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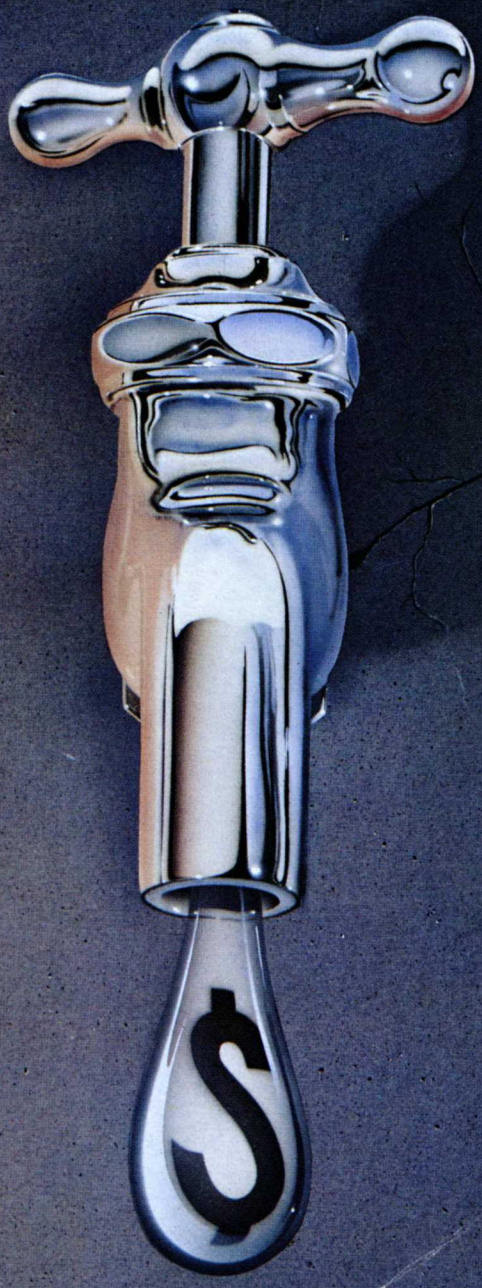

P. E. MYERS

MAKING EVERY DROP COUNT: 1982 DP BUDGET SURVEY

GRAPHICS FOR MANAGERS

WESTIN ON THE NEW PRIVACY DEBATE

INSURANCE AGAINST DISASTER

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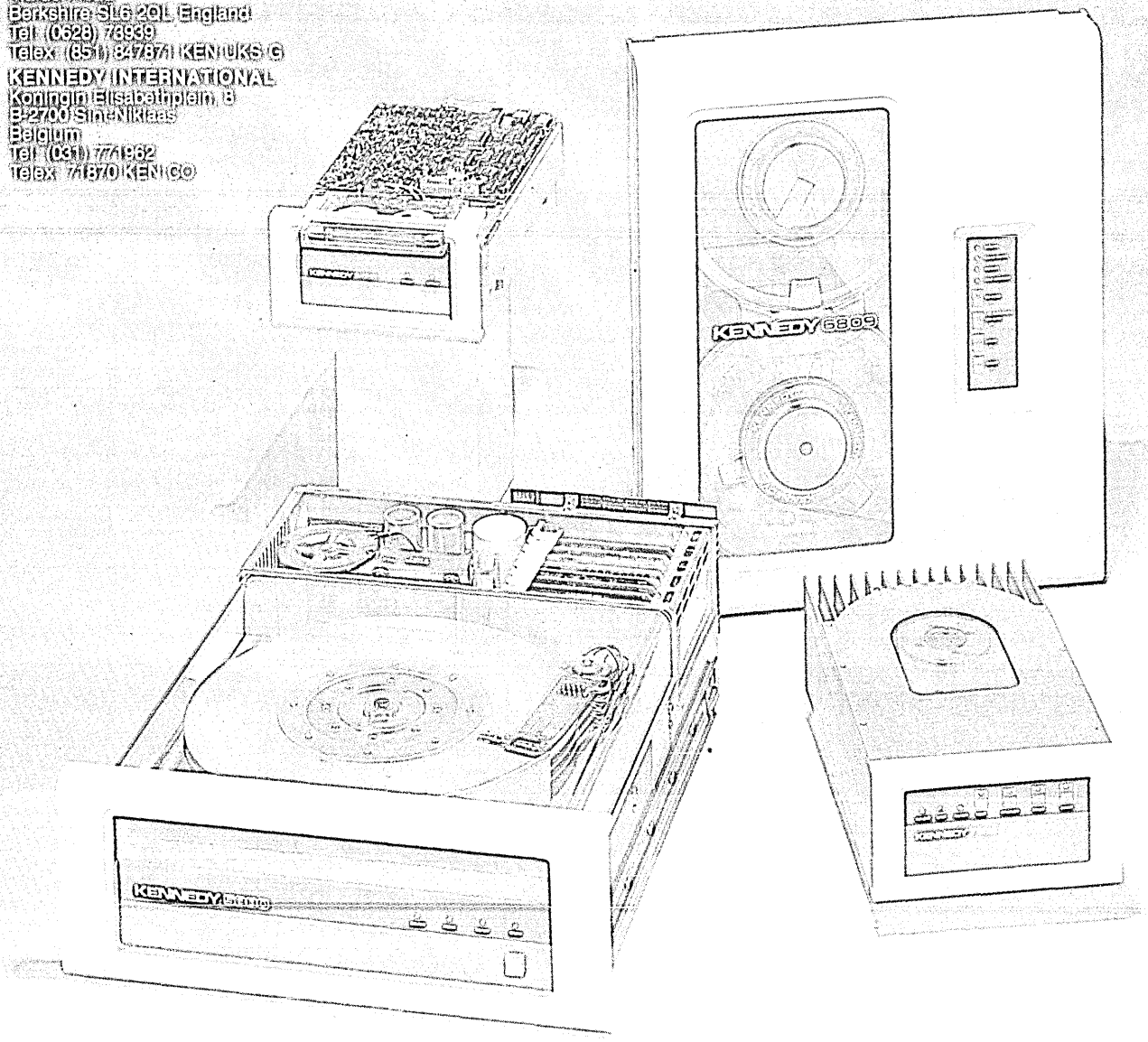

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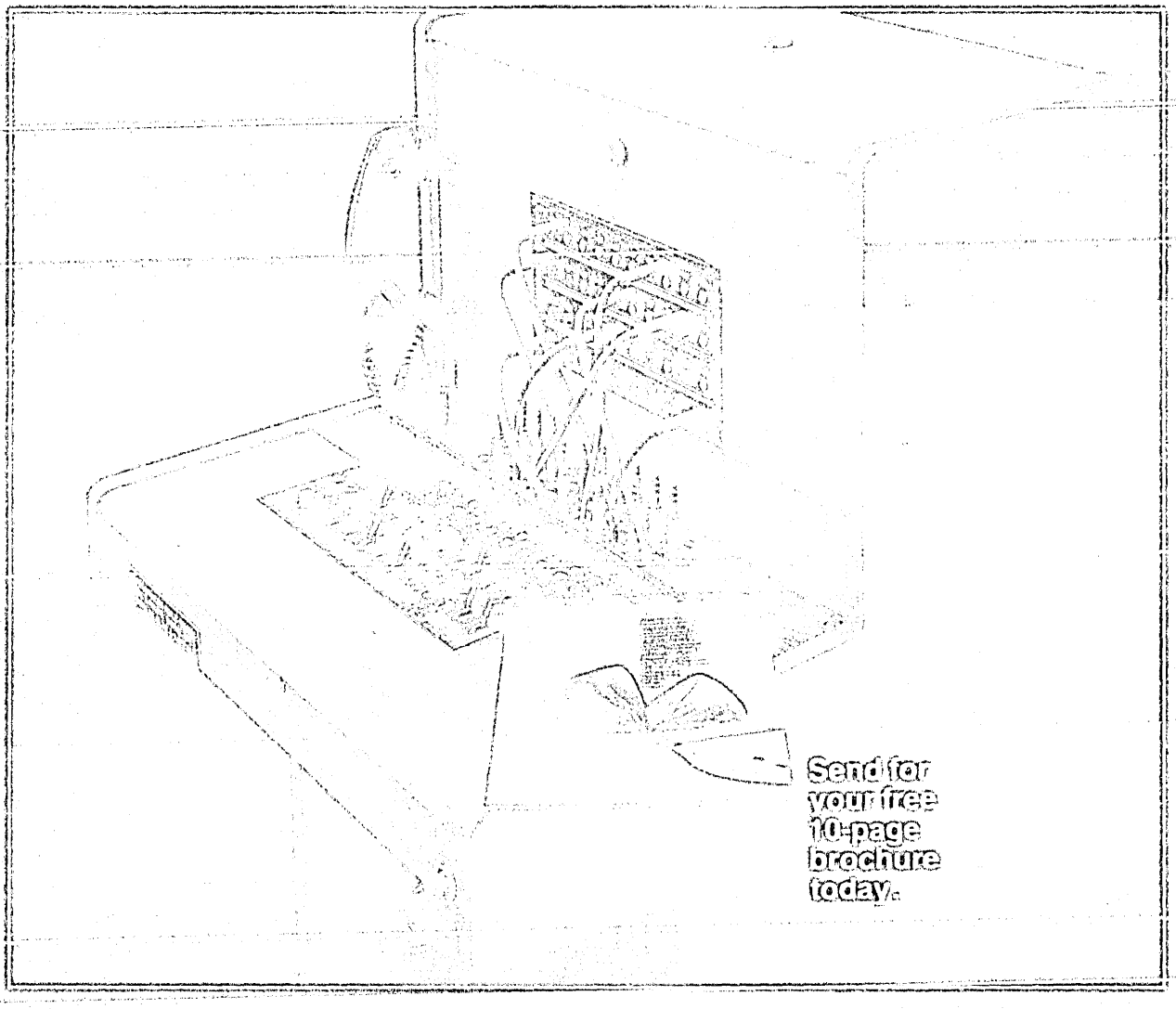

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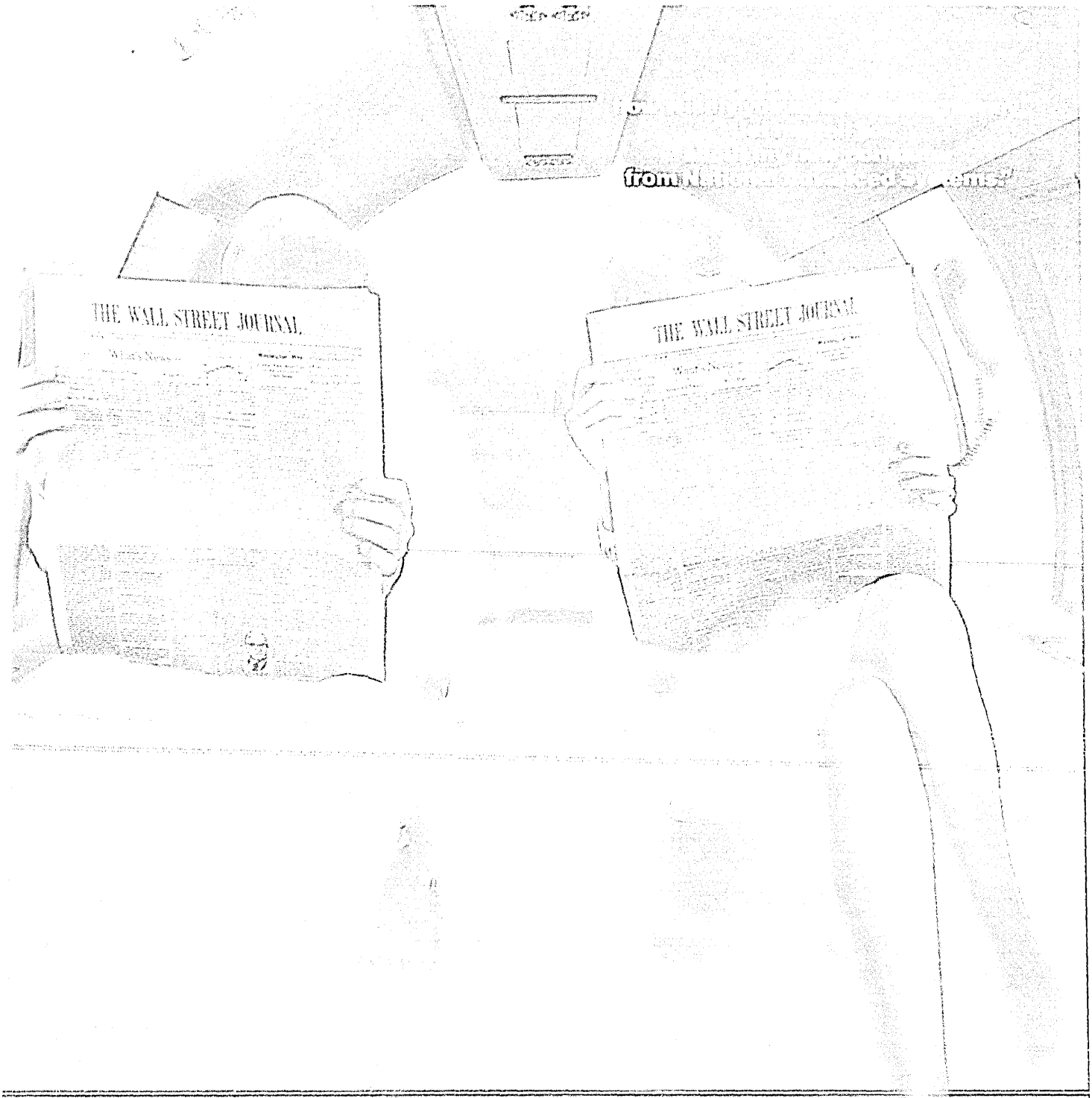

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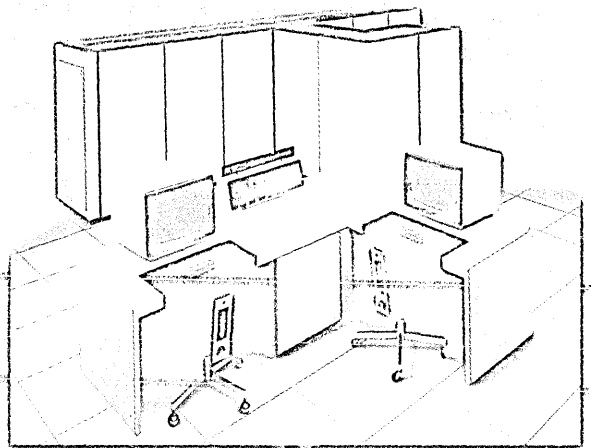

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JULY 1982/$4.00 U.S.A.
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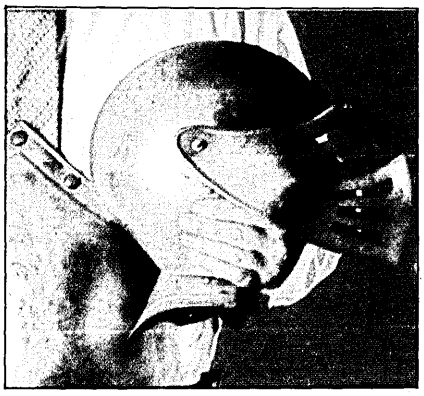

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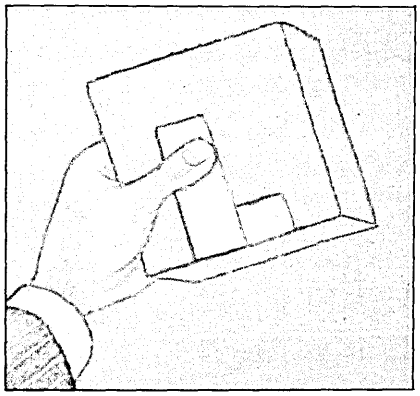

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Alan F. Westin
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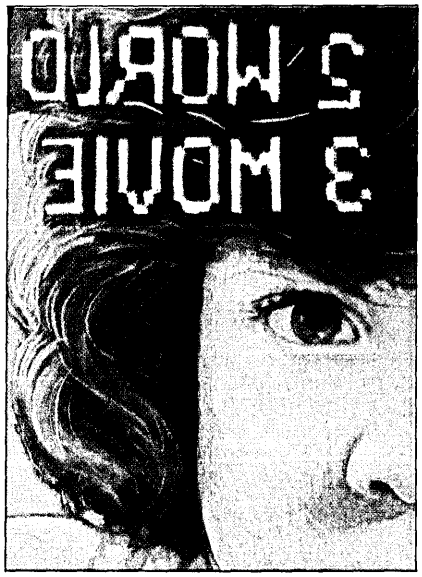

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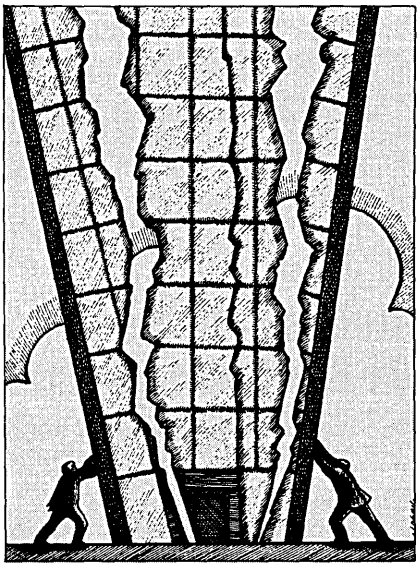

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COVER ILLUSTRATION BY DICKRAN PALULIAN

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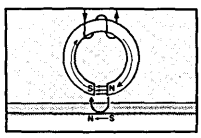

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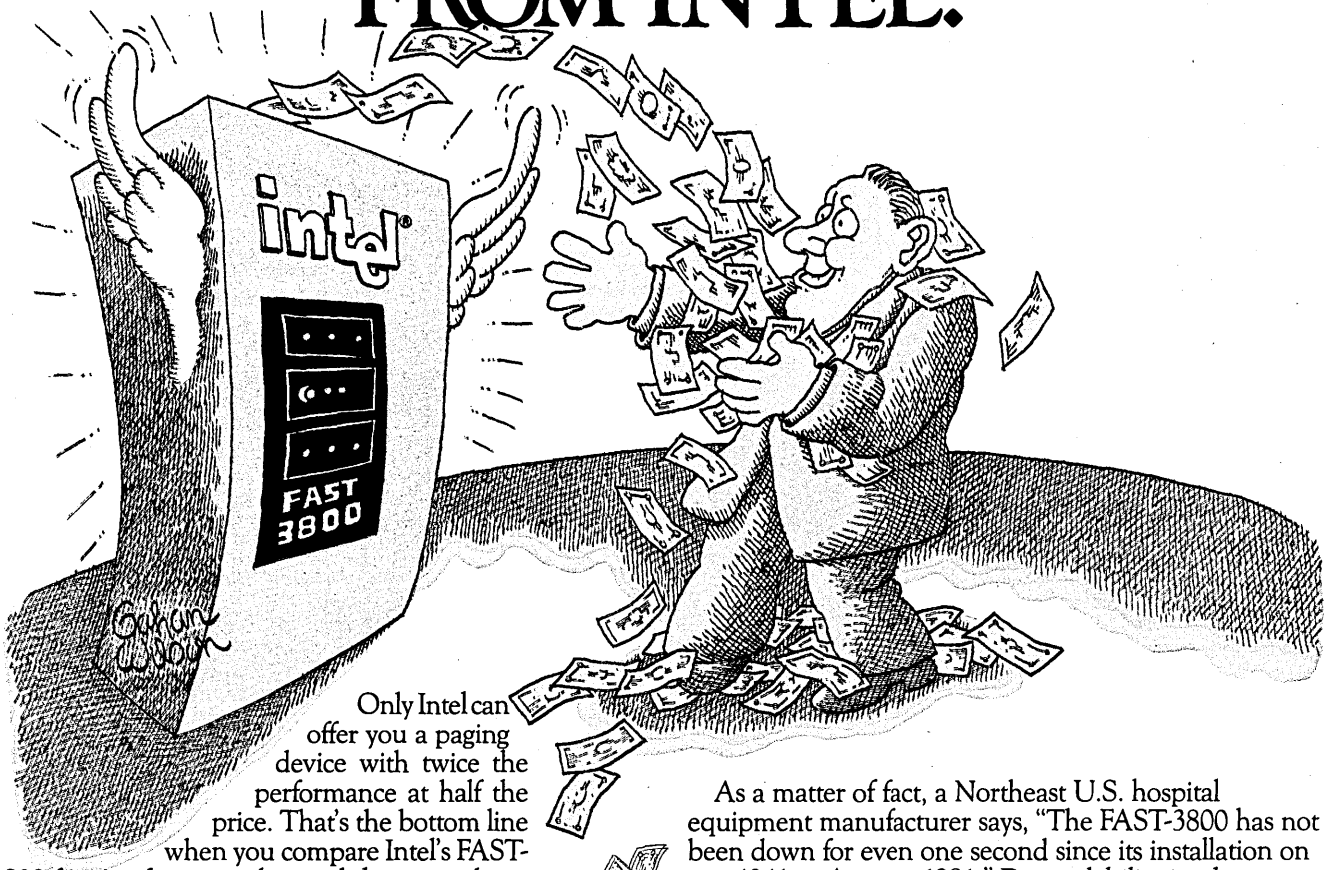
CACHE-IN ON FASTER PAGING PERFORMANCE FROM INTEL.



Only Intel can offer you a paging device with twice the performance at half the price. That's the bottom line when you compare Intel's FAST-3800 family of semiconductor disk paging devices to IBM's 3880 model 11.

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LOOKING BACK

GETTING AHEAD

July 1962: "Despite IBM's position of prominence in the industry," said the DATAMATION interviewer, "there is criticism frequently voiced that you have not been a leader in technological progress. In support of this argument, the comparison is frequently made with other manufacturers in the general purpose field, for example: Univac's 1107, Burroughs' B5000, and Philco's 2000. Would you care to comment?" Warren C. Hume, president of IBM's Data Processing Division, answered politely: "I don't think we have to take a backseat to anyone and I don't think anybody has scooped us." To back up his claim Hume referred his interviewer to the breakthrough of random access as a "philosophy," and the various approaches to it that IBM had promoted. He saw random access as a "real key to the future."

Asked to explain IBM's climb to the number one spot in the industry, Hume cited the company's approach to meeting users' needs. Businessmen don't buy microseconds, he explained; they buy solutions to particular problems. Thus, IBM educated its professionals in areas outside of dp. Another factor in the climb was the company's decision to switch many of its branch offices from a geographical orientation to coverage of specific industries. For example, one of IBM's five Chicago offices was entirely devoted to the financial industry. Hume described the atmosphere there: "They lived like bankers, so to speak; they ate like bankers, and they thought like bankers. They were in it all day long. They weren't thinking about manufacturing control in the Chicago financial office. They were thinking about finance, brokerage firms, and banks." According to Hume, the changes (which took two or three years to make) brought about a significant increase in IBM's sales volume.

IBM's marketing abilities were further enhanced, Hume said, when the company realized the value of a well-educated representative. Their long-term solution to user site repairs was a massive educational program, guaranteeing that no customer would have to wait for the "specialist" to get to him—every IBM rep became the specialist. Hume said IBM had to make a basic decision: "One choice was the task-force approach and the other was to take a broad educational approach, accept that it's going to be a broad market, invest heavily in education, and beef up systems engineering."

LOOK BEFORE LEAPING

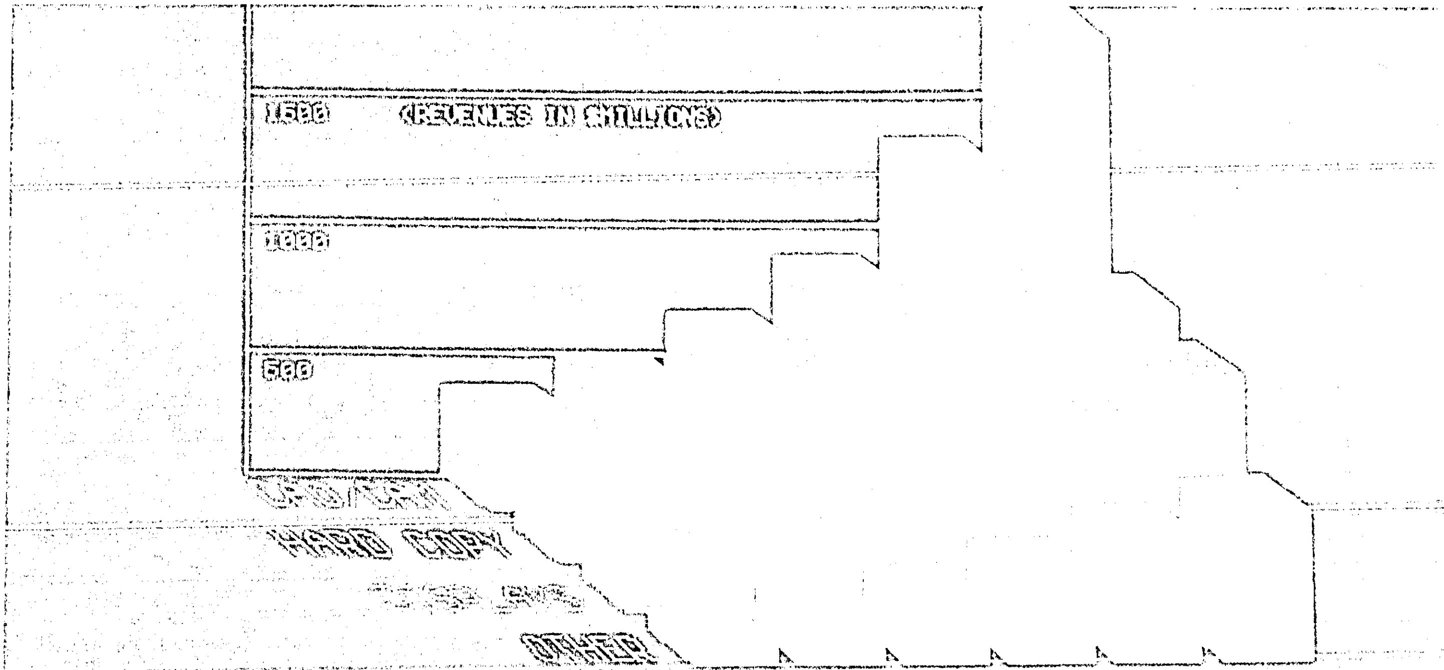
July 1972: Databases and database management systems are wonderful inventions, but to reap their benefits, potential users must be wary of some of the hazards and misconceptions that surround them. "The DBMS can easily be nothing more than an expensive toy for systems programmers and for technicians who seek an aesthetically pleasing, if uneconomical, solution to data storage and retrieval problems. With a blinding, sensuous flash, DBMS concepts have caught us up in fascination while sometimes obscuring the real, practical issues of dp." That was the opinion of Albert Patterson, assistant vice president and manager of the Advanced Systems Group, Bankers Trust Co., and author of "Data Base Hazards."

First off, said Patterson, the jargon must be stripped away to allow a thorough appraisal of the measurable benefits of DBMS use. Next, he cited a common misconception about how a DBMS is installed. "Many suppose that a DBMS is a turnkey operation. Some blue Monday morning the dp director comes to work, decides he cannot face any more problems and decides to install a DBMS before the coffee break. Still others suppose that when you install a DBMS, every application uses it immediately."

Then, of course, there are misunderstandings about what the DBMS will do after it's installed, as in the case of a perplexed dp director who suggested eliminating application programming costs from the budget because of the forthcoming DBMS installation.

Patterson warned that a DBMS must be installed for the right reasons, in the right way, and with complete understanding, so that in five years the user could look back and say yes, we did the right thing. Understanding begins with definitions; the next step is acknowledging the pros and cons of the DBMS approach. It is not a panacea, although it may solve many problems when used properly.

—Deborah Sojka



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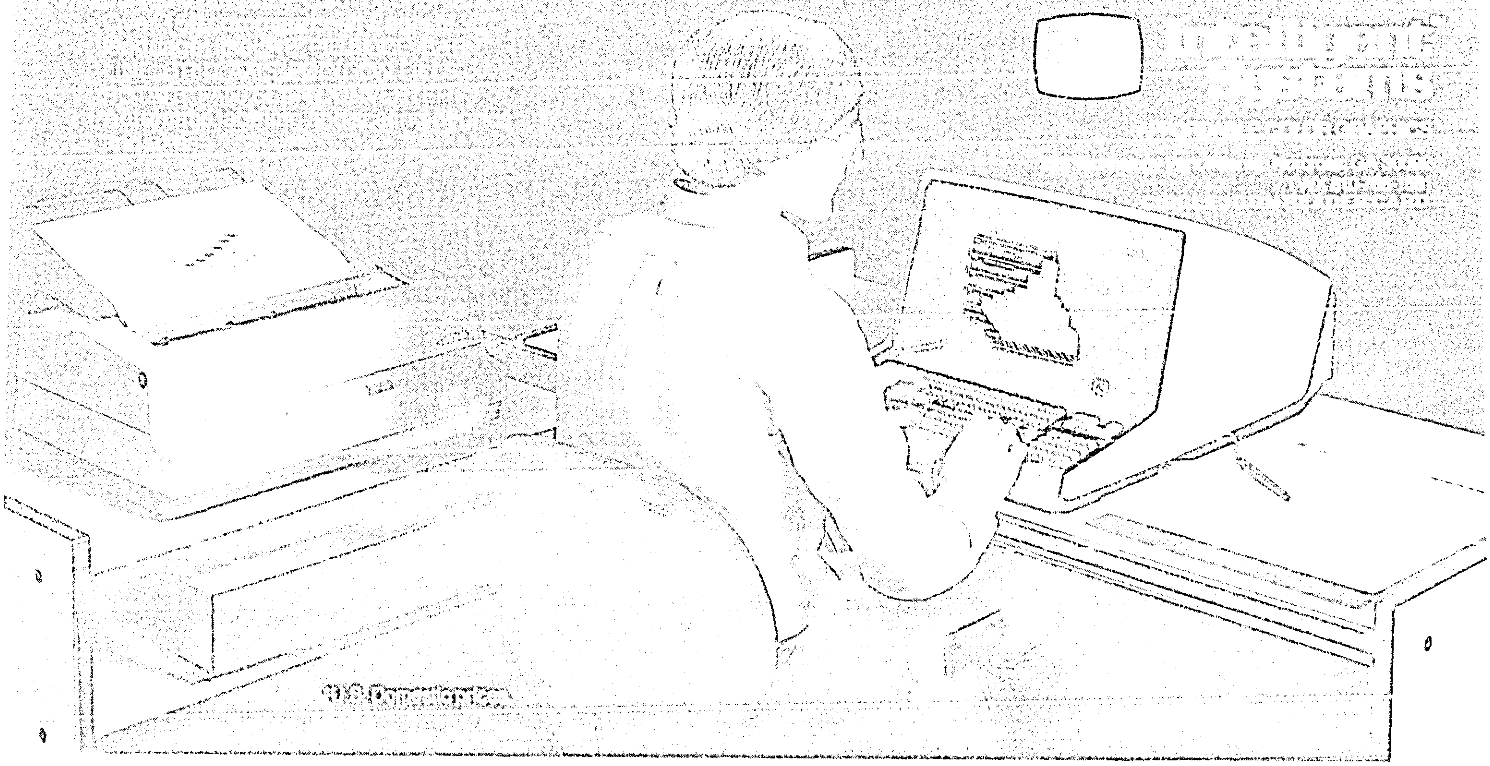

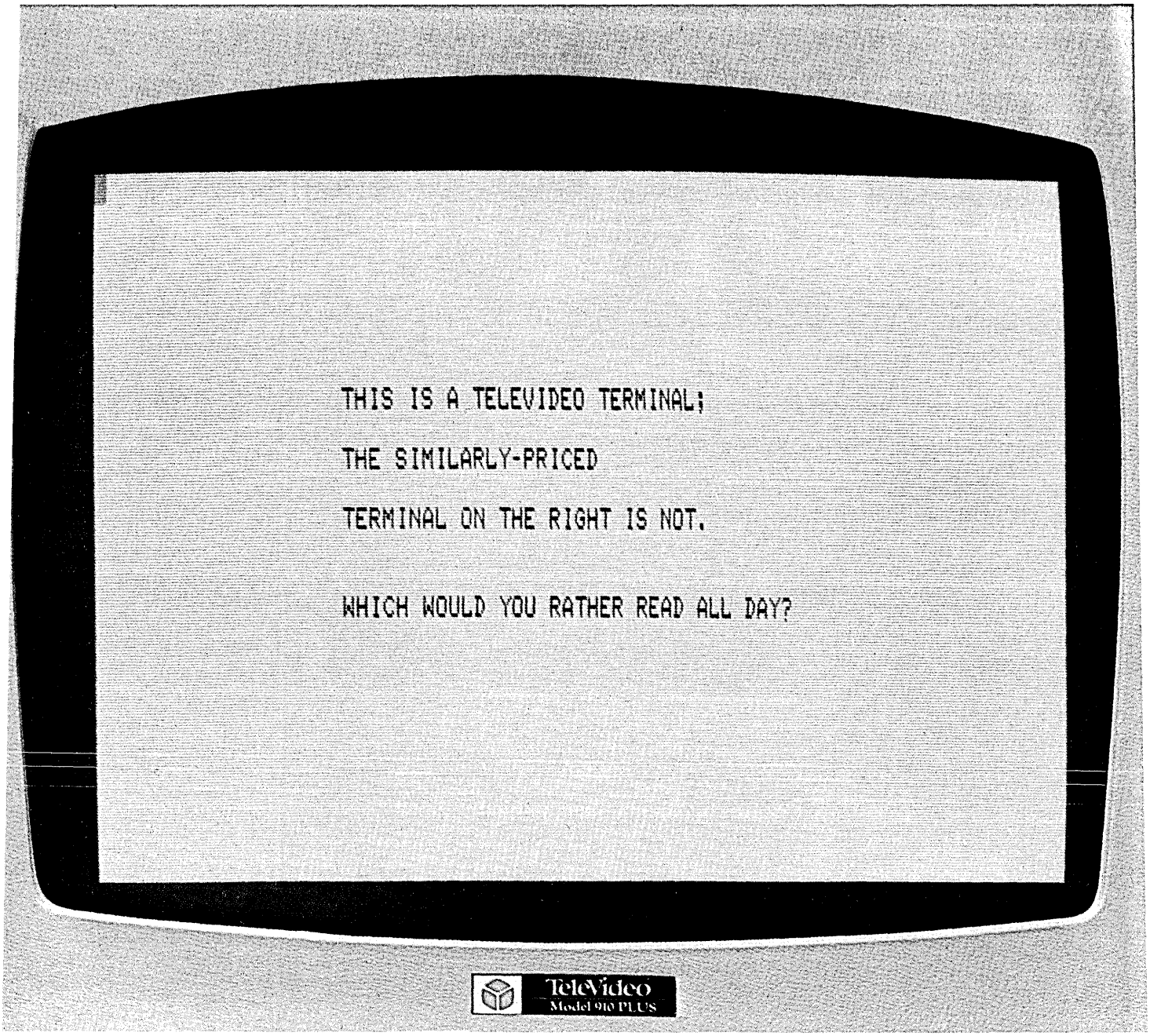

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Which would you

Our competitor on the right claims high resolution. But what about that glare? The washed-out background? And the black and white screen? It's enough to give you a headache.

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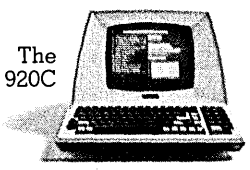
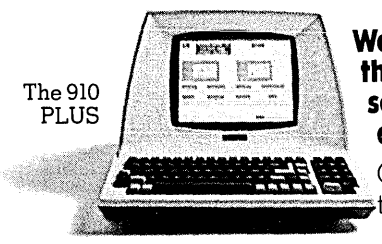
And if you order 1,000, well, maybe you'll have to wait a day or two.


The 920C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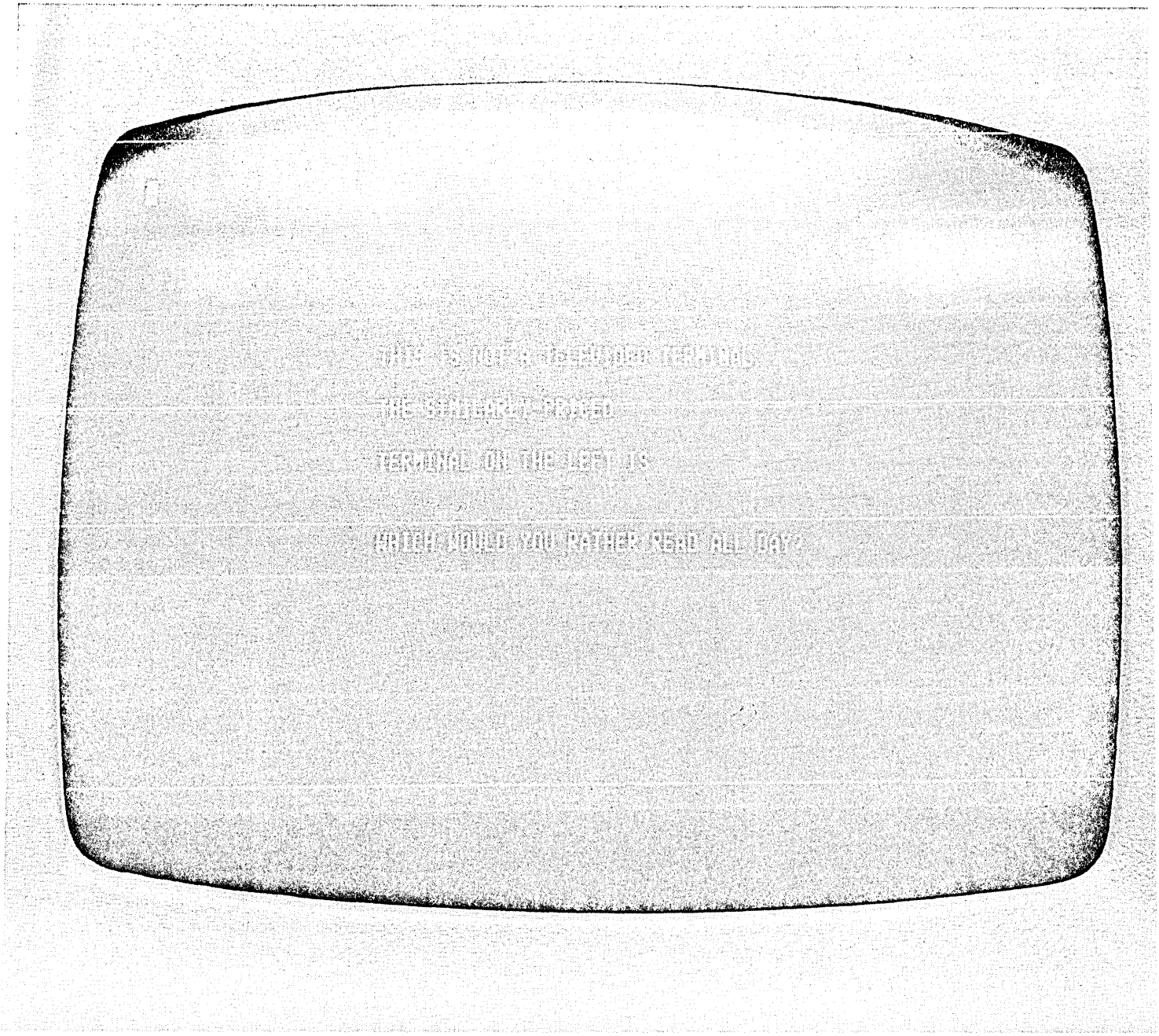

rather read all day?

155°F and shocks that simulate being tossed in the back of a truck. And before any terminal reaches you, every major component goes through a five day series of thermal and power-on cycling tests.

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The highest reliability rate in our industry.

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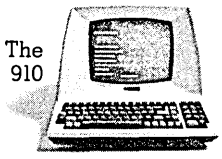
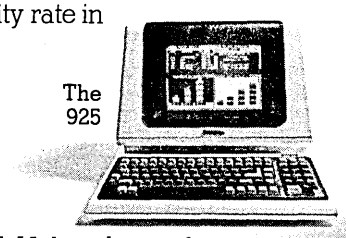
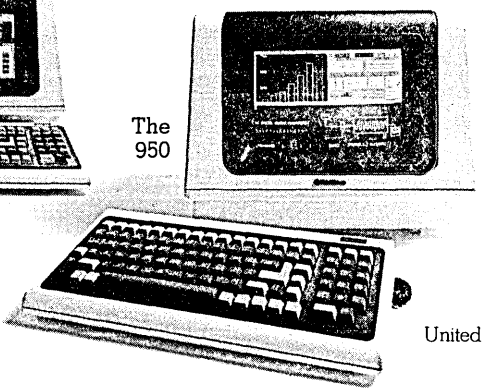
Three years ago, TeleVideo shipped its first terminal. Today, we're the number one independent terminal supplier.

One reason is because our advantages are clearly visible.

8 hours a day.







For more information call, toll-free, 800-538-8725. (In California, call 408-745-7760.) Or call your nearest TeleVideo sales office.

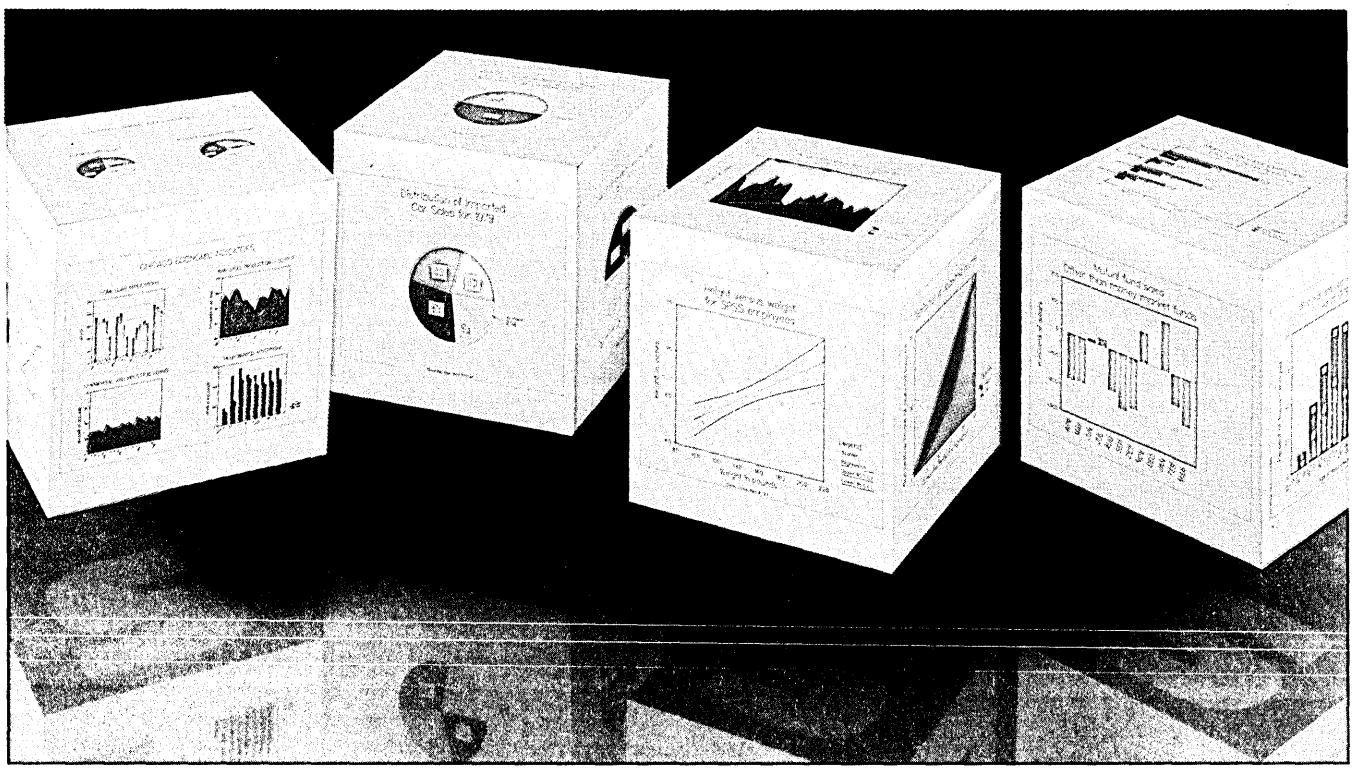
TeleVideo®

All TeleVideo terminals can be serviced by your nearest GE Instrumentation and Communication Equipment Service Center.

CIRCLE 11 ON READER CARD

Boston 617/668-6891; New York/New Jersey 201/267-8805; United Kingdom West End Surrey 44-9905-6464.

GRAPHICS MADE SIMPLE



Now the world's leading producer of computer software for data analysis—SPSS® Inc. —and the world's leading producer of graphics software —ISSCO®—have developed the most useful graphics package you can find—at any price. It's SPSS Graphics: the state of the art in versatility, range of options, simplicity, and "artistry".

Management graphics in one easy step.
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Produce hundreds of graphs—preview them on a graphics terminal—decide which to use —and have graphs drawn on a hard copy device—*all in one step!* You may combine independent graphs (pie charts, bar charts and/or line graphs) on a single page, in any order.

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312/329-2400

See for yourself why SPSS Graphics is another reason to choose SPSS—the largest selling data analysis system in the world!

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Currently operational or soon to be operational on: IBM 360, 370, 4300, OS, CMS/DEC Systems 10, 20, VAX/Prime 400-750/Univac 1100/Other SPSS conversions will be available. Contact SPSS, Inc. for more information.

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CIRCLE 9 ON READER CARD

LOOK AHEAD

BURROUGHS TALKS TO HITACHI	It looks like Burroughs is close to signing a deal to market goods from Hitachi here in the U.S. Officials from each company confirm that talks are underway but neither will say what products or marketing arrangements are under discussion. Such an agreement would follow in the pattern set a few months ago when the Detroit company came out with a family of small computers built for it by Convergent Technologies in Santa Clara, Calif. Burroughs chairman C. Michael Blumenthal told us the firm is not opposed to selling systems manufactured by others if that seems the best way to approach a particular market. Hitachi already supplies Burroughs with impact printers.
IBM TOUTS ITS TECHNICAL TURF	Why all this sudden boasting of technological prowess at IBM? The firm's NCC booth was dominated by exhibits of laboratory curiosities -- among them, Josephson junction devices and a large plasma screen -- and the press and financial analysts recently were given a show in East Fishkill, N.Y., where semiconductor production and development take place. Could it be IBM is stroking the egos of its unsung heroes in the labs, lest they take off and form companies of their own? The computer giant, like its many competitors, is eager to hold onto as much of its own talent as possible to create products for the many new markets it's eyeing.
TWO PI DUCKS PCM PUSH	Don't expect anything new in the way of IBM-compatible machines out of Two Pi, the West Coast manufacturer now under the wing of Four-Phase, which in turn is owned by Motorola. Four-Phase officials say they'll probably enhance the Two Pi system but they don't have any plans for additional models to match future IBM introductions. As such, Two Pi's business isn't growing much, especially since its major oem customer, National CSS, stopped marketing hardware systems a few months ago.
TV YESTERDAY, TERMINALS TODAY	Look for low-cost color ASCII terminals to begin appearing on dealers' shelves by the end of the year. High-volume manufacturers such as Televideo and ADDS are working to bring costs down and tap what they think will be a fast growing market analogous to the color tv market of 20 years ago.
BACK IN THE LABS	Bell Labs is said to have built its own VAX-like computer to run the Unix operating system. It's not clear, however, if the instruction-set compatible machine will ever make it to market.

LOOK AHEAD

SHADES OF IBM

We hear that at least two producers of Hewlett-Packard compatible peripherals are running into problems making their gear truly compatible. Some HP salesmen are starting to warn of possible damage to HP equipment and have threatened some withdrawal of HP support and service.

MOLECULES FROM MOLECULAR

Molecular Computers, San Jose, Calif., which has been delivering CP/M-based multi-user micros since November 1981, is looking closely at the Unix market and at the possibility of establishing its own local network product modeled after Ethernet.

AUTO DEPOSIT FROM FUJITSU

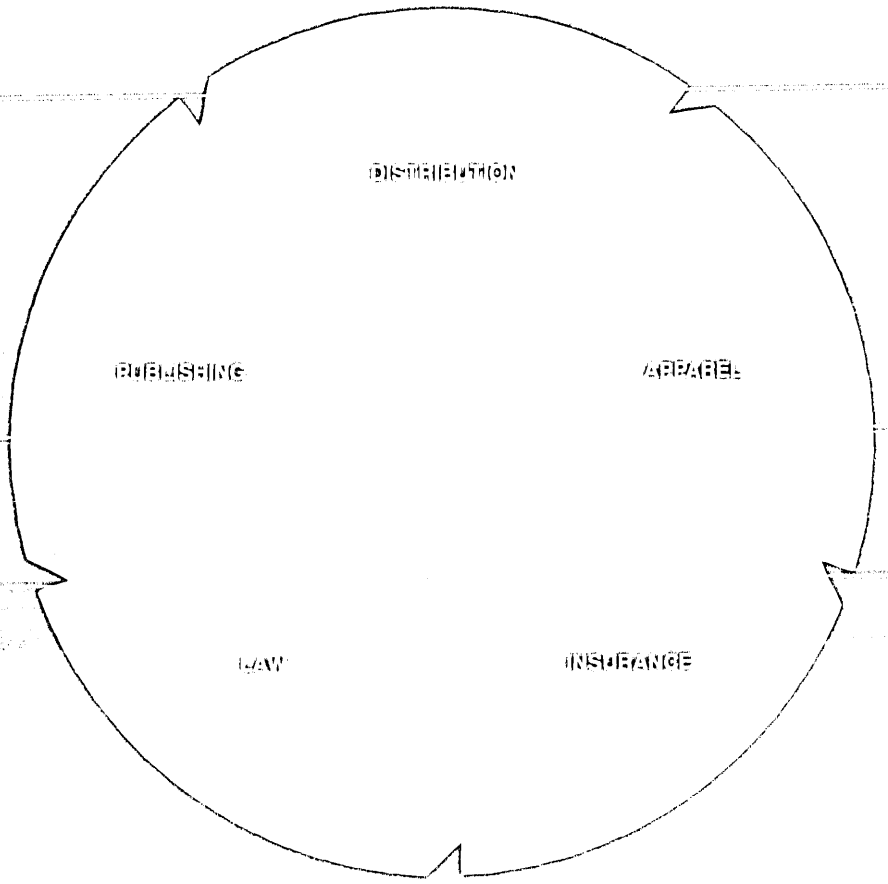
Watch for Fujitsu to bring over a new bank card machine that, in addition to doing automatic withdrawals, will optically count deposited money and automatically record that deposit. Current bank card machines are dummies on the deposit side, merely functioning as a night deposit box that stores the cash until it can be manually counted.

DOS TO MVS IN THREE DAYS

So you want to convert from DOS to MVS? A French company called Cortrans says it will do that monstrous task for $400,000, tying up your system for only one weekend. That cost is based on a system running about 2,000 programs, and it covers the expense of two Cortrans people working for six months on preparations and a special conversions program called Cortex. The company claims it has completed 30 painless conversions, all in France. It recently opened its first U.S. office in Los Angeles and is currently looking for distributors.

RUMORS AND RAW RANDOM DATA

Much talk at last month's NCC was devoted to who would buy out Datapoint. Possible suitors mentioned ranged from STC to Tandy. All agreed on one point -- Datapoint will have been purchased by this time next year....Sources hint at a possible tie-up between Paradyne and the Israeli hardware developer, Elbit, on a new 370-type distributed processor. Currently Elbit provides the stripped-down cpu for Nixdorf's 4300-class systems....Word has it that DEC is having trouble these days holding onto top members of its VAX team. It appears that some of them are drifting off to fancier technological fields, particularly attracted by the work in the AI areas and such companies as Three Rivers and its Perq product and Symbolics and its LISP machine....IBM Australia, which has been getting its 5225 printer from Argentina, has reportedly hit delivery problems due to the recently imposed trade ban with the war-torn Latin-American country. First deliveries, which were slated for March, are now expected in August.



Why settle for computer talk, when you can do business with a company that speaks your own industry's language?

Together, we can manage it.

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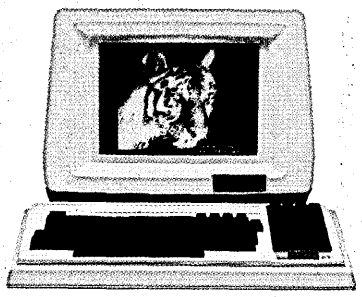
CIRCLE 13 ON READER CARD

THE REWARDS OF RETRO-GRAPHICS.™

Retro-Graphics is Digital Engineering's brand name for terminal enhancements that go into ordinary display terminals, turning them into bit-map graphics terminals — with no loss of existing features and at a price that is often half that of a comparably equipped graphics terminal. Our enhancements come as field-installable PC boards or as fully upgraded terminals.

For more than 20,000 graphics veterans and beginners, Retro-Graphics enhancements have been a very rewarding experience — making that first-time purchase just that much smarter or extending the value of an existing investment.



Datamedia ColorScan

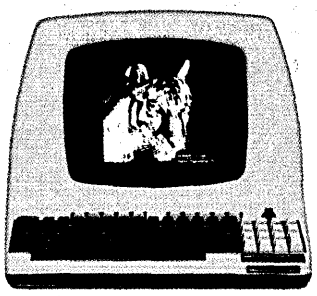
Introducing GEN.II™. A Superior Graphics Solution.

Our second generation of Retro-Graphics enhancements provides simulation of both the Tektronix® 4027 and 4010 graphics terminals.

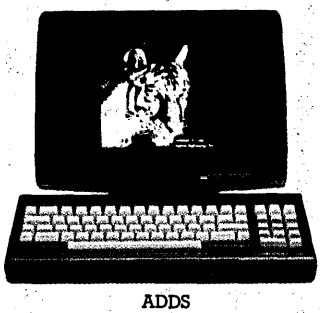
Because GEN.II products are based on industry-standard Tektronix protocol, operation is easy and familiar to most programmers. Further, "local" graphics intelligence is built right in. Graphs come up on the screen quickly because host-terminal data transmission is minimized.

English-like commands simplify graphics operation and programming. For example, the following command string:

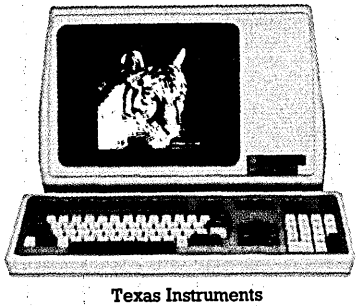
TeleVideo



Lear Siegler



ADDS



Texas Instruments

! PIE, 200, 90, 120

(either transmitted by the host or entered from the keyboard) will cause the terminal to draw a pie chart sector with a radius of 200 and fill in the area between 90 and 120 degrees. The filled area can be a color in the case of GEN.II Color Retro-Graphics™ products, an intensity level in the case of gray scale GEN.II, or a shading pattern in the case of monochromatic GEN.II.

In addition to performing *area-fill* and *arc-drawing*, a programmer can draw *polygons* and *vectors* and *define and shape text characters* with similar high-level command strings.

GEN.II Software Compatibility Protects Your Hardware Investment.

Since GEN.II Retro-Graphics products simulate the 4027 and 4010, compatibility with utility and applications programs, both present and future, is assured. Currently, Retro-Graphics products are successfully being used with ISSCO's® DISSPLA® and TELLA-GRAF®, Tektronix' PLOT 10™, Megatek's Template™, Precision Visuals' DI-3000™, and Signal Technology's Interactive Laboratory System (ILS)®.

Comprehensive Support At Every Level.

Good ideas mean little if you cannot build on them. An optional I/O interface lets you hook up a variety of input/output devices — light pens and digitizing tablets as well as impact and non-impact printers. There's solid documentation at every level. And fast and accurate service/support by our own customer service and worldwide distribution network.

Choose from a Wide Selection of GEN.II Enhancements.

A good idea is even better if it's available for a variety of terminals. GEN.II monochromatic products are offered for the Lear Siegler ADM 3A and 5, TeleVideo® 910, 912, 920, 925, and 950 and ADDS Viewpoint; gray scale GEN.II is offered on the Texas Instruments OPTI 900™ Model 940; and Color Retro-Graphics products are offered for the Datamedia™ ColorScan™.

GEN.II Retro-Graphics. The rewards are yours with Digital Engineering's latest generation of terminal enhancements.

DIGITAL ENGINEERING
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(916) 447-7600 Telex: 910-367-2009

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CIRCLE 14 ON READER CARD

Today we'd be crazy to introduce another microcomputer.

Unless it has better software.

With SuperCalc* SuperSheet,* the Monroe OC 8820 stands out from the confusing crowd of microcomputers.

