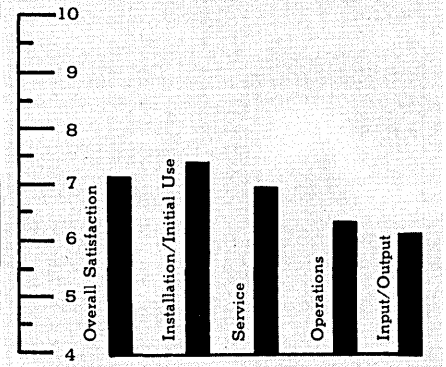
**Subgroup Averages** • 13 packages

**15.0 responses** • 13.4 users judged features/cost comparable or better than other packages • 3.2 users actively looking to replace package • ratings are below



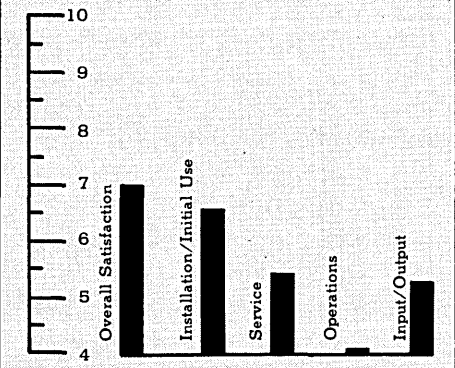

**IBM POWER** • spooler

**18 responses** • 17 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



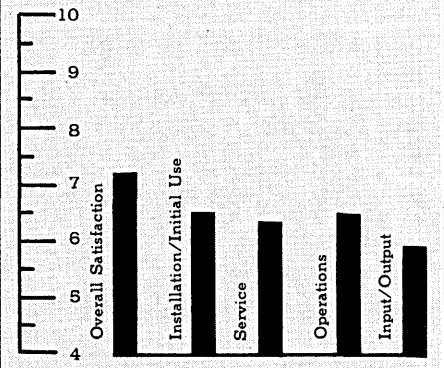

**IBM TSO** • time sharing facility

**14 responses** • 10 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



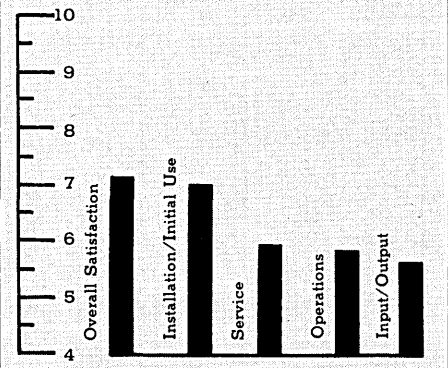

**Comten AMIGOS** • data access method • NCR Comten, Inc., 1950 W. County Road B2, St. Paul, MN 55113 • 612-633-8130

**5 responses** • 4 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below




**IBM VM/370** • operating system

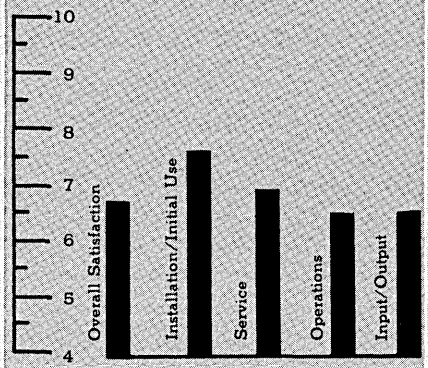
**15 responses** • 15 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below




☐ **Other Systems Software Packages**

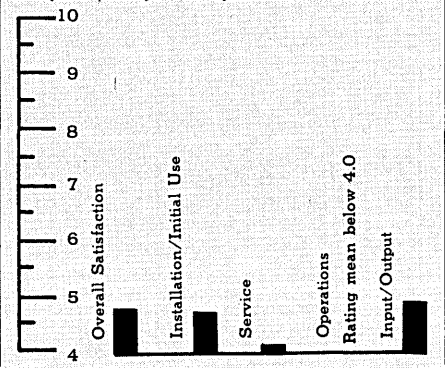
**Group Averages** • 40 packages

**14.7 responses** • 13.0 users judged features/cost comparable or better than other packages • 2.2 users actively looking to replace package • ratings are below



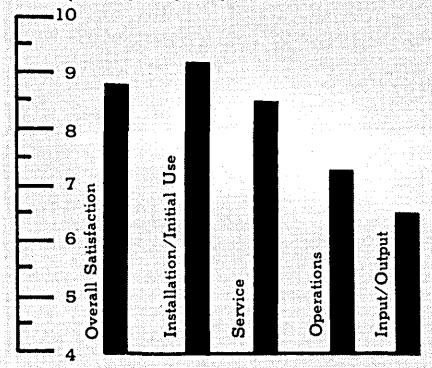

**IBM FASTER** • spooler • IBM, Data Processing Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

**5 responses** • 0 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below




**Innovation FDR** • file dump/restore • Innovation Data Processing, Inc., 970 Clifton Avenue, Clifton, NJ 07013 • 201-777-1940

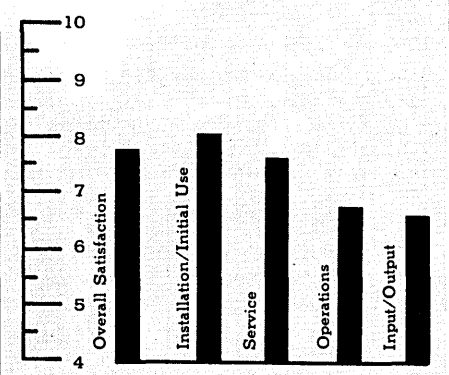
**24 responses** • 23 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



# SOFTWARE RATINGS

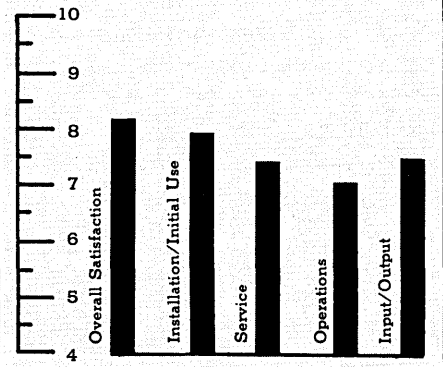
**Jason SPRINT** • spooler • Jason Data Services, 24871 Pylos Way, Mission Viejo, CA 92691 • 714-770-7789

**16 responses** • 13 users judged features/cost comparable or better than other packages • 7 users actively looking to replace package • ratings are below



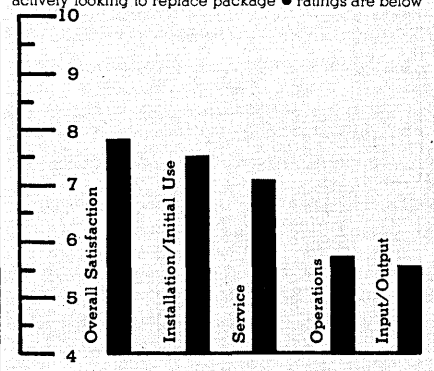

**SDI GRASP** • extended spooler • SDI, 2855 Campus Drive, San Mateo, CA 94403 • 415-572-1200

**12 responses** • 10 users judged features/cost comparable or better than other packages • 6 users actively looking to replace package • ratings are below



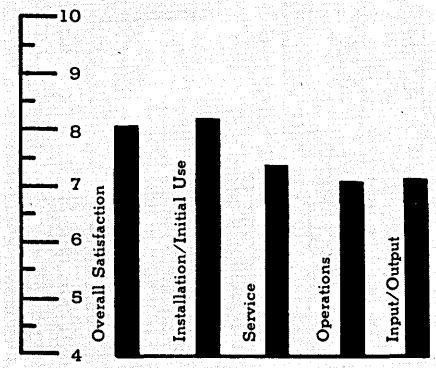

**University Computing UCC-TWO** • DOS to OS conversion aid • University Computing Company, UCC Tower/Exchange Park, Dallas, TX 75235 • 214-353-7100

**12 responses** • 11 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



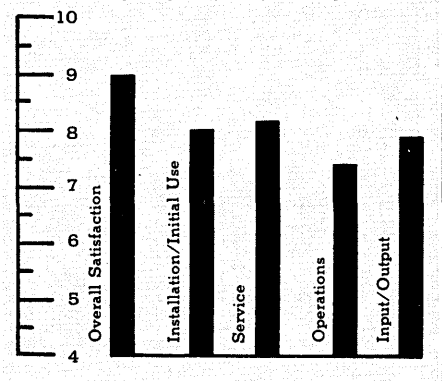

**Nixdorf DOS/RS** • operating system • The Nixdorf Computer Software Company, 6517 Everglades Drive, Richmond, VA 23225 • 804-276-9200

**7 responses** • 7 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



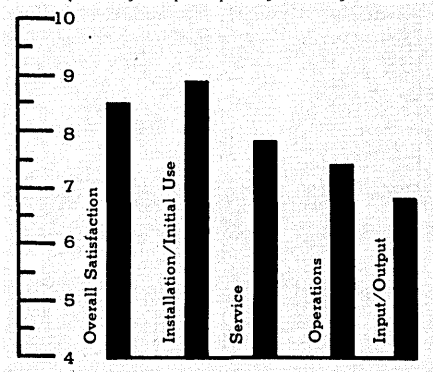

**Software Pursuits DOS/MVT** • operating system • Software Pursuits, Inc., Once Market Plaza, San Francisco, CA 94105 • 415-777-9529

**21 responses** • 21 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



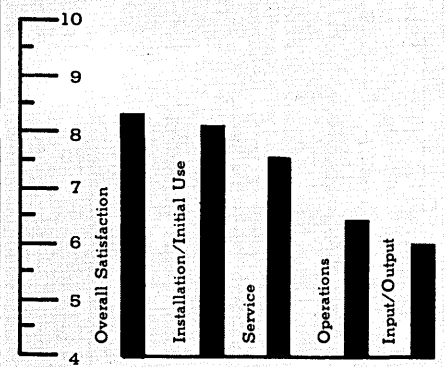

**Westinghouse DOS-UTILITY** • file dump/restore • Westinghouse Electric Company, 2040 Ardmore Boulevard, Pittsburgh, PA 15221 • 412-256-5584

**25 responses** • 25 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



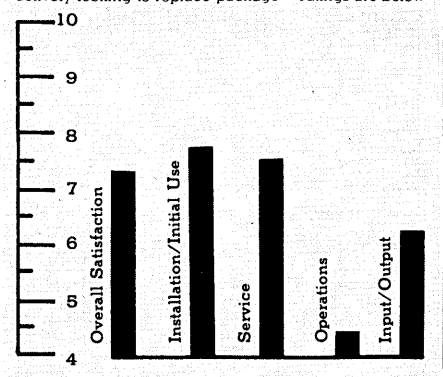

**Nixdorf EDOS** • operating system

**23 responses** • 23 users judged features/cost comparable or better than other packages • 6 users actively looking to replace package • ratings are below




**Universal ASAP** • spooler • Universal Software, Inc., Brookfield Office Park, Route 7, Brookfield, CT 06804 • 203-792-5100

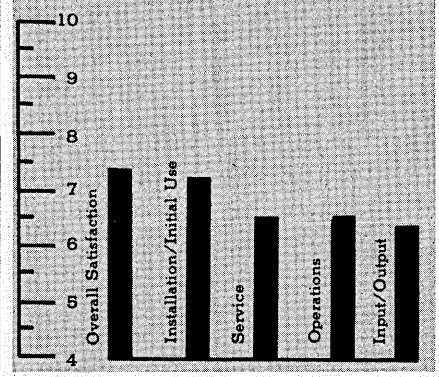
**12 responses** • 11 users judged features/cost comparable or better than other packages • 6 users actively looking to replace package • ratings are below




**System Management Aids**

**Subgroup Averages** • 15 packages

**12.1 responses** • 10.7 users judged features/cost comparable or better than other packages • 1.9 users actively looking to replace package • ratings are below



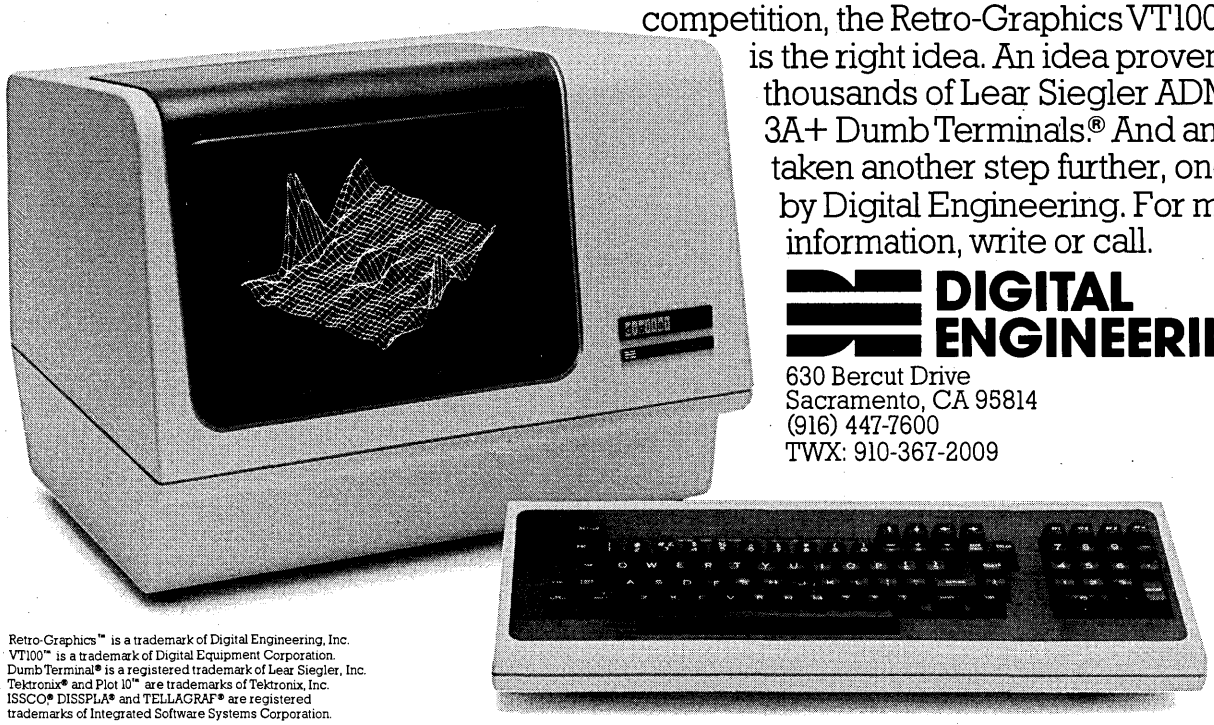
# The Idea:

## To take the Digital VT100™ terminal, make it a Graphical VT100 terminal—and still keep it economical.

Digital Engineering, the pioneer in retro-fit graphics, has done it again. This time, we've turned DEC's VT100 alphanumerics terminal into a sophisticated graphics terminal that features multiple character sizes, dot-dash lines, point plotting, vector drawing and selective erase for quick, easy updating of the graphics display.

But complete emulation of Tektronix® 4010 Series terminals—and compatibility with most existing graphics software, including Tektronix Plot 10™ and ISSCO's® DISSPLA® and TELLAGRAF®—is just the beginning of the Retro-Graphics™ VT100 terminal story. Graphics are displayed on a 12″ (diagonal) green-toned screen at 640 x 480 resolution. Refresh raster scan technology insures a bright, easy-to-read display. And all of the features that DEC's VT100 terminal begins with remain intact, including 96 upper/lower case ASCII characters, up to 132 characters per line, numeric and function keypads, detachable keyboard and a wide variety of screen customizing features.

The Retro-Graphics VT100 terminal. Whether you are looking for continuity with existing DEC products, or for a high-quality graphics terminal at hundreds less than the competition, the Retro-Graphics VT100 terminal is the right idea. An idea proven on thousands of Lear Siegler ADM-3A and 3A+ Dumb Terminals.® And an idea taken another step further, once again by Digital Engineering. For more information, write or call.



**DIGITAL ENGINEERING**

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

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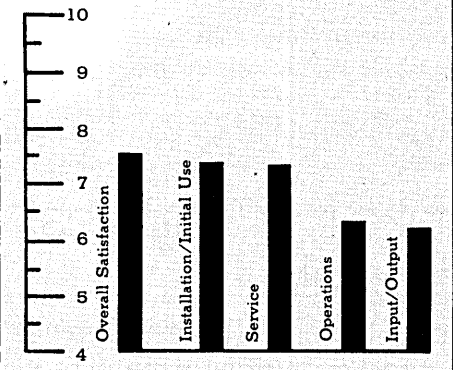
VT100™ is a trademark of Digital Equipment Corporation.
Dumb Terminal® is a registered trademark of Lear Siegler, Inc.
Tektronix® and Plot 10™ are trademarks of Tektronix, Inc.
ISSCO® DISSPLA® and TELLAGRAF® are registered trademarks of Integrated Software Systems Corporation.

CIRCLE 94 ON READER CARD

# SOFTWARE RATINGS

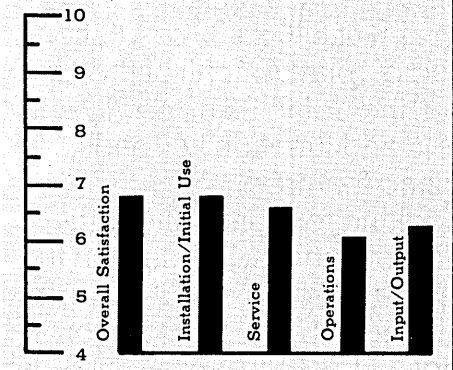
**ADR LOOK** • performance measurement • Applied Data Research, Inc., Route 206 Center, CN-8, Princeton, NJ 08540 • 201-874-9000

11 responses • 9 users judged features/cost comparable or bettern than other packages • 1 user actively looking to replace package • ratings are below



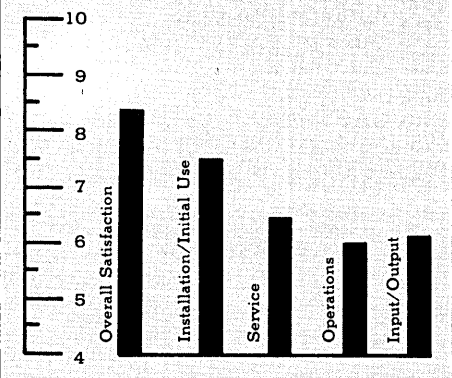

**Boole & Babbage CUE** • performance measurement • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

10 responses • 8 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



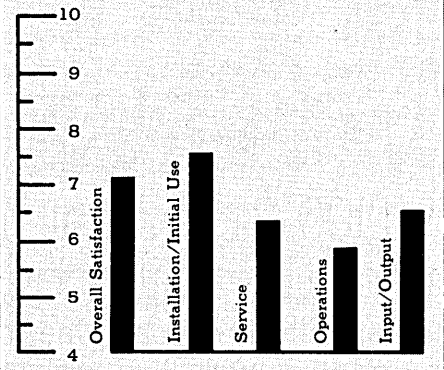

**Boole & Babbage PPE** • performance analysis

8 responses • 6 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



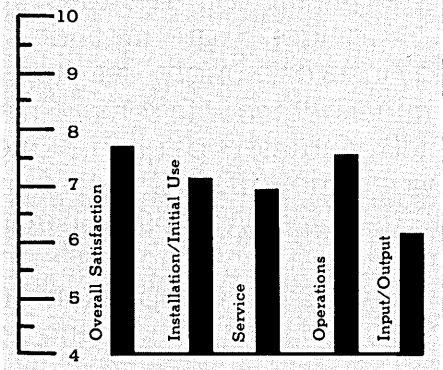

**Capex PLAN IV** • performance measurement • Capex Corporation, 4125 North 14th Street, Phoenix, AZ 85014 • 602-264-7241

6 responses • 5 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



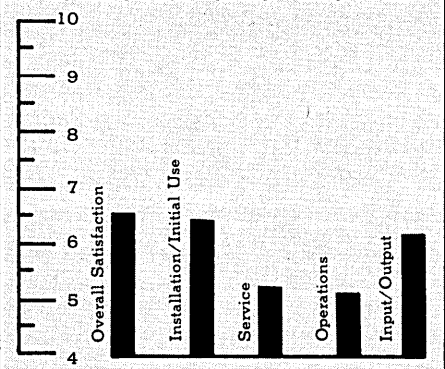

**Capex TLMS** • tape librarian

6 responses • 6 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



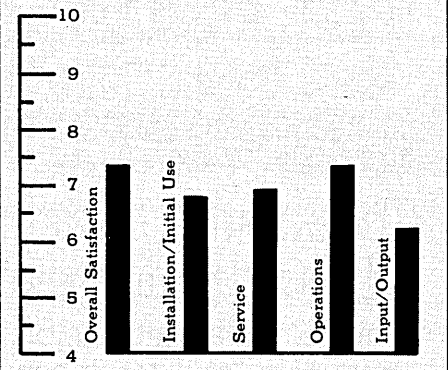

**Computer Associates JASPER** • job accounting • Computer Associates, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6700

17 responses • 16 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



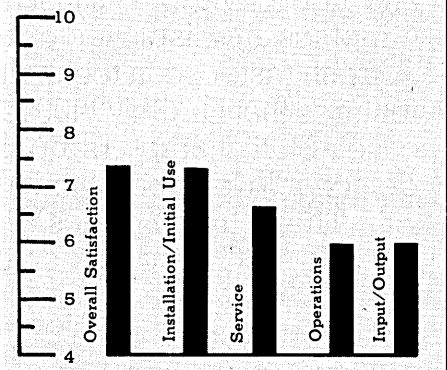

**Johnson JOB ACCOUNTING REPORT SYSTEM** • job accounting • Johnson Systems, Inc., 7923 Jones Branch Drive, McLean, VA 22102 • 703-821-1700

7 responses • 7 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



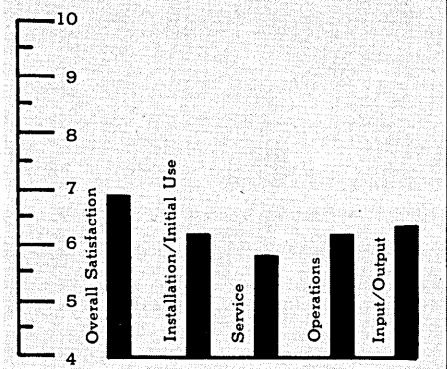

**Oxford DFAST** • disk space management • Oxford Software Corporation, 174 Boulevard, Hasbrouck Heights, NJ 07604 • 201-288-1515

13 responses • 12 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below




**Oxford TFAST** • tape librarian

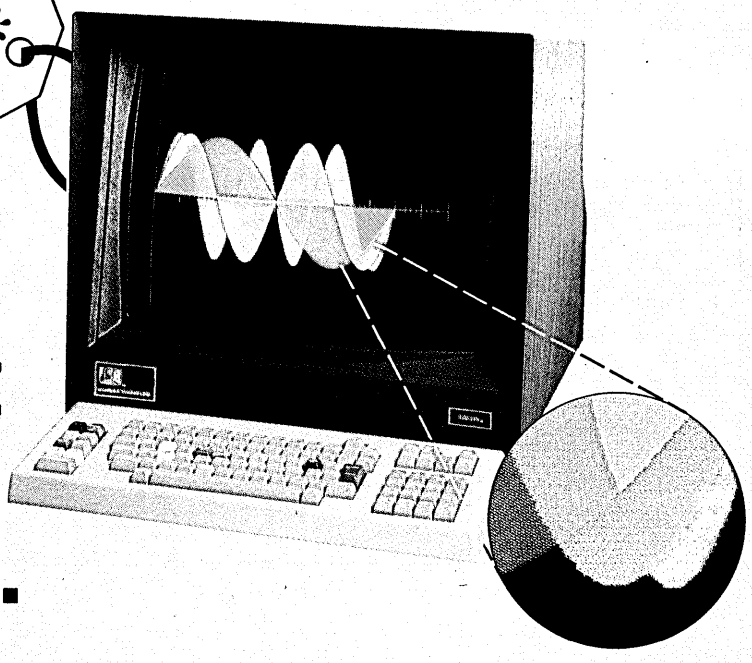
14 responses • 11 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



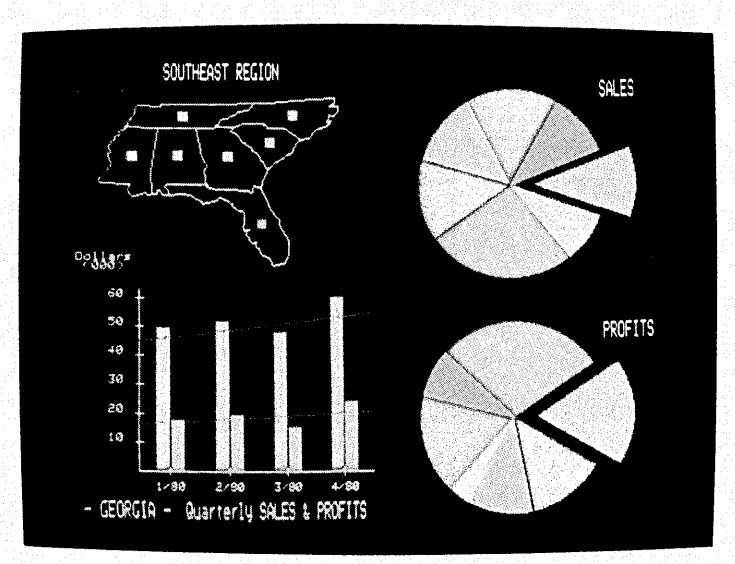
Introductory Special

**$3,355***

8001-I 19" CRT Terminal



# Another ISC breakthrough: Affordable dot addressable color graphics.




**Introducing the world's lowest priced high resolution color graphics.**

Now high prices don't have to keep you from high performance graphics. ISC's new 8000 Series "I" terminals and desktop computers display color vectors and arcs with full-screen, 480 x 384 individual dot precision —note the close-up photo above. Impressive? With terminals starting at a quantity 100 price of $3,355, try incredible.

**For any application requiring critical picture definition.**

ISC's new "I" series is suited for process control, energy management, MIS —virtually any application needing sophisticated color graphics. Available in contemporary or industrial cabinets, each model features an 80 cpl by 48-line character format and RS-232C interface. Individual dots displayed in any of 8 colors can shade to a wide spectrum of color combinations.

ISC's "I" series desktop computers include File Control System Disk BASIC, 8K to 24K RAM, and 80K to 26-Megabyte disk. OEM prices start at $4,635, quantity 100.

With ISC's new "I" series, you can now get dot addressable color graphics for a third less than anything else on the market. And we include the keyboard! See for yourself why ISC is the world's largest manufacturer of color graphics systems —call **800-241-4310** for the name of your nearest ISC rep.

**Note to current 8001G users:** You can easily add ISC's dot addressable option to your unit. This is the kind of upward compatible growth you can expect from ISC! Consult our customer service department for complete details.

*Per unit. Single evaluation units sold on cash-with-order terms. Limit one per customer. Orders must be received by February 1, 1981. 30-day delivery from factory. U.S. domestic prices. Unretouched photos of screens.

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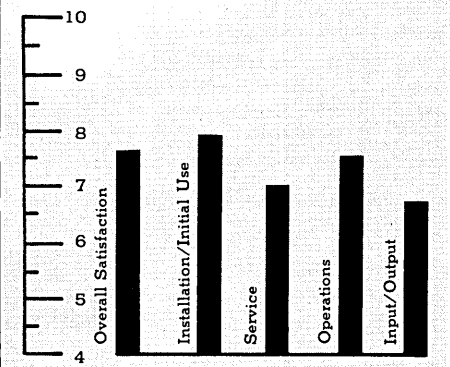
**CIRCLE 95 ON READER CARD**

# SOFTWARE RATINGS

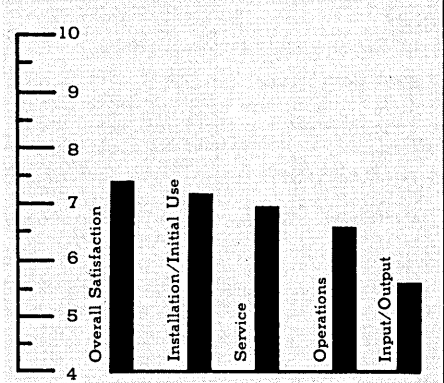
**SDI EPAT** • tape librarian • SDI, 2855 Campus Drive, San Mateo, CA 94403 • 415-572-1200

19 responses • 16 users judged features/cost comparable or better than other packages • 5 users actively looking to replace package • ratings are below




**University Computing UCC-15** • job recovery/restart

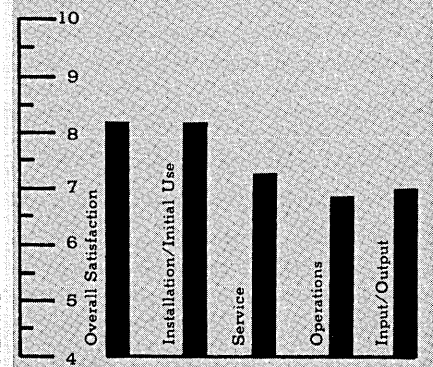
22 responses • 20 users judged features/cost comparable or better than other packages • 5 users actively looking to replace package • ratings are below




**Programming/Utilities**

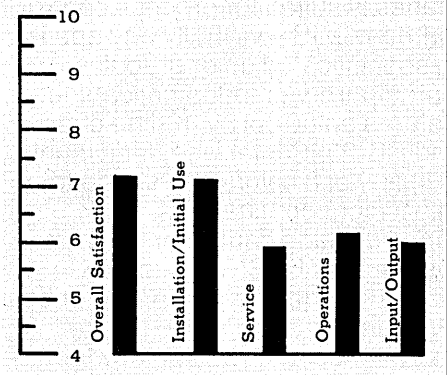
**Subgroup Averages** • 12 packages

17.5 responses • 15.3 users judged features/cost comparable or better than other packages • 1.4 users actively looking to replace package • ratings are below



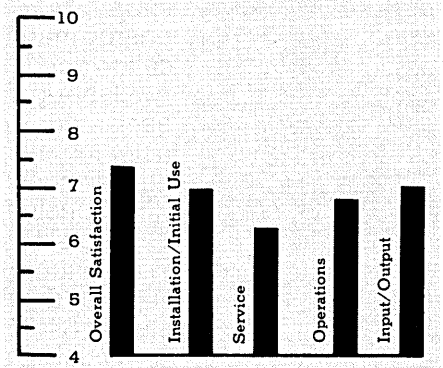

**Tower Systems DFAST** • disk space management • Tower Systems, Inc., 19782 MacArthur Boulevard, Ste. 365, Irvine, CA 92715 • 714-752-8263

17 responses • 15 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



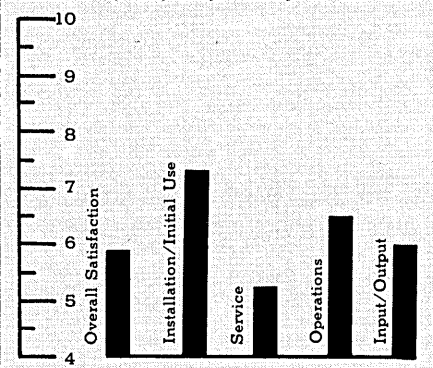

**Value Computing CSCS** • job accounting • Value Computing, Inc., 300 West Marlton Pike, Cherry Hill, NJ 08002 • 609-429-4200

8 responses • 4 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



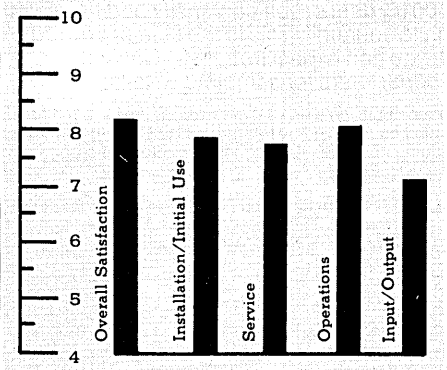

**ADR AUTOFLOW** • flow charter • Applied Data Research, Inc., Route 206 Center, CN-8, Princeton, NJ 08540 • 201-874-9000

11 responses • 5 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



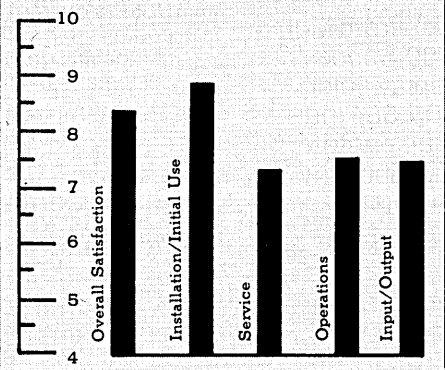

**University Computing UCC-ONE** • tape librarian • University Computing Company, UCC Tower/Exchange Park, Dallas, TX 75235 • 214-353-7100

14 responses • 14 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



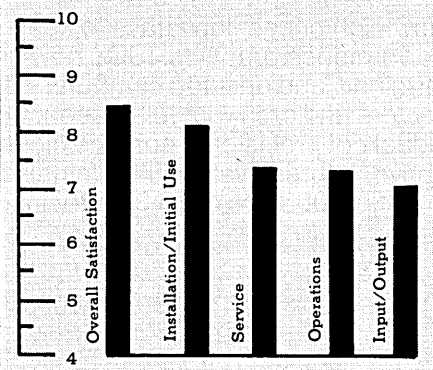

**Westinghouse JOB-MONITOR II** • job accounting • Westinghouse Electric Corporation, 2040 Ardmore Boulevard, Pittsburgh, PA 15221 • 412-256-5584

9 responses • 9 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




**ADR LIBRARIAN** • librarian

18 responses • 18 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below



Fran Tarkenton, ABC Television

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"So while we're proud to be awarded for what we've done for you before, we take greater pride in what we're doing for you today and tomorrow."

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Total Financial Management System—The Big 8™
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DAT1280

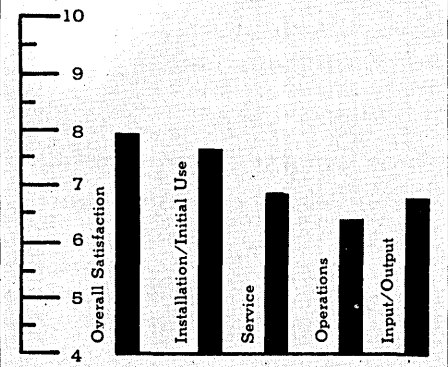
**CIRCLE 96 ON READER CARD**

3445 Peachtree Road, N.E./Suite 1300/Atlanta, GA 30326
(404) 262-2376/Attention: Robert Carpenter

# SOFTWARE RATINGS

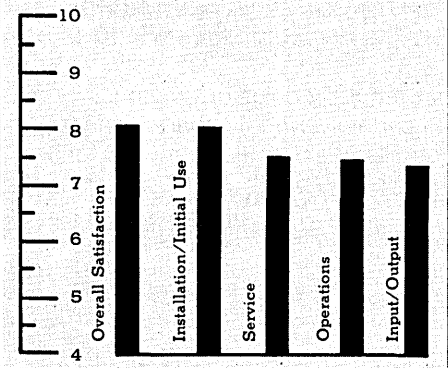
**ADR METACOBOL** • preprocessor

**9 responses** • 8 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



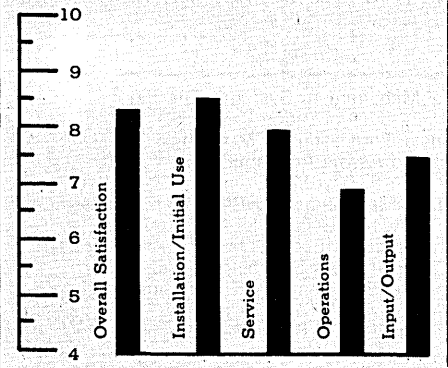

**Capex OPTIMIZER** • COBOL optimizer • Capex Corporation, 4125 North 14th Street, Phoenix, AZ 85014 • 602-264-7241

**19 responses** • 18 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



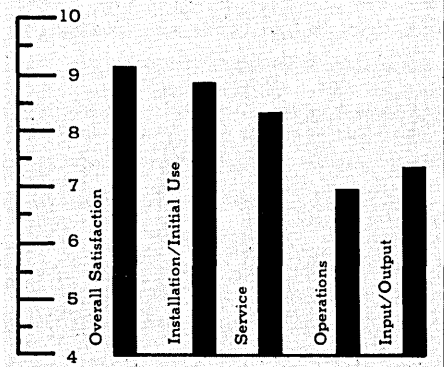

**Computer Associates CA-SORT** • sort • Computer Associates, Inc., 655 Madison 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6700

**29 responses** • 29 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



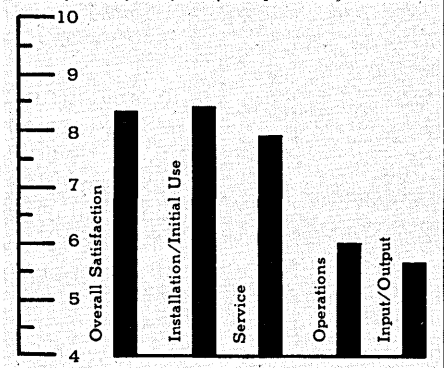

**Goal Systems FLEE/FLIM** • librarian, link editor • Goal Systems Corporation, P.O. Box 29481, Columbus, OH 43229 • 614-268-1775

**30 responses** • 29 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



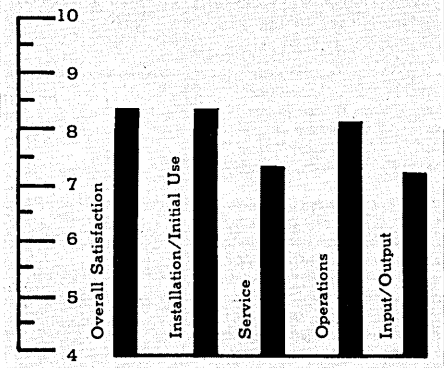

**IMSL LIBRARY-SYSTEM** • statistical routines • Int'l Mathematical & Statistical Libraries, Inc., 7500 Bellaire Blvd., Houston, TX 77036 • 713-772-1927

**17 responses** • 15 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



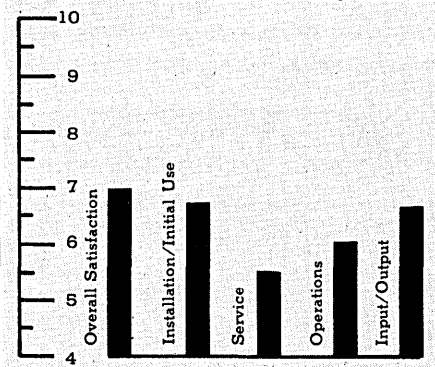

**NCI SLICK** • librarian • National Computing Industries, Inc., 3720 Longview Drive, Atlanta, GA 30341 • 404-451-7455

**29 responses** • 29 users judged features/cost comparable or better than other packages • 6 users actively looking to replace package • ratings are below



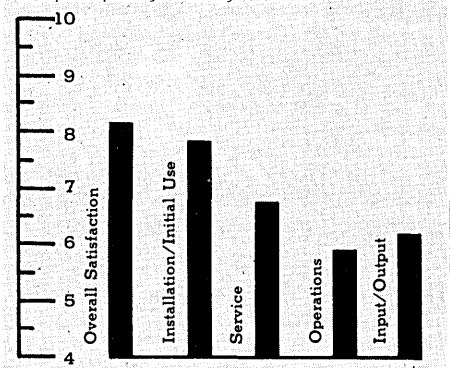

**Pansophic PANVALET** • librarian • Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, IL 60521 • 312-986-6000

**13 responses** • 12 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below



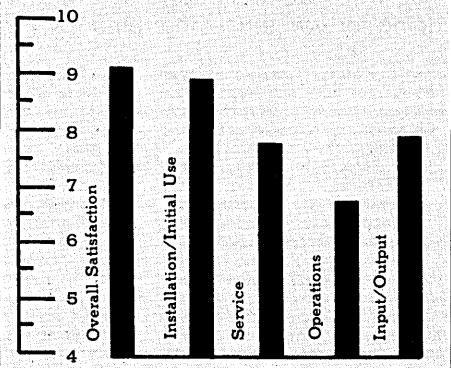

**Waterloo WATBOL** • COBOL compiler • University of Waterloo Computing Centre, Waterloo, Ontario, CAN N2L 3G1 • 519-885-1211 Ext. 3268

**8 responses** • 8 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below

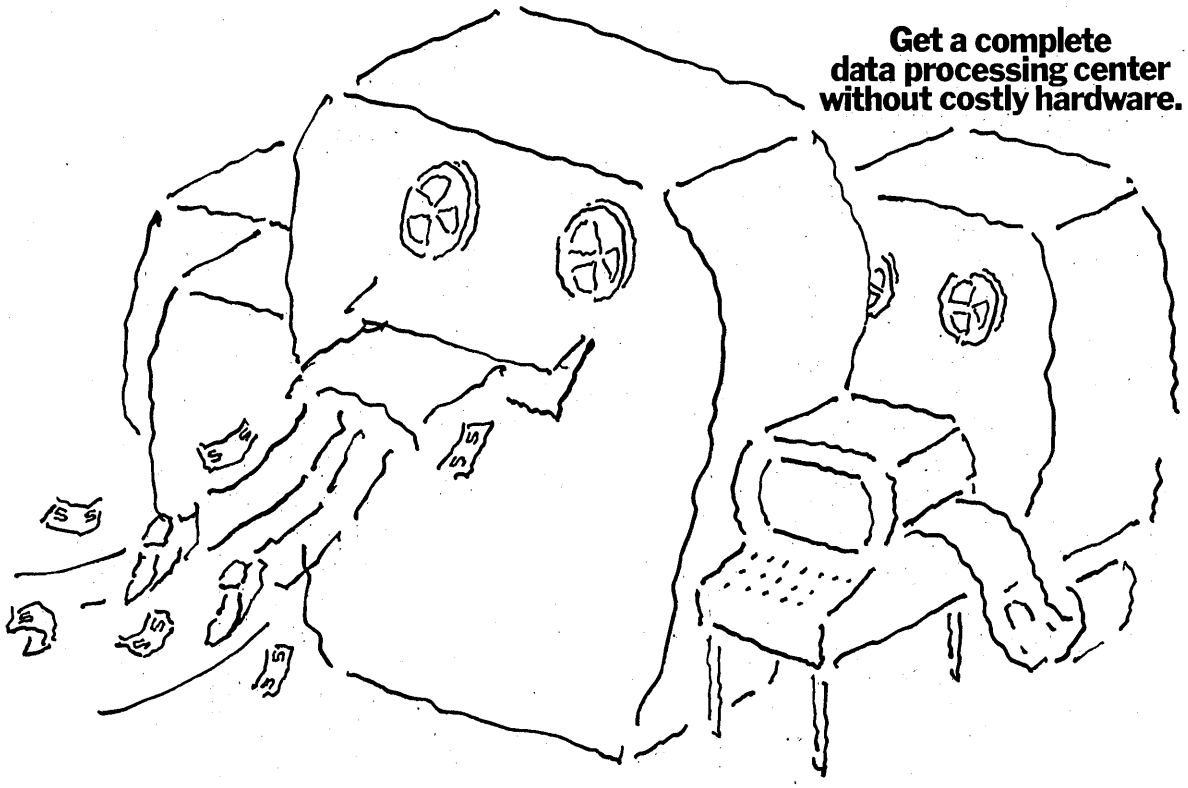



**Waterloo WATFIV** • FORTRAN compiler

**15 responses** • 14 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



# Get a complete data processing center without costly hardware.



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Developed for our own use, UNIX Systems are available under license from Western Electric and come "as is". With no maintenance agreements, no technical support.

For more information about UNIX Systems or other Bell System software, complete the coupon and mail to Bell System Software, P.O. Box 25000, Greensboro, N.C. 27420. Or call 919-697-6530. Telex 5109251176.

UNIX is a Trademark of Bell Laboratories.

DAT-13

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**P.O. Box 25000, Greensboro, N.C. 27420**

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# Micro-computer data base management at its best!

**Get the most out of your micro-computer.** Use our advanced and productive data management system.

**HDBS** is an extended hierarchical data base system offering
- fixed length records
- file-level read/write protection
- one-to-many set relationships

**MDBS** is a full network data base system offered as an upgrade from HDBS...or it may be ideal as your initial system. **Unique and versatile,** it adds these features:
- full network CODASYL-oriented data structures
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- one-to-one, many-to-one, and many-to-many sets
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- a single set may have multiple owner and member record types

**MDBS-DRS.** As an add-on to MDBS, the DRS system offers extraordinary flexibility in data base restructuring to meet new needs.
- Item, record, and set types can be added, deleted, or renamed in an existing data base as well as other data base characteristics. You can redesign the data base after it is already on-line!

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**MDBS-QRS.** An interactive Report-Writer/Query-System for HDBS/MDBS data bases. Features...
- may be customized for non-technical users
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- detailed reports can be quickly generated
- wildcard and "match-one" string specifications included.