The most advanced electronic worksheet at your fingertips.

We started out with the best software available for numerical analysis and report generation. Then we made it better.

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Data Protection	No	Yes
Wide Label Capacity	No	Yes
60K Worksheet Memory	Yes†	Yes
Fast Scrolling	Yes	Yes
Advanced Video	Yes	Yes

†Not available on most machines. VisiCalc® is a registered trademark of VisiCorp.

And SuperCalc SuperSheet is part of a complete software library that's designed to help you work more effectively.

Better hardware to run better software.

Designed for today's competitive business environment, the Monroe OC 8820 has greater operating potential than most microcomputers. Our 128KB RAM gives you larger worksheets, while 640KB of built-in disc memory gives you greater project storage capability.

The OC 8820 is designed for business people, with its standard typewriter keyboard and calculator pad. Just about everything you need comes in the self-contained unit.

Service that's really "at your service."

Behind every OC 8820 is a 350 branch service/support network. Whether you buy one machine or one hundred, you're just a phone call away from a service and support force trained to strict Monroe standards.

Find out how Monroe's harder-working business computer system can work for you. Call or send in the coupon today.

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Litton **MONROE SYSTEMS FOR BUSINESS**

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Welcome to the happy network managers' club.

Whether yours is a private network or one connected to public lines, TRT's COMPAC communications processing systems offer an easy, inexpensive solution to your problems. They reduce your network processing needs to the size of a family of hardware/software products combining simplicity and high performance.

All COMPAC components (switchers, concentrators, control points, etc.) interface easily with X.25 compatible public networks and can be remote-operated through them.

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Help users help themselves. That's the idea behind IBM's Information Center, where the data processing department will provide and maintain tools to allow users to retrieve, analyze, manipulate and present data (including textual material) more effectively.

They've got the right idea, but the wrong tools.

When productivity is all-important, why buy, learn, and support a hodge-podge of ever-changing systems in your Information Center?

With a single non-procedural language easily learned in a few hours, INQUIRE can boost user productivity, DP productivity, and support the entire decision-making process.

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CIRCLE 64 ON READER CARD

CALENDAR

JULY

International Manufacturing Systems Conference '82, July 11-15, Buffalo, New York.

The conference theme is "The Technology of Productivity." Exhibits, vendor presentations, plant tours, and seminars will comprise this year's show. Contact IMSC '82, 186 North Water St., Rochester, NY 14604, (716) 232-3950.

ACM SIGGRAPH '82, July 26-30, Boston.

The first two days of SIGGRAPH will feature computer graphics from introductory to advanced levels; the last three days will concentrate on technical sessions. Contact Convention Services Dept., 111 East Wacker Dr., Chicago, IL 60601, (312) 644-6610.

AUGUST

10th IMACS World Congress, August 8-13, Montreal, Canada.

This year's theme is "Systems and Simulation and Scientific Computation." Contact Prof. S. Sankar, Concordia University, Department of Mechanical Engineering, 1455 de Maisonneuve Blvd. W., Montreal, Quebec H3G 1M8, Canada.

Second International Computer Engineering Conference and Show, August 15-19, San Diego, California.

The technical presentations will include graphics, CAD/CAM, robots, database management, and human-machine interfacing. Contact the American Society of Mechanical Engineers, United Engineering Center, 345 E. 47th St., New York, NY 10017, (212) 644-7740.

SEPTEMBER

ICCC '82, September 7-10, London.

The Sixth International Conference on Computer Communication is hosted by British Telecom and sponsored by the International Council for Computer Communication. Contact ICCC '82, P.O. Box 23, Northwood Hills, HA6 ITT Middlesex, England, 44-9274-27511.

Eurographics '82, September 8-10, Manchester, England.

The University of Manchester Institute of Science and Technology hosts this year's conference on computer graphics. Contact Eurographics '82, c/o 170A Park Rd., Peterborough, England PE1 2UF.

Swissdata '82 and Ineltec, September 8-12, Basel, Switzerland.

These two shows are blended into an industrial electronics and computer sciences trade fair by the Foreign Commercial Service at the American Embassy in Bern. Contact Kurt Gross, American Embassy, P.O. Box 1065, 3001 Bern, Switzerland, 031-43-70-11.

COMPCON Fall '82, September 20-24, Washington, D.C.

The fall meeting concentrates on computer networking, including local area networks, value added networks, international systems, and network management. Contact COMPCON Fall '82, P.O. Box 639, Silver Spring, MD 20901, (301) 589-3386.

20th Annual TCA Conference, September 21-24, San Diego.

The conference program will center on the developing needs of the telecommunications professional. Contact the TCA Conference Office, 424 S. Peima Ave., W. Covina, CA 91790, (213) 919-2621.

SICOB '82, September 22-October 1, Paris.

This show, in conjunction with Convention Informatique (a European software exhibition), is one of Europe's largest dp, communications, and office automation events. Contact International Trade Exhibition, France, 8 West 40 St., New York, NY 10018, (212) 869-1720.

Federal Computer Conference, September 28-30, Washington, D.C.

Sponsored by Federal Education Programs, the conference functions primarily as a forum for information exchange by federal adp users. Contact Federal Education Programs, P.O. Box 368, Wayland, MA 01778, (617) 358-5181.

OCTOBER

INFO '82, October 11-14, New York City.

For the first time, INFO will occupy all four floors at the Coliseum and will feature a "Software Center." Information is available from Clapp & Poliak, Inc., 708 Third Ave., New York, NY 10017, (212) 661-8410

Federal Office Automation Conference, October 27-29, Washington, D.C.

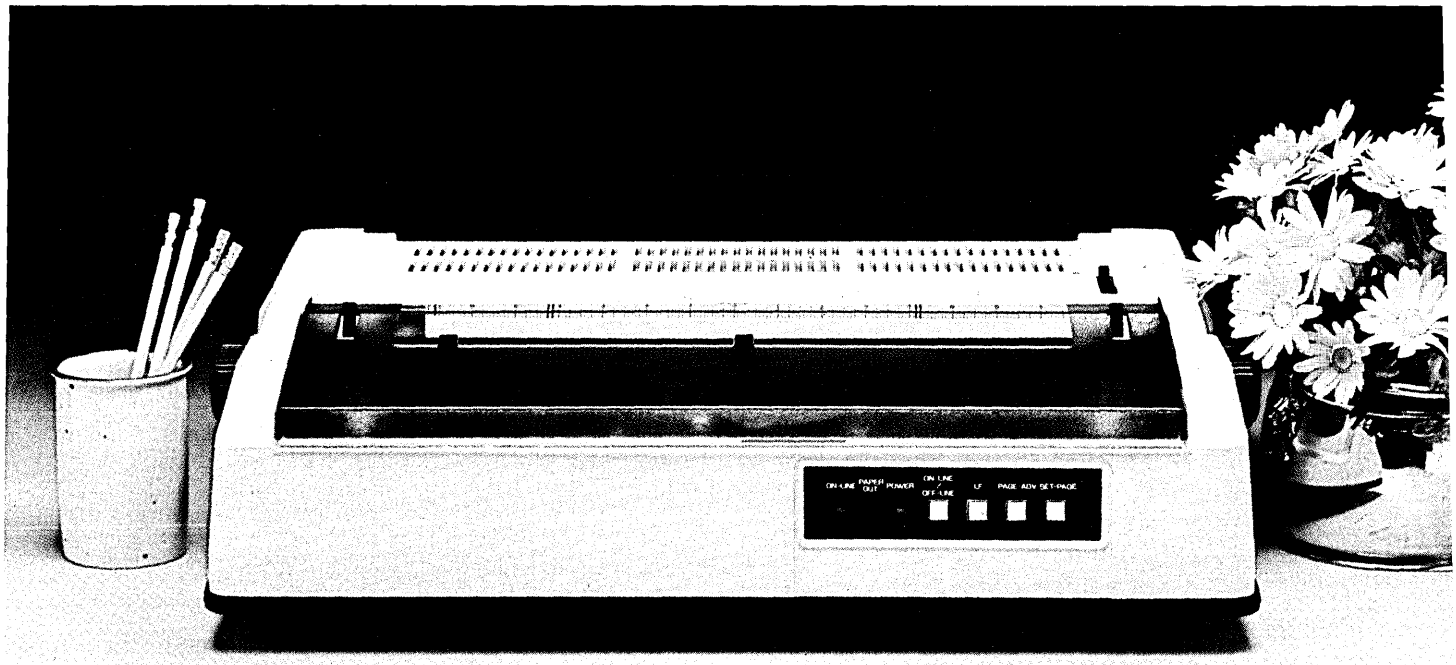
This year's event is dedicated to present and future federal government planning and implementation of office automation. Contact Federal Office Institute, P.O. Box E, Wayland, MA 01778, (617) 358-5119.

ACM '82, October 25-27, Dallas.

The annual conference will cover a broad range of topics from artificial intelligence to software engineering. Contact ACM, 1133 Avenue of the Americas, New York, NY 10036. (212) 265-6300.

CAD/CAM Graphics Expo, October 26-29, Reno, Nevada.

Sponsored by Computer Aided Manufacturing-International (CAM-I), the expo will be held in conjunction with CAM-I's 11th annual meeting. Contact CAM-I, Ryan Plaza Dr., Arlington, TX 76011, (817) 265-5328.



C. Itoh's F-10 Daisy-wheel printer is the compact beauty you can easily get attached to. Just look at all the useful features you get.

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

We could go on. But quite frankly, once you see the F-10 perform, you'll never look at another Daisy.

The F-10 is fully backed by C. Itoh's warranty and complete support organization. Contact C. Itoh Electronics, Inc. 5301 Beethoven St., Los Angeles, CA 90066 (213) 306-6700.

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One World of Quality

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

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

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

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

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

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

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

Consider Prime first. Today, more than ever before, you need the compatibility and the spectrum of solutions that only Prime can offer. For more information, write to us at Prime Park, MS 15-60, Natick, Mass., 01760.

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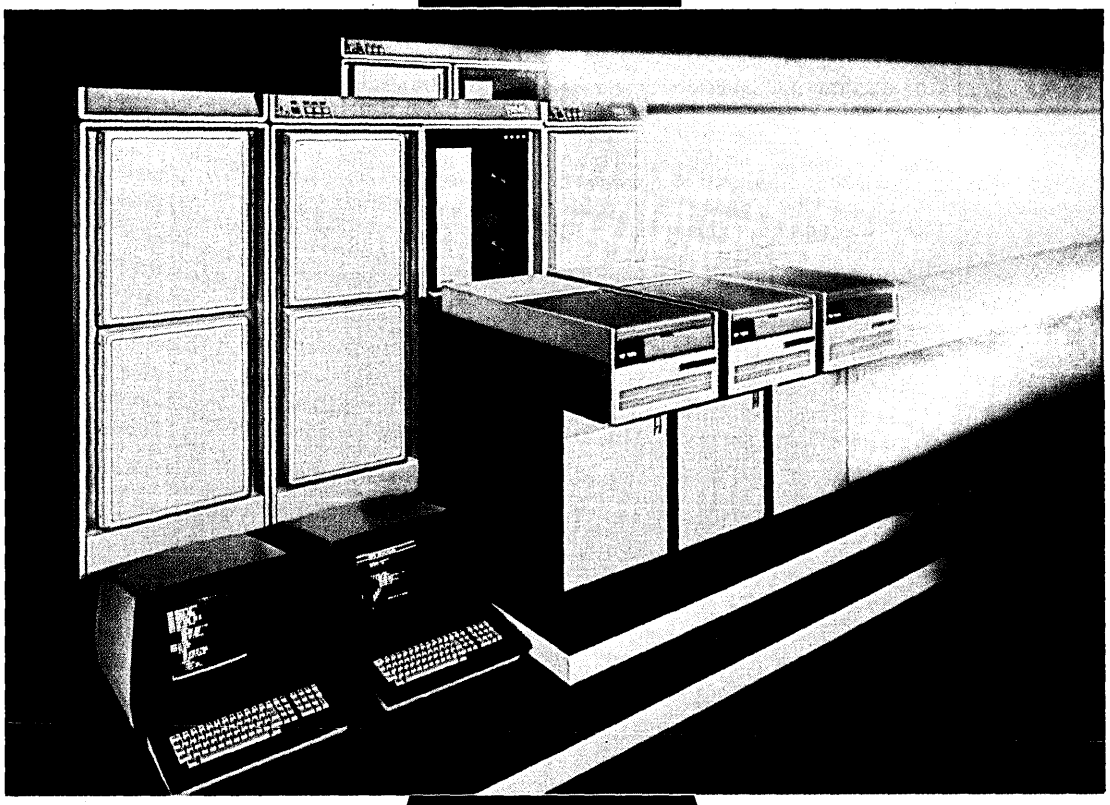
CIRCLE 18 ON READER CARD



LETTERS

GRAPEFRUIT SLICED

In "Maintaining A Grapefruit" (April) Dan McCracken is absolutely right in noting that the personal computer industry may be limited in its ability to expand by endemic problems relating to training and maintenance. However, my own experiences run counter to Mr. McCracken's: I bought my Peach (not to be confused with an Apple) last summer, had one initial problem (extremely frustrating at the time) relating to the fact that some of the ICs weren't fully seated in the motherboard, and have been successfully computing, adding both hardware and software, and in general loving my Peach ever since. I believe that part of the difference in our experience may stem not just from the knowledge of people at the computer store, but their understanding of the process of retailing and building a satisfied customer base.

I believe that our industry is facing problems of a type that it has never faced before in attempting to sell personal computers at all levels in society. As a physician friend of mine said, "How was I supposed to know that you start reading the manual at Chapter 8 in order to get the thing to work?"

We obviously have a long way to go before computers become as usable as other household appliances.

JERROLD M. GROCHOW
Vice President
Advanced Management Systems, Inc.
Arlington, Virginia

Cheers to Dan McCracken for his splendid piece cutting up the grapefruit. Change a few relatively minor facts and it was exactly my own experience with what was clearly a different fruit, right down to my wonder that if I couldn't make it go (28 years experience), what about the first-time user?

One would think that the example of Detroit's dramatic reversal of fortune would make other manufacturers think more about what users really need, but I suppose if they had the sensitivity to do that, they wouldn't need to.

CHARLES T. MEADOW
Professor of Information Science
Drexel University
Philadelphia, Pennsylvania

After reading Daniel McCracken's article, I feel compelled to sit down at my personal computer and word-process a letter to you regarding his unfortunate experience.

It is too bad he did not feel that he could share the name of the brand of personal computer he bought with us. It is interesting that he put enough information into the article to positively identify the brand as Apple (by referencing four-year company growth from 0 to $335 million).

My experiences have been different. When I bought my personal computer I asked my friends who had some experience in the personal computer marketplace for references. I made my own analysis of the marketplace and decided that I wanted to have both a wide variety of available software and the ability to get my machine fixed when it breaks. I have been rewarded with few hardware problems within the machine (one which was fixed by the dealer without charge, even though the machine was out of warranty, one involving a used peripheral, and a design flaw in a critical cable that causes spontaneous reboots if the cable is not cleaned with tuner cleaner once a week) over the two years of my ownership. I have also been rewarded with a wide variety of available software.

My proposal for dp people who wish to venture into the realm of personal computers is this: buy for useability and service. Plan ahead. Remember all the good things you are taught in DATAMATION: watch your legal rights, watch for an upwardly compatible family of equipment, check references, watch for obsolescence, and watch for maintenance. Consider the totality of your computer needs, both now and future, in a methodical, step by step, reasoned approach, and may the difficulties you encounter be minor and the rewards major.

WILLIAM R. PATTERSON
Somerdale, New Jersey

UNFRIENDLY NATIVES?

In humble response to Robert A. Sinclair's question (Letters to the Editor, March), "What computer software is a 'friendly native'?" I submit that, historically, natives are usually never friendly. They have to be conquered, converted, suppressed, subdued, etc. Some natives are strong and have to be appeased by gifts of apparent great worth (but to the giver these are often mere trinkets). A few natives are truly powerful and cannot be conveniently manipulated. These we choose as allies (if you can't lick 'em, join 'em). A very few invaders are so superior that they can eliminate the natives and install a completely new society in the natives' former environment.

PIERRE J. DU BOIS
Network Systems Division
Lawrence Livermore Laboratory
Livermore, California

THE PHOENIX FLIES

Given DATAMATION's penchant for fair and accurate reporting, I was a bit surprised to find that National Advanced Systems was "attempting to rise like the phoenix out of the ashes of Itel" (Software and Services, April). That hasn't been an issue for over two years. Apparently none of the ashes rubbed off because:

- We are now the largest PCM in the world with 750 systems, over 5000 megabytes of IBM memory, over 20,000 peripherals, and numerous program products installed in 2,000 customer sites in 29 countries. When you have nearly 200 more systems than your nearest competitor, that is "succeeding," not "attempting."
- NAS offers 15 mainframes, spanning the performance range from IBM's 4341-1 to greater than 1.3 times the 3081K. When you offer more mainframes than IBM itself, again you're beyond the realm of "attempting."
- NAS has, with its AS/9000 family, more H-class processors installed than any vendor other than IBM.

Incidentally, the writer's characterization of Extend/SP3 as a "transparent simulation" might also miss the point. The offering of a capability not otherwise available deserves perhaps a less pejorative description. Thank you for setting the record straight.

DAVID P. GOLDSMITH
Director, Sales Support
Advertising and Public Relations
National Advanced Systems
Mountain View, California

Intensive One- and Two-Day Seminars from...

THE DATAMATION INSTITUTE

Partial Listing of July and August Seminars

JULY

July 21-22, **Distributed Systems: Concepts/Management Overview,** New York City, Vista International
July 21-22, **Local Area Networks,** New York City, Vista International
July 22-23, **Strategic Planning for Information Systems,** Denver, The Fairmont
July 22-23, **Integrating DP & WP,** Cambridge, Faculty Club
July 22-23, **Measuring and Improving Programmer Productivity,** Cambridge, Faculty Club
July 26, **Decision Support Systems,** San Francisco, Holiday Inn Financial District
July 26, **Systems Analysis,** New York City, Vista International
July 26, **Business Graphics,** Chicago, The Palmer
July 26-27, **Management of Software Engineering,** Washington, D.C., The Shoreham
July 27-28, **Improving Your Leadership and Management Skills,** New York City, Vista International
July 28-29, **Systems Design,** New York City, Vista International
July 29-30, **Management Skills for First-Line DP Supervisors,** New York City, Vista International

AUGUST

August 2-3, **Strategic Planning for Information Systems,** New York City, Vista International
August 6, **Toward The Factory of The Future,** New York City, Vista International
August 9-10, **DP Concepts for Management and Users,** Philadelphia, The Stadium Hilton
August 9-10, **Demonstrating DP Performance to Non-DP Management,** Chicago, The Palmer
August 11-12, **Strategic Planning for Office Automation,** Philadelphia, The Stadium Hilton
August 11-12, **DP Center Operations: Lowering Costs Through Improved Productivity,** Chicago, Palmer House
August 12-13, **Data Communications: Regulation, Analysis, Design,** Washington, D.C., L'Enfant Plaza
August 12-13, **Project Management,** Cambridge, Faculty Club
August 12, **Financial Management's Use of Computer Graphics,** Chicago, Sheraton Plaza
August 13, **Decision Support Systems,** Chicago, The Palmer
August 13, **Electronic Communications: Mail, Message, Data,** Philadelphia, The Stadium Hilton
August 16-17, **DP Project Management,** Cambridge, Faculty Club
August 16-17, **The CAD/CAM Revolution,** New York City, Princeton Club
August 16, **Management's Use of Computer Graphics,** Washington, D.C., Marriott Twin Bridges
August 18-19, **Writing Skills for DP Professionals,** Washington, D.C., Ramada Renaissance
August 23-24, **Systems Analysis,** Cambridge, Faculty Club
August 25-16, **Systems Design,** Cambridge, Faculty Club
August 26-27, **Data Base Management Systems,** New York City, Vista International

IMPORTANT NOTE!

Coming in August
Special Summer Institute

August 9-13, **Strategic Management for Information Technologies (Summer Institute),** Southbury, CT, Harrison Conference Center

To receive further information, please contact Jill Kemp at the Datamation Institute Seminar Center at 850 Boylston Street, Suite 415, Chestnut Hill, MA 02167, or call (617) 738-5020.

CIRCLE 19 ON READER CARD

LETTERS

RIGHT CHURCH, WRONG PEW

I read "Battle of the Networkers" (March) with a great deal of interest. I found the article to be a very informative and comprehensive piece. However, there are some significant inaccuracies regarding A. B. Dick's networking system. Our network is called the "Loop" and not the Magna III, as indicated.

In addition, A. B. Dick's corporate headquarters have been located in Chicago since its founding 98 years ago. Your listing indicates we are located in Minneapolis, Minn.

I am sure you would agree that these are confusing and inaccurate statements that should be corrected in your next issue.

ROGER HALLIGAN
Manager, Corporate Advertising
and Public Relations
A.B.Dick Company
Chicago, Illinois

BUT DOES IT RHYTHM?

"A New Home for the Mind" (March) was a real eye-opener. It is rare indeed to find a story which is technically insightful and humanistically profound. Someday another Ted Nelson will be recognized as one of the true visionaries of the computer revolution.

His offhand remark on poetry is absolutely correct. I enclose an example to prove his point. Here is a sonnet I composed in which every single line is actually a link into an existing text.

How long will it be before DATAMATION—and everything else of value—can be accessed through the Xanadu system?

HYPERTEXT SONNET,
LINES FROM *A SHROPSHIRE LAD*

Say, lad, have you things to do? XXIV.1
Quick then, while your day's prime. XXIV.2
Clay lies still, but blood's a rover IV.21
There in the windless night-time. LII.5

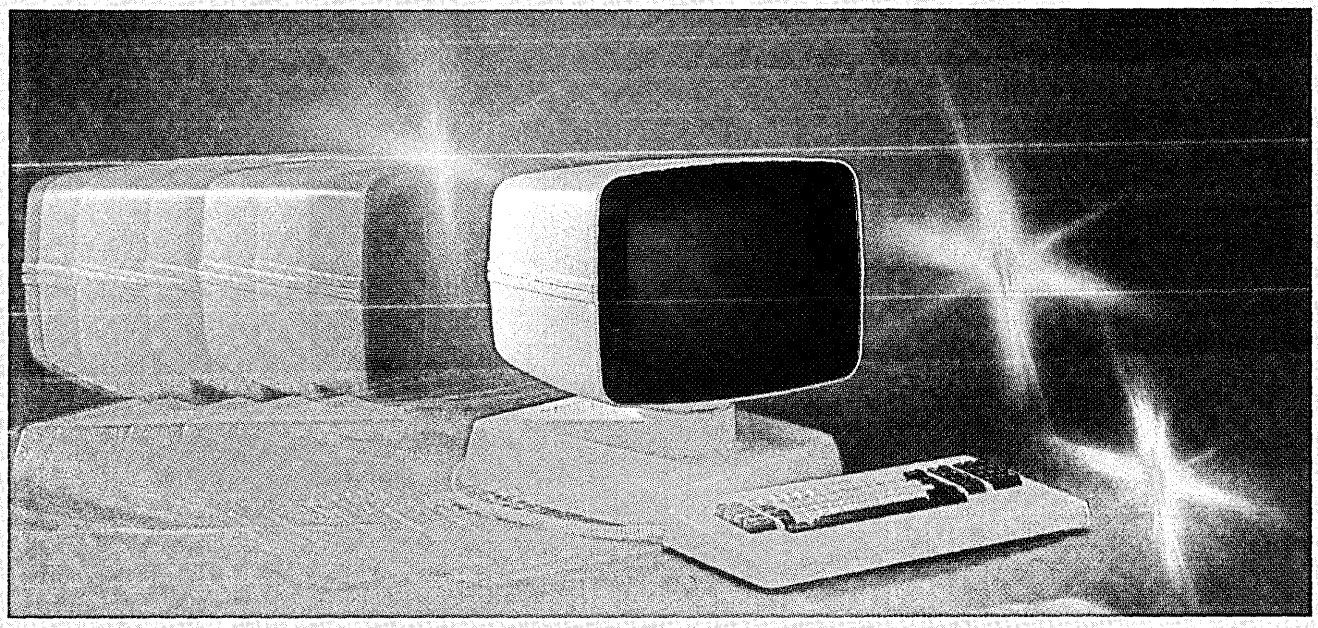
Up, lad, when the journey's over IV.23
The nettle on the graves of lovers XVI.3
It nods and curtsies and recovers XVI.1
Among the springing thyme. XXI.17

And nothing now remained to do LXII.41
But begin the game anew LXII.42
The nettle nods, the wind blows
over XVI.5
When I shall sleep with
clover clad XXVI.19
A.E. Houseman, A Shropshire
Lad source
And oh, 'tis true, 'tis true. XIII.16

(Roman numerals: index location of poem in book; Arabic numerals: index location of line in poem)

JONATHAN V. POST
Software Technology
Boeing Aerospace Co.
Seattle, Washington

Lee Data's NEW All-In-One Display System is ~~a better~~ the best choice for your 3270 requirements.



You get economy with Lee Data's Coax Eliminator™ and unsurpassed character clarity with our new high resolution All-In-One display. And you get the choice of BSC or SNA communications in either remote or local cluster systems.

DISPLAY ADVANTAGES

☐ Four 3278 compatible screen sizes in a single All-In-One display: 24, 32 and 43 lines by 80 columns and 27 by 132.
☐ Unsurpassed character clarity with no flicker achieved with a screen refresh rate of 60 times per second, twice that of similar displays.
☐ Display cabinet tilts 25 degrees vertically and rotates 180 degrees horizontally for convenient and comfortable viewing angles.
☐ Special treatment achieves non-glare and fingerprint-resistant screen, enhancing character readability.
☐ Detached and lightweight keyboard with 9′ extendable coil cable—available in five standard and many special styles.
☐ Display is lightweight, only 31 lbs.
☐ Display is also compact, with a base footprint of only 14″ x 16.″

The Lee Data Interactive Display System also includes: Model 310 Remote Controller, Model 320 Local Controller, Matrix Printer and the exclusive Coax Eliminator, Models C/8, T/1 and T/8.

SYSTEM ADVANTAGES

☐ A full range of controllers emulate IBM 3274 local and remote systems using either BSC or SNA communications.
☐ Multiple microprocessor design provides a system that easily meets the performance demands of a 32 station cluster.
☐ Select from a line of printers including printers compatible with the IBM 3287.
☐ Save coaxial cable costs with the Coax Eliminator™ that supports up to eight displays or printers on one coaxial cable or twisted wire circuit.
☐ Advanced system software offers • easy system configuration • access to multiple station addresses for individual stations • system and station statistics collection • dynamic on-screen communications line trace.
☐ Experienced and responsive service personnel in over 70 U.S. locations.

LEE DATA CORPORATION

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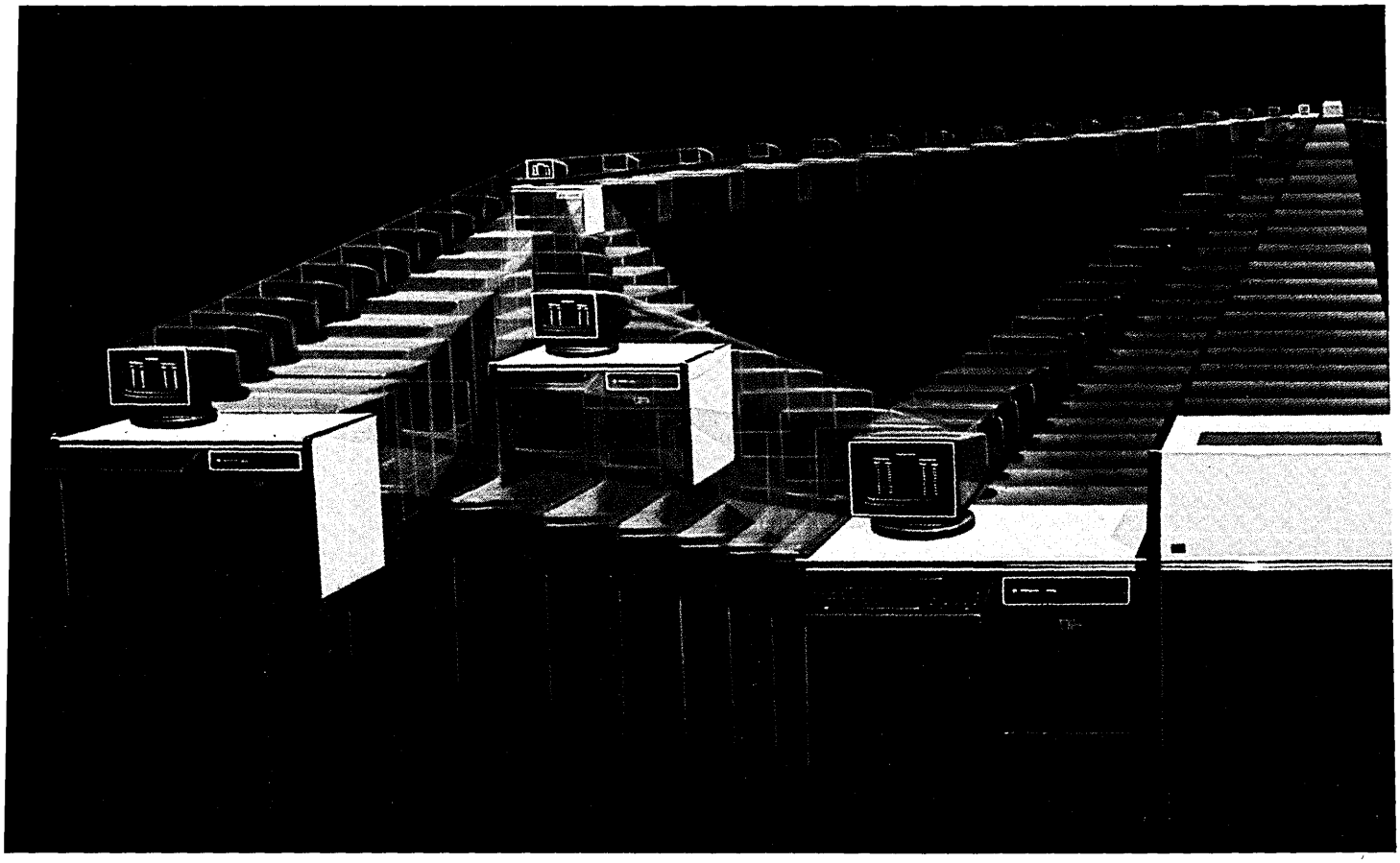
612/932-0300

Call our system specialists toll free and ask about our 30-day delivery:

800-328-3998

CIRCLE 20 ON READER CARD



Access all 10 advantages of terminal flexibility with one system. From Bell.

1

Manage a variety of applications—interactive, data entry and remote batch —with one, advanced, 3270-compatible, data communications terminal system.

2

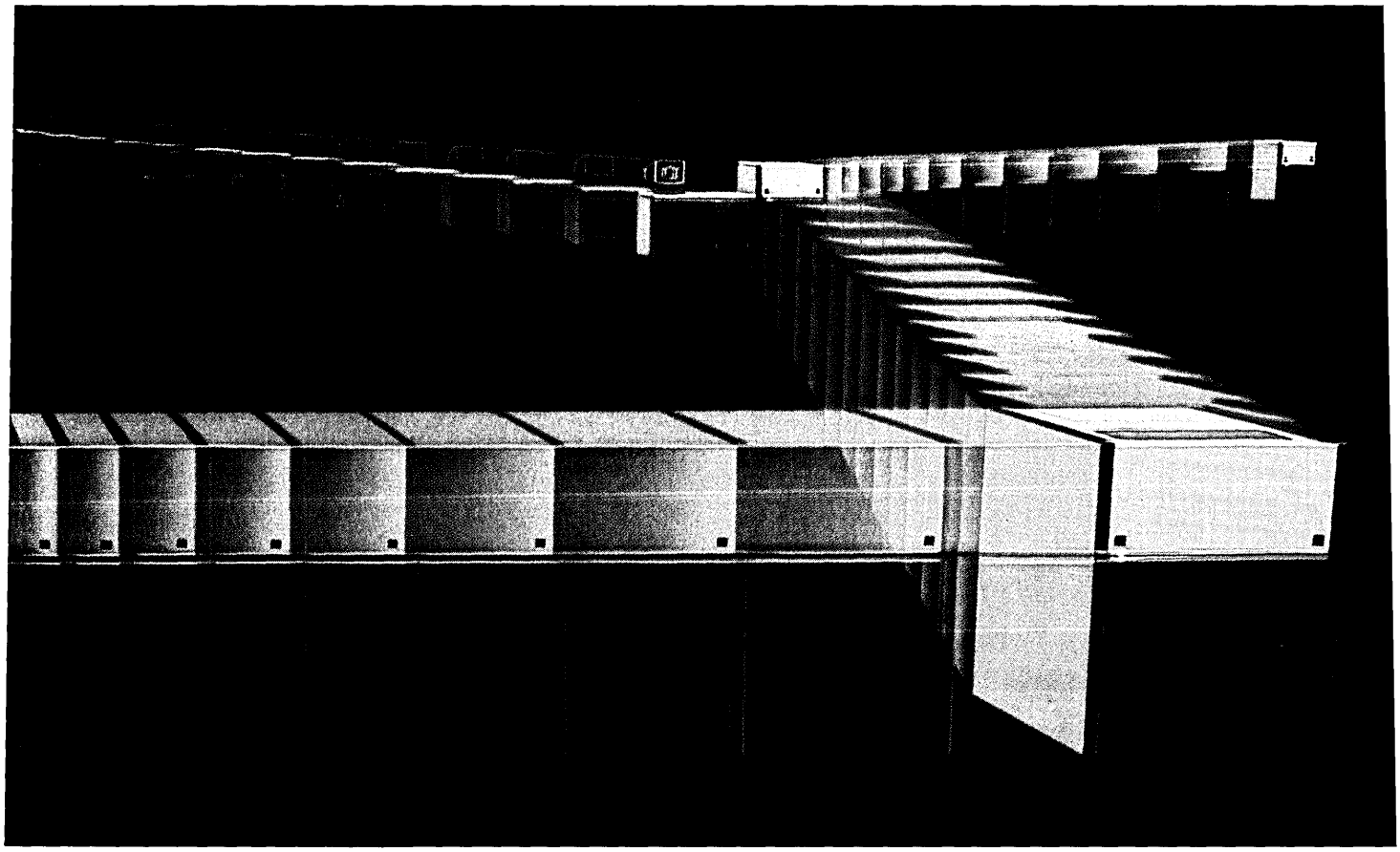
Choose from a family of modular components—CRTs, keyboards, printers —including a cluster controller that interconnects as many as 32 devices (8 of which can be printers). Displays can be located up to a mile away, printers up to 2,000 feet.

3

Operate at speeds from 2400 to 9600 bps, using BSC or SDLC line protocols.

4

Improve operator productivity with human-engineered keyboards that can be freestanding or console-mounted, available in five interchangeable arrangements.



5

Count on built-in diagnostics to pinpoint troubles, from a single component in a particular terminal to a problem with communication facilities. Depend on the Bell System for fast service end to end.

6

Select from a range of printers: 300-line-per-minute printers (80 or 132 characters) and a unique forms-access printer that eliminates waste by providing easy access to each form as it is completed.

7

Reduce operator fatigue and errors with display modules that have an adjustable screen angle to eliminate glare and display crisp upper and lower case characters.

8

Tighten security with your choice of keyboard lock or magnetic stripe reader to identify authorized users.

9

Save with any one of three payment plans—month-to-month, 2-year, or 4-year service—and count on continued advances in Bell System technology to protect your system from obsolescence.

10

Call your Bell System Account Executive to discuss how our terminal system can be fitted to your needs, step by step.

The knowledge business

Some data base management systems are like a trip to the Grand Canyon.

Viewing some data base management systems can be a breath-taking experience. The endless panorama of features (that often appear to be closer than they really are). The layer upon layer of closely linked data structures and access methods. The awesome, almost uncontrollable, power of the system to reshape the flow of information throughout your organization.

If you get the urge to move to such grand surroundings, stop and think what it will be like to live with such a system day after day, for several years to come. At Software AG we provide a DBMS that does more than make a good first impression. Compare our ADABAS system to any other DBMS for IBM or compatible processors and you'll see why.

In the time it takes to discover all the intricacies of other systems, you could be up and running with ADABAS. Instead of forcing you to get involved with the internal structure of the system, ADABAS lets you focus on something much more important: your applications. And with ADABAS you never have to worry about getting there and back. It's a totally integrated system that provides a full complement of development and support tools, including an online data dictionary.

In short, ADABAS can satisfy your desire for a state-of-the-art system while at the same time giving every level of your organization DBMS resources that are easy to use, adaptable to change, and fully supported by a world-wide organization. Use the coupon to arrange a guided tour of ADABAS, or to attend a free management seminar.

SOFTWARE AG
OF NORTH AMERICA, INC

CIRCLE 25 ON READER CARD

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☐ Please send information on your free DBMS seminars.

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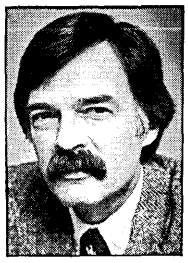
CPU_____ Operating System_____

DM 0782

John L. Kirkley, Editor

EDITOR'S READOUT



LIFE WITHOUT ANTITRUST

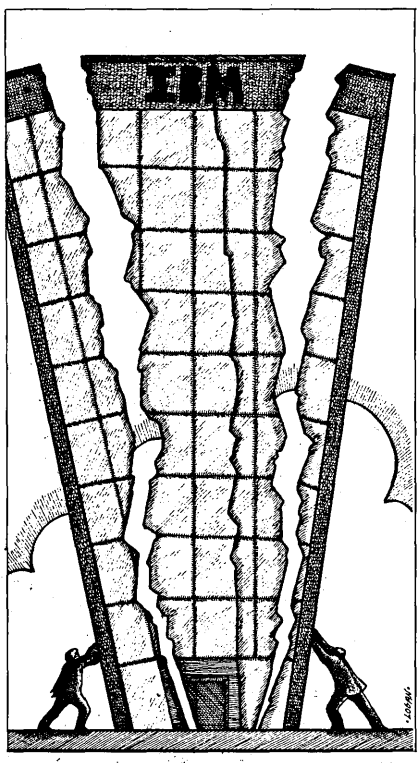
As this is being written there is a small ruckus going on about the application of the Tunney Act to the Government's dismissal of the 13-year-old IBM antitrust case.

Technically, it appears that the Tunney Act does not apply to dismissals. However, there seems to be growing sentiment that it should, an opinion openly articulated by Philip Stern, a private philanthropist, and Public Citizen Inc., a Washington, D.C., law group, at a hearing held by Judge Edelstein last May.

David Vladeck of Public Citizen was quoted in the *New York Times* as saying, "The burdens imposed by the Tunney Act are quite minimal. They don't interfere with the day-to-day exercise of prosecutorial discretion. All they say is, if you want to dismiss a case, or settle a case, you have to tell the public why."

Although we were delighted when this long, wearisome trial came to an end, we must agree with Vladeck. This case is too important to the economic future of the computer industry and the U.S.; the Justice Department should explain in detail the rationale behined its decision to drop the case.

But let's go a step further. Perhaps the whole antitrust system should be called into question. Perhaps the whole idea of business dominance, the concept that bigness is inherently bad,



needs review. Perhaps Justice vs. IBM should never have happened in the first place.

In April we had the opportunity to participate in a round-table discussion with a dozen bright, articulate law students at the Georgetown Law Center in Washington, D.C. This was the final session of a course on computers and the law taught by lawyer Milton Wessel. We covered a variety of topics; one of them was antitrust. To kick off this segment we hauled out an interview with the outspoken economist Lester Thurow of MIT that appeared in the February 1981 issue of *Dun's Review*. Thurow, a liberal democrat, advocates abolishing the antitrust laws, claiming that they have shown very little benefit and caused much harm. The international marketplace will take care of competition, he asserts, and he comments that the antitrust laws inhibit both the nation's productivity and its foreign trade.

Wessel's students, who have happily disagreed about almost everything all semester, ran true to form on this question. Opinions ranged from staunch advocacy of the antitrust statutes to *almost* agreeing with Thurow. But none were willing to go that far. One student, Nancy Smith, came closest. She had been studying antitrust during the class, particularly the IBM case. She advocated maintaining the antitrust laws application to older, more established industries but said, "If you have a field that is changing as quickly as the technology in the computer field, you must have a structure that is different from the present antitrust structure."

It's an interesting idea. Given the international marketplace, given the competition from France, Germany, and especially Japan, and given the fluid nature of our domestic marketplace, perhaps our industry should be exempt from the antitrust laws . . . at least until we mature into some semblance of stability.

Would IBM pick up all the marbles? Or AT&T? Or maybe Citibank team up with Sears and Atari? We doubt it. Competition remains stiff, both here and abroad. Technical innovation and entrepreneurship are still rampant. The micro revolution is daily changing all the rules.

Too much regulation, whether in the courts or by the Congress, could impose an economic hardening of the arteries in a vital U.S. industry that is still young and vigorous. ✲

ILLUSTRATION BY RON LOGAN

DISTRIBUTED PROCESSING NETWORKS

Another in a series of messages on advanced technologies from Honeywell Information Systems.

Many data processing professionals are being faced with demands for networks capable of moving increasing amounts of data among more and more locations. Up to now, application-dependent network structures—with their inherent risk of major conversions—offered the most readily available response. Honeywell's Distributed Systems Architecture (DSA), however, provides a more practical alternative. An application-independent networking structure, it fully supports public, value-added, private and international nets.

World-Class Networking Today

Honeywell's DSA establishes standards for data movement and application cooperation in compliance with the International Standards Organization's (ISO) open systems reference model. The architecture, which is not dependent on specific technology or techniques, keeps applications and communication processes separate. Thus DSA is transparent to the end user. DSA creates a cooperative, flexible environment within which the user can build and phase in a communications system that can handle current applications and grow to meet new domestic and international demands.

DSA Structure

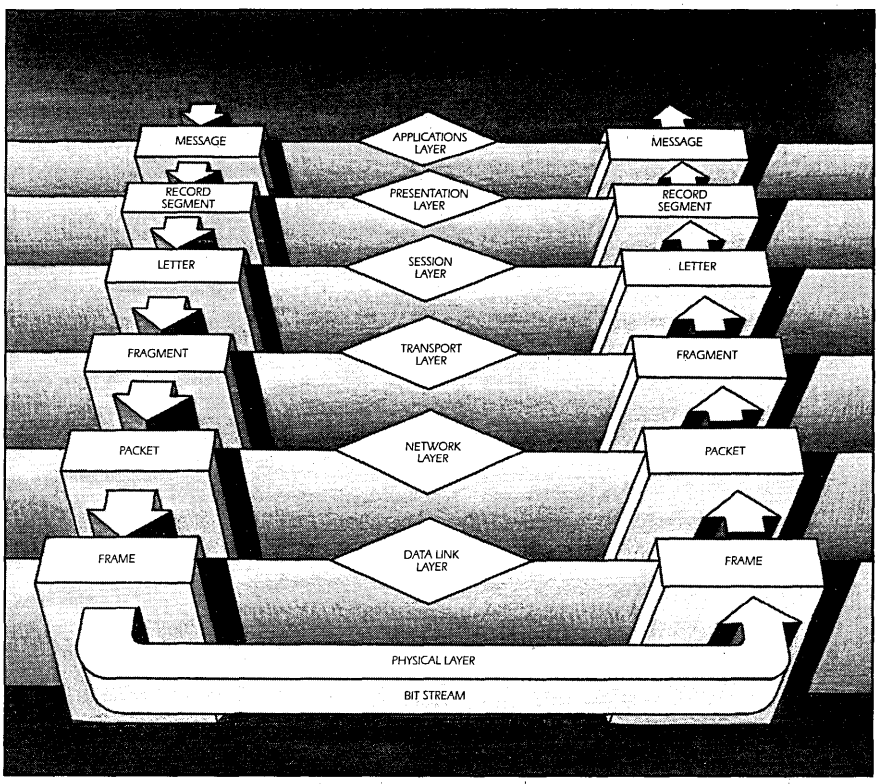
DSA's flexible set of rules, protocols, and interfaces allows users to configure and implement data processing systems and networks to help meet the needs of geographically dispersed organizations. Introduced in 1980, DSA consists of a seven layer architecture divided into three groups. The implementation of the first four layers in the Communications Management group controls physical exchanges across the network. The next two layers, the Message Management group, format messages so that the communicating entities can understand each other. They also contain the dialog mechanism that permits communicating activities to synchronize their actions, and the presentation control services which provide application independence from data format, character codes, and terminal handling conventions. The seventh layer, Applications, defines the logical rules to which computer applications conform when communicating. Finally, each layer of DSA also provides network administration and control data to enable overall network control of the distributed system.

Network Support

Because DSA conforms to the ISO open systems model, it's certified as providing native support for the CCITT international X.25 packet-switched and X.21 circuit-switched network protocols. These protocols are being implemented in a growing list of public data networks around the world as well as in value-added and private networks. DSA products support such X.25 based networks as TELENET and TYMNET (United States), DATAPAC (Canada), DATEX-P (Germany, Austria), DDX-P (Japan), DN 1 (The Netherlands), EURONET (European Economic Community), PSS (United Kingdom), EDWP (Switzerland), and TRANSPAC (France). Also supported is the X.21-based NORDIC Net (Scandinavia, Finland). DSA uses High-level Data Link Control (HDLC), also an ISO standard, for data communications between intelligent devices in private networks. Users can configure hierarchical, peer-coupled and hybrid network topologies.

Product Implementation

DSA already enables medium-scale and large-scale host computers and mini-computers to operate in a variety of network configurations. Specialized network processors can be utilized for front-end processing, remote concentration and switching, in addition to communications control and administrative functions. The implementation includes such distributed processing applications as file transfer, remote job entry, terminal concentration and two-level transaction processing as well as office automation applications, including document distribution and host storage, and printing of documents. In addition, DSA administration permits monitoring, control, and maintenance of the network from one or more control sites.



DSA consists of seven layers of functions and protocols governing data handling among network nodes. DSA's implementation of the bottom four layers makes physical exchanges across the network transparent to the end user.

Future Growth

DSA is an important part of Honeywell's implementation of its Distributed Systems Environment (DSE). Future DSA developments will support fully-distributed transaction processing with system-supplied coordination, control, and recovery, load leveling, and resource sharing across computers. This type of peer network will allow host and satellite processors to cooperate as full equals in distributed systems. The open architecture will be further enhanced to meet evolving international network standards while protecting investments in systems already installed. Additionally, data bases will be partitioned across multiple processors with automatic access and updates at all locations. Thus DSA is part of an evolution to fully distributed systems with globally accessible resources.

More on Distributed Processing Networks

For an in-depth description of the DSA open architecture call our toll free number, 800-343-6294 (in Massachusetts call 617-552-2264) or write Honeywell, 200 Smith Street (MS 487), Waltham, Massachusetts 02154.

CIRCLE 16 ON READER CARD

TSO ANSWERS

TSO is great,
but like other versatile capabilities,
you control it—easy and inexpensive;
or it controls you—difficult and costly.

To gain control you need answers to the following critical questions about TSO service, performance, use and mis-use:

How have outages affected individual users?

What are the resource usage ratios of our users?

Is the speed and consistency of our TSO response within acceptable installation and industry bounds?

Who are the users of specific libraries, programs and commands?

What is the usage-intensity of users, departments, projects?

What are the service and resource consumption statistics for all of the departments and/or projects running TSO?

If you want to control TSO, the TSO/MON program product, TSO Performance Statistics, and our TSO Management articles will assist you in finding the answers. They have for over 450 installations worldwide; write, or call for information.

CIRCLE 21 ON READER CARD

MORINO ASSOCIATES, INC.
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Vienna, Virginia 22180
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MORINO ASSOCIATES (UK) Ltd.
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THE CONVERGENT COMPUTER EVOLUTION HAS STARTED AN OEM REVOLUTION.

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SMALL BUSINESS COMPUTER

An entry-level Convergent system doesn't cost significantly more than a fully-outfitted personal computer. But it does a *lot* more.

You start with a 16-bit processor and as much as 1/2 megabyte of RAM—plenty of power for advanced applications. Optional 5-1/4" floppy and Winchester disks fit right inside the desktop lectern.

And if a small business suddenly becomes a big business, it won't outgrow the computer—there are many ways to add power and resources.

DISTRIBUTED DP

Every Convergent system comes with clustering capability built in—just plug the workstations together, with no software modifications.

Want to emulate X.25, 3270's, or 2780's? We've already written the software.

You can do your own program development in COBOL, FORTRAN, BASIC, or Pascal, using powerful data management facilities including ISAM and a forms package.

WORD PROCESSING

If you were defining the ideal word processor, you'd start with superb human engineering. So did we—with detached 98-key keyboard, high resolution tilt/swivel CRT, and built-in document holder.

Then we created a word processing program with the ability to manipulate seven separate documents on the screen simultaneously, to select 80 or 132 column screen lines, and do lots of other unique things.

GENERAL PURPOSE MINI

No, it doesn't look like the standard black box mini. But it has what you need, in a package that's more compact and a *lot* more attractive.

CPU? A powerful 16 bitter. RAM? Up to a megabyte. Disk? Up to 1.2 gigabytes. Interfaces? Industry-standard parallel and serial, plus Multibus® for special needs.

Software? Everything you'd want, including a real-time multitasking operating system that's designed to be built upon. Plus a comprehensive set of development tools.

SIX MODELS TO CHOOSE FROM

The six Convergent workstations look similar, but each has a unique combination of features and price. And perhaps most importantly of all, we're delivering all six *in quantity* right now.

Is it any wonder we've started a major OEM revolution?

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Where great ideas come together.

For information call (800) 538-7560 (in California, (408) 727-8830) or return the coupon.

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Name/Title _____

Company _____

Address _____

City _____ State _____ Zip _____

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Return to: Convergent Technologies Inc.
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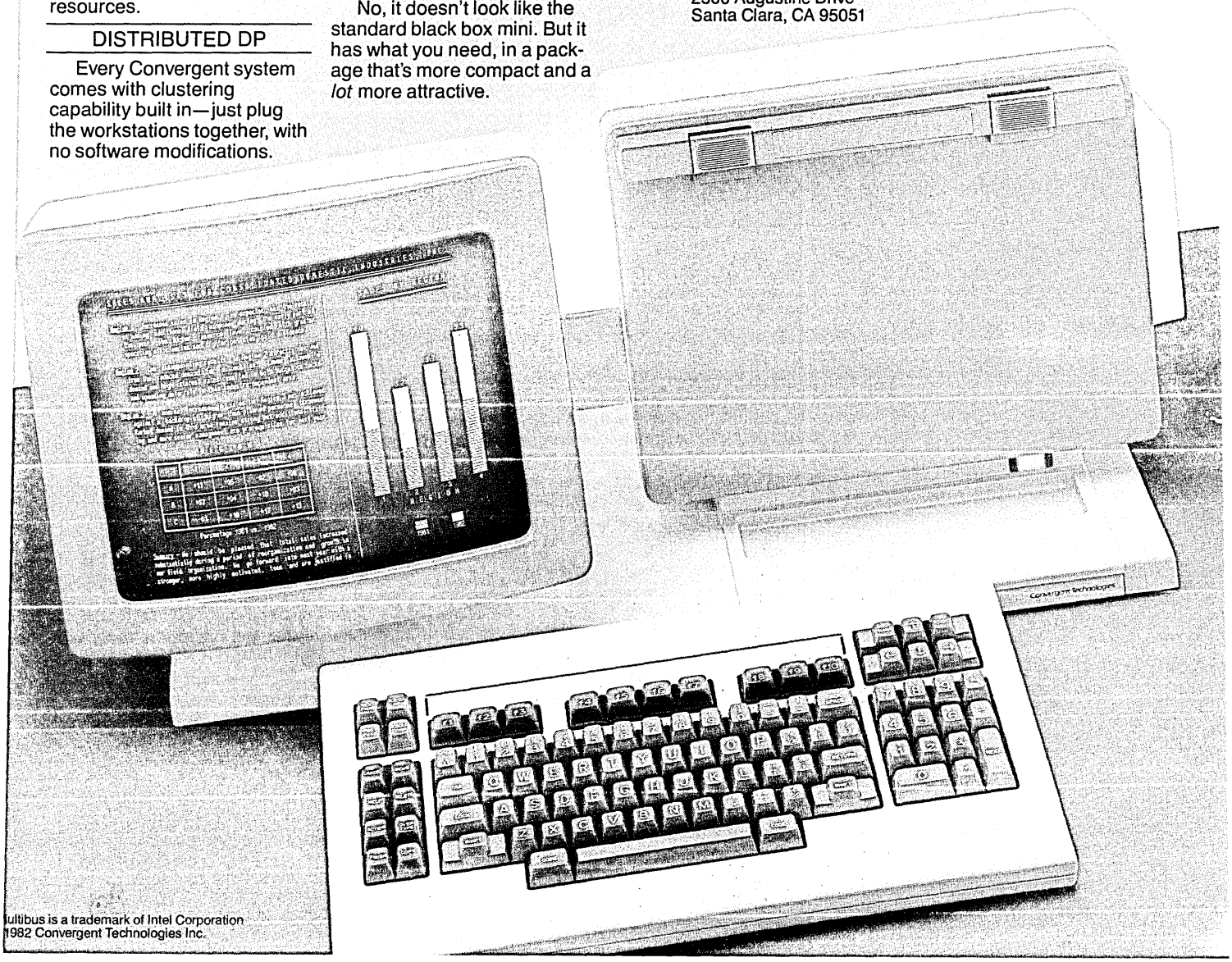

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NEWS IN PERSPECTIVE

PERSONAL COMPUTERS

DEC ENDS FENCE-SITTING

When Digital got off the dime in May with a slew of new products, users began to sense a renewed commitment from the company.

Following the splashy teleconferencing-style unveiling of its new personal computers, and a slew of other new products backed by a three-year network growth plan, the general feeling is that Digital Equipment Corp. (DEC) has shot its bolt for the year.

"But," says one DEC insider, "there's more in the fall, when the focus switches from small to large systems." This source said that a new 36-bit machine to sit above the DECSystem-20 top of the line is slated for fall announcement—though dates are fluid.

He also confirmed earlier DATAMATION reports (December 1981) that two even larger 36-bit machines (internally known as Venus and Saturn) are under development at the company's Marlboro, Mass., site.

"These are much further down the road—probably 1984 or '85 time frame—and this big centralized project [which is being headed by former IBMers] is quite unlike anything that DEC has yet attempted," he added.

One other source claimed that at least two more of the company's mainstream VAX "superminis" are in the pipeline. Both sit above the current top-end VAX-11/780s which are comparable to IBM's 4341 model 2 machine.

"They had looked to announce one of the pair this year, a machine that stretches up to the 4 MIPS level. But next year seems more likely," the source explained.

The top-end VAX machine that is now under development (and is also scheduled for a 1984 or '85 debut) is expected to soar to the 10 MIPS level, and is being developed along the lines of IBM's System/38, says one insider. "The focus of this machine has swung to relational database, distributed operating systems, and ease of use for end users, as DEC tries to anticipate IBM," the source concluded.

Such a scenario jells with the thoughts of one DEC watcher, the Yankee Group, which, like Digital, is based in the Boston area. "Even at this point in time the third-party software and hardware packages for such a VAX architecture are being prepared," says Yankee Group research director Dale Kutnick. "One company, for example, is building a back-end database machine for VAX. Among other things, this system will help offset Digital's traditional lack of commitment to DBMS [database management systems]."

Lack of commitment, or at the very best, fence-sitting, has also characterized other potential business areas for the Maynard, Mass., giant. But in the wake of what one employee called "our gay May," the month when new products appeared with machine-gun regularity, DEC appears to have come off the fence—at least in some areas.

"We are rarely first into the market with anything," DEC president Kenneth Olsen said of the company's new personal computers. "But when we come in, we offer the best and the most."

In the case of the personal computers, which cost $3,500 to $10,000 each, depending on hardware and software options, many experts agree with this assessment.

The new personal computers cannot yet be integrated into the other DEC families, such as the VAX and the PDP-11.

Kutnick says that the two new Professional Series models—the most expensive and sophisticated of the new entrants—are the best personal computers around, and will "wipe out" such computers as Apple in the top 2,000 U.S. accounts, as well as hobbling Xerox, Data General, and Wang, which has a new entrant. Says Kutnick: "The DEC machines have the best color graphics on any personal computer, as well as a powerful ROM diagnostics aid."

Top Arthur D. Little computing expert, Frederic G. Withington, also alluded to the power of the machines. "Basically, you're getting a PDP-11 for $8,000."

Others have highlighted the Professional's P/OS multitasking operating system, which allows the user to perform a number of simultaneous jobs and is equipped for voice mail.

Though described by one watcher as the announcement with everything, there were some notable omissions.

Says one consultant, "DEC has the most sophisticated and intelligent users in the world, users who are prepared to experiment. DEC has set about providing them with powerful options, powerful bits. But one other fence the company has been sitting on is offering the right kind of glue to string the bits together."

Though "powerful bits," the new personal computers cannot yet be integrated into the other DEC families such as the VAX and the PDP-11.

"You must understand," says one

ILLUSTRATION BY DAVID FEBLAND

DEC insider, "that Digital as an organization is bitty and fragmented—by choice—and this is reflected in its 18 marketing groups and also in its products, which lack what you might term a common center or focus."

The insider compared Digital's matrix organization to groups of "intellectual commandos" that come together to complete a mission and then split up once more. The main virtue of this approach, according to Olsen, is that the company can quickly respond to its users' needs, and get a product developed and on the market sooner than its rivals.

This approach is quite the opposite of the slower and more centralized management style of the industry leader, IBM, many of whose customers are also confirmed DEC users.

"The key to evaluating the recent moves of both these computer giants," says ADL's Withington, "is that both naturally want to capitalize on the network growth of their customers." He says that IBM is positioned to do that because of its control of the center—in essence, the large corporate database mainframe—and its moves into network building. He adds that DEC has begun network building and hopes in addition for a piece of the center.

DEC's network building will be erected in an orderly, three-year, step-by-step plan—though Withington says it's worth noting that no users, DEC's included, ever act in an orderly and logical way.

What is known as Phase IV of the company's DECnet architecture will embrace Ethernet for local nets, X.25 internationally, IBM's SNA computer nets, and DEC's own products and protocols, says a spokesman. One immediate result of all this, according to Digital, is that the number of supported nodes on a DECnet arrangement could flower from 225 to 1,000.

Phase IV of the company's DECnet architecture will embrace Ethernet for local nets, X.25 internationally, IBM's SNA computer nets, and DEC's own products and protocols.

Support for Ethernet and VAX-11 will come next summer when DEC makes available a new $3,500 communications controller. PDP-11 Unibus systems will follow in 1984, and DECSystem-10, 20, and above "mainframes" will join DECnet as nodes in 1984 to '85, according to the DEC scenario.

There is much uncertainty over exactly when the personal computers could join the community. One DEC source says the company plans to offer interfaces next July. But there is one major hurdle that DEC still has to overcome, say other sources. That is the cost of the VLSI interface chips necessary for the personal computers to link to Ethernet. Clearly, nobody wants to hand over $3,500 for a controller to allow interface, and so DEC has to get its VLSI chip economies into line with the pricing of its personal computers.

Says one DEC insider, "Currently there are more VLSI chips in the Ethernet interface device than in the personal computers themselves!"

He added: "The company has its specs with four semiconductor companies [Fujitsu through Ungerman Bass, Mostek, Intel, and AMD] which are all competing with each other to build low cost VLSI interface chips."

DEC preferred not to comment, and a spokesman would only say that interfaces for the personal computers would be made available in due course.

Withington describes such a networking plan as an attempt to "back all the horses at once" but pinpointed the gateway into IBM's SNA networks as "strategically the most important consideration."

The most obvious question is, what happens to all the data and information that the new DECnet nodes might be expected to generate in massive amounts. Where does

it go? How is it stored, manipulated, and retrieved?

"It makes a great deal of sense, if you don't have your own large database machines at the center, to use somebody else's," says Withington. "DEC clearly intends to use IBM's." (That's what one observer described as having a free lunch.)

This would mean, says Withington, that DEC, like others before it, would become more compatible with IBM and could plug whole DECnet communities into the industry leader's machines. "The net result for IBM, if this approach were successfully adopted, is that the company would become merely a sterile supplier of standards. An unlikely occurrence," says Withington.

Another view is that IBM is out to seduce DEC into dependence on its alluring SNA core as a prelude to squeezing it in a deadly embrace, a sort of Venus's flytrap syndrome.

"There are at least four levels in the SNA hierarchy that DEC hasn't provided yet," says Yankee Group's Kutnick, "which can be used against DEC in the form of richer SNA functionality and frequent changes to SNA."

So, from Yankee Group's perspective, the IBM SNA environment is initially positive and inviting for DEC, but it can eventually be used as a weapon against the minicomputer giant.

DEC clearly feels that it will have more control over its own destiny if it provides its own "center."

Next summer DEC plans to make available a new $3,500 communications controller.

"With the big centralized development at Marlboro, DEC is working in a new way," says one source. "It has a big project team in the hundreds and is trying to build big mainframes the IBM way. But so far the signs are not encouraging; the logistics of the thing—chips in one door and fat machines out of the other—don't follow the DEC way, but run counter to the company's whole culture."

Could these machines be used to provide a DECnet center? "The machines are being built because DEC's university and timesharing customers of DECSystem-10s and 20s require more raw power," says Kutnick. Some of these users are big and have much influence with DEC, and they like their machines, he adds. "This is why the whole DECSystem 36-bit line [which is incompatible with DEC's mainstream VAX and PDP products] has grown and prospered.

"But there is no way that VAX users would want to convert over to a DECSystem center. They would rather have, and will probably get, their own center," the Yankee Group researcher added.

For the present at least, VAX users must be content with more "powerful bits" and a pledge of more network integration over the next three years. Users have at least been offered a commitment. Maybe DEC is no longer just sitting on the fence—maybe it's just walking along it.

—Ralph Emmett

TELECOMMUNICATIONS

NEW YORK GETS A TELEPORT

A joint venture between a Wall Street brokerage house and a public agency will give the city its own antenna farm.

Merrill Lynch Pierce, Fenner, & Smith, Inc., the Wall Street brokerage firm, has entered the telecommunications business in a bullish way through a joint venture with a most unlikely partner, the Port Authority of New York and New Jersey. That's the agency that collects tolls on bridges and tunnels and runs the metropolitan area's airports and docks.

The two partners, along with a true communications equipment company, plan to set up an antenna farm in Staten Island that will eventually provide local enterprises access to as many as two dozen communications satellites. For the Port Authority, the so-called Teleport plan is a means to further economic development in New York and the surrounding area, but for Merrill Lynch it is the beginning of what could be a big business.

The brokerage firm has in recent years been widening its areas of business, moving aggressively into consumer financing, banking, and insurance. The company has gained a reputation as a financial supermarket of sorts, serving institutions and individuals with a wide spectrum of services. With so much financial activity already taking place on wires of one sort or another, an entry into the communications business is a natural follow-on.

"We're looking to service brokerage houses, banks, industrial firms, and other communications corporations," says Stan Welland, Merrill Lynch group manager of strategic technical planning.

Although Merrill Lynch's initial interest in the Teleport project was to develop its own communications facilities, it soon saw an opportunity to begin marketing services to others. "We hope to have a very flexible service offering. Our customers will be able to do just about anything: video, teleconferencing, data transmission, and voice."

According to plans as laid in early June, Merrill Lynch has agreed to be responsible for the communications aspect of the project while the Port Authority will handle construction of the Teleport site itself, where its location in Staten Island is a short fiber optical link away from the twin World Trade Center towers.

Merrill Lynch put out an RFP in the spring and was to have chosen a communications partner in mid-June, according to Welland, who declined to say which six firms had bid on the deal. In any case, Merrill Lynch expects to work hand in hand with the selected prime contractor and be ready to begin marketing the Teleport's services beginning this summer.

Welland declined to specify Lynch's long-range plans for the communications business. "Yes, we're entering the business," he says, "but just how, I'm not ready to say."

This summer's ground-breaking on the Teleport site will be the culmination of several years' work by the Port Authority in seeking to establish a wideband telecommunications facility that would help keep companies from leaving the city area and taking jobs away with them. According to Robert E. Catlin, Teleport general manager, New York has a high concentration of "information intensive" businesses—most of them in the mass media and financial arenas—that might be tempted to move away from the city in order to take advantage of satellite communications, which are more easily obtainable outside the congested city area.

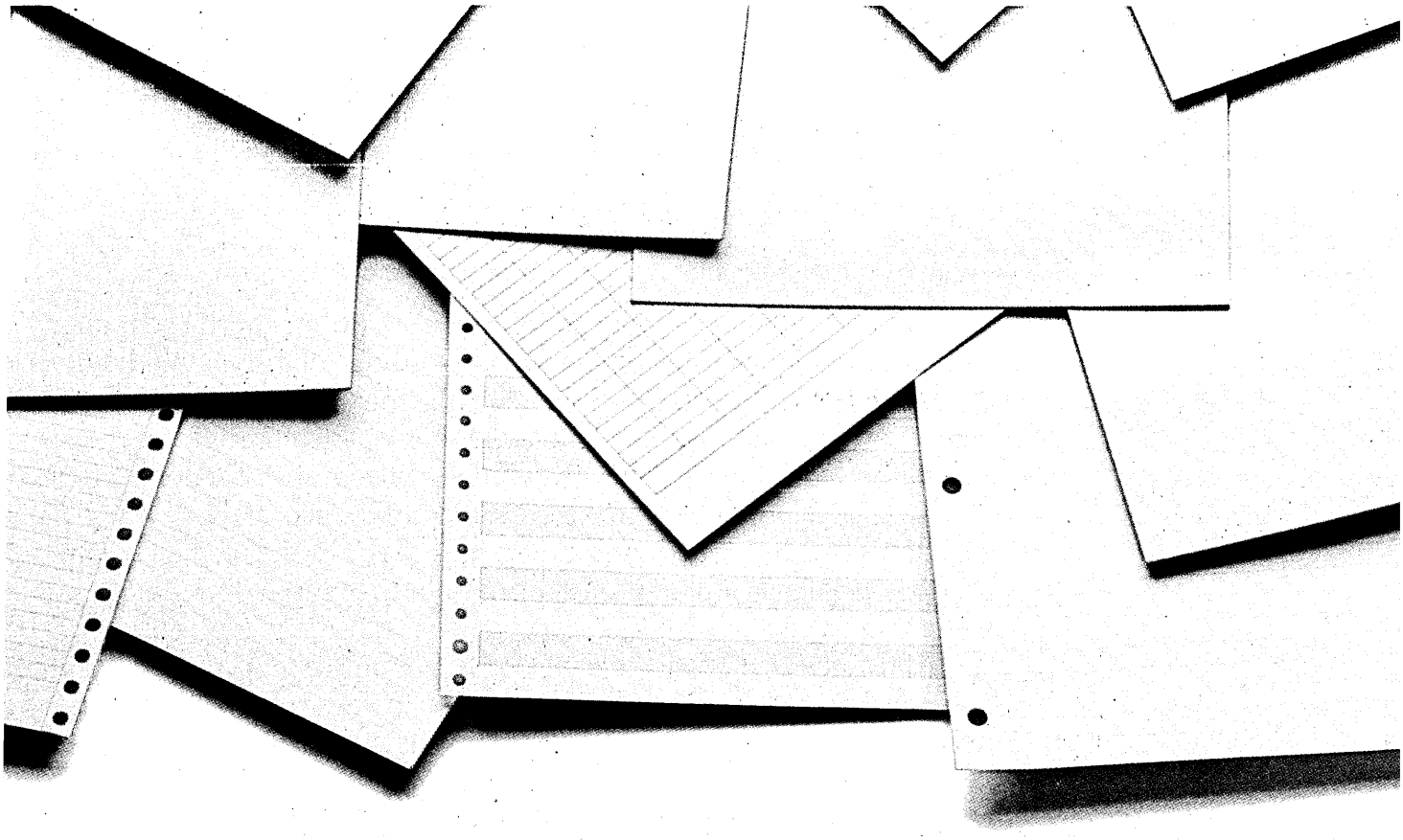
That congestion, Catlin explains, is found not only in the gridlocked streets, but also in the air, due to the extraordinarily dense concentration of terrestrial microwave links that crisscross the metropolitan

Merrill Lynch's initial interest in the Teleport was to develop its own communications facilities. But it soon saw an opportunity to begin marketing services to others.

New York area. Those links would play havoc with satellite earth stations located in most areas of the city, causing intolerable interference.

The Port Authority scratched its collective head about three years ago and with the help of Comsat began looking for possible sites for a shared earth station facility. The plan was for the authority to cut through the local red tape, find partners for the development of facilities, and bring to New York a communications port that could be flexible and powerful enough to serve the broad range of interests of local companies.

As many as 29 potential sites were found, each of which offered a dead spot



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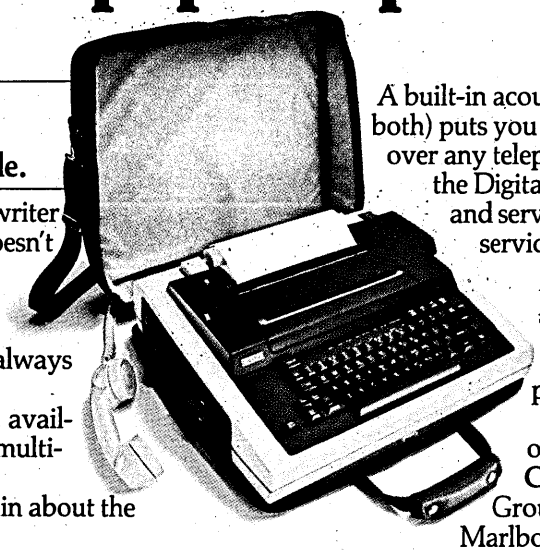

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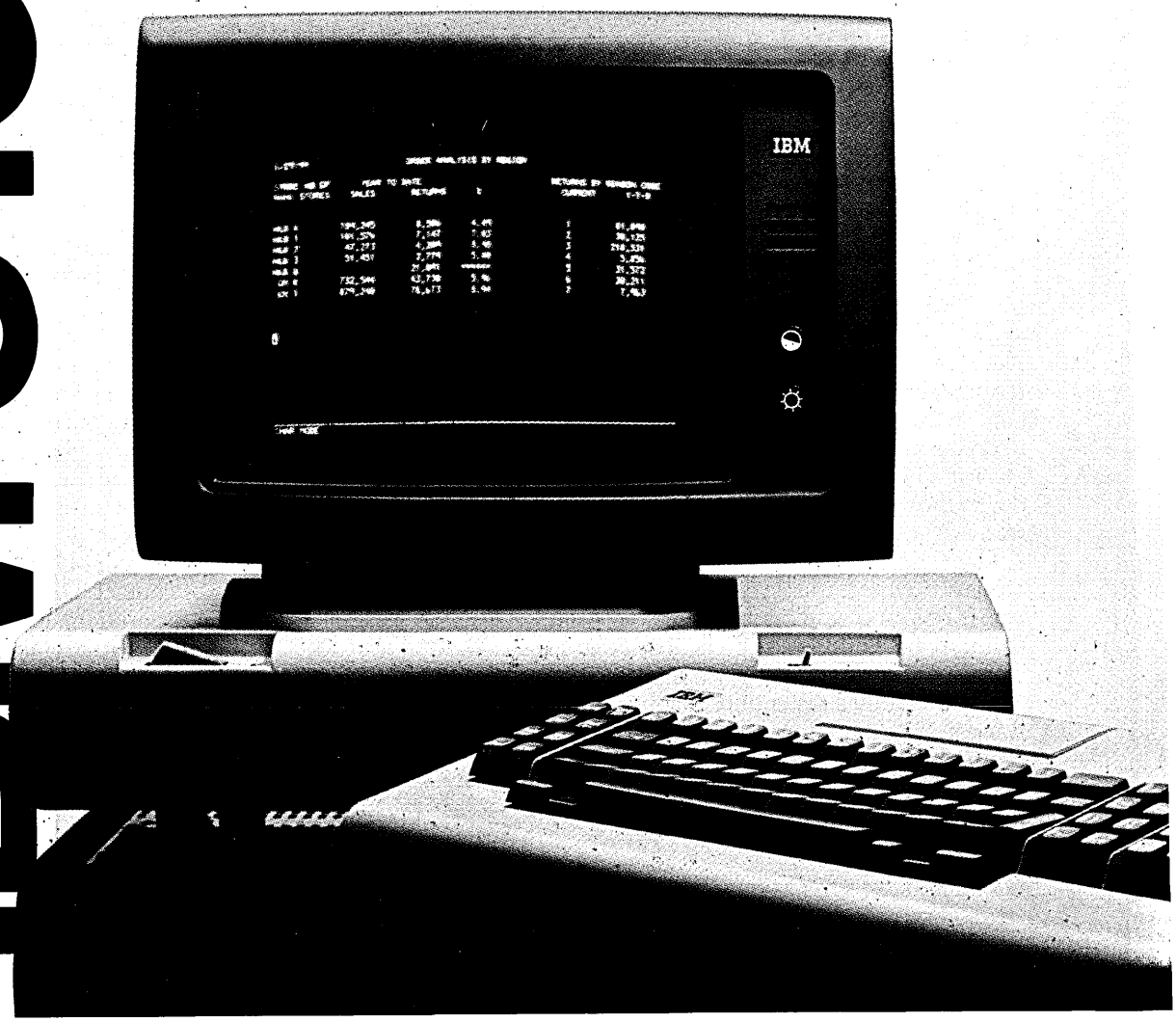

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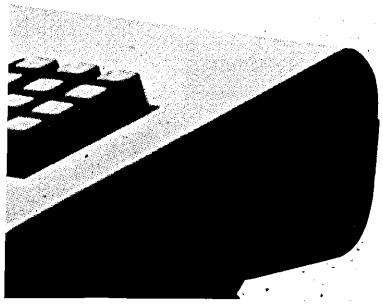

NEWS IN PERSPECTIVE

amongst the maze of microwave beams. Using other criteria such as environmental concerns, access to city services, and enough space to house the envisioned data processing and communications equipment, the list was whittled down to an unused landfill area on Staten Island. Luckily, the 200-acre parcel of land was zoned for an industrial park and it was in an area yearning for some long-term development, according to Catlin. Moreover, the city of New York already owned the land.

Catlin says fiber optics will be used to bring data to and from the Teleport, thus avoiding microwave links and their inherent problems. The fibers will be strung along a series of municipal rights of way, across the Goethals Bridge, along Conrail tracks, and through the Path subway tunnel to emerge at the World Trade Center, where customers will attach their systems. The 11 miles of optical cables will be configured to handle a bandwidth of about 90 megabits per second, Catlin notes.

According to charts in his office, future links will take the fibers into Newark, N.J., into New York City's Queens and Brooklyn boroughs, and into Westchester County if and when future demand calls for it. In order to provide redundant links between the Teleport antennas and the Trade Center, alternate routes of fiber optics will be laid, he explains.

The Teleport itself will be secured by fences and its own police force, and the antennas will be shielded from stray radio transmissions by thick earthen walls. The Port Authority will invite customers to build their own facilities within the Teleport's perimeter should they need extra space for data processing or communications. Indeed, one of the factors prompting the port's development was a general need within Manhattan's tightly packed financial district for well-suited computer space, Catlin says, noting that many older buildings are showing their limitations in housing highly critical data processing centers.

Staten Island was chosen because it offered a quiet spot away from the city's maze of microwave transmissions.

One motivation for developing such a facility is the need by certain organizations for backup computer centers. Catlin says a large California bank is highly interested in the Teleport as a location for such a redundant center that would run synchronously with a main data center back home. Should an earthquake or other catastrophe take place, the New York center would maintain records and time-critical processing. To take care of such potential customers, the Teleport is being designed to take in users on several bases. They will be able to purchase or lease land on the site and install and operate whatever equipment they choose. Some are expected to install whole data centers, perhaps only as an alternative to installing machines in costly real estate in Manhattan, while others may only share a fiber optic link from the city and its up-link to a satellite.

Users are expected to vary from banks to brokerage firms to television broadcasters. One television producer operating out of Hoboken, N.J., has expressed an interest in using the sytem to distribute programming to remote cable networks and transmitters, according to Teleport officials.

As of early June, the Port Authority said it expected to have its first earth station in place by spring of 1983, in time to start communicating with a Hughes Galaxy satellite set for launching early that year. Hughes Communications Inc. itself has recently been working its way through the labyrinth of city bureaucracy to set up its own antennas in East New York, a part of Brooklyn located close to the Kennedy International Airport. Local residents have been questioning the safety of such a system near their houses, thinking that the transmissions may be hazardous to their health. Catlin says there has been little of that sort of opposition to the Staten Island Teleport, however.

The first antenna should be operational by spring of 1983 in order to communicate with a Hughes Galaxy satellite.

So far, the Federal Communications Commission has authorized a total of 24 domestic satellites, 22 of which the Teleport will be able to communicate with through its 11-meter dishes, according to Chuck Seliga, marketing manager for the Teleport project. The satellites already launched have been separated in orbit by four-degree arcs, but the FCC is considering lowering that separation to two or three degrees in order to permit more satellites to be launched. Teleport antennas, he says, will be able to handle the closer spacing. Moreover, the chosen site will have a clear sight to Intelsat satellites that connect U.S. and European shores.

"We're just trying to do something that will give us, the city, an edge so that companies will locate here," Seliga says. "The bottom line is that we'll have something to compete with against other parts of the country and the world. This same technology could have worked against us."

Seliga and Catlin think the Teleport will be a first in the U.S., if not the world, in that it pairs a city agency and private investors in developing high-capacity communications facilities for local users. Several other cities across the country have taken an interest in the Teleport's evolution, he says, noting Chicago's mayor Jane Byrne as a particularly interested party.

—John W. Verity

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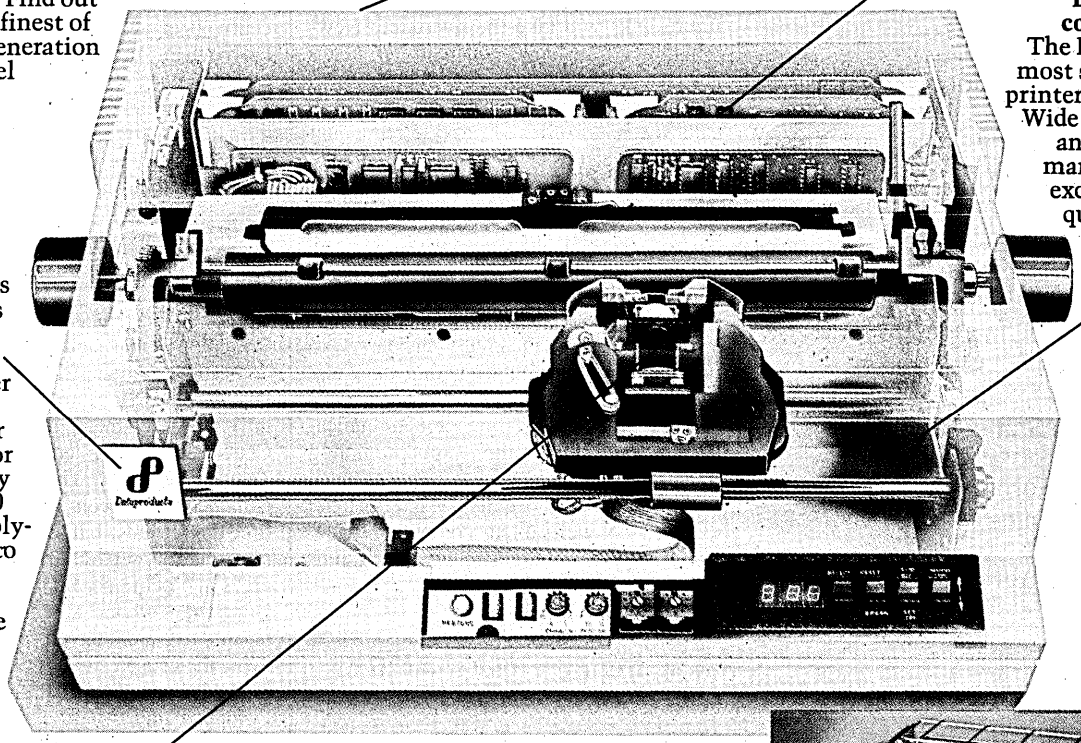

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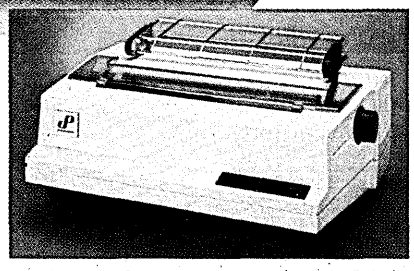

DP-55 DAISYWHEEL PRINTER

DATAPRODUCTS

CIRCLE 28 ON READER CARD

OFFICE AUTOMATION

LIVING ON BORROWED TIME?

Despite management problems, CPT continues to do well. But can it keep up with competitiors?

Dean Scheff, founder and President of CPT Corp., a fast-track Minneapolis-based word processor company, changes vice presidents of engineering like the New York Yankees changes managers. In the past three and a half years CPT has had four vps of engineering. But the past six months has been more tumultous than usual. In addition to losing a vp of engineering, an estimated 35% to 40% of the company's software and hardware engineers have either been fired or have resigned. Yet, like the New York Yankees, CPT continues to turn out winning results, growing at better than 50% over the past several years, and 71% just this past year.

Between early February and late March a number of managers and engineers were terminated. They included John Stearns, vice president of engineering; Bob Elzer, director of hardware engineering; Dave Stark, director of software engineering; 14 software engineers; and four hardware engineers. Since March, resignations from the remaining engineers have trickled in at a rate of about two a week, said a former office worker. "About 80% of the remaining engineers [about 40 people] started looking for new jobs after Black Tuesday [March 23]," estimated one CPT engineer still with the company.

While the latest round of robust rousting has left CPT short on engineering talent and knee deep in management problems, it reaffirms once again that CPT is not an engineering-driven company. It is driven by its dealer organization and by Dean Scheff, who cut his business teeth as an automated typewriter salesman.

The problem with his latest vp of engineering, said Scheff, "was that he didn't understand marketing. Stearns is a great engineer, but he also had a great ego. . . . He felt engineering could sit over there isolated from the world and design wonderful widgets; then the world would rush to their door to buy it. I tried to talk to those guys, but they wouldn't listen to me."

The stories from engineering paint another picture of CPT. According to several engineers close to the company, the new plant is "potentially" one of the fastest and most highly automated production facilities in the country. It's geared to roll out $1 billion worth of products per year when running full tilt, they said.

"It's a superflowing machine with one small catch," commented one CPT engineer. "If you are going to make a product that can move through a highly automated machine, you need super strong engineering behind it. Your product has to work when it comes off the production line, otherwise it jams up at the end. If you have to stop that kind of wheel, the overhead will eat you alive in weeks."

The ticking bomb within CPT, as they see it, is that the 8000 design is closer to a prototype design than a well-engineered, streamlined production design. The 8000's crt driver is a perfect example, offered a CPT engineer close to production. "When it comes off the line it has to be hand-tuned because the component tolerances are so low. Often, when a new batch of resistors comes in, the circuit becomes imbalanced. Several boards have to be tried together until the right combination that will play together is found. Quality control has taken care of some of that by checking the tolerance range of incoming components, but still the design tolerances are very delicate." On a bad day, the engineer figured, CPT is building one and a half to two monitors in order to ship one.

Another consistently heard complaint was that engineering was the fall guy, the scapegoat. When products designed by research run into problems, engineering was where the blame fell, surmised several engineers.

Cutting the explanation to its bare bones, two warring camps appear to have grown up within CPT. Off in one location, called Woodhill, which was several miles from corporate, was the new guard, the Holland camp (named for former president Gary Holland), generally identified as engineering and led by two very stong, charismatic personalities: Stearns, vp of engineering, and Elzer, director of hardware, both of whom came to CPT from upper level management positions at technology-driven companies. Stark, director of software, predated Stearns and is considerably younger than the other two. He had a far less dominating personality.

Two warring camps appear to have grown up within CPT—engineering and research.

Research was Scheff's old guard. Separated from corporate as well as from Woodhill by several miles, the Scheff loyalists consisted of a group of about 10 to 15 people responsible for the 8000 hardware and software design. At the core of this group was and is Clarence Lehman, his brother Fred, Jim Weinhold, and Henry Niles. Clarence Lehman is the recognized leader and one of the few within research to hold an engineering degree. Weinhold, who since has been installed as vice president of engineering and acting director over software and hardware, does not have a college degree. This business about engineering degrees was a thorn in the side of those at Woodhill, who felt research was not equipped to produce streamlined designs that would flow off a high-speed production line. In fact, the general perception was that it rests on engineering's shoulders to clean up the designs coming out of research and make them work, but all the whole doing so within the confines of the original design.

Each group had its charter. Engineering was to produce the midlife kicker to the 8000 line, code named Spartan. It was to weigh less, produce less heat, cost less to manufacture than the 8100, and not create any software overhead problems. Phoenix has been the prime project of research since 1977. It is generallly recognized as the follow-on generation to the 8000 line.

Software development at CPT is becoming the biggest development nightmare of all.

What happened from this point is nothing short of near disaster, in Scheff's estimation. Scheff believed that CPT had to introduce the 8500, the Spartan, at Hannover Fair in West Germany this spring or suffer a bad fiscal 1983. He also strongly believed that the 8500 had to be compatible with the previous 8000 line. He was under the impression that engineering was working on the ODL (office dialog link) network and the Intel database project.

Meanwhile, Stearns and Elzer had headed off in a hardware direction that was ambitious and modern, typically the direction engineering takes. But they tampered with a critical element of the 8000 design. They abandoned the old 8-inch single-sided, single-density drives for 5¼-inch dual-sided, dual-density drives. That decision stands out as hardware engineering's fatal flaw. Not only did that decision create a myriad of design problems for hardware engineering to solve—all of which were ultimately solved, claim most all hardware engineers—but it created a near-impossible problem for software.

Interfaces to the 5¼-inch drives had to be written. It was an impossible short-term project because of the peculiarities of MOL, the machine-level-like language developed by Clarence Lehman for the 8000. And for some reason that no one quite understands, Stearns seemed to be concerned only with solving the hardware problems. Hardware and software were not working together on Spartan.

Elzer might have been part of the problem, suggested several engineers close to the drama. Along the way, admitted several CPI hardware engineer, Elizer, with

his forceful "get-with-my-program-or-get-out" management style, had managed to alienate many people outside of hardware engineering, including those in software design, as well as those in research. Research, though, saw Elzer and Stearns as power brokers who ultimately wanted control of all CPT engineering, said several people on both sides of the fence—engineering and research.

It should be added, however, that inside the hardware group, Elzer did almost anything for his people. Loyalty to Elzer was so strong that, as one engineer put it, "We would have followed him to the gates of hell."

Scheff got the distinct impression that Stearns and Elzer were at odds with his beliefs about which path CPT should be going down. Too much change too quick, summarized one former engineer. Scheff said he really became alarmed when he discovered that Stearns did not support his ODL network. Stearns is reported to have called it "technological drivel." Stearns declined to comment on his experience at CPT. Scheff claims the same fate befell the Intel database project. "Stearns stuck that in his drawer too," said Scheff. "No one was working with Intel," he claimed.

CPT's market niche is just beginning to come under siege from an army of small systems sold by IBM, DEC, Wang, Tandy, and the Japanese.

With Holland gone, the top managers in engineering gone, and quality assurance (QA) trying to reengineer Spartan, by March the product design side of the company was completely out of control. No one was working with engineering and nothing was getting done in engineering. The Spartan hardware met a swift and sharp defeat at the hands of QA. Instead of working to solve the problems, QA tore Spartan apart, making multiple changes without documentation and completely muddying the waters as to who—QA or engineering—was responsible for what malfunction, related several exasperated hardware engineers. With only weeks to go before Hannover, Scheff told QA to redesign the machine. What appeared at the West German show, said a demoralized hardware engineer, was "basically a warmed-over 8100." What begins to emerge from this calamity tale is a picture of a company unable to manage a professional engineering group.

The image of two warring camps kept appearing during the weeks of our interviewing—from Scheff, to Stearns and Elzer, to the rank-and-file engineers. Admittedy, engineering had its fatal flaws, but research is not without faults. Many of the rank and file within the engineering group perceived those in research as being unquestionably smart and talented, but lacking the discipline that comes with formal engineering training. They claim work from research comes to engineering in prototype form with very poor documentation. This applies to both hardware and software projects. Research gets "all the glory," explained one engineer, while engineering has to work within research's predetermined framework and smooth out all the rough edges. "If it doesn't work, it's engineering that is blamed, not research or the orginal framework provided by research," said the engineer. While "poor documentation," as one engineer described it, may slow down hardware development, it was driving the software engineers crazy.

Software development at CPT is becoming the biggest development nightware of all, judging from the list of horror stories coming out of that group. When poor documentation is coupled with MOL, which was created in-house and with little mind to standards, programmer productivity is a lost concept. "Look at how the new MOL deals with disk I/O routines," complained a current CPT engineer familiar with software and hardware. "They are scattered throughout the code, they are not in one place, and they are not always done in the same manner. MOL is nice if you are writing small programs that are hardware intensive, but the problem is, things they are doing today are very sophisticated software functions." Scheff said "research" is working to develop a new language, a hardware independent language. Don't look for it anytime soon, though. In fact, Scheff didn't say when to expect it, only that it would be offered on the Phoenix at some point.

All this engineering turmoil has hit at a critical time for CPT, according to several industry analysts. They believe CPT's market niche is just beginning to come under siege from an army of small systems sold by IBM, DEC, Wang, Tandy, and the Japanese. They offer word processing, data processing, and office automation applications under one cover, and often at a third the cost of a CPT machine.

"With all the new competitors out there, CPT is going to find less and less room to sell and grow," predicted Dale Kutnick, director of research for the Yankee Group, the Boston-based research outfit. CPT dealers, who cover 500 U.S. cities and 60 foreign countries, say the pinch has yet to hit. Why is business still booming for high-priced word processors? "We don't try to sell feature for feature against other systems," began Dan McLauchlin, president of CPT Calif. Inc., San Diego. "What sells CPTs is the system's ease of use, our local service reputation, our responsiveness to our customers, the fact we are an independent sales organization and can make quick decisions, and, when you get right down to it, the sales guy and his relationship with the customer."

Although sales of one or two machines into small to medium-sized companies still represent CPT's basic mode of operation, back in 1979 CPT decided it was ready to take on the big boys and go after some national accounts. "We win some and we lose some," quipped McLauchlin, "but one thing for sure, the large companies are looking at us as a very viable competitor." In the past six mohts, McLauchlin said he has added six national accounts to his list of customers.

Kutnick still maintains CPT is "living on borrowed time." There is, however, one issue on which Kutnick and Scheff appear to agree. "Not getting into personal computers was a wise decision," allowed Kutnick. "That's nothing but a bloodbath. But where does the company go now that personal computers that can stand up to a CPT system are starting to hit the market? CPT should be in the systems business offering networking products, shared systems products with hard disk drive, and everything else. They don't have graphics, they don't have a 16-bit processor."

Scheff says CPT doesn't need a 16-bit microprocessor. He claims CPT's MOL language running on an 8-bit 8080 can "run circles around IBM's 8086," citing "page-up" speed as an example. "It takes the IBM machine four times longer than a CPT machine to page up," said Scheff.

As for graphics and a network, they are coming, Scheff assures. In fact, a network was introduced this year at the Hannover Fair, but it's not ready for the U.S. market just yet. Graphics, according to the company, is planned for Phoenix, the next generation CPT machine slated to make its debut by the end of fiscal 1983, which closes June 1982.

Scheff claims that ODL, his "local network," stirred quite a bit of interest at Hannover Fair.

Scheff claims that ODL, his "local network," stirred quite a bit of interest from customers dropping by the CPT exhibit booth at Hannover. It was designed by Datus, a German company, and is best described as a simple data switch, a simple data PBX, said Ken Thurber, president of Architecture Technology, which publishes a monthly newsletter for the local networking community. After reviewing Datus specifications and seeing a demonstration of ODL at the CPT Hannover booth, Thurber summarized his views on the Datus/CPT network in the April and May issues of the *LOCALNetter* newsletter: "It has an internal bus speed of 16 megabits per second and two protocol conversions included in the switch, with five more expected by December," reported Thurber.

The Datus product, according to Thurber, merely connects one station to another station via a phone line link. A user

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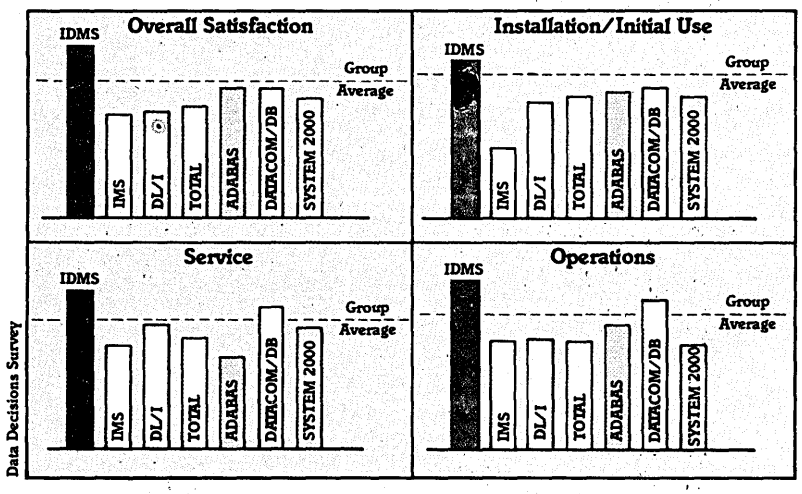

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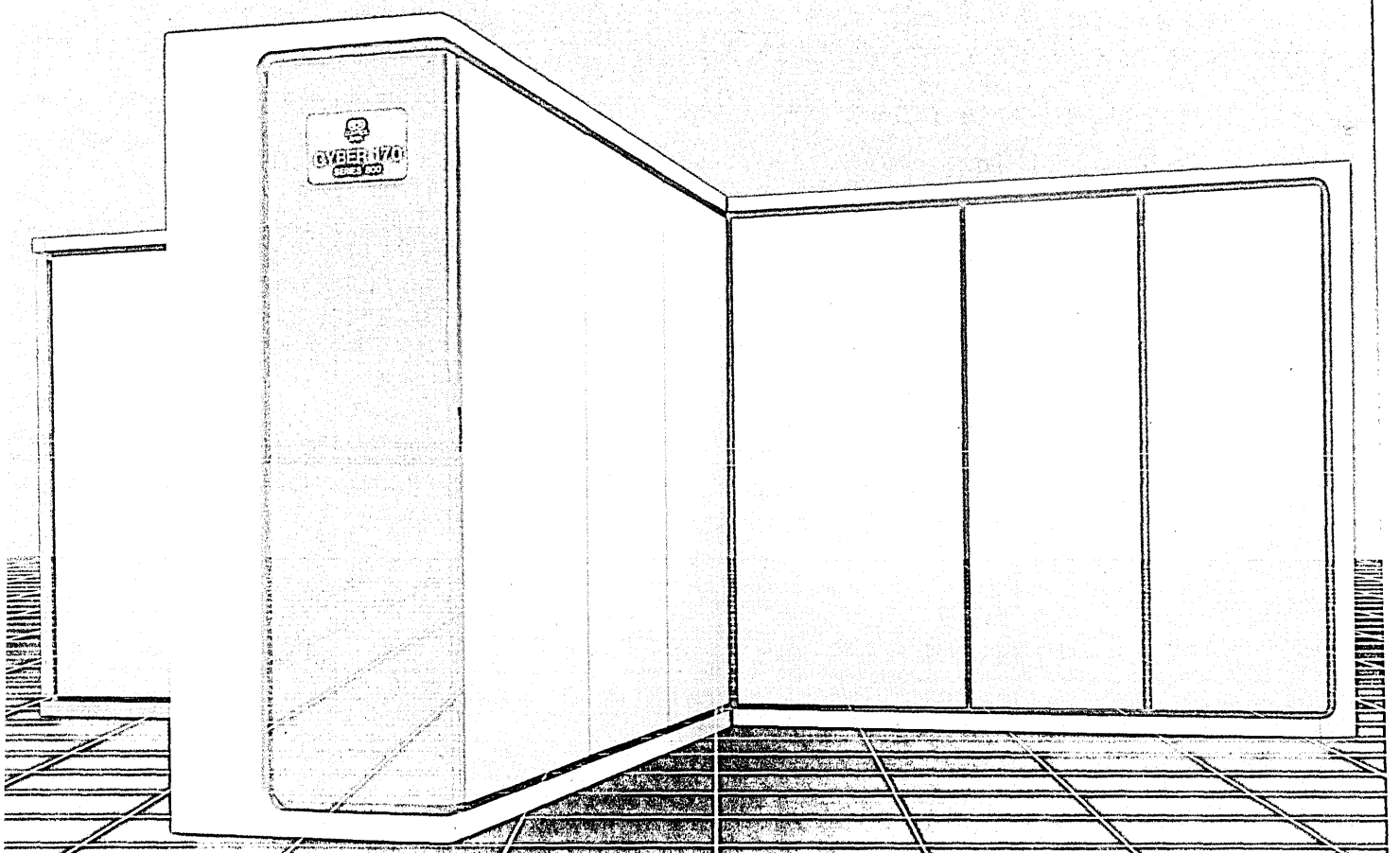

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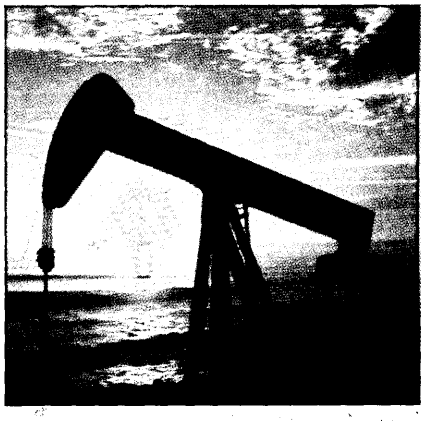

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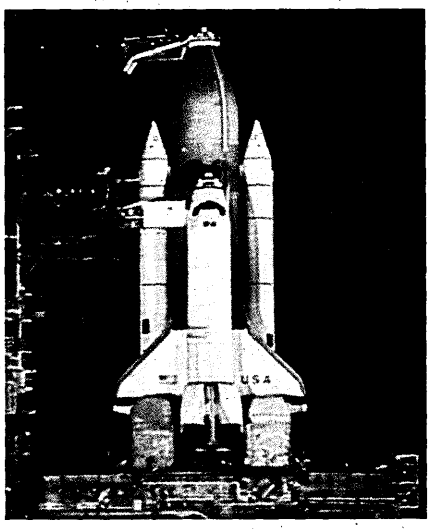

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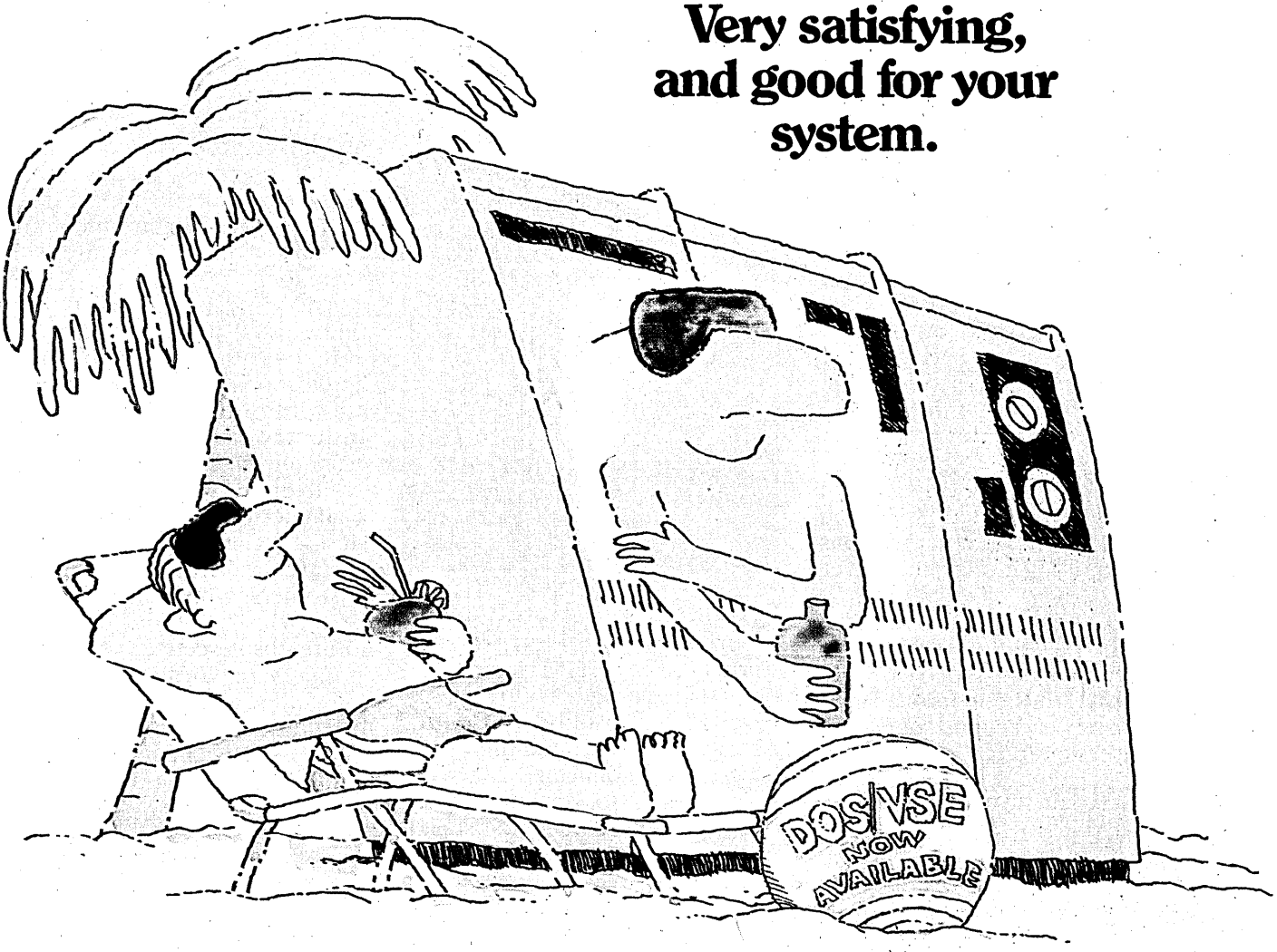

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puts in the number of the station and the device dials up that station and makes the link. It talks to one station at a time, and only does "low-level protocol, performance, and code matching," said Thurber. It does not implement "the higher levels of the ISO reference model for communications between non-like devices." In his opinion, the product is not an "advanced network and barely qualifies as a local network."

At present ODL has little of CPT's imprint on it. The product has yet to be "Americanized," admitted Scheff. Taking on Datus, though, means CPT has to take on a lot of engineering responsibility. Since Datus is not a manuacturing company and basically builds "one-of-a-kind things, we've got to modify the hardware so it can be built in quantity and eventually blend their software into our organization," revealed Scheff. Although *LOCALNetter* indicated the word from Hannover was that delivery of ODL was to begin this December, the company has not made any delivery date promises to its U.S. dealers, confirmed several of them. The reason for this cautious attitude toward delivery dates appears to be closely tied to the recent problems on the home front.

After Gary Holland's abrupt January departure as president of CPT (March, p. 73), CPT's engineering organization ruptured. "Engineering is so badly fragmented and demoralized as to be rendered nearly ineffective," related CPT engineers in a May memo sent to management. They saw the March 23 firings as "insensitive and arbitrary," pointing out in the memo that some "very competent people who were doing their jobs exactly as they had been assigned were terminated. . . . Competent people whose function had been eliminated were given no option to assume another function—they were simply terminated. They were given no opportunity to respond. When management has been pressed to explain or justify why particular actions were taken, it has had no answers. None of the involuntary termination policies in the employee handbook or supervision manual appear to have been followed, but no one outside of engineering seemed to care. It became an almost universal observation that the people in charge of the [termination and subsequent reorganization] action had no idea what they were doing.

"This feeling still persists and there does not seem to be the direction or the leadership to get things going again. The bottom line is that some projects are already behind, many others are in far worse shape than they were, and some are simply undefined. Given the present situation, in six months products expected from this organization are going to be in serious trouble." Among those projects are ODL and a database management project based on chips coming out of Intel.

Scheff's comment to this state of affairs: "How could so many cost so much and do so little? We just terminate people who don't want to work." The question is how did things get so out of whack? Part of the answer is unabashed politics and power games on both sides—engineering and research—running amuck.

If CPT does not somehow find a way to manage engineers, research will have to shoulder most of the responsibility for product failure as well as product success. It will be the only technical group within CPT with any sense of product history and continuity.

—Jan Johnson

TRADE GROUPS

WORLD POLICY POWWOW

The international delegates compared notes, discussed the future, and agreed not to form another organization.

Delegates to the first International Information Industry Conference came to Quebec City not to praise organizing but to bury it.

"In the first 20 minutes, everybody agreed there would be no new organization," said Vico Henriques, president of the Computer and Business Equipment Manufacturers Association. CBEMA had joined with trade associations of the 10 other countries, as well as Eurobit, the leading European group, in a quest for common ground on global information issues.

"No secretaries, no staff, no directors," Henriques reported. "Even if all we did was talk to each other, we were unanimously against another bureaucracy. There are far too many already. The last thing we need is another super organization."

What they've got is hardly such an entity. There are no secretaries, directors, or staff. There is no home office, cable address, TWX number. There are no goals, no bylaws, no articles of incorporation.

So what hath the delegates wrought after four days of wrangling? Henriques could do no better than "federation," a description which would cause Captain Kirk and Mr. Spock to abandon the *Enterprise* and resign. Conference chairman G.G. Murray, vice president, general counsel, and secretary of IBM Canada, didn't even proffer a noun in his closing remarks. The first amoeba certainly had more structure and quite possibly, more direction.

"We concluded that our first priority should be to make sure that all our associations are 'au courant' on these matters, particularly as they relate to our international relations," said Murray, immediate past president of the Canadian BEMA, the host group. "Secondly, we concluded we should compare notes on the way in which we believed that many of the key public policy questions should be resolved.

"As a result, each of the associations represented here has undertaken to become the focal point for a specific issue and to gather information from around the world as to the current trends and likely resolution of that particular issue."

That does not mean the issue is likely to be resolved. Each country's association becomes the focal point, or "synthesizer," for at least one of the dozen or so issues on the group's verbal agenda. CBEMA, for example, will handle software protection and trade barriers. The information will be transmitted in a report—not a position paper, as those involved repeatedly emphasized. The synthesizer will then circulate the report to the other associations. Tentative plans call for a small group—members to be determined at a later date—to get together before the end of the year, probably in October, to review the findings and prepare for a larger, more formal meeting in early 1983. That gathering will focus on a few selected topics and attempt to determine if there is any worldwide industry consensus on those issues. Potential resolutions, if any, will also be discussed.

"We decided to get together and talk because there's obviously something there," Henriques said. "Commonality overrode nationalism. We recognize there's a hell of a need for cooperation." CBEMA chairman Glen Haney proffered a similar scenario on the national level at the organization's spring meeting (May, p. 48). That organization would require a structure, in which CBEMA sees itself as the head carpenter. But the first board has yet to be nailed, putting it several stories behind the international version.

"I think this will enable all of us to better communicate with the public," Henriques said. "We can share among ourselves and make the local associations stronger. And if we reach a broad consensus, when we talk to our domestic counterparts we can cite the worldwide industry view. This is not a giant step. But it's a good beginning." For some it was barely a seed in the global information garden. Closing the telecommunications portion of the conference, Honeywell Information Systems president Stephen Jerritts championed the cause of a new worldwide focus on developing information industry policy to maintain an open, competitive environment.

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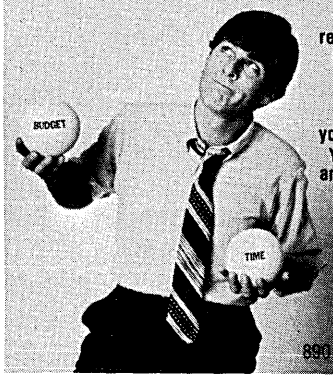

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NEWS IN PERSPECTIVE

transactions now done through information processing, the incompatibility of systems is a problem which hurts productivity, and in the future, the incompatibility of systems will be an even more serious problem.

"The solution necessarily involves a focus on worldwide information industry policy formation. The problem of developing the requisite policy agreement and standardization is too complex to be addressed on a fragmented, piecemeal basis by supplier, user, and government organizations. In effect, what is needed is master planning and master scheduling—a role which can only be effective if it has broad support and participation of the traditional policy- and standard-forming bodies. National and international information policy and standardization must be developed under joint participation of all involved parties—users, suppliers, and government."

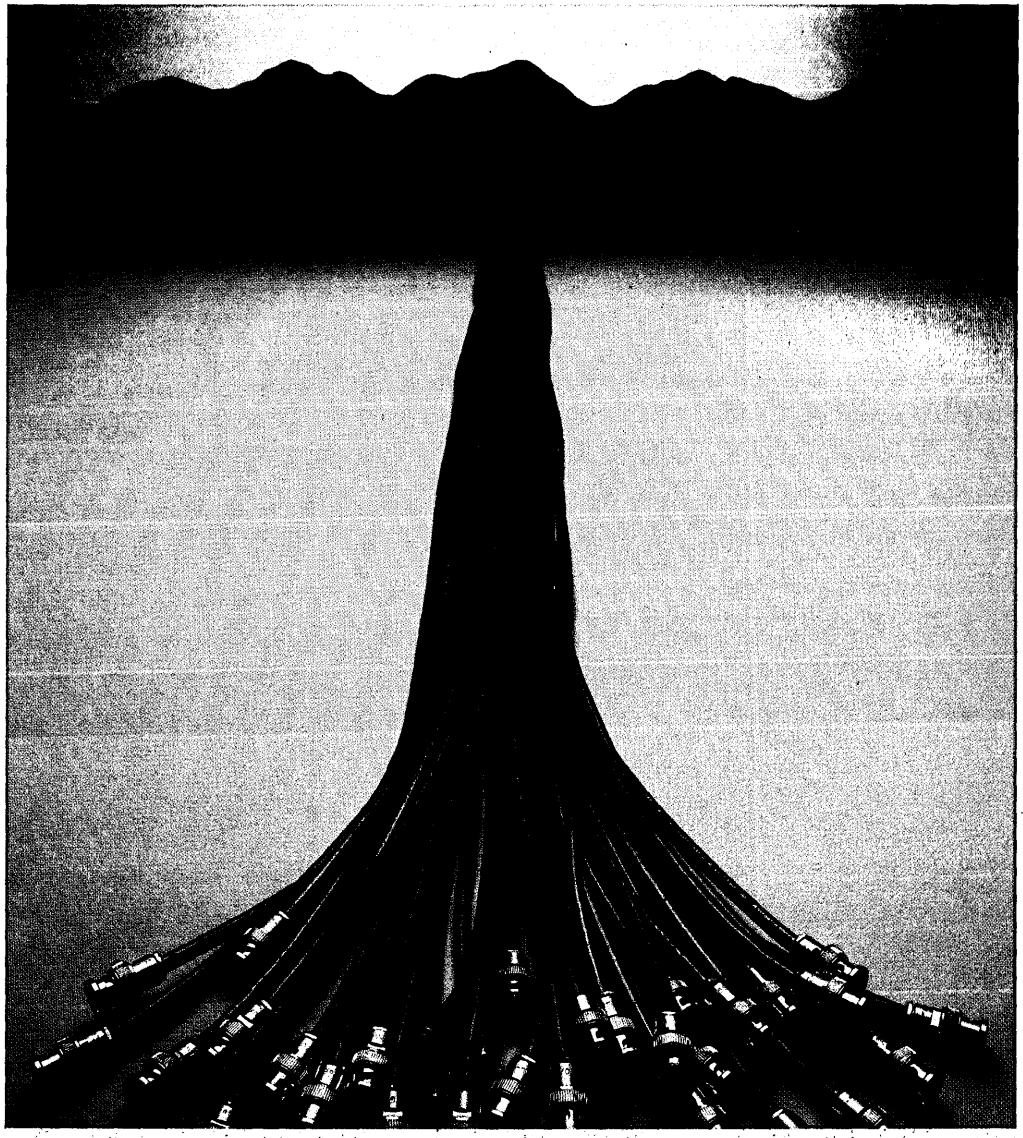
In Jerritts's scenario the body resulting from that participation would plan, coordinate, and monitor various standardiza-

There are no secretaries, directors, or staff. No goals, no bylaws.

tion and industry efforts. The group would develop a framework for discussion and resolution of industry-wide policy, part of which would involve standardization. The ensuing focus on the new information order—whatever the life form of the organization—would: 1) delegate development of related standardization areas to specific organizations; 2) ensure balanced participation in setting industry policy by users, suppliers, and other appropriate groups, representing the full spectrum of the information industry; 3) ensure that standards are developed to address a high enough level in system architecture to allow suppliers the freedom to develop legitimate product differentiation and innovation in product functionality; 4) establish and monitor a time schedule for completion of planned accomplishments and milestones; and 5) encourage adoption—at the national level—of information industry policies that are consistent with worldwide policies.