**HDBS and MDBS Packages Include:**
- DDL data definition language analyzer/editor
- 260-page users manual
- DMS data management routines callable from host language
- Sample application program and DDL files
- Relocator to re-org all routines
- System specific manual for bringing up our software

**Both HDBS and MDBS Systems...**
- Run under...
  CP/M® with CBASIC; Microsoft BASICs, FORTRAN or COBOL; InterSystem PASCAL/Z; Sorcim PASCAL/M; Micro Focus CIS COBOL; Digital Research PL/I
  OASIS
  TRSDOS and NEWDOS (Models I and II) with Disk BASIC
  North Star DOS with North Star BASIC
  Apple DOS and Applesoft BASIC
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- Up to 254 record-types definable in the data base; each record-type may contain up to 255 item-types; each item-type may be up to 9,999 bytes in length.
- Names of data items, records, sets, and files are wholly user definable.
- Commands to add, delete, update, search, and traverse the data base.
- Straightforward use of ISAM-like structures.
- Records can be maintained in several sorted orders.
- Written in machine language for maximum execution efficiency and minimal memory usage.
- Independent of types and sizes of disk drives. Support data base spread over several disk drives (max.8); disks may be mini- or full-sized floppies or hard disks.
- Available versions: Z80 (requires approx. 18K), 6502 (approx. 30K), 8080 (approx. 22K)
  Total memory requirement must allow for buffer areas. For Apple users, a language card is recommended.
- 8086 version available. (Call or write for details and prices.)

**Ordering information** (applicable to Z80, 8080 and 6502 versions):

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|---|---|
| HDBS (Version 1.04) | $ 300.00 |
| MDBS (Version 1.04) | 900.00 |
| DRS | 300.00 |
| RTL | 300.00 |
| QRS | 300.00 |
| HDBS upgrade to MDBS | 650.00 |
| MDBS with DRS, RTL, and QRS | 1500.00 |
| HDBS/MDBS Manual | 35.00 |
| DRS Manual | 5.00 |
| RTL Manual | 5.00 |
| QRS Manual | 5.00 |
| System Specific Manuals (each) | 5.00 |

Within a given operating system, add $125.00 for each additional language selected.

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1. North Star DOS and BASIC
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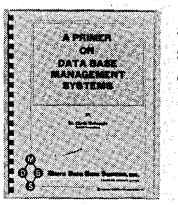


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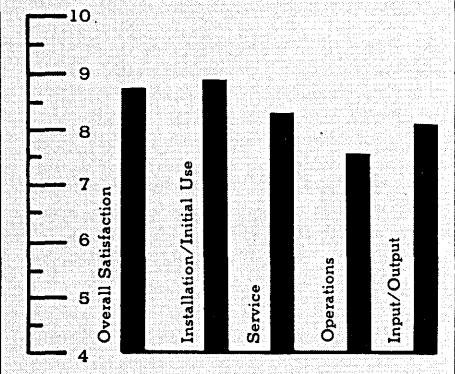
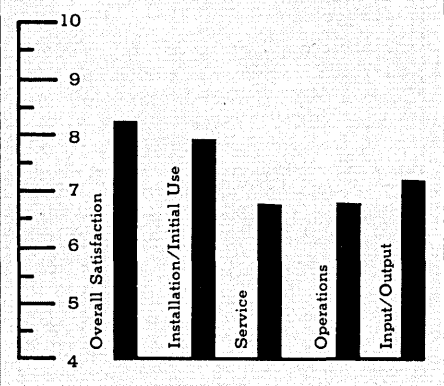
**Whitlow SYNCSORT** • sort • Whitlow Computer Systems, 560 Sylvan Avenue, Englewood Cliffs, NJ 07632 • 201-568-9700

12 **responses** • 11 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



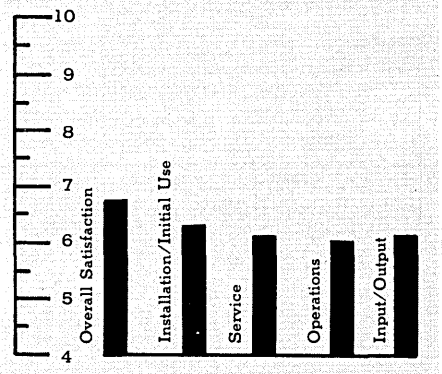

**Burroughs ACCOUNTS PAYABLE** • Burroughs Corporation, Burroughs Place, Detroit, MI 48232 • 313-972-8068

6 **responses** • 5 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below




**Honeywell ACCOUNTS PAYABLE** • Honeywell Information Systems, Inc., 200 Smith Street, Waltham, MA 02154 • 617-890-8400

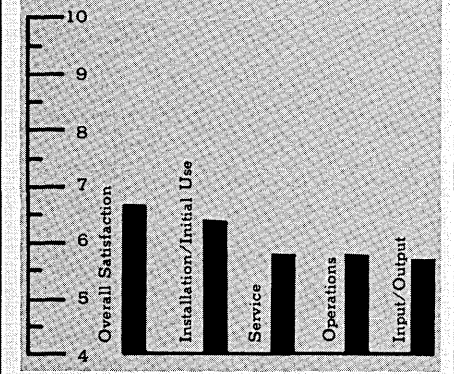
7 **responses** • 7 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




## □ Applications Software Packages

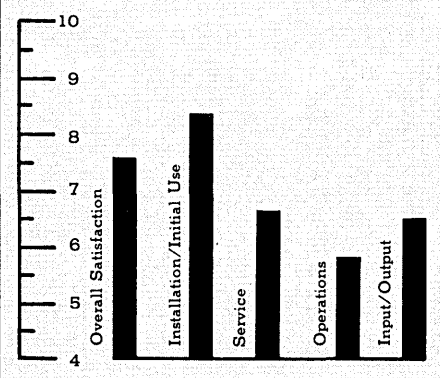
### Group Averages • 34 packages

14.4 **responses** • 11.3 users judged features/cost comparable or better than other packages • 3.2 users actively looking to replace package • ratings are below



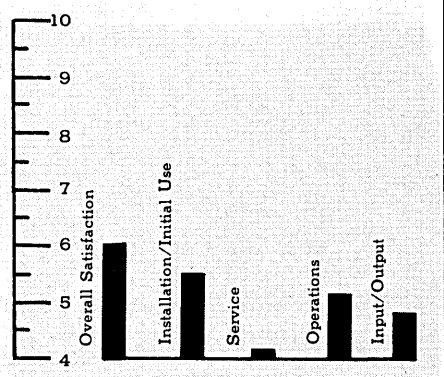

**Burroughs GENERAL LEDGER**

8 **responses** • 7 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below




**Honeywell GENERAL LEDGER**

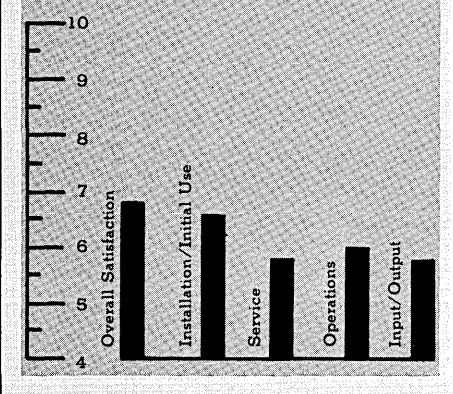
8 **responses** • 6 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




## Accounting Applications

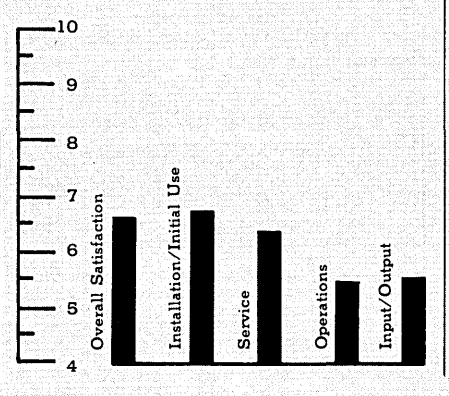
### Subgroup Averages • 20 packages

13.6 **responses** • 16.3 users judged features/cost comparable or better than other packages • 2.5 users actively looking to replace package • ratings are below



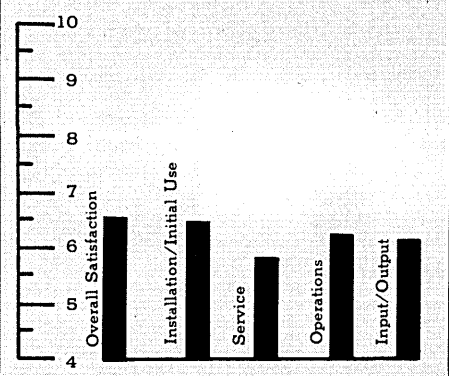

**Florida Software PAYROLL** • Florida Software Services, Inc., P.O. Box 2269, Orlando, FL 32802 • 305-831-3001

8 **responses** • 6 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




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

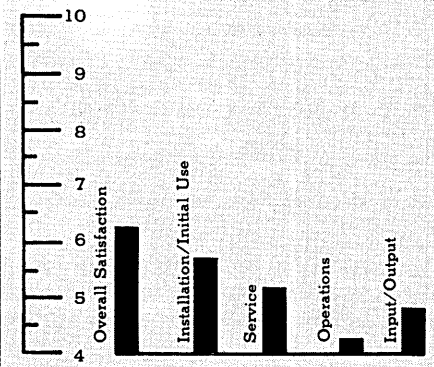
14 **responses** • 11 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



# SOFTWARE RATINGS

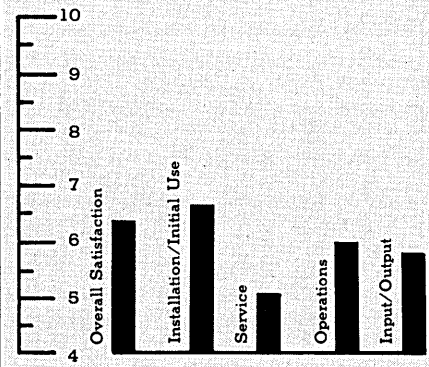
## IBM ACCOUNTS RECEIVABLE

10 **responses** ● 7 users judged features/cost comparable or better than other packages ● 3 users actively looking to replace package ● ratings are below



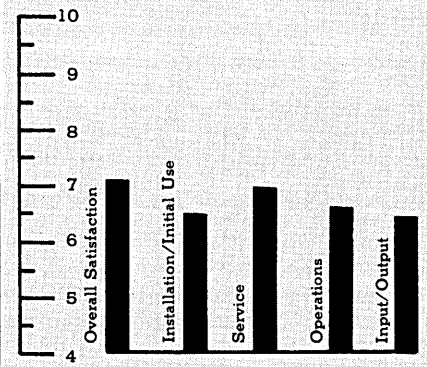

## Infonational GENERAL LEDGER

9 **responses** ● 8 users judged features/cost comparable or better than other packages ● 1 user actively looking to replace package ● ratings are below



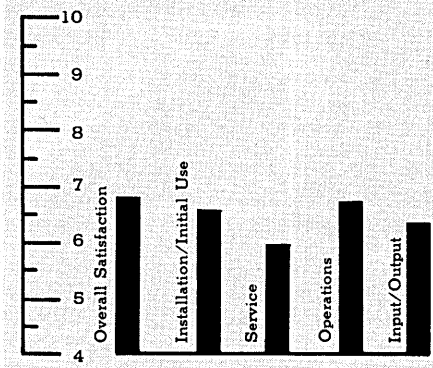

## MSA FIXED ASSET ACCOUNTING

8 **responses** ● 8 users judged features/cost comparable or better than other packages ● 0 users actively looking to replace package ● ratings are below



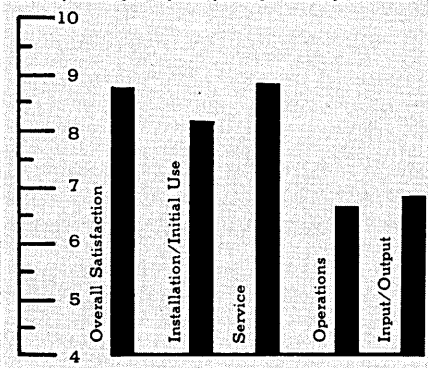

## IBM PAYROLL

20 **responses** ● 16 users judged features/cost comparable or better than other packages ● 4 users actively looking to replace package ● ratings are below



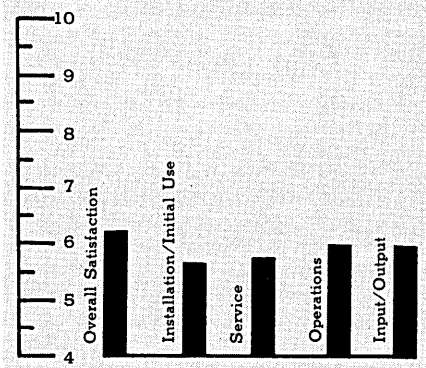

## MSA ALLTAX ● tax tables ● Management Science America, Inc., 3445 Peachtree Road, N.E., Suite 1300, Atlanta, GA 30326 ● 404-262-2376

26 **responses** ● 26 users judged features/cost comparable or better than other packages ● 0 users actively looking to replace package ● ratings are below



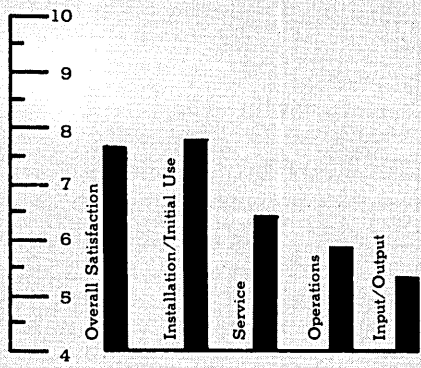

## MSA GENERAL LEDGER

21 **responses** ● 17 users judged features/cost comparable or better than other packages ● 7 users actively looking to replace package ● ratings are below



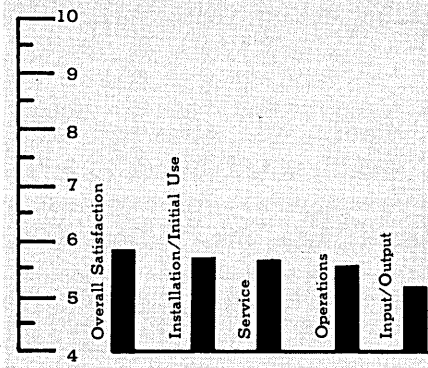

## Infonational ACCOUNTS PAYABLE ● United Computing Systems, Inc., 1901 Avenue of the Stars, Los Angeles, CA 90067 ● 213-277-2722

5 **responses** ● 3 users judged features/cost comparable or better than other packages ● 1 user actively looking to replace package ● ratings are below



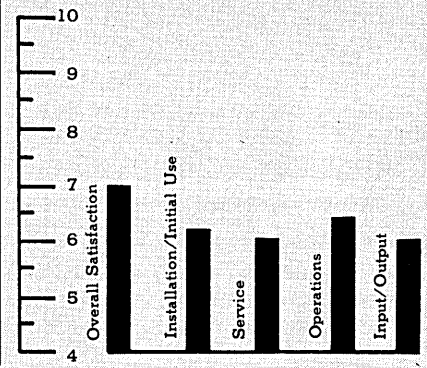

## MSA ACCOUNTS PAYABLE

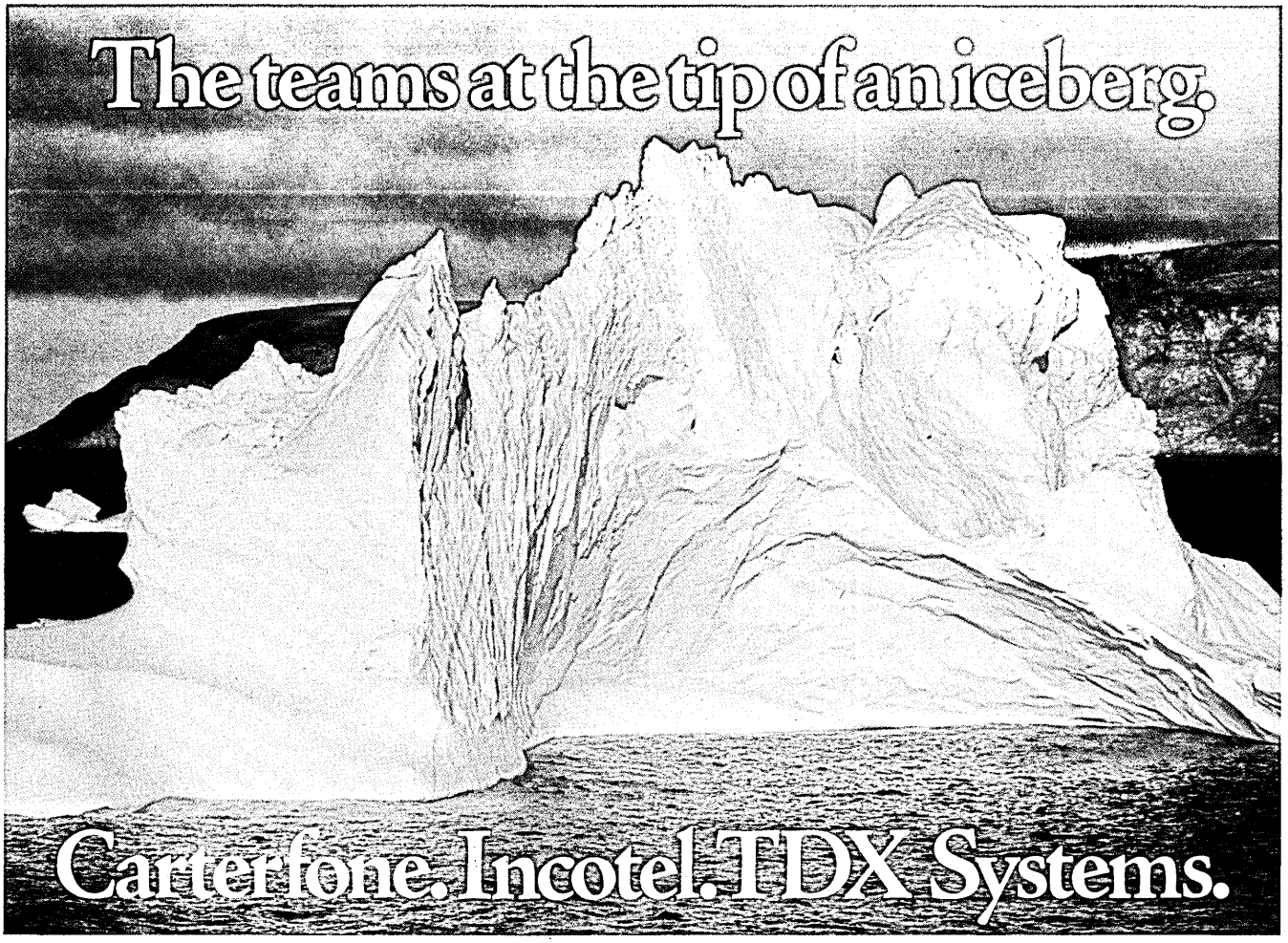
8 **responses** ● 5 users judged features/cost comparable or better than other packages ● 1 user actively looking to replace package ● ratings are below




## MSA PAYROLL

22 **responses** ● 21 users judged features/cost comparable or better than other packages ● 3 users actively looking to replace package ● ratings are below



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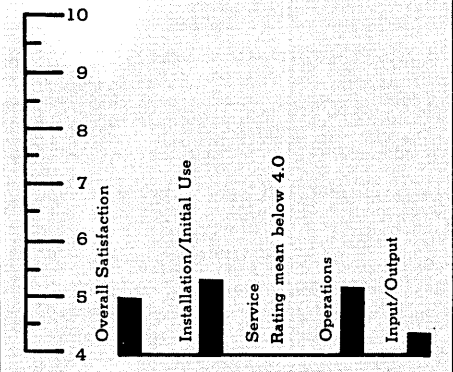
**CIRCLE 101 ON READER CARD**

# SOFTWARE RATINGS

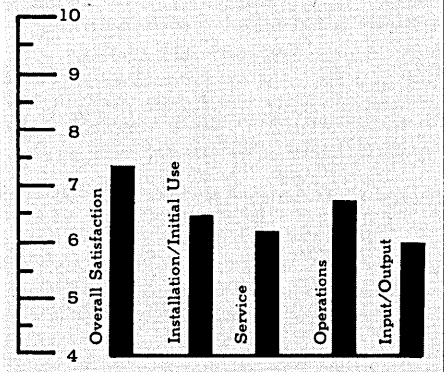
**NCR ACCOUNTS PAYABLE** • NCR Corporation, Stewart & Patterson Streets, Building 26, Dayton, OH 45479 • 513-449-4184

**5 responses** • 3 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



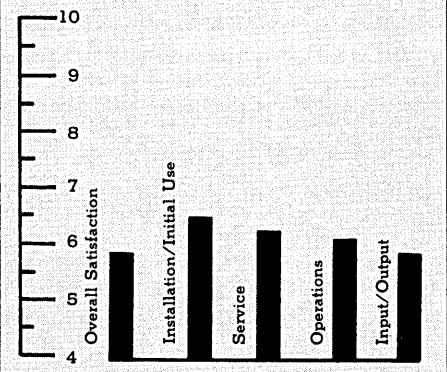

**Software International GENERAL LEDGER** • Software International Corp., 2 Elm Square, Andover, MA 01810 • 617-475-5040

**21 responses** • 19 users judged features/cost comparable or better than other packages • 0 users actively looking to replace package • ratings are below



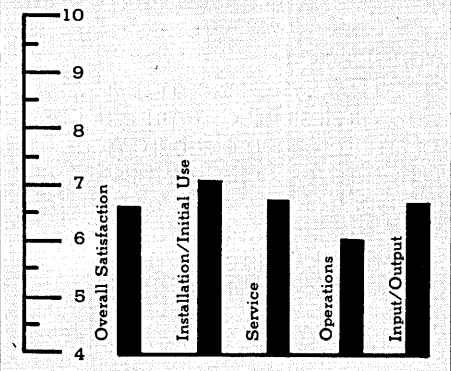

**Continuum LIFE/70** • insurance • The Continuum Co. Inc., 3429 Executive Center Drive, Austin, TX 78731 • 512-345-5700

**6 responses** • 5 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



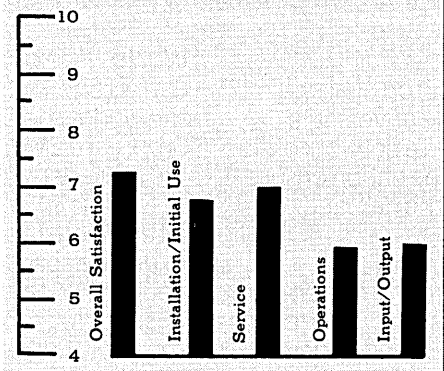

**NCR GENERAL LEDGER**

**21 responses** • 15 users judged features/cost comparable or better than other packages • 10 users actively looking to replace package • ratings are below



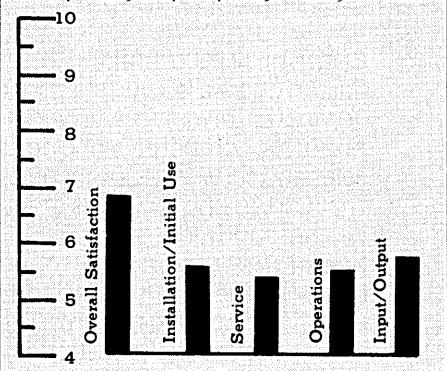

**Wang PHI-PAYROLL** • Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851 • 617-459-5000

**16 responses** • 16 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



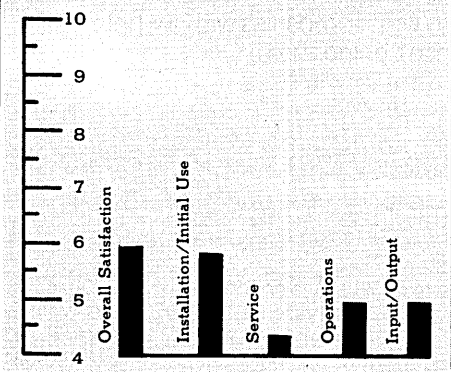

**Florida Software COMMERICAL LOAN SYSTEM** • Florida Software Services, Inc., P.O. Box 2269, Orlando, FL 32802 • 305-831-3001

**16 responses** • 15 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below




**NCR PAYROLL**

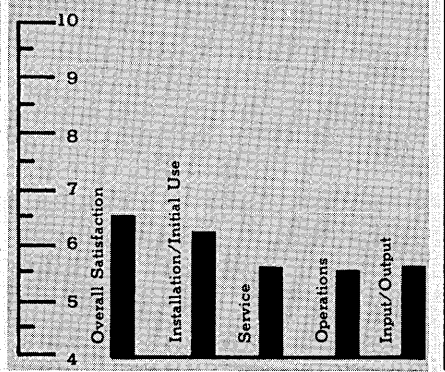
**28 responses** • 16 users judged features/cost comparable or better than other packages • 7 users actively looking to replace package • ratings are below




**Other Applications**

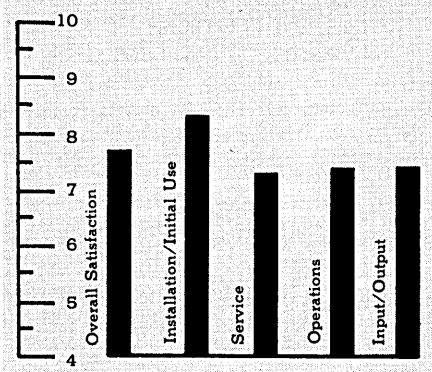
**Subgroup Averages** • 14 packages

**15.6 responses** • 11.5 users judged features/cost comparable or better than other packages • 4.2 users actively looking to replace package • ratings are below



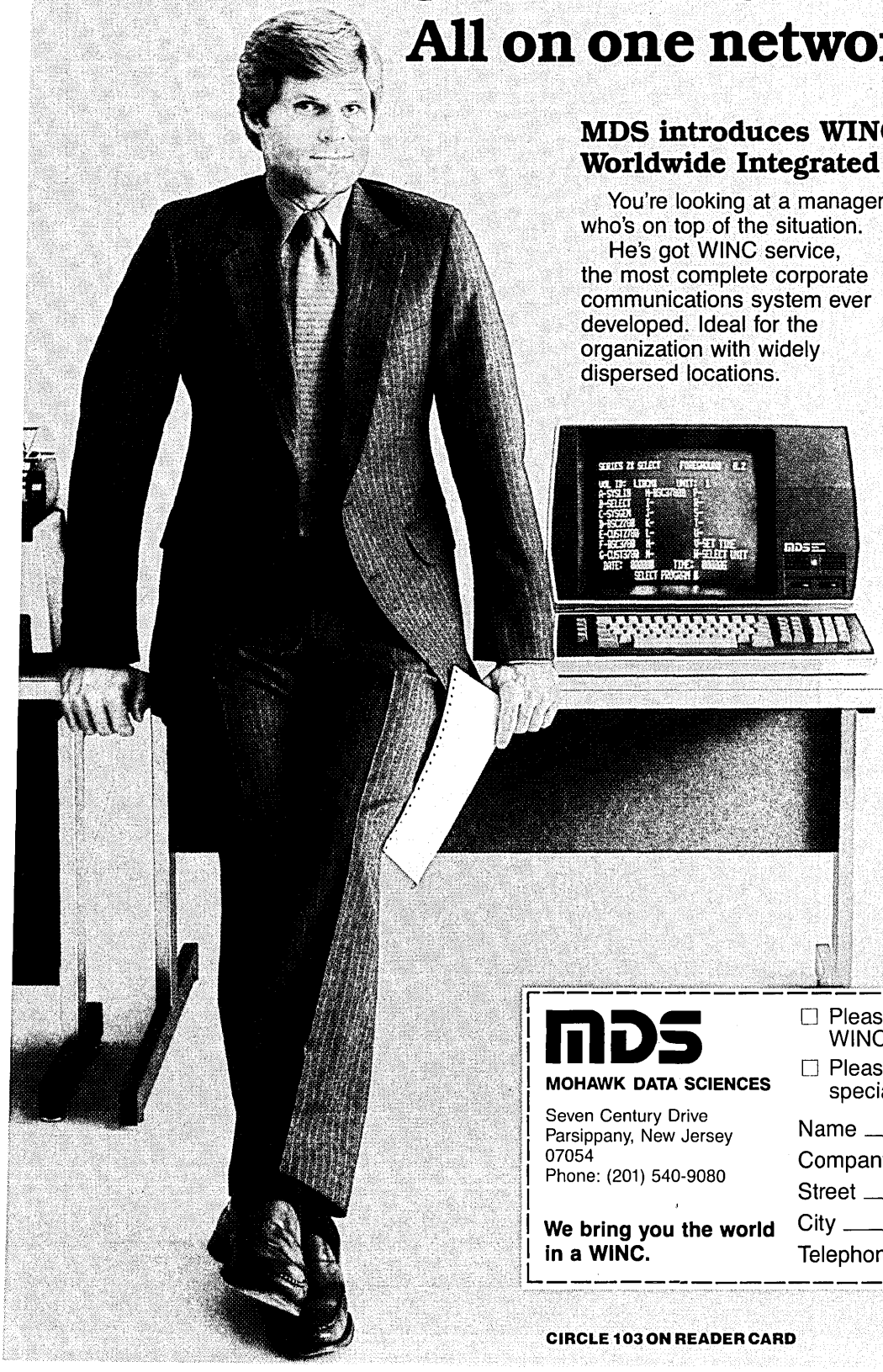

**Florida Software MORTGAGE LOAN EXTENDED**

**8 responses** • 7 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



# He just sent an electronic memo to 16 domestic and overseas branches, received the new sales report data, and revised and distributed the wording of a 30-page proposal.

# All on one network system.



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07054
Phone: (201) 540-9080

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☐ Please have an MDS WINC service specialist call for an appointment.

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Company _____

Street _____

City _____ State ___ Zip ___

Telephone _____

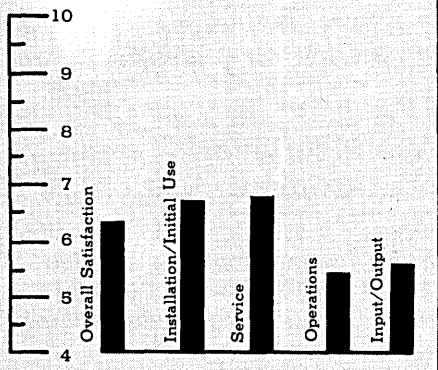
DM1280

**CIRCLE 103 ON READER CARD**

# SOFTWARE RATINGS

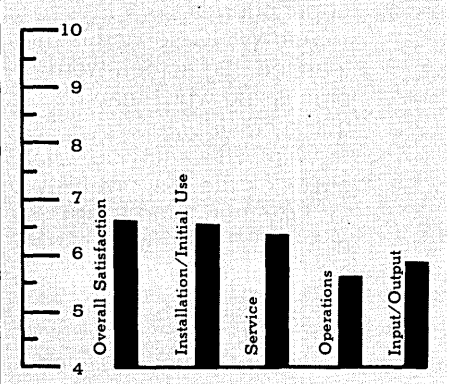
**Honeywell IMS (Inventory Management System)** • Honeywell Information Systems, Inc., 200 Smith Street, Waltham, MA 02154 • 617-890-8400

31 **responses** • 24 users judged features/cost comparable or better than other packages • 7 users actively looking to replace package • ratings are below



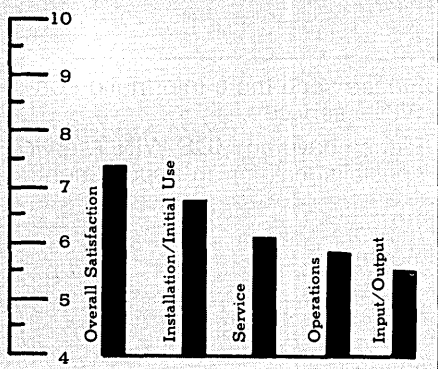

**IBM BOMP (Bill of Materials Processing)** • IBM, GSD, P.O. Box 2150 NE, Atlanta, GA 30301 • 404-238-2000

26 **responses** • 24 users judged features/cost comparable or better than other packages • 7 users actively looking to replace package • ratings are below



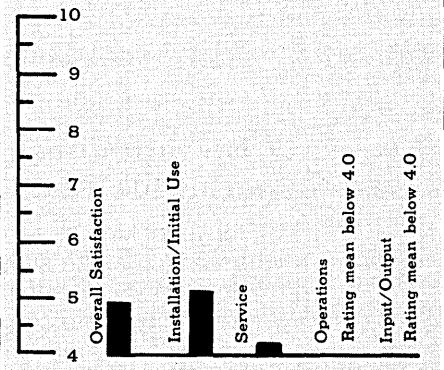

**IBM CFO** • insurance

6 **responses** • 4 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below



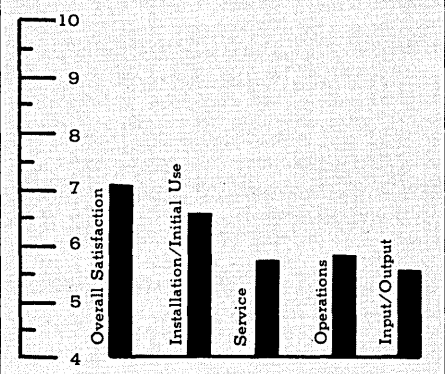

**IBM DBOMP (Disk Bill of Materials Processing)**

21 **responses** • 6 users judged features/cost comparable or better than other packages • 17 users actively looking to replace package • ratings are below



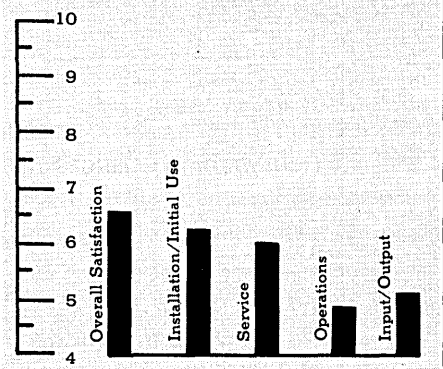

**IBM EPIC** • education

9 **responses** • 8 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



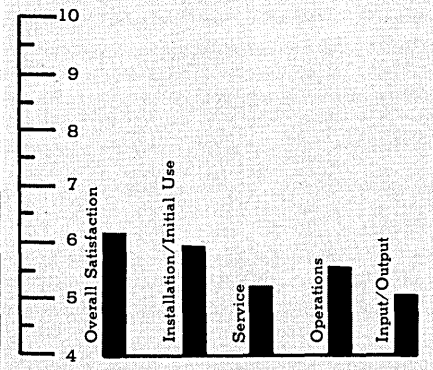

**IBM EPIC-SOC** • education

18 **responses** • 14 users judged features/cost comparable or better than other packages • 3 users actively looking to replace package • ratings are below



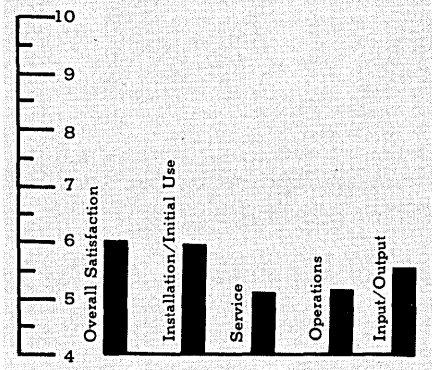

**IBM IPIC** • manufacturing

23 **responses** • 17 users judged features/cost comparable or better than other packages • 4 users actively looking to replace package • ratings are below



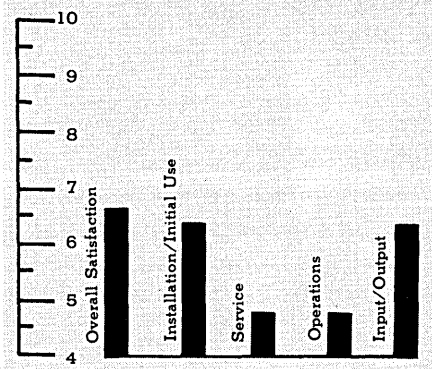

**IBM IRP** • inventory management

17 **responses** • 8 users judged features/cost comparable or better than other packages • 6 users actively looking to replace package • ratings are below

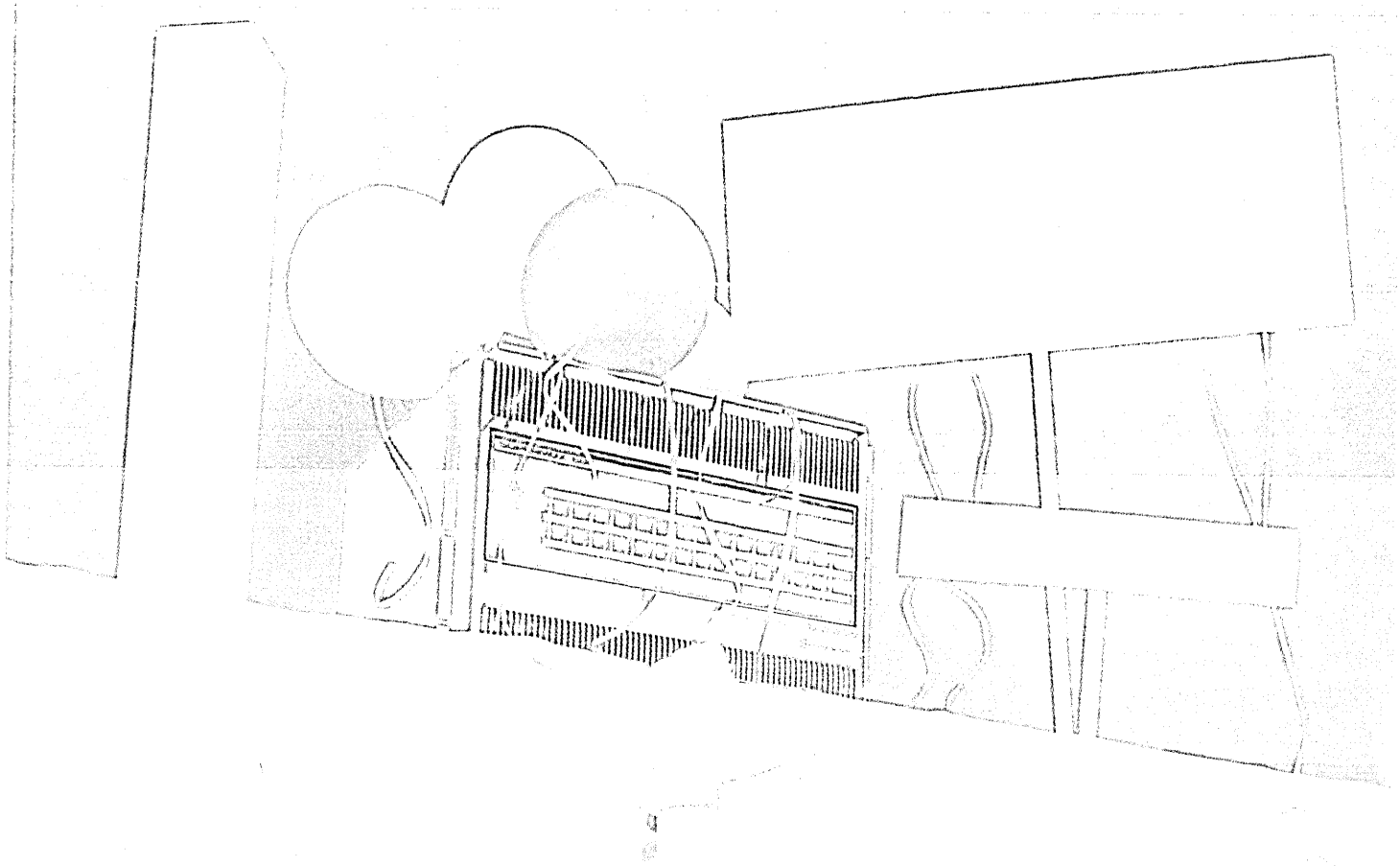



**IBM JAS/3** • job control

5 **responses** • 2 users judged features/cost comparable or better than other packages • 1 user actively looking to replace package • ratings are below



# The Winning Combination!



The Supermux 680, the hottest selling new statistical multiplexer in the industry, now has a running mate—a fully integrated 4800/9600 bps modem. A winning combination that cuts data communication costs.

The Supermux 680 concentrates up to thirty-two inputs, any combination of synchronous and asynchronous lines over a single high speed, unconditioned facility. The multiplexer and the modem work as a team. No cabling, no field debugging and no division of responsibility. The platform also includes other winning features like priority processing, flow control, down-line loading and more!

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Telephone: (0305) 66016
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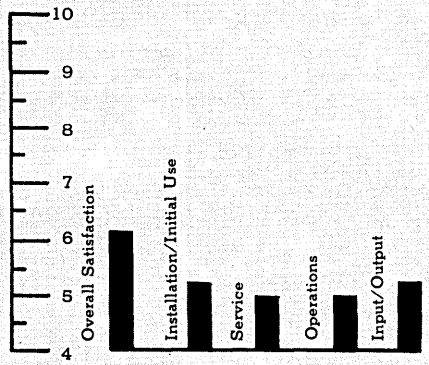
## SOFTWARE RATINGS

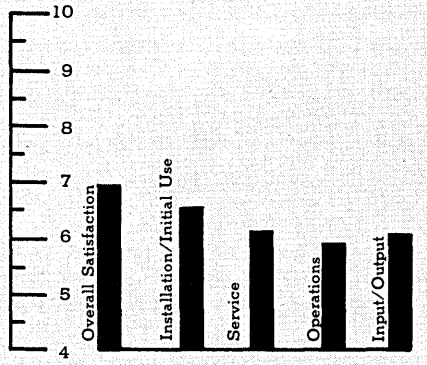
**Sperry Univac UNIS** • manufacturing • Sperry Univac Division, Sperry Rand Corporation, P.O. Box 500, Blue Bell, PA 19424 • 215-542-2172

**25 responses** • 22 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below



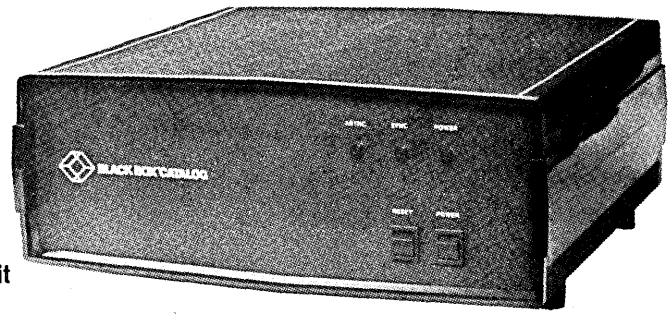

**United Computing FORESIGHT** • financial modeling • United Computing Systems Inc., 1901 Avenue of the Stars, Los Angeles, CA 90067 • 213-277-2722

**7 responses** • 6 users judged features/cost comparable or better than other packages • 2 users actively looking to replace package • ratings are below




Additional information on the packages in this survey may be obtained from the vendors listed on p. 122.


# What does Rohm and Haas think about the BLACK BOX Protocol Converter model A/S-1?



**"Our order delivery system, installed in 1972, was becoming obsolete; it was becoming more and more difficult to service...parts were becoming scarce, and it was a noisy system. We needed to improve it, but we didn't want to effect a lot of expensive software changes. The BLACK BOX Protocol Converter made it possible to transmit data from our IBM 3033 computer to our Texas Instruments Model 820 printers at our manufacturing plants across the country. The BLACK BOX Protocol Converter handles the bi-synchronous protocol and error checking...it converts the code from EBCIDC to ASCII and it converts the protocol from bi-synchronous to asynchronous. We looked at three other protocol converters before choosing the BLACK BOX Protocol Converter. After a trial run in a test environment, we were satisfied that the BLACK BOX Model A/S-1 could handle our application.**

**The system is working great...we've realized a significant improvement in our terminal up-time, which has improved our delivery time...hence we're better able to service our customers."**

***Walt Haswell***
***Manager of Corporate Communications***

Protocol conversion means more than just converting codes. It means "total bi-directional communications" using the proper code, at the proper data rates, in a proper specified format. The BLACK BOX ® Catalog's Model A/S-1 Protocol Converter "IS AN" IBM 2770, 2780, 3780, 2741, or 3741. Alone, it can communicate with a bi-synchronous computer port or terminal and maintain system continuity. With an asychronous terminal attached to the A/S-1, it will transmit and receive data, maintaining the prescribed bi-sync format/protocol.

For more information on the BLACK BOX Protocol Converter, contact: Expandor Incorporated, 400 Sainte Claire Plaza, Pittsburgh, Pennsylvania 15241 412-746-2910

**BLACK BOX CATALOG**
**EXPANDOR INCORPORATED**

**CIRCLE 108 ON READER CARD**

Dear Santa Claus,

My Daddy works so late I hardly ever see him any more. He always used to play with me but now he never does. He works all day in a computer room. He was telling me that you could bring him a package called Intertest, that would bring him home earlier so that he could play with me more. So Santa I would really like to play with him more. He is sad he can not play with me any more. So please bring him the Intertest, so he can play with me.

Thank You, Santa Claus

Tha

Kim Berdy age 9

☑ INTERTEST For CICS testing and debugging. Improves productivity and system reliability, with SYMBOLIC source level debugging.