Accomplishing this would be neither a small nor mean feat. In column A, we have the totally new organization. Chances of that? Nil and zilch. In column B, we have the enlarging in representation and influence of an existing organization, such as the GATT (General Agreement on Tariffs and Trade). With either choice, time is of the essence. "What these countries are doing here is only a small piece of what I'm talking about," Jerritts said. "I'm talking about something much broader.

"We are really in a screwed-up situation now, and unless we do something immediately, things will get even worse. And the U.S. is the worst offender. At least the European PTTs (Postal Telegraph and Tele-



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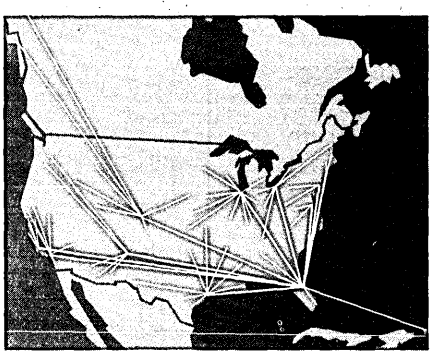

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phone associations of each country) have joined and said 'this is the way it will be.' It's politically impossible to have a PTT in the U.S. We've got a consensus that the need is there. The vehicle itself may be secondary to that. We have to get the policies and standards out and known so everybody plays under the same rules."

The scope of the rules and the condition and dimensions of the playing field consumed much of the attendees' energy. International trade, telecommunications, and informatics stole the show. Ergonomics interfaced fairly successfully. Standards totally failed to measure up.

"We are in crisis and the outlook is gloomy," warned William Kelly Jr., deputy director-general of GATT. "The combination of unfavorable world economic factors has led to protectionist pressure in all countries for restrictions on imports and for subsidies on exports. I emphasize, however, that we are talking about protectionist pressure, because relatively few protectionist measures have actually been imposed. So far at least, governments have generally held the dike against these mounting pressures. In today's economic climate it is somewhat remarkable that this has been accomplished."

Ergonomics interfaced fairly successfully. Standards totally failed to measure up.

No less stunning are the tariff reductions cited by Kelly as proof of GATT's effectiveness that the sky is not falling completely. Following the Tokyo round of multilateral trade negotiations, most tariffs have been reduced to less than 5%. Kelly then noted the severe problem of disputes being dealt with outside the framework of the GATT rules and urged countries to work within those rules.

Michael Smith, deputy U.S. trade representative, examined the practice of government support of high technology and found all save one guilty. If you guessed the U.S., you may accompany Mr. Smith to the November GATT ministerial meetings.

"Trade distortions caused by government intervention can strain the trading relationships that exist among industrial nations as well as between them and the newly industrialized and developing countries," Smith warned. "In the extreme, unrestrained intervention could induce government rivalries that tend to splinter global markets, reduce the pace of innovation, and impede application of discoveries to new technical products."

Smith kept his promise to be "controversial and undiplomatic." He defined high-tech industries as those engaged in extensive research and development and rapidly applying their discoveries to innovative products and services for expanding markets. "Does that include the automobile?" one observer wondered later. Smith placed the U.S. on the nonintervention end of the spectrum and Japan on the other. He also managed to chide Mexico, Canada, the European Economic Community, and the rest of the world for giving firms privileged access to domestic markets and substantial competitive advantages in foreign markets. He did, however, answer a question by admitting, "the U.S. doesn't claim to be without warts." Perhaps, then, it suffers from a shortage of toads.

Prof. Alphonse Chapanis alerted attendees to the problems of incorporating human factors (ergonomics to the rest of the cosmos) into standards. "Only by incorporating human factors into standards can we make this exciting new area of technology serve man for his benefit," said Chapanis, director of Johns Hopkins University's Communications Research Laboratory. "It is not something that can be done easily by a few casually chosen people in a few days. It will require persons who possess a wide range of knowledge in the field and are sophisticated enough to recognize the true dimensions of the problems they face." He was not inundated with volunteers.

Matthew Nimitz, former under secretary of state for science and technology, challenged the private sector to educate political and governmental leaders about technological advances and initiate a serious dialogue on their public policy consequences.

"Although the importance of informatics in daily life is quite extraordinary, most Americans would not recognize the work," asserted Nimitz, now a lawyer with a powerful New York firm. "Despite this pervasive impact, our policymakers know little about the informatics revolution. Whether out of indifference, intellectual fear, or plain ignorance, they at best only dimly understand the current level of technology, much less where the technology is headed. And yet these same policymakers are being asked to address fundamental issues with important consequences."

Therefore, the private sector must show them the way, the truth, and the light. There also must be an international dialogue, with both form and substance remaining flexible. Such talk would take years or decades. Perhaps somewhere in that continuum Nimitz will be able to revise upward his estimate of the number of government officials who understand U.S. information policy. "No more than six to 12," he told a questioner. There are some, of course, who think that already on the high side.

"This conference laid out some issues publicly that we have a great deal of concern about," CBEMA's Henriques said. "We may already have accomplished something by not building a new organization." They may have also created a paper tiger.

—Willie Schatz

SOFTWARE

B/4 GOES RETAIL

A former Basic Four dealer is arranging the company's initiation into the retail market.

"It's software work that's driving the industry," said Stephen J. Keane, president, Basic Four Information Systems, Tustin, Calif. It certainly is what has driven MAI's Basic Four Corp. into the world of microcomputers and computer retailing.

The company, which long has been selling its small business computer systems through 21 dealers with 28 offices, 19 branches with 43 offices, 15 subsidiaries in 17 countries, and 25 distributors in 24 countries, now is gearing up for retail store distribution for its new S/10 microcomputer system that, with a video display and keyboard, sells for $5,995.

Responsibility for setting up the new distribution lies with Basic Four Business Products in Albuquerque, which also is responsible for software development.

This operation formerly was known as RCO and was a Basic Four dealer in Albuquerque. Basic Four agreed to acquire RCO last February; the acquisition was consummated in May. Pat Riles, its president, reports to Bill Ribgy, vp of marketing in Tustin.

The key to the new system, said Keane, is BB/M (Business BASIC/Micro), its operating system. This was written by RCO specifically for business applications. All application programs written for BB/M can be easily upgraded or converted to run on all other Basic Four systems. Keane said RCO began development of BB/M as a result of two contracts, one from the state of New Mexico and one from the state of Arizona, which exposed them to the proliferation of microcomputers in business environments.

The S/10 is being manufactured for Basic Four Business Products by Direct Inc., Sunnyvale, Calif., with a close working relationship with the Albuquerque group. The system includes "our specially designed firmware," said Keane.

In addition to BB/M, the S/10 will operate under Digital Research's CP/M.

It is based on twin Z-80 microprocessors and incorporates two dual-density, 5 ¼ in. floppy disk drives of 600K bytes each and internal memory of 128K bytes. A pair of RS232 serial input/output ports is standard.

Keane said the lining up of retail distributors is about half done and he expects retail distribution to be underway by the middle of the fourth quarter of this year.

— Edith Myers

NEWS IN PERSPECTIVE

BENCHMARKS

RESURRECTION: IBM and the government claim their battles are over with the dismissal last January of the 13-year-old antitrust suit. But Judge David Edelstein thinks maybe the dismissal is subject to scrutiny under the so-called Tunney Act, which gives the public a chance to comment on proposed consent decrees. Mid-May saw the judge presiding over a hearing at which two friends of the court, philanthropist Philip Stern and Ralph Nader's Public Citizen Litigation Group, presented arguments that the Tunney Act does indeed apply in the dismissed case. IBM argued that Edelstein is prejudiced against the computer company and asked that he step down. The judge declined, and maintained his "only concern was to protect the integrity of the judicial process and to protect the public interest." An unrelated congressional investigation is currently underway to see if the intention of the Tunney Act does apply to dismissals. Some observers have said that Edelstein's post-dismissal concern stems mainly from his disgruntlement at not having any say in the conclusion of a case he had heard through such a long decade. IBM and the government's central argument against the judge is that he no longer has any authority over the case which itself ceased to exist in January when it was formally dismissed.

REORGANIZES: Burroughs Corp. has targeted specific industries with the establishment of a new Industry Systems operation that will handle engineering, manufacturing, and product planning for products and services aimed at financial, commercial, and manufacturing industries. The new operation will be responsible for selling the firm's new B20 small computer, which is built for Burroughs by Convergent Technologies. The 16-bit B20 is to be sold in a variety of configurations ranging from standalone small business computer to full-fledged distributed processor communication with a mainframe. As part of what chairman Michael Blumenthal says is a "new" Burroughs, the firm has structured itself similarly to the recently reorganized IBM with certain groups responsible for selling and product development in different market areas. Industry systems, for instance, will also handle terminals, software, document handling, and related items that are geared towards its industrial markets. Heading that group will be William P. Conlin, senior vice president.

REWORKED: American Telephone and Telegraph has upgraded its Dimension PBX (private branch exchange) switchboard with several products, including a computer to handle special applications, and a Distributed Communications System (DCS) that permits simultaneous transmission of data and voice on as many as 25,000 workstations and/or telephones. The introductions are apparently part of an effort to recoup some of the ground lost to innovators such as Mitel, Northern Telecom, and Rolm.

The Applications Processor minicomputer, which attaches to the switchboard, can be used for an electronic directory of employee phone numbers, or to record messages electronically when a telephone is not answered. When asked if the computer could be programmed by the user, an AT&T specialist said "not on this release," leaving room for the old suspicion that AT&T will eventually get into the computer business after deregulation.

DCS permits PBXs to serve not only as message centers, but to control a building's energy consumption by controlling a building's heaters and air conditioners. Bell Laboratories' new Data Communications Interface Unit (DCIU) connects up to a dozen Dimension PBXs in a DCS network along with their minicomputers. Using the system, a user can set up a data link and, while it is in use, make telephone calls. One of the new advanced calling features permits a Dimension to redial, if a shared computer port is busy, until the connection is made.

REPRIMANDED: After an embarrassing series of disclosures that its sales were padded and that profits were negative, Datapoint ousted five top executives and demoted another. Gone from the troubled San Antonio maker of distributed processing and office automation equipment are David B. Pearce, vice president of operations planning and analysis; Steven H. Haber, director of corporate credit and collections; Robert H. Oliver, director of administrative operations for the marketing division; G. Millard Allen, vice president of sales operations; and Steven D. James, staff vice president for special projects. Each was asked to resign.

In a related move, Richard V. Palermo, a member of the board since 1979 and executive vice president in charge of domestic operations, lost both of those posts and was named a vice president. His duties were taken over by president and chief operating officer Edward P. Gistaro. The moves were just the latest in a series of layoffs, plant closings, and salary freezes that have rocked the once solid company in recent months. Finally, financial results for the last few quarters were to be looked into by an independent auditor, according to a spokesman.

REVAMPED: National Advanced Systems boosted its high-end of IBM-compatible mainframes with a pair of machines built to its specs by Hitachi of Japan. The M-280H computer, marketed by Hitachi in Japan as a noncompatible machine, will be modified to enable NAS to compete with high-end machines offered by IBM and Amdahl. Scheduled to be available will be the 12-MIPS model 9060 and the dual-processor 20-MIPS 9080. Each will be able to support IBM's new 31-bit extended architecture (XA). The new machines are scheduled to be available by the end of this year. In related developments, NAS cut prices between 3% and 15% on the other three models in its AS/9000 series and said it would market a 43-MIPS Hitachi machine in the future once some operating system questions are resolved. NAS said it has received orders for more than 45 AS/9000 processors since shipments began in December 1980.

REMORSE: Former IBM salesman Richard H. Monks has pleaded guilty to income-tax evasion for money received in connection with the massive O.P.M. Leasing Services fraud. Monks, according to government attorneys prosecuting the case, sold O.P.M. confidential IBM customer lists and blank IBM invoices that were used to perpetrate the fraud. He was said to have received as much as $50,000 in payments from O.P.M. in exchange for his help. He worked for IBM from June 1967 through April 1978 and now faces a maximum of five years in prison, a $10,000 fine for tax evasion, and a $5,000 fine for filing a false tax return. More indictments are expected from the case, which is being prosecuted by Audrey Strauss, Assistant U.S. Attorney in Manhattan. So far, the main men in the fraud, co-owners of O.P.M. Mordecai Weissman and his brother-in-law Myron S. Goodman, have pleaded guilty and are cooperating with Strauss in her investigations. The total fraud is understood to have reached a value of over $200 million and involves several large mainframe users and Wall Street financial houses and insurance companies.

REVENGE: As reported in these columns (April 1982), some enterprising New Jersey entrepreneurs set up Franklin Computer Corp. to build personal computers that would be software- and peripheral-compatible with the popular Apple II machine. Apple has sued Franklin, claiming the firm has violated patents and copyrights and has engaged in unfair competition and misappropriation. Filed in U.S. District Court in Philadelphia, the suit seeks injunctive relief and the amount of profits Franklin makes on sales of its Ace 100 computer. Franklin's immediate comment was that the action was merely a nuisance suit designed to keep Franklin out of the lucrative Apple market. "It is without merit," said Barry Boden, chairman and chief executive, adding that Franklin's production plans still call for about 2,000 machines to be shipped each month by September. Franklin had been ready for such a suit from the beginning, it said. Industry observers see the Apple II's life as extending far into the future, in similar fashion to the Ford Model T. ✲

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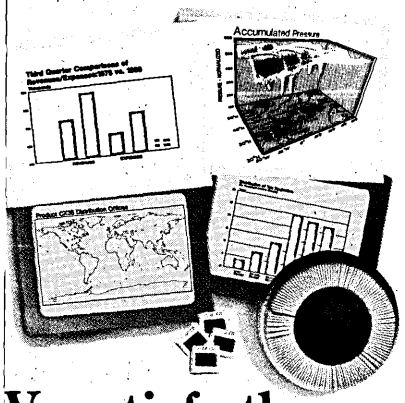

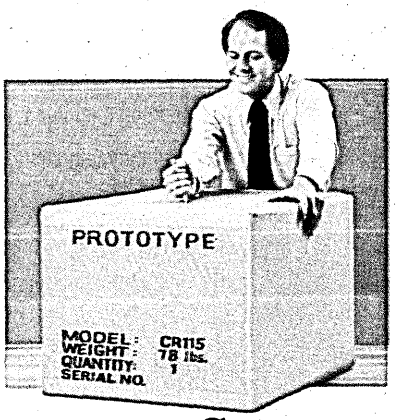

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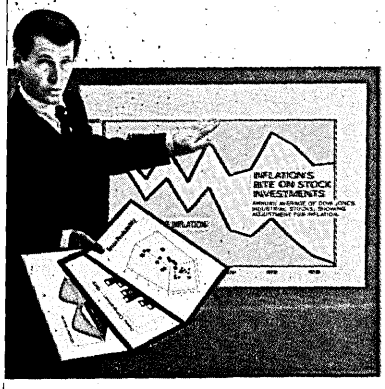

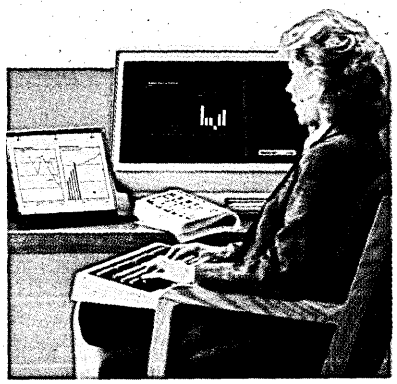

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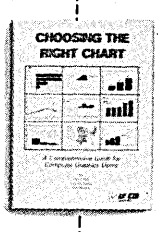

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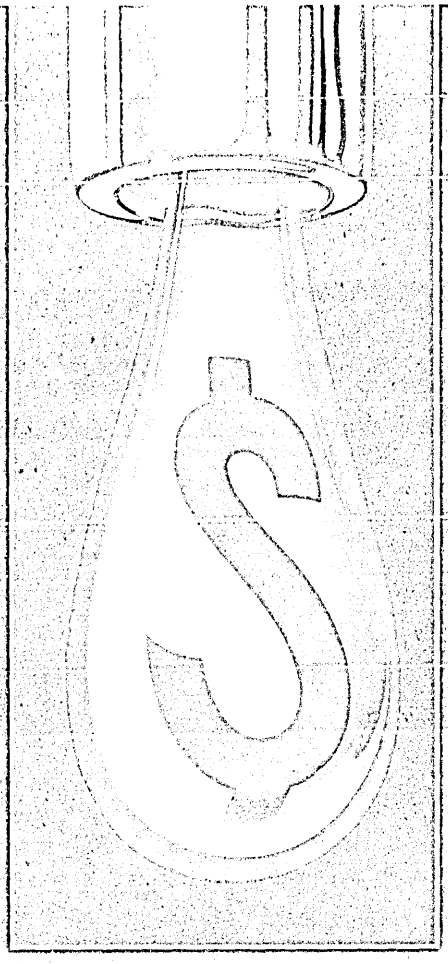


1982 BUDGET SURVEY:

MAKING EVERY DROP COUNT

by Englebert Kirchner

Despite complaints about the economy, dp spending has escaped relatively unscathed—especially when compared to other organizational functions.

"We're spending as little as possible."

That comment, from the dp manager of a medium-sized manufacturing company, sums up the most obvious finding of DATAMATION'S latest annual survey of dp budgets across the country. In what may well prove the worst year, economically, since the Great Depression, the typical description of current dp spending plans tends to be something like "holding the line," "just maintaining the status quo," "making do with what we've got," or even a blunt "We're not purchasing equipment this year."

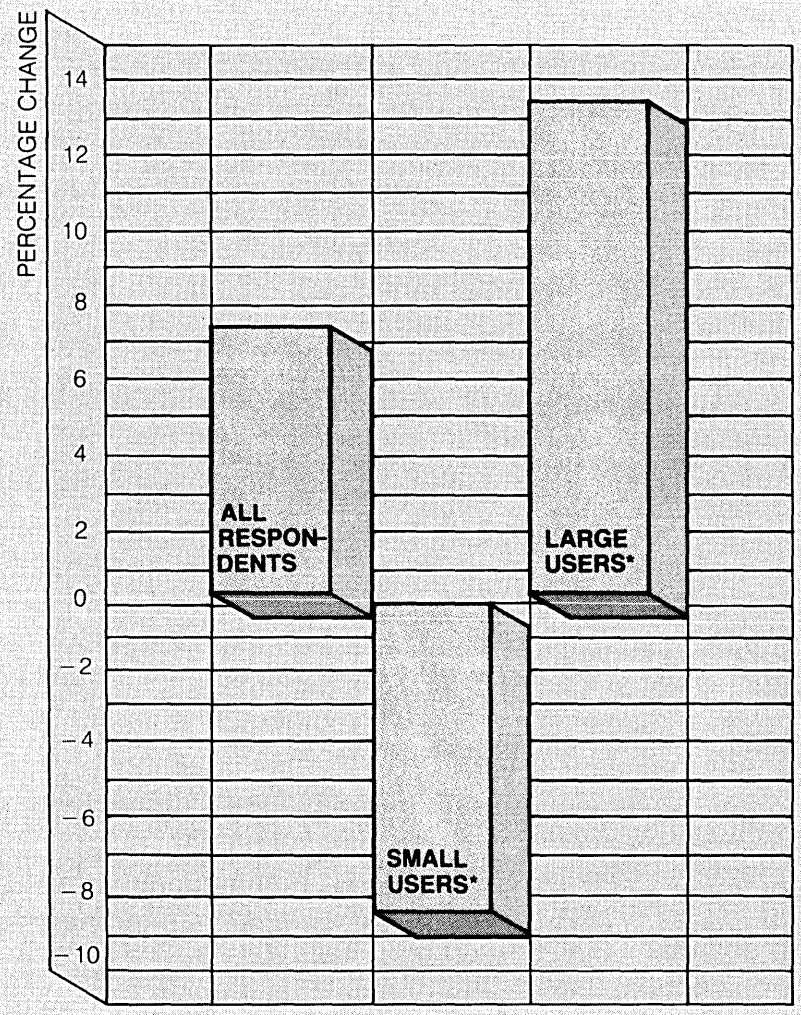
Such glum comments are confirmed by the most basic numerical result of the survey: the average dp budget for 1982 will be up over last year by only 7.3%. That, of course, means no real growth, since it is less than the probable inflationary increase this year, which even the most enthusiastic supply-siders expect to come to at least 7%.

Most dp budgets, moreover, will not be up even by as much as 7.3%. When the survey responses are broken down by budget size, it turns out that small users (with annual budgets of less than $500,000) plan on an average reduction of 8%, while the very largest users (with annual dp budgets of over $1 million) expect an average increase of only 4.3%. The reason for the higher and somewhat skewed overall average is that a relatively small number of medium-sized users (with annual dp budgets of $500,000 to $1 million) plan on sharp increases of up to 50%. Puny overall growth totals and ubiquitous complaints about the recession do not, however, tell the whole story of current dp spending. Other comments and other figures reveal that dp has remained relatively unscathed by the recession—certainly when compared to other basic organizational functions. Although it is, by a wide margin, the most novel of these functions, it is by now just as clearly entrenched and "established" as the others. As the comments of many survey respondents confirm, this means dp has become extensively routinized and has lost much of the innovative excitement it still had a few years ago. But the flip side of this coin seems more important: fully "established," dp appears in no danger—not even in a record recession—from any "last-in, first-out" syndrome.

Commenting on this contrast between external pressure from the economy and a strong internal position, some dp executives sound almost schizoid. For example, the dp manager of a large materials handling operation, asked about the forces that shaped his company's current dp budget, reports, "We've had drastic fiscal cutbacks recently due to the economic mess." But then, explaining the differences between his budget this year and last year, he says, "We're adding new applications, upgrading equipment, and adding personnel."

FIG. 1

AVERAGE DP BUDGET CHANGE '81-'82



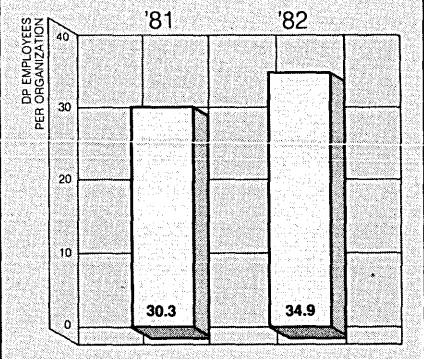
*"Large users" are organizations with an annual dp budget of $500,000 or more.

Personnel planning in fact offers one of the clearest pointers to how much dp has going for it as a corporate function these days. In the average organization, our survey shows, dp staff is expected to increase by some 15% this year, while total employment will go up only by around 2%. As might be expected from the overall budget figures, medium-sized users report the most ambitious plans for dp personnel expansion, and even small users expect an average increase of 7%, despite their plans to bring down dp budget totals. The typical explanation for this discrepancy is that medium and small users expect higher personnel spending to pay off in more cost-effective use of equipment. Most large dp shops, by contrast, say they expect no change in the size of their staffs.

Dp spending plans also show an up-

FIG. 2

AVERAGE DP STAFF '81 VS. '82



CHARTS BY CYNTHIA STCDDARD

ward trend when measured against total revenues expected for 1982. The result, of course, is a very small fraction, which has to be taken to two decimals before a change shows up, but the change is there: from 0.39% in 1981 to 0.40% this year. When these overall figures are broken down, the change becomes more readily apparent. Small users expect their dp spending to rise from 0.6% to 0.7% as a proportion of total revenues, and larger users (with annual dp budgets exceeding $500,000) predict an increase from 0.2% to 0.3%.

A breakdown of survey results by economic sector shows manufacturing companies (which accounted for roughly half the survey sample) and government agencies to be the ones mainly responsible for the general hold-the-line impression. On the average, their dp budgets will remain what they were in 1981, and their dp employment will be up only slightly. By contrast, financial institutions expect average increases of 50% in dp budget and 24% in dp personnel, while for retailers and distributors these average increases come to 13% and 22%. Not surprisingly, educational institutions make up the only sector for which the average dp budget is down in 1982—by 31%. Even they, however, expect an average rise of 12% in dp employment.

STABILITY OF DP FUNCTION

Schools and universities, as a group, were the only ones to respond atypically when asked if their current dp budgets are significantly different from last year's, with roughly two thirds reporting such a difference. In all the other sectors, only about one third of the respondents gave this answer. This obviously can be counted as further evidence of the stability the dp function has attained, as can be the 73% of the respondents who said they feel what's happening to their dp budgets is typical of their sectors of the economy rather than in any way peculiar to their organizations.

A common problem of dp managers in virtually all economic sectors is that a sizable chunk of the dp budget is effectively beyond their control. Our 1982 survey shows that 21% of the average respondent organization's total dp spending either is not included in the dp department's budget or is accounted for by transactions in which the dp department figures merely as the purchasing agent for some other part of the organization. Approximately this level of "off-budget" dp spending holds for all the sectoral groupings, excepting only the government agencies, whose off-budget average is a mere 7%. The survey also shows, however, that off-budget dp spending isn't spreading like widfire: on the average, it will go up this year by no more than some 11% (though that is, of course, more than the increase expected for total dp expenditures).

That dp departments are not in any imminent danger of losing their grip is also confirmed by the answers to some survey questions about dp centralization. Only 6% of the respondents described their organizations' dp setups as "strongly decentralized," while 77% went for "strongly centralized" and 17% for "a mix of both types," Moreover, only 8% of the respondents report that their organizations plan to decentralize their dp operations within the next two or three years.

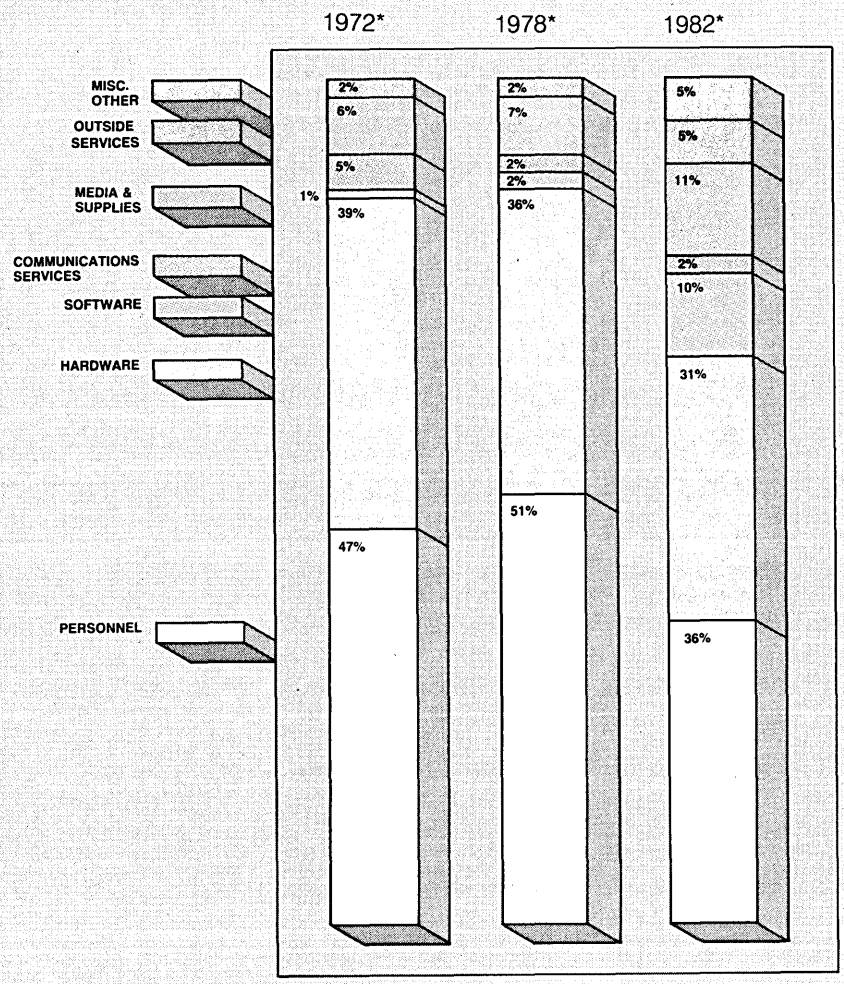
Asked about the factors that most strongly influenced their current budgets, dp executives naturally gave answers that range all over the lot. The picture of two opposing basic forces again emerges, though, when one counts only the phrases used most frequently in response to this question: 27% of the respondents referred either to "hold the line" directives or to the depressed "state of the economy," while 12% cited one of the three most common reasons for higher budgets—"equipment upgrading," "hardware purchases," or "moving to distributed dp."

While in this response restraining external pressures figure more strongly than does the expansionary impetus of dp, just the reverse holds for the explanations given by the 36% of the respondents who feel their current budgets are significantly different from last year's. Some 30% of this group mentioned "hardware purchases" as the reason for a major change, another 8% cited "personnel costs," but only 14% spoke of "general cutbacks."

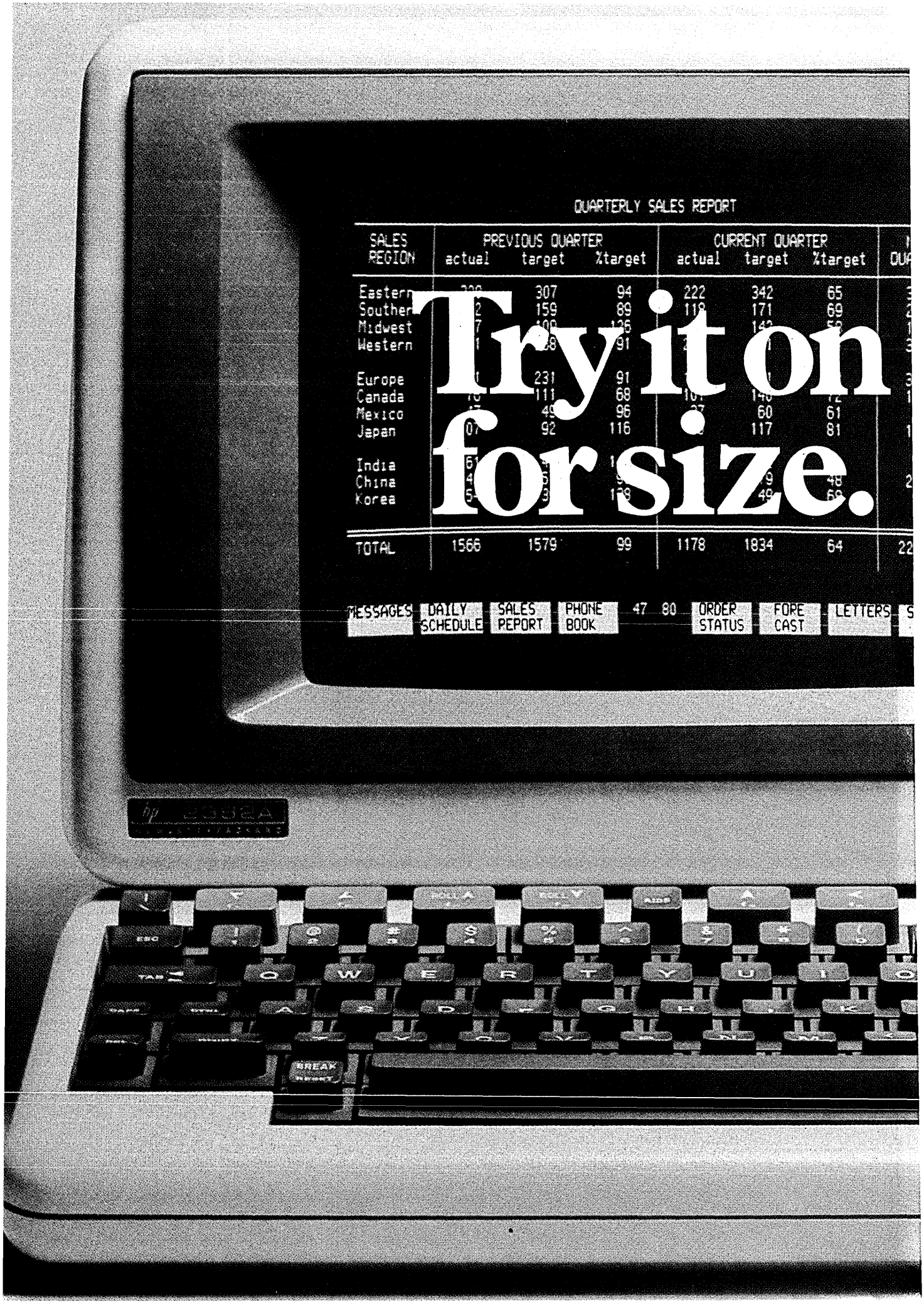
Applied to the entire survey sample, this 14% response describing general cut-

FIG. 3

DP BUDGET BREAKDOWN: THE 10-YEAR STORY



*Based on three different samples, yielding data that are not fully comparable and indicative of very general trends only.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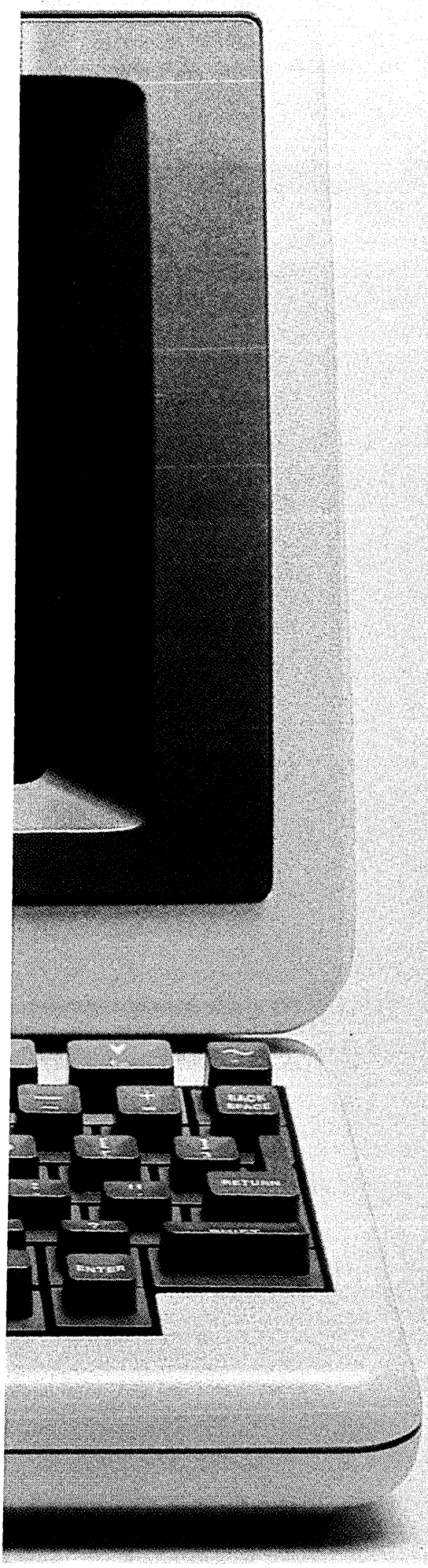

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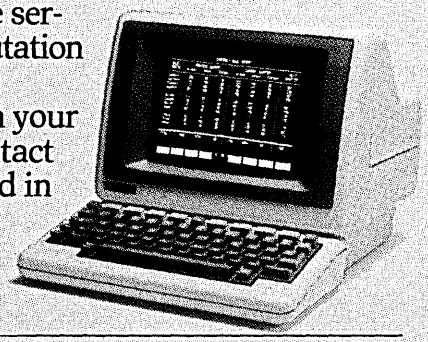

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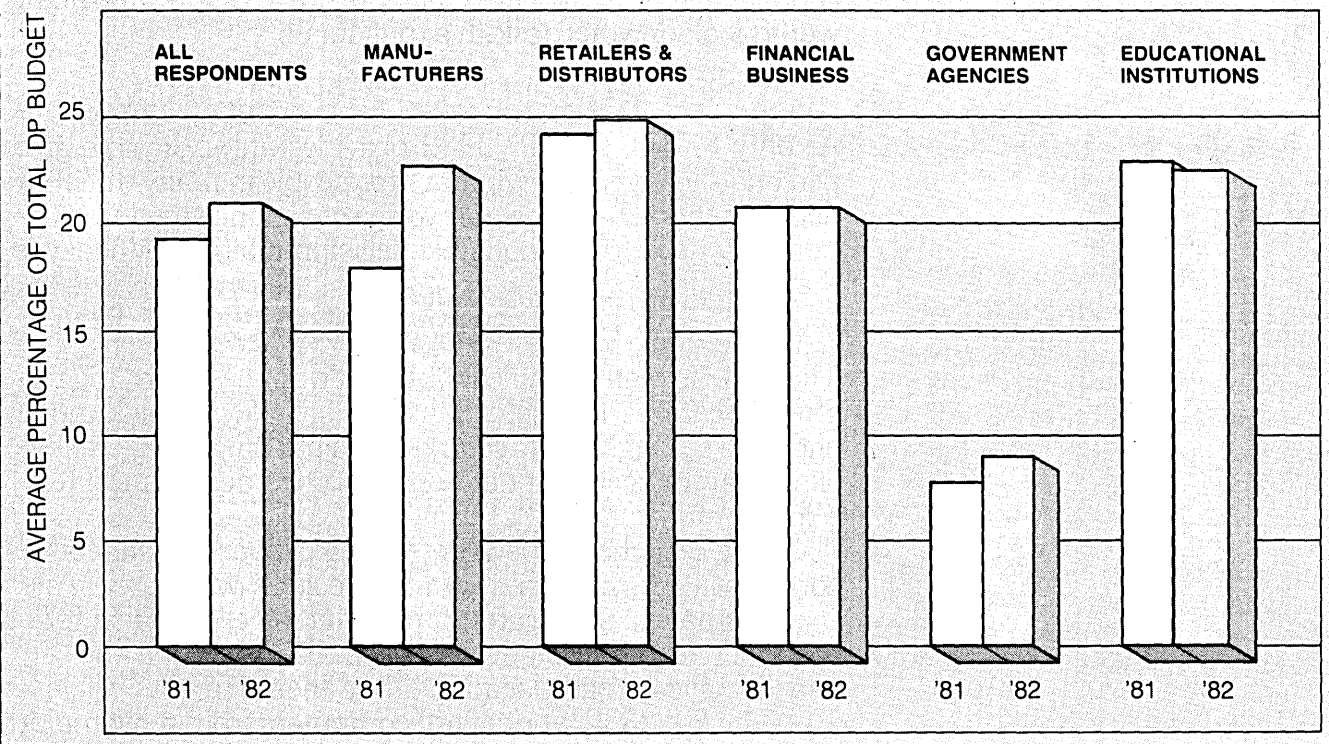
Keyboard reproduced actual size (11" wide); CRT appears slightly smaller because of photographic perspective.

CIRCLE 40 ON READER CARD

FIG. 4

HOW MUCH OFF-BUDGET DP SPENDING?*



*Off-budget spending: all dp expenditures either excluded from the dp department's budget or stemming from transactions in which the dp department acts merely as the purchasing agent for some other part of the organization.

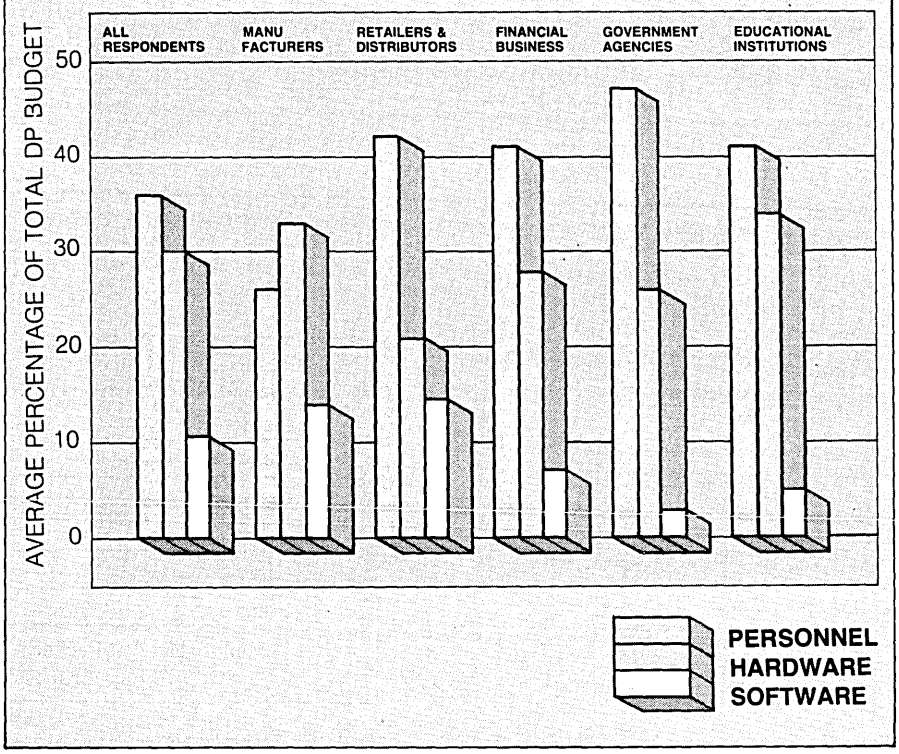
backs as a decisive feature of current dp budgeting of course reduces to about 5%. Yet, in response to other questions, 54% of all respondents agreed that their 1982 dp budgets had been affected by the state of the economy, and 41% agreed that their budgets were affected specifically by the current recessionary trend. Evidently many dp executives feel that, although the economy at large has had an effect on their budget, it has not been strong enough to constitute a significant change. And if some of them sound self-contradictory to the point of schizophrenia in describing this situation, that's because the situation is in fact fairly riddled with contradictions.

Another, less bewildering, point that emerges from the responses to questions about general economic pressures is that large users attach noticeably more importance to these than do small users. This obviously does not mean that large organizations are more at risk in a deep recession than small ones, but presumably it can be read as implying that large organizations are better at imposing effective cost controls—the kind that make a difference in the life of a department manager.

Little evidence of change, contradictory or otherwise, emerges from detailed breakdowns of current dp spending. When the average dp budget for 1982 is split up into its basic categories (hardware, software, communications services, outside services,

FIG. 5

'82 DP BUDGET PATTERNS BY USER SECTOR



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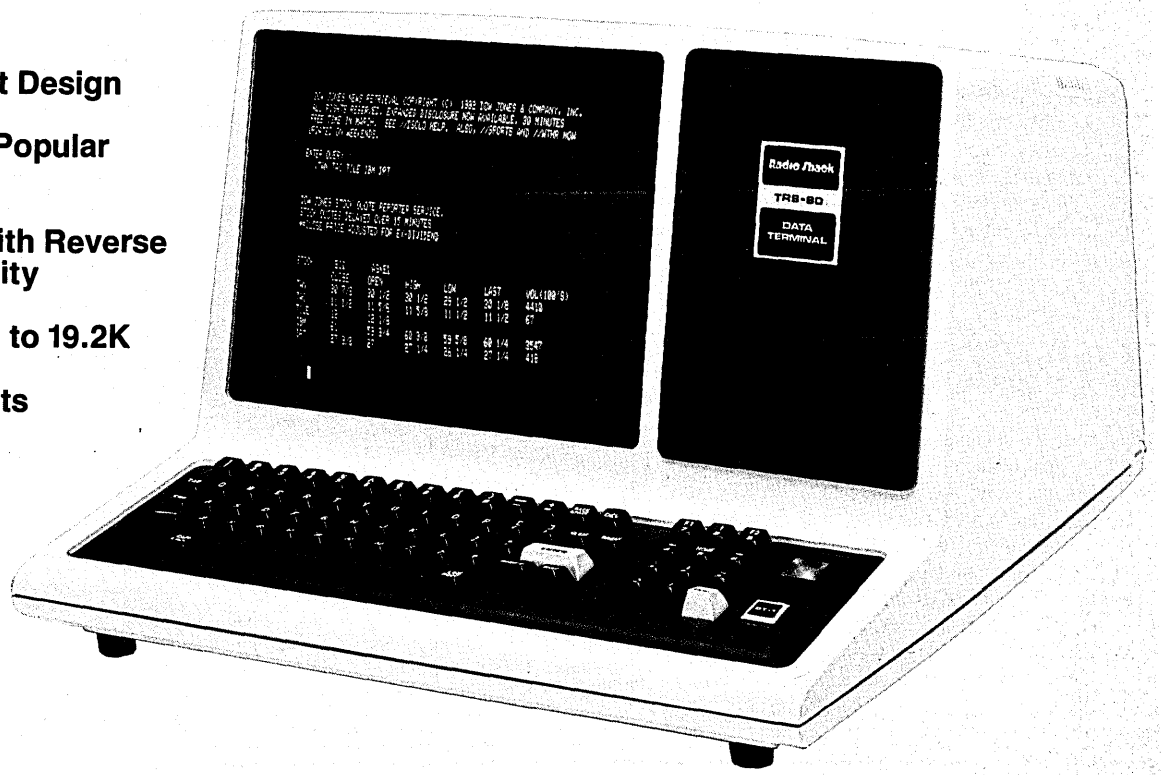

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CIRCLE 41 ON READER CARD

Half of the respondents predicted their dp budgets would remain essentially unchanged over the next three to five years.

personnel, and media and supplies) and compared to last year, no category shows a difference of more than one percentage point in its share of the budget total. Even when this breakdown is further refined by size and type of organization, only a few shifts stand out as possibly significant, and those all in a single category: manufacturers expect their average personnel spending will drop from 33% to 27% (in relation to total dp budget), while financial businesses and retailers and distributors report that theirs will be up from 30% to 41% and from 36% to 42%, respectively.

HARDWARE SPENDING PLANS

Nor does the picture change when hardware and software spending plans are broken down still further. In the average hardware budget, the biggest change is shown by the share going for cpus and memories, down to 8% from 12% last year. Otherwise, mainframes show a slight drop (from 26% to 23.5%), minis a very slight one (from 14% to 13%), and micros a slight rise (from 4% to 4.5%). This last set of shifts, moreover, does not apply across the board—it's largely accounted for by the financial businesses, which are sharply reducing their spending on mainframes and minis, and by educational institutions, which also are cutting back on mainframes but are allocating more of their budgets to both minis and micros.

An interesting point brought out by this breakdown may be one involving no change from 1981: retailers and distributors appear to be the users most interested in hardware for relatively novel dp functions. For them, the average hardware budget percentages of data communications, data entry equipment, word processing, and COM all are in the teens, whereas for all the other economic sectors these percentages range from zero (government agencies apparently have found no use yet for word processing) to 7.5 at the most.

The breakdown of the average 1982 software budget shows even less change. Operating systems, down from 34% to 29% make up the only category that's significantly different from last year. And again this is not an across-the-board trend—just about all of it is accounted for by the manufacturing and financial businesses. Also, it holds for the small users more than for large users, several of whom report, in fact, that they are allocating larger shares of their software budgets to operating systems.

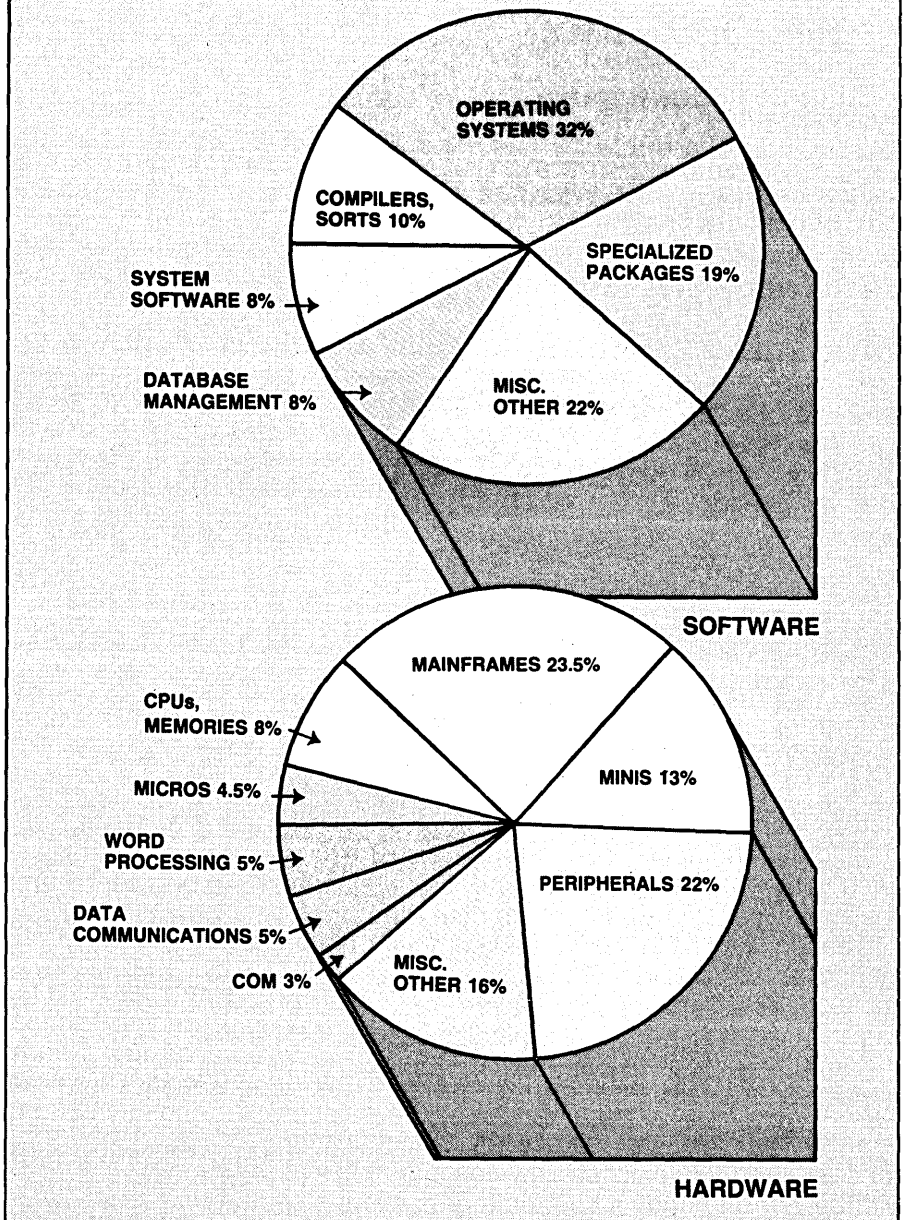
There has been a distinct general change, though, in software buying patterns. While last year 48% of all software purchasing was done from mainframe vendors, on the average, and only 40% from independent suppliers, this year it's the other way around: 45% from independents and only 42% from mainframe firms (with the mini and micro manufacturers a distant and essentially unchanged third at 13%). In this case, too, it's the manufacturing and financial businesses that are setting the trend among users, while the government agencies are bucking it—in their software purchasing, the average share going to independents is down.

Better than 80% of the survey respondents say that they feel their budgets were not significantly affected by new technological developments or by anything else that's happened recently in the industry they buy from. And among the small minority reporting that new technology had made a difference, the view expressed most often was very much a buyer's view, one straightforwardly preoccupied with the effects of the high cost of innovation.

Like many other implications of isolated parts of our survey, such evidence of little regard for what's happening in dp technology need not be taken at face value. When the respondents were asked if their organizations' recent experience was in line with the trend toward greater emphasis on data communications, some 55% answered yes. This response was particularly characteristic of re-

FIG. 6

FROM THE AVERAGE '82 DP BUDGET



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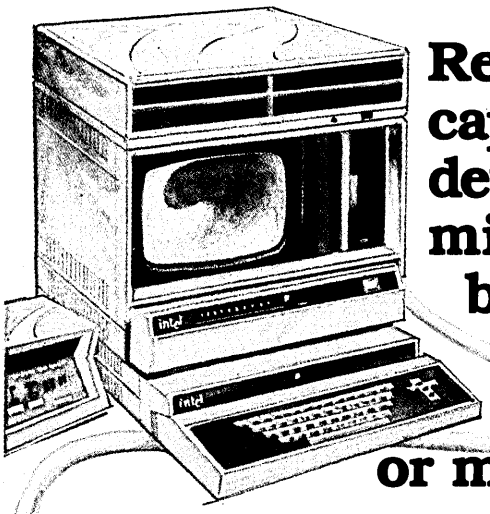

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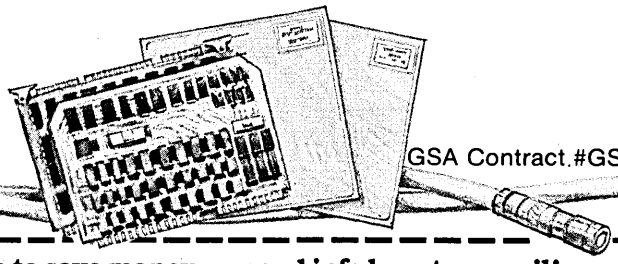

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CIRCLE 43 ON READER CARD

tailers and distributors (83%) and government agencies (69%), while the financial businesses were far off at the other end of the spectrum (just 20% yes).

To a more general question about what new developments seem likely to have a major effect on dp budgets over the next three to five years, the most common answer, given by 26% of the respondents, was a blunt "none." The next most frequent responses, given by 17% of the sample, were "general expansion" and "more equipment." Among more specific answers, "increased decentralization," "more telecommunications," and "more office automation" ranked highest by a wide margin.

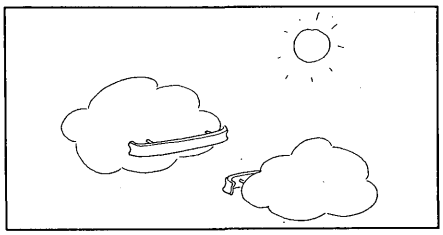
HIGHER BUDGETS FOR MANY

Asked to sum up their longer-range expectations, exactly half the respondents predicted that their dp budgets would remain esentially unchanged over the next three to five years. Forty-two % said they foresaw significantly higher budgets, while only 8% said their budgets would shrink significantly. Large users were a bit less inclined than small ones to believe that nothing much would change, and a slightly larger proportion of them thought their dp spending would decline. A breakdown by sector shows only the government agencies sharply out of line—as might be expected, most of their dp executives are not at all hopeful about the next few years.

When those respondents who expect their dp budgets to rise signficantly were asked to explain their predictions, the strongest echo emerged of a response that used to dominate dp surveys of the last few years: no less than 36% of these respondents cited higher personnel costs as the reason why their budgets seem likely to increase, while only 17% referred to "more applications."

On balance, the results of our latest budget survey can be judged reasonably encouraging, but there's no denying they are shot through with ambiguities, too. By way of summary, therefore, the impressions of three dp executives, imprecise as they may be, perhaps will serve better than still more numbers. An executive from a large conglomerate: "I feel that the dp department will have to expand to save money for the company." From a chemical manufacturer: "We foresee increased use of the management database system, which will require more management." And, from an executive of a billion-dollar-a-year corporation: "We are in a very stable situation at present."

Englebert Kirchner is a New York-based freelance writer and editorial consultant.



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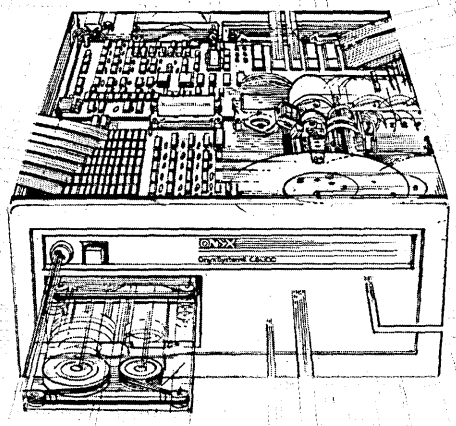
Floppy disks with their low capacities and high access times won't do.

Winchester disk drives that utilize slow-moving stepper motor head positioning devices won't do.

ONYX's IMI Winchester disk storage system, with its servo-driven voice coil



head positioning, is more than twice as fast!

So, obviously the ONYX C8002 *will* do.

And, as developed, the ONYX C8002 features expandable memory up to 1 Mbyte, and disk storage up to 160 Mbytes on-line. Its cartridge tape back-up offers cyclical redundancy checking on every backup. Both the Winchester disk storage system and the cartridge tape backup are *internal.*

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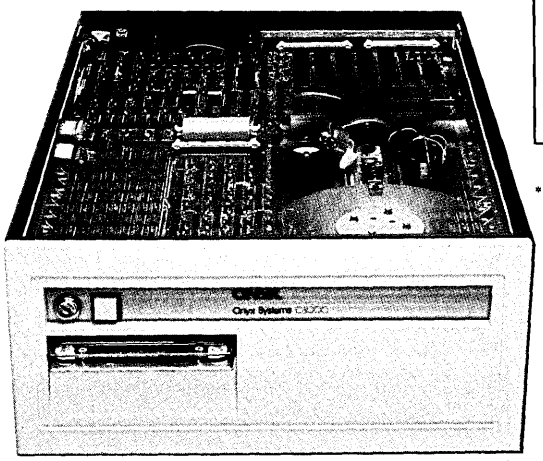

ONYX has installed over 1500 UNIX systems.

In the UNIX operating environment, the disk becomes an extension of main memory. *"Swapping"* programs between the disk and main memory increases the number of operations that can run concurrently. ONYX's memory management system utilizes *"scatter"* instead of *"contiguous"* allocation, and the more efficient swapping minimizes demand on the disk channel. That's why ONYX assures a highly efficient environment for the UNIX operating system.

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UNITED AIR CARGO

An interruption in dp operations—whether from fire, flood, or fraud—could mean anything from minor damage to financial ruin. These risks call for special coverage.

INSURANCE AGAINST DISASTER

by Joanne K. Tangorra

As dp operations grow and take on more importance, so does the potential for risk and the need to protect both computer and company against irrevocable loss. To do that, an increasing number of companies—both providers and users of dp services—are taking out special dp insurance that goes beyond the coverage offered by standard policies.

According to a recent survey conducted by the Chubb Group of Insurance Companies, more than 90% of all companies that manufacture and/or depend on electronic systems, and experience a serious interruption or injury to their dp operations, go out of business after the loss. The survey also points out that interruption of normal business can jeopardize earnings both during and after the actual loss period. And, it goes on, general liability insurance does not cover actual systems or products—which are generally highly sensitive and flammable—but rather the premises or facility. Nor does general liability coverage protect hardware and software, or the expenses necessary to recreate vital documentation and software programs.

Indeed, the general consensus among insurance experts is that the risks unique to data processing and computer equipment call for special insurance coverage. Don't expect standard property insurance to get your company through a dp disaster, they warn. "The range of perils insured in a standard risk policy is not broad enough to cover the risks that computer systems are subject to," says Guy Migliaccio, senior vp of Marsh and McLennan, Inc., a large insurance firm in New York City. "A special dp policy has fewer exclusions and would, for example, cover flood, earthquake, mechanical breakdown, and electrical disturbance." Adds Thomas Cornwell, marketing coordinator for the Underwriter Div. of Chubb & Son, Inc., another insurance company in New York, "Traditional property insurance tends to cover everything from punch presses to desks, but doesn't cover the intrinsic problems of computer processing.

"Whether a company is a dp service bureau or a producer of widgets that uses its computer for inventory control, it's got to be cognizant of the ramifications of downtime and damage to media," says Cornwell. Naturally, the size and nature of the company, and the extent to which it depends on its dp operations, will determine how extensive a policy is opted for. According to Migliaccio, "The larger firm has less of a need for a separate policy and can take care of all its insurance needs with one omnibus blanket corporate policy. The medium-sized firm, however, is better served by isolating hazards and taking out a specially designed policy."

When deciding on coverage, according to Cornwell, "The company has to ask, 'What happens if we lose our media and programs or if the hardware is down?' and then weigh the potential loss against what effect it will have on the corporation." Most insurance companies will help the client company identify loss potential by considering, for example: can the equipment be replaced, where will the firm get the new equipment, is its software customized, how often is the media updated, and so on.

If, in fact, a business won't survive a computer disaster or even a minor disturbance to its dp operations, then insurance is in order. Says Maar Haack, regional manager of The St. Paul Insurance Companies, Inc., in St. Paul, Minn., "Look for the broadest policy possible and carefully examine the perils that are covered."

Generally, there are three types of dp coverage. Basic All-Risk covers hardware, software, extra expense incurred should a loss occur, and costs due to business interruption. Professional Liability or Errors and Omissions—specifically tailored for companies that provide dp services—is usually an optional contract. Also optional is what is called a Computer Fraud or Infidelity contract. "Each is for a special purpose," says Migliaccio. "A company shouldn't assume that one includes coverage for everything."

Basic All-Risk: Hardware is by far the easiest risk to quantify in any policy and most coverage is written on a replacement cost basis (based on the current retail value) rather than according to cash value (replacement cost less depreciation). Typically, this covers equipment and components that are owned, rented, or leased. The insured should look for coverage that includes equipment in transit from one location to another. According to Migliaccio, most policies limit coverage to hardware between locations.

FINDING THE RIGHT POLICY

Minicomputer policies are not as broad as those for larger installations, says Cornwell, and do not usually cover mechanical breakdown unless special coverage is purchased with a larger deductible. When insuring hardware, it is best to give a generic description of the equipment rather than a serial number, especially when equipment is rented. Otherwise, should you replace that computer with another model, coverage will not apply.

It is much harder to quantify the loss of software programs and media, experts agree. Says Migliaccio: "A company may spend years enhancing a system, and the man-hours necessary to recreate the software and programs is huge." Media insurance typically pays for magnetic tapes, disk packs, etc., and for the re-creation of data and programs, not for the intrinsic value of the information. "This coverage assumes that there's a good copy off-site, says Migliaccio. "The company is not covered for the research and programming costs that would be involved in creating new programs." Standard property insurance only covers the blank value of the tapes themselves.

If duplicate tapes are stored off-site, typical dp coverage is based on the number of man-hours necessary to take them out of storage and reurn them, multiplied by the dollars necessary to duplicate the tapes (machine run-time), according to Cornwell. If there is no off-premises storage, he explains, coverage is based on number of man-hours multiplied by salary per programmer per hour, plus machine time, plus a factor for the unknown (5%, 25%, etc.), depending on the complexity of the programs.

Cornwell stresses that policyholders should be aware of the fact that media coverage does not pay for the loss of data but rather for the re-creation of that data.

PHOTOGRAPH BY LORI SKLAR/MAKE-UP BY LAURIE'L

The company that rents should have enough insurance to cover what it has assumed liability for.

Business Interruption: This insurance covers the loss of earnings resulting from a total or partial shutdown of business operations. "The user has to do some 'what if' scenarios to determine what the losses might be," says Migliaccio. With the typical dp policy, the insured company is awarded a predetermined differential that is written into the conract, and is reimbursed for all or part of the difference between downtime earnings and usual earnings. This is also true for extra expense insurance, which covers the cost of continuing normal operations—expenses incurred to rent or use another property or facility, for example. The policyholder is reimbursed—again, the amount is based on a differential formula—for the extra expenses over and above those normally necessary to run its dp operations, explains Cornwell. "For large corporations, we're talking about man-years—not man-hours—necessary to resume normal operations," says Cornwell, stressing the importance of extra expense coverage. He advise companies to consider alternate equipment and facilities in the event of a disaster and to "get a feel" for what it wil cost to continue operations. For instance, will a service bureau cost about 50% more than it would normally cost to continue operations internally?

Professional liability: This optional contract protects those companies that provide dp services to customers—service organizations, software developers, hardware manufacturers, and consultants, for example—from "malpractice" suits filed by dissatisfied clients. According to Migliaccio, the policy covers the defense of the insured in the event of a lawsuit and, if necessary, awards the judgment for the policyholder to the claimant.

Often part of professional liability coverage is Errors and Omissions—for programming errors and accidental erasure, for example—which is not traditionally covered in the basic dp policy and requires a special contract, usually with a large deductible. Says Cornwell: "It's very difficult to determine the exact situation in these cases. Was there a spike in the program originally? Were the instructions off? These questions are hard to answer, so coverage is not typically available."

Computer Theft and Infidelity: Also a separate contract, this is usually added on to the Basic All-Risk policy as part of a total plan, says Cornwell. This type of policy would cover, for example, unauthorized access to computer equipment for the purpose of stealing information, trade secrets, client lists, etc., or to make unauthorized electronic funds transfers—which some employees have been tempted to do.

The potential for theft has become greater with the decentralization of computers and the proliferation of minis and micros that can virtually be carried off the premises under someone's arm.

PAYING THE PREMIUM

As each company's insurance needs differ—one may choose All-Risk only, another may opt for all three contracts—it's difficult to estimate how much a policy will cost. According to Haack of St. Paul, a large dp center would generally pay 20 cents to 25 cents per $100 of insurance.

Insurance companies consider many factors when underwriting a policy and determining premiums. "The first question we ask," says Haack, "is what protective measures has the firm taken to reduce the potential for loss?" Does it have, for example, offsite storage of valuable tapes and data? Is there a disaster recovery plan that has been tested and documented? Is the computer room equipped with fire extinguishers and smoke detectors?

Other factors that help determine what the prospective policyholder will pay:

- What is the internal hazardousness of the basic building construction?
- What is the firm's "adjacent exposure," i.e., is it next door to a chemical company?
- Does the local fire department respond quickly?
- Is access to the premises by the public limited? Is the computer room guarded?
- Is there combustible carpeting in the dp room?
- Does the nature of the company's business make it susceptible to political threats? (Big oil companies, banks, and public utilities are often the target of activist groups.)
- Are there voltage regulators to protect the dp center from power brownouts and blackouts that might destroy data?

Obviously, the more an organization does to minimize risk, the lower the premiums will be. And, according to Migliaccio, "It's foolish to take out first dollar insurance; a company gets good credit by taking a nominal deductible."

There are certain things that the policyholder should look for when considering coverage:

1. A good valuation clause that states clearly how the policy will pay for a loss.

2. A co-insurance clause that protects the policyholder if the proper amount of insurance has not been declared. For example, if a company's hardware is insured for $80,000 and the replacement cost is $100,000, there is a penalty and only half the coverage can be collected.

3. When equipment is leased or rented, a waiver of subrogation[1] should be included in the insured's lease or agreement. This states that the lessor is not responsible for loss or damage to the computer in the event of an accident or disaster; the insurance company for the firm that leases out the equipment absorbs the loss for its client.

4. The company that rents should have enough insurance to cover what it has assumed liability for. If the lease says, for example, that the lessor is not responsible for fire, chances are it's responsible for a lot of other circumstances. Says Migliaccio: "You have to read what's implicit and cover for it.

Most companies can't afford not to insure their dp resources. For many, insurance can mean the difference between a temporary halt in operations and financial ruin. "The functions represented by a company's dp operations can't be easily made up," says Cornwell. "A dp policy is more than a cost factor, it's a necessity."

[1]If equipment is destroyed, the lessor's insurance company can sue the lessee for negligence unless a waiver of subrogation is included in the lease.

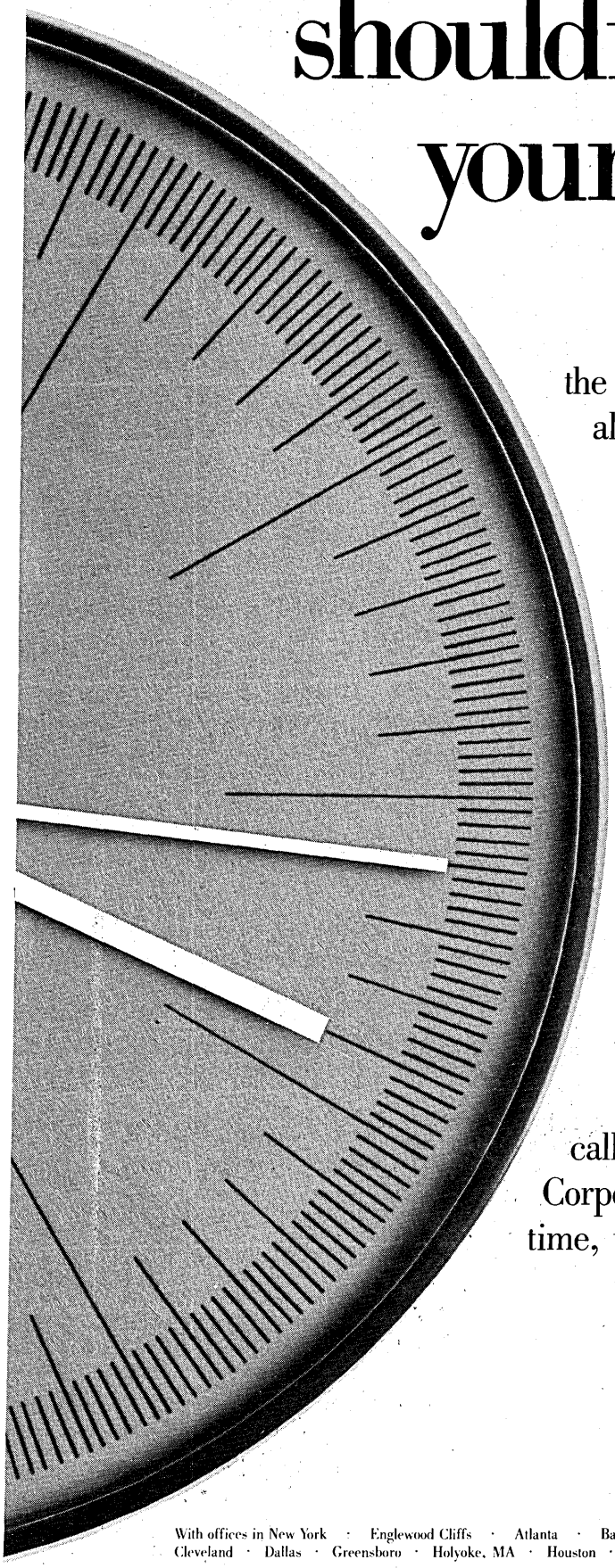
"I've just discovered that our umbrella insurance coverage merely covers our umbrella."

© DATAMATION

CARTOON BY JOSEPH DAWES

Joanne Tangorra is a New York-based free-lance writer.

Financing new equipment shouldn't cut down your credit line.



Buying new equipment can take a chunk of the credit line that your business needs to stay alive.

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CIRCLE 57 ON READER CARD

THE LEADING EDGE

#3 in a series of reports on new technology from Xerox

Xerox introduced the first xerographic copier, Model 914, in 1959. The 914 and xerography were great surprises to the world. They revealed and then satisfied an immense latent demand for plain paper copying. And they surprised scientists and engineers by demonstrating practical applications of physical phenomena that had not been thought to have much practical value. They used large page-sized sheets of semiconducting selenium to capture entire images by the phenomenon of photoconductivity. What's more surprising, they found a practical use for "static electrification," which is the transfer of electric charge that occurs when, for example, one rubs a cat on a dry day.

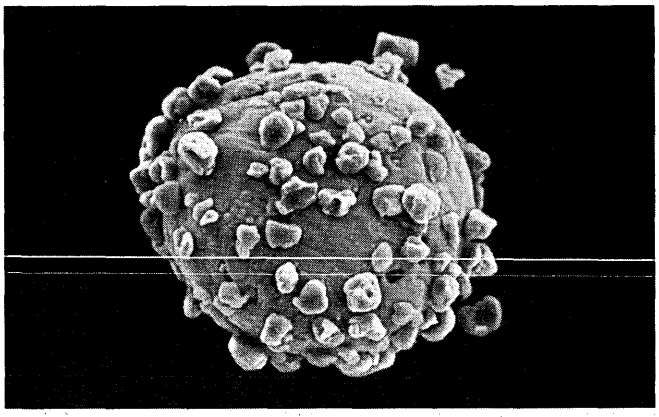
This fundamental part of the xerographic process was not at all understood scientifically. Early technology work was by trial and error.

Some years ago a few of us in Xerox Research became aware that as the demands on xerography increased, trial and error methods of xerographic design would become increasingly risky. We undertook a small, deliberate research program on the fundamentals of the xerographic process.

THE XEROGRAPHIC PROCESS

A xerographic image—a copy—is made of about 100 million carefully arranged bits of pigmented plastic called toner particles. The whole xerographic process is simply the means of arranging toner particles into faithful patterns, then transferring the patterns to paper and making them permanent by melting.

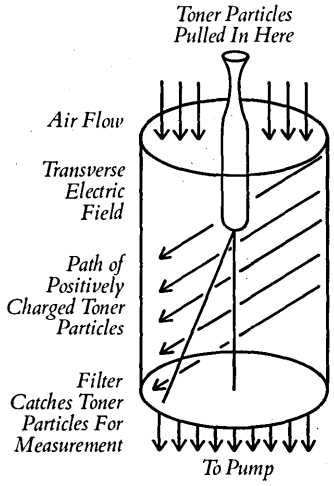
The process works as follows: First, a photoconductor, a paper-thin layer of glassy selenium coated on aluminum, is given a uniform electric charge on its top surface. Usually this is done with a spray of positive ions from a wire or point at high voltage. In darkness selenium is a good electrical insulator so the electric charges are stable. Next, the image of a document to be copied is projected onto the photoconductor discharging it in light-struck areas and leaving charge patterns corresponding to the black letters and marks of the original document. Finally, this latent electrostatic image is developed by attracting oppositely charged toner particles to it. Here is where static electrification becomes crucial. Toner particles get their charges by repeated rubbing against the surfaces of larger particles called carrier beads. A carrier bead with toner is shown in the picture. When the process is working properly, each toner particle carries the electric charge of about 20,000 electrons.



The photo shows a single carrier bead with toner clinging by electrostatic force. A xerographic copier might hold about three kilograms of carrier which itself binds 50 to 100 grams of oppositely charged toner. The combination is a xerographic developer.

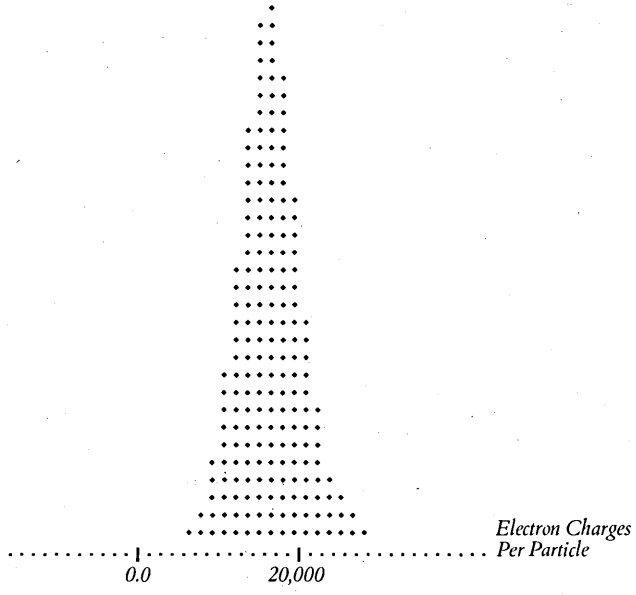
THE CHARGE SPECTROGRAPH

The trouble was that we had no way to make certain that a xerographic developer was in fact working properly. We could not measure the charge on individual toner particles to be sure that all of them had the right charge. We suspected that wrong-charge particles might often be present and responsible for poor copy quality and for at least some of the dirt contamination of xerographic equipment. A reversed-sign particle will go in exactly the wrong place—the white areas—and only a small percentage of these in the whole toner population can produce a visible flaw. A particle with no charge is uncontrollable. By measuring charge distributions on toner we could characterize xerographic developers independently of copier hardware. We hoped also that charge distributions would eventually provide insight into the physical mechanisms responsible for static electrification.

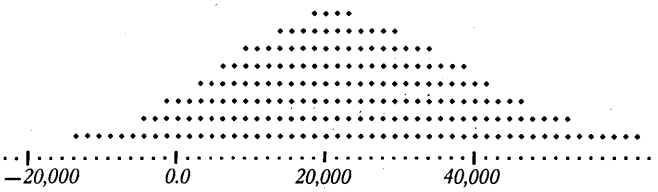


With these things in mind, E.W. Connors, R.F. Koehler and I built the charge spectrograph sketched here.

It's a kind of low-speed wind tunnel with a uniform electric field across the direction of air flow. Toner particles are stripped from carrier beads with a tiny air jet and introduced on the axis of the instrument. As they move downward with the air flow, they are pulled laterally by the electric field according to their charge and size and finally caught on an exit filter for examination. Afterwards, the filter is removed and the drift distance and size of each toner particle is read through a microscope by an automated analysis system.



Example 1. *The charge distribution on the 10 micron size class of toner particles. This is a fairly sharp distribution.*



Example 2. *Charge on the 10 micron toner particles in a worn-out developer. Note the reverse-sign and uncharged toner.*

Experimental results are in the form of distributions or histograms, which are plots of the fractions of the toner particles having various charges. Here we show only a particular size category, the toner particles with measured diameter of 10±1 micron. The first example is free of low-charged or reverse-charged toner particles. This xerographic developer performs well in equipment.

The second distribution is from a developer that has been used to make too many copies. This developer is worn out; the charge-exchanging character of its carrier surfaces has changed.

And in cases that we haven't shown by example, the charge on each toner particle is proportional to its surface area; and in some others, it is proportional to toner diameter. These and other regularities, once seen, beg for explanation. These explanations lead to completely new developer designs which work as predicted.

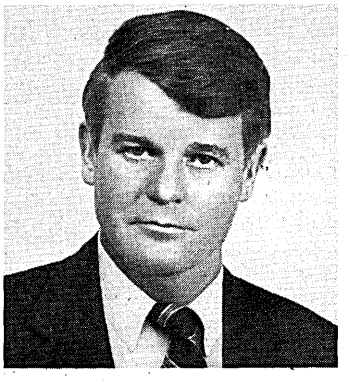
The most satisfying outcome is that we are beginning to understand the underlying physics well enough to formulate rules for the design of xerographic materials.

Over many years we have examined hundreds of developers under many conditions of use. A few have already gone to market and others are on the way.

The charge spectrograph is only one example of how we can make xerography work even better in future generations of copiers and printers. During the past ten years people have sometimes said that xerography was a mature technology. We never believed it.

ABOUT THE AUTHOR

R.B. Lewis is a member of Xerox Corporate Staff specializing in electronic printing strategy. The work described here was done when he was manager of the Imaging Physics and Materials Laboratory at the Xerox Webster Research Center. He holds a B.A. degree from Yale and a PhD degree in physics from Princeton.



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CIRCLE 51 ON READER CARD

It's widely agreed that graphically displayed information can help managers make better decisions. But how do you get the pictures to the boss's desk?

GRAPHICS FOR MANAGERS: THE DISTRIBUTED APPROACH

by David Friend

It is clear to most people in the data processing community that many executives would prefer to get their information in graphic form or, at least, to use graphics to augment tabular information. Charts and graphs are a well-established form of business communication. In fact, if one looks through the popular business magazines, one finds significantly more graphs than tables of numbers.

One cannot, however, simply interpret a manager's desire for graphs to mean that the information he now gets ought to be converted into bar charts or pie charts. What is unstated and frequently misinterpreted in a manager's desire for graphic data presentation is not the need for graphs per se, but a dissatisfaction with the content and usefulness of existing information sources. Frequently what the manager sees in graphics is more an implied solution to a database problem rather than the solution to a communications problem.

No graphics system, no matter how fast or powerful, can create a chart showing long-term trends in business data if the historical information is not available to the computer. Consider the case of a marketing vp for a major consumer products company who had become disenchanted with the reams of printout that constituted his "sales summary report" each month. His department installed an elaborate graphics system that could extract nearly any information stored on the mainframe and turn these data into charts and graphs. When the system was operational, he said, "Fine. First let's make a chart of total quarterly sales for the company, domestic and international, for the last five years. I'd like to get some feeling for the relative growth in these two areas since we broke off this division."

The data processing manager replied that the summary historical information was not available from the mainframe because it was impractical to keep such historical information on-line: he was dealing with over 100,000 line items on a monthly basis. "Instead," he continued, "old data are routinely dumped to mag tape and stored in the archives." Naturally, the marketing vp suggested that the old tapes be mounted so that the old information could be recovered. To his amazement, the dp manager announced that the old tapes were no longer readable because the operating system had been changed recently. Realizing that the corporation MIS was not going to provide him with the necessary information, the marketing vp hired a young MBA to begin assembling a historical database from the printed archival financial reports and provide those data live on a small separate computer.

This story illustrates a crucial point for the management graphics system designer: the existing databases in many organizations' mainframe systems may serve the accounting system well but do not really provide information needed by top management, or at least not in a form that is sufficiently useful and convenient. The concept of storing historical information as a "management subset" of the monthly transaction and financial files is not only new to many dp managers, but also problematical because it brings up the age-old problem of getting managers to define their needs and stick to their definitions.

If you subscribe to the classic business school hypothesis that a manager's primary function in an organization is the assimilation of information and the production of decisions, then it is clear that a manager's information needs can be articulated in terms of supporting those decisions. In other words, define the person's job and you can define his database. What many dp professionals fail to understand about this process, however, is that the mere existence of data does not guarantee their usefulness.

A manager's primary resource is time. He has only so much time in a day to absorb information that is relevant to his immediate decision-making responsibilities. If information is not readily accessible, then the manager's return on his invested time will not be satisfactory. Decisions will be made without supporting information, based on other input or "gut feel." The more data you throw at the manager, the harder it is for him to find a relevant piece of information in a reasonable amount of time. Thus, more data can yield less information. The number of computer generated "reports" that go directly from in-basket to trash can without ever seeing the light of day attests to this problem.

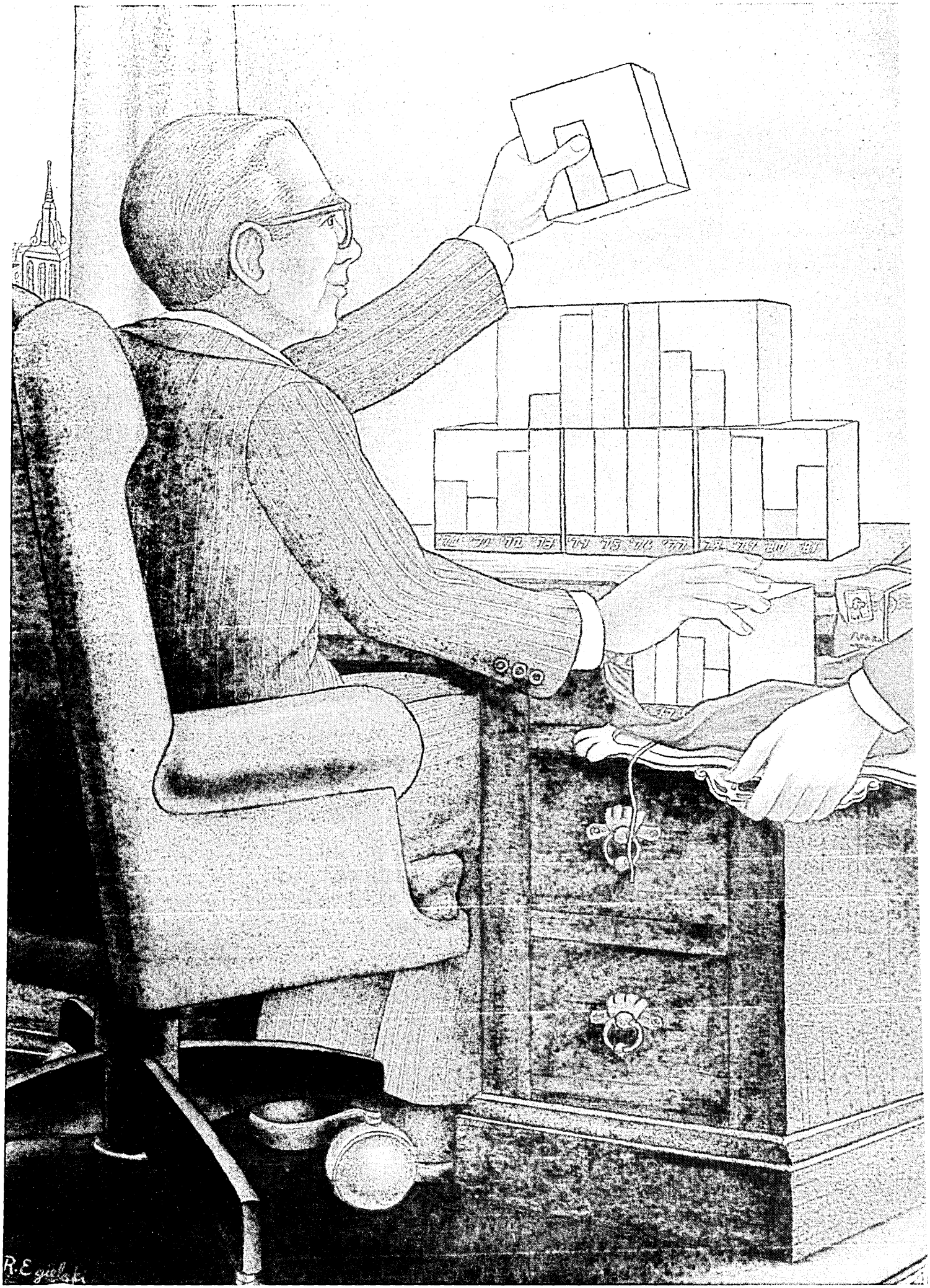
The solution lies not in providing the manager with more data, but with less data. A small quantity of data from which useful information can be obtained rapidly is what the manager really wants, and that's what he sees graphs offering. It's the old 80/20 principle applied to decision making—you can make 80% of your decisions with 20% of the data.

The key to a successful management graphics system is providing managers with an instant look at the "core" 20%. This approach to data management is oriented toward decisions rather than transactions.

EXTERNAL DATA SOURCES

The higher you go in an organization, the greater the need for external data sources. An illustration: in planning your own personal finances, it is not sufficient merely to monitor the transactions in your bank account. You need to be concerned with your paycheck, with what things cost and what they are likely to cost next year, how much you'll owe in taxes, and so on. Similarly, a senior corporate executive cannot survive simply on data that percolate up through the accounting system. Most top managers spend a great deal of their time considering information that is totally external to the organization—information about

ILLUSTRATION BY RICHARD EGIELSKI


R.Egielski

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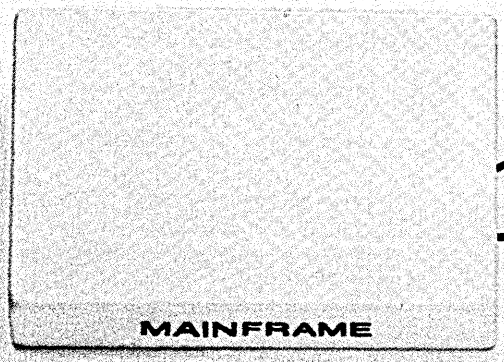


By now, everyone understands the need for standard communications protocols. Without them, an electronic Tower of Babel would surely ensue. But there have to be different standards for different networks. A local-area network is different from a wide-area network. A public network is different from a private one.

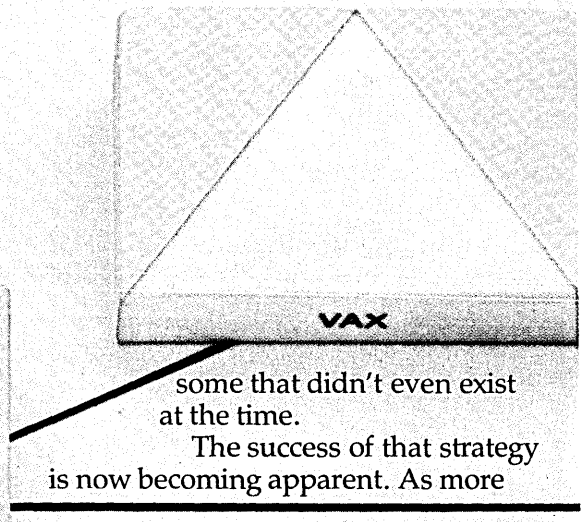
No single universal standard has emerged. Nor is one likely to. There are simply too many diverse networking environments, each fulfilling specific, mutually exclusive needs.

That's why Digital is committed to supporting and, in fact, actively promoting the more important standards now surfacing in the various environments.

Our goal is to offer our customers a range of standards to achieve any combination of networking objectives. And we've been pursuing that goal for many years.

A forward-thinking strategy.

When we first developed our networking architecture, we understood the need for flexibility. We consciously adopted an architectural strategy that would allow our networking software to work freely with a wide range of protocols, including



some that didn't even exist at the time.

The success of that strategy is now becoming apparent. As more vendors enter the networking field, Digital is uniquely positioned to offer compatibility with the emerging protocols. We've gone farther than anyone to assure that your options are open.

X.25 and other public networks.

Digital offers the X.25 protocol for use with public packet-switched networks such as Datapac (Canada), Transpac (France), and PSS (U.K.).

But when used with our computers, X.25 is much more than a simple link. We can provide you with the higher-level protocols that will take your systems beyond mere communications and into the sophisticated functionality that has made us a leader in networking software.

Hierarchical networks.

Even though we prefer to implement more flexible distributed networks, we are amply equipped to support SNA and related mainframe-oriented protocols such as Batch BISYNC, Interactive BISYNC, and HASP.

Local-area networks.

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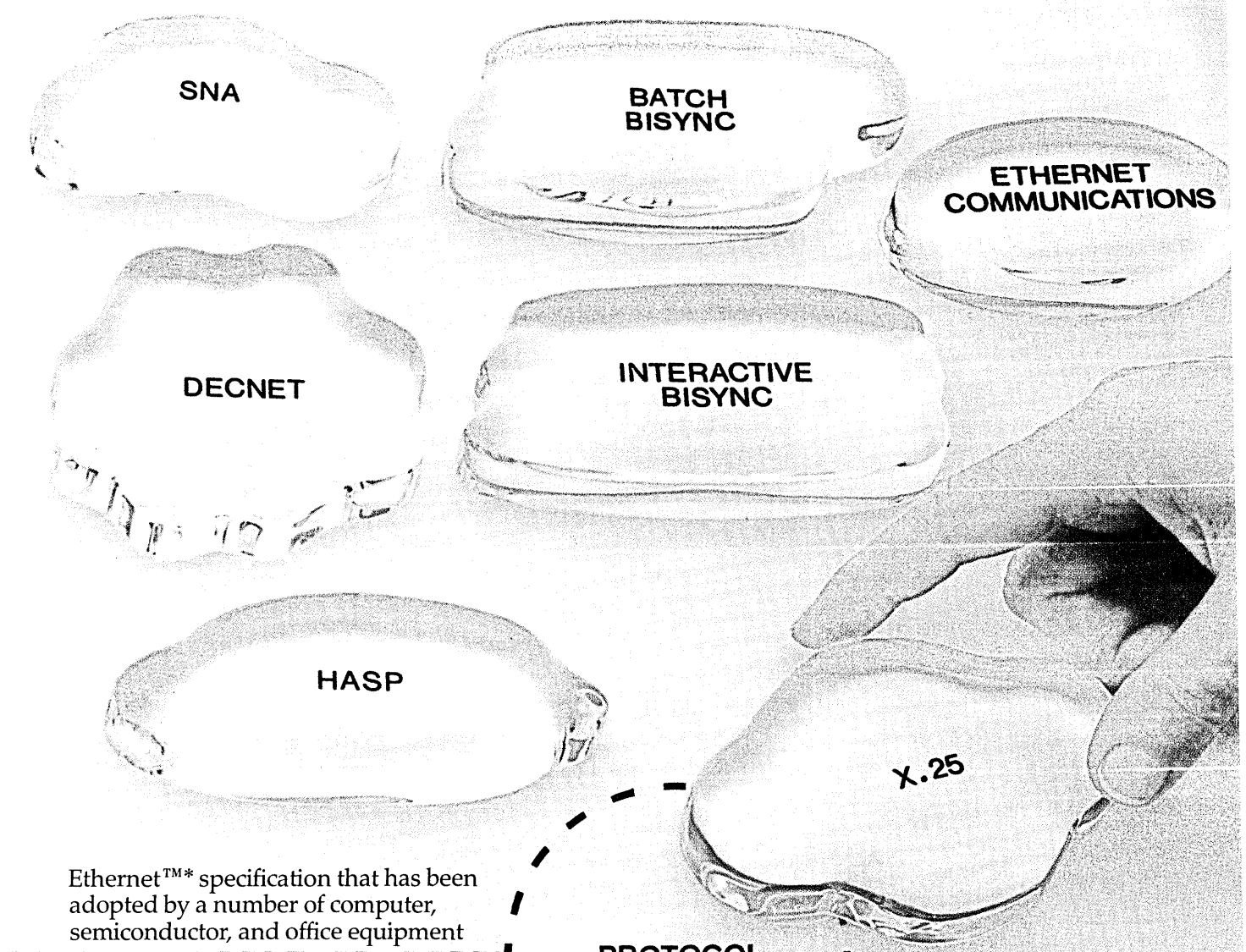

Ethernet™* specification that has been adopted by a number of computer, semiconductor, and office equipment manufacturers. We recognized early on the need for highly reliable local-area networks. We were in on the ground floor of the definition, development and, now, the implementation of the Ethernet specification.

Distributed data processing networks.

DECnet,™ Digital's proprietary networking software, is based on a layered architecture. This is the same architectural approach followed in the model proposed by ISO. Our DECnet offers a wide range of quality networking products, products that allow such sophisticated options as adaptive path routing, down-line loading, and enhanced network management capabilities.

And so on.

We have listed a few of the many standards we are currently supporting. There are more.

But even more important than the number of protocols is the attitude we have toward them. We are determined to help you meet any kind of networking objective. And our capabilities in that regard are as far-reaching as they are farsighted.

So if you're planning a network, don't make the mistake of planning just for the present. Talk to the people who can meet your current needs and still keep your options open for the future. Talk to us.

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

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digital

We change the way the world thinks.

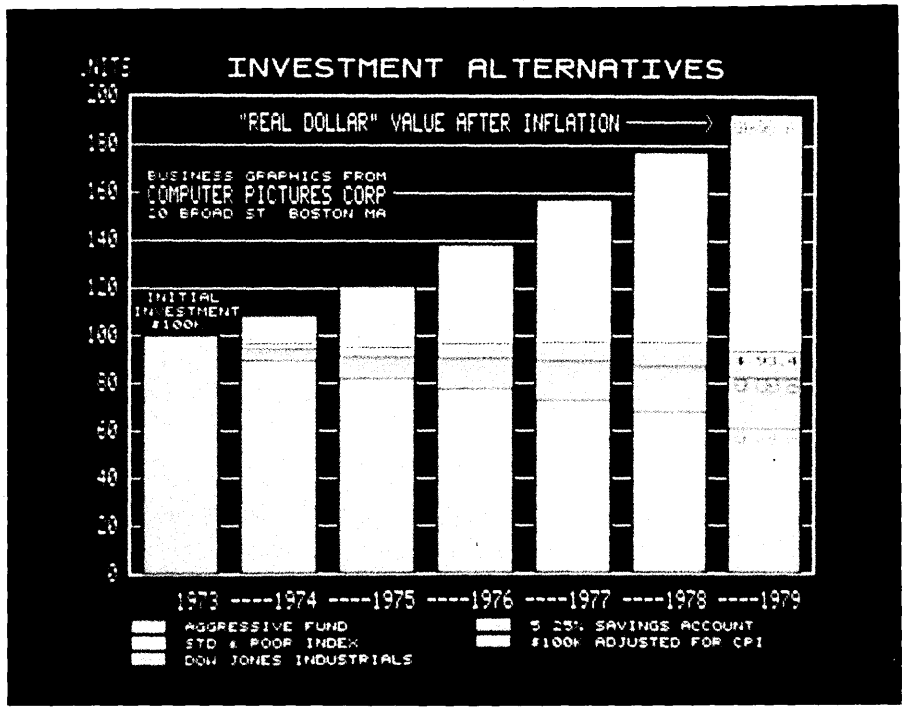
Frequently what the manager sees in graphics is more an implied solution to a database problem rather than the solution to a communications problem.

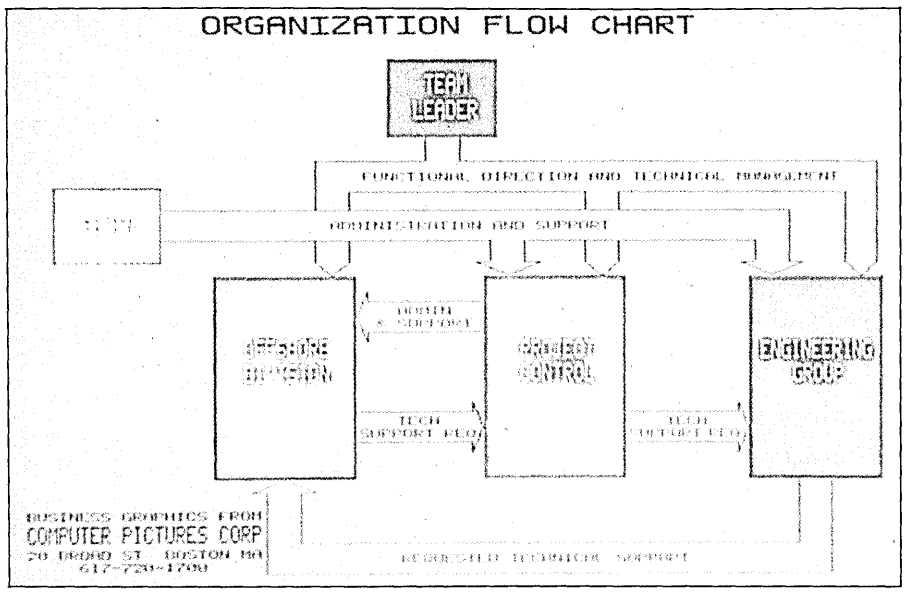
competition, industry regulations, foreign exchange, financial markets, international politics, national economics, and so forth. They spend considerable resources on market research, consultants, and involvement with trade associations and governmental agencies. In essence, the job entails not just the management of the organization, but the interaction of the organization with the outside world (see Fig. 1).

It's a fine idea to provide managers with graphs showing the performance of the organization, but it is even better to be able to provide charts that show how the company's performing compared to the industry as a whole, compared to specific competitors, or to economic indicators, such as the GNP. Graphs are really at their most useful if they can demonstrate the relationships between several sets of data.

The president of a major natural resources company once told me that "a rough cut at the numbers today is worth a lot more to me than an audited accounting a month from now. Most of the time, I'm not interested in that last percentage of accuracy." If timeliness is a problem in the production of financial data, there are frequently ways of getting a "rough cut" a lot earlier. Most companies have "flash reports" that are prepared almost immediately at the end of a financial reporting period. Usually these flash reports are not integrated into the computer system. Rather, they are gathered up and prepared by staff assistants. In many organizations, dp people have a strong aversion to "soft" numbers and steer away from any situation where there might be two databases both purporting to report the same numbers. "What about data integrity?" is a common complaint. This concern only highlights the transaction orientation of the entire data processing system.

Is there a solution to this dilemma? In my experience, although it is technically possible to accommodate a "management database" on a host computer (such databases are generally tiny in the overall scheme of things), the functions and underlying disciplines of a decision-oriented database are so different from those of a transaction-oriented database that the two functions do not merge well organizationally. In fact, one could say that the only thing they have in common is that they both employ computers. Consequently, many organizations are finding it necessary to set up a separate facility to handle the management database problems. The typical solution involves a small computer that strips current information from the transactional database in the mainframe and tacks it onto historical files. In this manner, the mainframe is relieved of the task of dealing with databases that may not be consistent with the transactional files and which serve a specialized function for a limited number of users.





The software that performs this file stripping has traditionally resided in the host mainframe. With the distribution of corporate databases in several computers, however, it appears to make more sense to put most of the software in the small machine that is doing the interrogating. This is especially true when dealing with a top-management database. In most large corporations, there are many computers handling transactions for different divisions of the company. Frequently, management needs to be able to keep track of trends involving all these divisions.

Hence, there is a need for the ability to dip into databases in different machines to extract current information. Sometimes these machines may be totally different and the methods of recovering specific data fields may vary considerably. Furthermore, most organizations make use of external data sources and/or financial modeling at top levels of management. It would be convenient, for instance, to download commercially available databases without rekeying information. All of this argues strongly for the existence of a "foreign file interface" that allows the management data acquisition system to adapt to the information retrieval

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Features	Benefits
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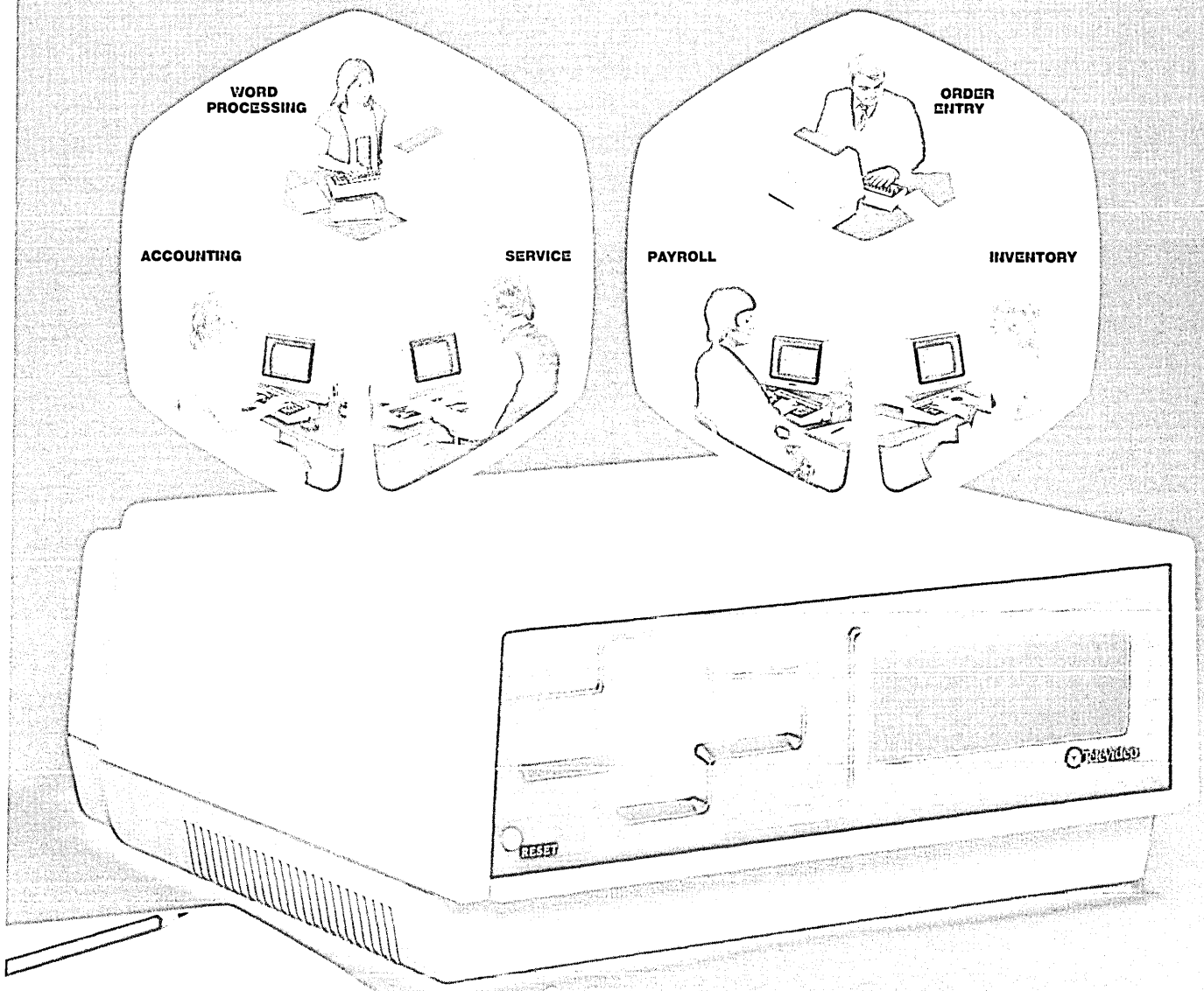

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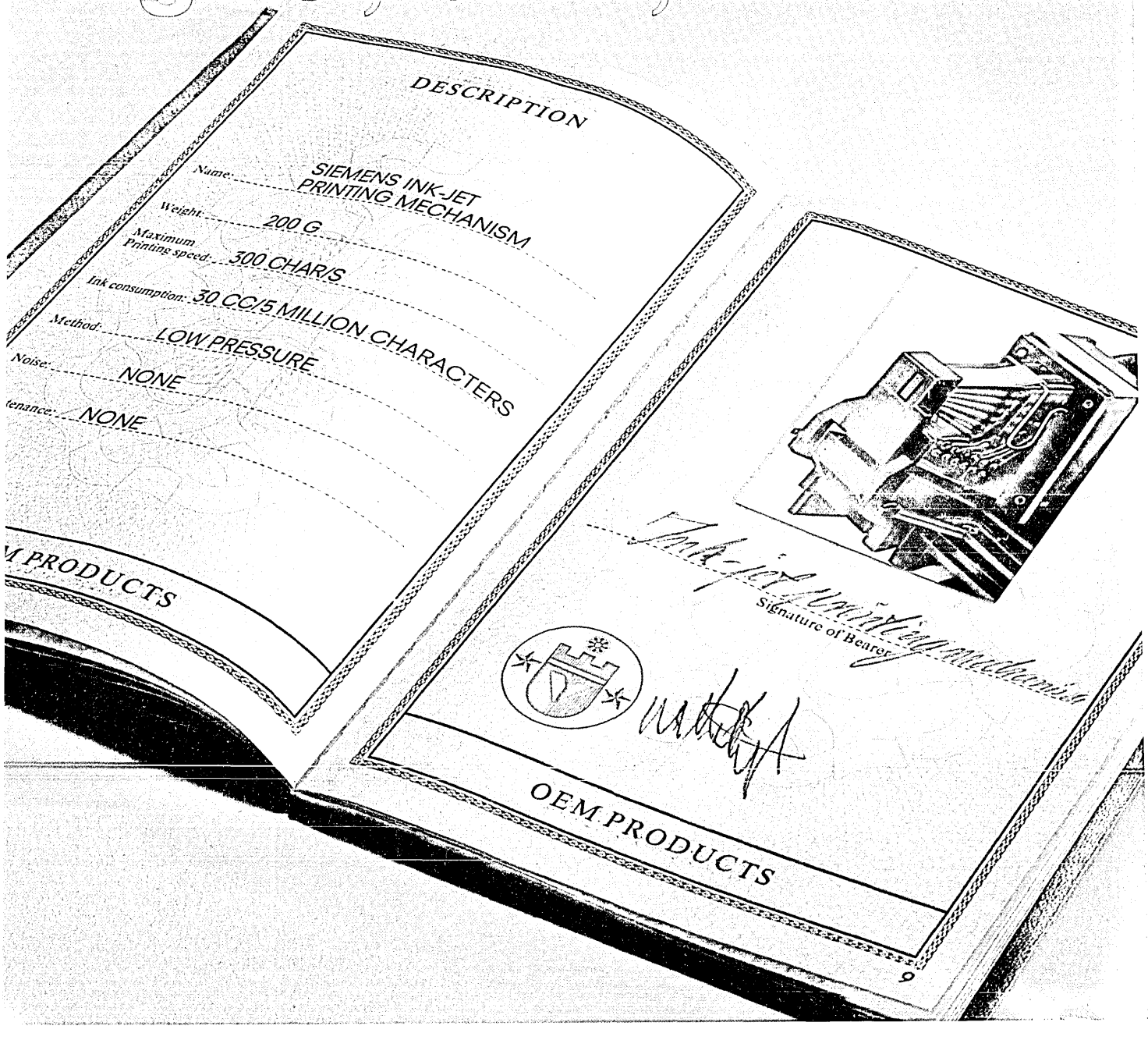
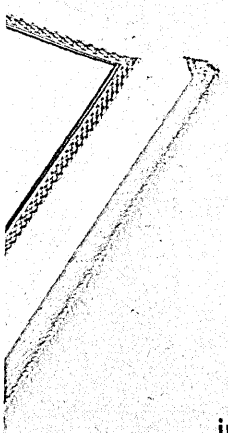


em for the OEM Market. hical.

The unique ink-jet printing method developed by Siemens works on a low-pressure principle that provides maintenance-free operation. Because there are no moving mechanical parts in the ink-jet head, no routine maintenance is required.

Any character from any typestyle can be formed out of individual droplets of ink ejected from twelve nozzles in response to electrical pulses.

Silently but surely, our silent ink-jet printer is making conventional printers obsolete, while making color printing an economical reality.



The printer's ink supply is held in easily replaceable plastic cartridges which can be sealed for transport and storage. Each cartridge is equipped with a special seal for quick replacement in the printer. Siemens' specially formulated ink is black, lightfast, indelible, waterproof and instant-drying, and applicable to plain paper.

Replacing ink is fast and simple.

As text communication becomes increasingly more important in today's business office, terminals are becoming an integral part of individual workstations. Because of its practically inaudible operation, no other printing system is better suited for this purpose than ink-jet printing. Its economy, reliability, and exceptional print quality make it superior to any other conventional system.

To receive more information about ink jet mechanisms and printers please contact:

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Telex 5288351

CIRCLE 53 ON READER CARD

F275/8225

Graphs are really at their most useful if they can demonstrate the relationships between several sets of data.

methods of a number of other machines and databases. Such software exists on a number of systems and can provide those responsible for developing the management database with an extraordinary tool for avoiding the delays usually associated with additional applications implementation on mainframes.

Unlike alphanumeric terminals that require only 300 to 1,500 characters to create an entire display, color graphics terminals require from 3,000 to 15,000 characters to create a typical chart. Therefore, a color graphics terminal's refresh time will be more than an order of magnitude slower than that of an alphanumeric terminal.

In most organizations, one of the benefits of a mainframe software implementation is the ability for terminals in remote locations to gain access to the system. Usually remote locations are tied to the host via a serial port and modem. The most common speed for these remote hookups is 1200 baud. Since 1200 baud translates to roughly 100 characters per second, a normal alpha display will be refreshed in less than one second. However, a typical color chart will take over one minute just to transmit at this baud rate.

FIG. 1

Venn diagrams show overlap of job information requirements and ability of existing MIS to fulfill those requirements.

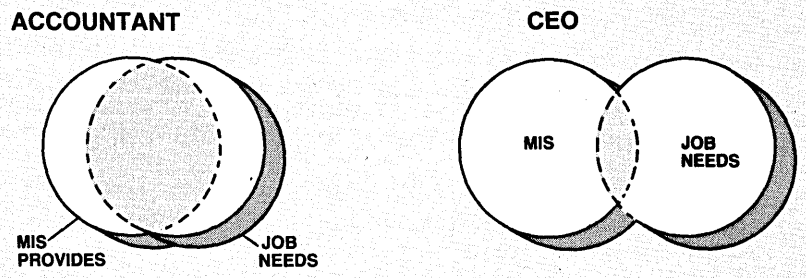
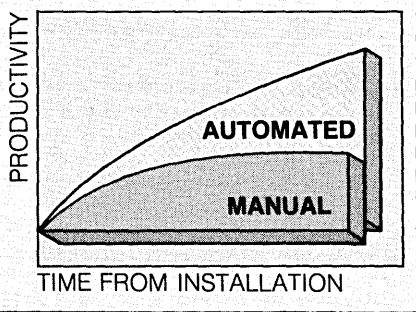


FIG. 2

System productivity continues to increase as more procedures are generated.



THEY HATE TO WAIT

This physical limitation of the transmission medium and the correspondingly slow response time creates a serious problem if one desires to provide managers with on-line graphic reporting. Most managers will not wait more than five to 10 seconds to get a screen full of information. They are used to opening a typed report and quickly getting what they want.

Obviously, one could take the approach that the graphics displays will not be available on-line, and that hardcopy graphics reports printed out on a high-speed color printer will be the communications medium. But in order for a graphics information system to fully replace or effectively augment the existing financial reporting system, the manager will need random access to a fairly large number of charts, probably in the range of 500 to 2,000. The time to print several copies of this many charts would create considerable delays and would represent a substantial expense. Furthermore, who wants to be on the receiving end of 1,000 or so charts when in any given month only a fraction of them will ever be used?

Consequently, it makes sense to do the graphic computations in physical proximity to the graphics terminal in order to take advantage of inexpensive short-length, high-speed communications between the two units. Furthermore, much of the computation that goes on in the generation of a graphics display list (the series of ASCII characters that tells the graphics terminal how to draw the display) can be performed at relatively low precision. Unlike an accounting report, which must be able to represent billions of dollars to the penny, the highest resolution color graphics crt devices have resolutions in the neighborhood of 1,000 by 1,000 lines. This means that any computations to determine the position of a line, for instance, will be rounded off to one part per thousand by the terminal. Therefore, the high precision inherent in long bit-word mainframes is to some extent wasted on graphics computation. A high-speed micro with a 16-bit or even 8-bit architecture dedicated to graphics processing can generally outpace most timeshared mainframes in this low-precision environment.

Just as in the world of numerical tabular reporting, there are two distinct jobs for a graphics system to perform: 1) turning numbers into charts and graphs, and 2) providing users with ready access to the charts. In a tabular system, there are different software systems for the generation of raw data and for the presentation of that data. For instance, most organizations use certain software packages for entering and maintaining a database. These tools would normally be used by the data processing personnel. They might include accounting applications packages, database management systems, systems utilities, and so forth. Managers, on the other hand, normally receive printed output that is generated by report writers or special purpose programs. In most cases, these are the manager's only access to the computer's data. In some cases, an on-line query system is used to give the manager the benefit of accessing information directly from the computer. In this way, data can be extracted from the financial database and made accessible to the manager via a crt.