ON LINE SOFTWARE INTERNATIONAL

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CIRCLE 107 ON READER CARD

# VENDOR INDEX

For additional information, contact the following vendors:

**Altergo Software, Inc.**
Four Faneuil Hall
Boston, MA 02109
(617) 227-5100
**CIRCLE 400 ON READER CARD**

**Applied Data Research, Inc.**
Route 206 Center, CN-8
Princeton, NJ 08540
(201) 874-9000
**CIRCLE 401 ON READER CARD**

**Boole & Babbage, Inc.**
510 Oakmead Parkway
Sunnyvale, CA 94086
(408) 735-9550
**CIRCLE 402 ON READER CARD**

**Burroughs Corp.**
Burroughs Place
Detroit, MI 48232
(313) 972-8068
**CIRCLE 403 ON READER CARD**

**Capex Corp.**
4125 North 14th St.
Phoenix, AZ 85014
(602) 264-7241
**CIRCLE 404 ON READER CARD**

**Cincom Systems, Inc.**
2300 Montana Ave.
Cincinnati, OH 45211
(513) 662-2300
**CIRCLE 405 ON READER CARD**

**Computer Associates, Inc.**
125 Jericho Turnpike
Jericho, NY 11753
(516) 333-6700
**CIRCLE 406 ON READER CARD**

**Continuum Co., Inc.**
3429 Executive Center Dr.
Austin, TX 78731
(512) 345-5700
**CIRCLE 407 ON READER CARD**

**Cullinane Corp.**
20 Williams St.
Wellesley, MA 02181
(617) 237-6600
**CIRCLE 408 ON READER CARD**

**Dylakor Software Systems, Inc.**
16255 Ventura Blvd.
Encino, CA 91436
(213) 995-0151
**CIRCLE 409 ON READER CARD**

**Florida Software Services, Inc.**
P.O. Box 2269
Orlando, FL 32802
(305) 831-3001
**CIRCLE 410 ON READER CARD**

**Goal Systems Corp.**
P.O. Box 29481
Columbus, OH 43229
(614) 268-1775
**CIRCLE 411 ON READER CARD**

**Hewlett-Packard Co.**
1501 Page Mill Rd.
Palo Alto, CA 94304
(415) 856-1501
**CIRCLE 412 ON READER CARD**

**Honeywell Information Systems Inc.**
200 Smith St.
Waltham, MA 02154
(617) 890-8400
**CIRCLE 413 ON READER CARD**

**IBM Data Processing Div.**
1133 Westchester Ave.
White Plains, NY 10604
(914) 696-1900
**CIRCLE 414 ON READER CARD**

**Informatics, Inc.**
Software Products Div.
21050 Vanowen St.
Canoga Park, CA 91304
(213) 887-9121
**CIRCLE 415 ON READER CARD**

**Innovation Data Processing, Inc.**
970 Clifton Ave.
Clifton, NJ 07013
(201) 777-1940
**CIRCLE 416 ON READER CARD**

**Intel Corp.**
3065 Bowers Ave.
Santa Clara, CA 95051
(408) 987-7266
**CIRCLE 417 ON READER CARD**

**Int'l Mathematical & Statistical Libraries, Inc.**
7500 Bellaire Blvd.
Houston, TX 77036
(713) 772-1927
**CIRCLE 418 ON READER CARD**

**Jason Data Services**
24871 Pylos Way
Mission Viejo, CA 92691
(714) 770-7789
**CIRCLE 419 ON READER CARD**

**Johnson Systems, Inc.**
7923 Jones Branch Dr.
McLean, VA 22102
(703) 821-1700
**CIRCLE 420 ON READER CARD**

**Management Science America, Inc.**
3445 Peachtree Rd. N.E.,
Suite 1300
Atlanta, GA 30326
(404) 262-2376
**CIRCLE 421 ON READER CARD**

**Mathematica Products Group, Inc.**
P.O. Box 2392
Princeton, NJ 08540
(609) 799-2600
**CIRCLE 422 ON READER CARD**

**National Computing Industries, Inc.**
3720 Longview Dr.
Atlanta, GA 30341
(404) 451-7455
**CIRCLE 423 ON READER CARD**

**NCR Comten, Inc.**
1950 W. Country Rd. B2
St. Paul, MN 55113
(612) 633-8130
**CIRCLE 424 ON READER CARD**

**Nixdorf Computer Software Co.**
6517 Everglades Dr.
Richmond, VA 23225
(804) 276-9200
**CIRCLE 425 ON READER CARD**

**Oxford Software Corp.**
174 Boulevard
Hasbrouck Heights, NJ 07604
(201) 288-1515
**CIRCLE 426 ON READER CARD**

**Pansophic Systems, Inc.**
709 Enterprise Dr.
Oak Brook, IL 60521
(312) 986-6000
**CIRCLE 427 ON READER CARD**

**SDA Products, Inc.**
475 Park Ave. South
New York, NY 10016
(212) 481-6800
**CIRCLE 428 ON READER CARD**

**SDI**
2855 Campus Dr.
San Mateo, CA 94403
(415) 572-1200
**CIRCLE 429 ON READER CARD**

**Sperry Univac Div.**
Sperry Rand Corp.
P.O. Box 500
Blue Bell, PA 19424
(215) 542-4011
**CIRCLE 430 ON READER CARD**

**Software AG of North America, Inc.**
11800 Sunrise Valley Dr.,
Suite 917
Reston, VA 22091
(703) 860-5050
**CIRCLE 431 ON READER CARD**

**Software International Corp.**
2 Elm Square
Andover, MA 01810
(617) 475-5040
**CIRCLE 432 ON READER CARD**

**Software Pursuits, Inc.**
444 Market St., Suite 800
San Francisco, CA 94111
(415) 392-7171
**CIRCLE 433 ON READER CARD**

**Systems Support Software, Inc.**
5230 Springboro Pike
Dayton, OH 45439
(513) 435-9514
**CIRCLE 434 ON READER CARD**

**Tower Systems, Inc.**
19782 MacArthur Blvd.,
Ste. 365
Irvine, CA 92715
(714) 752-8263
**CIRCLE 435 ON READER CARD**

**Turnkey Systems, Inc.**
50 Washington St.
S. Norwalk, CT 06854
(203) 853-2884
**CIRCLE 436 ON READER CARD**

**United Computing Systems, Inc.**
1901 Avenue of the Stars
Los Angeles, CA 90067
(213) 277-2722
**CIRCLE 437 ON READER CARD**

**Universal Software, Inc.**
Brookfield Office Park,
Route 7
Brookfield, CT 06804
(203) 792-5100
**CIRCLE 438 ON READER CARD**

**University Computing Co.**
UCC Tower/Exchange Park
Dallas, TX 75235
(214) 353-7100
**CIRCLE 439 ON READER CARD**

**University of Waterloo Computing Centre**
Waterloo, Ontario
Canada N2L 3G1
(519) 885-1211 Ext. 3268
**CIRCLE 440 ON READER CARD**

**Wang Laboratories, Inc.**
One Industrial Ave.
Lowell, MA 01851
(617) 459-5000
**CIRCLE 441 ON READER CARD**

**Westinghouse Electric Co.**
2040 Ardmore Blvd.
Pittsburgh, PA 15221
(412) 256-5584
**CIRCLE 442 ON READER CARD**

**Whitlow Computer Systems**
560 Sylvan Ave.
Englewood Cliffs, NJ 07632
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# The Invisible Modem is Here!

## Dear Ma:

## Racal-Vadic introduces the Amazing Modemphone—World's first voice-data telephone with a built-in Bell 103/113 compatible 300 bps full duplex modem.

An invisible modem?

That's right. It's packaged INSIDE a standard rotary or tone telephone.

Now, all you need is the Modemphone and your terminal. Use it for regular voice communication, or, with a flip of a switch, transmit and receive data at rates up to 300 bps full duplex.

Bell 103/113 compatible, the Modemphone is FCC registered for direct-connect to the switched network. You can choose either manual or automatic Originate/Answer.

Racal-Vadic engineers have done a remarkable job of packaging a COMPLETE MODEM inside a conventional telephone. All standard modem circuitry is mounted on a 17.5 square inch PC board, while a 6 square inch board adds the automatic Originate/Answer option.

The Modemphone is amazingly simple to install and to operate, with instructions on a pullout plastic card.

No doubt about it — the world's first voice-data telephone is the shape of things to come, eliminating the need for a separate modem and associated wiring. At $250, the price is right, too.

For fast info call the 800 number right now.

Your independent thinking son,

*Alexander Graham Jr.*

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**CIRCLE 109 ON READER CARD**

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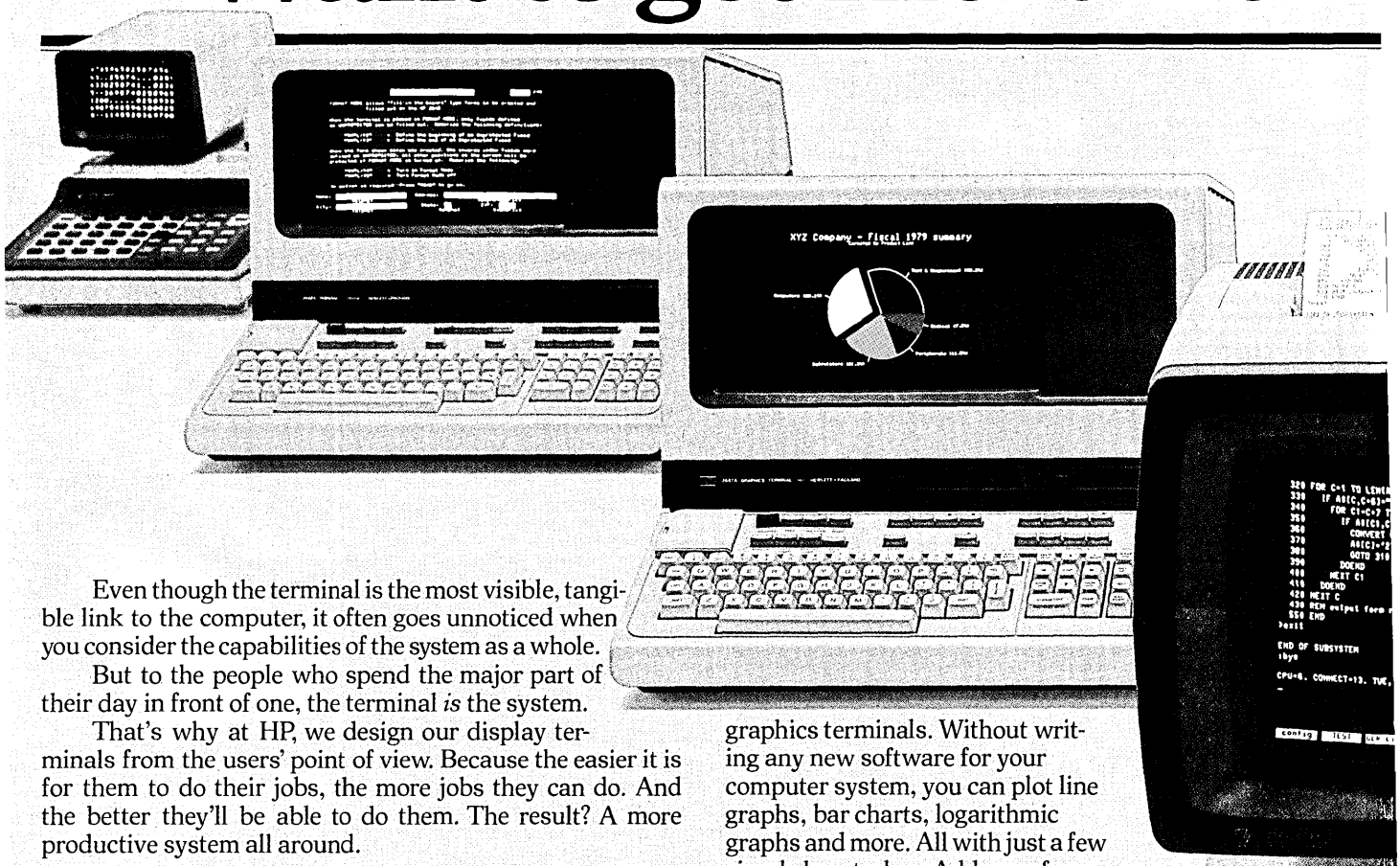


Even though the terminal is the most visible, tangible link to the computer, it often goes unnoticed when you consider the capabilities of the system as a whole.

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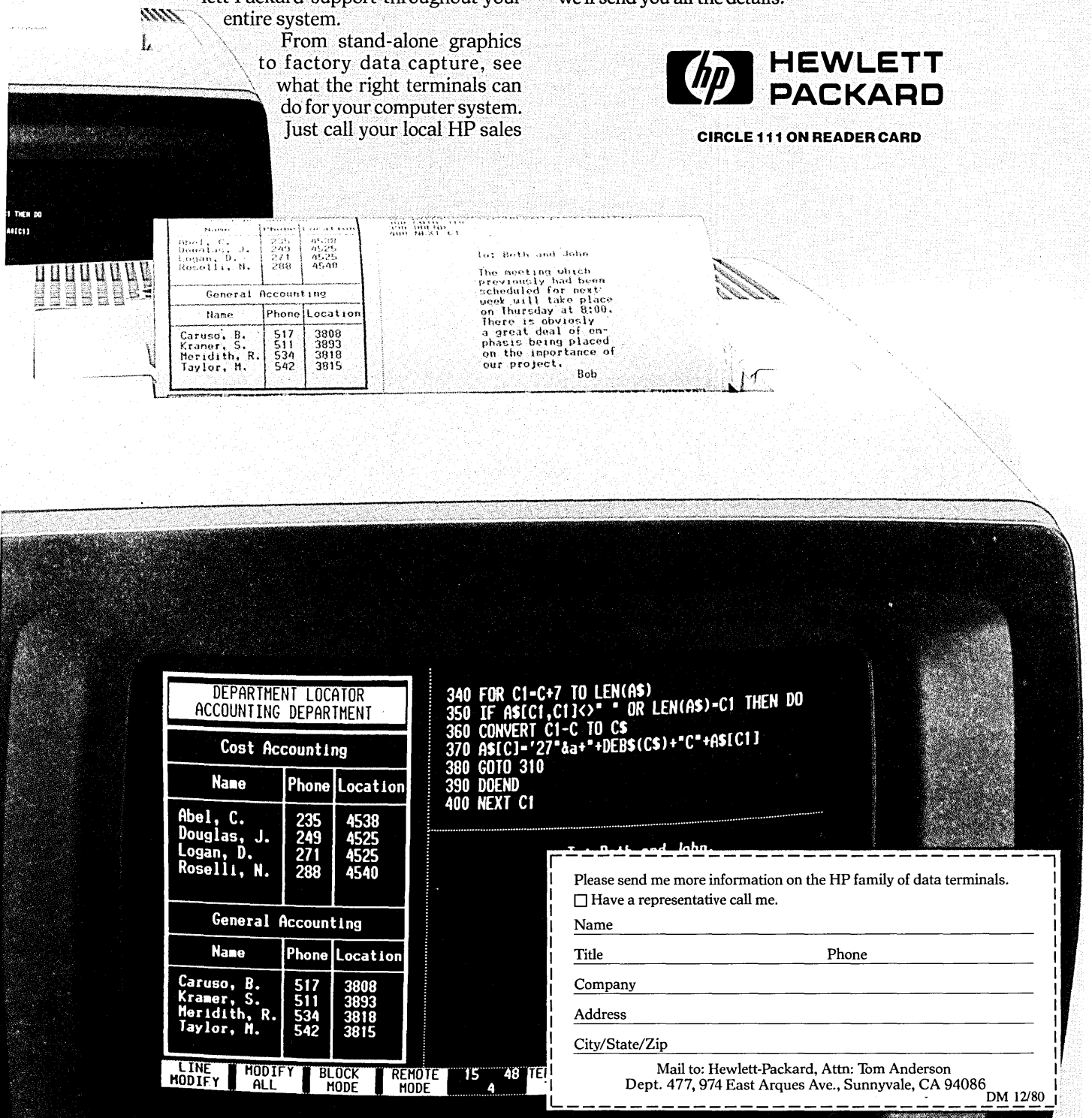


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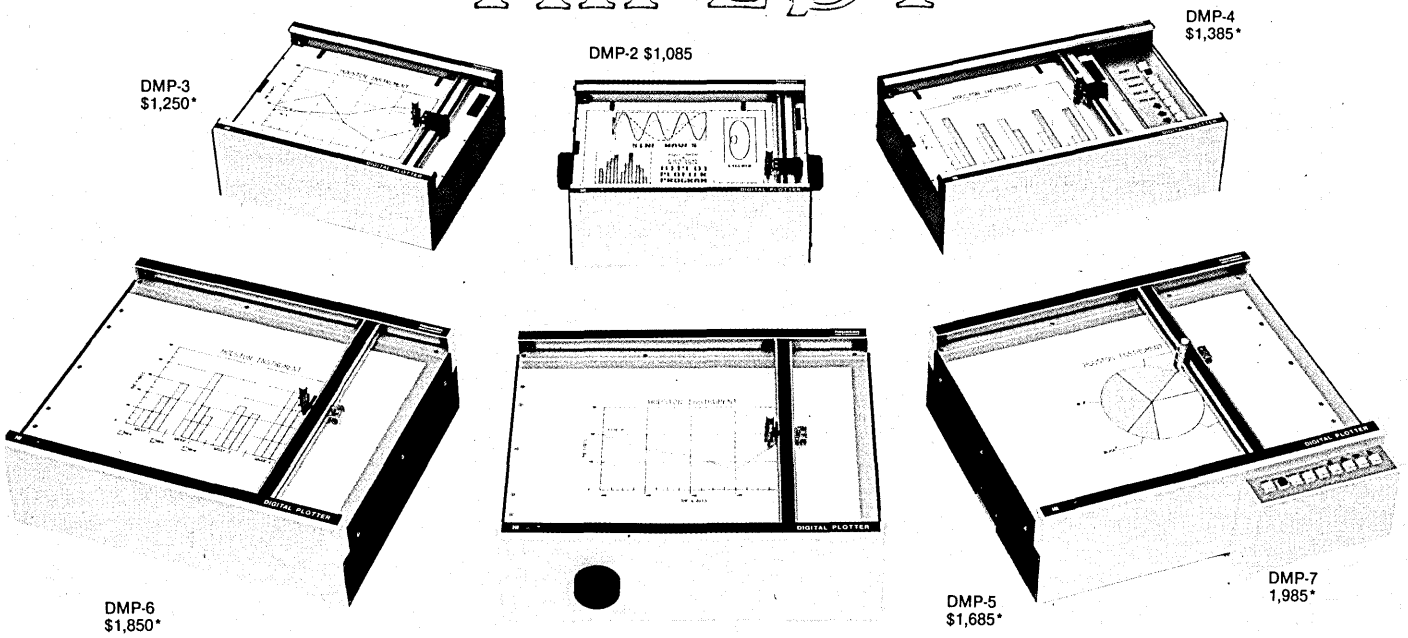


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**The independent software product industry has developed into a $1 billion-plus business with 1,400 vendors, 8,000 products, and 30,000 users.**

# THE ORIGINS OF SOFTWARE

## by Larry Welke

Here, we define software to include programs that modify computer hardware and extend its function beyond the general-purpose digital computer. Software includes, but is not limited to, control programs, executive supervisors, teleprocessing and communications monitors, application programs, programming aids, languages, etc. I do not differentiate on the basis of delivery vehicle used: software could be delivered as a product, with or without large- or small-scale hardware, as a service through a time-sharing network, as one of the value-added components in a facilities management arrangement, etc. I am defining software in the broadest sense possible, and I do so because the current marketplace requires it. What, after all, is the difference among these aforementioned products other than their mode of delivery and their pricing algorithm?

There always have been three participants in the computing equation: the hardware manufacturer/provider, the software manufacturer/provider, and the end user. In the beginning days of computing these three individuals were one and the same person, or at least part of the same team. The man with a computing problem (the end user) built a machine (thereby becoming a hardware provider), then modified it to accomplish his specific task (creating software).

With the commercial acceptance of computers, the end user (the man with the computing problem) was separated out of the equation. Software was provided by either the hardware manufacturer or an in-house group of specialists whose purpose was not necessarily in concert with that of the end user.

Now the pendulum has completed its swing to where all three participants to the computing equation are, or can be, independent of each other. More importantly, it is the software vendor who might also offer hardware rather than the hardware vendor that also offers software. This might seem to be a very subtle distinction, but it is an important one. The hardware vendor that also offers software is selling computers; the software vendor who also offers hardware is selling a solution to a business problem. This delivery of a solution, using both hardware and software components has evolved, giving rise to several different business activities.

Commercial acceptance of computers first occurred in 1956 with the introduction of the IBM 650. That same year, the data center (or service bureau) industry started. The two events are unrelated; the data center industry was born out of the 1956 Consent Decree against IBM, a judgment by the government that required IBM to treat its Service Bureau Division as an arms-length, wholly owned subsidiary rather than as an adjunct activity to its dp sales.

Contract programming firms formed in 1959, largely due to government programming needs. Their existence and importance increased when IBM had difficulties bringing its third generation computer equipment to the marketplace in 1963-64.

That same third generation equipment —or at least the promise of it—also gave rise to the time-sharing industry in 1966-67. And while time-sharing was heralded then as an event resulting from hardware breakthroughs, we have since concluded that time-sharing's success is almost wholly because of software.

Facilities management was formulated in 1968; it was structured as yet another alternative to in-house computing.

### SOFTWARE PRODUCT ORIGINS

Meanwhile, the software product's origins may also be placed at some point during the '60s. Some trace the actual beginning of software to the advent of the Program Application Library, formulated by IBM for the 1400 series computers. But these were seldom if ever used as programs; rather, the overall system design was usually modified and then recoded to the particular user's requirements. Or, it could have been the birth of either Mark IV (from Informatics, Inc.) or AutoFlow (from Applied Data Research). Neither of these were originally designed and written as products but they became products through multi-client use. Others say it could have been the attempts at taking end user programs and modifying them for attempted multi-installation use, a practice that began in 1967-68, and is notable if only for its failure rate. There are those who even attribute the start of the software industry to IBM's decision to unbundle in June 1969. That may have been the seal of approval then needed, but it was not the birth of the industry.

The common thread through each of these events is the attempt to make a program portable, transferable, and usable on a second computer unrelated to the first. Our present vantage point makes it difficult to see why we could not easily solve that problem. And yet, in some respects we still have not completely solved that problem, possibly because we have lost sight of the objective.

If the objective was to sell the software product, that was accomplished. If the objective was to provide an inexpensive user alternative to relying on an in-house programming force, that also was accomplished. In the process, an array of computing alternatives was developed and made available.

To understand the U.S. marketplace of software products, it is helpful to look at the structure and components of the entire information product and service marketplace. Table I lists the type of product or service and indicates the value-added components that are normally supplied with the particular product or service. For instance, consulting is thought to be basically a people-dependent service; a turnkey vendor, on the other hand, normally supplies hardware, software, people (for support, at least), and perhaps a communications capability or even a proprietary data base.

Each of these 11 kinds of businesses was originally established and developed apart from any other; the lines of demarcation separating them were obvious. Changing technology and a demanding public caused coalescence, a crossing of boundaries, a merging of these various disciplines. Today, it is difficult to find a firm specializing in just one business. Most service and software firms are in two or more.

What then becomes confusing is to determine who is or isn't in the software product business: almost all vendors are involved in software products to some extent. It becomes a matter of perception, market positioning, and posture.

Nevertheless, software product has served and continues to serve as an entry level

**IBM's decision to unbundle in 1969 may have given the seal of approval, but it was not the birth of the software industry.**

business into the larger information product and service marketplace. The reasons are fairly evident:

1. There was, and continues to be, a relatively low entry fee. Compared with starting a hardware company, for instance, software product requires little front-end investment. (Obviously, now that the marketplace has settled a bit, that entry fee is higher.) There are additional costs due to the need for product differentiation and competition, for incorporating data base design and new communications requirements. A minimum entry cost today would be $500,000—a relatively low fee compared to other business activities.

2. It promises a high rate of return and very attractive margins, particularly with multiple sales of software product.

3. The diverse requirements of the marketplace, then as now, almost preclude domination by any one firm. The software marketplace has so many needs and demands that the small firm can easily carve a niche.

TABLE I

**VALUE-ADDED COMPONENTS**

| Product /Service | Hardware | Software | Communi-cations | People | Data Base |
|---|---|---|---|---|---|
| Consulting | | | | X | |
| Education | | | | X | |
| OEM Distributors | X | X | | X | |
| Turnkey Vendors | X | X | maybe | X | maybe |
| Software Product | | X | | maybe | |
| Professional Services | | maybe | | X | |
| Information Processing Services Batch | X | X | | X | maybe |
| Remote Batch | X | X | X | X | maybe |
| Interactive | X | X | X | maybe | maybe |
| On-Site | X | X | maybe | X | maybe |
| Hardware Manufacturers | X | X | | maybe | |

## BIT BY BIT, PIECE BY PIECE

The software product marketplace occurred not because of a grand design, a technological breakthrough, or the genius of any one individual or company. It developed bit by bit and piece by piece, with form chosen only sometimes by technology, with standards dictated by economic necessity, with risk taken out of ignorance, and with the rewards sometimes going to the perverse as well as to those who just persevered.

The independent software product industry, which by 1969 had attained $25 million a year in sales, and had reached $400 million by 1975, closed 1979 with sales approximating $1 billion and will probably hit $1.4 billion at the end of 1980. But that is only one factor describing this marketplace. Some quantitative statistics about the business and some characteristics which further describe this industry follow:

Today, there are approximately 1,400 vendors of large scale software product in the United States, selling slightly more than 8,000 products to more than 30,000 users. (These figures do not include or reflect the volume of business done by IBM or other computer mainframe manufacturers.) In addition to these, some 2,800 have software product available for minis (with or without hardware), or as a secondary line of business activity to whatever is their primary line.

The typical firm in the software product business continues to be relatively small (approximately 30 to 40 employees) with annual sales of about $3 million. But those are average figures. The marketplace also has 50 or more major corporate firms in the software product business, directly or indirectly, through a subsidiary.

Further, all but two of the 15 largest CPA firms are in this business, selling the product directly or providing it as part of their auditing service.

By far the majority of software product firms specialize in a segment of the market, whether a hardware manufacturer, an industry discipline or a type of application. Very few firms serve more than one industry unless they are in "systems software" or have what in any way could be considered a full portfolio of product offerings.

What continues to sell well are the basic systems:

- Hardware utilization/performance measurement and accounting systems
- Payroll and personnel information systems
- Financial planning and profit analysis programs
- Project management and control systems
- General accounting and integrated financial reporting systems.

And while there is much activity in the minicomputer marketplace, the majority of dollars are spent in the large scale equipment marketplace. The mini market has yet to settle down and establish procedures. On the one hand, this is unfortunate, and yet, the problems of the two markets are different. The minis have a smaller profit margin to work with on each sale, a lower price requirement, a less sophisticated user, and usually a local, rather than national, market.

The success of the large scale marketplace is probably because the equations for success are well known to the participating vendors. Among these equations:

1. Software should be leased or licensed—not sold. This definition has not yet reached the participants in the mini marketplace.

2. Maintenance can be and should be priced apart from the basic transaction. Further, the maintenance fee should be at least 10% and more likely 12% or 15% per annum of the basic lease price. Maintenance includes corrective changes, i.e. errors; adaptive changes, i.e. operating system or equipment upgrades as well as some business practice changes (like tax rates); and some perfective changes, i.e. those things that will make the product more efficient or effective.

3. Continual enhancement of the product is a requirement that all buyers expect. When computer users buy a software product, they are entering into a long term relationship with the software vendor and expect that vendor to meet their continual and changing needs much like IBM does with its hardware. They want "total" support and service.

4. Product modification, or tailoring, must be minimized to reduce installation costs and to better leverage maintenance expenses and income. Initially it was thought that multiple copies sold of a software product gave that product its major leverage. It has since been concluded that, while multiple copies are important, shared maintenance cost is where the real leverage lies.

5. Incremental expense monies

MCBA is a software house which specializes in developing and supporting business application packages for mini-computers. We license our packages to hardware manufacturers, other software houses and OEMs, and to end users who have their own support resources. Licensees receive Source Code, complete documentation, and one year's warranty.

## Digital Equipment Corp. — Accounting Software

### DIBOL®-8 packages for PDP®-8, 78/88 Series:

- ☐ Accounts Receivable with Sales Analysis
- ☐ Order Entry/Billing
- ☐ Accounts Payable
- ☐ Payroll
- ☐ General Ledger
- ☐ Accountants' Client Write-Up
- ☐ Lawyers' Time and Billing
- ☐ Accountants' Time and Billing
- ☐ Mailing List Maintenance

### DIBOL-11 packages for PDP-11s and LSI-11s:

- ☐ Accounts Receivable with Sales Analysis
- ☐ Order Entry/Billing
- ☐ Accounts Payable
- ☐ Payroll
- ☐ General Ledger
- ☐ Accountants' Client Write-Up
- ☐ Professional Time and Billing
- ☐ Accountants' Time and Billing
- ☐ Fixed Assets and Depreciation

## Digital Equipment Corp. — Manufacturing Software

### DIBOL-11 packages for PDP-11s and LSI-11s:

- ☐ Bill of Material Processor
- ☐ Inventory Management

## Data General Corp. — Accounting Software

### Interactive COBOL packages for DG's CS Series:

- ☐ Accounts Receivable with Sales Analysis
- ☐ Order Entry/Billing
- ☐ Accounts Payable
- ☐ Payroll
- ☐ General Ledger
- ☐ Accountants' Client Write-Up

### Multi-User Extended BASIC Packages for DG's microNOVA™ and NOVA.®

- ☐ Accounts Receivable with Sales Analysis
- ☐ Order Entry/Billing
- ☐ Accounts Payable
- ☐ Payroll
- ☐ General Ledger

## Wang Laboratories — Accounting Software

### Interactive COBOL for the VS series:

- ☐ Accounts Receivable with Sales Analysis
- ☐ Order Entry/Billing
- ☐ Accounts Payable
- ☐ Payroll
- ☐ General Ledger

## Texas Instruments — Accounting Software

### ANSI '74 COBOL for the DS990 series:

- ☐ Accounts Receivable with Sales Analysis
- ☐ Order Entry/Billing
- ☐ Accounts Payable
- ☐ Payroll
- ☐ General Ledger
- ☐ Mailing List Maintenance

## Hewlett Packard — Accounting Software

### HP COBOL II for HP's 3000 series:

- ☐ *Accounts Receivable
- ☐ *Order Entry/Billing
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**CIRCLE 114 ON READER CARD**

**The software product marketplace did not occur because of a grand design; it developed bit by bit, piece by piece.**

should not be spent on marketing, and not necessarily on the technical perfection of the product. The marketplace will be satisfied with "80%" products as long as they work and are well supported.

It is possible to describe the overall software product industry by saying it is labor intensive, marketing- and sales-oriented, providing a living product (where maintenance can and is a major income stream). It is also capable of multiple, repetitive and add-on sales with an inelastic price structure through relatively chaotic distribution networks and virtually non-existent standards for production and product interfacing, and yet it still offers increasing benefits to users who are doing the buying.

## FORCES IN THE MARKET

The U.S. marketplace of information products is a more stable market than ever before—but it certainly is not static. The very nature of computer technology, and the dynamics of its engineering and costs, contribute to the further volatile evolution of computing. In addition, there are other forces at work:

1. The demand for computing continues to increase. There are more users; and more use from present users; and there are new applications that become economically viable as the technology increases and the price of the hardware and communication decreases. It is fairly evident that the market is nowhere near saturated.

2. The amount of money being spent on software for its creation as well as its maintenance continues to increase. And the increase is in absolute terms of monies spent, as well as the percentage of monies spent relative to hardware. (It should also be noted that while the price of hardware decreases, the amount of money spent for hardware in an absolute sense continues to increase.)

3. Office automation, all the way from smart typewriters and communicating copiers to telephones with memory, is changing the information requirement and flow in business organizations.

4. Data base technology, not just the software products that are the data base management systems currently being offered, but rather, the entire shift in information processing concept, is changing the way dp is done. The use of data bases is increasing, on both centralized and decentralized bases. And it appears to continue despite the problems of possible redundancy, data security, and system responsiveness.

5. Factory automation continues apace. Automation is not only in the form of machine tool control and communication but also in factory data control and communication.

6. The communications revolution, due to satellite technology, resulting in tariffs not dependent on distance, is encouraging some companies to centralize and others to decentralize. And it is making all kinds of new applications possible. (It is also bringing new, major competitors such as AT&T into the marketplace.)

7. There seems to be no abatement to the problem of people shortage. This, coupled with the fact that programmers have mostly priced themselves out of the commercial market due to escalating wage demands and lack of measurable productivity, again causes dp management to search for alternative solutions.

This is not meant to be an exhaustive list, merely a critical list. All of these factors will help shape the next five to 10 years of both software and services.

For all the good inherent in the above points, it might be well to spend just a moment on one of the net negative consequences. There was a time when any new application had several years of use during which it could pay back the investment cost of its development. Increasingly, that is no longer true. Because of the increasing pace of change and the increasing complexity of systems development, the time necessary to bring a new application into existence (doing in-house programming in a normal installation) tends to exceed its potential life cycle. The result is that the system must be severely changed before it has a chance to return any of its investment, or it is not changed and becomes a "cripple" system as the overall automation program moves forward.

## FUTURE MARKET TRENDS

What can we expect of the software product marketplace for the next five or 10 years? Several things become evident.

On the one hand, more than ever before, any product or service must be easy to use. The more transparent, the better. Those products that do the least amount of violence to the environment in which they are placed will be the most successful. And if indeed violence is required, then it will be incumbent upon the vendor to provide the buffer to ease the installation.

More than ever, a product will have to be portable. That is, its basic design and architecture must be for multiple installations, with simple maintenance and enhancement capability and optional modules that require a minimum of manual modification to have them meet the diverse operational requirements of the intended users.

We must continue to think of new and different delivery vehicles for software, be that a time-share service or a chip. In the user's eyes, after all, an information processing problem can be solved with in-house programming, a contract programming firm, a software product, a remote batch processing service, or a dedicated minicomputer. It can even be labeled as unsolvable at today's costs. Any but the last alternative can be construed as a proper software solution; and the last is unfortunately a step backwards.

I believe the marketplace will continue being value priced rather than cost priced. Not only are users willing to pay a value based price, but it is necessary for the vendor to charge one to generate enough revenue to perform the necessary R&D for product improvement and enhancement.

Finally, both communications and data base technology will impact on the '80s. And there is no researcher who is willing to predict the consequence of either technology. We don't know whether it will cause centralization or decentralization, whether it will contribute or detract from the electronic office, whether we are helping business get larger or allowing all businesses to stay small. But it is changing the basic equation by which we have processed information in the last 30 years.

For all the above, I do not see the markets changing drastically with regard to the kind of product sold. Today's hardware utilization, performance and accounting systems and the payroll and forecasting systems, will continue to be sold for years to come. They will have enhanced features, and will involve data base concepts and graphic display reporting. And they will be sold to government, manufacturing firms, and segments of the financial industry hitherto ignored.

New technology and new economics will also promote new applications. The electronic office begs for new software—as does the new factory and the new home.

The software market of the 1980s, the international global market, will be better than its predecessor of fragmented parts. It will be a larger market, possibly more difficult to enter, certainly more stable, and more lucrative. ✱


LARRY A. WELKE

Mr. Welke is president of International Computer Programs, Inc. (ICP), the Indianapolis software information service company he founded in 1966. He has also been a chapter chairman for the Central Indiana ACM, and the president of ADAPSO's Software Section.

**A great number of new mini-based applications is needed, and users are even more ready to accept packaged systems programs.**

# THE GOLDEN AGE OF PACKAGED SOFTWARE

## by Frederic G. Withington

Software packages have been around for more than 20 years. Few of them sold very well until recently; the software subindustry has been small. But in the last few years this has changed.

- In 1979 U.S. users spent about $2.5 billion for software packages (excluding contract software). About two-thirds of this went to the computer manufacturers and one-third to the independent software industry.
- Analysis of the DATAMATION 100 (July, p. 87) shows a 1977-1979 annual growth rate of 44% for software and services companies. (The analysts could not separate software revenues of computer manufacturers. The statistics in this market are as soft as the product.)
- Use of packaged software is becoming a matter of course in some industries. Banks have always been relatively receptive to packages: an American Bankers Association survey showed that in 1978, of 1,040 responding banks, 583 had acquired 6,257 software packages for 46 applications. It seems that more than half of all software in banks is provided in package form.

Much more growth is likely. The users are ready for it, and the vendors are ready for it.

Users of every size and type have become more receptive to the idea of using software packages. A major reason for this is the growth of distributed processing and the accompanying proliferation of minicomputers. Suddenly, a great number of new mini-based applications is needed, and central programming staffs are often relatively inexperienced with minis. A complicating factor is the ease of use often required of distributed mini-systems, which must serve relatively untrained users; it isn't easy to write software the first time that proves truly easy to use.

At the same time, the old bread-and-butter applications of many users have become decrepit. Some accounting and payroll programs are more than 20 years old and look like patchwork quilts. Reprogramming becomes essential, but no staff is available; why not buy a package instead? General ledger, payroll, and personnel applications have proved the most successful targets for application packages, largely for this reason.

Whether the user wants to develop new applications, reprogram old ones, or both, he is troubled by a shortage of staff. Increasing turnover rates and salaries serve as a brake on progress. Desperate to progress faster, many a dp manager has become willing to toss aside the not-invented-here syndrome and consider a package as an alternative to in-house programming. (Ironically, he thereby makes his problem worse. As the package market grows, the package-makers hire programmers, and the jobs they offer are often more attractive than jobs with users.)

Of course, very small user organizations getting their first computers have no professional programmers at all, at most a couple of part-time ones. Without packages (or systems so easy to use that professional training is unnecessary), the small user can't consider a computer at all.

Some users have become extremely enthusiastic about software packages. The MIS manager in one $2 billion corporation sees his job as primarily one of selling packages. He noses about among the divisions looking for applications that might be standardized at multiple sites. Then he goes to the package vendors, selects the one he prefers, and negotiates a contract to make whatever changes are needed to adapt an existing package to his company's needs. This done, he and the package vendor jointly visit the divisions and attempt to sell the package to them. At last count this manager had made nearly 60 sales (packages times divisions). General ledger packages were the easiest to sell, he says, then payroll, then personnel records. He's now emphasizing manufacturing packages with few sales so far, but with high hopes.

So far, only application packages have been discussed, but the users have demonstrated even more readiness to accept packaged systems programs. The largest independent companies in the package business are all primarily producers of systems programs (data base managers and data dictionaries, program development aids, schedules, etc.).

Very few users even think of preparing their own systems programs any more, and the computer manufacturers can satisfy only a majority (at best) of the diverse demands of their customers.

New opportunities for systems programs keep appearing, and the software industry will continue growing as it takes advantage of them.

One of the new opportunities is for protocol translators that permit interlinking of computer systems and terminal complexes (including word processors) from multiple vendors. (These are generally implemented as combinations of controllers, protocol-dedicated microprocessors, and software: there's nothing wrong with selling hardware-software combinations.) Another opportunity is for high-speed channel managers that permit users to separate their multiprocessor complexes into front-ends for network and transaction processing, and back-ends for file processing.

The computer manufacturers are rather slow to support this inevitable trend, so a number of users are implementing such functionally decoupled systems themselves. As they do so they need appropriate software for intersystem coupling.

Perhaps the most exciting new systems program opportunity is for packages that permit relatively untrained end users to develop their own interactive applications. Such packages make complex systems easy to use, by making available a subset of the functions of the central software via lead-through and menu-driven dialogs. IBM calls these "application generators"; all the major manufacturers and some independent software firms

**Packages that permit untrained users to develop their own interactive applications are among the most exciting new systems program opportunities.**

offer them. They have had great market success already, but the surface has only been scratched.

## VENDORS ARE READY

Application packages are as old as the computer industry. In the early years few were very successful. Users' needs have always been diverse, and most users refused to be forced into the rigidity and limited functionality of the available packages. There were some successes, but mostly in finance-related areas where functions were standardized.

Nearly 20 years have passed and the package vendors have learned a great deal. They have incorporated wide ranges of options and alternatives in the packages, so the packages can be tailored to a wide variety of user needs. They have added report generators and easy-to-use ways for users to modify the packages to meet changing business needs (changing depreciation formulas, adding fields to records, preparing new reports). They have made the packages available for wide ranges of operating environments: different operating systems, different computer families. They have made the packages robust and failure-tolerant, usable in the real world of breakdowns and errors. The diversity of users' needs will always exceed the versatility of packages, but obviously enough progress has been made to greatly expand the acceptance of packages.

Having learned what it takes to produce acceptable packages, the vendors will build their future packages accordingly. As they move into new areas (fast-response manufacturing control, computer-aided design, graphic processing, or whatever), they will produce packages that have a better chance of being right the first time. (If nothing else, the vendors have learned what it costs to develop successful packages—years and millions of dollars, in many cases.) The result should be more rapid acceptance of the new packages and even faster growth of the market.

The computer manufacturers, beset by profit pressures, have done several things that enhance the position of independent software vendors.

"You'll just have to pick out something else, Gold, frankincense and a gift certificate from Spiegel's sounds tacky."

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CARTOON BY CHUCK VADUN

- The manufacturers price most of their packages separately now, charging enough to permit independent vendors to operate profitably. Not so long ago almost all manufacturer-supplied software was free.
- The manufacturers have largely frozen the instruction sets and system program environments of their product lines. They did this to accommodate the software lock-ins of their customers, but independent software vendors also benefited. Their packages live longer now, and are compatible with larger numbers of user installations.
- The computer manufacturers have encouraged the growth of software vendors, often actively marketing their products for them. Most small system salesmen refer potential customers to system houses or package vendors that are thought to be reliable. Some manufacturers have paid package vendors to reimplement popular packages for their computers. If a computer manufacturer offers a particular package for its system it would of course prefer to sell both, but if a hardware sale results from the customer's selection of competitive software, that's quite all right too.

It seems that the coming years will be a golden age for packaged software. The market is much more willing to accept packages. Even well-established packages have reached only a fraction of their potential users. Many new types of packages seem to have promising potential, too, both in application and system control areas. The vendors are more skillful at preparing satisfactory products, and the independent vendors have a (more or less) cordial relationship with the computer manufacturers. Surely the $2.5 billion market of 1979 will triple or quadruple during the coming years.

## A COUPLE OF WORRIES

For the long range, however, there are a couple of worries. As noted above, software is becoming available that makes computer systems easy to use. Early market success of this software is dramatic on all fronts. The computer manufacturers are enthusiastically pushing further developments. Surely such software will become increasingly versatile and attractive. Computer literacy will rise, too, as more and more people in the work force become confident of their ability to interact with computers. As a result, more and more end users will take to preparing their own applications in a few hours' or days' time. Will this mean that the market for application packages (and professional programmers, too, incidentally) will eventually start to decline?

Another concern is a possible "rebundling" of software and hardware. All modern computers contain multiple microprocessors dedicated to specific subfunctions of the sys-

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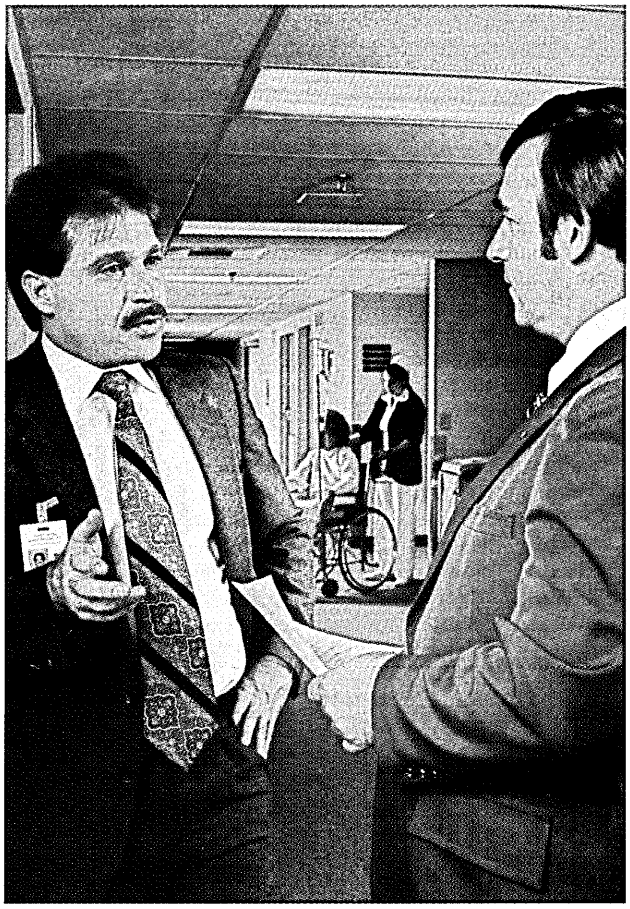

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## Surely the $2.5 billion market of 1979 will triple or quadruple during the coming years.

tem. Microprograms for these subfunctions turn out to be capable of performing some of the work previously done by systems programs in such areas as telecommunications and disk file management. Conventional systems programs are being nibbled away by the microprograms for the "federated microprocessors" that increasingly make up modern computer systems. These microprograms are provided as part of the hardware by the system manufacturer, for a combined price. The user is provided with no information about the microprograms and does not ask for it; few users have the skill or desire to rework the microprograms embedded in their computers. Any independent software vendor that wants to do so would have difficulty obtaining the technical data and knowledge required; even then it might be impeded by trade secret or other law (a murky issue at present).

Microcode is invading applications software too. So far microcoded application packages have been confined to handheld devices, personal computers and application-dedicated terminals, but many forecasters believe "application chips" will enter general use in the future. More immediate is the possibility of application-oriented microcode being substituted for the general-purpose microcode now being delivered with most computers. Today microcode is used to emulate the general-purpose instruction sets of past machines (e.g., the IBM 360/370), so past application packages run on today's machines. But if the computer manufacturers discover microcode-software combinations that are better for performing broad classes of applications (e.g., financial transaction processing, computer-aided design) they will surely be offered as substitutes. Will independent software vendors be able to compete with them, given the increased technical knowledge needed, the lack of data, and (perhaps) legal impediments?

From the user's viewpoint all this may not matter. If the computer manufacturers find ways to provide better systems by imbedding software in hardware and charging a single price, the user will benefit. If they do not and the software package industry continues to evolve with independent vendors and computer manufacturers improving side by side, the user will benefit too. (The independent software vendor has a lot at stake, however.)