Most graphics systems have addressed only the issue of chart creation. Since there are many ways to create a chart and display data, the programs that create charts and graphs need to have a fairly high degree of flexibility. Furthermore, regardless of the many attempts to standardize graphic reporting, it seems inevitable that every user will have a unique cognitive style and his own ideas about what he wants in his charts. Consequently, most graphics systems are so sophisticated and flexible that it takes a fair amount of time to learn them thoroughly.

Very little attention has been paid to the needs of the manager who would like to use a computer to randomly view a wide range of graphics information. It seems that up until the last year or so, every supplier of graphics systems had made the assumption that an analyst or trained operator would create the required charts, produce some sort of hardcopy output, and then deliver this output to the users. As the number of charts and graphs accessible to the user becomes greater and greater, considerations of costs and speed become increasingly important, as does the ability of the graphics software to automate the process of producing charts.

NEED FOR AUTOMATED METHODS

Let us focus for a moment on the problem of producing a large number of graphs. One of the characteristics of traditional tabular report writers is that they plug new data into the same report

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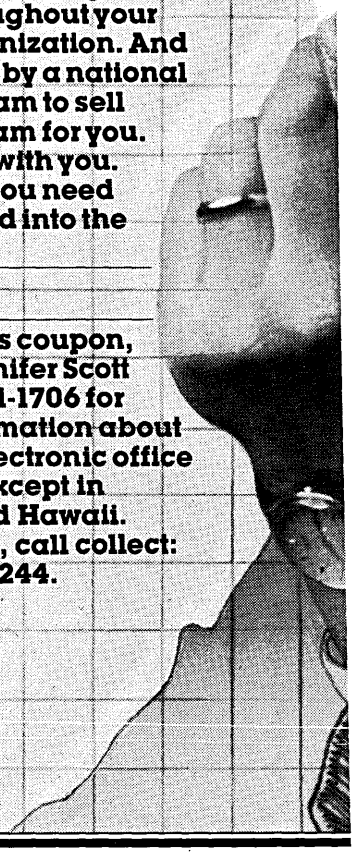

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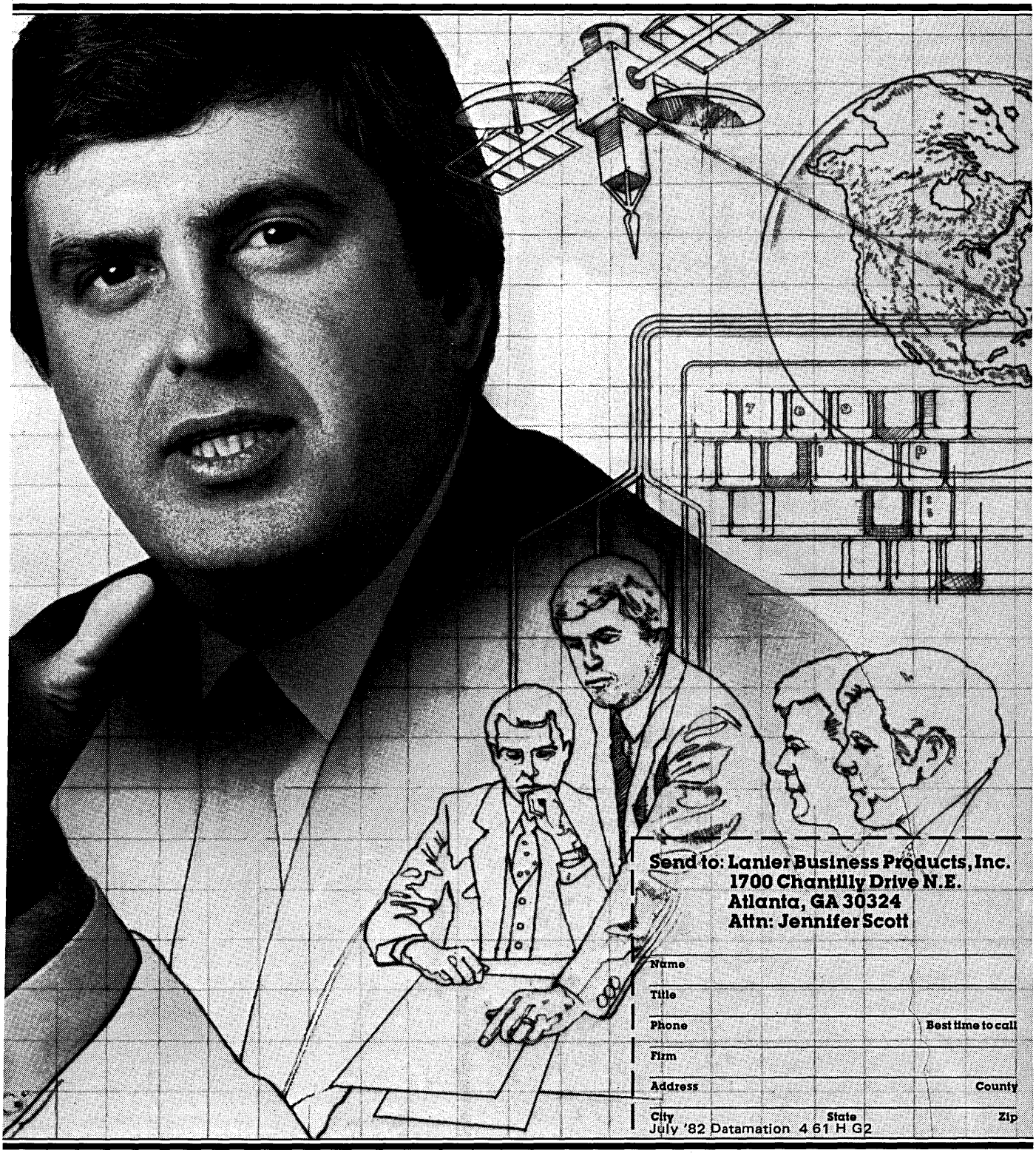
"Control." *Reg Parker, Director, National Accounts Marketing, Electronic Office Systems Division*



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A NEW BELL COMPA
WHAT ALEXANDER GRAH

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–Just as the first switchboards made it possible for telephones everywhere to talk to each other, a new service will link many different computers, terminals and data networks.

–Questions about the best ways to manage widely distributed information are resolved by the new alternative.

–Other needs in data communications–flexibility, control, low start-up costs, integrated internal and intercompany data communications–now all come together in one solution.

Now there is Advanced Information Systems (AIS*)/Net 1 service, and a new AT&T subsidiary to market it–American Bell.

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It is a distributed, intelligent service to be used in the communication and management of information.

Distributed means it will be available throughout the country.

Intelligent means that Net 1 adds function and capability to existing terminals, and provides the user with the ability to design and control an integrated system.

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NY DOES FOR DATA AM BELL DID FOR VOICE.

Net 1 also means that there is no large initial investment. Customers pay only for what they use.

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Meanwhile, we wanted you to know that American Bell is here. We're in business. And our first service will become the new alternative in data communications.

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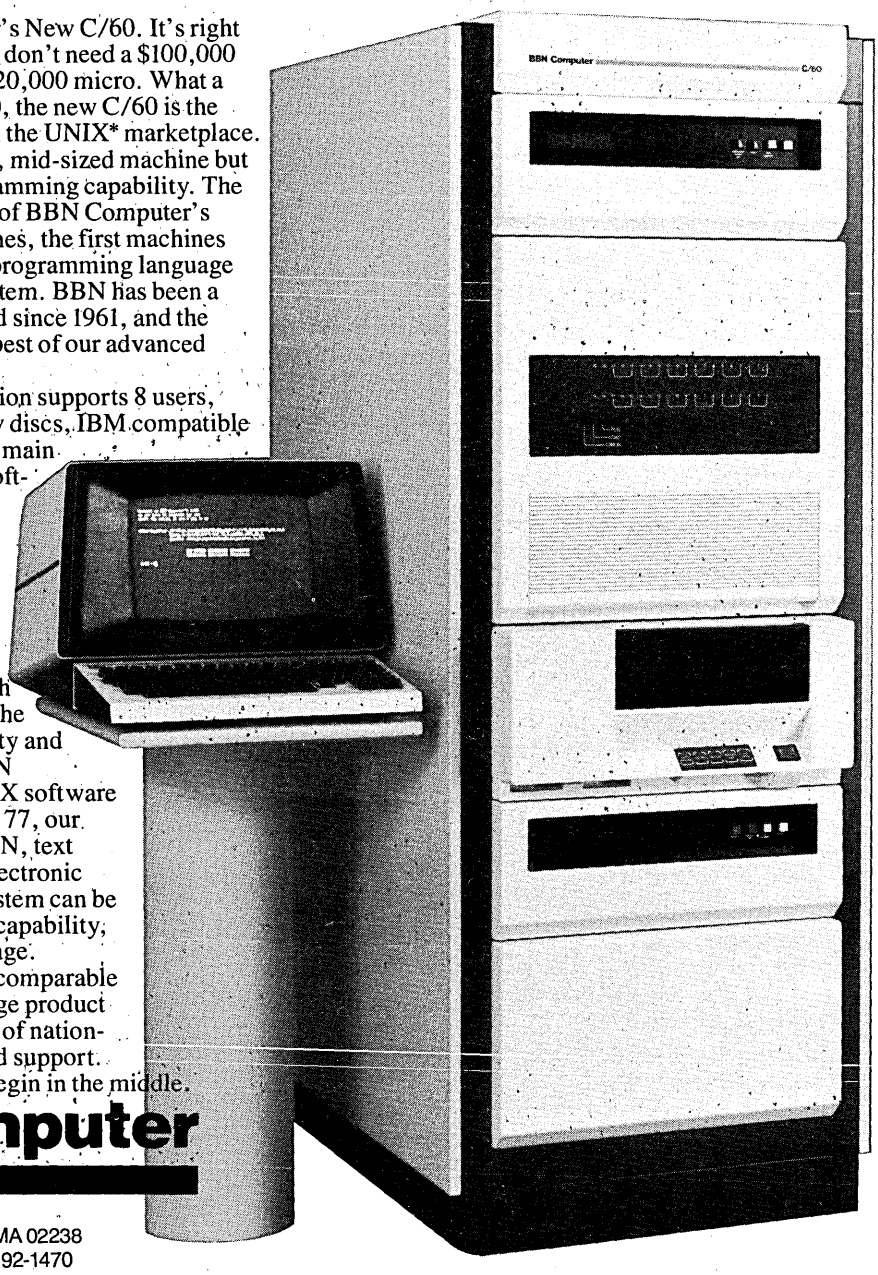
BBN Computer offers incomparable customer service, a full range product line, and the rare advantage of nationwide single vendor sales and support. If you want to finish first, begin in the middle.



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CIRCLE 58 ON READER CARD

It seems inevitable that every user will have a unique cognitive style and his own ideas about what he wants in his charts.

FIG. 3

MAINFRAME VS. DISTRIBUTED GRAPHICS PROCESSING

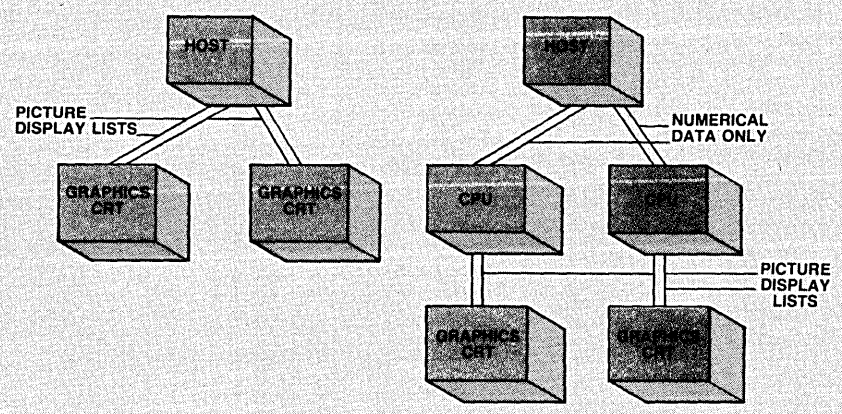
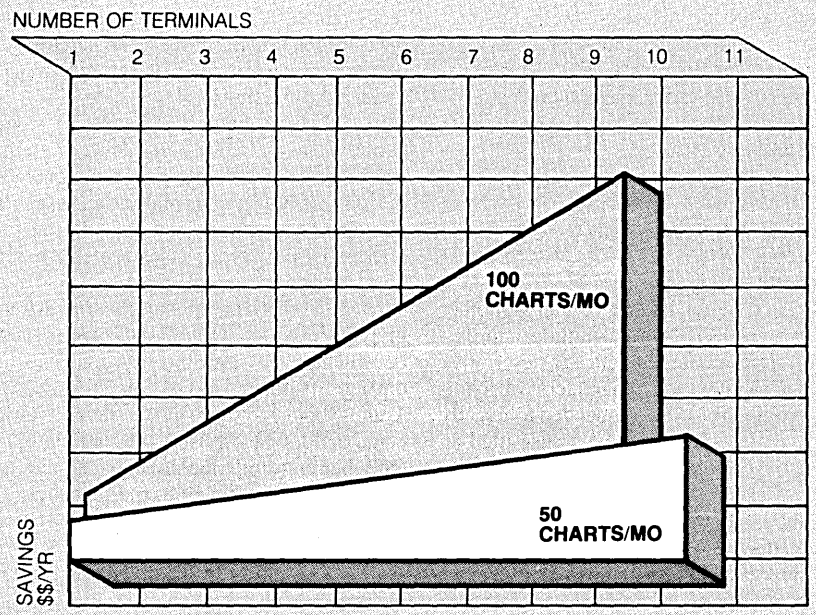


FIG. 4

COST SAVINGS FOR DISTRIBUTED GRAPHICS PROCESSING OVER MAINFRAME SYSTEM



every month without a great deal of operator intervention or reprogramming. Instead of the programmer spending time each month on the same reports, he completes one applications job, installs it in the system, and then moves on to the next.

A graphics system that is to provide managers with a large number of graphs must have the same characteristic. The time that a high-level person spends with the system should produce a cumulative effect on productivity, rather than a repetitive one. Most graphics systems have a limited capability to automate processes that have been perfected in the past (see Fig. 2).

In other words, a significant amount of operator labor is required to turn out the same charts each month. This characteristic, plus the technical problems discussed in the next few paragraphs, will have a severely limiting effect on the maximum productivity of the system. This problem is always aggravated by the natural tendency in an organization to require rapid turnaround time once the financial numbers are made available. Normally, there will be a week or so where graphics production must run flat-out, and then there will be a few weeks of relatively low activity. A system that provides for a highly automated production method will allow the programmers and analysts to spend the off weeks teaching the system to make new kinds of charts that will be perfected and added to the existing list of automated charts.

Consider the two simple systems in Fig. 3. In the first, we have a traditional mainframe graphics system where software resides on the host computer and the graphics display terminals are connected to the host via direct lines or modems. In the other system, the host computer is connected to a dedicated graphics computer that is located near the graphics terminal. The link between the graphics computer and the graphics terminal is short and very high speed. The link between the graphics computer and the host is again simply a modem or direct line.

For a single user, the system involving the local graphics computer is probably cheaper because the cost of the graphics computer and software is generally less than a terminal plus a mainframe graphics software package of comparable sophistication. As more terminals are added to the system, however, the incremental cost to the mainframe system is only the terminal, while the incremental cost to the "distributed" system is the terminal and the computer. Thus, one might conclude that when one gets to three or four terminals, the mainframe approach is cheaper.

This analysis is misleading for the following reasons:

- It ignores the rather substantial incremental cost of computing a chart on the mainframe and the usage that each new terminal implies.
- It ignores the additional operator time needed to run a mainframe system.
- It ignores the speed considerations imposed by the low-speed link between the terminal and computer.
- It ignores the utility of the system to a manager who must get very quick response with extremely simple system operation.
- It ignores degradation of other mainframe applications that are trying to run at the same time as the graphics program.
- It ignores the value of local data storage and local picture storage that is independent of

By placing a great deal of intelligence at both ends of the wire, we can substantially reduce the communications time and costs.

the loading or operational status of the host.

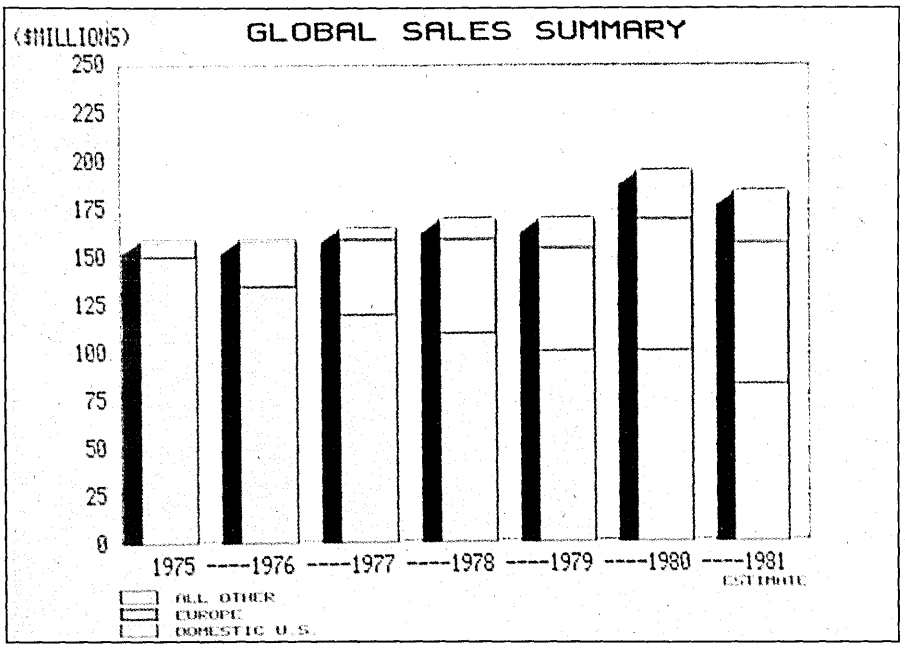
The cost to compute a typical chart on a mainframe computer generally runs in the area of $7 to $14. This cost estimate reflects both the costs of commercially available timeshared graphics such as ISSCO's DISSPLA and Tel-a-Graf (available from Tymshare, Inc.) and numerous in-house users of such systems. A typical single-user distributed system costs about $35,000 in three to six unit quantities. A simple graphics terminal, which is one component of this system, is about $12,000 to $15,000. Therefore, the cost difference between an additional graphics terminal and an additional complete distributed graphics computer system is about $20,000. If we amortize both systems over a five-year period, then the incremental cost of the distributed system is approximately $333 per month. On an operational basis, then, the distributed system becomes more economical when the usage is only 30 to 40 charts per month. The savings for using the distributed system based on a five-year life are reflected in Fig. 4.

This cost analysis frequently startles computer specialists who are used to the idea of buying a mainframe computer and simply hooking up as many terminals as needed. The cost tradeoffs with graphics are a little different from most computer applications because of the sizes of the graphics programs, cpu time to generate a chart, and the intensive use of I/O. By distributing the graphics processing, the host computer performs only its usual tasks of recovering numerical data.

TIME AND COST REDUCTION

Another factor to consider where multiple users are concerned is communications costs. If the graphics facilities are all to be located within a short distance of the mainframe, then there is not an appreciable incremental cost of transmissions. However, most large corporate users have many branch locations and divisions that require access to graphics reporting. This requirement implies leased communications channels or normal telephone connections. Using common interstate carriers, the coast-to-coast communications costs would be about $1 per chart, based on a picture with 5,000 to 10,000 characters in the display list.

In most cases, the actual alphanumeric data contained in a chart is only 1% or 2% of the number of characters needed to draw a chart. For instance, the chart above (Global Sales Summary) contains only 20 data points, plus about 30 characters of descriptive alphabetic titles. If we use 4 bytes to transmit each data point, then the entire chart contains only 110 characters. However, it took roughly 7,800 characters to convert the data into a display list for this graph, making the actual data only about 1.5% of the display list.



Another way to look at this relationship would be transmission speed of data. At 1200 baud, the picture would take about 75 seconds, whereas the data would take about 1 second. Some distributed graphics systems will also allow for the transmission of a "command list" that can turn the raw alphanumeric data back into a picture. The chart above was created on a Trend-Spotter system from Computer Pictures Corp. The commands needed to create the picture were:

```
WHITE
32BAR DATA1
RED
3DBAR DATA2
YELLOW
3DBAR DATA3
HEADING
```

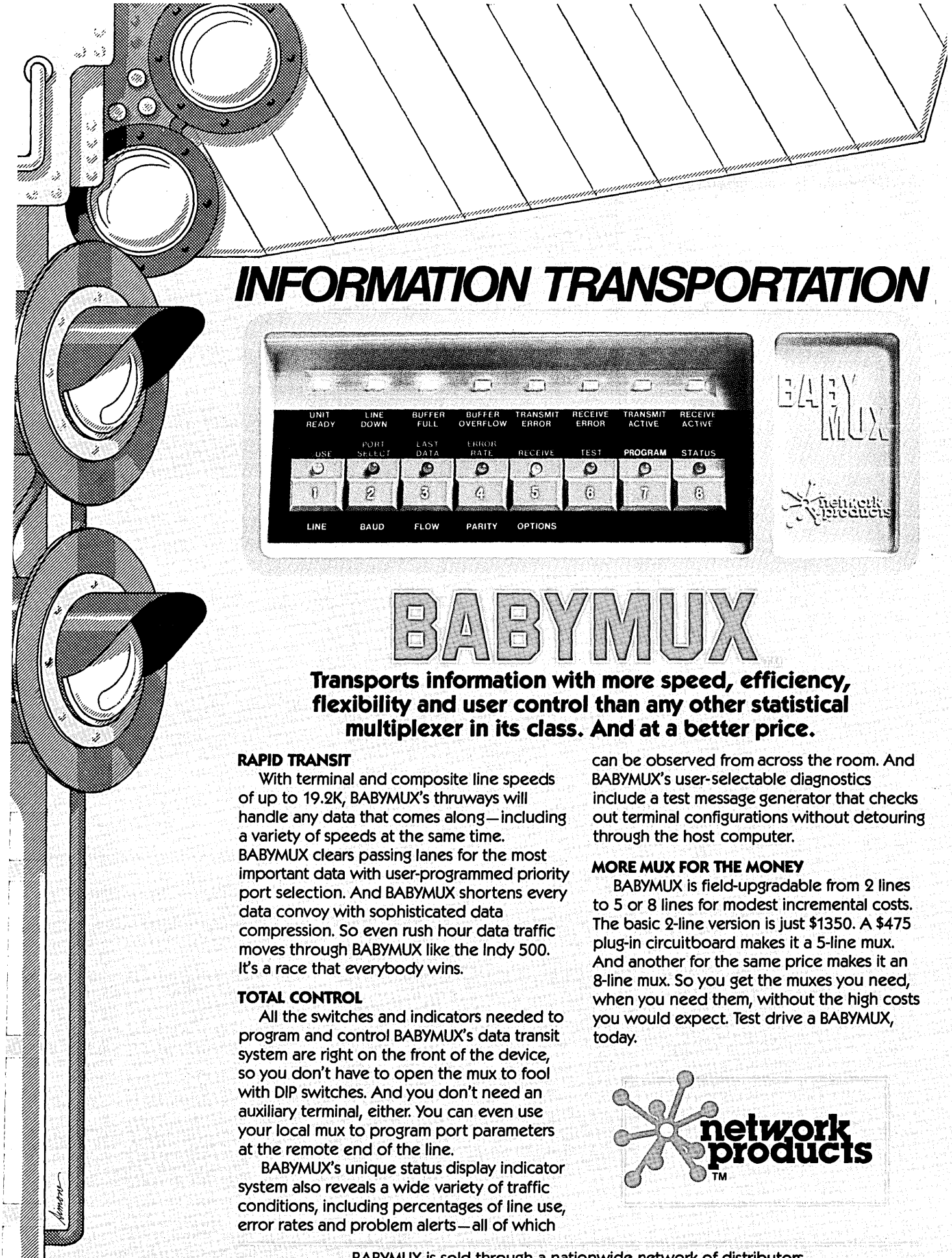
This command list contains another 55 characters. So, by transmitting approximately 110 characters of data and descriptive titles and another 55 characters of commands, all the information needed to exactly reproduce this chart can be transmitted in about 1.5 seconds. Therefore, it is safe to assume that the communications cost between the host and the graphics devices in a distributed system will be between 1.5% and 2% of the costs for a system which processes graphics on the mainframe.

Essentially, by placing a great deal of intelligence at both ends of the wire, we are able to substantially reduce the communications time and costs.

Distributed systems also feature local data storage. This feature is perhaps the most important in terms of providing rapid access to stored data and facilities for manipulating and maintaining a specialized database. Most of the 8- and 16-bit micros on the market can be outfitted with a Winchester hard disk in the 10 to 40 megabyte range. When one considers that 14 years of monthly historical data can be stored in about 750 bytes, it is easy to see how one could readily store thousands of high-level time-series files on such a system. Since seek times and transfer rates for such disks tend to make data recovery a process measured in milliseconds, a dedicated system of this sort can provide the user with unparalleled response time.

Another benefit of local data storage comes from the ability of such a system to strip data from the host's transactional files during off-hours. Normally, an executive will want to view information during peak hours when everyone else wants to use the host. At such times, response can be too slow. But some manufacturers of distributed graphics products will allow a list of files to be downloaded from the host and executed during off-hours, largely unattended. The Trend-Spotter system, for instance, can execute a "download list" and then automatically begin turning the downloaded data into graphs by commencing the execution of chaining command files, called "Procedures."

The ability to locally store data (and pictures, which are of course a form of data) also means that distributed systems can talk with each other without involving the host at all. For instance, if you were viewing a chart in New York, and you had a similar system in San Francisco, you could transmit the picture display list directly from one machine to the other. More efficiently, however, you could simply transmit the raw numerical data and the command list needed to recreate the picture at the other end, thereby saving nearly an



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CIRCLE 59 ON READER CARD

Call it laziness, executive ego, or what have you... very few top managers display much affinity for the typewriter keyboard.

order of magnitude in communications costs and speed.

Foreign file interfaces are programs that let a remote computer decipher data files stored in other computers. Such software is available on several mainframe financial modeling software systems, as well as distributed graphics systems. The foreign file interface is programmed with a list of specifications for each type of data file that it is expected to read or download. The specs include the protocol for getting the host computer to transmit the desired data, as well as definitions of where to look for the desired data fields in the returning data. Generally, you might say that the foreign file interface mimics a dumb terminal in that it will reproduce the commands needed to get the host to correctly respond, and then pick out the desired information from the returning code.

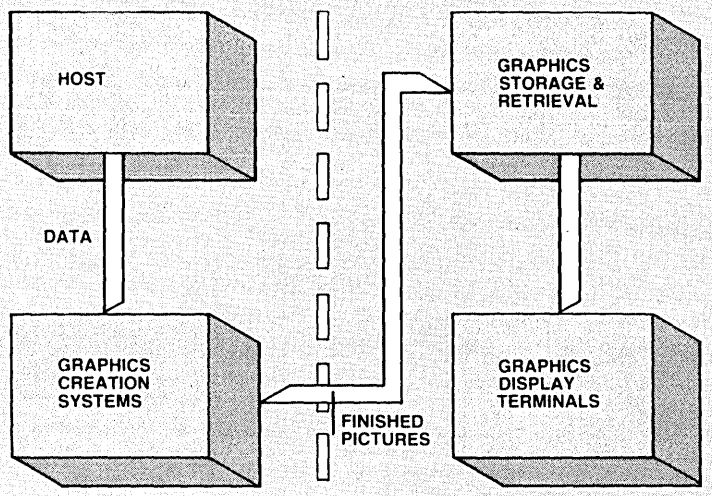
Normally, if you can give the host a command that will cause a data file to be displayed on a crt and if you can physically spot the data you are trying to recover somewhere on the screen, you can probably easily extract the data automatically with a foreign file interface.

These software tools are a powerful part of the management graphics system because they go a long way toward addressing the problem of database maintenance. Furthermore, they give the "owners" of the graphics system some degree of independence from the data processing departments and their usual backlog of applications projects. It is therefore possible to operate a system with sophisticated communications software at the remote location without interfering with the normal operation of the host computer and its support staff.

Also, as mentioned before, specs can be written to describe the data formats that are provided by commercial database vendors. Once written, the system can download datafiles completely automatically.

FIG. 6

TWO-PART GRAPHIC SYSTEM—CREATION AND RETRIEVAL



EXECUTIVE RETRIEVAL STATION

The retrieval of charts has not been done too successfully in the past, partly because people were attempting to deal with the problem using standard computer hardware that was simply not up to the task.

An executive retrieval station must have the following characteristics:

- extremely easy to use
- limited use of typewriter-like keyboard
- vary rapid response time
- random access to a large selection of graphs
- consistent in its performance from month to month
- good-looking display and acceptable cabinetry
- high security

Ease of use is probably the biggest issue. For years I went around trying to convince businessmen that they ought to learn to type and that the younger business school graduates would certainly all know how. At last, I am about ready to give up on this issue. Very few top managers, young or old, display much affinity for the typewriter keyboard. Call it laziness, executive ego, or what have you, it does not seem to work. Consequently most of the companies that are trying to get display devices into executives' offices (including most of the office automation companies) are looking to alternative control devices.

"Computerish" interactions, even such simple ones as logging on or interacting with a host computer's job control system, seem doomed to failure at the top executive ranks. Here, it's both an issue of complexity, the inevitable implied typewriter keyboard, and response time. About the only thing that seems completely acceptable is a nonkeyboard system (especially a touch screen) that comes right up to the master menu when you turn on the power. No disks, no boot-up, no log-on.

Random access to a large selection of graphs implies a local hard disk of some sort. A 10 or 20 megabyte Winchester can store between 1,000 and 2,000 graphs. Here the ease-of-use factor arises. I don't believe that there is a software package or system for creating charts that can succeed in today's executive environment. These people don't want to create graphs, they want to *see* graphs. Someone else further down in the organization creates the graphs. Computer Pictures' Touch-Track station, for example, uses a hierarchical menu system that allows the manager to page down from menus displaying high-level information to menus displaying details. Several different graphic "views" of the data are filed on the hard disk.

Such a system can become a primary source of day-to-day information for a top manager, if implemented intelligently. It must provide the manager with a set of financial graphs that are updated on a regular and timely basis. Also, each of these graphs should be consistent in format from month to month in order for the user to gain the benefit that comes from viewing consistently displayed data.

Two points about executive retrieval systems which cannot be overlooked are aesthetics and security. First of all, you can't put a product that looks as if it belongs on the U.S.S. *Missouri* into the executive suite. And when the image comes up on the screen it should be better than any color display that the executive is likely to have seen (color tv is the most likely frame of reference). The flickering of a 30 Hz refresh and all the alignment problems that can plague color displays are definitely negatives. At this level in the organization, money is not the most important purchase criterion. Image quality and content of the display will take precedence over cost.

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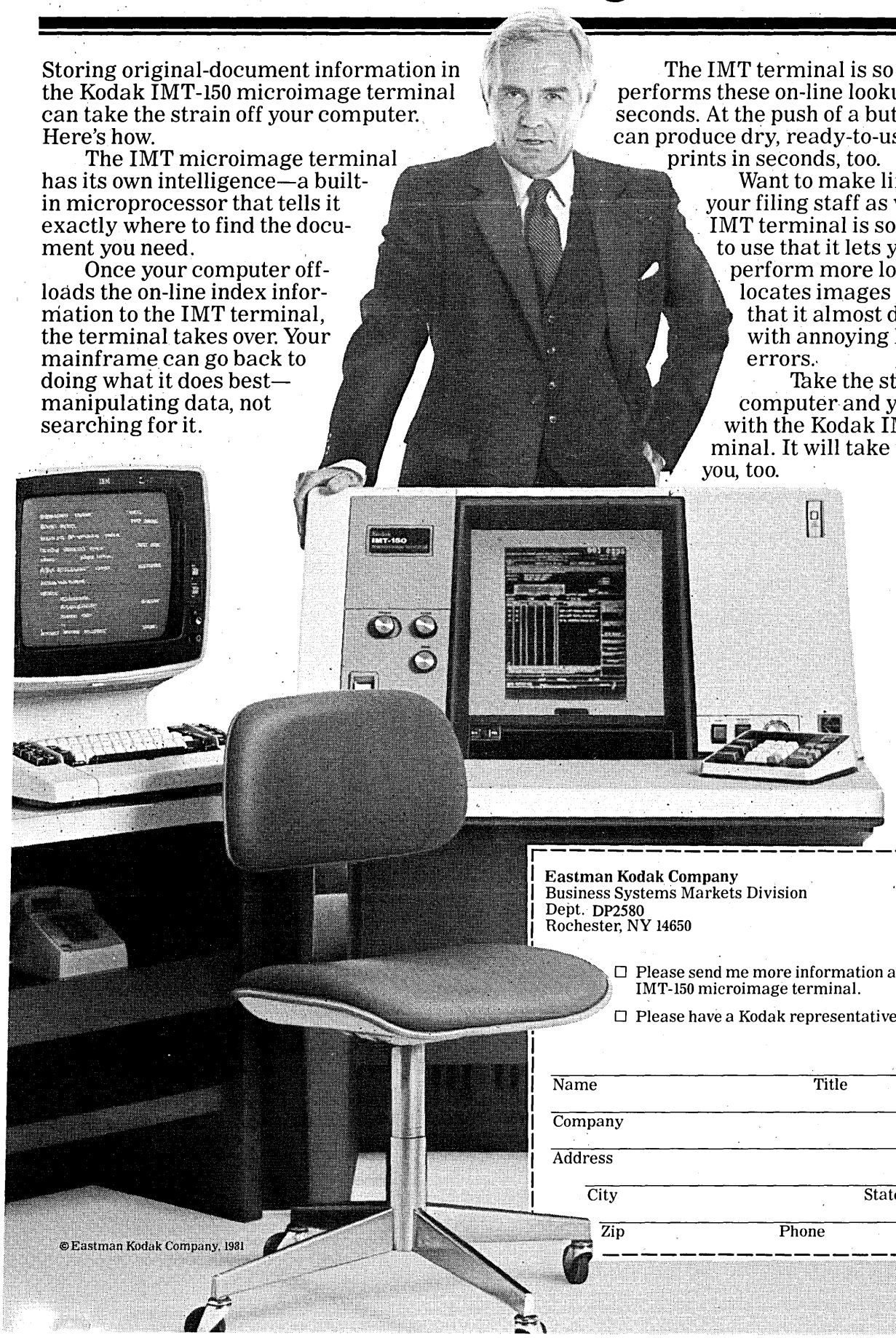

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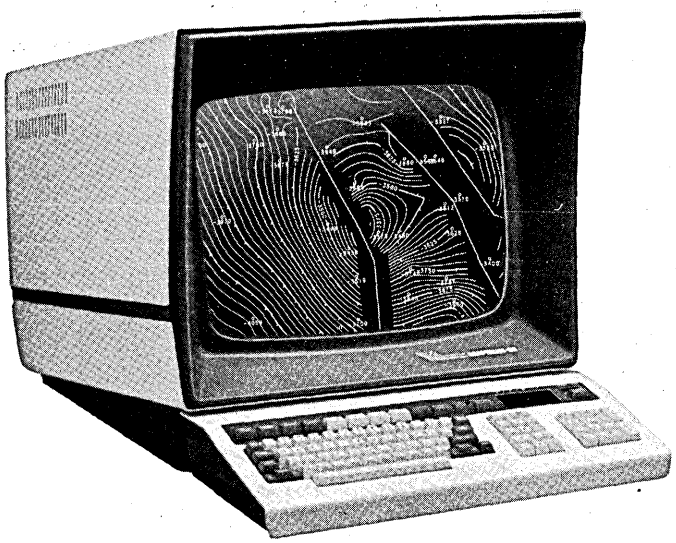

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CIRCLE 61 ON READER CARD

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One of the problems the distributed approach has yet to solve is that of getting data on and off the host computer, a task many managers will not find easy. Therefore, there is no easy way for users of distributed systems to share common data or pictures without going through the host or calling one another to arrange a direct machine-to-machine transfer (a process that is only slightly less inconvenient). What is needed is a dedicated master computer whose primary characteristic is the ability to handle a hefty-sized hard disk and an operating system that will allow all users to access this common data source relatively transparently. Apollo Computers, for instance, is marketing a system that allows users to look to other computers in a local network for data that it cannot find locally. The user doesn't even have to know where data are stored in order to find them.

In such a system, the master will act as an intermediary, communicating with the host computer to obtain data from the transactional files, and providing a large repository for data that has to be shared by a number of graphics systems throughout the organization. From a hardware standpoint, we don't need a lot of number-crunching ability to perform this task—just the ability to handle a large database and get in and out of the ports.

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David Friend is chairman of the board of Computer Pictures Corp. In 1980, he founded Friend Information Systems, which merged with CPC in 1981. Before founding FIS, Friend was president of ARP Instruments, Inc. He graduated from Yale University with degrees in music and engineering, and later attended the Princeton University Graduate School of Engineering.

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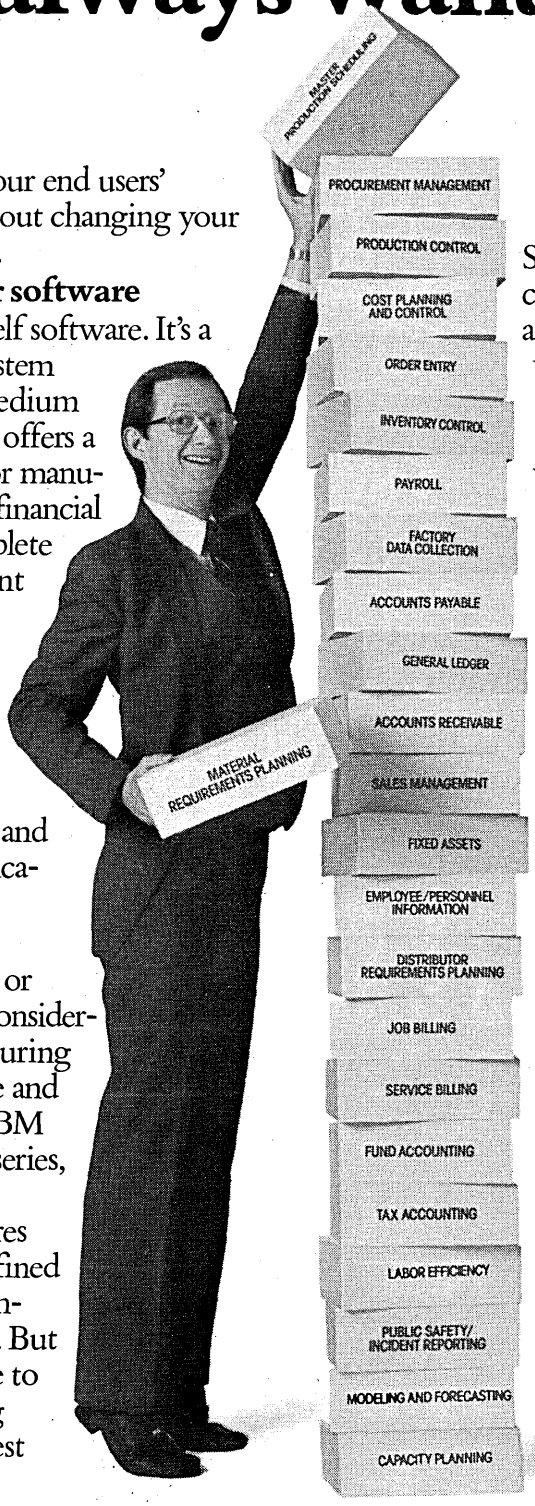

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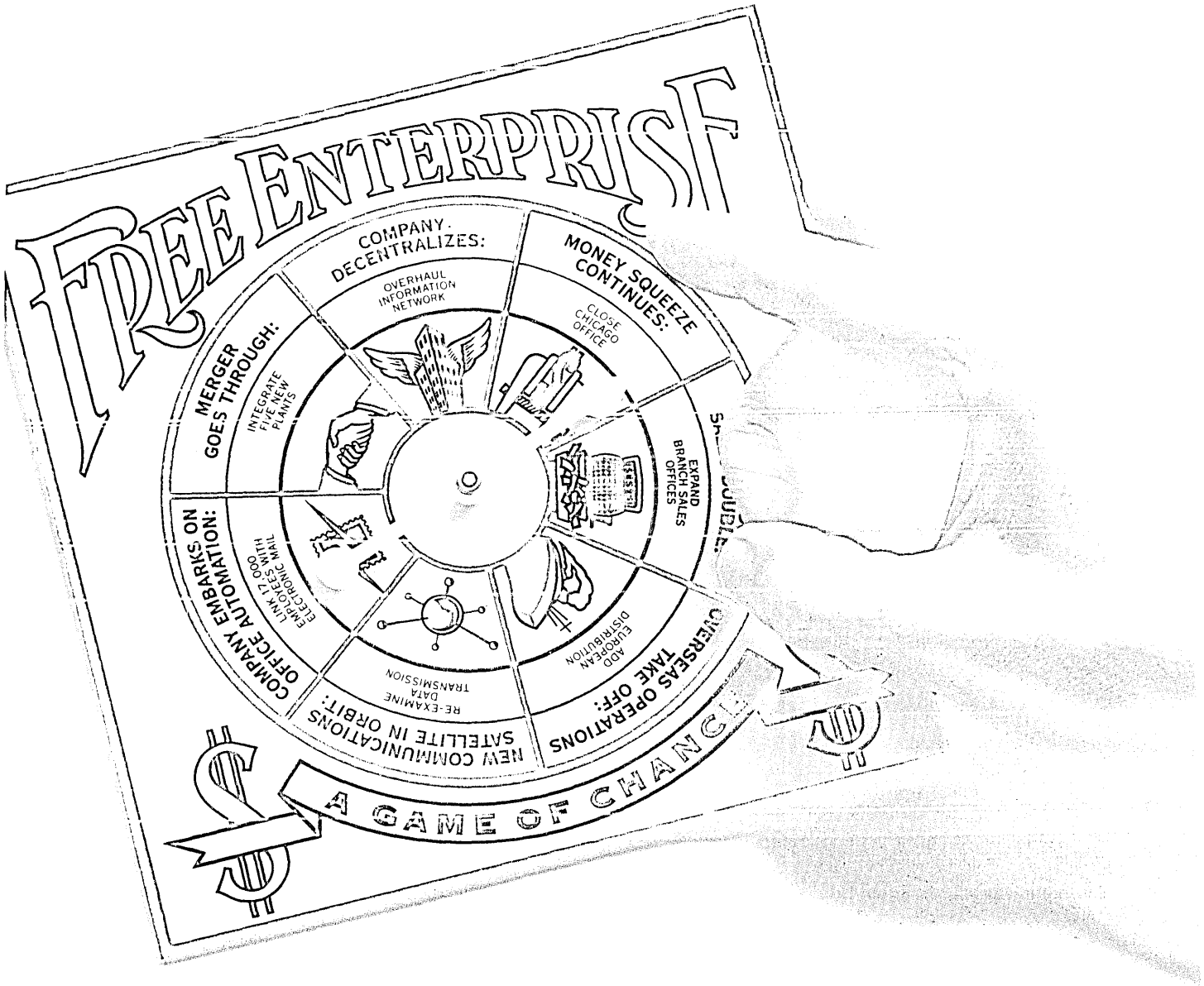

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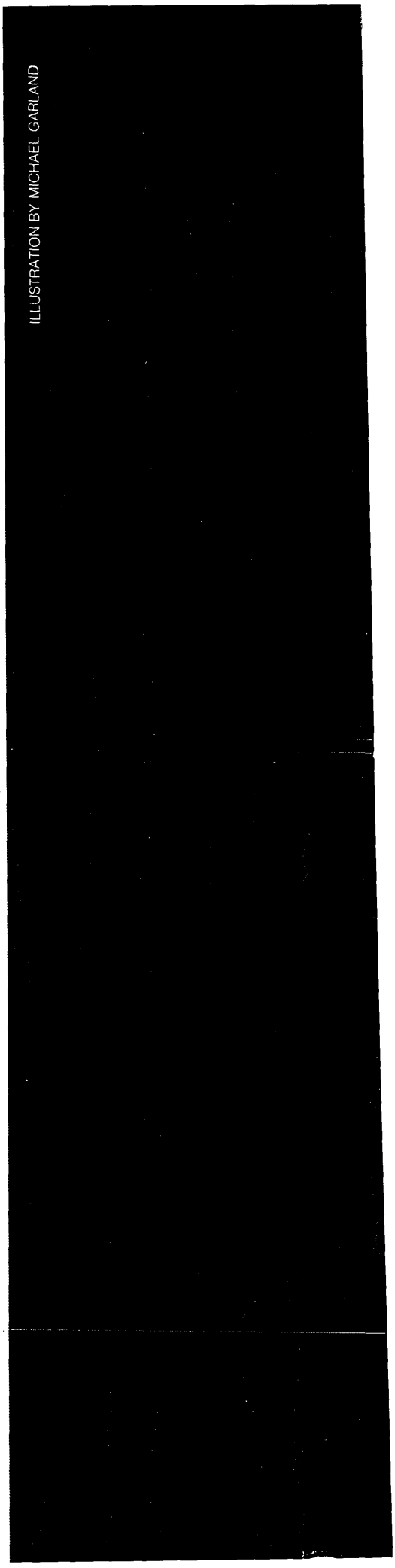
CIRCLE 63 ON READER CARD

The people who plan to wire your home may get to know you very well. Lawmakers have noticed, and are beginning to hammer out some rules.

HOME INFORMATION SYSTEMS: THE PRIVACY DEBATE



by Alan F. Westin

During the 1960s and '70s, technological forecasters gave a lot of thought to the possible development of two-way households. These were interactive home information systems that might, one day, enable consumers to receive a wide array of individualized information services and also to communicate purchases, opinions, investments, and many other personal transactions outward at the touch of a button. The problem of protecting the sensitive personal data that such at-home systems could generate was widely discussed and even prompted hearings by state commissions looking into one means of wiring up the home—cable television. In those years, however, it all remained highly speculative. There were no commercial systems in operation, the technology was costly and uncertain, and it wasn't clear whether there was actually a demand for such services.

Now, in the early 1980s, two-way home information systems seem to be moving toward both technological feasibility and financial attractiveness. With pilot projects drawing enormous attention in the popular media and new entries coming on-stream steadily, it's time to look seriously at the issue of privacy raised by these systems.

About 25% of American households (and about 25 million viewers) are estimated to be wired for cable tv in 1982, with over 4,000 local cable stations in operation. Only a fraction of these stations—a few dozen—now offer two-way service, and these are all pilot projects. It's estimated, however, that 5 million households (with 15 million to 20 million viewers) could have interactive systems by the end of the '80s, from a base by then of 50 million cable-wired households.

About 96% of American households have telephones. Many industry observers believe that home terminals linked to service-providers via the telephone network will become the most common kind of two-way home information system in the next decade.

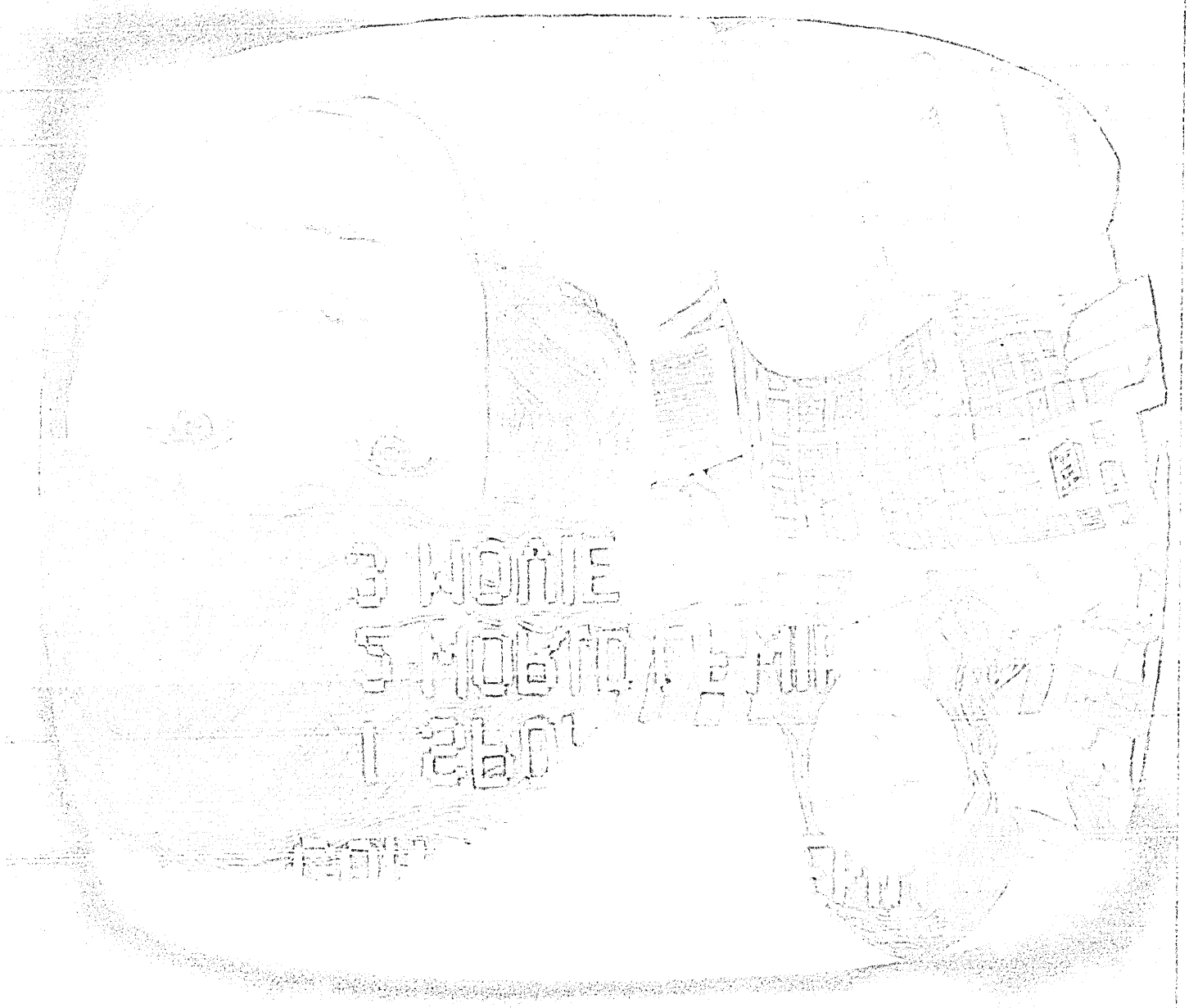
The prime terminal for these systems is the home computer. An estimated 1.5 million to 2 million microcomputers are in use today, and that number is expected to grow to 5 million by 1985 and as many as 10 million to 15 million by the end of the decade. This would provide 30 million to 50 million potential consumers for home information services.

Both cable tv and telephone-based systems are currently testing the market for a wide array of consumer services; a recent Federal Trade Commission study found no less than 60 possibilities. From the standpoint of potential privacy issues, these can be grouped into eight main categories:

1. *Home banking*. By early 1982, there were almost a dozen major home banking projects in operation across the country. A recent survey by Payment Systems Inc. found that banking from the home was the two-way service most desired by American consumers. The banks developing these projects have often linked up with communication firms or information service partners. For example, United American Bank's project in Knoxville has Radio Shack and CompuServe as participants, while Southeast First National Bank is working with American Telephone and Telegraph and the Knight-Ridder newspaper group.

2. *Shop-at-home services*. In a period of high transportation costs and other inconveniences, the opportunity to choose from a wide variety of goods (including supermarket orders) and have these delivered to the home is seen as a service for which there could be a sizable middle-class market.

3. *Information services*. General and



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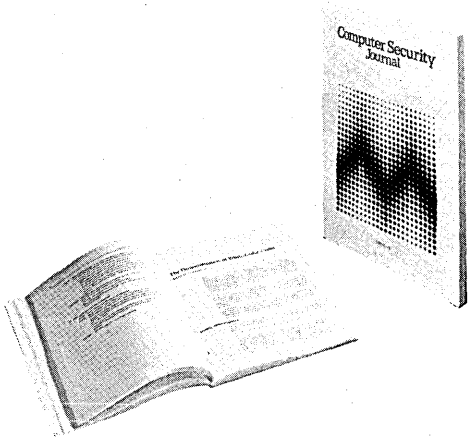

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Personal information is the vital lubricant of the data-based social system.

specialized information services for the home via computer or cable tv terminal are already thriving. Almost 1,000 databases are presently available to home computer owners, containing information on the stock market, public affairs, professional fields (such as law, medicine, agriculture, etc.), and many other subjects. In the cable tv system, subscribers also have access to a rapidly expanding body of videotext information displays.

4. *Home and personal security services*. Many systems offer their subscribers what one cable tv firm calls "high interest two-way services" such as fire, security, and intrusion protection, and medical emergency alert. Automatic monitoring, billing, and control of utility services is another application currently being piloted.

5. *Instant opinion polling*. Projects using this service have asked their subscribers about local community issues, national politics, social questions ("Would you favor a publicly known homosexual teaching in the school system?") and just about every kind of topic that appears in door-to-door or telephone opinion polls.

6. *Home study*. "Instant-response home study courses" are available on two-way systems, offering the subscriber access to interactive educational programs.

7. *Special entertainment options*. While sports programming is seen as the big potential money-maker in this category, both soft- and hard-core sexual materials are coming onto the cable tv market.

8. *Organizational fund raising*. Regular cable tv already offers a variety of religious programming, ranging from a few hours per day for some religious groups to a 24-hour-a-day Christian network. Also being screened are black, Japanese, Italian, Jewish, and many other group packages. Political, civic, consumer, and single-cause groups of all kinds are not far behind. (Even the American Civil Liberties Union is currently exploring a move into cable programming.) The dream of all such organizations—which the two-way systems stand ready to fulfill—is the home pitch. "If you believe what you have just seen and heard, and share our sense of urgency, don't wait to write a check and send it in the mail. Just put your finger on the keyboard and let us receive your support immediately."

THE HEART OF THE ISSUE

What these and other service options have in common is that the operators managing these systems will be collecting a significant pool of personal data from their subscribers. Into the operator's computer will flow information about checking and charge-account expenditures; purchase of reading material, novelty items, and magazine subscriptions; which special information databases are subscribed to; times owners left their homes or turned alarm systems off, and health conditions involving special alerts; viewer positions on survey questions; and home profiles produced from aggregating many individual responses, including purchases of sexually oriented films and services and contributions to various civic, political, religious, social, and charitable causes conducting home telethons.

Whether subscriber records listing use of these services will be preserved or will simply be used temporarily for transactional purposes and then destroyed is one of the key issues involved in home information systems. But, to the extent that personal data are preserved, a future subscriber who takes advantage of these enticing options would be creating a highly detailed record of personal and family data. And therein lies the heart of the privacy issue.

If there was one lesson that was learned during the first part of the computers-and-privacy debate, it was that personal information is the vital lubricant of the data-based social system we have been building since the 1950s. Knowledge of consumer preferences and behavior is central to marketing of goods and services, extension of credit, decisions about employment and insurance, and many other activities. Computerized personal information is equally sought by government for a host of rational administration purposes such as tax compliance, law enforcement, licensing, program eligibility, etc. When such personal information exists in automated form, we have learned to assume that there will be business uses made of it and there will be legal obligations created to produce it for government, unless organizational policies or new legal constraints are developed to keep such data confidential.

The potential threats to privacy fall into four main categories:

- Improper commercial use by the system operator. Here, the potential harm is that personal information supplied in order to bank, shop, vote, be entertained, or contribute to causes may be used—without the subscriber's knowledge or consent—for additional business purposes. Lists of subscribers with various characteristics could be sold to commercial marketing firms or to civic and religious organizations. In addition, lists of individuals with "derogatory characteristics" could be sold by the operator to services that would resell the information to groups such as merchandisers, credit grantors, landlords, employers, and insurers.
- Breaches of confidentiality to private third parties. Sensitive subscriber information could be obtained by private third parties through illicit cooperation of employees and executives of the system operator, or through outsider penetration of the system's security measures. Such intruders could be persons seeking data for the commercial or organizational purposes cited above. Or the intrusions could arise as part of the rough and tumble of American business, labor, and political life, which has featured extensive wiretapping and other forms of organizational espionage throughout our history.
- Pressures on subscribers to authorize release of their profile data. If home information systems store income and expenditure profiles, persons applying for credit or other financial-based opportunities might be asked to authorize the system operator to supply information to business or government organizations that the subscriber was applying to. This would add home information profiles to the list of other records that individuals are increasingly being required to provide when applying for credit, health insurance, housing, government benefits, etc.
- Investigative or litigative access by government. Telephone toll records, credit-card receipts, bank records, and other data generated by individuals and kept in organizational files have been sought for law enforcement investigations, legislative hearings, and judicial proceedings for many decades. Therefore we can assume that any personal data that government agents consider relevant to an investigation or prosecution could be sought directly from home information system operators.