Also, the idea that end users will write all the organization's programs in their spare time is utopian. What about the big operations support applications that still constitute the bulk of the work: the payrolls, billing programs, financial control systems, order entry systems? Will the end users ever understand the intricacies of reporting requirements, audit trails, etc., involved in these? Will they even want to?

In any case all this is well in the future. The next few years, at least, will surely be a golden age for software packages, but no golden age lasts forever. ✲


FREDERIC G. WITHINGTON

A 25-year veteran of the computer industry, Mr. Withington is a vice president of Arthur D. Little Inc. He has written four books and 25 articles and papers, and is a longtime contributing editor to DATAMATION.



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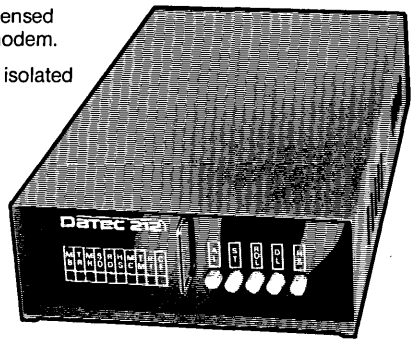

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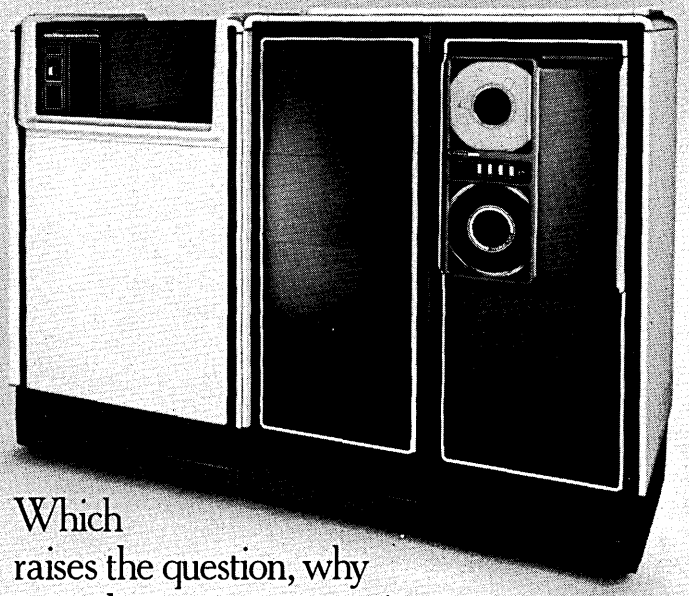

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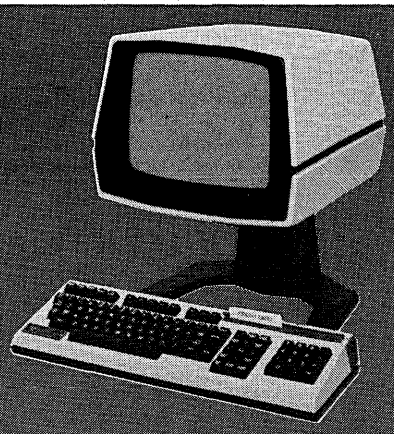

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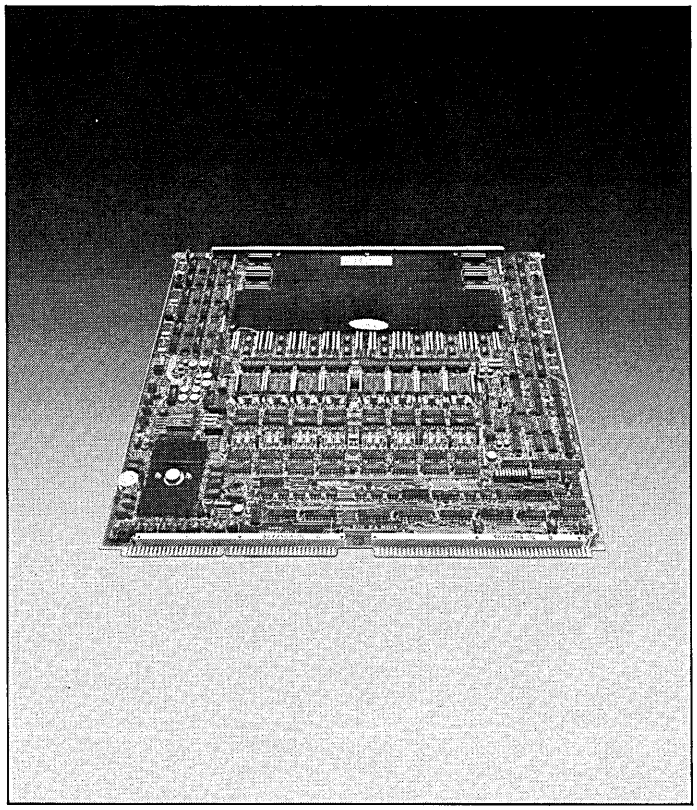

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**Banking, insurance, and manufacturing executives talk about selecting, modifying, and using software.**

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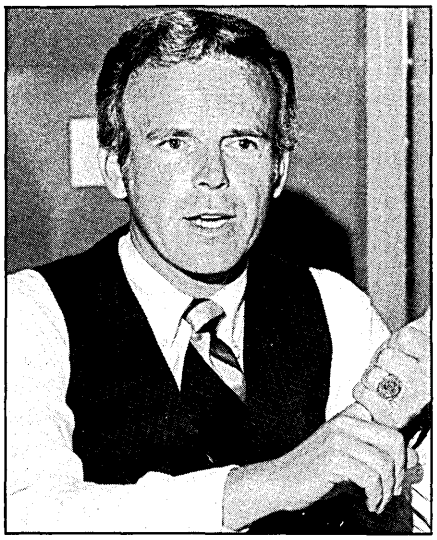
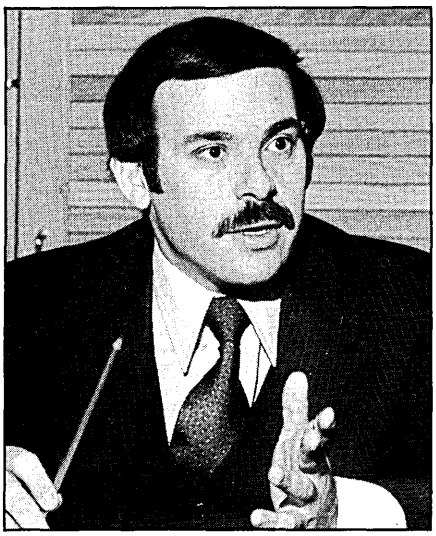


R. Thomas Bigelow



Allan D. Elstien

William Werben

Larry D. Woods

PHOTOGRAPHS BY MARC WEINSTEIN

*A few months ago, DATAMATION assembled four executives with dp responsibilities at major businesses and asked them to relate some of their experiences, attitudes, and procedures in evaluating, selecting, and installing software packages. Moderated by contributing editor Phil Dorn, the four participants —Larry Woods, Bill Werben, Tom Bigelow, and Al Elstien—candidly discussed the issues for three hours—and 140 pages of transcript. Operating, as always, under space constraints, we present the following highlights.*

*All of you represent large companies. Your corporations have established procedures and policies that go back 40 or 50 years, if not longer. How do you fit a software package into your environment? Do you change the environment to fit the package—which can be politically difficult—or do you change the package to fit the environment—which can be technically difficult?*

*Bigelow:* It depends on the package. If you're going from a structured sequential mode of operation to the implementation of a data base management system, then certainly it will impact the way you do things: perhaps you will hire new people or retrain old people. But if you're putting in something like a productivity aid, the impact will be minimal; the organization doesn't need to change.

*Woods:* Our experience has been that most purchased application packages have to be rewritten. We have found in many cases in the manufacturing environment that we'd install the packages the way they came in, and then as soon as we'd get a breather, we'd rewrite. Our business is dynamic and we can't depend on a package fitting well in the long run.

*Werben:* We have had similar experiences. The applications packages have been evaluated as to how they met the structure of the organization of the department to be supported. Also, we have so many other systems, interfaces must be taken into account. We can't buy a package that will result in a number of changes—there is a rippling effect throughout the other systems. So the applications package has to conform to the requirements of the bank. We'll make some slight adjustment to modify the department's operations procedure to conform to the package, but not anything significant.

*Elstien:* Our goal is to implement a package that does not need to be changed more than 10% to 15%. If we have to do changes, we prefer to do them at user exits or as additions to the main package. We try not to change the fundamentals of the package. Once a package is at a certain level and the changes are made, we're not really interested in further maintenance from the vendor anyway.

*Bigelow:* Some packages are generalized. We use an old IBM package, ALIS (Advanced Life Information System) that has been modified substantially, but it was a generalized system that was meant to be modified. If you need to make modifications, who makes them? Do you make them? Does the vendor make them? Or, do you do them in tandem? I think it's reasonable to do them in tandem, because you're learning the package together as you go along.

*Elstien:* That's one of the advantages of a company being at the forefront, near the leading edge of what's happening. As an example, we bought a general ledger package and we participated in the testing of the DL/1 version, since we use a data base and data communications. Before we'll buy any package, it has to fit our system objectives, so we convinced the vendor that we needed DL/1, and they worked with us, supplying programmers

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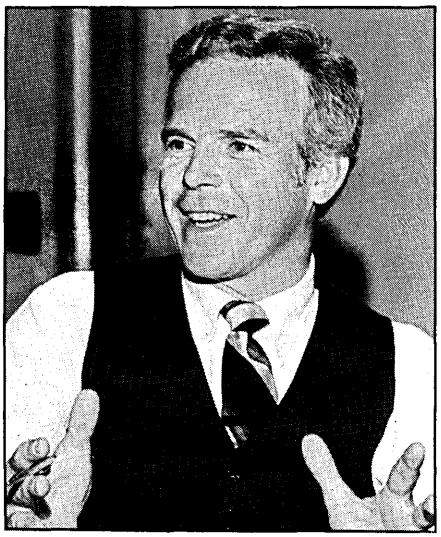
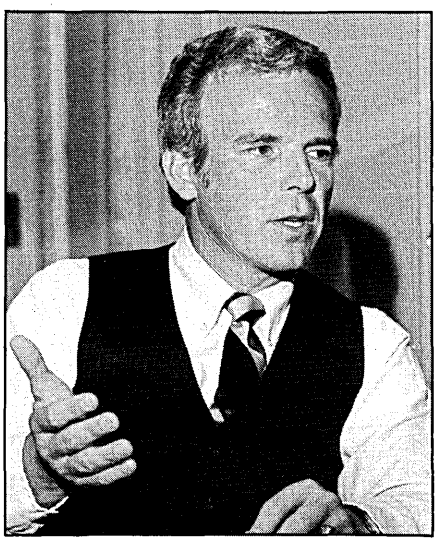




who worked at our place. Then we submitted a list of changes we wanted, and they helped us with that.

*Bigelow:* We have found there are some active users groups; some of the groups have forced vendors to bring out new modifications.

*I'm interested in Larry's remark about rewriting . . .*

*Woods:* Many of our control packages come as part of a hardware/software combination. Even though we work with the vendors in modifying the packages, we often find that once a system is installed we haven't done a complete analysis of what we need. We end up going back and rewriting the package to a great extent; therefore, we always insist we get the source code from the vendor, and we take responsibility for that code. Even when a package may be 80% written by the vendor, we put our people at the vendor site to work with its programmers so we can understand the code. Here, I mean packages from small vendors; we just assume they're not going to be around tomorrow.

*Good assumption. Where would you be if the vendor folds?*

*Woods:* He either folds or he's so small that when we call him a year from now he's busy in Argentina.

*Werben:* We consider applications packages a short-term solution to an immediate problem, and not as something we will have around for the next five or 10 years. We have an immediate, identified business need, and we need to establish a system to reach a short-term objective. In the long run, we will replace the system with an in-house version integrated into the total operation of the bank. The only way we can cope with change is to have our own in-house supported systems.

*Woods:* Vendors have put it to us with these changes. We picked up a financial package and adjusted to it even though we didn't like it. Then we went back to the vendor for changes and he brings out the order sheet, and starts writing up the numbers—the numbers got so high so quickly that now we're considering buying the package and taking the responsibility. We're tired of putting up the bucks for the vendor to make all the changes.

*Elstien:* When we installed a general ledger package we considered only those vendors that had installed a certain number of packages. General ledger package vendors are very competitive, which makes it good for the user. The vendors really want to produce a good, innovative package, and so they're constantly working at it.

*Woods:* We have here a case of two different philosophies. We only buy packaged software when we're forced into it or if it is a unique package. It seems in your case, you looked for a common package. We would never buy a general ledger, we'd write our own.

*Elstien:* I read recently that there will be an average of 1.9 programmers per general purpose computer in the '80s. That means more people will be forced to buy packages because there won't be the available programming personnel. The cost of personnel is skyrocketing. In the future, we all will buy packages; it's the only competitive way we will develop new applications in any meaningful time frame. So, if we all have packages, we all have hardware, and we all have people, the difference between success and failure will be how skillfully we implement those packages. That's the whole premise for the future . . . we will buy generalized packages that are modifiable within bounds allowed by the people who designed them. These packages will be complex, with higher level English translators, and we will not be able to make changes to the software as it comes from the vendor as easily as we can today.

*Woods:* I don't agree that there will be more packages. We all remember 1970, when we said the same thing—well, it didn't happen. I do agree, though, that there's a large market for productivity aids. Programming is going into the users' hands, and we will see more users writing programs—in FORTRAN, in COBOL, in PASCAL . . .

*You don't really mean true end users writing FORTRAN programs?*

*Elstien:* They'll write it on their own computer at home and bring it in the next day.

*Woods:* That's right, and they're doing it now.

*Elstien:* In the early '70s, I was against software packages. My philosophy has changed after some massive projects that take two years to write and install, and then you find there's one just come out down the block and it's better. I'm not interested in the heartaches. Also, over the life of a software project, 50% of the cost is maintenance. Now, software packages are evolving to the point where we'll spend less of our time maintaining them. When that happens, we'll be willing to pay more money for them.

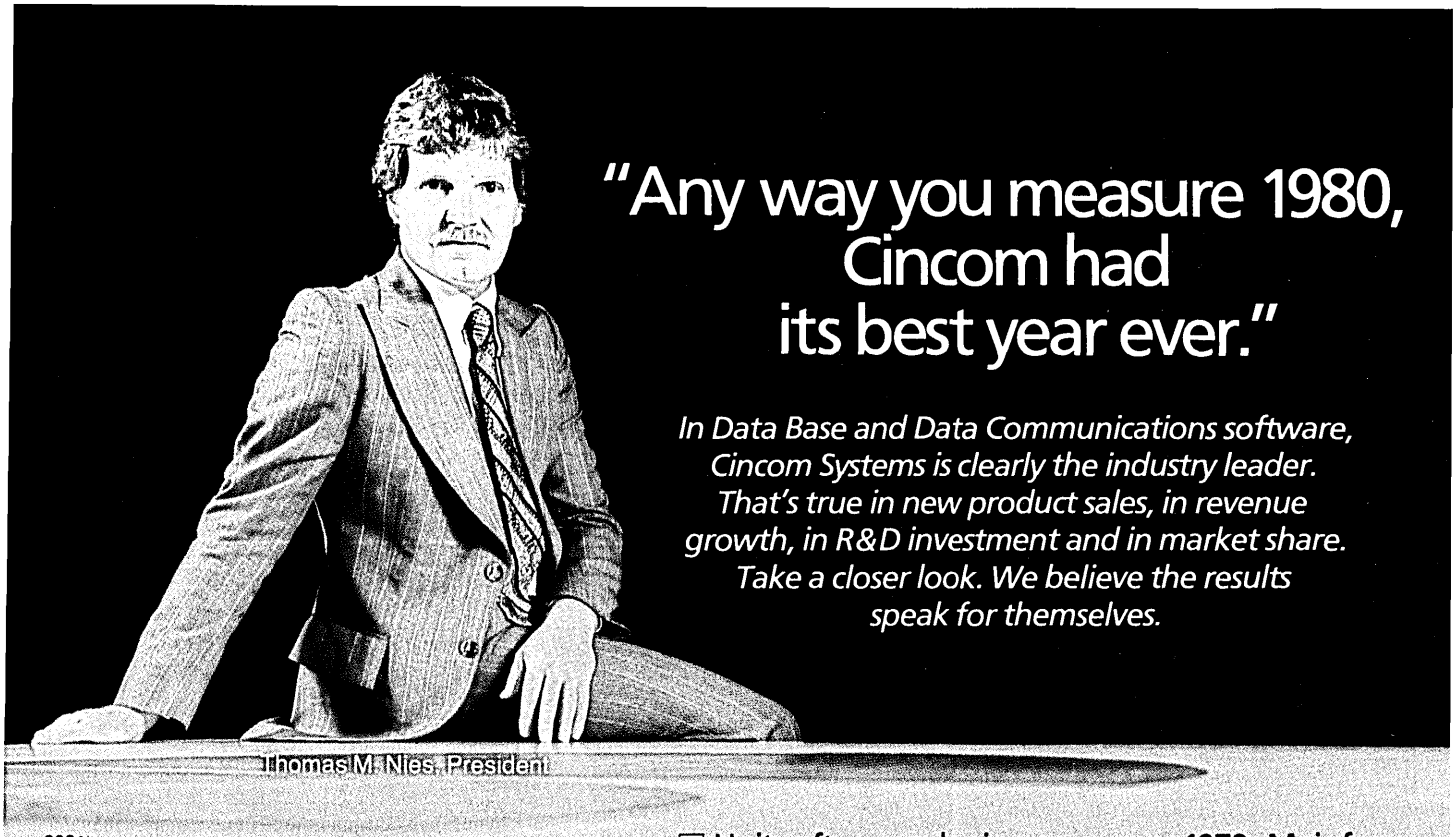
*We don't want that on tape!*

*Elstien:* It's true.

*Larry, how do you evaluate a package? Do you judge it by a different set of standards than you would for in-house work?*

*Woods:* When I say "package," I think of a report generator or something like that which we plan on the vendor supporting. We spend quite a bit of time evaluating the vendor, and interviewing past customers. You can learn more by talking to people who use the package than you can by all the benchmarks in the world. You need to do this. In the case of a package where we plan on taking over the maintenance, we don't spend much time evaluating the company. We talk to past customers to see how they've gotten along with the software. More important, we evaluate the software to make sure it's well documented. In the case of something like Informatics' Mark IV, we don't benchmark the software, and we don't evaluate the software documentation because we expect the company to stand behind it.

*Werben:* We get the user involved so he gets the functions he needs. Once a package looks good from a functional standpoint, we look at it from a technical point of view and an operational point of view. Will it fit into our environment? What hardware dependencies are in



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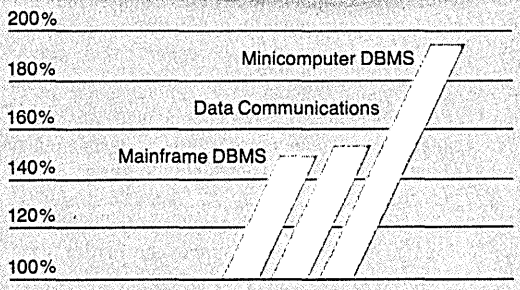
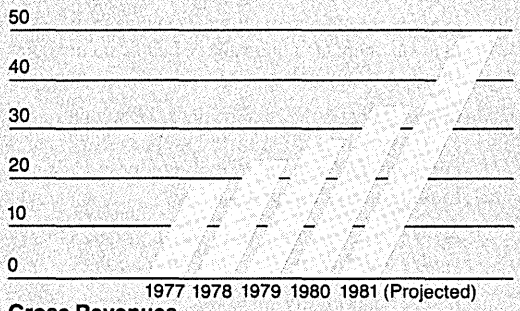
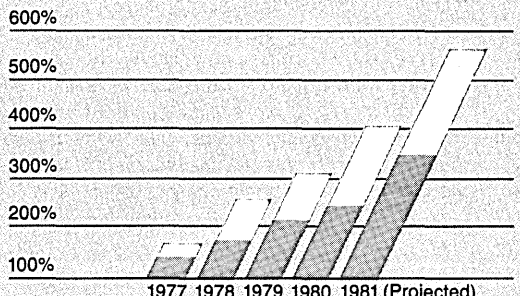



**Percentage increase in DB/DC unit sales over 1979.**




**Gross Revenues (in millions)**




**Comparison of R & D expenditures to gross revenue.***

☐ R & D ▩ Revenue

*1976 Base 100% for R & D and Revenue.

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*Based on IDC Report—August, 1980

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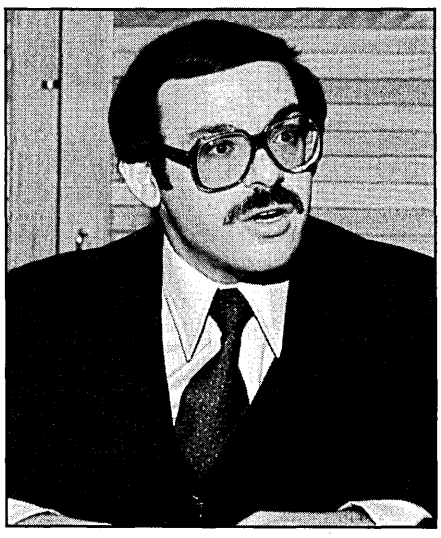
**ELSTIEN: My philosophy on packages has changed since I've worked with some massive projects that take two years to write ... I'm not interested in the heartaches.**



the system? How will it fit the data center? Also, I agree with Larry about talking to other users, asking what their problems were in implementing or converting to the project; what response did they get from the vendor.

*Elstien:* We take some of our more difficult reports and ask the vendor to work with our computer people to evaluate the implications of installing these in the data center.

*Do you actually look at the code to see if it meets your standards?*

*Elstien:* Absolutely. Even with the big vendors, where there's a lot of competition. It's night and day in the way different vendors approach things like a general ledger package.

*Let's assume for the sake of argument that your shop, like most large shops, writes 90% to 95% of all its programs in a high-level language. That's not true of all software vendors. They write in oddball invented languages, or else in assembly language. Do you enforce your standards on them?*

*Elstien:* We look for COBOL and assembler. And we have a lot of RPG programs because there are many projects for which that is the best language.

*Bigelow:* We also visit the vendor site. We go to the headquarters and talk with the senior people to see how well they'll support the package. It is really illuminating. One time we visited a vendor and found out that it was a storefront operation. It had a whole list of resumes but it turned out they were part-time people.

*Elstien:* That isn't necessarily bad. Prior to 1976, "Alltax" had only two people in the whole company, but everybody uses "Alltax."

*Bigelow:* Another thing is documentation. Take a look at the source listings. How well are they commented? Also, some vendors will lock you into hardware or software with a vendor-peculiar method. Finally, we write a fairly tough contract with vendors. We go over important questions up front, and if the vendor can't adhere to the contract, if we can't reach a negotiated settlement, we just won't do business.

*Essentially, you try to bring the vendors up to the level of programming standards you have defined for your own shop?*

*Bigelow:* Yes.

*Werben:* There are two types of documentation. Operational documentation—how to use the system—is even more critical to the successful implementation of a package than the program documentation. Again, it depends on whether you're supporting the package or expecting the vendor to support it. Programming documentation is a nicety, but it's not a make-or-break point in deciding to bring a package in.

*Can the user documentation quality be a make-or-break factor?*

*Werben:* Yes.

*Woods:* There are certain types of software for which we want to make *sure* we have good system documentation, such as the packages for minicomputers.

*Let's get back to Bill's comment that he took his users along. How much user involvement is there in purchasing a software package? Do you listen to the users? Is the original thrust to purchase coming from the user's side? Do the users light the fire under you?*

*Werben:* We're all under a crunch in not having enough programming resources to develop the systems we need. It's a question of how we best utilize those resources. When it comes to that, it's up to the user to justify his needs. One of the ways we can help him is by looking for a package to support him as opposed to taking 30 people and putting on a large-scale development effort. So, yes, the user has to be involved and has to say, yes, this package really does fit my requirements.

*Elstien:* We divide our software department into three functional areas: financial, distribution, and manufacturing. We also have a steering committee of which the executive vice president is the user head. All requests have to go through him; he has to sign off on them. Now with general ledger, for example, the users had an active role. They decided which package they wanted and from which vendor. We were there as support.

*What if the users discover an interesting package that doesn't run on your equipment?*

*Elstien:* That can happen. Generally, when it comes to software, they'll ask us who the vendors are they should deal with. But having your own computer doesn't necessarily mean that's the only place you can run programs. We also use a service bureau, and we use time-sharing.

*Bigelow:* Before I came, I reviewed a list of what packages we have. In the systems area alone, we have 64. These include things like performance analyzers . . . we had a conference in Denver recently, and one group had done a survey of 30 companies. In the 30 companies, just in productivity improvements, they were using 40 different packages!

*For example?*

*Bigelow:* ADF is an example; TSO was in there; SPF was there. But also a lot of cats and dogs, things I'd never heard of.

*Woods:* That's the kind of package with a future—system software. If I were a software company and wanted to make money, I'd be looking at system software.

*Are you suggesting that in buying packages, you're shifting away from applications?*

*Woods:* Definitely.

*If you go to Cincinnati, Boston, or Washington, the home base for some of the few remaining independent, major software houses, you'll find that they are scared to death of systems software because they seem IBM squeezing them out. Each operating system rewrite contains more and more of the functions provided by the independents. The software houses are beginning to think that their future may well be in applications packages. Are you on a very different course than the software houses?*

*Woods:* There's a place for applications packages, but the software houses will have to design applications that are either so large that most companies won't touch the development phase, or else applications that are

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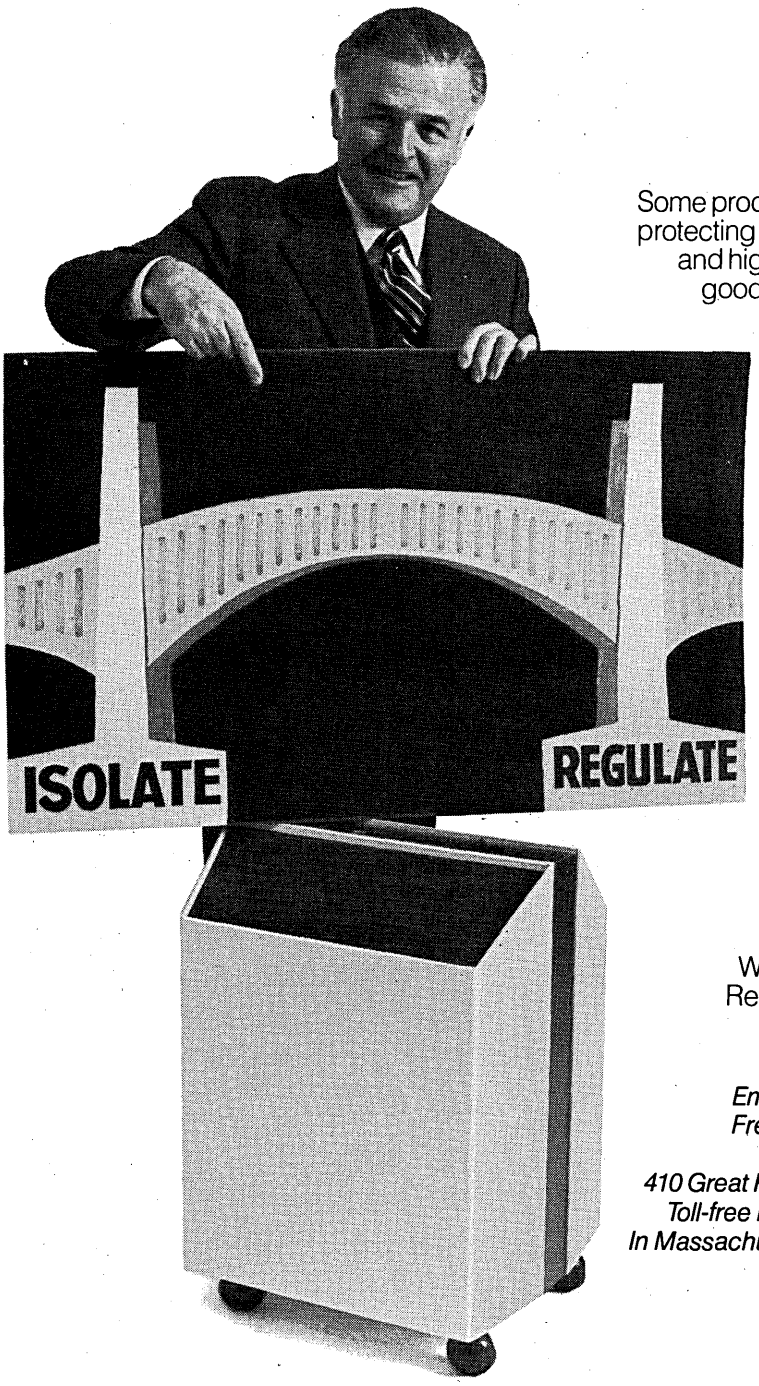


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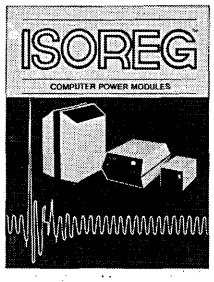


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**WERBEN: We're all trying to compete in the same marketplace. If we're all using the same application package, where's the competitive advantage?**

unique. For example, there is a place for a good, generalized, linear program package. Now linear programming can be complex, and most people won't write an LP package because it's a hell of a mess—on the other hand, I don't think IBM would either because it's too specific.

*Werben:* Another idea is for vendors to start off with a joint development project with some company, and then get a licensing fee to go ahead and market it to other organizations. This gives the vendor an immediate payback to offset the initial development cost, it gives him a long-range product to sell, and it gives an advantage to the user organization in that it's not putting up all the development money.

*Woods:* There's something else software houses may start doing—mass marketing.

*Would Allstate walk into its friendly neighborhood computer store and buy a package off the rack with the only guarantee that it would load? Can you live with documentation that is often little more than a few badly needed printed pages?*

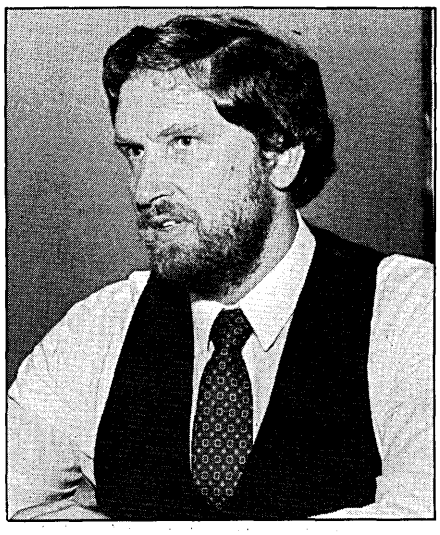
*Werben:* What we'll see is a lot of independents developing software packages and moving it through a separate marketing organization. There's no guarantee of any support . . .

*Here in New York, we have a company called Lifeboat. They collect programs, written at home and by freelancers, package them, advertise them widely, and sell them by mail. While they deal with microcomputer software only, if they should move up a notch or two, for example, to keep PDP-11s under RSTS or UNIX, would your companies buy from this type of operation?*

*Woods:* If John Deere were approached by the right company that said, "You're not interested in being in the software business . . ." and we'd say "Right." "But you've got good packages in some areas you don't consider competitive . . ." And we do have such a package—an access method that does its own queueing on DEC machines in case the host goes down. I don't think that it has a competitive advantage, we just need it. So the software house says, "We'll take that from you and pay you a royalty, and we'll take responsibility . . ." Of course, they'd have to accept the maintenance . . .

*Werben:* They would go around and solicit software products like Larry's IMS interface . . .

*ADAPSO says that the software industry was about $1.6 billion in 1979. This is less than 2% of the revenues for the total information services industry. Why isn't it bigger? Are there some fundamental weaknesses in the software package industry that have prevented growth?*



*Elstien:* Everybody's always wanted to grow their own. Now that's becoming economically unjustifiable.

*Bigelow:* I just visited a software vendor. It had a staff of over 600 people and it had just embarked on a $10 million to $15 million developmental effort for a new life insurance system—which astounded me. First, that it was making that kind of capital investment, and secondly, that it had that many people . . .

*Elstien:* Probably brought them all in for the day . . .

*You've all dealt with the big vendors. Do they have the right applications? Do they give you the right level of support? Do they know how to market? Do they have good products?*

*Elstien:* The support depends on whether what you want is what a lot of other folks want. We have found that the support is sometimes lacking for specific things. People don't get back to you. Companies don't always have hotlines that work or else they're so hot they can't touch them. You've got a problem at two in the morning and there's nobody to help you.

*Werben:* It gets back to the problem that we have with our system development staffs. You start developing a certain application with a core group of people who are intimate with the workings of the system. Once those people leave, where does your support come from? A software vendor often has the same problem. What he's trying to do is sell as many copies of the product as he can . . .

*Bigelow:* That's why we're in favor of tandem development, particularly in applications.

*Elstien:* That's your only shot. Once you're past that point, you're on your own.

*Woods:* When you buy a package, regardless of what type it is, if it's generalized, it's generalized to the lowest common denominator. Well, we're large enough and we have big enough staffs that we do things our way and it's not the generalized way. The vendor comes in with a package and it doesn't fit. And they say, "Well, gee, it's generalized." Well, it wasn't generalized for us.

*You have really described nonprofessional companies.*

*Werben:* Those are realistic situations. . .

*Elstien:* I wouldn't say they're nonprofessional. Why do you say that?

*Well, you just said you got left hung high and dry for support . . .*

*Elstien:* Then there aren't many companies that are professional. It's probably not so terrible anyway, we ought to be able to take care of the package ourselves if we want to survive. . . and of course, they force us into that.

*Werben:* We got into a situation with one package where we wanted to bend it a little to fit our environment. We came up with some strange diagnostics during installation and you had to be one of the original developers to understand the internals of the system in order to respond. The company we were dealing with was trying to be very supportive. It even gave us home phone numbers. . .

*Elstien:* Of past employees.

*Woods:* Talk about a package that's going to be impossible to support, it's the System/38. They'd better hope that on day one the software works because that will be the last time anybody sees it in one place at one time. You page in and out of microcode. My God, you'll never know where the thing is. . .

*Bigelow:* That's one of the reasons it's been delayed.

**WOODS: We large mainframe users should influence the vendors. We know damn well the direction they're taking, and we want to make sure we get products we can use.**

*Woods:* I've heard all they have to do is lose one pointer in any of those data bases and it's all over. . .

*Elstien:* That's why I said that in the future, systems software will have to come from the major vendors and be interlaced and interrelated to the architecture of the machine, just like in the 38. Nobody else could write it—nobody else could *afford* to write it.

*Woods:* The System/38 is a calling card. It's an alternative with growth potential, a whole new way of doing things, and it's theoretically clean.

*Since the System/38 is very new, until now it has been a closed system and the software houses haven't been able to get at it. Will you get the tools you want and need?*

*Elstien:* The applications productivity tools are already coming along.

*Bigelow:* We're saying that the road will be in small systems and in applications as opposed to major development of systems software by software houses.

*Woods:* We have apples and oranges here. System/38s will come along and tie it all up. But you have to remember, the big one for years is still the 360/370. There are still people selling 1401 to COBOL conversion. So there's a hell of a software market in just writing code for 360/370s. And it appears as if the H will look just like another 370. At the software level, it has to because we won't go through *that* change again.

*We've been talking about the market for software packages as if it is totally a market for packages on IBM and IBM-compatible systems. While there are some packages for Univac equipment and some other systems, most of the effort is aimed at the 360 architecture market. Is this always going to be true? Are there already some signs that lead you to expect a growing software market outside the IBM world, on DEC systems, for example?*

*Bigelow:* If you went to all but the 10 largest software companies and asked them what they spend on R&D, the answer would probably be close to zero.

*Werner Frank of Informatics has written that marketing costs eat up 50 cents of every revenue dollar received in the software package industry. Yet, as an industry they are still producing packages that you have to support heavily in-house. Marty Goetz of ADR has said that software companies really only begin to recover their development costs three to four years after the project starts, and significant profit doesn't accrue until well into the fifth year. These statements together suggest some real problems in the package software industry. Any comments?*

*Werben:* How many people are looking for a system that's five years old?

*The software cycle is lengthy. You're really probing some fundamental issues. Is there a viable software industry because of these factors? Because of the marketing costs, the long lead times?*

*Bigelow:* As Dick Brandon says, the companies that will survive the '80s are the companies who manage information as a resource. How a company draws from its collected information and responds to the marketplace will determine its success. And to respond quickly, you need software systems. To me that just solidifies the case for the growth of the software industry.

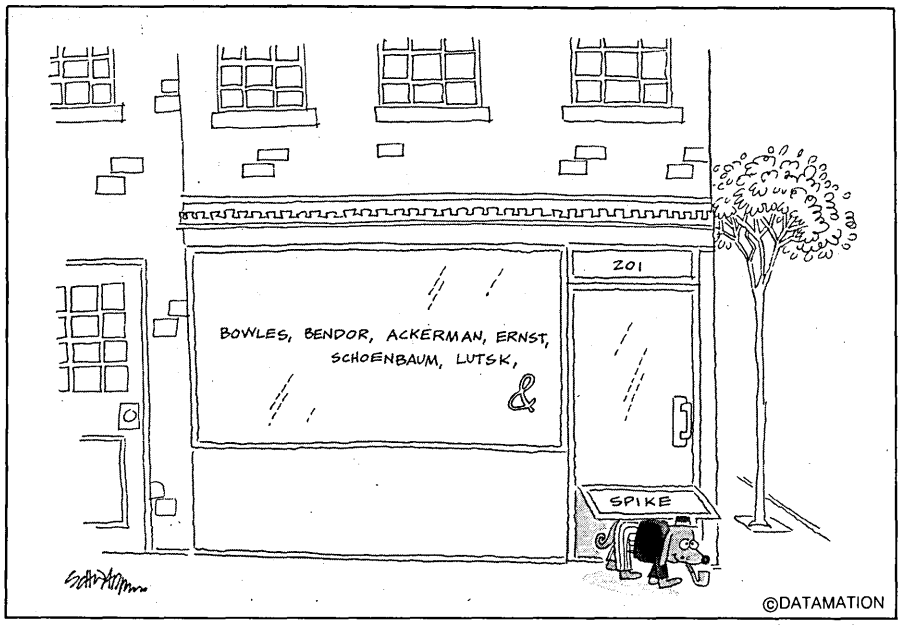
*Does the software industry know how to get to you to ask these questions? Do they understand what you're saying?*

*Bigelow:* Probably not. Maybe we do a bad job of telling the software industry what we need. That's an interesting question, though . . . how they determine what the marketplace needs.

*We know how IBM determines market requirements, right? Get those salesmen out there making check marks, and sending cards into Poughkeepsie. Can the software industry do the same thing? Are they out there looking?*

*Woods:* Most of the software companies I've known are single product companies. They came up with *an* idea. And they're out selling the heck out of it. They don't have any R&D because they don't know for sure where they're going next. They just keep milking the one product as long as they can—maybe once in a while they come out with some enhancement.

*Werblen:* Users will not get together to find requirements for a particular application. We're all trying to compete in the market-

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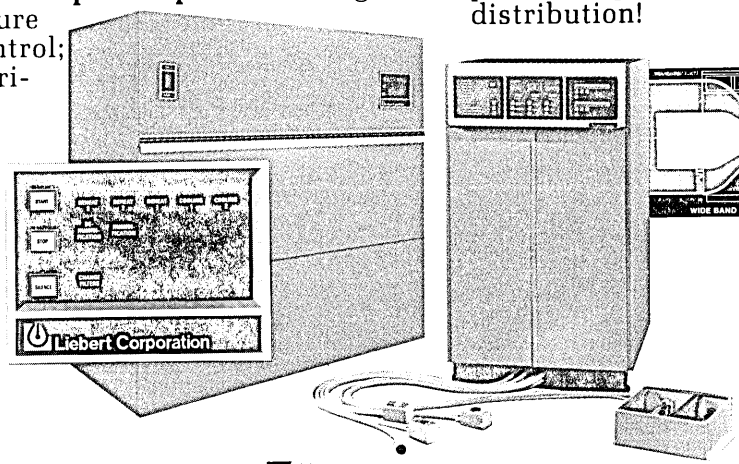


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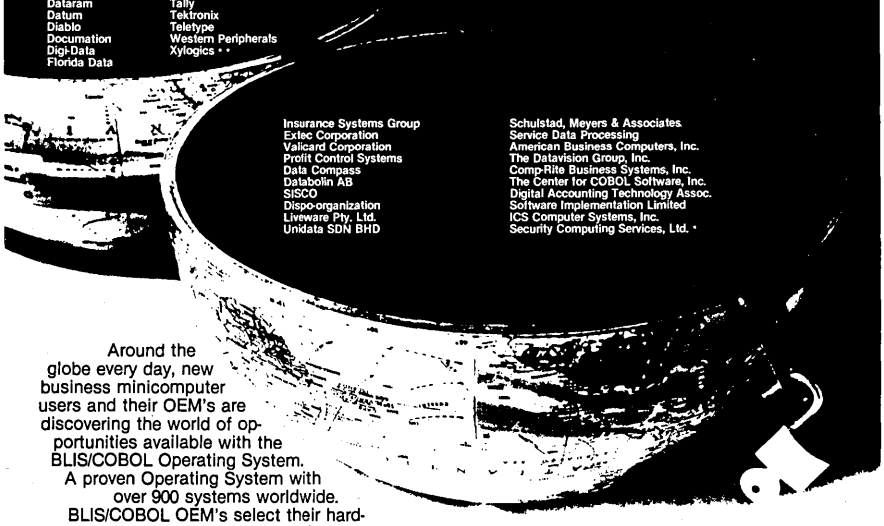

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place, and if we're all using the same application package, where's the competitive advantage? Maybe we'll do it on systems software, but not on applications.

*Elstien:* We as users of software need to understand that we have to be more involved with the package and support it ourselves. There's a lot of knowledge required to make better use of the software we buy.

*Werben:* As long as there are limited dp resources for us to develop our own system, there will always be a need for applications packages . . . they just need scrutiny in determining how well they can be integrated into your total environment.

*Woods:* We're going to see more systems software coming from the vendors, and that will block out some independent software companies. That means we as large mainframe users should be devoting more of our time in working with user groups to try to influence the mainframers . . . we know damn well that's the direction in which they're going, and we want to make sure we get products we can use, because they're taking us further and further out of the systems software game by directing it all to the end user.

*Bigelow:* There's a bright future for packages. The key is for a vendor to be well managed and to also have enough money to afford marketing *and* R&D. ✻

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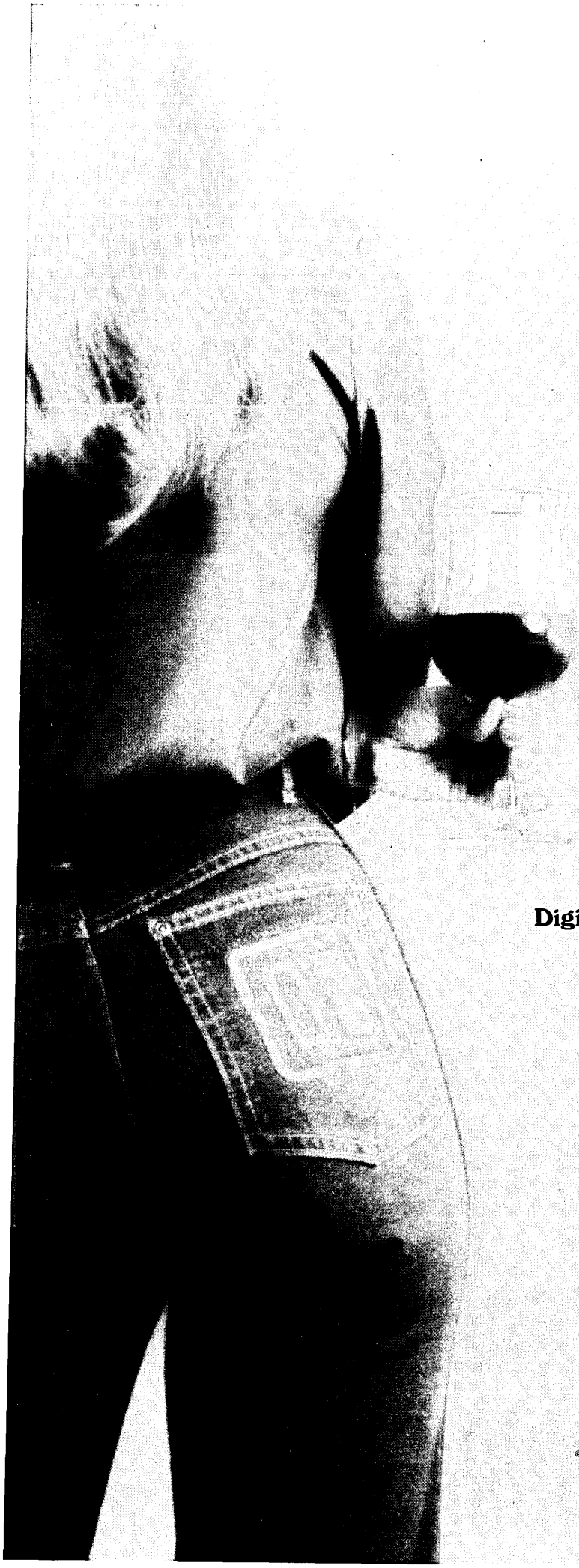

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Photograph by Batista Moon Studio

**CIRCLE 127 ON READER CARD**

**The 7 most common mistakes made in designing computer room environment.**

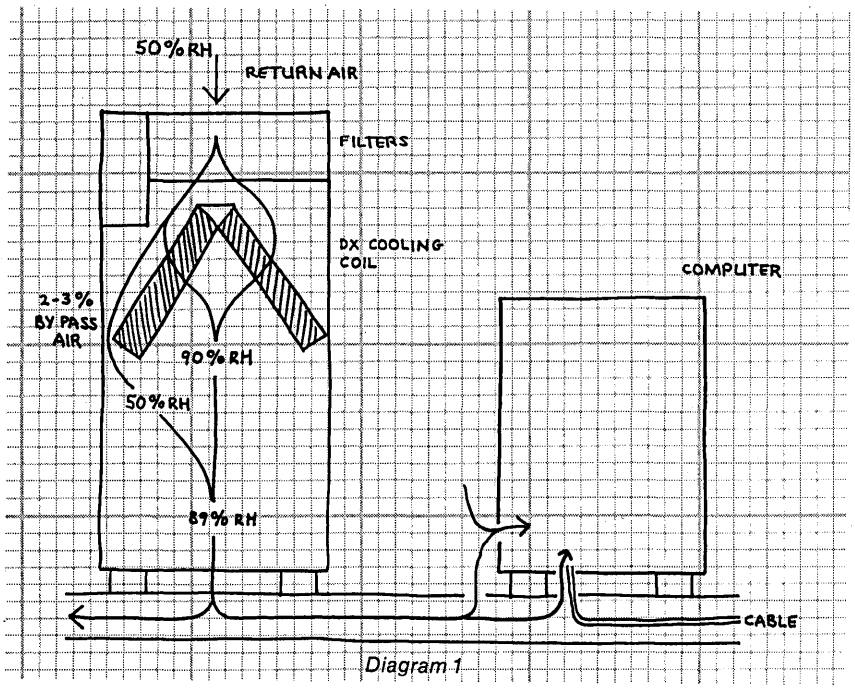

Diagram 1

# Mistake No. 6 Failure to limit relative humidity to 80% under the floor.

Costly computer downtime can be caused by this expensive mistake. The IBM Installation and Planning Guide (Page 1.7) specifies that air entering computer equipment *must not exceed 80% RH.* All other computer manufacturers have similar restrictions.

Why 80%? Humidity over 80% causes physical changes in gold and silver contacts and circuits. The results are intermittents and chaotic operation. Eventually, the computer will suffer a hard failure causing loss of system time and dependent business.

Comfort air conditioning systems pass all the air through the cooling coil to cool and dehumidify the room. This brings the leaving air close to saturation.

The answer is to bypass the cooling coil with *extra air* which remixes with the cool humid air before leaving the system.

In an attempt to meet specifications, some systems provide a small bypass (Diagram 1) allowing only 2%-3% of the air to bypass the coil. This is often done without any increase in air quantity. The result: Relative humidity leaving the system is much higher than the required 80% and with it go all the problems that can occur.

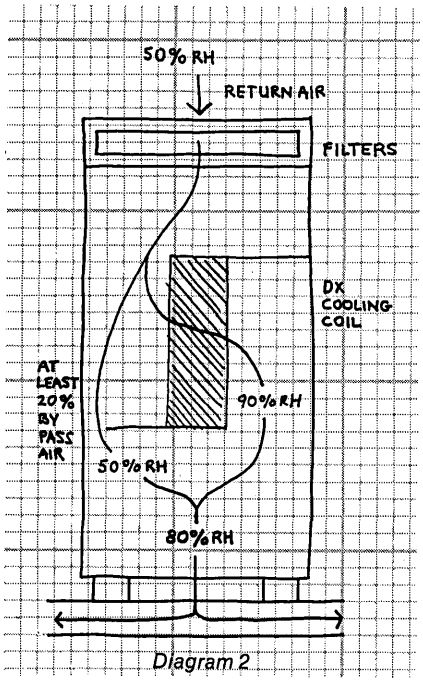

Diagram 2

### The EDPAC Solution

EDPAC Process Cooling Systems (Diagram 2) handle at least 20% more air than comfort air conditioning. And, a full-size bypass is engineered into the system. This allows EDPAC equipment to supply air at the required 80% RH.

EDPAC Process Cooling Systems are designed and engineered to meet all computer manufacturers' specifications.

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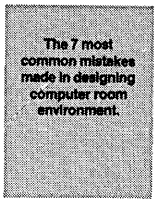


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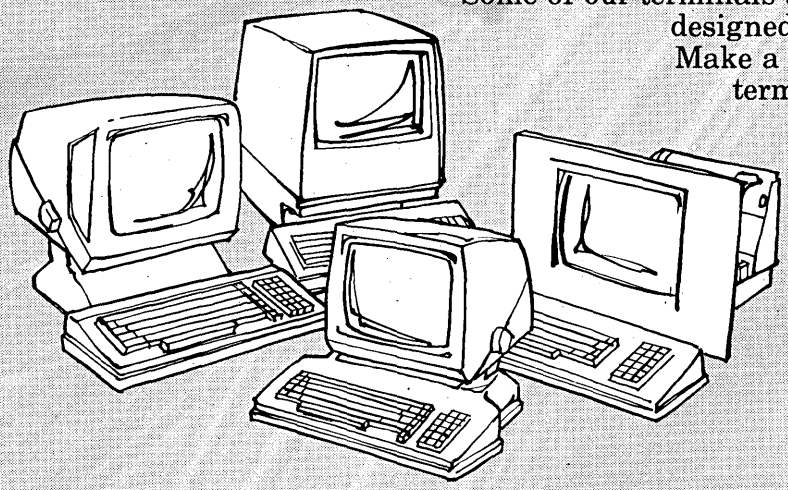

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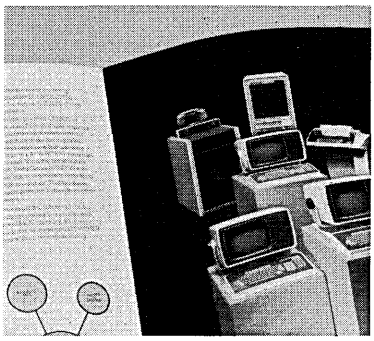

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**CIRCLE 130 ON READER CARD**

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|---|---|---|---|
| Income: | 1978 | 1977 | 1976 |
| Operating revenues | $1,918,988 | $1,686,696 | $1,383,442 |
| Other income, net | 10,873 | 16,810 | 20,787 |
| | $1,929,861 | $1,703,506 | $1,404,229 |

to a 132 column statistical tabulation on the same standard narrow 8¾" paper like this:

| Consolidated Summary of Earnings | | | | | |
|---|---|---|---|---|---|
| Income: | 1978 | 1977 | 1976 | 1975 | 1974 |
| Operating revenues | $1,918,988 | $1,686,696 | $1,383,442 | $1,163,284 | $1,013,357 |
| Other income, net | 10,873 | 16,810 | 20,787 | 13,005 | 12,956 |
| | $1,929,861 | $1,703,506 | $1,404,229 | $1,176,289 | $1,026,313 |

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CIRCLE 136 ON READER CARD

**After a decade of disappointment, software is making a strong comeback.**

# JAPAN REDISCOVERS DBMS

Commercial DBMS packages have once again attracted the attention of dp specialists in Japan.

The first DBMS boom occurred in Japan approximately 10 years ago. At that time, several DBMS packages, such as TDMS, GIS and IDS, were introduced, and many people involved in the computer field felt that DBMS packages would come into wide use. However, DBMS utilization was disappointing. First, the utility and value of computer-processed data was not recognized, and its usefulness as a company resource was not explicitly appreciated by management. Second, from a technical viewpoint, most early DBMS packages were user language-oriented and were inadequate in both cpu utilization and memory requirements even with the most powerful computer system available at the time. Third, disk devices were not readily available for DBMS operation. Finally, poor telecommunication facilities inhibited on-line use. Therefore, only a small number of the DBMS packages developed at that time survived, and these were compact users of simple host language functions.

These problems are not critical for the DBMS packages in use today, especially those related to hardware capabilities such as memory size, disk units, and telecommunication lines. Advanced computer technology has resulted in remarkably powerful hardware in Japan, and rental charges have dramatically decreased. Moreover, the concept of using an integrated data base to better utilize multipurpose data has taken root among management, who now treat it on a level with personnel management and production facility management. Many academic achievements in theoretical DBMS studies, such as the relational data model, a new DBMS concept, have also been realized. Today, therefore, there is a resurgence of DBMS packages.

How many commercial DBMS packages are in use in Japan today and what is the level of user satisfaction in private companies? Although the statistics on computer hardware installations in Japan are announced periodically and several yearbooks

CHARTS BY CYNTHIA STODDARD

TABLE I

**RESPONDENTS IN DETAIL**

| INDUSTRY | SAMPLE NUMBER | RESPONDENT NUMBER (%) |
|---|---|---|
| Construction | 147 | 36 (24.5) |
| Food, food products | 86 | 21 (24.4) |
| Textile, paper | 116 | 36 (31.0) |
| Chemical | 162 | 48 (29.6) |
| Petroleum, coal | 32 | 11 (34.4) |
| Ceramic, glass | 62 | 10 (16.1) |
| Iron and steel | 59 | 19 (32.2) |
| Metals | 88 | 18 (20.5) |
| Machinery | 59 | 48 (81.4) |
| Electronics | 157 | 47 (29.9) |
| Transport Equipment | 79 | 29 (36.7) |
| Precision and misc. | 75 | 25 (33.3) |
| Wholesale and retail | 146 | 44 (30.1) |
| Finance, insurance | 140 | 32 (22.9) |
| Real estate, transport | 120 | 27 (22.5) |
| Electricity, supply | 61 | 7 (11.4) |
| TOTAL | 1,589 | 458 (28.8) |

| COMPUTER MFTR. | INSTALLATION NUMBER |
|---|---|
| FACOM | 160 |
| HITAC | 95 |
| NEAC | 73 |
| TOSBAC | 21 |
| OKI | 31 |
| MELCOM | 16 |
| IBM | 155 |
| Univac | 35 |
| Burroughs | 24 |
| NCR | 15 |
| CDC | 2 |
| Others | 13 |
| TOTAL | 640 |

FIG. 1

**RATE OF COMMERCIAL DBMS PACKAGE USE**

**RESPONDENTS: 458**

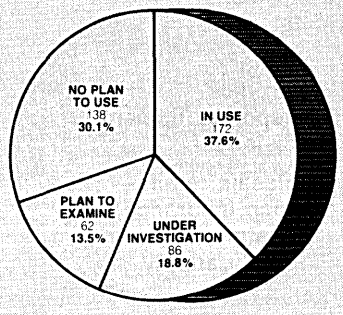
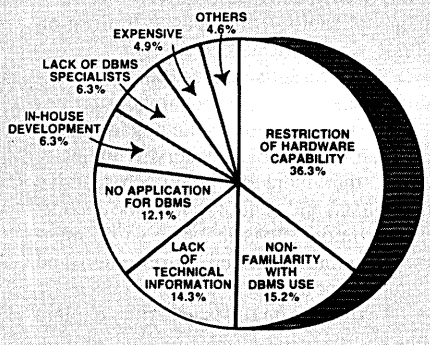



FIG. 2

**REASONS DBMS NOT USED**

**RESPONDENTS: 138**



**Rapid diffusion of small office computers in Japan should prompt vendors to develop compact DBMS for minicomputers.**

have been published, the actual situation of DBMS package use in Japan has remained unclear. The present study has attempted to investigate this problem along the following three lines:

1) How many commercial DBMS packages are being used in private companies?

2) What is the purpose of DBMS utilization?

3) How do users rate their DBMS packages?

The survey was based on questionnaires mailed to the system departments of 1,589 companies listed on the Stock Exchange in Japan. Of these, 458 companies responded (see Table I).

Fig. 1 shows the rate of use of DBMS software packages in the companies listed on the Stock Exchange in Japan. Of 458 companies, 172 (37.6%) have already installed DBMS packages, 86 companies (18.8%) are investigating DBMS, and 62 companies (13.5%) are planning to examine DBMS in the future. Therefore, the results of the survey indicate that DBMS packages are already in use or under study in 70% of the leading companies, indicating a growing interest in DBMS package use.

On the other hand, 138 out of 458 companies (30.1%) do not plan to use DBMS for a number of reasons, as illustrated in Fig. 2. The major reason mentioned is the restriction of hardware capability (36.3%). Some of them added the comment, "We will examine DBMS packages when we replace or enhance existing hardware." Most DBMS packages have been developed to run on large-scale configurations, and only a few packages can be installed on medium- or small-sized computers. However, the rapid diffusion of small office computers in companies should prompt vendors to develop compact DBMS for minicomputers in Japan.

Besides hardware restrictions, the following were cited as primary reasons for resistance to DBMS:

- Nonfamiliarity with the use of DBMS packages (15.2%)
- Lack of technical information required to examine DBMS packages (14.3%)
- Nonapplicability to DBMS utilization (12.1%).

These reasons suggest DBMS marketing deficiencies, as well as ignorance of DBMS and conservative attitudes among dp managers. The results of the survey indicate, however, that there are many prospective users of DBMS, and vendors should be encouraged to promote DBMS in Japan so dp managers can gather technical information and case study reports.

Textbooks on DBMS generally explain the purpose of using a DBMS as "integration or rationalization of work," or "multipur-

FIG. 3

**REASONS FOR USING DBMS (MA)**

**RESPONDENTS: 172**

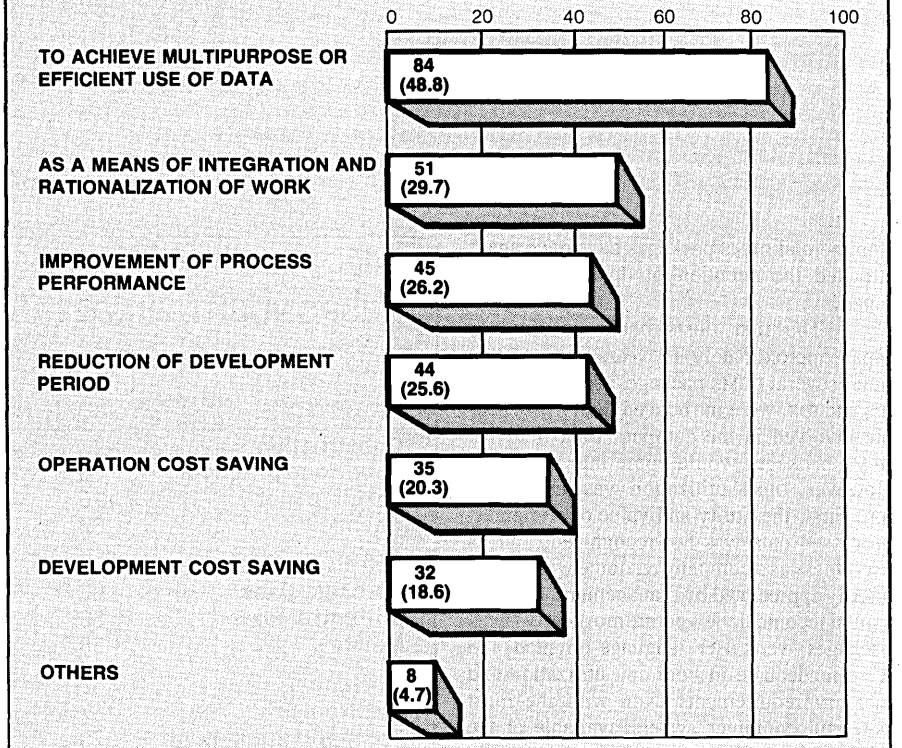



TABLE II

**DBMS USE BY INDUSTRY**

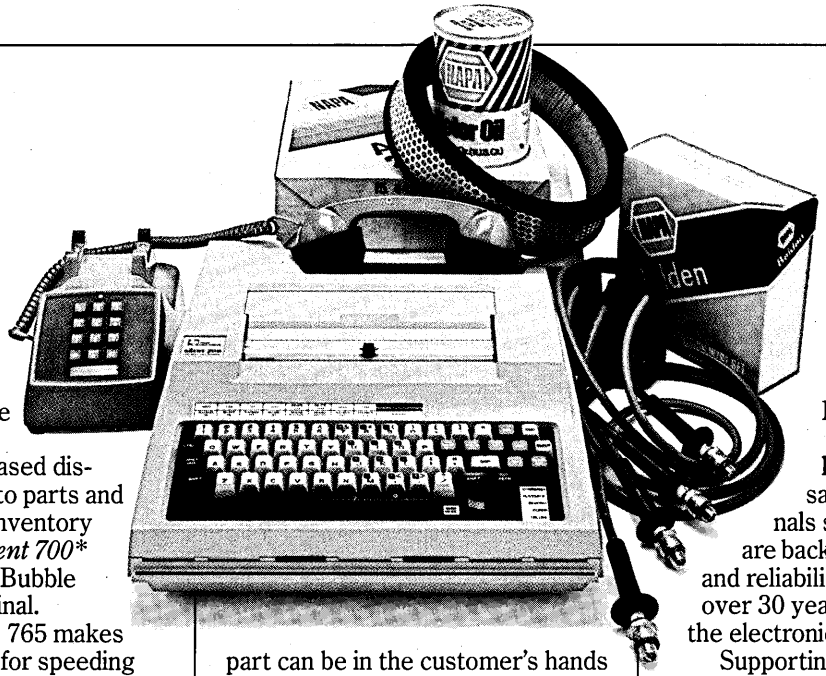
**RESPONDENTS: 458**

| INDUSTRY | RESPONDENT NUMBER | DBMS USING NUMBER | (%) |
|---|---|---|---|
| 1 Construction | 36 | 12 | (33.3) |
| 2 Food products | 21 | 4 | (19.0) |
| 3 Textile, paper | 36 | 6 | (16.7) |
| 4 Chemical | 48 | 19 | (39.6) |
| 5 Petroleum | 11 | 6 | (34.3) |
| 6 Ceramic | 10 | 1 | (10.0) |
| 7 Iron, steel | 19 | 9 | (47.4) |
| 8 Metals | 18 | 6 | (33.3) |
| 9 Machinery | 48 | 20 | (41.6) |
| 10 Electronics | 47 | 24 | (51.1) |
| 11 Transport equipment | 29 | 20 | (69.0) |
| 12 Precision | 25 | 10 | (40.0) |
| 13 Wholesale, retail | 44 | 10 | (22.7) |
| 14 Finance, insurance | 32 | 17 | (53.1) |
| 15 Real estate, transport | 27 | 7 | (25.9) |
| 16 Electricty, supply | 7 | 1 | (14.2) |
| TOTAL | 458 | 172 | (37.6) |

CHARTS BY CYNTHIA STODDARD

IMMEDIATE DELIVERY

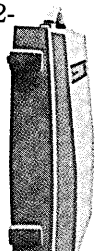
# Auto Parts Counter.




## GAP puts a lot of stock in TI's 765.

General Automotive Parts Corporation (GAP), the Dallas-based distributor of NAPA auto parts and supplies, keeps its inventory moving with TI's *Silent 700** Model 765 Portable Bubble Memory Data Terminal.

The responsive 765 makes an ideal counterpart for speeding sales turnaround time. The owners and sales clerks of over 850 auto parts stores, covering a 12-state area, use GAP's remote order entry system to access inventory at any of 15 NAPA distribution centers in the Midwest.


Model 765

With the 765's easy-to-use typewriter-like keyboard, a clerk can verify the availability of a needed part, place an order, specify shipping instructions, and even check the progress of previously ordered parts. The compact 765's built-in acoustic coupler uses a standard telephone and electrical outlet to put the data terminal on-line instantly with GAP's host computer. So, the out-of-stock part can be in the customer's hands within 24 hours.

The 765 never forgets a part name or number. Its built-in non-volatile bubble memory data storage keeps the store's ordering information on file, even when the power is turned off. The handy editing feature on the 765 allows the clerk to add, delete and correct data as needed. And, its thermal printhead provides speedy hard-copy printouts at a virtually silent 30 characters-per-second for instant data access.

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**CIRCLE 39 ON READER CARD**

**Many users are content with the monopoly of hardware manufacturers selling DBMS.**

TABLE III

**DBMS APPLICATIONS IN USE**

**RESPONDENTS: 172**

| ITEM / APPLICATION FIELD | Personnel | Payroll | Finance & accounting | Production line | Inventory control | Cost management | Order entry | Sales management | Reservation | Customer, credit | Quotation | Transport management | Message switching | Engineering | Management | Scientific application |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Computerized A | 130 | 160 | 143 | 97 | 142 | 117 | 121 | 144 | 20 | 55 | 28 | 35 | 48 | 65 | 58 | 87 |
| DBMS applied B | 25 | 15 | 14 | 33 | 47 | 18 | 40 | 41 | 4 | 18 | 3 | 8 | 9 | 14 | 6 | 2 |
| DBMS usage B/A(%) | 19.2 | 9.4 | 9.8 | 34.0 | 33.1 | 15.4 | 33.1 | 28.5 | 20.0 | 32.7 | 10.7 | 22.9 | 18.8 | 21.5 | 10.3 | 2.3 |
| High usage field of DBMS by industry (B/A440%) | | | | | | | | | | | | | | | | |
| 1. Construction | | | | | | | | | | | | | | | ○ | |
| 2. Food product | | | | | | | | | | | | | | | | |
| 3. Textile, paper | | | | | | | | ○ | ○ | | | ○ | | | | |
| 4. Chemical | | | | | | | | | ○ | | | | | | | |
| 5. Petroleum | | | | | ○ | ○ | | | | | | | | | | |
| 6. Iron, steel | | | | ○ | | | | | | ○ | | | ○ | | | |
| 7. Metal | ○ | | | ○ | | | | | | ○ | | | | | | |
| 8. Machinery | | | | | ○ | | ○ | | | | | | | | | |
| 9. Electronics | | | | | ○ | | ○ | | | | | | | ○ | | |
| 10. Transport equipment | | | | | | | | | | | | ○ | | | | |
| 11. Precision | | | | ○ | ○ | | ○ | ○ | | | ○ | | ○ | | | |
| 12. Wholesale, retail | ○ | | | | | | ○ | ○ | | ○ | | | | | | |
| 13. Finance, insurance | | | | | | | | | | ○ | | | | | | |
| 14. Real estate, transport | | | ○ | | | | ○ | ○ | | ○ | | | | | | |
| 15. Electricity, supply | | | | | | | | | | | | | | | | |

pose and efficient utilization of data," but how do Japanese dp departments explain its purpose? Fig. 3 summarizes the answers to this question. Of 172 companies, 84 (approximately half of DBMS users) aim "to achieve multipurpose or efficient use of computer-processed data by using DBMS." Thirty percent of the users consider their DBMS "as a means of integration and rationalization of work," 26.2% felt that DBMS "improves process performance," and 25.6% say "It will reduce the system development period."

Contrary to expectation, relatively few companies are interested in "saving costs or manpower for system operation and maintenance" or "saving system development expenses." These results show that the purpose of using DBMS in Japanese private companies is neither for saving cost nor labor, but rather for the consolidat00ion or rationalization of work and the multipurpose utilization of computer-processed data, the typical textbook explanation for DBMS utilization.

The number and percentage of DBMS in use by industry are shown in Table II. One thing immediately remarkable is the high utilization of DBMS in the technology-intensive industries such as transport equipment, banking and insurance, electronics, and steel. More than 50% of such industries utilize DBMS. This suggests that commercial DBMS packages were found to be effective by Japan's key industries and have gradually spread to other industries.

Table III represents the various DBMS applications. Most DBMS applications are

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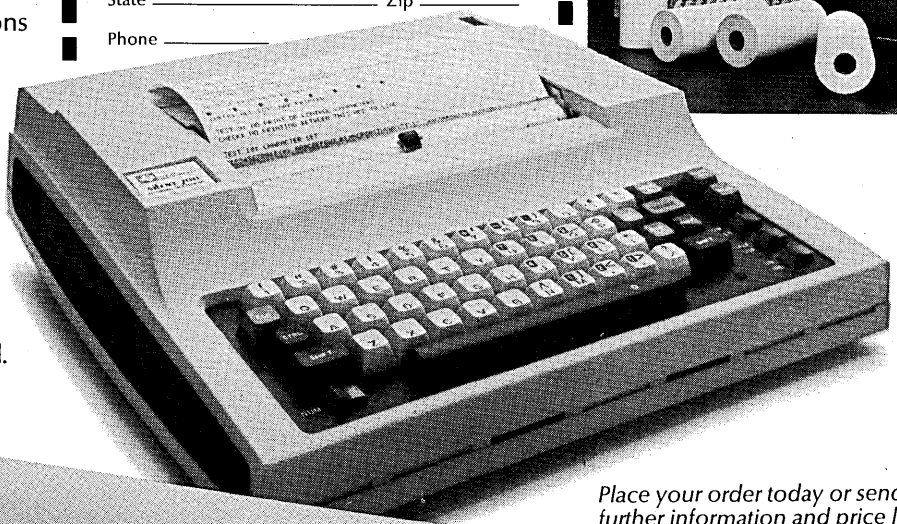

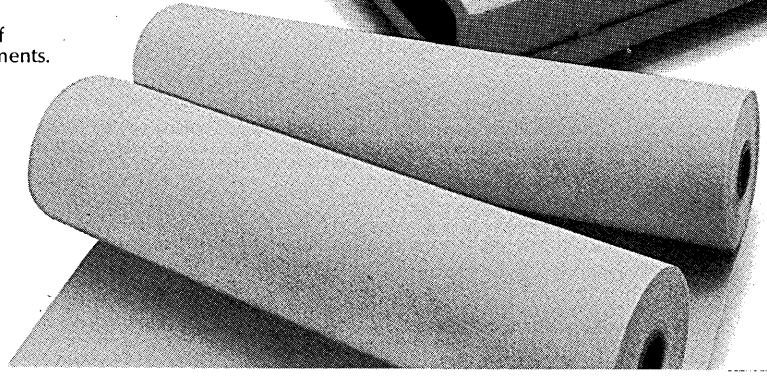

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|---|---|---|
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| Dot Matrix | 9-wire head (9 hi x 7 wide) | 7-wire head (7 hi x 9 wide) |
| Lower Case | Standard, with descenders and underlining | Standard, but no descenders or underlining |
| Buffer | 512 expands to 2048 | Fixed 1280 |
| Space/Blank Compression | Yes | No |
| Interfaces | Serial and parallel | Serial only (parallel not available) |
| Current Loop | Standard | Optional |
| Forms Control | 14 settings standard | Optional |
| Elongated character sets | Standard | Optional |
| Price | Base Price $2045<br>Expanded buffer 100<br>Price as shown $2145 | Base Price $1995<br>Options 310<br>Price as shown $2305 |

The 310 Ballistic Printer is capable of satisfying low-speed day-to-day requirements and is economical enough to handle those high-speed tab runs, too. With the patented Ballistic printhead and 100% duty cycle, no job is too difficult.

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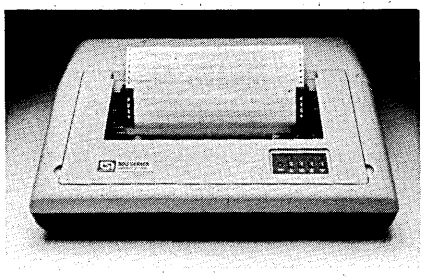

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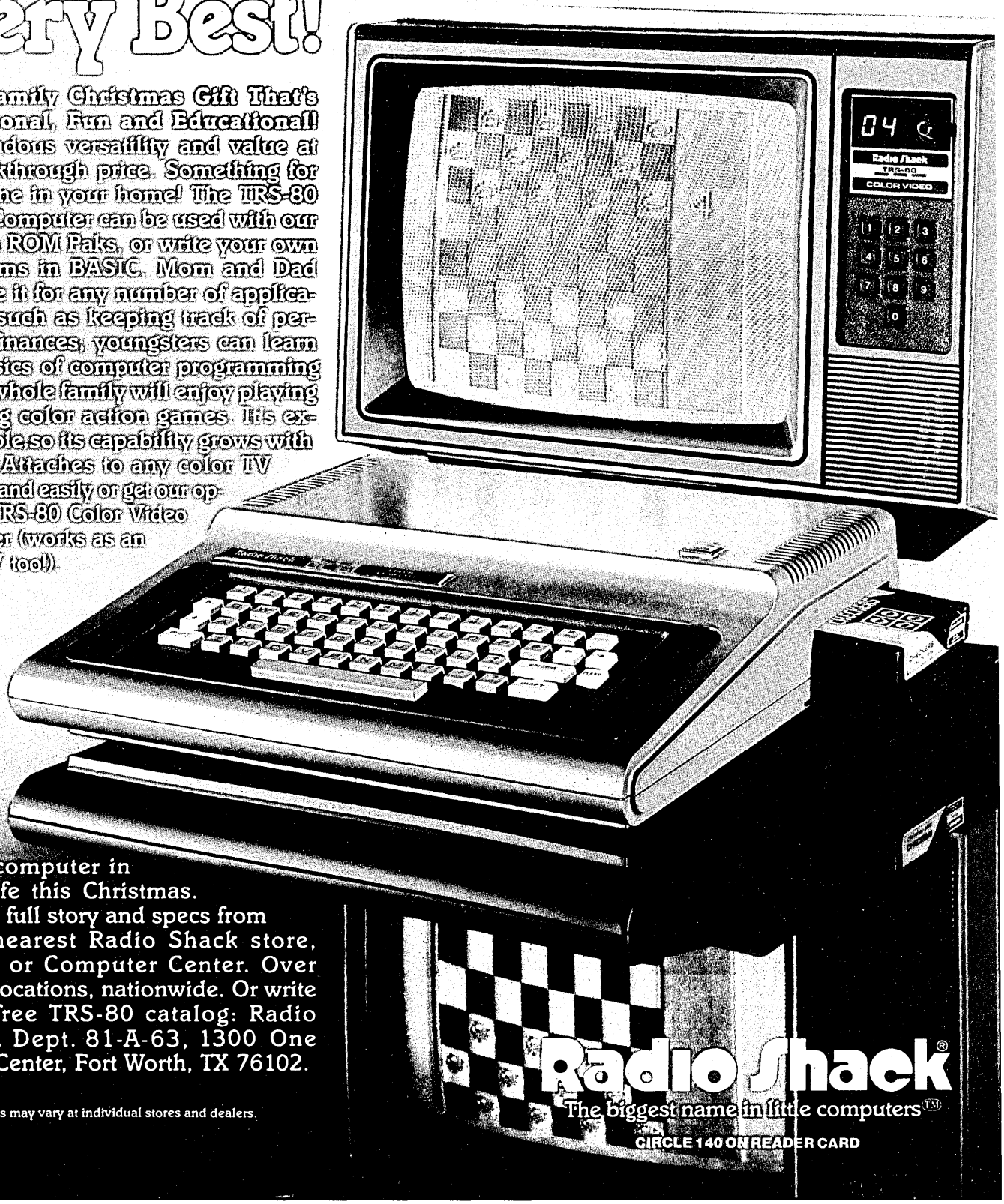


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CIRCLE 140 ON READER CARD

# The Japanese rated DBMS packages somewhat lower overall than did U.S. companies.

concerned with production line control, inventory, order entry, and credit management, and stand at the core of a company. Furthermore, a wide variety of applications in manufacturing can be recognized, while applications in tertiary industry are restricted to personnel, order entry, sales management, and customer credit management.

## MARKET SHARE & HARDWARE

Table IV gives the number of users of each commercial DBMS package. IMS (IBM) is the most widely used, followed respectively by DL/1 (IBM), PDM (HITAC), AIM (FACOM), IDS (NEAC, TOSBAC), INIS (FACOM), DMS-1100 (Univac), ADBS (NEAC, TOSBAC), TOTAL (Cincom Japan), ADM (HITAC), INFORM (Univac), DMS-II (Burroughs), all of which have more than five users.

This indicates that the market share of commercial DBMS packages is greatly influenced by hardware. The products of hardware manufacturers overwhelm independent software houses in the DBMS market.

Of 172 users of DBMS packages, only 11 were supplied by independent software houses: TOTAL, 8; ADABAS, 2; SYSTEM 2000.1. This is partly because of hardware or operating system restrictions associated with independent DBMS packages. Moreover, hardware manufacturers often provide software products including DBMS for little or no charge, in spite of regulations requiring software unbundling. It seems that many users are content with the monopoly of hardware manufacturers with regard to DBMS packages.

Generally speaking, DBMS can be classified into three types by data model: hierarchical, network, and relational. Among these, the network type, such as PDM and AIM, has the most users, followed by the hierarchical type, usually IMS. The relational type has the fewest users in spite of being of great interest to dp specialists in Japan. DBMS can also be distinguished as host language or user language oriented. The vast majority of users have chosen the former.

The results of the survey indicate that DBMS with a hierarchical or network data model, established in the 1960s, has been put into practical use in Japan in the 1970s. If the trend continues, the relational and user language-oriented DBMS designed in the 1970s will spread and take root in the 1980s.

As shown in Fig.4, only 33.7% of 172 companies using commercial DBMS packages have undertaken comparative studies in selecting a DBMS. The reasons why the remaining companies (66.3%) did not examine DBMS were:

- Few commercial DBMS packages were common when the selection was made
- Sufficient information was not available to compare different DBMS

TABLE IV

### NUMBER OF DBMS IN USE BY PACKAGE

**RESPONDENTS: 320**

| DBMS Package (Vendor In Japan) | Number In Use | Plan To Use | Plan To Examine | Data Model * | User Interface ** |
|---|---|---|---|---|---|
| IMS (IBM) | 31 | 7 | 11 | H | H |
| DL/1 (IBM) | 24 | 10 | 11 | H | H |
| PDM (HITAC) | 23 | 14 | 9 | N | H |
| AIM (FACOM) | 22 | 24 | 29 | N | H |
| IDS (NEAC, TOSBAC) | 14 | 1 | – | N | H |
| INIS (FACOM) | 11 | – | 1 | N | H |
| DMS-1100 (Univac) | 10 | 7 | 7 | N | H |
| ADBS (NEAC, TOSBAC) | 9 | 10 | 12 | N | H |
| TOTAL (Cincom Japan) | 8 | – | 7 | N | H |
| ADM (HITAC) | 7 | 8 | 6 | H | H |
| INFORM (Univac) | 6 | – | – | – | H |
| DMS-II (Burroughs) | 5 | 4 | 3 | N | H |
| EDMS (Melcom) | 3 | 1 | 2 | N | H |
| STAFF (FACOM) | 3 | 2 | 6 | N | U |
| NCR-TOTAL (NCR) | 3 | 1 | – | N | H |
| DMS-90 (Univac) | 2 | 3 | 8 | N | U |
| ADABAS (Software A.G.) | 2 | 4 | 8 | R | H,U |
| SYSTEM 2000 (Chiyoda) | 1 | – | 1 | H,R | H,U |
| INQ (NEAC) | – | 2 | 1 | R,N | H |
| ADBS (NEAC) | – | 2 | – | N | H |
| MODEL 204 (MKI) | – | 2 | 5 | R | H,U |
| DMS-5 (Melcom) | – | – | 2 | N | H |
| Others | 8 | 1 | 5 | | |
| Total | 192 | 103 | 134 | | |

*Data Model
H: Hierarchical
N: Network R: Relational

**User Interface
H: Host language-oriented
U: User language-oriented

FIG. 4

### COMPARATIVE STUDY IN SELECTING DBMS PACKAGE

**RESPONDENTS: 172**

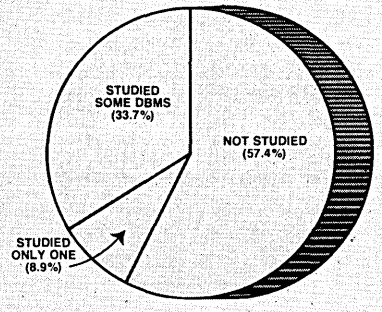
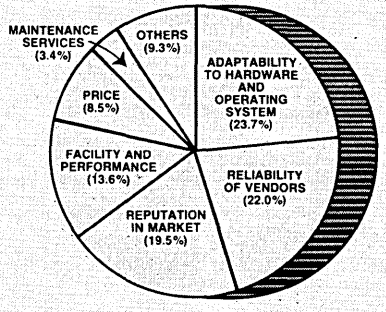



FIG. 5

### DETERMINING FACTOR OF DBMS

**RESPONDENTS: 172**



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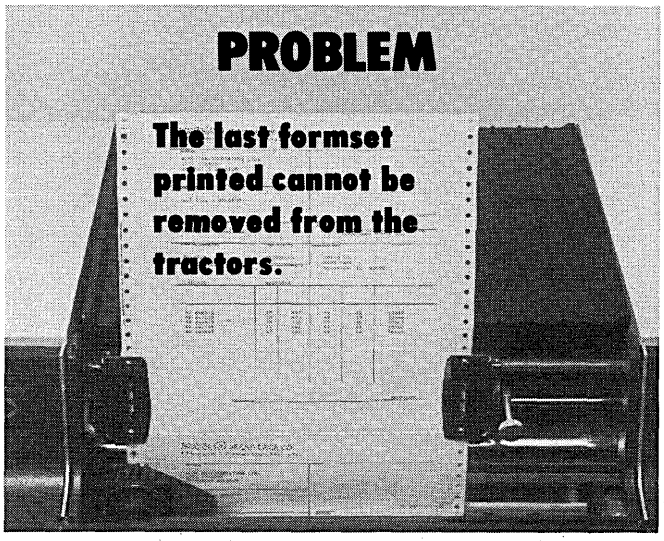


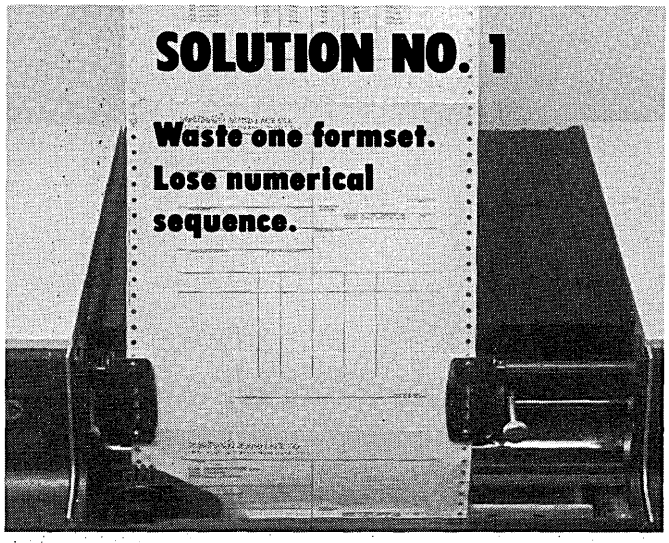


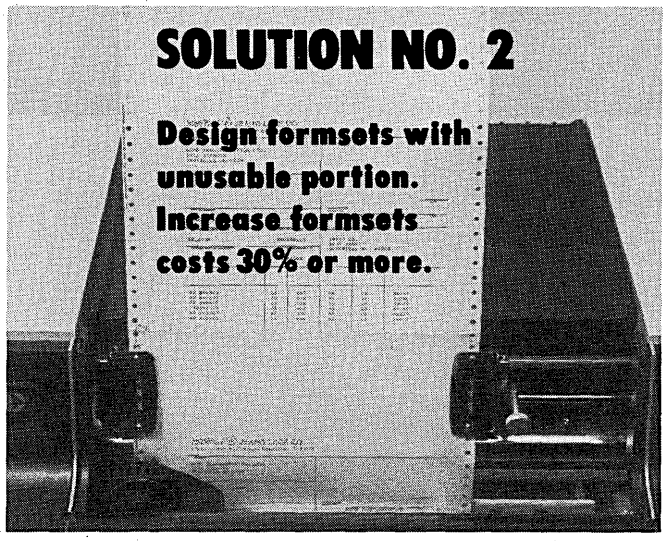


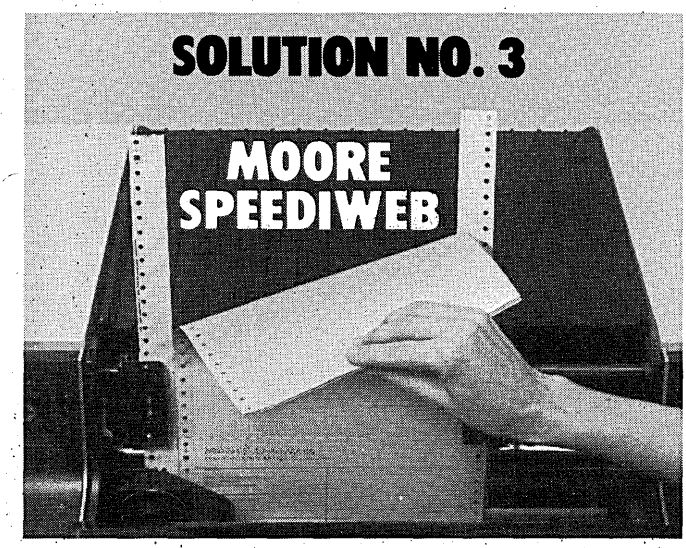


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TABLE V

## USER RATING OF DBMS IN JAPAN

The form asked users to assign "excellent," "good," "fair," or "poor" ratings in each of eight categories: overall satisfaction, throughput/efficiency, ease of installation, ease of use, documentation, vendor's technical support, training, vendor's reliability.

Each user rating of "excellent" was weighted as 4, "good" as 3, "fair" as 2, and "poor" as 1. Then the weighted average was computed by dividing the sum of products by the total number of user responses in each rating category.

| DBMS PACKAGE (VENDOR) | Respondents | Overall satisfaction | Throughput/efficiency | Ease of installation | Ease of use | Documentation | Vendor's technical support | Training | Vendor's reliability |
|---|---|---|---|---|---|---|---|---|---|
| IMS (IBM) | 27 | 2.6 | 1.9 | 2.5 | 2.5 | 2.7 | 2.7 | 2.7 | 3.2 |
| PDM (HITAC) | 21 | 2.4 | 2.3 | 2.6 | 2.3 | 2.2 | 2.2 | 2.2 | 3.0 |
| DL/1 (IBM) | 18 | 2.5 | 1.8 | 2.3 | 2.5 | 2.4 | 2.3 | 2.1 | 3.3 |
| AIM (FACOM) | 17 | 2.3 | 2.2 | 2.2 | 2.2 | 2.1 | 2.2 | 1.9 | 2.4 |
| IDS (NEAC, TOSBAC) | 12 | 2.9 | 2.8 | 2.8 | 2.8 | 2.5 | 2.4 | 2.3 | 2.8 |
| INIS (FACOM) | 8 | 2.5 | 2.1 | 2.5 | 2.5 | 2.1 | 2.3 | 2.4 | 2.9 |
| TOTAL (Cincom Japan) | 8 | 2.8 | 2.9 | 3.0 | 3.1 | 2.1 | 2.1 | 2.3 | 2.1 |
| ADM (HITAC) | 6 | 2.3 | 2.0 | 2.6 | 2.2 | 2.5 | 2.5 | 2.2 | 3.0 |
| DMS-1100 (Univac) | 5 | 2.8 | 2.8 | 3.0 | 3.0 | 2.4 | 2.8 | 2.2 | 3.4 |
| ADBS (NEAC, TOSBAC) | 5 | 2.8 | 2.2 | 3.0 | 2.8 | 2.4 | 2.6 | 2.4 | 2.8 |
| DMS-II (Burroughs) | 5 | 2.4 | 2.4 | 2.6 | 2.7 | 2.4 | 1.8 | 1.8 | 2.6 |
| Average | (163) | 2.5 | 2.2 | 2.6 | 2.5 | 2.3 | 2.4 | 2.3 | 2.9 |

*This table shows only DBMS with at least five respondents.

• Architecture or operating system restrictions limited the number of applicable DBMS packages.

Comparative study of available packages is not only essential for the selection of the optimal package, but is also useful for understanding the technical features and relative advantages of a particular DBMS. In Japan, however, most users are not aware of the technical issues, although they do have a clear theoretical understanding of DBMS.

Users who have undertaken comparative studies reply that the determining factor in their selection was "adaptability to hardware and operating system" (23.7%), "reliability of vendors" (22.0%), and "reputation in market" (19.5%). (See Fig.5.) Thus, these three factors were cited as primary considerations in over 60% of DBMS selections. "Facility and performance" was the deciding factor for only 13.6% of the respondents. This result implies that most users included in the study group based their selection on hardware considerations rather than on technical evaluation of the software.

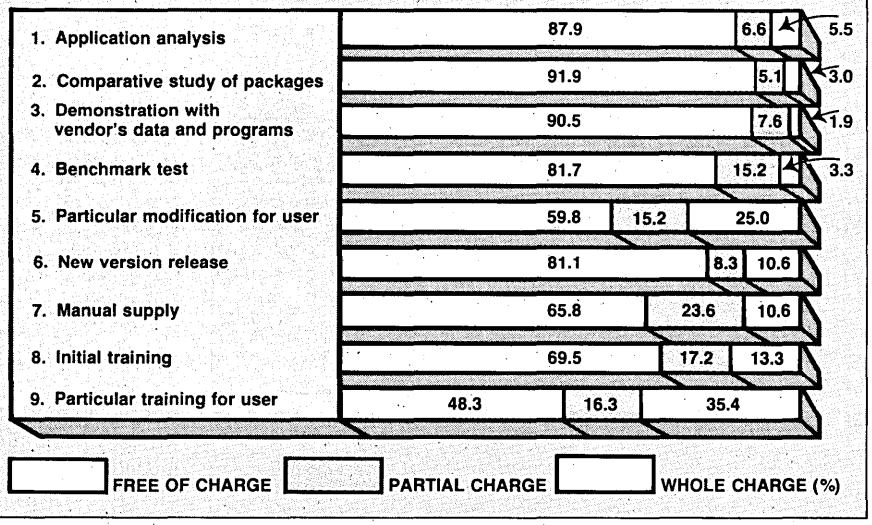
In order to fully understand the DBMS market in Japan, it is also necessary to know how current users rate their DBMS packages. In the U.S., Datapro Research Corp. has been gathering user ratings of software products and has published the results for some years. Their survey, however, does not cover the situation in Japan. Therefore, the present survey has also sought to investigate user ratings of their DBMS packages. Table V shows the results for DBMS packages with five or more respondents.