DATA USE WITHOUT CONSENT

This raises the question of whether the system operators would have to (or would be legally able to) notify the subscriber that a government demand had been made, and whether the subscriber would be able to challenge the scope or pertinency of the demand. In addition, to the extent that records of the home information system might pinpoint the location of individuals at a given time (especially where unique personal identifiers were used to authorize certain kinds of purchases or services, either from the home or from remote-terminal services), one could expect the files of home system operators to be especially attractive to government officials for surveillance or evidentiary purposes.

Until 1980, legal protection for subscriber privacy had been limited. Only one state cable commission, Minnesota's, had issued a privacy rule requiring privacy safeguards to be written into every franchise agreement issued by a municipality. In other states, some individual municipalities in the 1970s had written guarantees against use of subscriber data without consent into their ordinances on cable operations or into regulations for franchise operators. However, no general legislation (state or federal) had been enacted that gave privacy protection to sub-

The FCC had said it would not act on the privacy issue because "evidence of abuse in this area had not yet come to light."

scribers of interactive cable tv (or to other forms of home-information-service systems). The Federal Communications Commission had said several times in the 1970s that it was watching the issue of privacy on interactive cable systems, but that action would not be taken because "evidence of abuse in this area had not yet come to light."

Then, in 1981 through 1982, as the pilot interactive systems spread and their uses were highlighted in national publicity, the pace of action quickened. This has been marked by four parallel developments: the enactment of more detailed municipal privacy regulations; the promulgation of the Warner Amex Privacy Code; a move to enact state and federal cable privacy legislation; and accelerated privacy protection activities by state cable commissions.

Some municipal governments began in 1981 and 1982 to issue detailed subscriber privacy protections. Lexington, Ky., for example, forbids either the grantee or the government to tap or monitor a subscriber's line "for any purpose whatsoever without the express written permission of the subscriber"; an exception is made for "sweeps" to verify system integrity, control "return-path transmission," or bill for pay services. Lexington also forbids grantees, "without specific written authorization of the subscriber involved," to provide any party with a list of names and addresses "which identifies the viewing habits of subscribers." Violation by a grantee of either of these sections subjects it to a fine of up to $10,000, and any other party violating the regulations is also subject to fine and/or imprisonment.

Milwaukee, Wis., adopted a similar general ordinance governing cable communications in May 1981. A 1981 study in Wisconsin, however, found that out of 80 municipalities served by cable, 61 had no ordinances protecting subscriber privacy. Of the 19 that had enacted some safeguards, mainly in the middle to late 1970s, only 10 dealt with the elements the study regarded as essential: bans on collecting or releasing identified subscriber information without express consent, and a prohibition on requiring such consent as a condition for receiving the cable service. The study found that even the 10 ordinances with these rules "were vague, redundant, contradictory, and, in general, poorly written." Therefore, the study concluded, adequate and uniform privacy protection for local cable subscribers needed "to be handled at the state or federal level."

VOLUNTARY OPERATOR RULES

In October 1981, Warner Amex, operator of the Qube system in Columbus, Ohio, announced the first comprehensive "code of privacy" to be promulgated by an operator of an existing interactive project. Gustave Hauser, Warner Amex's chairman, stated that the growing discussion of "social policy issues relating to privacy and individual rights [in cable systems] . . . is understandable and welcome," and that such questions "have to be answered as part of any responsible two-way cable development program."

The Warner Amex code drew heavily on fair information practices rules developed in the '70s. Because the code was what Hauser called a "codification" of rules developed through experience in running the Qube project since 1977, its provisions are presumably practical measures that would not jeopardize the operation of a successful system.

Subscribers are guaranteed the right to "examine and copy any information developed by Warner Amex pertaining to them, and to correct such records upon a reasonable showing by the subscriber" that any information is "inaccurate." As for developing "individualized information concerning viewing or responses," the code says these will not be compiled "unless the subscriber has been advised in advance and given adequate opportunity not to participate." Warner Amex promises to keep "individual subscriber information" for only as long as is reasonably necessary, e.g., to verify billing." All third parties who provide services to Warner Amex subscribers would be required to adhere to the company's code of privacy. It is promised that individual subscriber information will be surrendered to government agencies requesting it only in response to a subpoena or court order, and that the operator will notify the subscriber "prior to responding, if permitted to do so by law."

The Warner Amex code represents a well-formulated and responsible voluntary action by a service provider, comparable to the employee privacy policies that IBM and a few other progressive companies pioneered in the early 1970s. Like those IBM policies, which were widely copied by other large employers during the '70s, the Warner Amex code is likely to be adopted by at least some other service operators. And, the New York State Cable Assn. issued a 10-point code for its members in May of 1982 that closely parallels the Warner Amex rules. However, the National Cable TV Assn. stated it has no immediate plans to issue an industry-wide code (a point to which we will return later.)

There has been some concern that not all operators will adopt these rules, especially where they threaten to diminish income from secondary uses of subscriber data. There is also concern that the company codes do not provide for penalties to punish employee violations or proper damages to subscribers who might be harmed. It has also been stressed that no voluntary code can cope with the demands for information that government or third parties might make through legal process.

One example, widely cited to show that this is not a hypothetical concern, involves Warner Amex's own Qube system in Columbus, Ohio. A local theater owner, prosecuted on obscenity charges for screening an allegedly pornographic film, became aware that an abridged version of the same film had been offered on Qube's popular pay-movie option. The theater owner's lawyer subpoenaed the Qube records to obtain both the number of local viewers who had ordered the film and the names of these subscribers. Reportedly, he wanted to see whether the list might turn up any policemen, prosecutors, judges, city officials, and perhaps even leader of antiobscenity groups who had watched the movie in their homes.

The presiding judge, under his judicial authority to define the proper scope of a subpoena, directed the Qube management to produce only the number of viewers who had ordered the film, not the names. Warner Amex has stated that it would have appealed any other ruling to higher courts. But local judges could well rule differently in other cases, and the appellate courts might sustain those rulings where there is no statutory protection for the identified records. For example, where it is not forbidden by statute, courts have repeatedly compelled reporters to produce their notes for stories when the notes seem to be relevant in the determination of libel cases or in serious criminal proceedings, despite strong protests that such compulsory disclosures intrude upon the confidentiality expected by news sources.

Concern over such possibilities has led to the third recent development, a move to formulate new state or federal legislation.

CABLE TV PRIVACY ACT

In 1981 Illinois became the first state to enact legislation to protect individuals from invasions of privacy in the operation of cable tv systems. The Cable Television Privacy Act is relatively short, and contains the same kinds of safeguards as the Lexington and Milwaukee ordinances. It prohibits a cable tv company from monitoring "an individual subscriber's set or his individual selection of viewing fare," except for service purposes. It also forbids the operator to give anyone, without express written consent, a list containing a subscriber's name; to "conduct research for any purpose"; or to "install or maintain a home-protection scanning device in a dwelling."

In April 1982, Wisconsin became the second state to enact cable privacy legislation. Opening with a legislative finding that "the use of cable television may infringe on the right to privacy in this state," the law adopted two major regulations. The first re-

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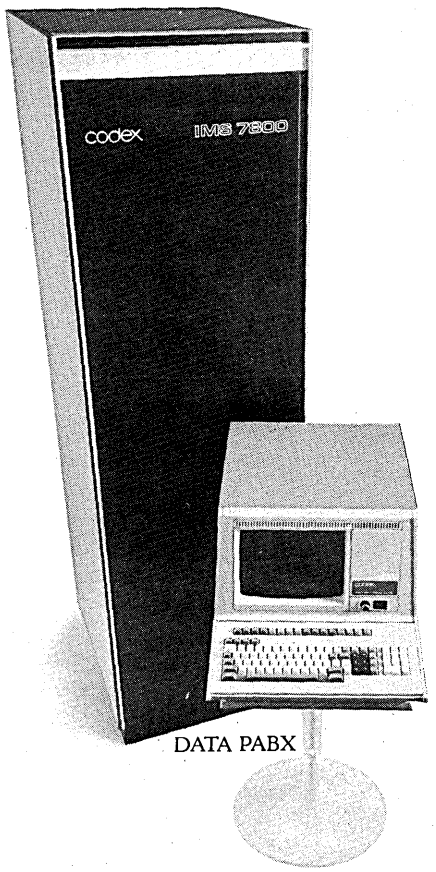

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CIRCLE 65 ON READER CARD

Violations of Wisconsin's new cable privacy law include first-offense fines up to $50,000 and subsequent fines up to $100,000.

quires operators to give any subscriber who asks for it an "on-off" device to prevent signals from being transmitted from the home. The switch is not required to interrupt constant-interval signals, such as those used for home security, fire detection, and utility service monitoring.

The second main provision forbids any person, without the written consent of the subscriber, to monitor the subscriber's cable equipment or the use of it, except for service purposes; to provide anyone with information that discloses any "aspect of behavior" of the subscriber, of members of the household, including "individual habits, preferences, or finances"; or to "conduct research that requires the response of the subscriber or a member of the subscriber's household, except by mail or personal interview," unless the subscriber is notified in writing before the research begins and "at least once a month while the research is being conducted."

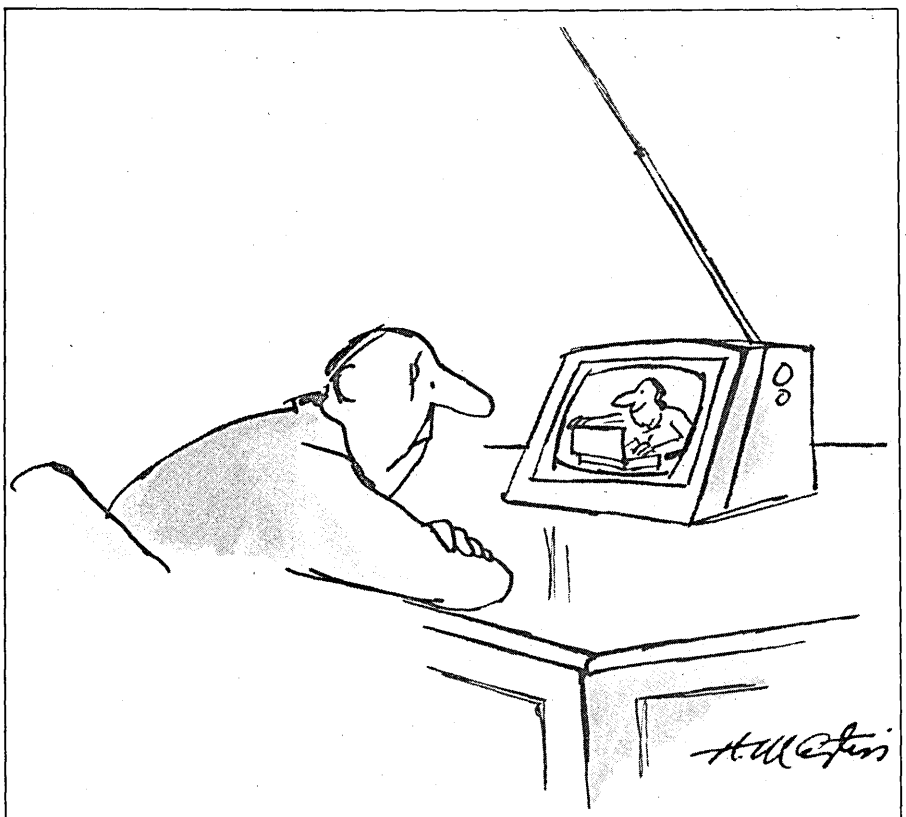
Violations of Wisconsin's new cable privacy law include first-offense fines up to $50,000 and subsequent offense fines up to $100,000. Damages and injunctive relief can also be awarded to injured parties who sue under the law.

"Ours was a low-key, low-visibility effort," observed Marlin Schneider, the bill's sponsor. "But we now have a good law that can channel the conduct of this new industry in ways that observe and protect subscriber privacy."

By mid-1982, cable tv privacy bills had been introduced in Maryland, California, Missouri, Massachusetts, and New York. Since the New York bill has attracted the most attention, and promises to be a focal point for national debate over the immediate need for detailed state regulation, it is helpful to look at its origins and main provisions.

In January 1982, a month after the State Consumer Protection Board had recommended safeguards to protect subscriber privacy in two-way cable systems, State Attorney Gen. Robert Abrams submitted the most comprehensive two-way cable privacy bill put before any state legislature. Several days of public hearings were held in May 1982, and the bill is now pending.

Many of the New York bill's provisions parallel the Warner Amex code, and would seem to pose no compliance problems for system operators who have adopted that code. But the New York bill does more. It would establish a subscriber's "expectation of confidentiality" and right of access to his or her own file as legal rights, providing a clear basis for judicial treatment of subscriber privacy claims as these might arise in government inquiries or court proceedings. In addition, the bill specifies duties of accuracy in keeping personally identifiable data, and sets obligations on operators to correct inaccurate or outmoded information. There is a very detailed (and complex) notification procedure for obtaining and updating several forms of subscriber consent. The bill would also make tapping or interception of cable signals a crime under the state wiretapping statute. Finally, the bill gives authority to the state Cable TV Commission and the Attorney General's Office to issue further rules to carry out the legislation.



"... and now, let's rejoin hidden camera number 3 in the stockroom where employee number 372094 seems to be helping himself to paper clips, rubber bands, memo pads and petty cash."

© DATAMATION

CARTOON BY HENRY MARTIN

STANDARDS BY LAW

Attorney General Abrams and his staff believe that such legislation is essential despite the Warner Amex code or even the possibility of an industry-wide voluntary code with no enforcement sanctions. Robert Perry, the specialist who worked on the bill, stressed that setting privacy standards by law would put compliance costs on all system operators (not just the "good guys"); would lead to useful standardization; and would lead operators to install protective procedures more cheaply in the early stages of system development, rather than having to disrupt their systems later at what would probably be far greater costs.

California also held hearings on a cable privacy bill in 1982. Drafted by Assembly Majority Leader Mike Roos, a Democrat from Los Angeles, the California bill reduced the complexity of the notice provisions and other regulatory details of the New York bill and was written with considerable advice from the California Cable Television Assn. as well as the State Dept. of Consumer Affairs. The sponsors believe they have a bill that retains essential safeguards but is less cumbersome than the New York draft. With an interactive system about to start in Southern California, they say their measure has a good chance of passage in 1982, or at least in 1983.

Industry spokesmen are generally opposed to state legislation at this time, on the basic premise that no abuses of subscriber privacy have occurred. They oppose "premature" regulatory intervention, and especially the New York bill's threat of administrative rule-making that could carry restrictions still further. Some also believe that if there is to be law, it ought to be federal law, in order to promote a uniform set of rules and procedures for an industry in which multistate, standardized operations are needed to turn a profit. In addition, the executive director of New York's State Commission on Ca-

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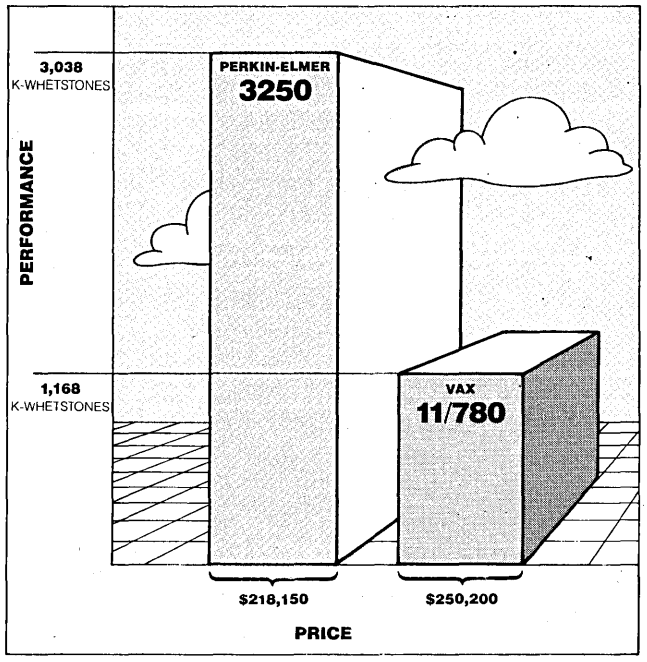

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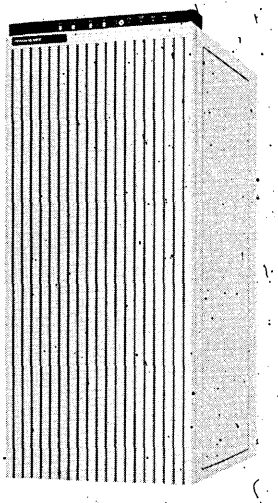

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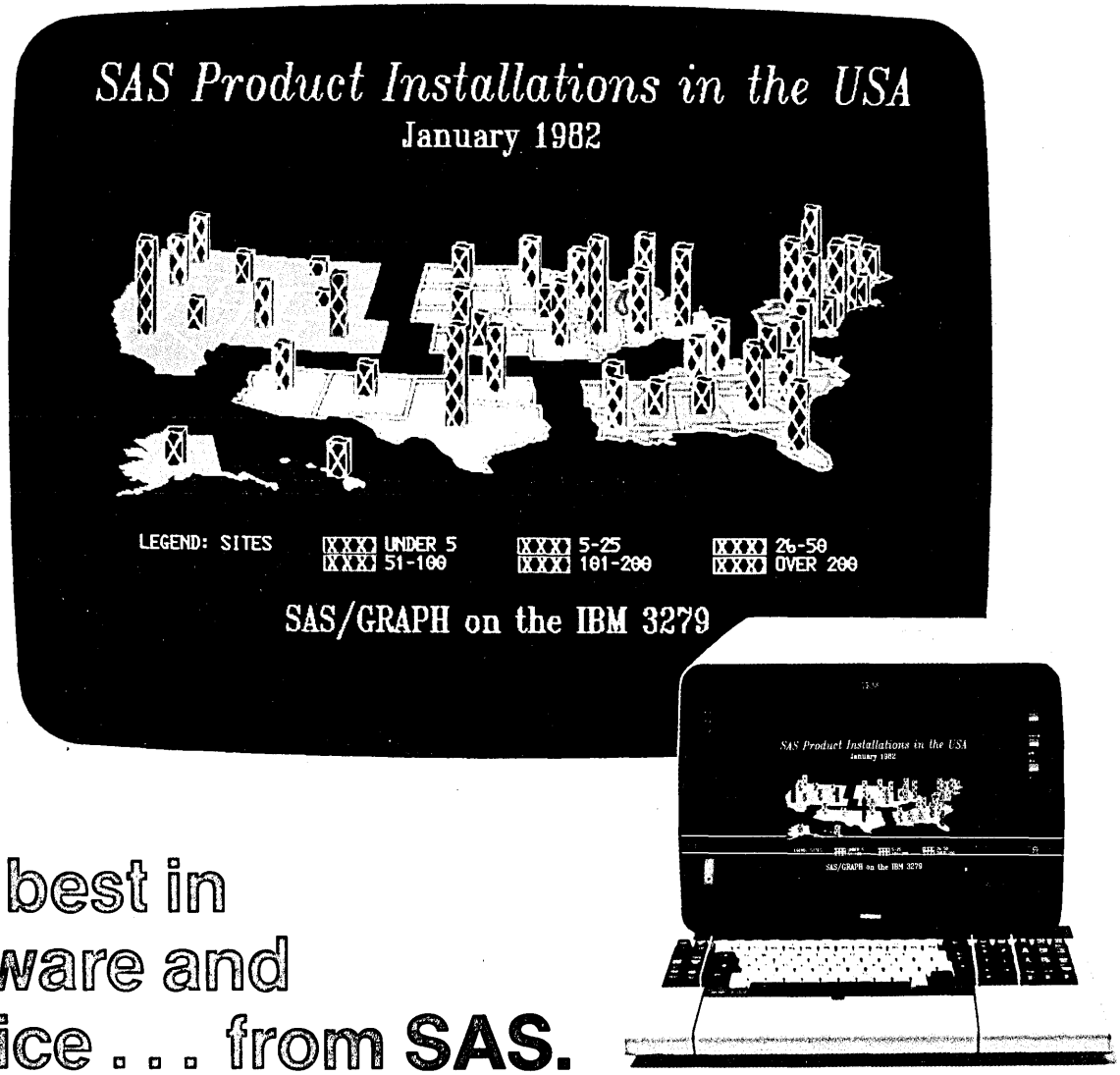

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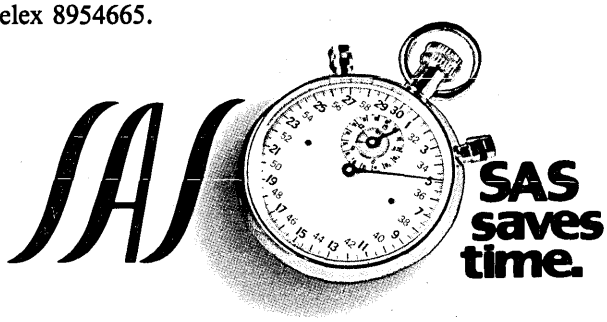

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CIRCLE 68 ON READER CARD

The New York bill would make interception of cable signals a crime under the state wiretapping statute.

ble Television sharply attacked Abrams for "frightening people and giving interactive cable a bad name." "I don't think the wolf is at the door," Edward P. Kearse retorted to the state attorney general. The problem "doesn't exist, and we already have a solution to it in our rules," which he said prohibited cable companies from collecting or disseminating subscriber information without permission.

SENATE CABLE BILLS

Early 1982 was also the time when federal bills were introduced to provide privacy protection in cable operations. Sen. Barry Goldwater, sponsor of a general "Cable Telecommunications Act" that would give the FCC primary regulatory authority over cable, included a section on "Protection of Subscriber Privacy" that would prevent unauthorized interception of cable signals by declaring them "wire communication" protected against tapping. The act would also forbid cable operators to disclose personal information about subscribers without permission. If a court orders such disclosure, the subscriber must be notified and given at least 14 days to contest the order. A subscriber whose privacy is "violated" can recover civil damages, and cable operators who violate the privacy protections are subject to criminal prosecution. Senator Goldwater feels that even though voluntary codes are useful, basic subscriber rights to privacy need to be protected by any federal law regulating the cable industry.

In addition, Senators Ernest Hollings of South Carolina and Howard Cannon of Nevada, both Democrats, included basically similar subscriber privacy protections in a measure they introduced in late April 1982, to leave cable regulation with the municipalities. Thus both the Republican and Democratic bills proposing to create federal policy for cable operations now include privacy sections. However, the National Cable Television Assn. has said that it opposes the privacy sections of both bills, because it feels there is no problem and no legislation is needed.

While the Reagan Administration has not yet expressed a position on the cable legislation pending in Congress, Chairman Fowler of the Federal Communications Commission stated in February 1982 that, as far as the FCC was concerned, cable privacy was not yet an issue calling for federal action. In addition, a staff report done at the FCC, "Economics and Telecommunications Privacy: A Framework for Analysis," recommended that the federal government leave privacy protection to the marketplace; privacy could then be "priced" and would be supplied as a service to those who really wanted it.

Though 11 states have created state cable commissions, only Minnesota's has as yet issued broad subscriber privacy rules. The Minnesota privacy rule was issued in 1975, under a legislative act giving the state commission authority to establish rules for cable, including rules "relating to privacy." This format reflects two of Minnesota's long-standing traditions—early enactment of strong consumer and privacy protections, and broad legislative assignment of rule-making authority to state administrative agencies.

The Minnesota rule requires that any municipality franchising a cable system must enact the following privacy protections by ordinance:

- No cable signal can be transmitted from a subscribers's terminal to monitor individual viewing patterns without express permission of the subscriber. Permission must be obtained in a separate document describing fully the use to be made and cannot last longer than a year, though it can be renewed.
- No penalty can be invoked for refusal of a subscriber to consent or renew a consent to such use, and it can be revoked at any time by the subscriber.
- No information on the viewing habits of a subscriber obtained by monitoring a subscriber's transmission can be sold or otherwise made available to any party other than the operator and its employees unless authorized by the subscriber.

Since issuing this rule in 1975, the Minnesota commission has updated it from time to time as cable technology has developed. For example, an additional regulation clarified that sweeps to verify system integrity or to carry out billing do not require a subscriber's written permission.

A move by some of the other 10 states with cable commissions to adopt regulations similar to Minnesota's seems likely in 1982 or 1983. Forty states, however have no such cable commissions. Unless commissions are created in these jurisdictions, some other route will have to be found to formulate and adopt statewide administrative privacy rules for franchise operators.

WHERE DO WE GO NOW?

What observations and judgments should be drawn from this report of quickening interactive projects and early privacy-protection responses? First of all, it helps to compare home-information-system activity with the way that the first uses of information technology unfolded in the '60s and '70s. Then, business and governmental organizations that had manually collected personal data about clients, customers, and subjects for many years, moved part of their record-keeping and information uses into automated forms. Instead of adopting privacy regulations solely for the automated activity (as the Europeans have largely done with their licensing of EDP systems by data protection boards and commissioners), the United States chose to update and expand traditional privacy expectations in these organizational settings, and apply them to all collection and uses of personal information, whether manual or automated. We did this in two ways: by enacting some broad fair information privacy codes to cover all federal agencies (the Federal Privacy Act of 1974), with some states having done likewise; and, by enacting specific federal and state privacy codes to cover particular areas of informational activity (criminal justice and credit reporting for example) that needed detailed regulation.

In this perspective, we need to ask whether—for privacy protection purposes—we should characterize home interactive systems as being essentially an expansion of familiar activities such as telephone communications, banking, and charge-card shopping. Or, should we regard home interactive systems as a new kind of business requiring new privacy rules?

Despite all the recent promotional publicity of system developers and futurists, which tells us what these new home systems will soon be like, and despite the reactive conclusions adopted by privacy advocates based on such predictions, the cold fact is that home interactive systems are in such an early stage of development that many of their privacy-critical elements are still not clear.

For example, despite the fact that some conglomerate operators of interactive cable projects now include credit card firms, banks, and publishers, along with the communication organizations, the cable company may turn out to function primarily like a communication carrier, such as the telephone company. If so, specific information services would be provided by banks, department stores, and educational companies, as lessors of communication time, and they would be the organizations that kept individual subscriber records. Presumably, traditional confidentiality relationships and existing legal rules would apply between subscribers and the providers of such services. If no legal rules were in existence for a particular service, such rules could be set for the service-provider using the cable facility.

Under this possible line of development, neither the cable company nor the telephone company would monitor or record the content of any information passing from the subscriber to the service provider; it would only record usage levels for billing and spot check for system integrity. Like the telephone company, which now keeps long distance toll records only for the six months required by FCC regulations, a cable carrier could similarly destroy individual records after the short period needed for customer billing needs.

The moment has been reached at which industry pleas of *laissez innover* are not persuasive.

Should this be the route that cable and telephone-based systems take, effective privacy regulations might well be limited to: a ban on releasing any data as to what services are used by an identified subscriber, without consent; forbidding any penalty for refusing to agree to such release; rules controlling third party and government access to such subscription data; and a prohibition against tapping of cable lines by third parties.

This common carrier model, however, may not prove to be the business operation that emerges in the next decade. If, as many think likely, cable and telephone-based systems themselves decide to provide home security, utility management, medical alert, and similar monitoring functions, then privacy regulations would have to be extended to cover any records the carrier would keep about such subscriber uses.

Furthermore, if the cable or telephone-based systems decide to make use of their current conglomerate status to offer credit card, banking, news, entertainment, shopping, or other specific information services, then the cable or telephone-based operator has become, for all practical purposes, a new form of consumer organization. The new operation would bring under one administration sensitive personal information now held by a variety of separate consumer-service organizations. The subscriber profile that could be drawn from records of this unified system would be broader and potentially more extensive than anything available today.

TOWARD AN INDUSTRY CODE

Should this be the case, extensive privacy rules would be called for to provide legal rights of confidentiality and access covering the cable or telephone-based system as a new multiservice provider, as well as any outside providers that were also allowed to offer services on the system.

While it may be too early to tell which of these arrangements will prevail, one thing seems clear: the moment has been reached at which industry pleas of *laissez innover* are not persuasive. Enough pilot projects are under way that the National Cable Television Assn., not just Warner Amex or the New York State Cable Assn. has an obligation to be more forthcoming than it has yet chosen to be. So far, the NCTA has refused to develop an industry code and has been content to assert that because there are no fully operating commercial systems and because no operator abuses have taken place, legislators and regulatory agencies should leave the industry alone.

Moving to the substance of the privacy issue, clearer discussion would be possible if public policymakers distinguished commercial and research uses of personal data from problems of government access.

Today, names, addresses, and characteristics of persons who belong to organizations, subscribe to publications, shop at stores or use various credit services, and give money to civic or political causes are exchanged or sold by the organizations providing such services, either to other single organizations or to mailing-list brokers. Some private organizations give persons an opportunity to decline having additional uses made of their names: for example, American Express does this for its credit card customers. Most private organizations do not provide such a choice, and are not required to do so by law.

The possibility that such commercial uses might be made by home information system operators has produced what might be called the "free market" versus "prohibitory" debate over secondary uses of subscriber data. Some industry leaders see the ability to sell lists of subscriber names and characteristics as an important source of revenue, as it is for many magazine publishers and voluntary organizations today. Privacy advocates have insisted that if this is to be done, persons should be asked in advance whether they agree to such further use, and should be able to decline without penalty. Some privacy advocates want all such additional uses to be banned outright, on the theory that people shouldn't be pressured into consents that weaken social boundaries of self-disclosure.

The free market view argues that the decision on secondary uses of subscriber data should be left to the individual viewer, not dictated by the privacy advocates. There would be no penalty for declining, but a money benefit might be provided to those who agree to have their names supplied for contact in areas of their consumer or social interest. In my view, this kind of option should be open to subscribers, since the core of privacy is the individual's right to choose what he or she reveals to others.

The same is true for market and social research uses. Wisconsin's new law now bans any research use of the interactive system, even with full disclosure and subscriber consent, unless it is done by personal interview or by telephone. This represents the kind of paternalism and overkill that American privacy protection has not previously engaged in. It resembles the Swedish data projection board's ban on computer dating services, which the Swedes reject as too self-revealing for people to be allowed to choose. In the United States, we let people select such services, and the law steps in only if blackmail or other abuses are found to be taking place.

My own view is that legislation or regulatory-agency action dealing with commercial and research uses ought to be simple and basic at this point. It should concentrate on advance notice to subscribers of any additional uses contemplated by service providers or system operators; a requirement of consent without penalty; and rights of inspection and correction by subscribers for any identified data kept about them. Such a law could require franchise applicants and those awarded franchises to file specifications as to how they would meet these requirements, and the internal confidentiality and security safeguards they would install. It is hard to take seriously the argument that such basic protections of privacy and consumer rights would cripple the emerging industry.

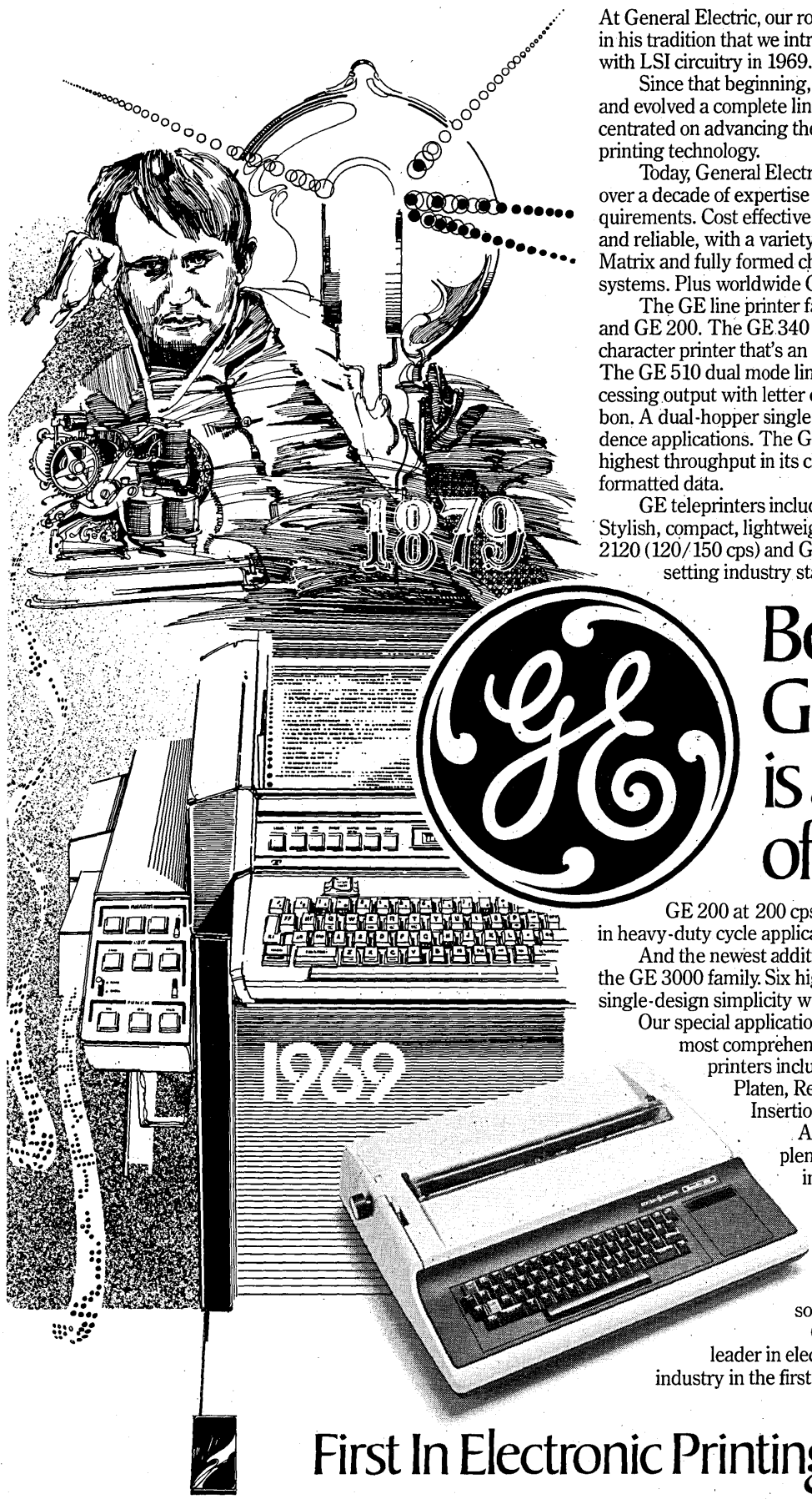
ESSENTIAL ACCESS SHIELDS

Industry representatives and privacy advocates agree that shielding identified subscriber data from "improper" government access is essential. The industry position is that adequate protection exists now through confidentiality laws governing particular consumer activities (banking, insurance, etc.) plus expected judicial protection of identified subscriber data that system operators would actively assert, as in the subpoena of identified Qube records for the obscenity trial in Columbus, Ohio.

Looking over judicial decisions of the past decade involving government access to employee medical records, drug prescription records, private social-agency client records, and similar sensitive data, it is hard to see the basis for such optimism. In almost every case in which the government has asserted that there was a compelling public interest in reaching databases, the courts have ordered the holders of the data to surrender them. And, in the banking area, where the courts flatly rejected any right of privacy by the depositor in his or her account information, it took legislation in the late '70s—federal and state financial privacy laws—to set the proper framework so that courts can now properly weigh the government's claims against the depositor's claims.

For these reasons, my view is that minimal legislation is needed at this time to set rules for government access. Such legislation should provide personal data kept in interactive systems with a legitimate expectation of confidentiality; require that subscribers be notified in advance and have an opportunity to litigate when government seeks to obtain personal data; specify the standards for courts to apply in weighing such conflicting claims (e.g., that subscriber data should be requested only if other sources of documentation are not available to the government); and bring any tapping of cable signals directly under state or federal wiretapping control laws.

If simple and basic legislation is needed now, as I believe it is, my choice would be



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GE teleprinters include the GE 2000 series and the GE 200. Stylish, compact, lightweight, easy to use, our office-quiet GE 2120 (120/150 cps) and GE 2030 (30/60 cps) matrix printers are setting industry standards for desktop machines. The GE 200 at 200 cps is a throughput champ, built to take it in heavy-duty cycle applications.

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GENERAL ELECTRIC

CIRCLE 69 ON READER CARD

Can industry spokesmen show persuasively that detailed privacy protection would be unduly costly, restrictive, or cumbersome?

to have this passed at the federal level, assuring national uniformity and allowing a national floor of conduct to be set for all system operators. The federal government also has the best potential resources for keeping track of the new systems as they develop, and paying attention to the effects of new technological and organizational developments.

Until such first-stage federal legislation can be enacted—and it might take some time—the states will (and should) step in. Useful experience will be gained while a federal bill is pending. But, in the long run, any industry as clearly national in character as this one ought to be under basic federal rules, with state laws able to add noncompetitive, protections if these are found to be necessary. The credit reporting industry was brought under national privacy rules this way with passage of the Fair Credit Reporting Act in 1969, and that is not a bad model to apply here.

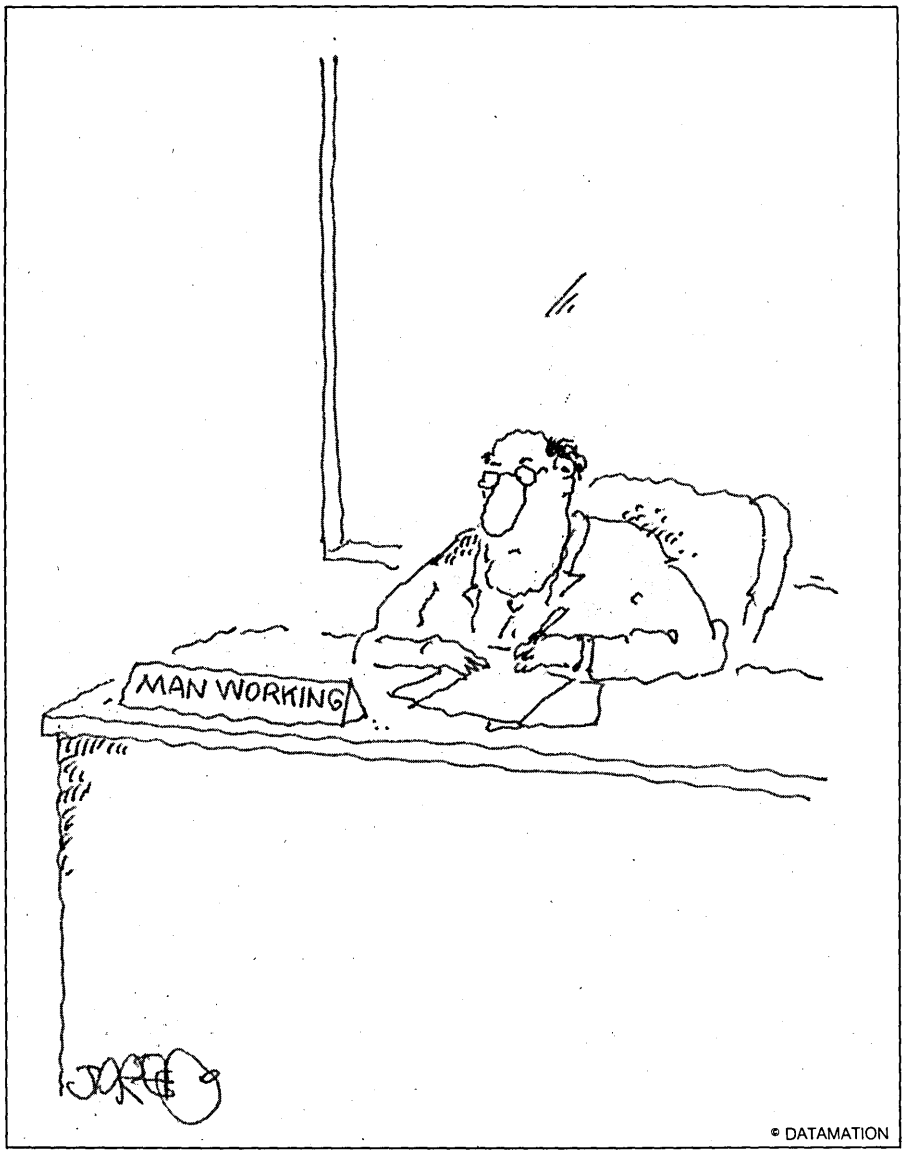
MYTHS OF COMPUTER ABUSE

As the privacy debate progresses, it will also be important to dispel some of the false accounts of computer abuse that surface in these discussions and mislead public policymakers. During the May hearings on the New York bill, for example, James Cameron, a journalist who did a radio documentary on the Qube system for NBC News in 1981, testified about what he called serious "indiscretions" by Warner Amex's Qube operators. According to Cameron: "Data on the viewing habits of Qube subscribers has got in the wrong hands in the past, despite Warner Amex's best efforts to safeguard the computer's database. During a local mayoralty election it was revealed that the incumbent's tv viewing patterns included the soft-core porn channels that Qube offers—some of their most lucrative, best-watched channels, by the way. The candidate for mayor of Columbus, his privacy violated, admitted that the computer data were correct, but that his viewing of the channels was out of civic duty, not moral turpitude. 'As mayor,' he said, 'I should know what's on the cable tv system franchised by my city.'"

Cameron cited this as proof that the Warner Amex system couldn't be controlled by its managers and that New York should enact the Abrams bill. But a call to Mayor Tom Moody's office reveals that this information never came from the computer. A reporter was in the mayor's office interviewing him. The mayor, fairly nonchalantly, mentioned that he watched the sexually oriented channels "once in a while," to see what was being shown. When this was published, the local newspapers played it up, and that was how the fact of the mayor's practice entered the reelection campaign. So much for another lurid tale of computer abuse of privacy.

Whether industry self-regulation or public regulation will be the rule in the next few years is likely to turn on several developments. How widely will a privacy code such as Warner Amex's be adopted as an industry standard and followed by all operators? Will threats such as the subpoena of Qube-system records begin to appear in other pilot projects unfolding during this period? Can industry spokesmen show persuasively that detailed privacy protections such as those in the New York State bill would be unduly costly, restrictive, or cumbersome?

A broad consensus about the types of potential privacy violations and the kinds of rules that could meet these threats seems to be emerging in the early stages of interactive home systems. A thoughtful debate over best remedies and best regulators is already under way. This suggests that the early alarms, empirical analysis, and adoption of first-generation privacy rules that our society went through during the first era of computer use in the '60s and '70s has served us well. If we nurture that sense of necessary anticipation and timely response, we may be able to apply computer and communication technologies in the next two decades in ways that protect rather than impair the fundamental values of a free society. ❋

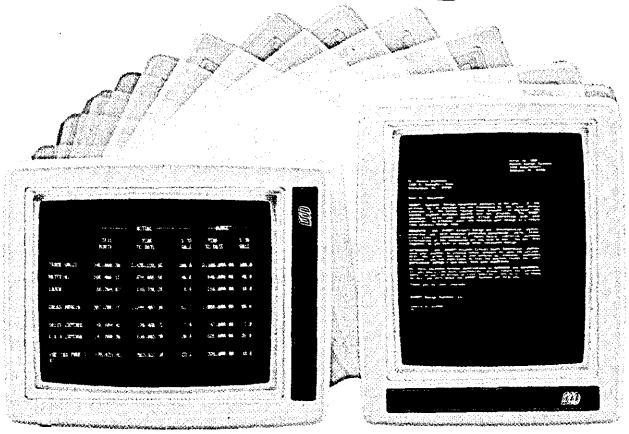


© DATAMATION

CARTOON BY JARED LEE

Alan F. Westin is professor of public law and government at Columbia University. He is the author of many articles and books on privacy, including *Privacy and Freedom* and *Databanks in a Free Society*. Westin is currently vice chairman of the New Jersey State Commission on Individual Liberty and Personal Privacy. He received his law degree from Harvard Law School and his doctorate in political science from Harvard University. He is a member of the District of Columbia Bar.

Go from spread sheets to letters in one easy move with a new double-duty DMS-5000.



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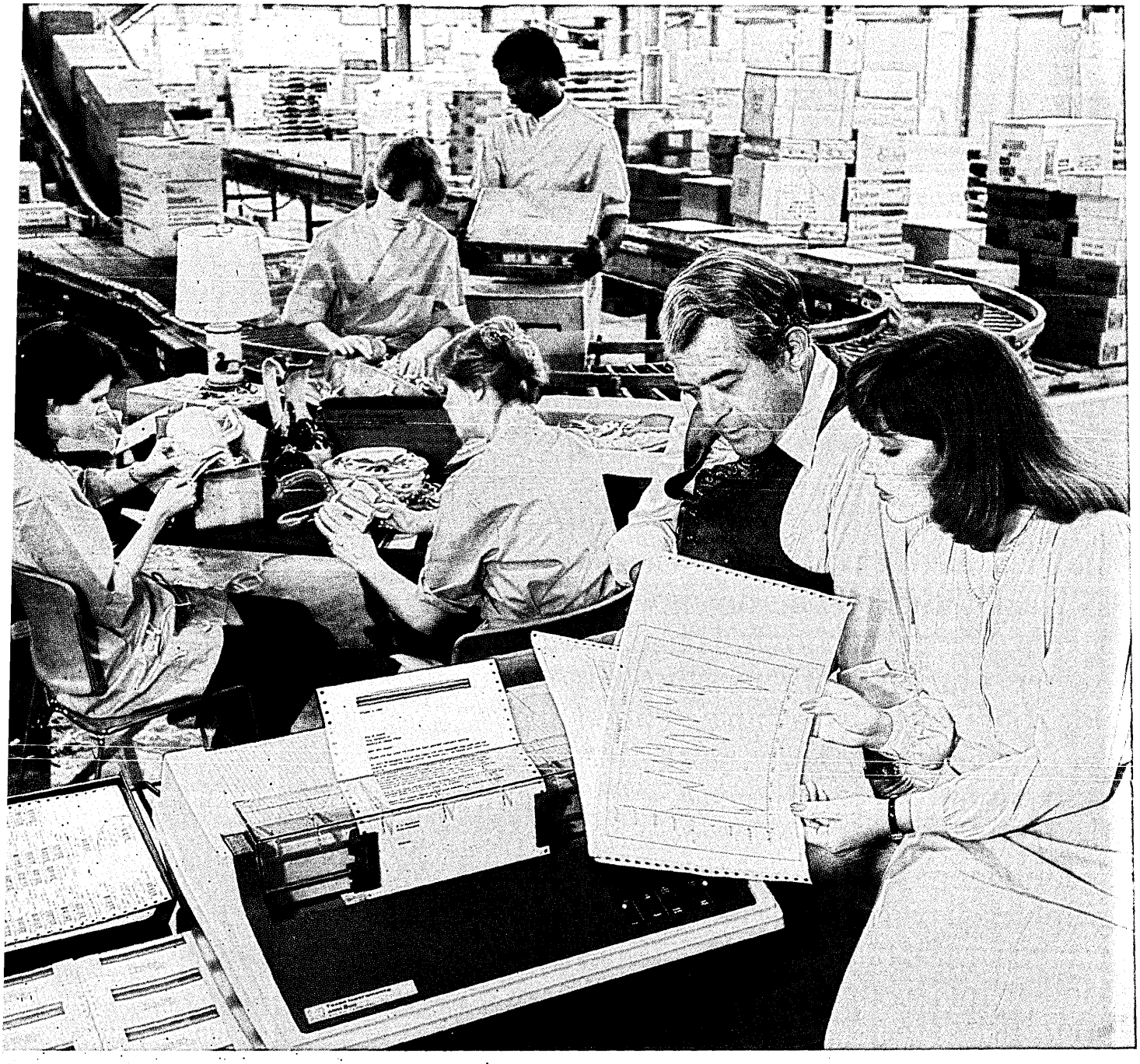

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CIRCLE 71 ON READER CARD

HARDWARE

OFF-LINE

Take a Hewlett-Packard HP-85, remove the printer and crt and turn them into full-scale peripherals, get rid of the built-in cassette-tape drive, then add CP/M and a floppy disk peripheral, increase the memory expandability, enhance the BASIC, build in printer/plotter interfaces, and you've got the HP-86, due to debut this month at $1,795 with cpu, keyboard, and 64K of RAM memory.

Having trouble reading data off that little five-inch screen on your Osborne 1 computer? Squint no more--Dipco has dipped into the good old days of small-screen tv and come up with a magnifying lens you can mount on your machine, with a detachable bracket. The plastic Fresnel lens is $34 from Dipco (short for Diesel Parts Co. of California, in Oakland). What's the connection between the lens and a company that makes diesel engine parts for trucks and boats? They bought an Osborne 1, and were having trouble reading data, so....

The if800, which has the most tentative name in the business, was introduced at Comdex last November by the Business Microcomputer Division of Technology Group. It was reintroduced in May, mainly to let the press know BMC will be spending, through Doyle Dane Bernbach, $10 million on advertising over the next year to publicize this all-in-one computer made by Oki Electric Industry of Japan. With built-in color monitor, printer, and dual floppies, and selling for $7,000 to $11,000, the if800 is aimed at companies earning from $500,000 to $50 million. The computer is expected to earn $50 million in 1982 and half a billion dollars a year by 1992, BMC says.

VOICE AND DATA NETWORK

Action/Honeywell's multinode network system for integrating private voice and data networks, Roadrunner Digital Edition, will be marketed to the 500 largest companies, large financial institutions, and state government organizations that have "significant communication needs." The system combines private voice and data networks along with two-way full-motion color video teleconferencing, electronic mail, message systems, and high-speed facsimile into one common digital network.

This digital version of Roadrunner, built by Honeywell's Action Communication Systems Division, costs $500,000 to $1.5 million per node; a typical network in one of the top 200 companies would consist of three to five nodes. The system offers the interfaces for integration from low-speed data to T-1 and packet data switching, and permits corporations to select any PBX system, common carrier, and data processing vendor.

Among the features provided by Roadrunner Digital Edition are dynamic allocation of facilities based on the required bandwidth of the circuits required, sharing of high-speed video-conferencing digital facilities with other voice and data requirements (for economy), automatic circuit testing, and management and control functions for allocating costs back to users. ACTION/HONEYWELL, Dallas, Texas.

FOR DATA CIRCLE 301 ON READER CARD

SUPERCOMPUTER SERIES

Priced from $11.4 million to $14.5 million, the Cray X-MP series of supercomputers is designed for multiprocessing and concurrent independent uniprocessor jobs. Applications are in the processing of large-scale applications programs in petroleum exploration and production, weather forecasting and environmental research, nuclear power, and simulation and analysis in the automotive, electronics, and chemical industries.

Described by its manufacturer as the fastest general purpose computer system commercially available today, the Cray X-MP mainframe contains two identical cpus, each of which is "even more powerful" than the Cray-1 uniprocessor. The two share a central memory of 2 million or 4 million words, arranged in interleaved banks for high transfer rates. Clock cycle time is 9.5 nanoseconds, compared with 12.5 for the Cray-1.

The X-MP features four parallel memory-access ports per processor: two ports for vector reads, one for vector writes, and one for I/O. This provides the X-MP with more than eight times the total memory bandwidth of the Cray-1.

An optional memory is the new Solid-state Storage Device (SSD), with very high transfer rates for use as a fast-access disk device for large datasets generated and manipulated repetitively by user programs, and for temporary storage of system programs; $1.76 million to $3.28 million. CRAY RESEARCH, INC., Minneapolis, Minn.

FOR DATA CIRCLE 302 ON READER CARD

400-CHARACTER DAISYWHEEL PRINTER

Called by Diablo Systems "the first 400-character daisywheel printer," the 630 ECS (Extended Character Set) uses printwheels with two concentric circles with up to 96 characters in each, two per petal. From the basic set of up to 192 alphanumeric characters and symbols, up to 250 more characters or graphics can be constructed, such as putting an umlaut over vowels, or printing a large integration sign in two parts.

The printwheel is moved vertically so that characters from either circle on the daisywheel can be positioned under the print hammer. The 630 ECS takes standard 96-character printwheels as well as the new 192-character wheels. The first two printwheels for the 630 ECS are a Teletex-multilingual wheel with 307 official Teletex characters plus the additional characters

INTEGRATION

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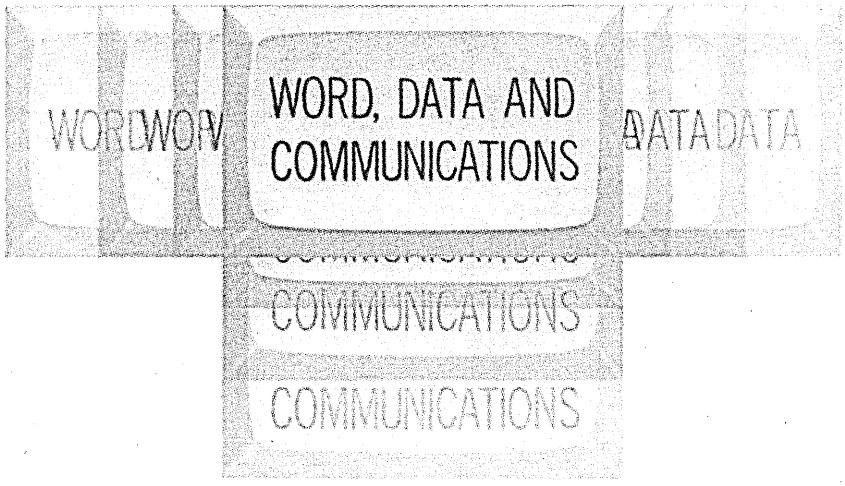


Honeywell

CIRCLE 72 ON READER CARD

needed to print in 33 languages, and a scientific and technical wheel that combines a standard alphanumeric set with Greek, math, and other special characters. Future ECS wheels will combine dual typefaces, dual pitch, graphics, and other combinations defined by users.

Priced at about $5,000, the 630 ECS is a variation on the 630; the carriage has been changed to allow the printwheel to move up and down. The ECS model is said to reduce the number of times printwheels have to be changed, thus increasing convenience and productivity. DIABLO SYSTEMS INC., Hayward, Calif.

FOR DATA CIRCLE 303 ON READER CARD

PERSONAL COMPUTER

The latest entry by a large company in the personal-computer race is from Olivetti, which claims its M20 to be a "true" 16-bit machine because of the 16-bit bus used. Built around the Zilog 8001 chip, the M20 has a high-resolution graphics display of 512 by 256 pixels and complete software compatibility between monochrome and color display. The display can be split into as many as 16 separate windows, each with independent graphics and alphanumerics. The character display can be either 16 rows of 64 characters, or 25 rows of 80 characters, as desired.

Standard memory is 128K bytes, expandable to 512K internally. The M20 houses one or two 5¼-inch disk units, each storing 320K bytes with double-sided double-density recording, unformatted. A 5¼-inch Winchester, with an unformatted capacity of 11 megabytes, can replace one of the floppy disk drives, or be connected externally. Quadruple-density floppy disk drives will be available in September, as will a color monitor.

An M20 with 128K memory, 12-inch monochrome display and a single disk is $2,965, including Olivetti's proprietary PCOS (Professional Computer Operating System), which supports Microsoft BASIC; CP/M will be available in September. Other software includes Multiplan (Microsoft's version of VisiCalc), Oliword (an enhanced version of WordStar, for word processing), Olientry (similar to DataStar), TTY and remote batch-terminal emulators, and accounting packages. OLIVETTI CORP., Tarrytown, N.Y.

FOR DATA CIRCLE 304 ON READER CARD

MULTIFUNCTION WORKSTATION

Basically a word processor, but better defined as a multifunction secretarial workstation, the Burroughs OFISwriter 400 features an electronic document distribution system said to be unique to the industry. Beside creating and distributing documents, the OFISwriter 400 provides word processing, personal computing, and communications.

The system stores frequently used distribution lists, and documents can then be sent to as many people and places as needed. Because the OFISwriter 400 has a timer, documents can be transmitted at any time selected by the sender, who can thus take advantage of reduced phone rates. Because of its auto-dial/auto-answer feature, no one needs to wait at the receiving end; the document will be stored automatically by the receiving unit. If the system sends a document and gets a busy signal, it will automatically try to retransmit after a preset interval. All word-processing codes are transmitted intact, allowing the receiver to make changes directly to the original text. No retyping is necessary if editing is required.

The OFISwriter 400 becomes a personal computer with the addition of the CP/M 2.2 operating system, available from Burroughs. Users can add the Microsoft BASIC-80 interpreter. Burroughs General Business Math and Records Processing software packages are available.

A self-paced training package allows users to train in their own offices at their convenience. The OFISwriter 400 with a single disk, without printer, is $4,900 or $200 a month to lease. BURROUGHS CORP., Danbury, Conn.