As a whole, DBMS packages in Japan scored an average rating of 2.5 in "overall satisfaction." This is lower than the corresponding average of 3.1 for the U.S. Datapro survey. This is probably due to the Japanese preference for moderate ratings. The highest average rating of 2.9 for "reliability and vendor" indicates the strong reliance of respondents on hardware manufacturers. The second is 2.6 for "easy to install." Low ratings are observed for "throughput/efficiency" (2.2), "documentation" (2.3), and "training" (2.3). The DBMS packages with high ratings in "overall satisfaction" are IDS (2.9), TOTAL (2.8), DMS-1100 (2.8), and ADBS (2.8), while those with low ratings are AIM (2.3) and ADM (2.3). For "throughput/efficiency," network models scored the highest: TOTAL (2.9), IDS (2.8), and DMS-1100 (2.8); hierarchical models had low ratings: DL/I (1.8), IMS (1.9), and ADM (2.0). "Easy to install" gave high ratings to TOTAL (3.0), DMS-1100 (3.0), and ADBS (3.0), and the low ratings to AIM (2.2), and DL/I (2.3). "Ease of use" did well for TOTAL (3.1) and DMS-1100 (3.0), and poorly for AIM (2.2) and ADM (2.2).

As far as "documentation" was concerned, IMS of IBM (2.7) had the highest rating; AIM (2.1), INIS (2.1) and TOTAL (2.1) had

FIG. 6

## SERVICES PROVIDED BY DBMS VENDOR



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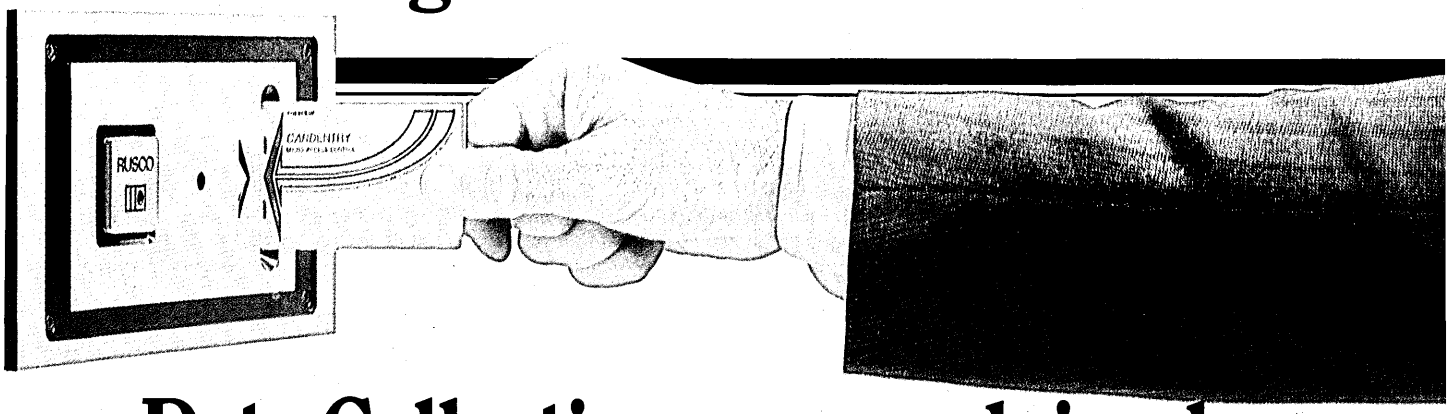


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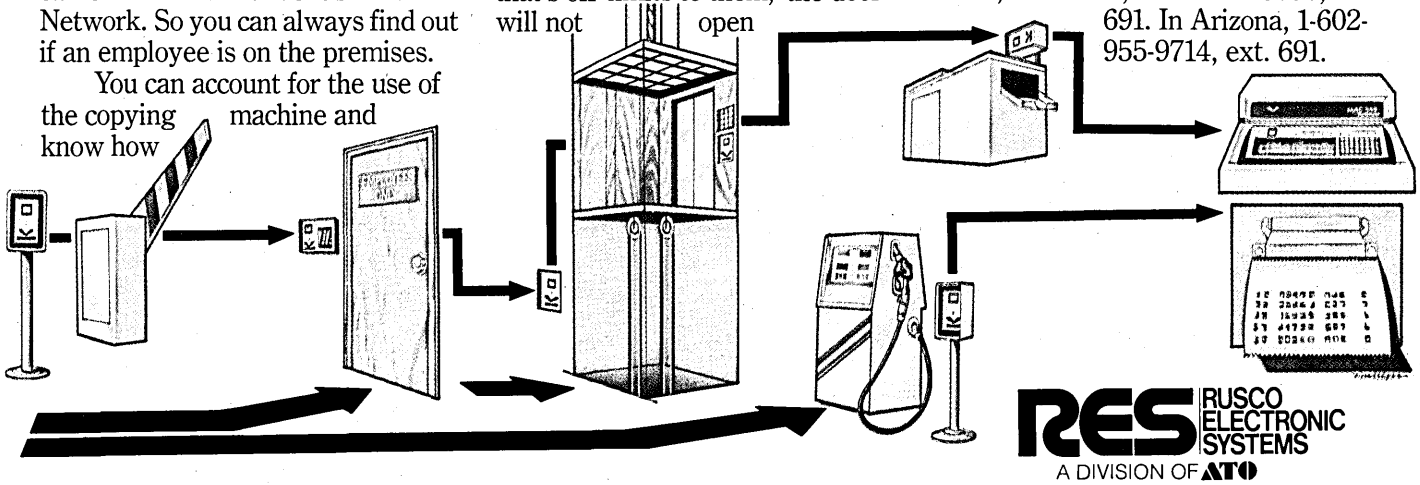

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**Hardware and operating system considerations are more important than software in choosing a DBMS package in Japan.**

low ratings. "Vendor's technical support" showed high ratings for DMS-1100 (2.8) and IMS (2.7), but not for DMS-II (1.8) and TOTAL (2.1). "Training services" results indicate high ratings for IMS (2.7), but low ratings for DMS-II (1.8) and TOTAL (1.9). For "reliability of vendor," the highest ratings were received by DMS-1100 (3.4), DL/I (3.3), and IMS (3.2) provided by foreign manufacturers, while the lowest rating was for TOTAL (2.1), which is provided by an independent software house.

The survey shows slightly lower ratings for overall satisfaction, throughput/efficiency, documentation, and vendor's technical support. This is probably due to the nuance of terms in the questionnaire in Japanese. Judging from the high ratings of hardware manufacturers in "reliability of vendor," we can conclude that hardware and operating system considerations are more important than software considerations in choosing a DBMS package in Japan.

## SERVICE CHARGES VARY

DBMS packages are sold separately from hardware and other software packages. However, the price of maintenance and other services is not well defined in Japan. Therefore, the questionnaire asked the users to detail the cost of services provided by the vendor during and after installation of their DBMS packages.

Fig.6 illustrates the result of this part of the survey. The services provided free varied from vendor to vendor as expected. However, there were also differences in responses from users of the same DBMS package. This suggests the multiplicity of terms for service depending on negotiations between user and vendor. Services nearly always mentioned as free include application analysis, comparative study of DBMS packages, and demonstration with vendor's data and programs. Charged services usually included particular modification for user and particular training for user.

Japanese manufacturers tended to charge for services such as manual supply and particular training for user. Foreign manufacturers charged for particular modification and particular training.

Independent software houses required new release charges. Thus, the free services available vary from vendor to vendor and even among users supplied by the same vendor. It should be noted that vendors should clarify the free services available to the user in advance of selling a DBMS package.

The final question of the survey asked for additional comments. Many of the 123 responses, representing 27% of all respondents, suggest areas where DBMS utilization could be improved. The following comments are representative of these suggestions:

1) DBMS packages should be easy to understand, have a high degree of usability and flexibility, and have excellent user language facilities.

2) There should be a clear and practical presentation of those applications for which the DBMS is best suited.

3) There should be standardization of DBMS specifications to allow compatibility between different computers and systems.

4) Compact and inexpensive DBMS packages should be available to operate in small system environments.

5) Small system DBMS should be upward compatible with large system DBMS to allow for easy growth.

6) DBMS packages should be easy to install and require little reorganization and maintenance.

7) DBMS packages should have integrated DB/DC features for on-line applications.

8) There should be special considerations for performance to allow reasonable conversion from existing specialized on-line systems.

9) Vendors' support services should be improved with respect to maintenance, manuals, etc.

These comments indicate various problems and dissatisfactions with commercial DBMS packages and denote a wide range of disadvantages associated with them.

Although half of the respondents use or intend to use a commercial DBMS package, we are sure that some of these concerns are certainly due to a lack of understanding of DBMS by the users. Many problems are also due to the fact that current DBMS packages have not fully matured as commercial products. Further confusion is generated by vendors' marketing claims. They sometimes promote their packages as all powerful, without considering the adaptability of their package to a specific user's applications.

"General purpose" does not always mean "comprehensive." It is generally known, for example, that an application such as an inventory system that requires fast on-line response and has a relatively simple data structure will perform better if implemented using a conventional DBMS package with a hierarchical or network data model.

Applications such as sales management and management information systems dealing with ad hoc relationships between data records would require a relational model DBMS package. However, as the cost of hardware decreases and its power increases, it will be increasingly possible to run a single general-purpose DBMS package for all applications.

This survey can be considered as a starting point for the study of DBMS marketing in Japan. *

"Relax, I've come for an old CRT."

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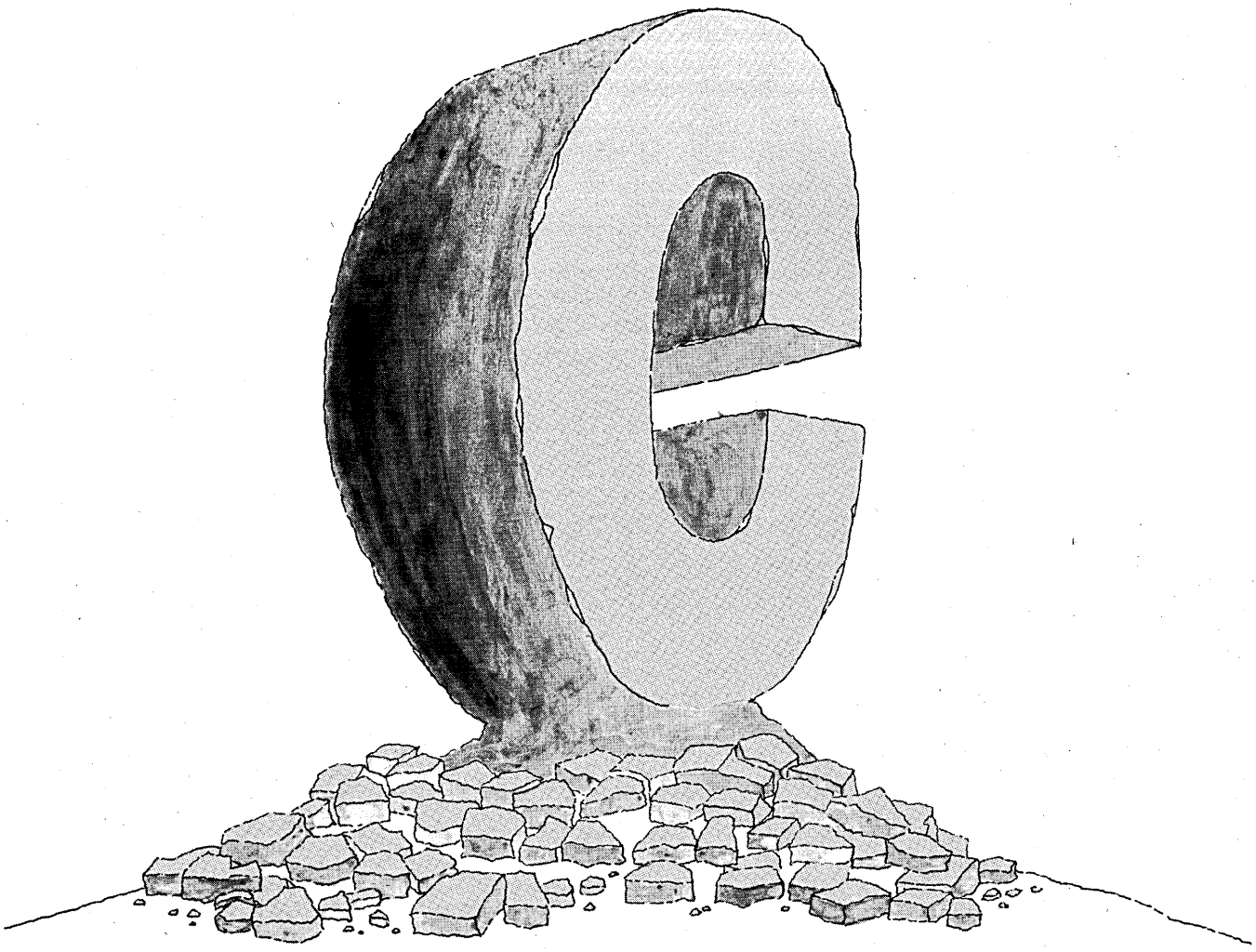
CARTOON BY LEONARD TODD

"Commercial DBMS Utilization in Japan" was researched by Katsuhiro Morita and written by Takashi Ishizuka of the Mitsui Knowledge Industry Co., a private Japanese research institute in Tokyo. The original report and survey appeared in the March 1980 issue of *Computopia* magazine, published by Computer Age Co., Ltd., Japan.



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# Xerox announces the most advanced printing system in the world.

# Again.

Introducing the Xerox 5700 Electronic Printing System—a word processing printer, text communicator, forms printer and remote computer printer all in one. It's the most remarkable printing system developed since we introduced our last one.

### We wrote the book on Electronic Printing.

In 1977 we introduced the Xerox 9700. Today, it is still the only printer that can turn digital information into a printed page of unlimited type styles and graphics. But the 9700 was designed primarily for high-volume computer applications.

Now we're introducing the Xerox 5700. Like the 9700, each page is letter-perfect with the quality of offset printing. It can also print word processing output, send or receive pages of text over telephone lines, print forms and computer output and more. It brings Xerox advanced technology from the computer room right into the office.

### Word processing printing at laser speed.

The 5700 prints word processing output up to 40 times faster than typical word processing printers and delivers sets collated and stapled. It accepts input from communicating word processors as well as magnetic media.

### The coast-to-coast speed record.

The 5700 can send 50 pages of correspondence from New York to Los Angeles in less than three minutes. It will send or receive completely unattended. And because each page arrives an original, separate retyping and duplicating steps are eliminated.

### Computer printing and forms.

The 5700 can initiate a job at a central computer site and then receive and print the output. It can create and store forms electronically using graphics and company logos, and then print them or send them where they are needed.

It's also a convenience copier, delivering one- or two-sided copies stapled and stacked into nice, neat sets.

### What else is new.

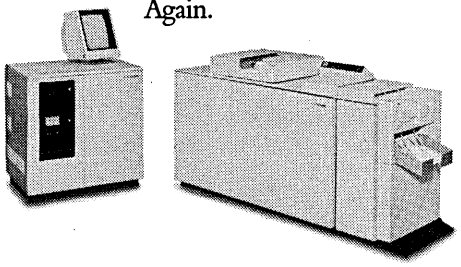
The 5700 has no buttons to push. It's operated by a touch control screen that makes the system friendly and easy to use. It even answers a call for help.

The 5700 is the second product announced by Xerox that will be able to use the Ethernet local data communications network.

To learn more about the Xerox 5700 call collect or write Charles Coffman, Xerox Printing Systems Division, Dept. 5700, 880 Apollo Street, El Segundo, California 90245. (213) 615-6441.

We think you'll be impressed.

Again.



XEROX

XEROX® 9700, and 5700 are trademarks of XEROX CORPORATION.

Initially available in Los Angeles, New York, Chicago, Washington and Dallas. Copier option initially available only in Los Angeles.

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# Get on the PTS-2000 Growth Path.

## And get one low-cost, high-performance terminal family that expands with your needs.

Imagine a single 3270-type product line that can be expanded in large or small increments, with functions that range from basic inquiry/response to multi-station, multi-peripheral operation, and with support, service, and pricing advantages that are unparalleled.

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Capabilities that start with BSC and grow on site, to SNA/SDLC support. 3276/74/78 compatibility. Large display screens, up to 3440 characters. Enhanced 3270 function. Cursor select and 25th line features. Data rates up to 9600 bps. Numerous operator convenience and productivity aids. Built-in diagnostics. And a unique distributed intelligence architecture that allows for rapid and significant future expansion.

The PTS-2000 display system supports 3276/78 small cluster systems in both BSC and SNA/SDLC protocols, and 3274/78 large cluster systems as well. It differs from all other terminals in its class in that the PTS-2000 is designed to be upgraded in modular fashion from single station or small cluster capability to large cluster, full function, enhanced 3270 capability without equipment swapout ever ... easily and with significant cost savings always.

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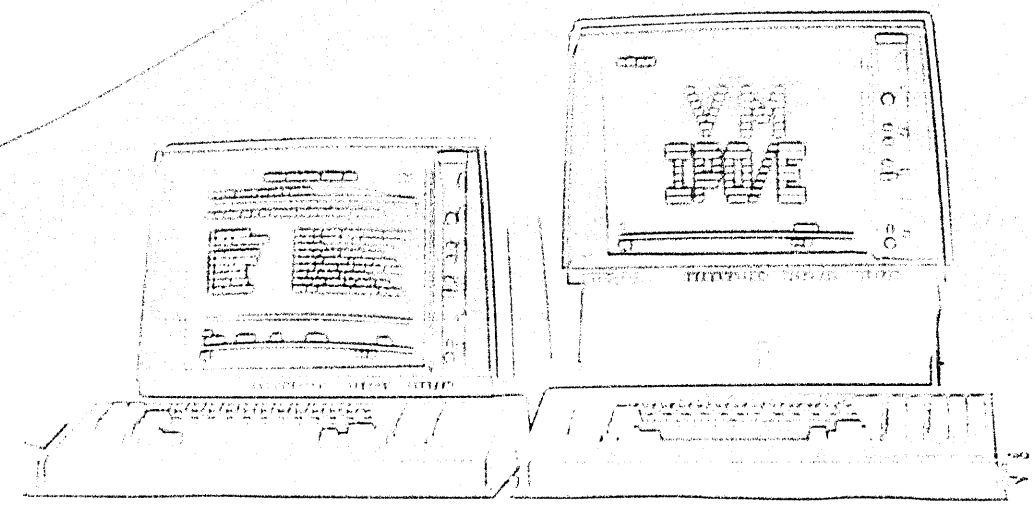


RAYTHEON

RAYTHEON DATA SYSTEMS

[illegible]

CIRCLE [illegible]

# HARDWARE

## OFF-LINE

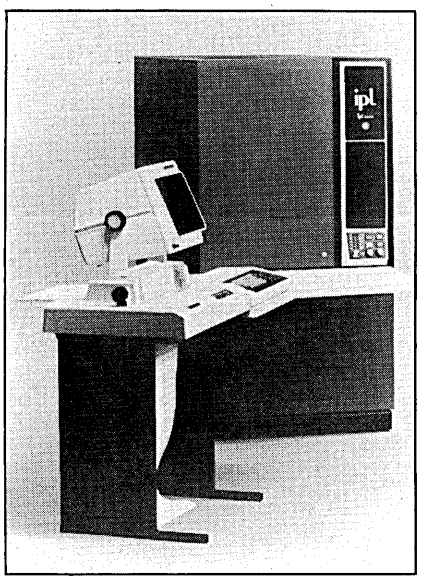
At the International Conference on Circuits and Computers, three IBM engineers described an experimental 5,000-circuit bipolar logic chip with the data flow capability of an IBM 370/138. The principal findings of the project are that a 5,000-circuit chip could handle the 370/138's data flow, and that such a chip could be developed using IBM's existing manufacturing and design techniques. Because the 370 architecture requires more registers than could fit on the chip, a high-speed, off-chip local store contains the registers. The circuit's measured speed is 2.2 nsec., but it is conservatively clocked at 4nsec. Almost all of the automated design work for the chip took place in less than five hours of running time on a 370/168. The IBM papers delivered at the conference were "IBM System/370 Bipolar Gate Array Microprocessor Chip," by Claud M. Davis, Gerald A. Maley, Royce G. Simmons, Herb I. Stoller, Raymond H. Warren, and Thomas E. Wohr; "Bipolar Circuit Design for VLSI Gate Arrays," by Allan H. Dansky; and "The Layout and Wiring of a VLSI Microprocessor," by Dr. Michael Feuer, Kantilal H. Khokhani, and Deepak A. Metha.

Durango Systems, makers of the desktop Durango F85 small business computer, has inked a multimillion dollar contract with Micropoplis for 5-1/4 inch floppy disk drives, to be delivered over the next two years.

Telex Computer Products' oem division will be supplying Prime Computer with GCR tape drives. Telex will sell the mini-maker model 6250 dual density 75ips drives and model 6850 formatters. The multiyear contract is valued at about $10 million.

## MAINFRAMES

IPL Systems, the Massachusetts PCMer that grew out of an effort at Cambridge Memories several years ago and has been selling IBM-compatible mainframes on an oem




basis, has gone the end-user route with the introduction of three machines targeted at the 4300 market.

IPL calls its 4300 competitors the 4400 series. It consists of three field-upgradable machines ranging from the 4436, said to offer higher speed than the IBM 4331 Group 2 and twice the channels, up to the 4446, which is said to be faster (in most applications) than the recently announced IBM 4341 Group 2. Holding up the middle there's the 4443, competition for the 4341 Group 1.

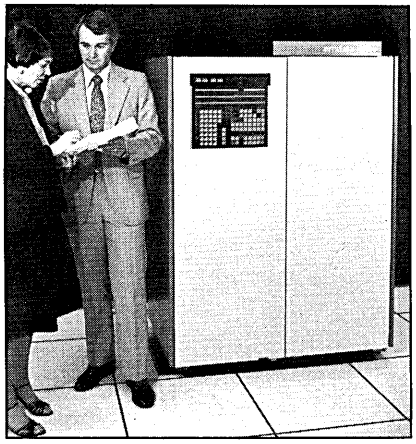
The 4400 series offers from 1MB to 8MB of main memory, two to five block multiplexor channels, and reloadable control store that allows IPL to respond to microcode assists introduced by IBM. IPL ssys that any peripheral that can attach to an IBM 4300 can be attached to its 4400s, including 3370 and 3375 disks. Microcode offerings cover IBM's ECPS: VSE with single level addressing and virtual channel addressing, ECPS: VM/370, and ECPS: VS1. The 4436, with 1MB, carries a $175,000 price tag, while the 4443 with 2MB comes in at $225,000. Both are currently available. The 4446 will become available in the third quarter; with 2MB its price will be $330,000. IPL SYSTEMS, INC., Waltham, Mass.

**FOR DATA CIRCLE 301 ON READER CARD**

## COMMUNICATIONS PROCESSOR

According to benchmark tests conducted by Amdahl Corp., the California PCM's 4705 programmable communications processor —which is software-compatible with IBM's 3705-II—has up to 1.8 times the throughput (aggregate data rate) of a similarly configured 3705-II Model F8. With candor, the vendor's spec sheet adds the following caveat to its benchmark results: "As throughput measurements are highly dependent upon configuration, application, and operating characteristics, individual user environments should be carefully evaluated before making an estimate of throughput."

The 4705 comes in four models: 4705-5, -6, -7, and -8, with capacities of up to 64 lines, 160 lines, 256 lines, and 352 lines, respectively. Each basic model comes with 64KB of memory, and can be upgraded in the field to a larger model by adding additional hardware. The 4705's



memory can be expanded to 512KB on any of the four models. The 4705 is said to be compatible with any mainframe software, including ACF/VTAM; the 4705 itself can run any 3705-II software, including NCP, ACF,

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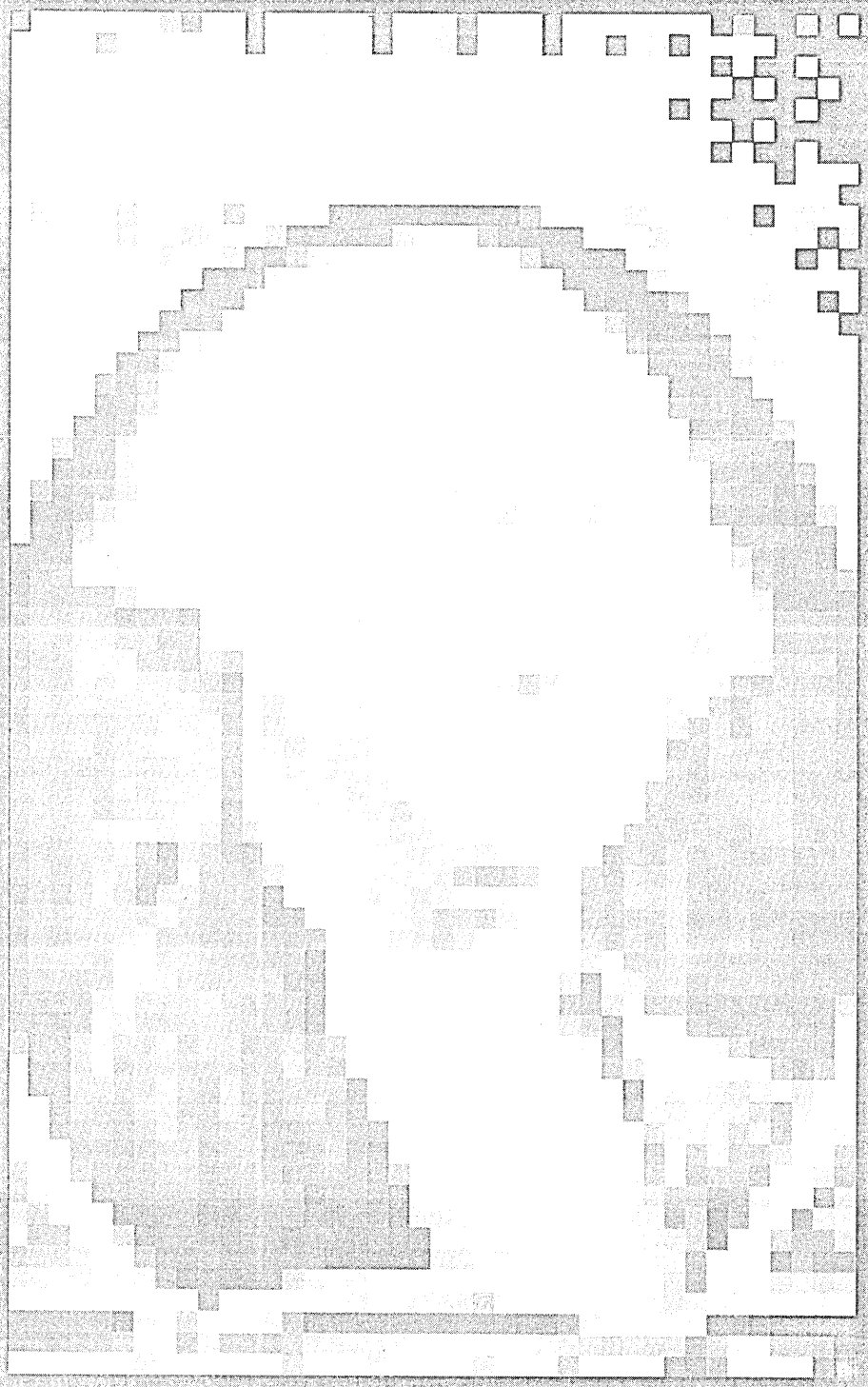

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and support programs. Up to four cpus can be attached to a 4705. Protocols supported include start/stop, bisync, and SDLC. Transmission speeds can range to 56Kbps. Purchase prices range from $60,000 for a typical 4705-5 to $350,000 for a typical large 4705-8. Monthly maintenance ranges from $300 to $1,500. AMDAHL CORP., Sunnyvale, Calif.

**FOR DATA CIRCLE 304 ON READER CARD**

## COLOR COMPUTER

Chromatics, the Georgia color computer maker, has come up with its most powerful machine to date: the Motorola 68000 16-bit microprocessor-based CGC 7900. The CGC 7900 comes with a 19-inch color crt display with an on-screen resolution of 1024 by 768 pixels (1024 by 1024 within the graphics memory) and 128KB of memory (most of which is available to the user) in its basic configuration, which sells for $19,995. The CGC 7900 features high-speed image generation, an eight-color overlay mode, and up to 256 colors in a single display. Options include a dual-screen buffer that allows rapid alternation between two displays, and a 10MB Winchester disk. There are 14 slots within the chassis that can be used for additional memory—packed 128KB per board—for a total maximum memory size of 1.75MB.

An overlay capability allows the display of alphanumeric characters or graphics to be overlayed on a bit-map display; the underlying image can be rolled, panned, or zoomed, without affecting the overlay display. Additionally, the screen can be divided into as many as eight graphic windows, with eight more overlay windows. The CGC 7900's 151-key keyboard includes 34 keys dedicated to graphics functions, 24 program function keys, and a cursor pad. A joystick and a light pen are available as options.

Initially, users will have to develop their applications in 68000 assembler. Those seeking a higher level language can take advantage of the already announced 68000 applications languages available from some microcomputer software houses. CHROMATICS, INC., Tucker, Georgia.

**FOR DATA CIRCLE 303 ON READER CARD**

## COMMUNICATIONS

Tandem Computers has broadened its span of communications capabilities with the introduction of a Tandem-to-IBM Link (TIL), a Tandem Hyper Link (THL) to Network Systems' Hyperchannel, and a Peripheral Line Adaptor allowing multiple terminals to share a modem. The firm also released enhancements to its Exchange RJE and Expand network software.

The TIL allows point-to-point communications between a Tandem system and an IBM mainframe. The TIL consists of the hardware necessary to interface the Tandem system to the IBM mainframe through an IBM 3803 (Model 2 or 3) mag tape transport controller; support software is provided allowing high-speed (to 300KBps burst rate) transfers between systems. The TIL provides a path for moving files between systems. The TIL goes for $24,500, including support software.

For users who want to interconnect their Tandem system with mainframes and minis from a number of other sources, Tandem has developed an interface to Network Systems Corp.'s Hyperchannel. The Hyperchannel is a co-ax link that provides transfer rates of up to 50Mbps between disparate systems, including those made by IBM, CDC, DEC, Data General, Cray, and others. Tandem developed its own hardware and software interface to the link; the rest of the Hyperchannel comes from Network Systems in Brooklyn Park, Minn. The THL sells for $15,250.

The 6180 Peripheral Line Adaptor allows up to eight of the vendor's 6520 or 6524 terminals to share a modem or a com-

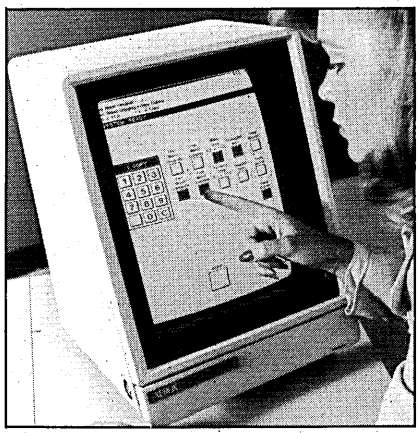
# HARDWARE SPOTLIGHT

## XEROGRAPHIC PRINT SYSTEM

Xerox's 5700 electronic printing system is a little difficult to classify, as it combines a number of functions—involving printing, copying, and communications—in a single unit. It can function as a word processing printer, remote computer printer, interoffice communications system, or office copier, depending on the user's needs and the options selected.

The 5700 consists of two boxes. One is essentially a Xerox 5600 photocopier with the addition of a laser imaging system. The second unit houses a 16-bit microcomputer, system diskette station, 18MB rigid user disk (used for spooling, storing electronic mail, etc.), and a touch screen operator control panel. Instead of presenting the user with a panel of buttons and dials, the 5700's touch screen leads the operator through the steps to set up a job. It's a menu-driven operation, but instead of giving the user a keyboard, the system displays options on the screen and the user makes a selection by touching the screen.

Printing can run at up to 43 pages per minute, with printing on one or both sides of the page. Various font styles and



sizes (from 6-point to 24-point, fixed and proportional spacing), forms, logos, and signatures can be stored within the 5700 in digitized form. A forms compiler option allows users to create, store, and print electronic forms.

As a word processing printer, the 5700 can accept input—in the form of magnetic media—from Xerox word processors as well as IBM equipment. There are four magnetic media options offered—mag card for Xerox 800 Electronic Typing system cards, mag card for IBM equipment (MC-ST, MC-ET, MC-II, MC-A and OS/6), cassette tape for Xerox 800s, and software enabling the system to use its system diskette station to read diskettes from OS/6 and Xerox 850 Display Typing systems. Up to three may be put on a single 5700 (and if you take three, the configuration rules require that one must be the enabling software). Additionally, the 5700 can accept input from communicating Xerox and IBM word processors.

For remote computer printing, the 5700 can accept input, via an RS232 interface, in IBM 2770 protocol. (The same communications option can be used to accept input from communicating word processors.) Communications work in both directions, allowing use of one of the 5700's magnetic media stations for RJE.

Additional communications facilities allow 5700s to form the basis of an electronic mail system. Both RS232 interfaces and Ethernet interfaces can be used to transmit messages between 5700s (attended or unattended). The message must enter the system digitally (either from magnetic media or another communicating device)—the 5700 is neither a fax machine nor an OCR device. The copier function, initially offered only in Los Angeles, includes a recirculating source document handler. Pages of graphics (or whatever is loaded into the document handler can be interleaved with the text being printed from digital form. Graphics and text cannot be printed on the same page; a control code, inserted in the text by its creator, specifies which document should be printed on the next available page—either a separate page or the back of the current page.

In its least expensive configuration, including the basic printing system and an optional magnetic media station or communications option, the 5700 sells for $66,300 (or $1,440 per month on a one-year lease). A typical system with two magnetic media stations, communications, copying capability, forms compiler, and automatic stapler, sells for $91,050 (or $2,040 per month). XEROX CORP., El Segundo, Calif.

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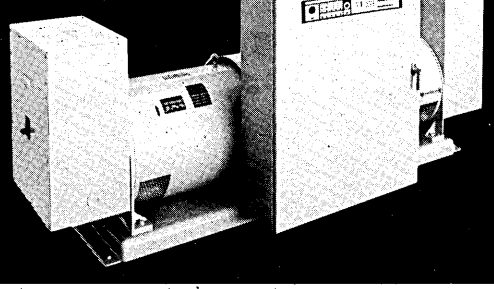

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## HARDWARE

puter port. Terminals may be located up to 1,500 feet from the PLA. The PLA also allows connection of remote printers. It sells for $1,975.

Tandem's RJE software has been enhanced with multileaving support, allowing interleaved jobs and files to be transferred between Tandem systems and mainframes. Expand, Tandem's networking software (see Software & Services, Nov. 1978) has been modified to allow use of multiple lines between network nodes.

The enhancements are available for no additional charges; Exchange is currently priced at $2,000, and Expand at $15,000 (plus $2,000 per processor for additional microcode). TANDEM COMPUTERS INC., Cupertino, Calif.

**FOR DATA CIRCLE 307 ON READER CARD**

### 1200BPS ACOUSTIC COUPLER

Racal-Vadic has come up with yet another multifunction modem to fill out its product line. The VA3413, an acoustically coupled modem, is an originate-only modem that can operate at 0bps to 300bps with Bell 103/113 compatibility, and to 1200bps with Racal-Vadic 3400 modems at the receiving end.

The VA3413 operates in full-duplex mode over the two-wire switched telephone network. A microprocessor within the VA3413 automatically senses whether the

called modem is a VA3400 or Bell 103 compatible device; the microprocessor also determines character length (9-bit or 10-bit). Terminal interfacing is RS232. A single VA3413 sells for $895; oem discounts are offered. RACAL-VADIC, Sunnyvale, Calif.

**FOR DATA CIRCLE 308 ON READER CARD**

### MANUFACTURING

Forman is a bundled manufacturing resource planning system built around Formation Inc.'s F4000 370 code-compatible minicomputer. Marketing plans call for sales only to existing F4000 users or those buying the complete hardware and software system—currently Formation plans not to sell the software to 370 or PCM users (in part to keep better control over software maintenance resources, in part to sell additional systems).

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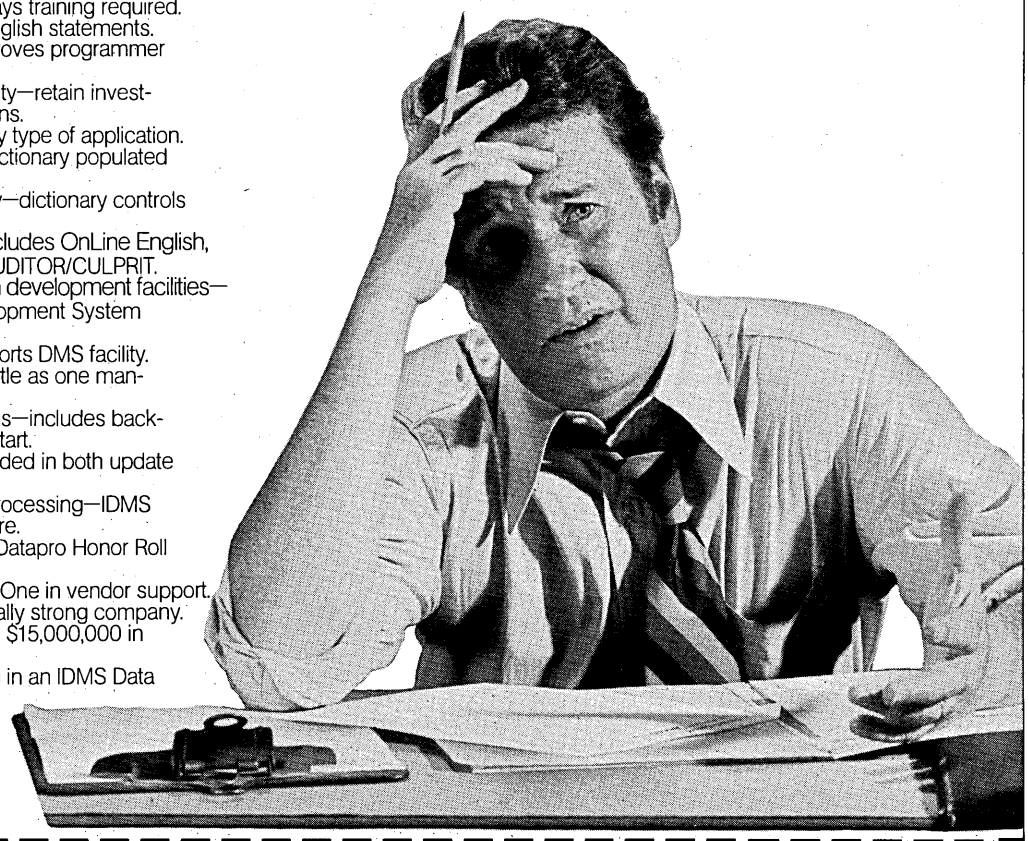

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Automatically converts from IBM PL/1 to ANS COBOL. The Translator is capable of handling IBM OS or DOS (48 or 60 character set) source programs as input.
**Circle 251 on Reader Card**

**RPG/RPG II to PL/1**
Converts RPG and RPG II programs to an optimized PL/1. The translator achieves an extremely high percentage of automatic conversion (approaching 100%) of the source code.
**Circle 252 on Reader Card**

**AUTOCODER/SPS to COBOL**
Automatically converts a high percentage of SPS/1400 Autocoder source code to ANS COBOL.
**The Translator converts from:**
- **IBM 1401**
- **IBM 1401 SPS**

} can be mixed in a single source program

- **IBM 1440**
- **IBM 1460**
- **IBM 1410**
- **IBM 7010**

**Circle 253 on Reader Card**

**(Any) COBOL to (Any) COBOL**
**Circle 254 on Reader Card**

**EASYCODER/TRAN to COBOL**
**Circle 255 on Reader Card**

**BAL/ALC to COBOL**
**Circle 256 on Reader Card**

**FORTRAN to FORTRAN**
**Circle 257 on Reader Card**

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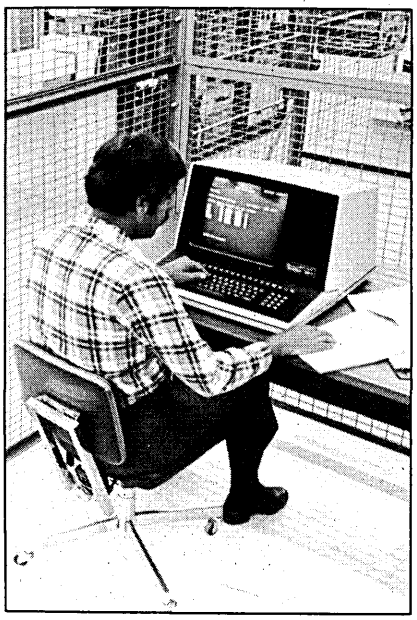
## HARDWARE

An on-line, interactive closed-loop manufacturing control system, Forman includes master production scheduling, materials requirements planning, inventory management, capacity requirements planning, and shop floor control. As each terminal transaction is entered, the system



automatically updates the data base. Financial and accounting functions also are supported. To simplify training, the Forman system comes with a specially designed training data base, allowing novices to gain experience with the system without impacting live data. Similarly, a "simulation" mode is provided, allowing planners to posit various changes within the system, and generate reports showing the effect of these changes, again without impacting the live data base.

The Forman software—offered only to F4000 users—is priced at $30,000; a complete hardware and software system falls in the range of $120,000 to $150,000, which includes a 512KB processor, disk, tape, printer, and terminal, plus user-selected options. FORMATION INC., Mt. Laurel, N.J.

**FOR DATA CIRCLE 309 ON READER CARD**

### OPTICAL COMMUNICATIONS LINK

LED Systems is another vendor to check out if you need relatively fast, short-haul communications. The firm's LED 4D1 system is an infrared light communications link for line-of-sight communications between locations up to a mile apart (a limit that can be extended with the use of repeater units). Repeater units also can help users around the line-of-sight limitation.

Each 4D1 system consists of a pair of control units and a pair of weatherproof transceiver heads. The control units interface to digital equipment with standard RS232 connections (Burroughs' two-wire is optionally offered as an interface). The system supports full- and half-duplex, synchronous or asynchronous communications using any character code of any length, according to the vendor. Asynchronous transmission speeds range up to 9600bps; synchronous transmissions can run to 76.8Kbps.

A single system, with control units and transceivers for both ends of the link, sells for $5,950. LED SYSTEMS, INC., Mechanicsburg, Pa.

**FOR DATA CIRCLE 310 ON READER CARD**

### CRT TERMINAL

The 3751-11 Display Station is the first in Decision Data's new series of I/O devices for IBM System/34 and 38. Plug-compatible with IBM's 5251-11, the 3751-11 has a tiltable 15-inch screen capable of displaying 24 lines of 80 characters. Other features include adjustable key click, cursor position display, field-convertable numeric pad arrangement, automatic dimming, and an expanded error message display. The 3751-11 sells for $2,800, and can be used either locally or at a remote site. A remote cluster controller is under development for introduction in 1981. DECISION DATA COMPUTER CORP., Horsham, Pa.

**FOR DATA CIRCLE 305 ON READER CARD**

### OCR READERS

AM ECRM broadened its Concept Pagereader series of OCR systems, with the introduction of three new models. The Concept 2 allows multifont recognition, with fonts loaded from diskette. The Concept 3 adds an editing keyboard/display terminal, while the Concept 4 includes terminal and dual floppy drives, allowing concurrent page reading and editing of previously read information. Eight fonts currently are supported: three Modified Courier 12 fonts (English, Mexican/Spanish, and French Canadian), Courier 72, ECRM Legal, OCR-A, and OCR-B.

Concept 2 users can change fonts simply by loading a new diskette. The system comes with a dual-port communications board; a second communications board is optional. As with other members of the Concept family, the Concept 2 outputs ASCII characters via an RS232 interface at asynchronous speeds of up to 19.2Kbps; bisync communications are optional. The Concept 2 has a base price of $23,500.

The Concept 3 adds a display terminal allowing modification and correction of scanned text. Concept 3 pricing starts at $25,900.

Editing and storage capabilities of the dual diskette Concept 4 enhance its usefulness in computer data entry as well as word processing text entry. Text stored on a diskette can be recalled and edited while the pagereader scans other documents. Concept 4 pricing begins at $31,900. AM ECRM, Bedford, Mass.

**FOR DATA CIRCLE 313 ON READER CARD**

# THE LATEST ADVANCE IN VIDEO GRAPHIC HARD COPY RECORDING FROM HONEYWELL

VGR 4000, Honeywell's new and advanced video graphic recorder, provides fast, crisp, 8½ x 11" hard copies on dry silver paper from most CRT's and other video sources.

White-on-black or black-on-white images are as simple as flipping a switch. With options, images can be produced having up to 16 shades of grey or even more.

An innovative processing technique eliminates the need for large heated platens. This allows the recorder to run cool, consuming very little energy.

The VGR 4000 is the only recorder on the market available with a self-contained test-pattern generator providing a choice of formats for proper copy verification.

Rugged, yet cleanly designed for easy operation, the compact VGR 4000 can be used on a desk top or rack-mounted, taking up only 7" of front panel space.

Honeywell's VGR 4000 is the latest advance in video-input hard-copy reproduction systems, built by the people with the most fiber-optic CRT recorder experience in the field.

To get the whole story on the VGR 4000 and how it can meet your needs, call Durke Johnson at 303/773-4700. Or write Honeywell Test Instruments Division, Box 5227, Denver, Colorado 80217.

**WE'LL SHOW YOU A BETTER WAY.**

**Honeywell**

**CIRCLE 213 ON READER CARD**

# SOFTWARE AND SERVICES

## UPDATES

Two University of Florida facilities and the Marine Biological Laboratory in Woods Hole, Mass., recently began using high-speed digital facsimile transceivers made by Rapicom. Spanning more than 1,200 miles, the facsimile link is part of a two-year interlibrary exchange experiment. In Florida, the C.V. Whitney Laboratory, a basic research facility specializing in cell biology using marine organisms, is linked to the 170,000-volume health center library at the University of Florida's main campus in Gainesville. The Whitney Lab's library contains few scientific journals predating 1974; researchers often need access to older documents. The fax links allow researchers to get copies of documents from the 2,300 medical journals kept in Gainesville, and the 5,300 journals, dating to 1667, kept at Woods Hole. Dr. R.T. Smith, scientific director of the Whitney Lab, describes the benefits of the fax system: "It comes down to basic productivity. The initial cost of this kind of communication is high on the surface, but when you consider everybody's time involved and how fast science moves it, it is economical and effective."

IBM has announced that its Audio Typing Unit, originally marketed in five metropolitan areas of the U.S., now is available nationwide.

Sperry Univac's Remote Support Center has provided hardware support for 1100 users for more than eight years; now software support has been added to complement the center's capabilities. Currently, 1100/60 users can call for help from the software specialists at the center. Other 1100-series users will be phased into the service.

## SYSTEM/34 UTILITY

QWICII the Quiet Wait Interval Control version II, gives System/34 users greater control over long-running or resource monopolizing RPG II programs. A program time control system, QWICII provides the ability to time-slice long-running programs to better balance the machine's workload. Users can specify a start time for programs or procedures, and program stop time, wait time cycle, and process time cycle; any parameter can be changed dynamically. QWICII is offered for a one-time charge of $1,200. CRS WEST INC., Lake Oswego, Ore.

**FOR DATA CIRCLE 326 ON READER CARD**

## UTILITY

Fastcopy is a set of refinements to IBM's IEBCOPY utility that speeds up execution while requiring no JCL or program changes. According to IDAPS, the developer of Fastcopy, the package unloaded a copy of SYS1.SMPACDS from tape to disk in slightly over 11 minutes (75 cpu seconds) on a 3033 running MVS (R3.8), while IEBCOPY took nearly 40 minutes (1,187 cpu seconds) for the same job. Fastcopy also provides two additional functions: a compress utility for compressing all PDS datasets on specified volumes, and a PDS member cross-reference report program. Fastcopy goes for $2,500 for the first copy, with multiple copy discounts available. A 30-day free trial also is available. IDAPS, San Francisco, Calif.

**FOR DATA CIRCLE 327 ON READER CARD**

## UTILITIES

Memorex, known primarily as a media and peripheral, also sells software for mainframes. The firm now offers a 30-day, no-charge evaluation of its Direct Access Space Manager (MRXDASM); a second offering, MRXPRINT provides remote printer support in an MVS environment.

MRXDASM provides backup, recovery, and space management functions for large disks; it is said to cut backup time on a 3350 by up to 50% when compared to other utilities in its $8,500 price range. Developed by Far North Systems and marketed by Memorex, MRXDASM is a full-track dump/restore package that provides such space management functions as data set control by group name, disk-to-disk copy, disk-to-tape and tape-to-disk compression, device independent copy/restore, and an archiving facility.

**FOR DATA CIRCLE 328 ON READER CARD**

For MVS installations, MRXPRINT allows the printing of output on IBM 3284, 3286, 3288, Memorex 2089, and equivalent printers at local or remote locations. Output can be queued from user-written programs, JES2, and TSO terminals. The package sells for $7,500. MEMOREX CORP., Santa Clara, Calif.

**FOR DATA CIRCLE 329 ON READER CARD**

## SOLAR HOME SIMULATION

The Berkeley Solar Group, an engineering and time-sharing firm specializing in efficient energy use, offers engineers and architects a simulation to evaluate passive-solar home designs. Via Telenet, uses can access BSG's Eclipse MV/8000 and the program CALPAS3 (originally developed at the California Polytechnic State University).

To evaluate a home, the user provides something on the order of 30 to 100 word-and-number pairs describing windows, walls, heat storing objects, and other parameters. The user also specifies the climate of the building site; the simulation will run against a weather data base originally obtained from the National Oceanic and Atmospheric Administration.

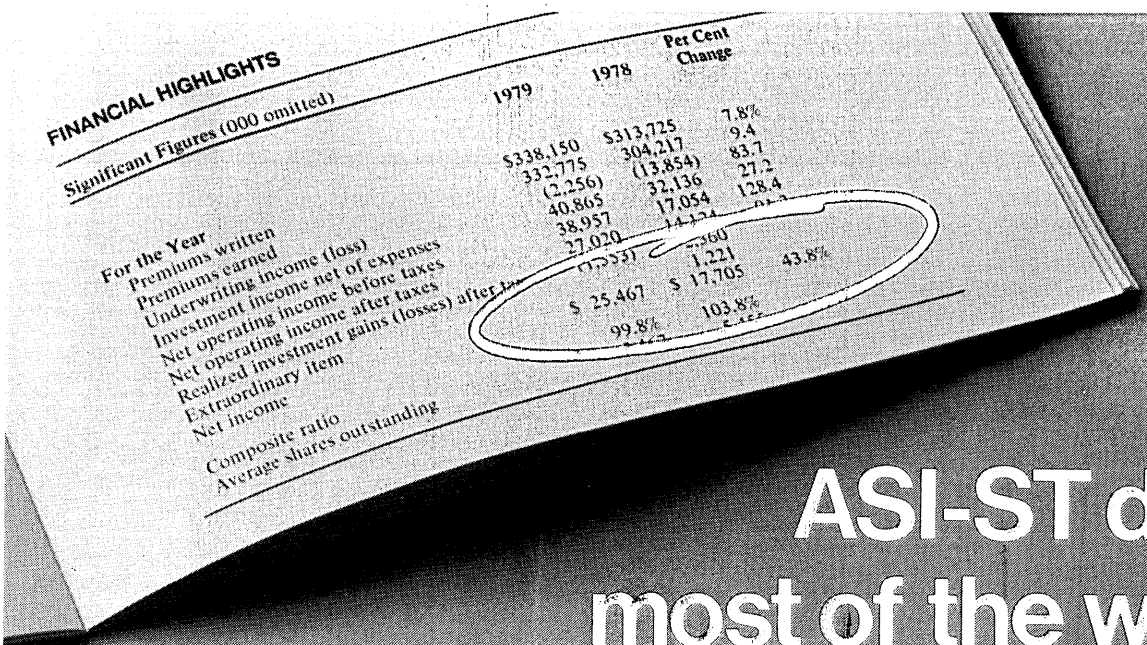
With the user-supplied parameters and the weather data base, CALPAS3 calculates the heat flows and temperatures within the house on an hourly basis over a one-year time span. The results are presented in a report indicating the amount of heat provided by the sun, heat gains and losses through walls and air leaks, and other factors, such as the amount of backup heating or cooling required on climatically extreme days. The report also shows the total utility bill for backup heating and cooling. The user may specify the time frame for the report.

BSG charges $100 initially for a user to sign up to use CALPAS3; a typical run is said to cost $10. BERKELEY SOLAR GROUP, Berkeley, Calif.

**FOR DATA CIRCLE 330 ON READER CARD**

## COBOL GENERATOR

David R. Black & Associates' COBOL Program Generator (CPG), currently installed

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By eliminating up to 90 percent of the programming effort usually required to perform data management functions, ASI-ST is saving time and money for hundreds of users. Typical examples:

- COMBUSTION ENGINEERING, INC. (CE) currently executes from 18,000 to 22,000 ASI-ST runs every month. Some runs produce more than 100 reports in a single pass of one or more TOTAL data bases and conventional files.
- Using ASI-ST, AMERICAN EXPRESS COMPANY recently required only four minutes of CPU time to process over 12 million records. AMEX also uses ASI-ST with IMS.
- CORNING GLASS WORKS now executes an average of more than 18,000 ASI-ST runs monthly against IMS and TOTAL data bases and standard files.
- UNION CARBIDE's usage of ASI-ST averages over 9,000 runs per month at each of its worldwide data centers where ASI-ST is used with IMS.

**Uses Less Machine Time**
Although not originally intended to replace higher-level computer languages, ASI-ST can solve 70 to 90 percent of your commercial data processing problems. And ASI-ST can process your IMS or TOTAL data bases more economically—because it uses less machine time. In a single run, for example, ASI-ST creates and updates related or independent files; retrieves, manipulates, calculates, and displays data; and generates detail and summary reports. How's that for versatility—and efficiency?

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on a variety of processors (including minicomputers from Prime and others) at more than 50 sites around the world, has been enhanced with several new capabilities. Four major new features—Auto Screens, Auto Reports, Master System Menu Control, and Source Code Control—are now a part of the $27,500 CPG system.

Auto Screens builds, organizes, and optimizes data entry programs based on file definitions. Auto Reports facilitates the rapid creation of full feature reports. The user can control the calling of programs from job menus with the Menu Control feature. This enhancement also provides security functions, including controlling access to programs based on password, line, time, and date, as well as maintaining security logs. Source Code Control tracks programs and source code of production programs. It allows a user to locate items in the data dictionary and to identify programs using the items. DAVID R. BLACK & ASSOCIATES, INC., Pittsburgh, Pa.

**FOR DATA CIRCLE 335 ON READER CARD**

## MAINFRAME SUPPORT SOFTWARE

Amdahl has two new system software offerings, the Multiple System Communication and Control (MSCC) program product and the Universal Timesharing System (UTS).

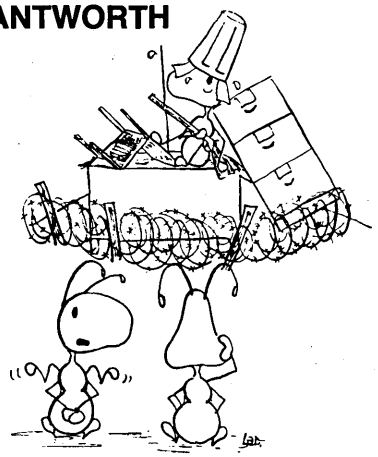
MSCC loosely couples two processors and provides many advantages of a single processor operation. It gives the customer more flexibility in job scheduling, and provides a single system console image and mountable device control. MSCC is priced at $250 per processor per month.

**FOR DATA CIRCLE 338 ON READER CARD**

A modified version of Bell Lab's UNIX Timesharing Operating System (version 7), UTS lets the user focus on the details of the job at hand, not the details of the timesharing system. It provides mainframe users with the advanced functions of the widely acclaimed UNIX operating system, which previously weren't available to large mainframe users. UTS is priced at $3,000 per processor per month. AMDAHL CORP., Sunnyvale, Calif.

**FOR DATA CIRCLE 337 ON READER CARD**

## ANTWORTH



"All I said was that we needed to debug his system."

©DATAMATION

CARTOON BY TOPOLSKY

## SOFTWARE SPOTLIGHT

## ON-LINE PROGRAM GENERATOR

Genasys International's automated application development system (also known as Genasys) has been generating PL/1 and COBOL applications in batch mode since its release. To specify a system in the batch mode, analysts and users collaborated in filling out a workbook description of the system; the workbook description was then keypunched and fed to Genasys.

Realizing that today's users are on-line oriented (and that the batch approach contained duplicated efforts of first filling in the workbook, then keypunching the same information), Genasys International developed Specifier, a transaction processing application that runs under the command level of CICS. Specifier automates the creation of the workbook system specifications, automatically validating specifications as they are input, and creating design documentation for users and analysts. Specifier can be used alone as a design tool, or its output can be sent to the code generation section of Genasys. Specifier also provides on-line "help" facilities, allowing the user to electronically browse through the Genasys/Specifier manual.

The generated design manual describes each part of the system in terms that are both user friendly yet specific enough for use by analysts and programmers. Product (module) status reports, specifications revision history, file and data base layouts (with verification criteria), data element dictionary (cross-referenced), a system flowchart, and operational information are all provided by the Specifier. Screen and report mockups are also created.

As a standalone package, Specifier licenses for $52,500; as a front end to Genasys, Specifier licenses for $12,500. GENASYS INTERNATIONAL, INC., New York, N.Y.

**FOR DATA CIRCLE 325 ON READER CARD**

## MANUFACTURING PACKAGE

Qantel, the Hayward, Calif., small business system manufacturer, has drawn upon the experience it gained by installing various manufacturing system modules in more than a score of different company environments, to produces an integrated manufacturing management system, dubbed QMRP. QMRP is the result of 15 work-years of programming and enhancing the system, plus an additional three work-years invested in documentation. The modular system can run on any of Qantel's systems, from the System 231 (with 64KB of main memory, one display terminal, 10MB of disk, mag tape unit, and 150cps printer) on up to the company's largest systems.

The vendor says its typical market will be companies or divisions with volumes in excess of $2 million up to about $100 million; larger operations can use multiple systems connected by communications lines. The software is modular, allowing users to select the functions they require now, and add additional functions as the need arises. The base system handles inventory processing and bill-of-material processing; it carries a one-time license fee of $15,000.

Three additional modules are offered: MRP/Labor, Purchasing/Receiving, and Order Entry/Accounts Receivable. Modules are priced at $6,000 apiece when ordered separately; a complete system consisting of the base software and all three modules can be had for $27,000. Qantel's distributors will handle any user requests for system modification and support. Additionally, Qantel offers telephone support, with troubleshooting via a remote terminal; this support costs $150 per month for the base system and $300 per month for a full-blown system. Combined hardware and software systems also can be leased. QANTEL CORP., Hayward, Calif.

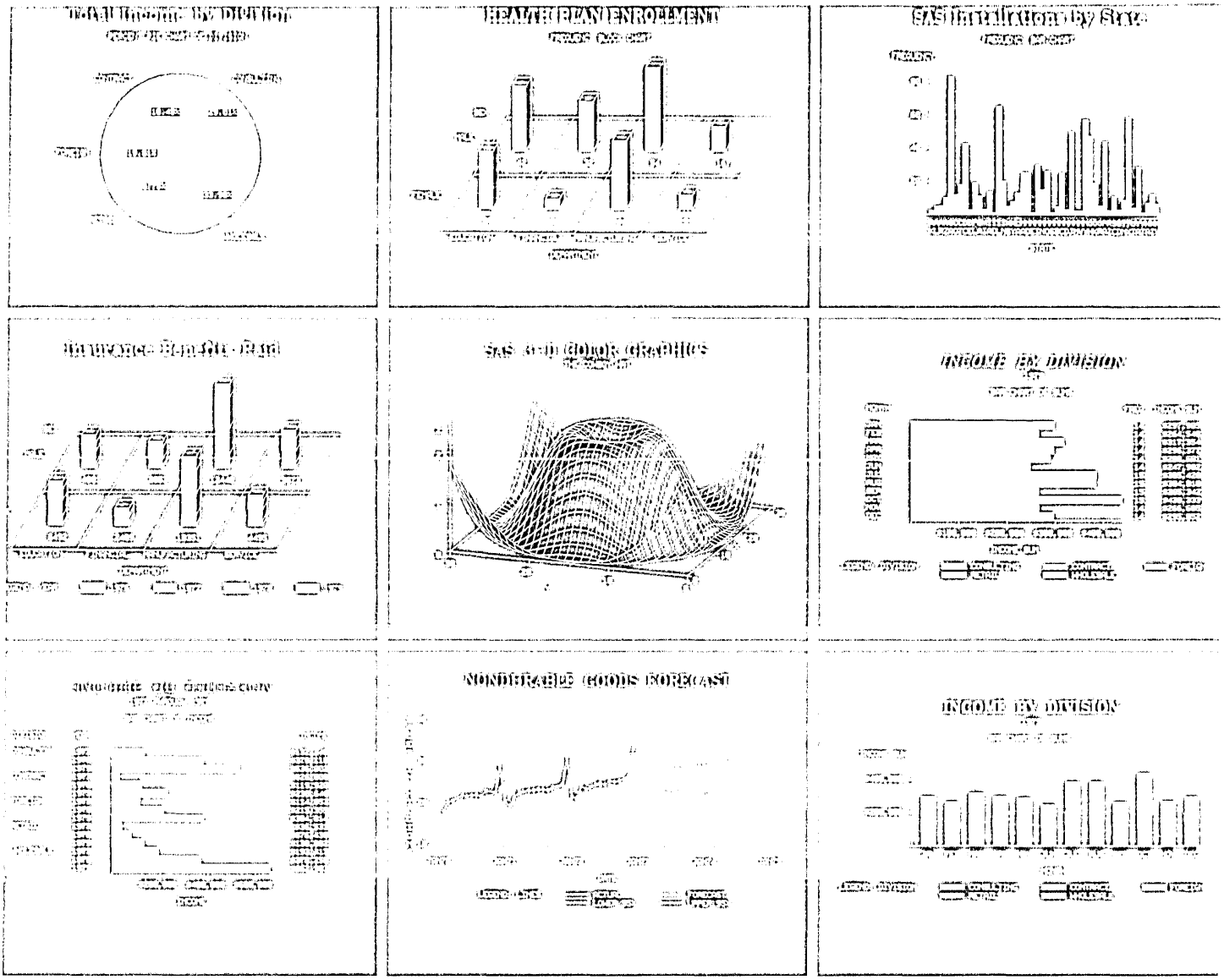
**FOR DATA CIRCLE 339 ON READER CARD**

## SERIES/1 PERFORMANCE ANALYZER

A set of three programs for the IBM Series/1 minicomputer can help analyze system performance in an RPS (version 4.1) environment. A data gathering program, executing in its own partition concurrent with the program being analyzed, captures data every 30msec (in response to an interrupt from the optional timer hardware). Information recorded includes the identification of the task interrupted and the address of the next instruction to be executed. The vendor says that after 20 to 30 minutes of data sampling, a statistically valid profile of cpu utilization can be prepared.

Two analysis programs process the data captured by the data gathering program. TIMEPLOT graphs cpu use as a function of wall-clock time, showing the percentage of time used by each partition; subsequent breakdowns show usage by partition and task as well as time spent executing user code and RPS system services. The second analysis program, COREPLOT, generates a histogram showing the percentage of cpu time versus instruction addresses. This helps identify the most frequently executed segments of code, indicating where program optimization is likely to provide the most improvement in system performance. The program package is offered in executable and source form for $500. APPLIED COMPUTER SERVICES, INC., Van Nuys, Calif.

**FOR DATA CIRCLE 341 ON READER CARD**



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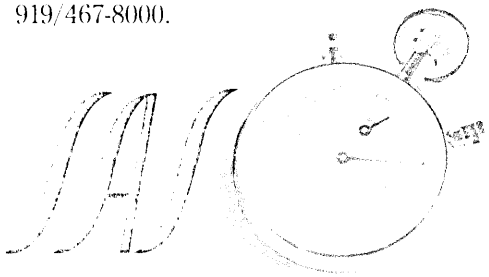
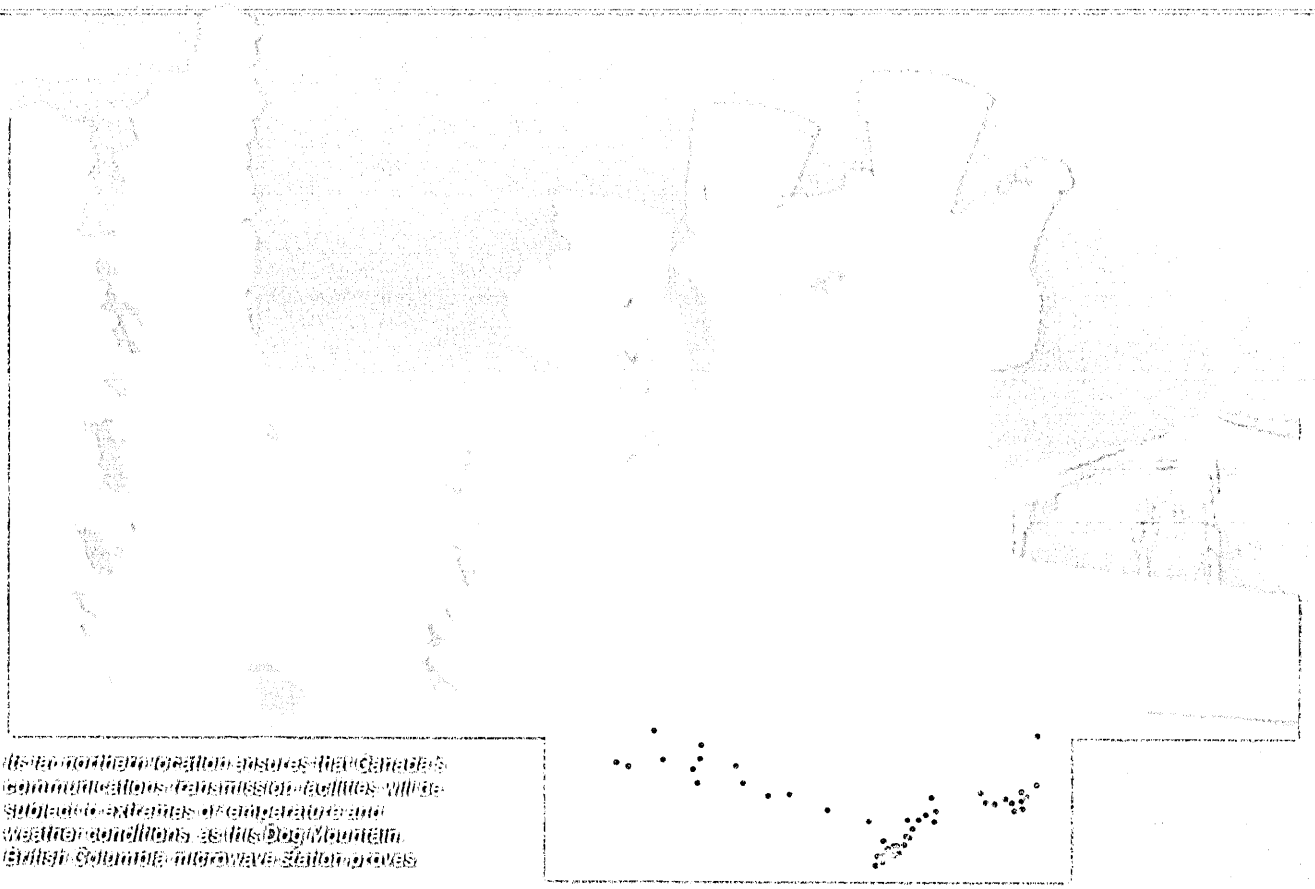


*Images produced by SAS/GRAPH with Tektronix 4027, Dunn Instruments 631 Color Camera System and Polaroid film*

# Canada's Dataroute Network ...



*Its far northern location ensures that Canada's communications transmission facilities will be subject to extremes of temperature and weather conditions as this Dog Mountain, British Columbia microwave station proves.*

# ... is also a Tran Network

In 1976 the Computer Communications Group introduced in Canada the world's first commercially-available nationwide digital data network. Initially installed in 11 cities, the new "Dataroute" is an all-digital highway spanning over 8,000 miles from coast to coast. It offers point-to-point and multipoint private line service as well as dial-up connections over the public telephone network. It also provides multiple speed, high performance data transmission at reduced cost.

Geographically dispersed Canadian companies suddenly found they were able to economically automate their purchasing, distributing, billing, inventory control, and other business activities.

Today the network links directly to 47 Dataroute Serving Areas from St. John's, Newfoundland in the east to Victoria, British Columbia in the west. From each of these network node locations, private and public telephone lines spread out over the country's 3.7 million square miles of territory, moving digital transmissions at up to 56,000 bits per second. The Tran equipment used throughout the network is manufactured in Toronto, Canada.

In addition to providing a cost efficient alternative for the nation's high volume communications needs as it was designed to do, Dataroute has also become a solid, reliable backbone on which other networks are now being implemented. And it continues to grow in size, in traffic volume, and in applications — a continuing tribute to the pioneering efforts of the Computer Communications Group of the TransCanada Telephone System.

*Tran has installed nationwide networks on two continents and statewide networks in several states south of the Canadian border. In addition to its north-of-the-border achievements, its customers include many of the world's most prestigious communications users in private industry, educational and financial institutions, government agencies and telephone operating companies in the U.S. and in other nations. As a result, Tran now has more international experience in the construction of digital data networks than any other communications company in the world.*

tran TELECOMMUNICATIONS CORPORATION

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CIRCLE 153 ON READER CARD

# SOURCE DATA

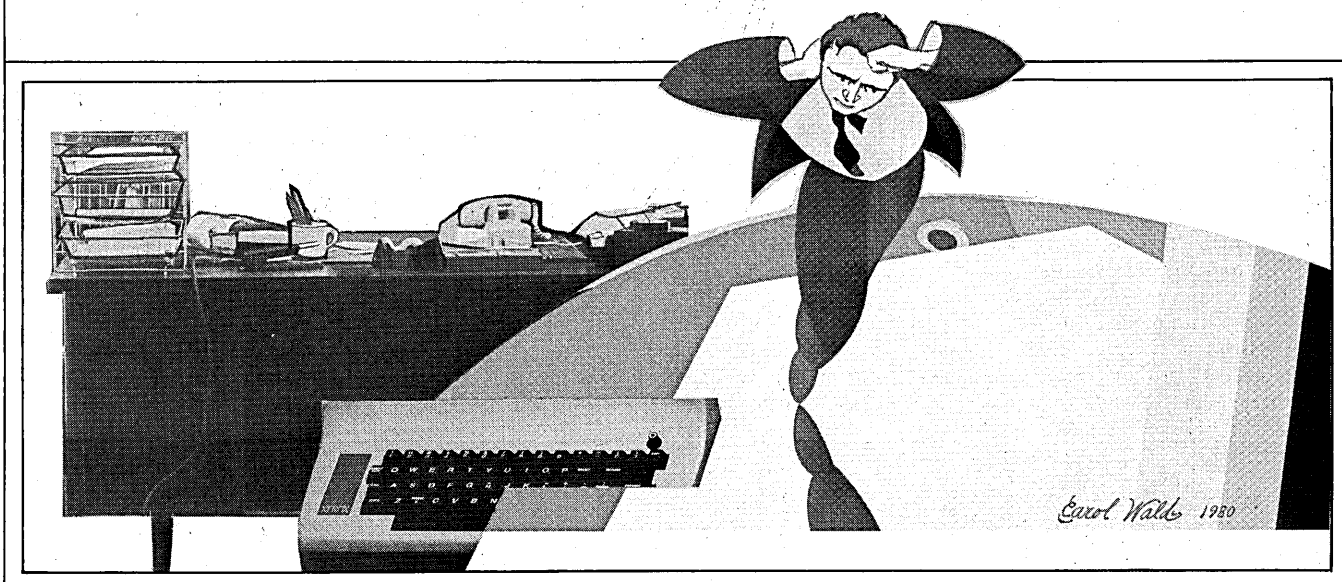


ILLUSTRATION BY CAROL WALD

## BOOKS

### An Age of Innovation: The World of Electronics 1930-2000
### by the editors of "Electronics"

How do you put 50 years of electronics history into perspective? It helps to have been publishing a premiere technical magazine in the field since 1930. This work is the 50th Anniversary Commemorative Issue of *Electronics*, the magazine that popularized the word (although credit is given to a British publication for first using it).

The book is definitely designed for the coffee table, with over 300 photographs and illustrations, many in full color. On first picking it up I was prepared for the worst: a jumble of pieces by different authors, endless verbatim quotes from old issues of the magazine, and infinite technical detail. Nothing could be further from the truth. *An Age of Innovation* does, in fact, concentrate on innovation, describing the inventors, the inventions, and the existing technological environment in a most readable way. The organization of the book is generally outstanding, and great pains were clearly taken to avoid overlap and discontinuity.

*Electronics* began publication in 1930, a year in which the world was badly in need of innovation, and the authors evoke that bleak period with the inevitable photograph of a bread line. They then describe some key developments of the 19th and early 20th centuries. The reader is reminded of the close relationship between experimentation and theory, for example, mathematician James Clerk Maxwell's theory, published in 1864, which explained experimental results obtained three decades earlier by Michael Faraday.

The next six chapters are basically chronological, and concentrate on major areas of electronics development:

The Radio Years—In the '30s, improvements to commercial radio and early development of television.

At War—Military electronics in World War II, with emphasis on radar.

The Solid State Era—Starts with the invention in 1947 of the point-contact transistor by Bardeen, Brattain, and Shockley of Bell Telephone Laboratories.

In the Wake of the Transistor—The '50s, emphasizing color tv and computers.

Computers and Space—Begins with America's response to the Soviet Union's triumph in orbiting a man in space in 1961; culminates with Neil Armstrong's setting foot on the moon on July 20, 1969. Major emphasis on computers.

The Digital Age—The '70s, with emphasis on large-scale integration, calculators, and communications.

Fascinating sidelights are presented with the technical material. During World War II, we learn, one-fifth of America's physicists were working on radar at MIT's Radiation Laboratory. The significance and effectiveness of search radar in detecting enemy aircraft during the Battle of Britain is discussed. It is fairly well known that most Silicon Valley semiconductor companies trace their lineage back to the company William Shockley started in 1954 in Palo Alto. But did you know that the cost of development for IBM's 360 was more than double that required for the first atomic bomb?

Inventions are, of course, described on a technical level. The skill with which the authors have done this is particularly evident in the discussion and illustrations describing transistor technology and its evolution. There are a few voids, however. For example, the significant achievements

in computer disk storage recording are largely ignored.

A small section of the book presents biographical sketches of 11 great innovators, based on interviews. While the sketches are good, the choices are so highly selective that the reader is left wondering, "Where are the rest?" Another short section presents circuit diagrams for 12 "classic circuits." Interestingly, only two of these are more recent than 1912-1938.

The book concludes with four chapters on the future: Systems, Technology, Engineers, and Industries. This is a mixed bag of projections of present trends to the year 2000. Microprocessors in automobiles and the further integration of computers and communications are considered, as are more dramatic projections that envision the whole citizenry seated before information displays at work, school, and play. The technology section provides a good treatment of, refreshingly, the problems in achieving the highest levels of very large scale integration of semiconductor devices. There is also an excellent discussion of trends in magnetic bubble technology. Future electronics engineer, forget Maxwell's equations—you will need to know more about programming and software.

*An Age of Innovation* is highly recommended reading for the computer scientist or engineer who wishes to view the evolution of computers in the context of the electronics industry. Best of all, it's enjoyable. Electronics Magazine Books, Hightstown, N.J. (1981, 274 pp., $18.50).

**—Lowell Amdahl**

## THE COLLAPSE OF WORK by Clive Jenkins and Barrie Sherman

Clive Jenkins is the general secretary and Barrie Sherman the director of research of the British white collar trade union, the Association of Scientific, Technical and Managerial Staffs (ASTMS). It is the union that union-minded data processing managers, systems analysts, programmers, and designers join. Messrs. Jenkins and Sherman are thus in the best possible position to be informed about the dimensions of the forthcoming "third industrial revolution" based on the microprocessor, and this highly readable book shows that they are.

In a review of British economic history since the first industrial revolution, they show that a large pool of unemployed resulting from technological change and/or business investment cycles was the norm in Britain right until 1939. It is the full employment of the 1945-1973 period, based on postwar reconstruction, the armaments race, and the development of the mass market for cars, tv, and other consumer durables, which has been the economic exception, rather than the growing unemployment we have had since then.

Jenkins and Sherman believe unemployment can only get worse within the framework of contemporary 40 hour week working patterns. On the other hand, microprocessor-based automation in factories, supermarkets, banks, telephone exchanges, and many other industries will greatly accelerate the rate at which jobs based on older technologies are obsoleted. On the other hand, the OPEC price rise induced economic recession will slow down the creation of new service jobs to replace the displaced manufacturing jobs.

The problem will be further aggravated in Britain by the second bulge of school-leavers reaching the labor market in the early 1980s: the children born during the 1965-70 period to the many children of the post World War II baby boom.

These three trends taken together will lead, in the authors' estimation, to a rise in U.K. unemployment from a present level of 2.2 million (OECD and ASTMS estimates against official British government figures of 1.5 million to 3.5 million in 1985 and 5 million (nearly 20% of the labor force) in 1990.

Unlike many of their fellow trade union officials in blue collar unions, Jenkins and Sherman see no merit in trying to block the introduction of the new

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microprocessor-based technology into British manufacturing in order to preserve jobs. That would merely make British products uncompetitive against products from more technologically advanced countries such as the U.S., Japan, and Continental Europe. The end result would be 5.5 million unemployed in 1990, compared with 5 million if Britain embraces microprocessor technology wholeheartedly. And a technologically retarded Britain would have far greater balance of payments difficulties in keeping its unemployed at the standard of living to which they had become accustomed than an efficient, fully automated economy.

The only solution that the authors think feasible is to share out the diminishing amount of work still required far more radically throughout the population than anyone has yet envisaged. Continental European trade unions are pressing for a 35-hour-week, but Jenkins and Sherman think this is far too little. Nothing less than a combination of a four-day workweek, or three-week work month; up to six or eight weeks annual vacation for all; longer full- or part-time education for all up to the age of 21 or 25 instead of the present school leaving age of 16; and earlier retirement schemes, will meet the dimensions of the problem.

Yet even if these drastic solutions were adopted, many thousands if not millions of permanently unemployed would still remain, because their acquired skills were made obsolete by technology, and they were too old or insufficiently flexible to acquire new ones. Such victims of economic change should not be penalized either in their standards of living or in their self-esteem by being made to feel useless.

To achieve this, the authors call for the abandonment of the whole Protestant work ethic, which they see as the artificial product of generations of brainwashing initiated by the Christian churches at the dawn of the first industrial revolution to provide the early capitalist entrepreneurs with a labor force. Instead, schools should put much greater emphasis from now on teaching children and young adults to use their growing leisure time creatively.

One does not have to agree with all the authors' proposals nor with their detailed forecasts to support their main plea to governments and industrial managements to plan for the coming microprocessor revolution, and foresee the resulting social problems, rather than leave them to blind market forces. An unplanned third industrial revolution would cause much more misery than necessary, and might even endanger democracy itself. Eyre Methuen, London (1979, 182 pp. paperback, £3.50 or $8.40).

**—Fred Lamond**

## Two Views: THE MICRO MILLENNIUM by Christopher Evans

It is not surprising that books about the future, especially as it relates to science and technology, tend to be curious mixtures of fact and fiction, insight and naivete. Human subjectivity would not allow otherwise. What is surprising, however, is that in spite of the myriad contradictions of contemporary life our notion of "progress" is still so closely wedded to the quest for technological innovation.

Christopher Evans' recently published book, *The Micro Millennium*, is instructive in this regard. The response to this book has tended to be favorable—and, on the surface, for good reason. Evans, a computer scientist and experimental psychologist until his death in 1979, gives us a lucid and enjoyable account of some of the history and principles of computer technology—from the mechanical cogs and wheels of Blaise Pascal's 17th century adder to the electronic microprocessor chip of today's general purpose computer.

Evans paints a colorful and optimistic picture of the "computer revolution" that is altering our lives. Not only does he adroitly chart the already considerable impact that computers have had on the social, economic, and political fabric of the Western world, but he also gives us a plausible view—both in the short and long terms—of


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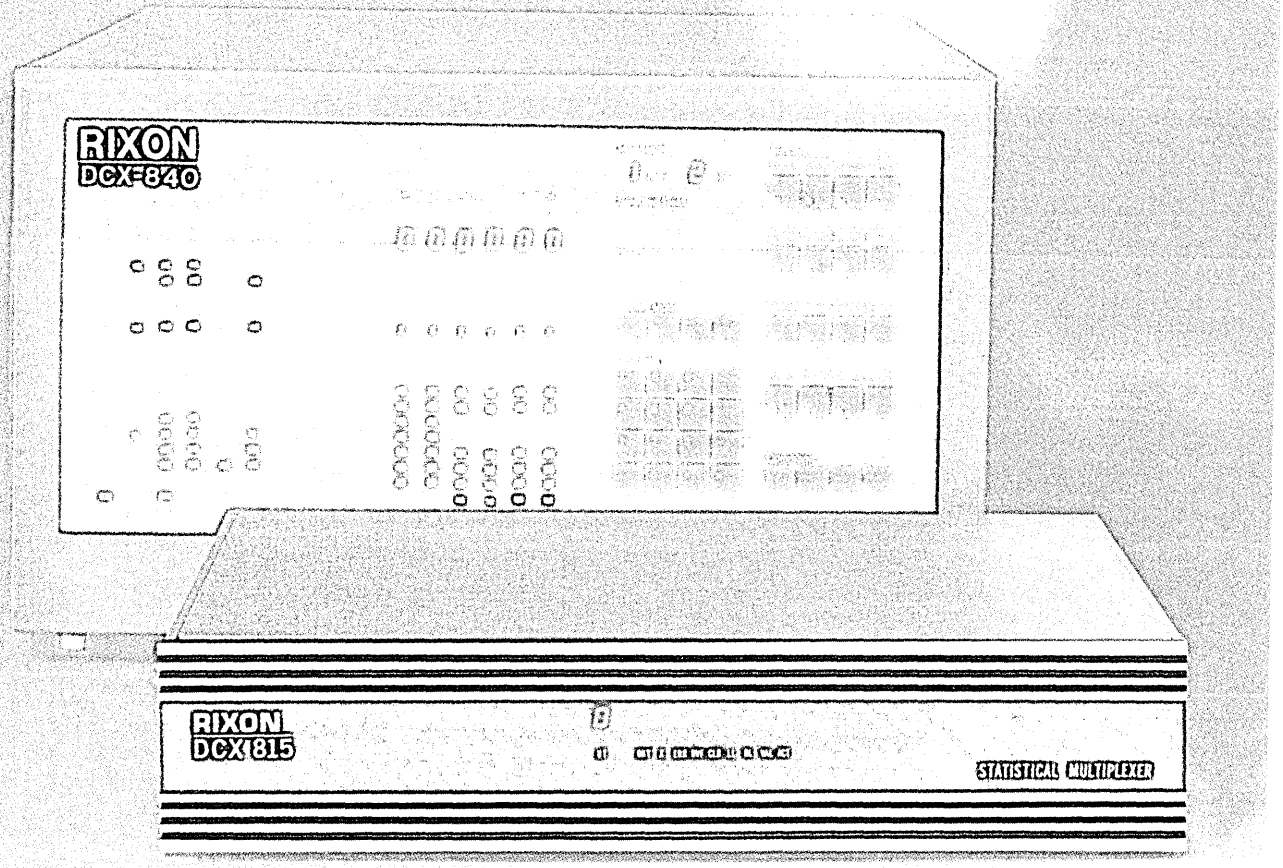


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where it is all leading.

Evans writes dramatically, if not always convincingly, about the death of the printed word, the decline of the professions, the collapse of the work ethic, the appearance of the cashless society, and the development of ultraintelligent machines. The stuff of science fiction becomes everyday reality: bathroom scales that talk, doorbells that let you know how many visitors you've had and when, robots to do your dirty work.

Even if Evans is right in his technological prophesying, however, his overall optimism is based on a notion of progress which is itself highly questionable—a notion that may well blind us to the real inner and outer changes that modern life is calling for. His fatidic prose rests mostly on the assumption that more and better technology means a more rewarding way of life. For Evans—as for so many others—the movement of progress takes place along a one-way road called technology. In discussing primitive peoples, for instance, Evans writes that they had to work "for the whole of their waking life simply to find food and ensure survival. With advances in technology and science, Man gradually achieved greater mastery over his environment, and his work-load was reduced and the wealth of his society increased." Not only is Evans' history a bit shaky—since recent studies show primitive peoples worked far less than we do to survive—but, more importantly, Evans ignores any real discussion of values, meaning, and purpose.

The way Evans sidesteps issues such as these is shown clearly in his arguments regarding computer creativity and thought. A good example is his discussion of the Turing Test for Thinking Machines, in which a "judge" is put in a room with two computer terminals—one connected to a computer and the other to a person. The judge must decide which terminal is which by carrying out conversations through the terminals. Evans writes: "If the intellectual exchange we achieve with a machine is indistinguishable from that we have with a being we *know* to be thinking, then we are, to all extents and purposes, communicating with another thinking being."

That Evans sees nothing strange in limiting the human side of the conversation to what can be conveyed through a terminal; that he can talk about an "intellectual exchange" and communication apart from the experience and consciousness of the participants; and that he can refer to a computer as a "being" at all—reflects the extent to which modern, technological society has lost its relationship with the perennial questions of man's identity and place in the cosmos.

In *The Micro Millennium* we see the challenge of our future shrunk to the size of a silicon chip, a bloodless electronic savior Evans believes can rescue us from the limitations of our own subjectivity. Unfortunately, this savior uses a logic that has no relationship to the basic; unanswerable questions that bring meaning, value, and even joy to our lives. It is these heartfelt questions, these openings into the miracle of human existence, that renew our purpose and energy, and remind us that technology can be used wisely only when people themselves are wise.

**—Dennis Lewis**

*

The late Christopher Evans has left us with *The Micro Millennium*, a book about the future. In it he heralds a Silicon Valley Cockaigne, a land transformed by the innovation of the microprocessor, where labor becomes redundant and life is serene.

Evans' predictions, while occasionally sober and well founded, are too stubbornly sanguine to be believed. Although he does incidentally refer to the harrowing that, realistically, must be before us, Evans finally succumbs to predicting a comforting, roseate future where few are alienated and where all share in a great material abundance. A pleasant thought, but not a likely one.

Everybody likes a book about the future. Consider Edward Bellamy's 1888 work, *Looking Backward*, which was listed


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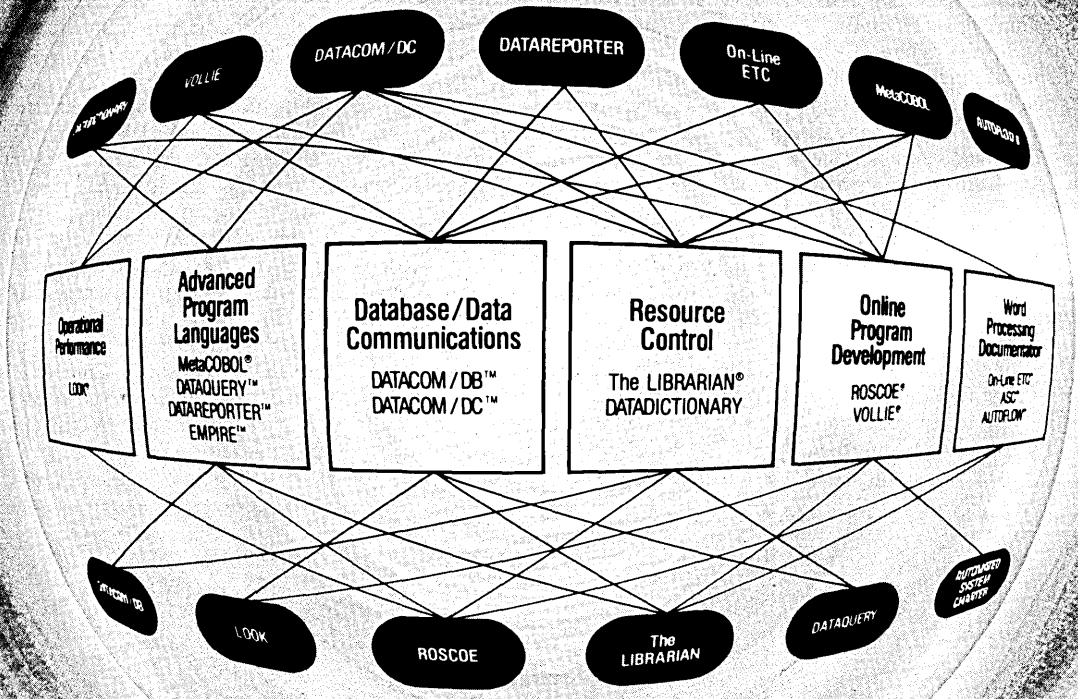


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by John Dewey as one of the two most influential books—along with *Das Kapital*—of the 19th century. The chief character in Bellamy's book awakes in the Boston of the year 2000 to find a world where all citizens share equally in the nation's wealth, and where acquisitiveness and domination have disappeared. Robert C. Elliott has written that "after its publication the social conscience of America was never again the same." Bellamy's was a sustaining book; its vision of a glorious tomorrow helped reinforce a basic American idea. A rational and cooperative society is much more appealing than a destructive and oppressive one. Still, potholes have appeared in Bellamy's alluring path to the future; Evans could prove to be just as much a Pollyanna.

In Evans' utopia money will disappear, to be replaced by electronic credit. The professions—law, medicine and teaching—will greatly benefit from access to the microcomputer. Crime will wane. The workweek will shrink to a pleasant 30 hours, with six weeks' vacation and meaningful, eventful retirement at 55.

This does seem promising, but there is no mention of an arms race, diminishing resources, the declining quality of human life, or a fragile economic situation. He tentatively mentions some gloomy prospects but is mostly too busy touting new gadgetry to consider the grave problems we will ultimately have to solve. Though he allows the possibility of social disorder and worries about the formation of a neo-Luddite anticomputer bloc, Evans eventually manages to dismiss these acute illnesses, prescribing little more than business-as-usual. There is an unnerving subjectiveness to his reckoning; his chase, obviously, has a beast in view. That teleological beast is the continued leapfrogging prosperity of the microprocessor industry—at the expense of such supposedly inviolable social rights as privacy—and the perpetuation of everlasting exponential growth.

Joseph Weizenbaum has suggested that the premise of technological inevitability is not a certainty. His *Computer Power and Human Reason* is a far more compelling book than Evans' when dealing with the world computers will engender. Evans also fails to deal with the writings of Dennis Gabor, another man likely to question an uncritical confidence in the microelectronic manufacturer. On the future of computers and dp, Gabor writes: "In this field, technological forecasting is easier than foreseeing the social effects. One might easily fall into . . . error by assuming that the tremendous technological development which can now be confidently expected will be absorbed by society with equal ease."

Dispelling the faith in this predicted technological growth, Gabor reminds us that "exponential curves grow to infinity only in mathematics. In the physical world they either turn round and saturate, or they break down catastrophically." It would be enough for Evans to disregard dire predictions, enough for him to not concern himself with forecasts of world starvation or ecological disaster. But to further compound his omission, Evans anticipates steady sustained growth.

Perhaps the greatest flaw in Evans' book can be explicated with a quote from Gabor concerning our present social order: "It demonstrates clearly the imbalance between the technological and social innovation, and the unhealthiness of a state in which most of the best brains still try to improve technology when the bottleneck has shifted long ago to the mismatch between technology and society."

Rather than share in Evans' enthusiastic suppositions, and rather than pledge the advancing ascendancy of Technique, the modern person must confront those urgent disorders threatening our society. To do otherwise is to lull oneself to sleep with visions of Cockaigne. *The Micro Millennium* dismisses our most important concerns. Read Weizenbaum's *Computer Power* or Gabor's *Inventing the Future* and pass Evans' book by. The Viking Press (1980, 255 pp., $10.95).

**—Lee Froehlich**


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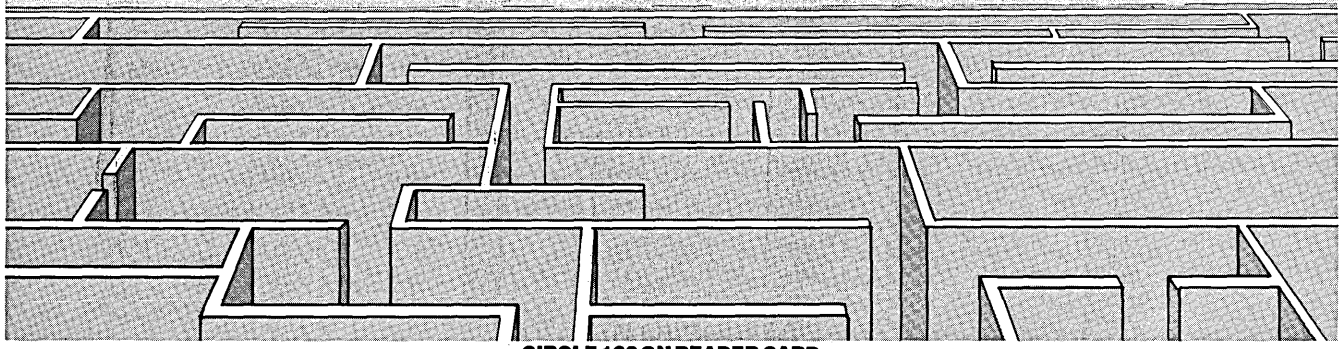

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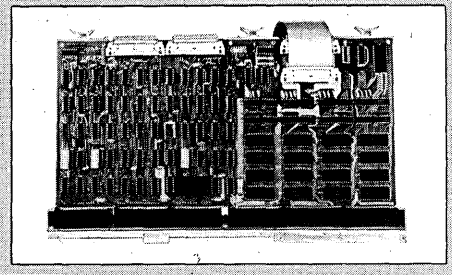

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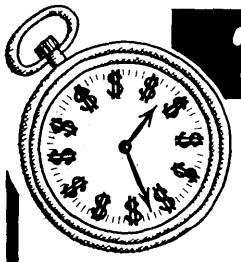

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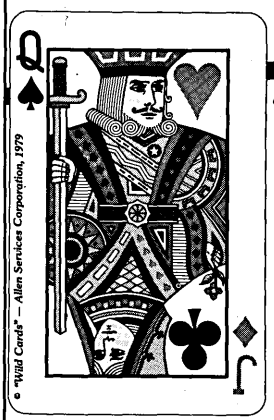


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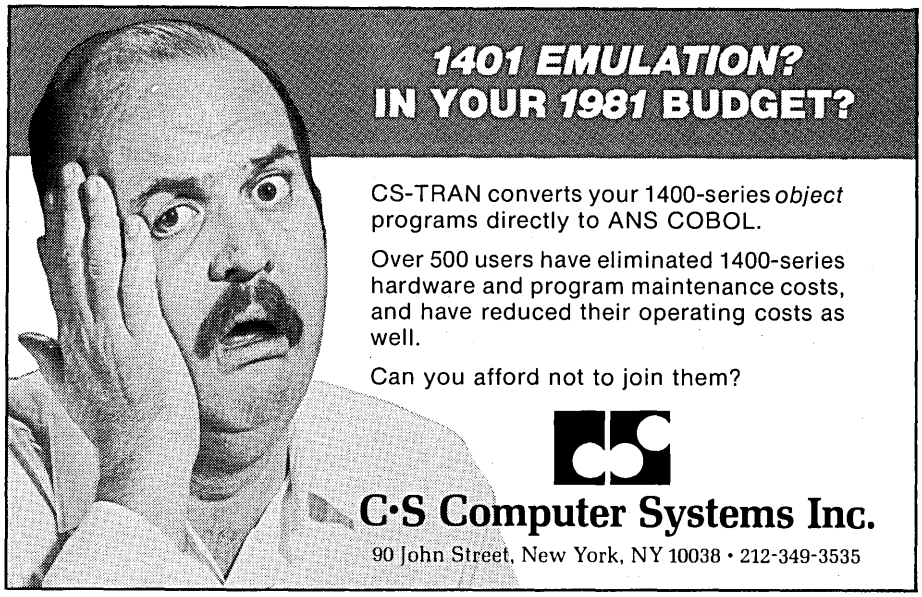


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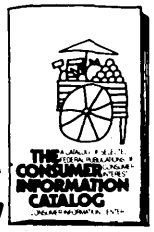


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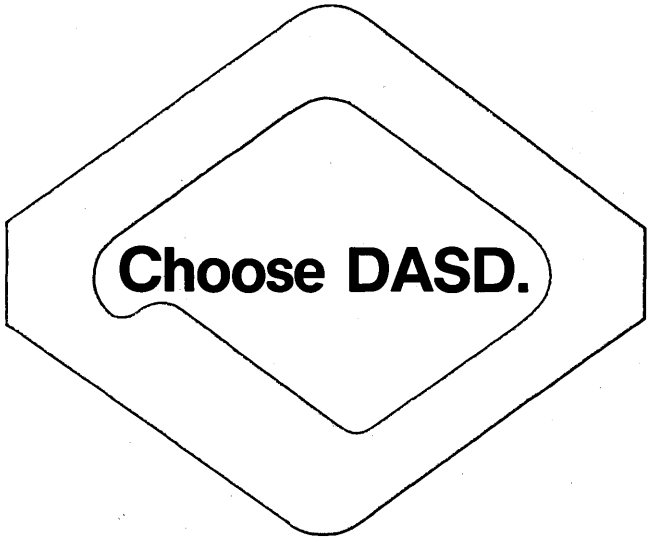


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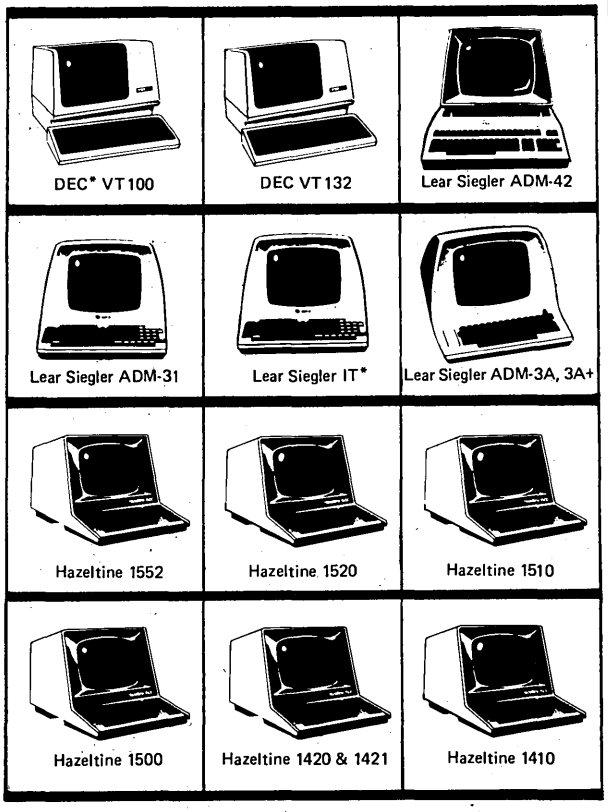


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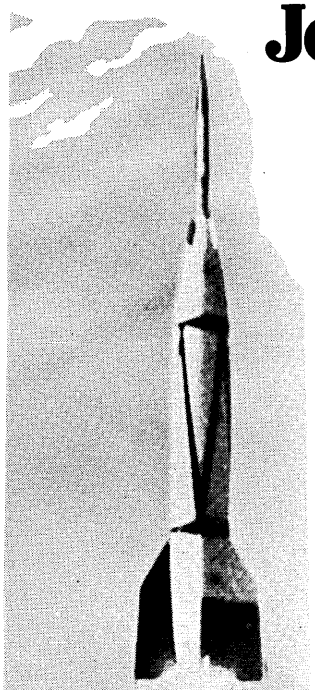

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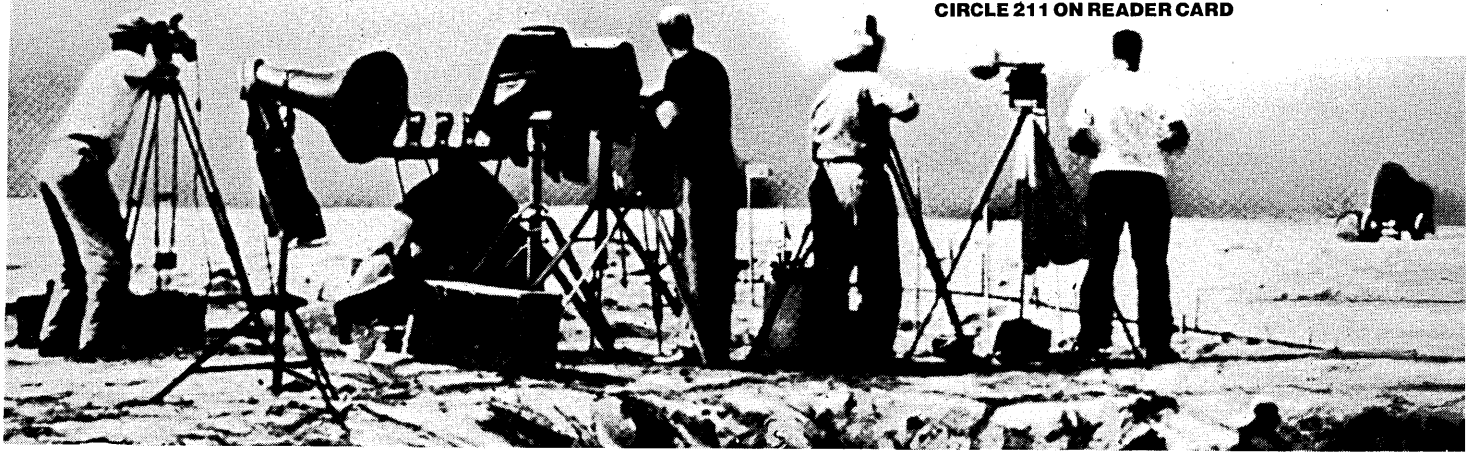

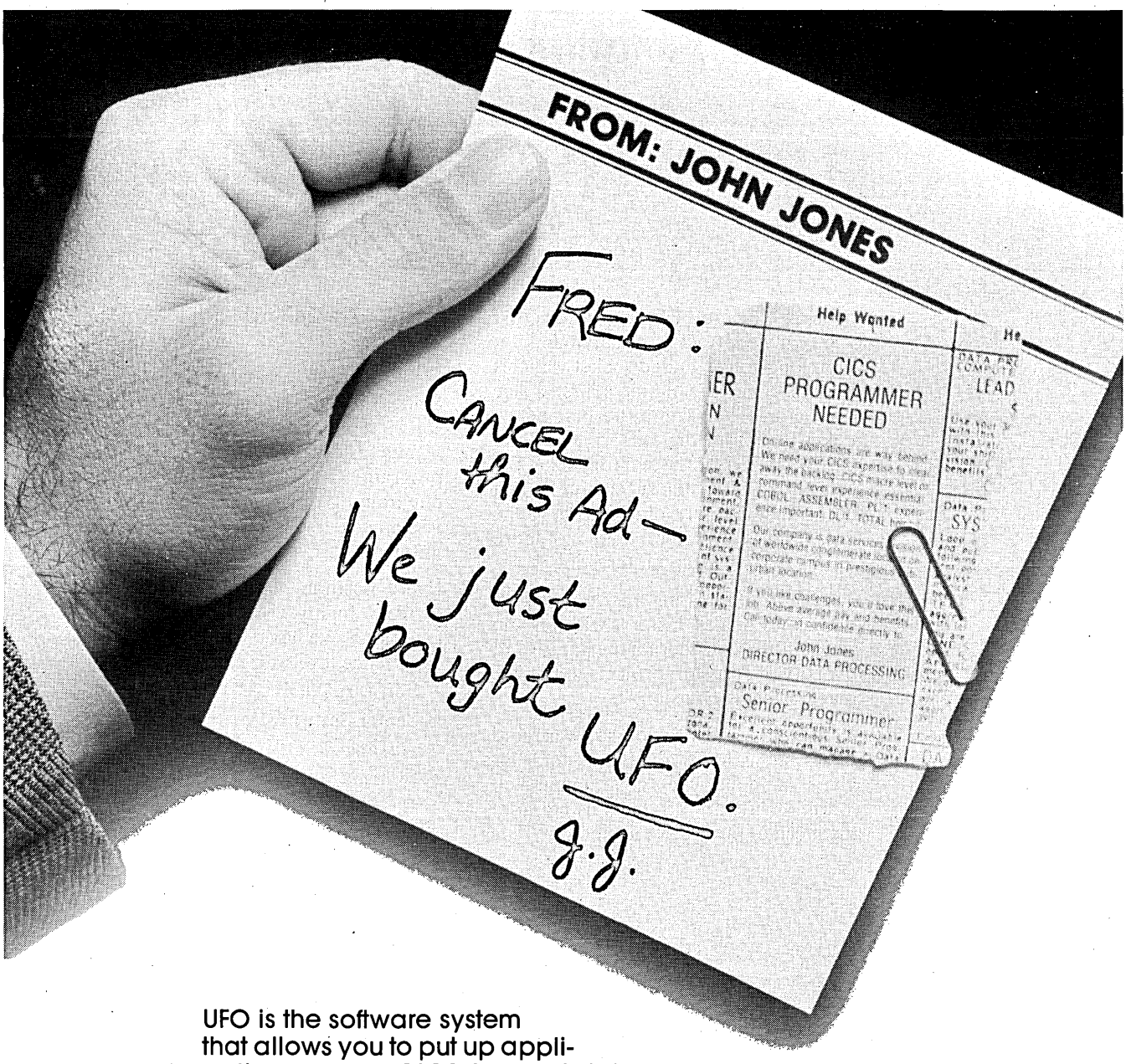


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An exchange of readers' ideas and experiences. Your contributions are invited.

# READERS' FORUM

## KEEP TESTING TO ACHIEVE SECURITY

The importance of maintaining complete system and program documentation has often been stressed by dp managers, computer security officers, and external and internal auditors. Such documentation should highlight the controls that are supposed to exist to assure exposures to security-related problems are either nonexistent or at tolerable levels.

Controls, however, should be tested *continuously* to see if they are actually working. All too often we hear of situations where a set of controls seems adequate on paper, but for one reason or another is not operational.

Now is as good a time as any to institute a continuous compliance testing program in your organization. The purpose is to let you know whether security controls are doing the job.

Before starting:

1. *Review the system*. Interview both dp and non-dp personnel and reviewing system and program documentation to ascertain what controls are supposed to exist. (This will also give you the opportunity to appraise the adequacy of your present documentation.)

2. *Evaluate*. Do the controls, as described, provide sufficient protection? Assuming the controls are operational, will irregularities be prevented/detected? If not, take corrective action.

If the results of review and evaluation are favorable, you are ready to begin continuous compliance testing. At this point, you have said in effect that you are satisfied the security control system is adequate *if* it is functioning as described. Continuous compliance testing is necessary to provide assurances that the system is operational.

Compliance testing programs will vary, depending on the nature of the organization, but strong programs have many common elements. Programs should be:

1. *Predetermined*. Know in advance when you will be testing each control element.

2. *On-going*. Testing should continue at all times, not just once or twice a year.

3. *Confidential*. Testing should be done on a surprise basis.

4. *Comprehensive*. Examination of controls leaving no audit trail, such as "separation of duties" controls, should be included in the program as well as the testing of controls leaving visible documentation.

5. *Documented*. Keep a record of all testing procedures and results.

6. *Monitored*. Unfavorable test results should be made known to appropriate people and corrective action should be taken.

7. *Reviewed and Revised*. Periodically, the testing schedule should be examined to assure it is meeting the needs of a changing organization.

**—Michael A. Pearson**
**Kent, Ohio**

## COMPANY PROFILE

Circuistatics may well be a diamond in the microprocessor rough. Although the company's common stock (quote code CUS) has long since been delisted from the Rocky Mountain Stock Exchange, ceo James Rawbone is optimistic about his company's prospects.

"For one thing," he observed, "We have an imaginative debt-consolidation program now under way. For another, we've trimmed off the deadwood and the dead weight, substituted bone and gristle for meat and fat, and generally trimmed our sails to fit a leaner, tighter craft."

A tour of Circuistatics' Poltroon, Texas, facility quickly and succinctly bears him out. Gone are the splashy sports cars and nine-passenger country squires that used to grace the parking lot. In their place is a Volkswagen and an LST.

"This facility used to be a storage depot and breaking yard for W.W.II surplus Land Support Transports," Rawbone volunteered. "Since reverting to a leaner, tighter, trimmer transportation fleet for our employees, we've cut our fuel costs practically 10%. By cannibalizing the LSTs that came with the property, we can amortize our capital expenditure and operating costs over the same base. By moving employee residences into the plant proper, we've cut to/from work time practically in half. And that's a real saving, when you stop to think about it."

Rawbone, or "Jim" as his brother calls him, insists on leading all the facility tours himself. As he puts it, it shows that "can-do" executive attitude so distinctive of the modern ceo. "I like our

visitors to know they're dealing with the boss. I like them to know that the buck stopped here long ago, so there's no use trying to go over my head looking for it because it's right here in my pocket."

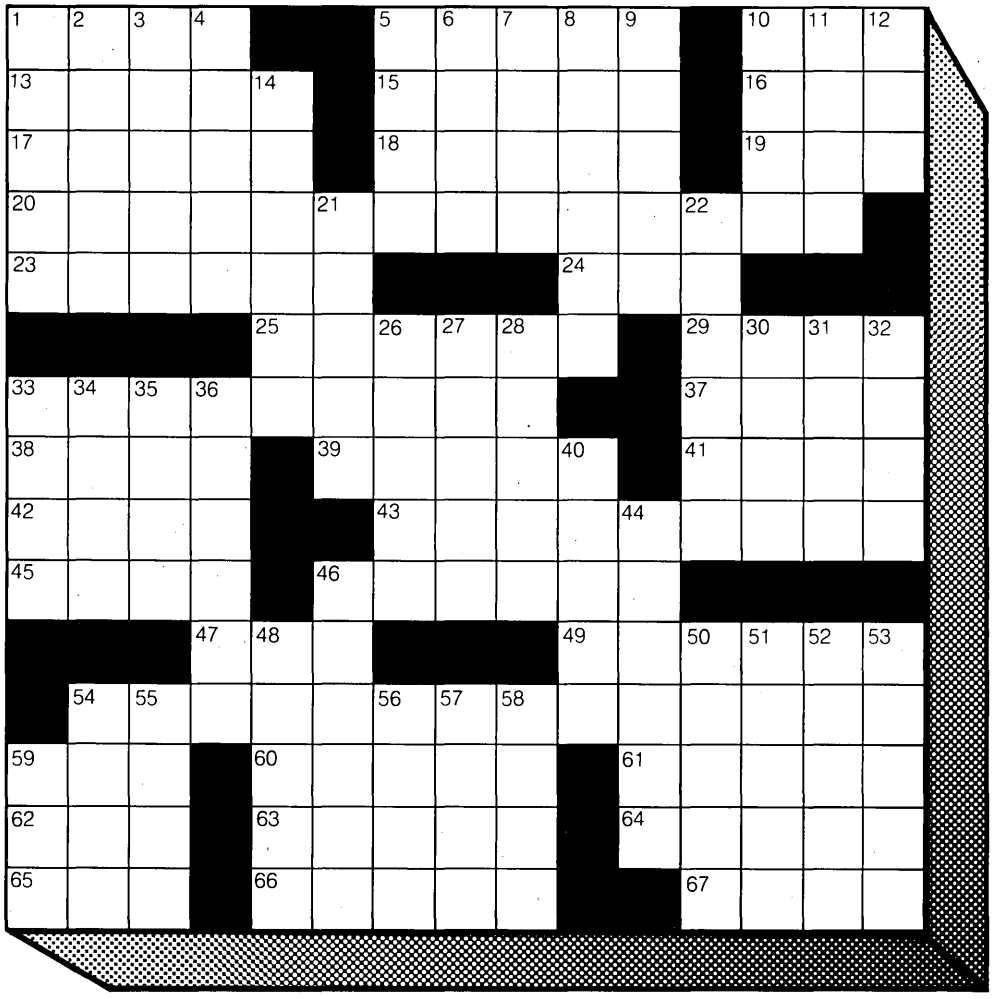
A door marked R&D opens into a sleek room packed with drafting tables cluttered with integrated circuits. Colorfully decorated floppy disks festoon every available square inch of wall, and a variety of fully independent sound systems play a wide-ranging selection of musical pieces drawn from the major branches of harmonic culture. "We like to keep things sleek," Jim explained. "Here at Circuistatics, we believe R&D is the heart of any successful state-of-the-art enterprise. Without an R&D department, we figure a company's just got no heart. Now take finance. Finance is really the guts of a business organization. And this is definitely a business with both heart and guts. As to manufacturing, why, that's your arms and legs. Some places feel comfortable contracting out the manufacturing function. Maybe it makes sense to them to depend completely on some foreign guy with a soldering iron, but not us.

"To begin with, you're totally dependent on them for the very stuff you sell. What if there's a war or a strike, or they all get tropical diseases from those bugs they got all over the place? What do you do then? Tell your customers that maybe you'll deliver Lord knows when? If we could sell 'maybe's,' we'd be in politics. Our philosophy is to keep our arms and legs at home where they belong. Without your arms and legs, your heart and guts go nowhere."

In a corner, four white-smocked technicians were playing three-dimensional checkers with unused silicon chips manipulated with sophisticated hydraulic tweezers. An inquiry about this apparently nonproductive expenditure of time elicited the quick response that, far from being nonproductive, the scientists were actually exploring new applications for the ubiquitous chip. When it was point-

# DATAMATION CROSSWORD

**PUN-ISHMENT**
**by**
**Brian FitzGibbon Burke**



## ACROSS

1. ___Spee
5. Storied
10. Fit or join closely
13. Honestly: colloq.
15. White poplar
16. Put this before the carte
17. Mine openings
18. Vladmir Ilyich Ulyanof, originally
19. Sort
20. Ormandy and Ozawa, from the waist down
23. Orb in back of a fireplace
24. ___ Kabibble
25. Bowery potation
29. Foil
33. Sup-routine
37. Royal fiddler
38. Browning's duchess
39. Novelist Shaw
41. Homonym of a synonym for rule
42. Ripens
43. Texas chews
45. Actor Richard
46. Microorganism needing oxygen
47. Top degree for an Esq.
49. John's greasy playmate
54. Boston blues
59. South African antelope
60. Dirge for an electron tube
61. Painter's reluctant agreement
62. The old country
63. Becomes worthy of
64. Blood vessel: comb. form
65. Brief exchange
66. Unobserved departure
67. Eliot's peach dare

## DOWN

1. Grind
2. Dude activity
3. Out on ___
4. Assimilate
5. P.R. liberation group
6. In the grip of Morpheus
7. Bill of fare
8. Educe
9. Bucky et al.
10. Scarborough ___
11. Start of a Shakespeare title
12. Ruminant of Central Asia
14. Accompaniment
21. Ancient Greek coin worth 1/6 drachma
22. William Sidney Porter
26. Singer Mel
27. Champion of 42nd Street
28. Half of elevator operator's autobiography
30. Bog content
31. Lake or Canal
32. Eternities
33. Signal
34. Fad
35. Suffix with AB
36. ". . . is fear ___."
40. Agnew's negative natterer
44. White sturgeon
46. Only English pope
48. Ore deposits
50. Rhone contributary
51. Peace Corps, at home
52. Implant
53. Marketplace
54. Son of Seth
55. Kind of beach
56. "Renaissance" poet, to her friends
58. Word with city or copy
59. Computer Science's contractor

**Solution on page 208**

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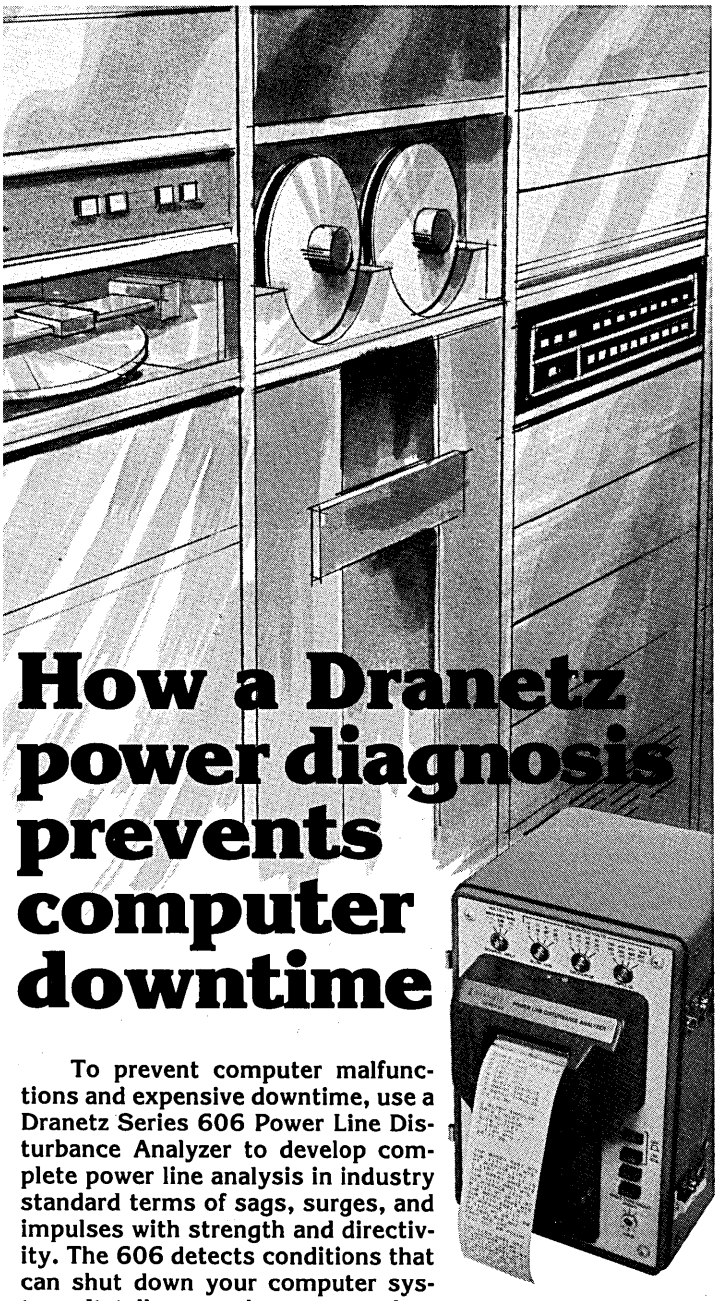

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## READERS' FORUM

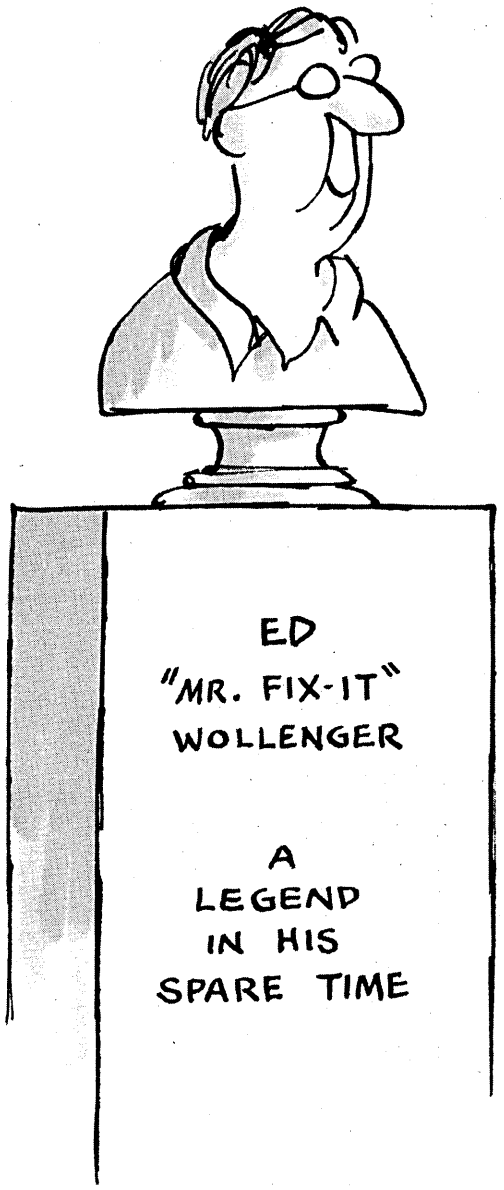
ed out that three-dimensional checkers has been around for years, Jim explained the corporate philosophy that pervades R&D:

"Well, hey, I'm no scientist, but we've found that these guys are better left to putter around the lab as best they can. You never know when you're going to open your mouth and bam, there went the creative process that might have been the idea of the decade. See that fellow making his move right now? His father invented those little tin things that go on the end of shoelaces and make it possible to stick them through the grommets. Someone got pretty rich off that one, and I'll bet my last nickel he kept his mouth shut when his R&D guys were working on it."

When finally asked about the conspicuous absence of Dr. Norbert Beansprout, the gifted conceptualist who was Circuistatics' R&D chief, Jim's brow furrowed.

"We had to let him go. In fact, he wanted to go. You can't keep a man against his will, can you? By gosh, I'd say you can't, as long as this is still America. If a man wants to go, he goes. Out the door. Right out the door."

**—Robert J. Hard**
**New York, New York**

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CARTOON BY HENRY R. MARTIN

# THE NEW BELDEN BIT-DRIVER™ HAS ARRIVED

For simplex and full duplex asynchronous data transmission at up to 56K bps, Belden's new Bit-Driver system is ideal for in-house and in-plant interconnection of a wide range of EDP and process control equipment. Users can now get all hardware including either metallic or optical Bit-Drivers, plus cables to match specific environmental needs and RS-232 interface cables from one supplier. Our integrated system approach gives you "matched performance" reliability for the entire data link. Our optical unit is ideal for solving your lightning, EMI and ground loop problems, too.

When you consider the savings in telephone company rates and equipment rental charges plus the advantage of owning your own system, the Bit-Driver is an idea whose time has arrived. For more information, contact Belden Corporation Fiber Optics Group, 2000 S. Batavia Ave., Geneva, IL 60134, (312) 232-8900.

CIRCLE NUMBER 232 ON THE READER SERVICE CARD FOR OPTICAL.
CIRCLE NUMBER 233 ON THE READER SERVICE CARD FOR METALLIC.

## Both optical and metallic units available

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*with new ideas for moving electrical energy*

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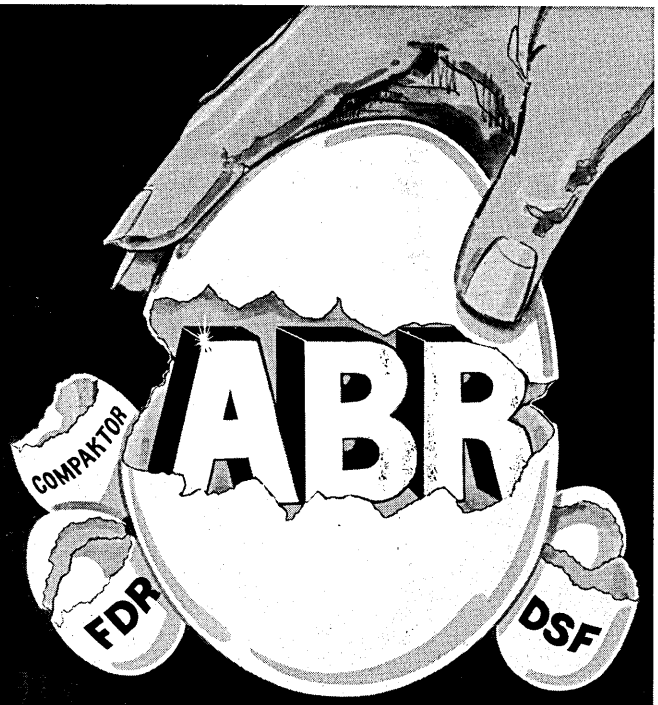


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**CIRCLE 215 ON READER CARD**


## READERS' FORUM

# FINAL REPORT OF A CORPORATE SUBCOMMITTEE

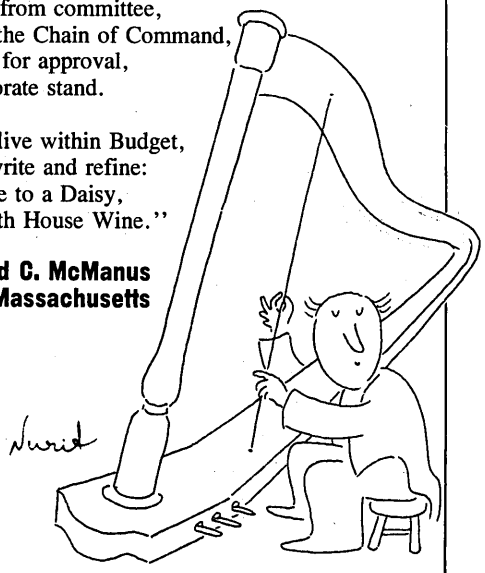
We proposed a policy statement
On "What is the Meaning of Life?"
To educate guileless employees,
And minimize tension and strife.

We sat 'round the table and pondered,
And prayed to the Muse for a Sign,
And then in a flash came the answer:
"Life's a Rose in a Goblet of Wine."

We reported it out from committee,
Passed it up through the Chain of Command,
To Executive Row for approval,
Of this glorious corporate stand.

But Wisdom must live within Budget,
So they slash and rewrite and refine:
"Cut back the Rose to a Daisy,
"And fill the Cup with House Wine."

**—Edward C. McManus**
**Marlborough, Massachusetts**



DRAWING BY NURIT KARLIN

**Answer to puzzle on page 203**

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| S | E | M | I | C | O | N | D | U | C | T | O | R | S | |
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| A | S | E | | S | N | E | A | K | | | E | A | T | A |

# DEC, Data General, H-P communications costs are down

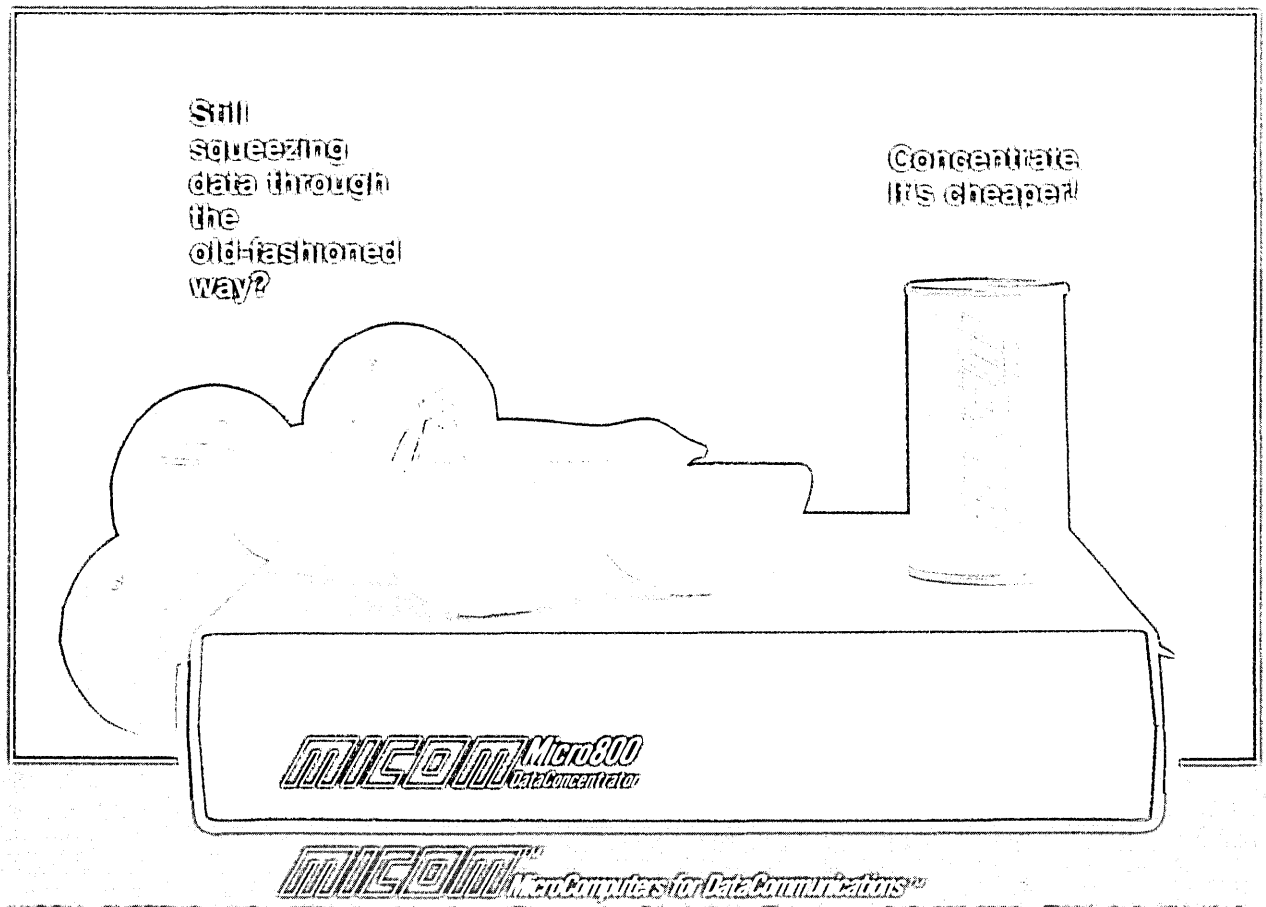
If you're supporting multiple remote terminals on your minicomputer system, whether from DEC, Data General, HP or anyone else, chances are you are paying a fortune in communications costs and probably not even running the terminals as fast as you'd really like to. And, to add insult to injury, you have to put up with the occasional phone line glitch which drives your CRT's crazy.

What you really need is a smart little box that will provide error control for your dumb terminals and allow several of them to share one telephone line, contending for the line when they need it, not each paying for a dedicated transmission facility all day.

Well, look no further. MICOM's Micro800 Data Concentrator allows up to 16 terminals to share a single phone line — and our new Micro900 Multidrop Concentrator even lets you *multidrop* those terminals at up to eight different locations, *without requiring any changes to existing hardware or software.*

More than 20,000 Micro800's are already in service, installed by the user as painlessly as plugging in a terminal. And with some of our customers supporting four 2400 bps CRT's on a single 2400 bps line, no wonder they're delighted! What's more, with the Micro800, transmission errors are gone forever. We even have a single channel configuration for lone terminal installations. And for added convenience, our new Micro8000 Concentrator Modem packages both concentrator and high-speed modem in a low-cost compact package.

Send for complete details of the MICOM concentrator family today . . . . better still, why not call and order a pair on a 30-day sale-or-return basis. No strings attached! We *know* you'll love it.

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Ease of operation, keyboard feel and usability, print quality, reliability and maintenance service were all considered. And when the figures were tallied, *the Teletype® Model 43 got the highest rating for Overall Performance.*

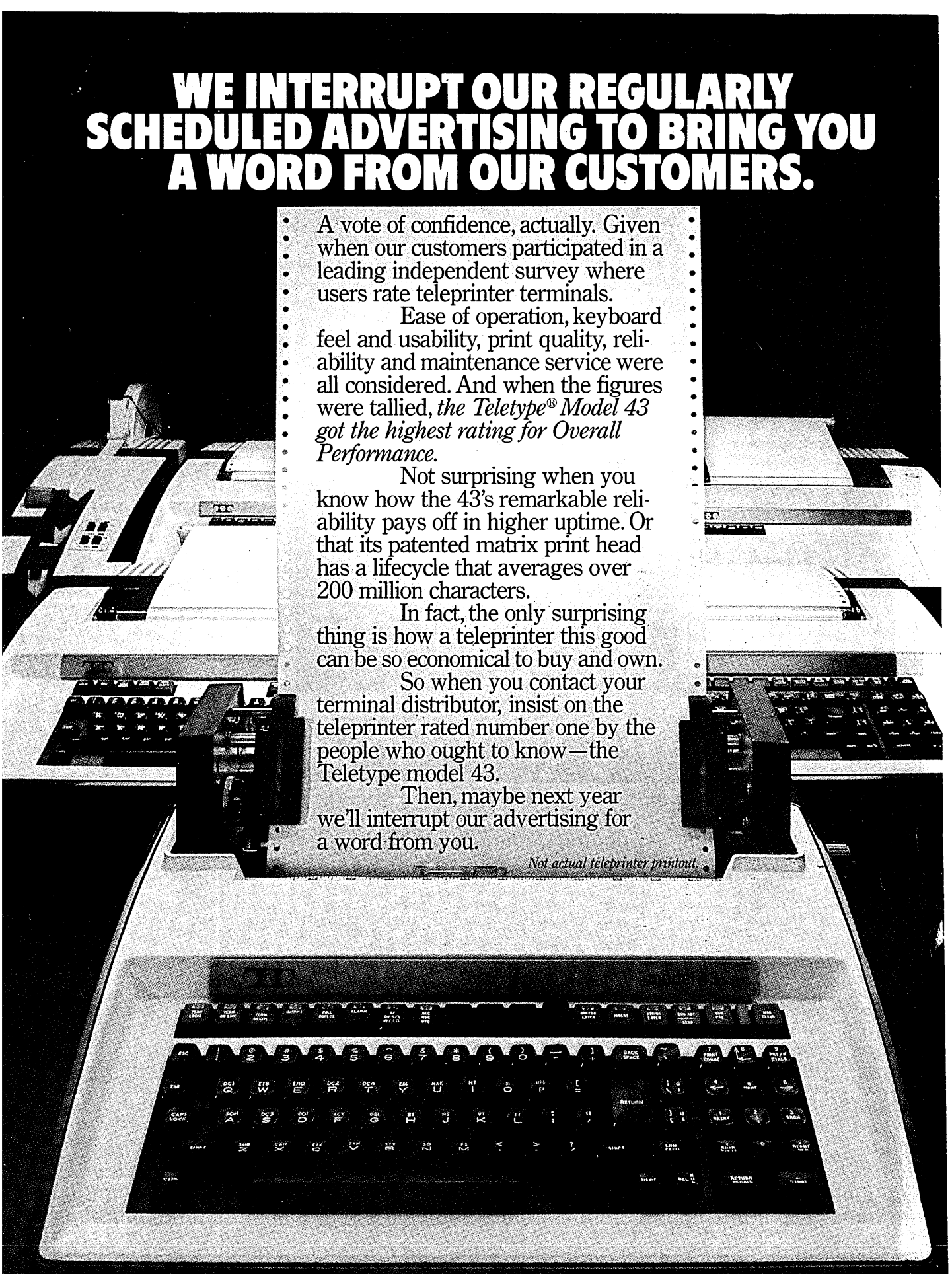
Not surprising when you know how the 43's remarkable reliability pays off in higher uptime. Or that its patented matrix print head has a lifecycle that averages over 200 million characters.

In fact, the only surprising thing is how a teleprinter this good can be so economical to buy and own.

So when you contact your terminal distributor, insist on the teleprinter rated number one by the people who ought to know—the Teletype model 43.

Then, maybe next year we'll interrupt our advertising for a word from you.

*Not actual teleprinter printout.*



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