FOR DATA CIRCLE 306 ON READER CARD

THREE PERSONAL COMPUTERS

DEC's three modular personal computer systems are designed to support a wide range of activities, from off-the-shelf applications to word processing, video color graphics, multiple-task management, and advanced communications. All use dual 5¼-inch floppy disk drives with a total of 800 kilobytes of storage, and a 12-inch monochrome video display; color monitors are optional.

The Professional series consists of two models, the 350 starting at $4,995 and the 325 starting at $3,995. Both use the PDP-11/23 cpu, 256K bytes of memory, and a multitasking operating system. They can function as standalone systems or as distributed workstations. The 350 contains space for a 5¼-inch Winchester disk, priced at $3,500.

The DECmate II, based on the DECmate Work Processor system, is mainly aimed at business applications and secretarial word processing. Priced from $3,740, it contains 96 kilobytes of RAM memory and an optional CP/M auxiliary processor. The Winchester disk can be added externally.

The Rainbow 100 uses a dual processor and runs both 8-bit and 16-bit software, for $3,245 and up. For $250 more, DEC's CPM-86/80 operating system is available; the Rainbow 100 can use other operating systems such as MS-DOS. Basic memory is 64K, expandable to 256K bytes; other options include floppy-disk expansion to 1.6 megabytes, external Winchester disk, and graphics capabilities. DIGITAL EQUIPMENT CORP., Maynard, Mass.

FOR DATA CIRCLE 305 ON READER CARD

HIGH-SPEED COMPUTER

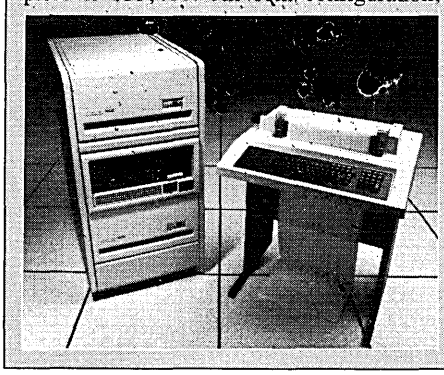
The Basic Four System 810 high-speed data processor is based on three symmetric 16-bit bipolar arithmetic logic units that are switched as needed to process independent instruction streams.

The top-of-the-line 810 features 32-bit architecture, with a 32-bit memory data path supporting a 53.36-megabit band-

HARDWARE SPOTLIGHT

SMALL VAX SYSTEM

DEC's latest and smallest member of its VAX family is the 11/730, which combines in a single 42-inch-high cabinet a central processor, a megabyte of memory, DMF32 communications controller, and two 10-megabyte removable-cartridge RL02 disk units. Add an LA120 DECwriter III console terminal and VMS operating system for a minimum system, at $48,900. Replace one of the RL02 drives with a 121-megabyte Winchester-type R80 disk drive, and the price is $59,400. An oem configuration, consisting of the central processor with one megabyte of memory in a 10½-inch-high rack-mountable box, is $28,500.



The 32-bit virtual-memory VAX-11/730 is said to deliver 30% of the performance of the large VAX-11/780 at 20% of its cpu price, and supports simultaneous operation of up to 24 interactive terminals. It is fully software compatible with VAX-11/782, VAX-11/780, and VAX-11/750 systems; all use Version 3 of the VMS operating system.

The VAX-11/730 and the VAX-11/750 are the first DEC computers to use 64K-bit RAM chips in main memory "to achieve compactness, high capacity, and low price."

The intelligent direct-memory-access communications controller provides both multiline asynchronous and synchronous communication, plus an interface for a line printer or other special purpose device. Optionally available is the FP730 hardware floating point accelerator. DIGITAL EQUIPMENT CORP., Maynard, Mass.

FOR DATA CIRCLE 300 ON READER CARD

width. The 810 also offers an instruction length variable between 8 and 80 bits, an 80-megabit input/output bus bandwidth, direct addressing of 16 million bytes, and virtual addressing of 1 billion bytes.

The System 810's minimum configuration consists of 1.5 megabytes of memory, 57 megabytes of Winchester fixed-disk storage, a 45-megabyte magnetic-tape streamer drive, a 150 lines-per-minute printer, and a high-speed video display terminal, priced at $117,679.

Said to be nearly twice as fast as the next larget Basic Four business computer, the System 710, the 810's hardware and operating system are designed "to optimize real-time response in transaction-processing business environments where users want fast throughput when running concurrent tasks." The system can be upgraded by adding processors, which also improves system reliability; if one device goes down, the others take over the workload. BASIC FOUR INFORMATION SYSTEMS DIVISION/MANAGEMENT ASSISTANCE INC., Tustin, Calif.

FOR DATA CIRCLE 309 ON READER CARD

COLOR PRINTER

The Facit 4544 color printer provides a choice of two different printing methods. One allows the separate use of black, blue, green, or red. The other provides, black, cyan, magenta, and yellow processor colors that can be used singly or combined to produce "any desired hue" in the color spectrum. A gray-scale mode provides 10 different shades.

The $5,000 Facit 4544 uses either scanning or pixels, and permits individual hammer control, to allow printing curves, diagrams, logotypes, and maps, as well as drawings or pictures. Alphanumeric characters are printed within an 8 by 14 matrix in either normal (10 characters per inch) or proportional spacing. Six different interfaces can be used with the 4544. Characters in 95 sizes and 14 different bar codes can be printed, with either parallel or serial interfaces. The Facit 4544 prints at 260 characters per second; with proportional characters, it prints up to 535 cps. FACIT, INC., Greenwich, Conn.

FOR DATA CIRCLE 310 ON READER CARD

OFFICE AUTOMATION COMPUTERS

Highlights of Four-Phase's new Series 5000 family of computer systems include a personal-computer option, touch sensitive screen, voice store and forward, and broadband local-area networking, with processors designed to meet the office automation needs of large multisite corporations.

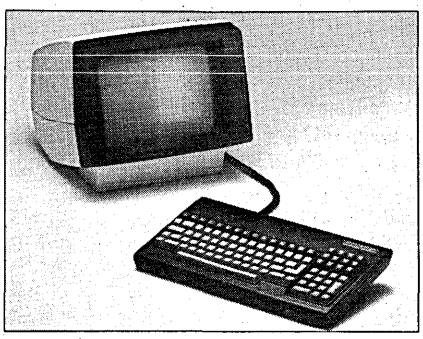
The Series 5000 consists of three processors—the 500, 700, and 800—offering up to 6 megabytes of memory, 2.2 gigabytes (billion bytes) of disk storage, and support for up to 128 multifunction Fastrak intelligent workstations with printers. The 500, for small or remote branch offices, supports from one to four workstations. The 700 is for offices requiring 24 to 96 workstations and a larger range of office functions. The 800 addresses corporate office automation requirements and supports up to 128 workstations. A typical System 700 with cpu, 3 megabytes of RAM, 200 megabytes of disk storage, a line printer, 16 character printers, 64 workstations, and communications, is $475,000, or $18,000 per month on a one-year lease.

The personal-computer option uses an I/O controller card and up to four 5¼- or 8-inch diskette drives to transform Fastrak workstations into personal computers, using the CP/M operating system, SuperCalc, Pascal, etc. The voice store and forward capability, also called voice mail, is a standalone system that will, in later software releases, be tied to the Fastrak workstation. FOUR-PHASE SYSTEMS, Cupertino, Calif.

FOR DATA CIRCLE 307 ON READER CARD

SMART EDITING TERMINAL

Shown for the first time at NCC, the Viewpoint/60 smart editing terminal "at dumb terminal prices" features a detachable



keyboard with tactile touch keys and selectable audible click, tilt mechanism to adjust the crt to the viewer's viewing angle, and eight programmed function keys.

The buffered terminal, offered at $895 by Applied Digital Data Systems Inc. (ADDS), a subsidiary of NCR, also features extensive screen editing, fine-line business graphics and five operating modes (local, conversational, page, message, and forms). The 12-inch (diagonal) screen displays 25 lines including a status line, with 80 characters per line.

Transmission rates range from 110 to 19,200 baud, and three interfaces are available: RS232C, RS422, or current loop. The Viewpoint/60 is also said to provide a migration path for current users of ADDS' Regent 40 and Regent 60 midrange terminals. APPLIED DIGITAL DATA SYSTEMS INC., Hauppauge, N.Y.

FOR DATA CIRCLE 315 ON READER CARD

PORTABLE MICRO

Looking very much like the Osborne 1, and priced at the same $1,795, the Kaycomp II from Non-Linear Systems has a nine-inch screen and a metal carrying case; the plastic-cased Osborne 1 has a five-inch crt.

Weighing about 25 pounds, Kaycomp II includes two 5¼-inch floppy disk drives that provide up to a total of 400 kilobytes of storage, a typewriter keyboard with 13-key numeric pad, and a Z80 central processor. Software included in the base price is Digital Research's CP/M operating system, MBasic and the MultiPlan spreadsheet from Microsoft, and a word processor from Select Systems. The screen displays 24 lines of 80 characters each. Interface accommodations include a Centronics-type parallel port for 80- or 120-column printers, and an RS232C for a modem or other peripherals.

Originally designed with the crt centered between the two drives, the portable now has the screen on the left side and the drives paired on the right to reduce noise. The drives, originally single density and single sided, with double density as an option, are now double density on the standard model, each drive providing 200 kilobytes of unformatted storage.

NLS claims $6.5 million in April sales for the Kaycomp II, due to be delivered in late May. As for the Kaycomp I, it was a somwhat larger model that never got past the preproduction stage. NON-LINEAR SYSTEMS, INC., Del Mar, Calif.

FOR DATA CIRCLE 308 ON READER CARD

FOUR COMPUTERS

The Classic II computer line from Modular Computer Systems (Modcomp) offers four minis ranging from 128K to 4M bytes of error-correcting semiconductor memory, software compatible with the original Classic computer series.

The Classic II/25 small-size mini, which can be used as a standalone system or as a network satellite, has an integral I/O processor and a maximum memory of 512K bytes. Prices range from $18,900 to $27,300, depending on memory size.

A medium-scale mini, the II/45 is said to be suited to applications requiring more memory and high I/O throughput. Selling for $34,500 to $67,200, the II/45 holds up to 2M bytes of memory and has an integral I/O processor that provides 16 multiplexed I/O channels with data-transfer rates up to a megabyte per second.

The Classic II/55 has the same features and memory capacity as the II/45, plus a high-speed extended arithmetic unit, for $60,100 to $85,100.

A large supermini with integral extended arithmetic unit and memory up to 4M bytes, the Classic II/75 uses four-way interleaving for cycle times "as low as 125 nanoseconds."

An optional single or dual I/O bus provides up to 48 or 64 mapped direct-memory channels. Price: $84,600 to $101,600. MODCOMP, Ft. Lauderdale, Fla.

FOR DATA CIRCLE 311 ON READER CARD

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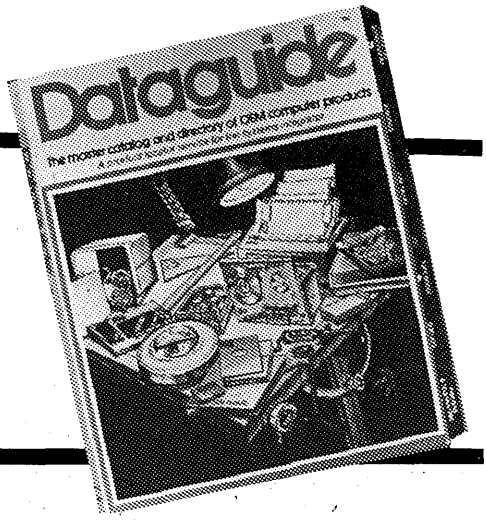

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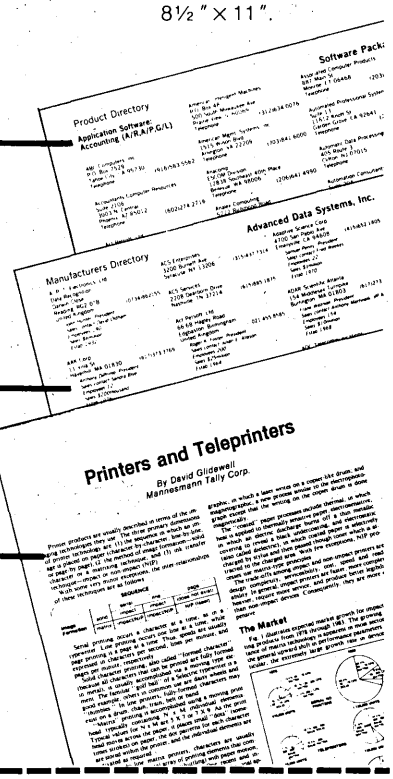

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SOFTWARE AND SERVICES

UPDATES

General Electric's Information Services company has reduced data storage prices for customers of its HISAM database management system to 8 cents from 14 cents per 1,260-byte storage unit for customers who agree to a fixed $500 monthly subscription fee for a year, with lower prices for higher monthly fees, down to 4 cents a unit at $4,000 per month.

IBM has eliminated dollar royalty ceilings for individuals and companies wishing to submit programs to be used with the IBM Personal Computer. Also, the submission procedure has been simplified, as part of a new Software Submission Plan designed to encourage "even greater author participation in the form of high-quality software." Information packets are available from IBM, External Submissions Dept. 765 PC, Armonk, NY 10504.

Called "the computer that comes on a tape," Micronexus is a virtual 8080-based microcomputer software system for use on a DEC PDP-11 or VAX, making the mini compatible with micro software; $850 license fee from Datanexus, Salt Lake City, Utah.

Business software you can try out before buying is offered by Soft-Link of Los Altos, Calif. For $49.95 the user has up to six months to test a program at the office or home. The product line includes electronic spreadsheets, spelling checker, and word processing and accounting packages for CP/M-based machines.

More experts are being sought to work on the many coded-character-set standards of the X3L2 Technical Committee of the American National Standards Institute (ANSI). Potential technical experts in terminal or software design or implementation should contact Thomas N. Hastings, Digital Equipment Corp., Mail Stop ML1-2/H26, Maynard, MA 01754, (617) 493-8109.

DECISION SUPPORT

Stratagem is the name given by Integrated Planning to what it calls a new generation of decision-support software. The capabilities include database management, financial modeling, statistical routines, graphics, report writing, and a higher-level command language. The database management structure allows users to store many types of information in arrays. The unlimited multidimensional storage and retrieval capabilities can be used to analyze and report on internal data sources such as financial results and factory shipments, and to set up executive information systems. Stratagem can also read and analyze a wide range of syndicated data such as Compustat, Barr-Rosenberg, Nielsen, SAMI, panel diaries, and multipunch survey information.

Stratagem, which runs on IBM's 43xx, 370 and 30xx computers and IBM-compatible computers, runs under either VM-CMS or MVS-TSO operating environments, and has a perpetual license fee of $75,000. It is also available on timesharing. INTEGRATED PLANNING, INC., Boston, Mass.

FOR DATA CIRCLE 326 ON READER CARD

LEGAL MIPS

Designed to meet the total management information processing needs of a corporate legal department, Data Retrieval's MIPS supports tailored applications such as contract management, calendaring and scheduling, docket control, time management, legal memoranda management, litigation support management, and outside-counsel tracking and management. MIPS integrates text processing, research, and photocomposing capabilities that, combined with the Application Builder, provide the legal department with a system that is customized, "easily modified and user friendly."

Data Retrieval's MIPS runs on a variety of IBM and compatible mainframes, and also on Intel's iTPS front-end processor. A variety of terminals and printers is supported, including many IBM-compatible devices. For information backup and portability, Data Retrieval provides facilities for a half-inch IBM-compatible streaming-tape drive. Basic configurations of hardware and software begin at $115,000, which buys an Intel iTSP with dual processors, a megabyte of memory, 84-megabyte Winchester disk, and the basic text-processing software. The mainframe software is available unbundled, with each module priced separately. DATA RETRIEVAL CORP. OF AMERICA, Milwaukee, Wis.

FOR DATA CIRCLE 327 ON READER CARD

SOFTWARE FOR NOVICES

DEC's new Application Development Environment (ADE) package is said to enable nontechnical and first-time computer users to develop small applications for office and business environments. The package runs on VAX computers under VMS and on PDP-11 systems using the RSTS/E operating system.

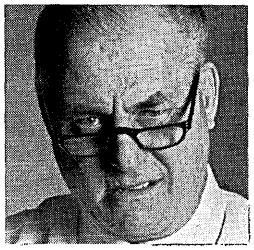
ADE requires no knowledge of languages or techniques, and uses English words. Users can create databases; add, change, or delete data; perform basic arithmetic; produce simple bar graphs; and assemble and print reports. The software prompts the user after each input and provides extensive HELP messages that explain all commands and input procedures.

ADE is customer-installable and has a single-use license fee for VAX-11 of $4,500; for PDP-11 ADE-RSTS/E the fee is $3,500. Designed to be used with small, frequently changed and reported databases, ADE software allows nonprogrammers to develop applications such as project management, personnel records, parts/product order status, equipment-problem reports, budgeting, simple financial forecasting and modeling, salary planning and administration, and mailing and telephone lists.

The package permits users to copy ADE applications data, and allows transfer of data to and from other applications on the system, such as COBOL, BASIC-Plus 2, VAX-11 BASIC, and Datatrieve. It also allows transfer of data to and from list-processing formats files used in DEC's word processing software. DIGITAL EQUIPMENT CORP., Maynard, Mass.

FOR DATA CIRCLE 328 ON READER CARD

"What if I want to add fields to my data base?"



MicroRIM™ makes it expandable

Now you can have large scale features in a DataBase Management System for microcomputers. MicroRIM offers actually relational software package with exceptional versatility for the end-user. It lets you add multiple fields whenever you wanted to, even after the data structure has been defined and data entered.

MicroRIM evolved from the mainframe version of RIM first used in the NASA space shuttle program. English-like commands make it simple to use by operators inexperienced like

A powerful programmer interface lets your application programs access a MicroRIM data base directly. The same interface allows you to load data in your own specific language using your established procedures and formats. Using B-tree indexing with multiple variables to sort and search records can be quickly retrieved for analysis and modification.

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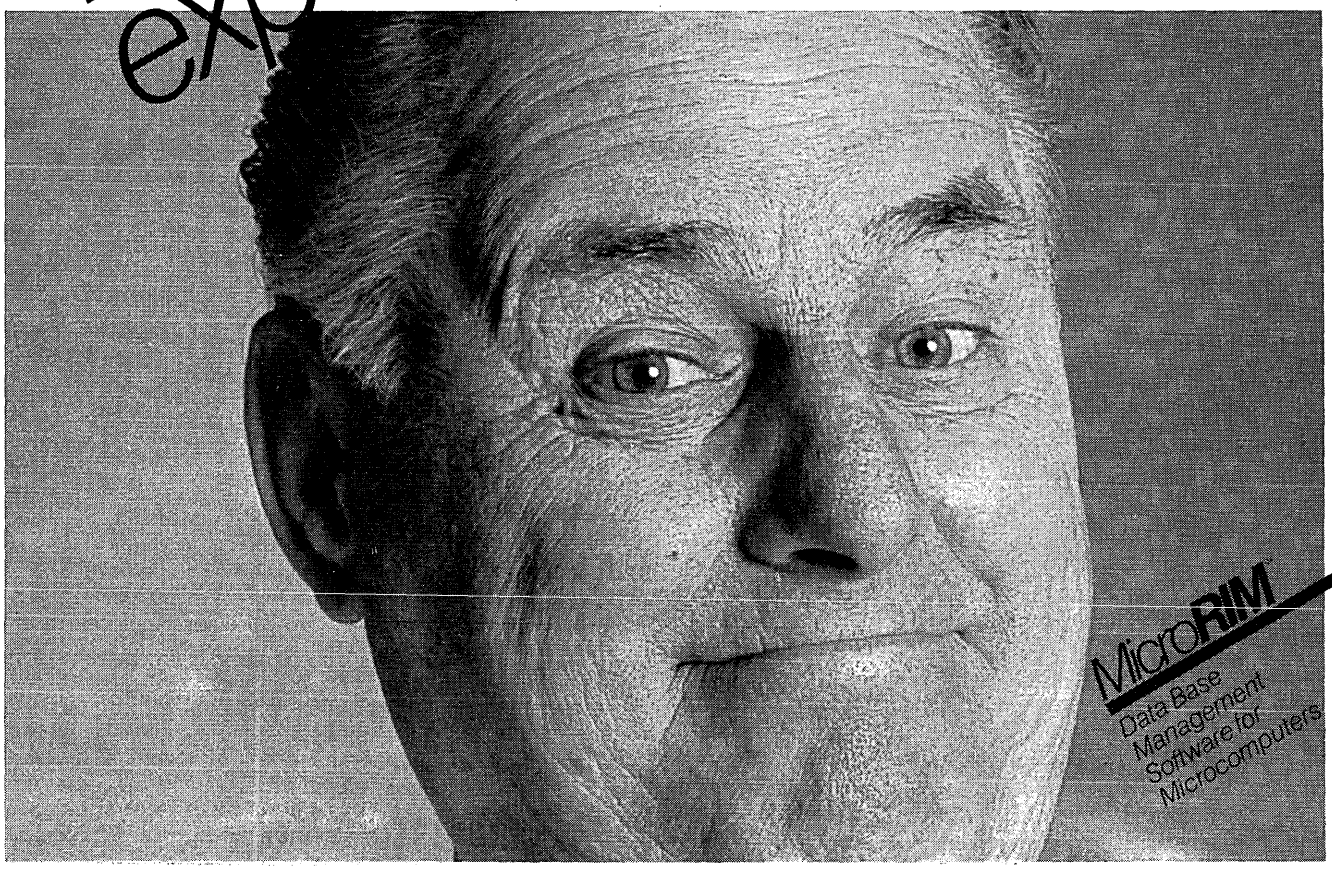

MicroRIM
Data Base Management Software for Microcomputers

CIRCLE 220 ON READER CARD

SOFTWARE AND SERVICES

FOUR VISISERIES PROGRAMS

VisiCalc has now been joined by four new members of VisiCorp's VisiSeries for the IBM Personal Computer. Along with VisiCalc, which is an electronic spreadsheet, the four provide the businessman with financial modeling, record keeping, trend analysis, statistics, charting, and graphing.

VisiFile, at $300, stores business records in a flexible format and can be used for applications from organizing a mailing list to inventory management. One floppy disk stores up to 12 files, and up to 32,000 records can be stored within each file.

VisiTrend/Plot, at $300, provides trend analysis along with high-resolution plotting and graphing. The program provides multiple linear regression of numerical series; descriptive statistics such as minimum, maximum, standard deviation, and totaling; and functions such as moving average, lead, lag, cumulative, and percent change. Charts can be drawn as lines, bars, pies, high-low-and-close graphs, X-Y plots, or areas.

The $250 VisiDex program is a filing system designed for personnel information, sales reports, company financial details, or other short reports or memos that can be written without having to use specific formats or data fields. Each screen of information can be stored on disk and cross-referenced against a large number of special words or dates chosen by the user.

Desktop/Plan is a $300 program for financial modeling with menus to guide the user through a modeling session, featuring 80-character lines and high-resolution graphics. VISICORP, San Jose, Calif.

FOR DATA CIRCLE 329 ON READER CARD

FINANCIAL MODELING

Release 6.0 of the Model line of modeling and analysis software from Lloyd Bush & Associates includes an interactive hierarchical consolidation system with data manager ($18,000), a Pert/CPM project scheduling system ($5,000), and a Box-Jenkins forecasting system ($3,000). Extensions to Model's modeling language include adding multiple matrices and multidimensional modeling, said to go beyond the single-spreadsheet concept found in most modeling packages.

Model's prices have been unbundled, and start with the base modeling language at $9,000, followed by 29 separately priced products and features. A typical configuration for basic budgeting, planning, and simple consolidation might run from $20,000 to $30,000. Pricing for the full list ranges over $200,000.

Model runs on Prime; DEC VAX; HP 3000; Univac 1100; Honeywell DPS 8, 66, and 6000 under GCOS or DTSS; and IBM 370, 3000, and 4300 under TSO, CMS, or DOS/VSE ICCF. A version for 16-bit micros is under development. LLOYD BUSH & ASSOCIATES, New York, N.Y.

FOR DATA CIRCLE 330 ON READER CARD

BUSINESS GRAPHICS FOR APPLE

Business graphics such as bar, pie, or line charts can be created on an Apple computer with the PIK software from Business & Professional Software. The graphics can then be printed on a variety of printers and plotters, including the new Hewlett-Packard 7470 and IDS Prism.

Available for a $50 to $75 installation fee or a $150 purchase price, PIK modifies the BPS Apple Business Graphics package for the Apple II or III to support letter-quality printers, single- and multiple-pen plotters, and both black-and-white and color dot matrix printers. Graphics created with Apple Business Graphics are said to be drawn with the full resolution of the output device, rather than being limited to the resolution of the computer's graphics memory or that of the crt screen. BUSINESS & PROFESSIONAL SOFTWARE, INC., Cambridge, Mass.

FOR DATA CIRCLE 331 ON READER CARD

RELATIONAL DBMS

The System 300 and System 600 from Britton-Lee are relational database management systems for DEC computer systems, designed for use with the VAX-11/750 and VAX-11/780 machines that use the VMS operating system. Heart of the System 300/600 is the Intelligent Database Machine (IDM), which combines relational DBMS software with high-speed database management hardware. Located between computer and disks, the IDM offloads the entire database management function from the computer.

The System 300, which starts at $62,900, is said to be ideally suited for medium-demand VAX applications, and can control up to four SMD-compatible disk drives for databases of up to 2.7 billion bytes. The System 600, starting at $85,300, is a higher performance product, for high demand applications with large databases and many users; it controls up to 16 disk drives for a maximum database size of 10.8 billion bytes. Both systems attach to the VAC computer via a high-speed IEEE-488 parallel interface.

The System 300 and System 600 include an IDM (mounted in a 40-inch cabinet), hardware to interface directly to the VAX Unibus adapter, and support software. BRITTON-LEE, INC., Los Gatos, Calif.

FOR DATA CIRCLE 332 ON READER CARD

FORTRAN FOR TRS-80 MODEL III

FORTRAN for Radio Shack's TRS-80 Model III computer includes an editor, a compiler, and a linker, plus a subroutine library for $99.95 on a 5¼-inch floppy disk. The editor permits writing and editing FORTRAN source files on disk. The compiler reads the FORTRAN source code from the disk, translates it into relocatable object code, and saves it on disk. The linker takes the relocatable object program, links it with all the subroutines it calls, and saves it on disk. This complete, independent object program can then load and execute directly from TRSDOS, the Model III operating system.

Model III FORTRAN includes extensions to ANSI Standard FORTRAN such as subscripted variables, using Holleriths and literals in place of integer constants, using hexadecimal and constants whenever integer constants are allowed, and automatic conversion and use of mixed-mode expressions and assignments. Model III FORTRAN requires a 48K two-disk TRS-80 model III. A similar package is available at the same price for a 32K two-disk TRS-80 Model I. TANDY CORP./RADIO SHACK, Fort Worth, Texas.

FOR DATA CIRCLE 333 ON READER CARD

ACCESS TO SNA

A software package that allows vendors of independent computer products to "quickly and economically" enter the market for products compatible with IBM's System Network Architecture (SNA) has been developed by Communications Solutions. The emulator, called Access/SNA, is said to integrate with a broad range of minicomputers, microcomputers, personal comput-

SOFTWARE SPOTLIGHT

LASER-PRINTER GRAPHICS

Using new graphics software, the Hewlett-Packard HP 2680 laser printer can now merge text and graphics, simplifying the production of documents and enhancing word processing by adding office graphics. Said to be especially useful for organizations that produce business reports and technical documents, the new capabilities eliminate typesetting, paste-up, vendor printing, and collating. The HP 3000 Business Computer System is used to design graphics, combine them with text, and merge them both into a completed document that is then printed under command of the computer on the laser printer.

Graphics are produced as a first step, using optional graphics hardware and the new graphics software that permits producing graphics, organization charts, flowcharts, or schematics which can then be merged with text and printed all at once on the laser printer. The text portion is produced using HP's TDP/300 Text and Document Processing software, with which text is entered into the system, edited, and formatted. The graphics package is expected to cost from $19,250 to $34,450, depending on options. List price of the HP 2680 laser printer is $92,000. HEWLETT-PACKARD, Cupertino, Calif.

FOR DATA CIRCLE 325 ON READER CARD

New!

The NCR V-8500 II computer series for even better price/performance.

More systems, larger memories than ever — for faster transaction processing.

The new V-8500-II Series now offers an even wider range of systems. Seven models, including a new, smaller, entry-level system and two new, larger computers, all provide virtual operation, increased memory and expanded performance.

Sharply increased price/performance — This new series now offers more power per dollar invested. More than 40 percent better than NCR's already highly competitive price/performance levels.

Lower entry level — The new V-8535-II is a 32-bit processor with cycle time of 112 nanoseconds and a memory of one megabyte. It employs NCR's powerful Virtual Resource Executive (VRX) operating software.

Expanded memory — For most of the enhanced systems in the new series, potential memory is increased from 50 to 100 percent. Maximum memory now ranges from one megabyte for the V-8535-II to eight megabytes for the dyadic V-8595-II.

New dyadic systems — The NCR V-8500-II Series now includes three dyadic systems. Systems that combine symmetrical, tightly-coupled dual processors in a single cabinet. Both processors share all system resources equally with continuous dynamic load leveling.

Migration Path Engineering — As always, NCR provides easy transition from one system to the next without difficult conversion of software.

For more information, just call toll free (800) 543-8130 (in Ohio, 800-762-6517). Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

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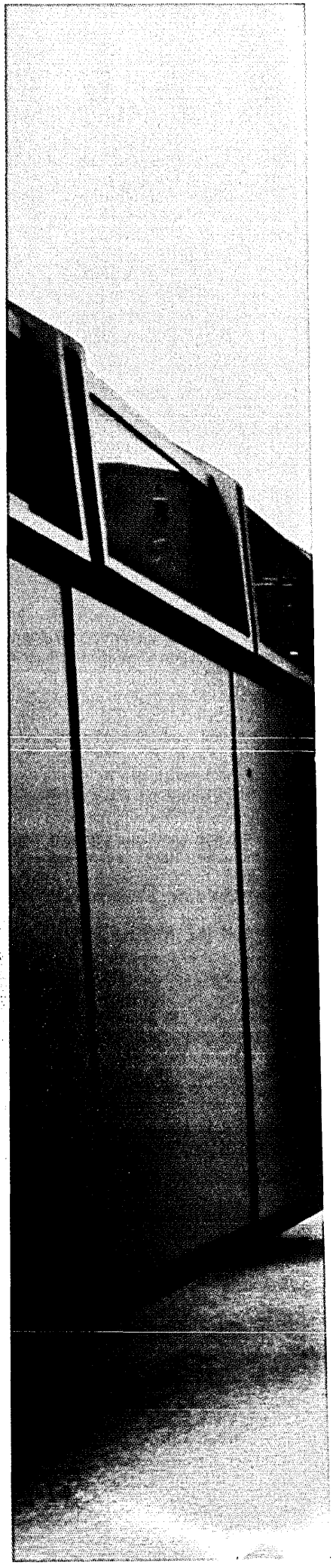


ers, intelligent terminals, distributed data processing systems, hardware networking systems, and office automation products such as word processors and multifunction workstations.

Oem pricing is structured on a base license fee plus royalties; initial costs are about $80,000 to $90,000. Access/SNA is initally targeted for use by computer-product oems, especially those with 16-bit microprocessor-based systems. It is written in C language so it can be used with other micro and minicomputer systems.

Access/SNA can be used by oems to create products that compete with such IBM communications products as 3274/3276 Information Display System, 3770 Batch Communications System, 8100 Information Systems, Displaywriter 5520 Administrative System, 6670 Information Distributor, and Series 1 minicomputer. The company notes that SNA support within almost the entire IBM product line has made it the new standard for IBM-compatible data communications, and predicts that SNA will soon include IBM's new personal computer. COMMUNICATIONS SOLUTIONS, INC., Cupertino, Calif.

FOR DATA CIRCLE 334 ON READER CARD

APPLE/DEC NETWORKING

XChange-11 is a distributed data processing communications utility which allows the "true networking" of Apple microcomputers and DEC's PDP-11 RSRS/E systems. Using the CP/M Christensen protocol, XChange-11 enables users of an Apple II or II Plus to send or receive disk files to and from a PDP-11 RSTS/E system.

Data-file transmission in either direction is initiated and controlled by the Apple user, and operates at up to 4,800 baud locally or 1,200 baud remotely. The size of the file to be transferred is limited only by the size of the Apple's disk. The package consists of two programs, one for the PDP-11, the other for the Apple, and is $995. Each additional RSTS/E cpu is licensed at $795, and each Apple at $150. GEORGE W. HALLAHAN AND CO., Boston, Mass.

FOR DATA CIRCLE 335 ON READER CARD

INTEGRATED GENERAL ACCOUNTING

Unifacs 80 is an integrated general accounting applications system for the Sperry Univac System 80 computer. It is an ANS'74 COBOL-based on-line interactive system derived from, and compatible with, the Unifacs 1100 system used by Series 1100 computer users. It consists of four modules: accounts payable, accounts receivable, payroll/personnel, and general ledger/budgeting. Each of the four can be used separately or along with any of the other modules. Monthly license fees for the four are, respectively, $195, $195, $260, and $225.

The fourth module has a self-contained budgeting facility that provides budgeting functions that allow the user to create and maintain multiple budgets, actual vs. budget comparisons, and any customized budget reports required. SPERRY UNIVAC, Blue Bell, Pa.

FOR DATA CIRCLE 336 ON READER CARD

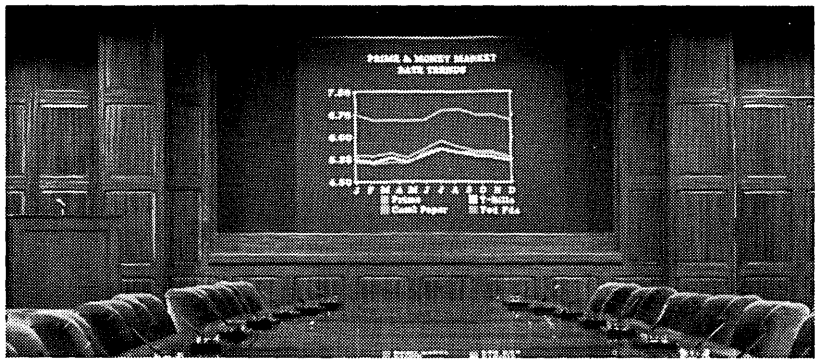
BUSINESS PACKAGES

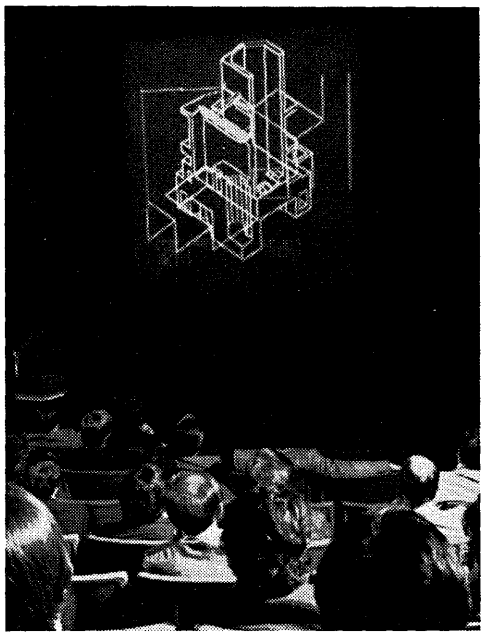
Control Data has three new small-business software packages for their 110 microcomputer: seven accounting applications of the Financial Management System, Supercalc financial-planner system, and the Magic Wand word processing system.

The Financial Management system, developed by Open Systems Inc. and priced at $9,995, includes accounts receivable with billing and sales analysis, accounts payable, general ledger, inventory, payroll, job-cost applications, and sales-order processing.

Supercalc, at $295, is an electronic worksheet developed by Sorcim Corp., which can prepare profit-and-loss statements, break-even analysis, and monthly budgets and budget reports.

The Peachtree Magic Wand word processing package, listed at $450, has been modified to allow for the 30-line scrolling of the CDC 110. Magic Wand's





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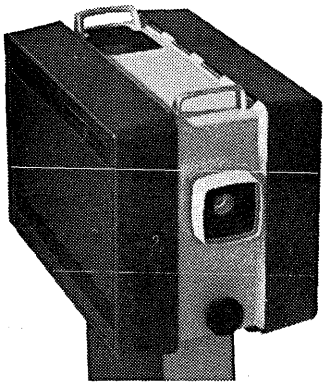

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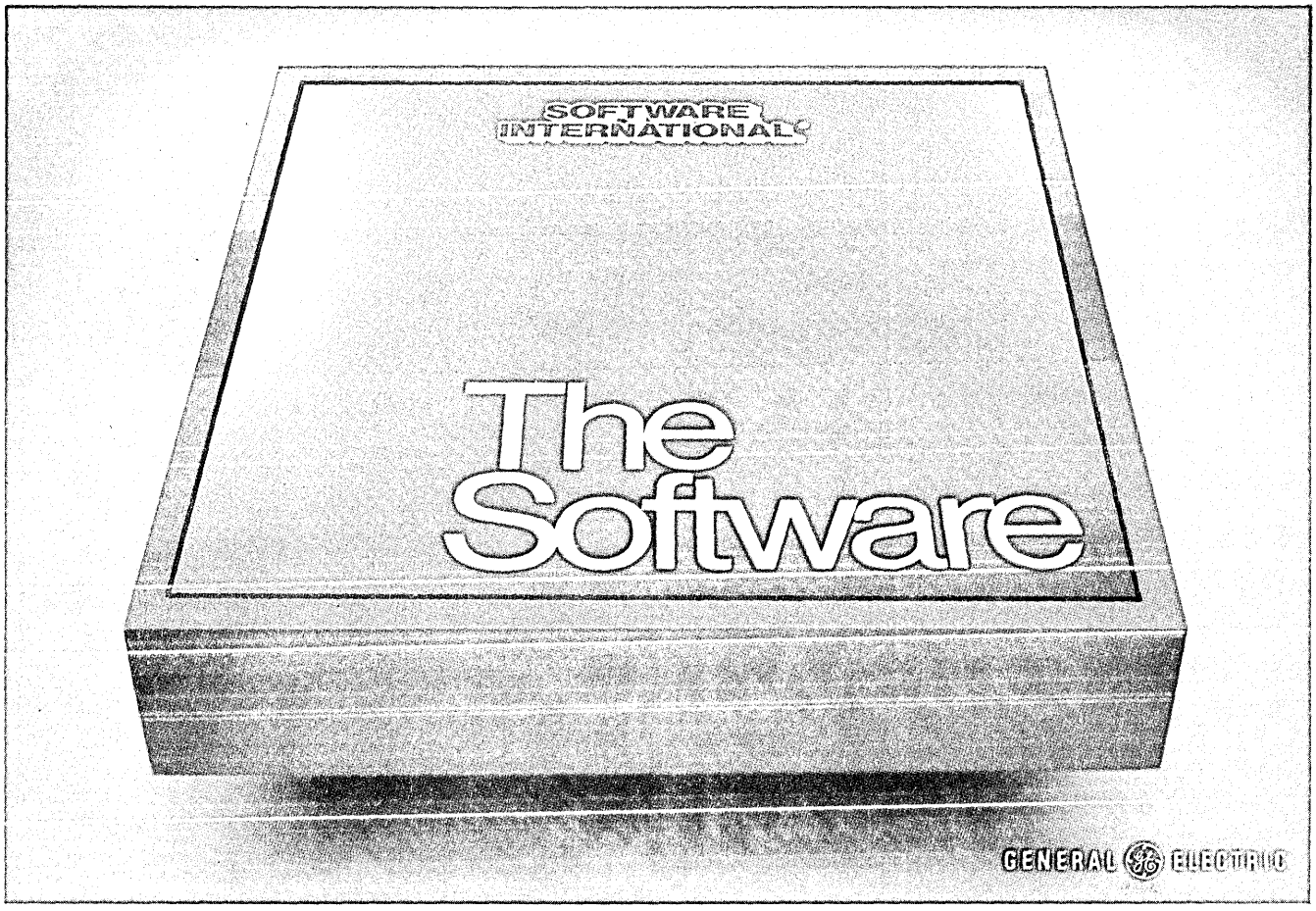
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SOFTWARE AND SERVICES

edit program is said to allow virtually unlimited changes, and print commands can be given at any time. CONTROL DATA CORP., Baltimore, Md.

FOR DATA CIRCLE 337 ON READER CARD

RELATIONAL DATA MANAGEMENT

Version 1.1 of Quad, a data management tool for computers with CP/M or CP/M-compatible operating systems, has been released by QuanTeckna Research Corp (QTRC). Quad allows end users and programmers "to easily design and implement" complete financial accounting and management applications "without having to program."

Without generating additional program code, the Quad user can build various integrated applications using the relational capabilities of the software, which can be used to develop an application as simple as a mail list or as complex as an inventory control system or general ledger. Terminals that support video attributes such as reverse video, half intensity, and underlining, can use these capabilities with Quad.

Carrying a suggested list price of $495, which includes an accounts receivable application, Quad permits the user to interface with other software packages. He can convert data entered under various formats to correspond with the Quad format, or convert data entered under the Quad format to correspond with other data formats. Programmers who prefer to use their own custom-written programs in conjunction with Quad may do so and access them directly from Quad. QUANTECKNA RESEARCH CORP., Mountlake Terrace, Wash.

FOR DATA CIRCLE 339 ON READER CARD

TRAVELER'S ELECTRONIC MAIL

The traveler who wants access to Wang's electronic mail and message system called Mailway can now get into the system from almost any telephone by using a Teletype-compatible portable terminal. He dials a Mailway-managed asynchronous communication line at an appointed Mailway distribution center. After giving his password, he receives a printed index of mail waiting for him, with the most recent listed first. He can then select items for printing, forwarding, copying, or deleting. Traveling users can also create and edit messages, attach distribution lists, and then send them through Mailway.

Automatic software upgrades to Mailway Release 2.03 will be free to those now using Mailway Level III, whose software requires a distribution-center VS computer and additional communications hardware and software. WANG LABORATORIES, INC., Lowell, Mass.

FOR DATA CIRCLE 340 ON READER CARD

ADA FOR IBM P.C.

The TeleSoft-PSE (Programming Support Environment), which features the Telesoft-Ada compiler, is now available on the IBM Personal Computer. PSE for the IBM Personal Computer includes an interpreter for the intermediate code generated by the Telesoft-Ada and Pascal compilers.

The intermediate code is said to be more compact than native code, saving memory during development and execution. PSE features TeleSoft's proprietary operating system, ROS, which provides access to all available memory on the hardware configuration.

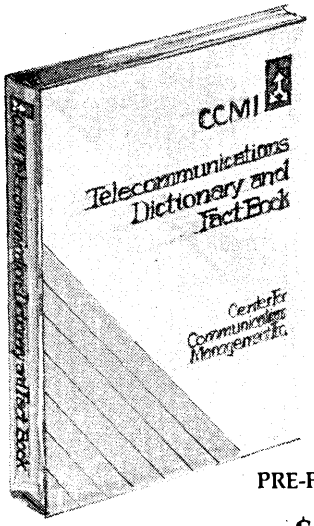
The minimum memory required is 256 kilobytes in configurations with Winchester disks, and 348 kilobytes in floppy disk systems.

The TeleSoft-Ada compiler is $2,400; the ROS operating system is $100. There are also development utilities, a run-time support package, and an editor. A starter kit, including ROS, utilities, compiler, and other packages, is $2,975.

The TeleSoft-Ada compiler is a partial implementation of the Ada programming language; the firm is developing it further to enable implementing the complete Ada. Updates to the full Ada language will be available for a $75 handling charge. TELESOFT, San Diego, Calif.

FOR DATA CIRCLE 338 ON READER CARD

Telecommunications Dictionary and Fact Book



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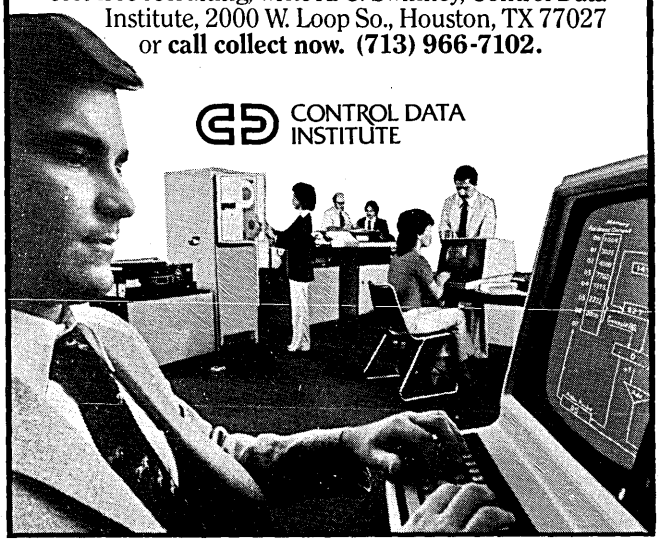

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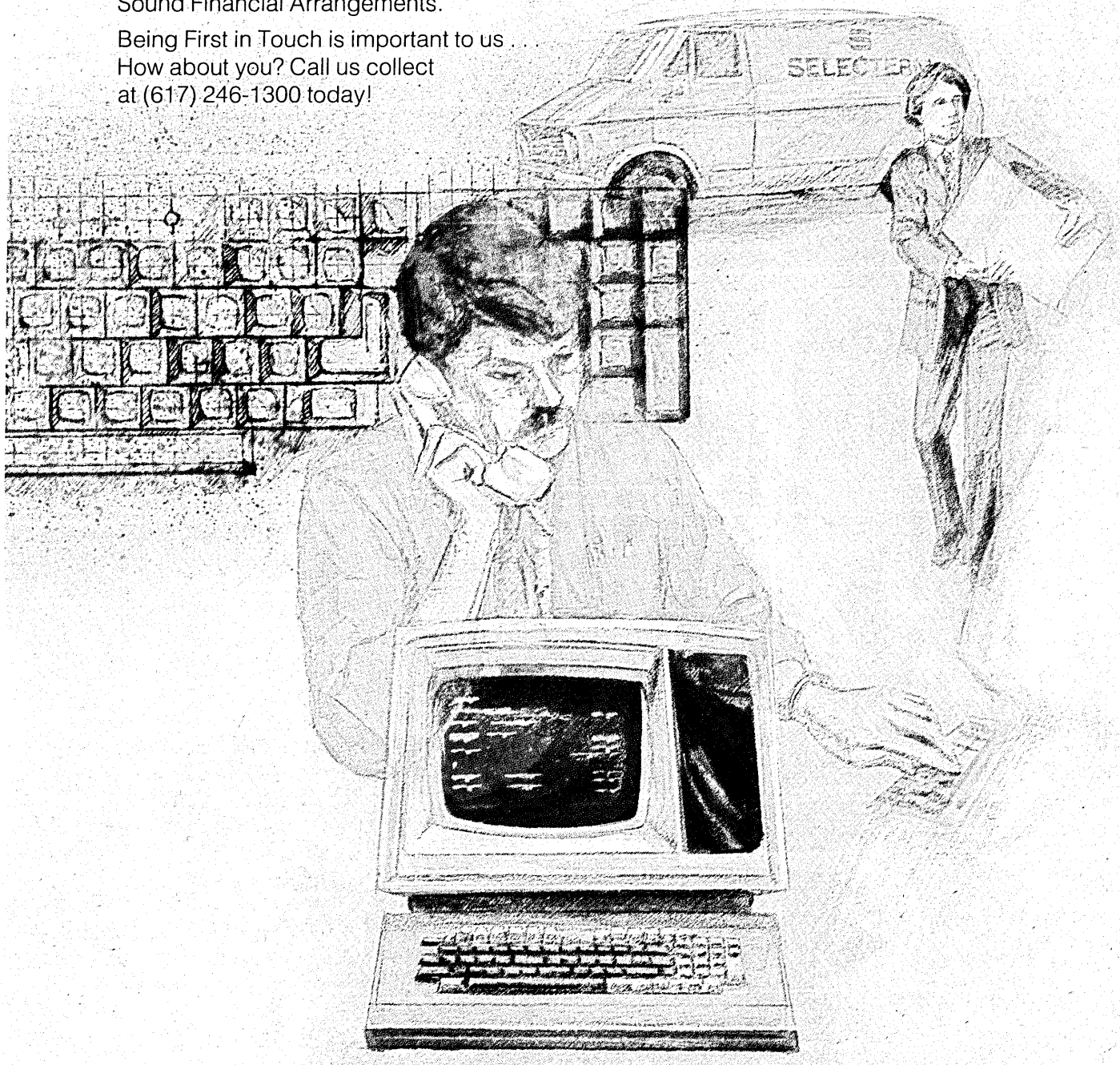

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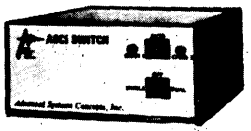

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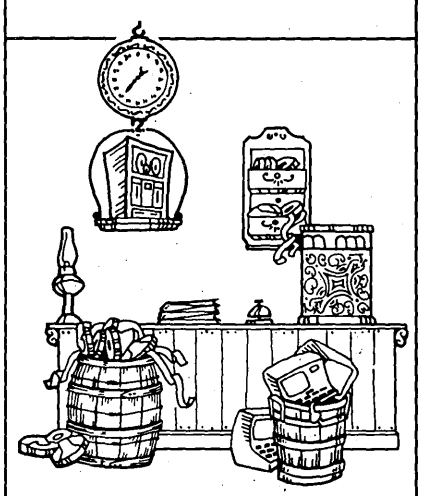

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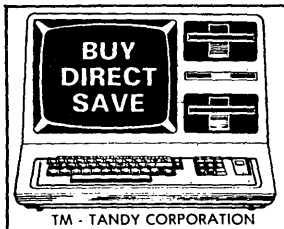

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A research vessel crewman may owe his eyesight to the oldest, continually-operating communications satellite. The man was helping conduct climate tests in the Pacific Ocean last year when one eye became infected. (He previously had surgery on the eye after fragments from an exploding light bulb injured it.) The man's doctor in Seattle was contacted via radio to prescribe care, but the infection worsened and radio contact was lost. The ship's medical technician turned to NASA's ATS-1 satellite to arrange an evacuation. When the ship docked at the Galapagos Islands, a waiting plane flew the crewman to Panama for treatment that may have saved his sight. The Hughes-built ATS-1, though expected to serve just three years, recently celebrated its 15th year in orbit.

Transistorized series-resonant-inverter (SRI) technology has been advanced to a resonant operating frequency of 200 kHz in another step toward minimizing inverter size and weight for spaceborne power-conditioning applications. The new Hughes SRI design uses power field effect transistors, which permit higher switching speeds. The design allows use of smaller inductors and capacitors, resulting in faster response to transient load changes and input-voltage variation. The SRI could be used as a beam power supply of an auxiliary propulsion ion thruster, or as a power conditioner for a high-power traveling-wave tube.

A new eraser/simulator/programmer supports existing EEPROMs from Hughes, plus additional planned memories. The microprocessor-controlled smart programmer is designated H3000 ESP. It can erase, program, read, copy simulate, modify, and compare a variety of PROMs. It requires no personality boards, hardware changes, or switch settings for different memory and parameter selections.

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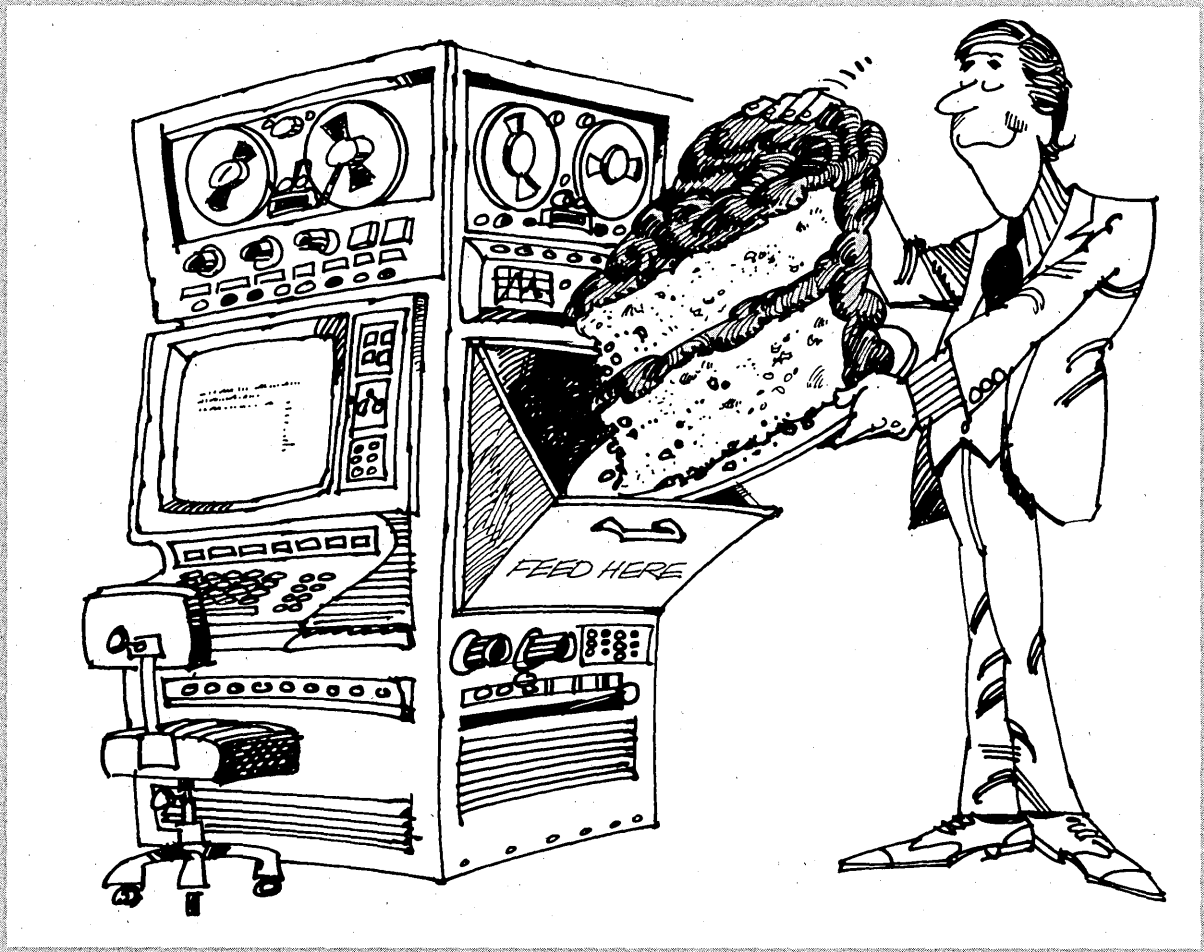

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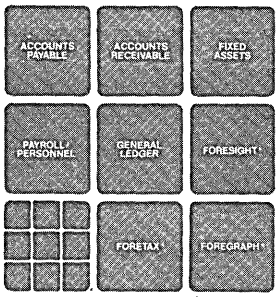

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SOURCE DATA

TECHNICAL ASPECTS OF DATA COMMUNICATION, Second Edition by John E. McNamara

Today's data processing professional quite often needs to know something about data communications. Systems or applications that do not involve some networking or communications are becoming increasingly rare.

In general terms, there are three aspects or levels of communications. The most visible is the networking software level. Examples include the ISO Open System Interconnection Architecture, IBM's SNA, and Decnet. The primary issue here is how to make systems, homogeneous or heterogeneous, communicate to achieve a distributed data processing environment. This is an evolving, complex area, the subject of much research and attention.

At the other, less visible, end are those things of interest to the hardware engineer: electrical and electronic aspects of data transmission, hardware descriptions that specify the function of each bit in each register, and so on.

The book covers an area somewhere between the preceding two topics. It describes the design and functioning of data communications equipment and systems. Although it presents a lot of material on lower-level protocols, it does not address the upper-level software issues essential to distributed data processing and networking. It makes use of circuit diagrams and register descriptions, but does not delve deeply into hardware systems engineering. It is a book that describes how things work.

An example may clarify where this book fits. The most popular hardware interface for connecting digital devices to a data communications system is defined in a standard known as RS232C. It may be used for both asynchronous and synchronous communication. The first five chapters and one appendix (out of 28 chapters and seven appendices) are devoted to building up to and explaining the use of RS232C for asynchronous communication. First, asynchronous communication is defined. It is shown how two devices, not sharing a single clock, can cooperate to transfer the bits of a character one at a time. The key problem to solve is timing: the sender transmits bits as voltage pulses; the receiver needs to know when the first bit is arriving and how long each pulse is. Circuit diagrams with AND gates and registers, plus narrative, are used to describe the solution.

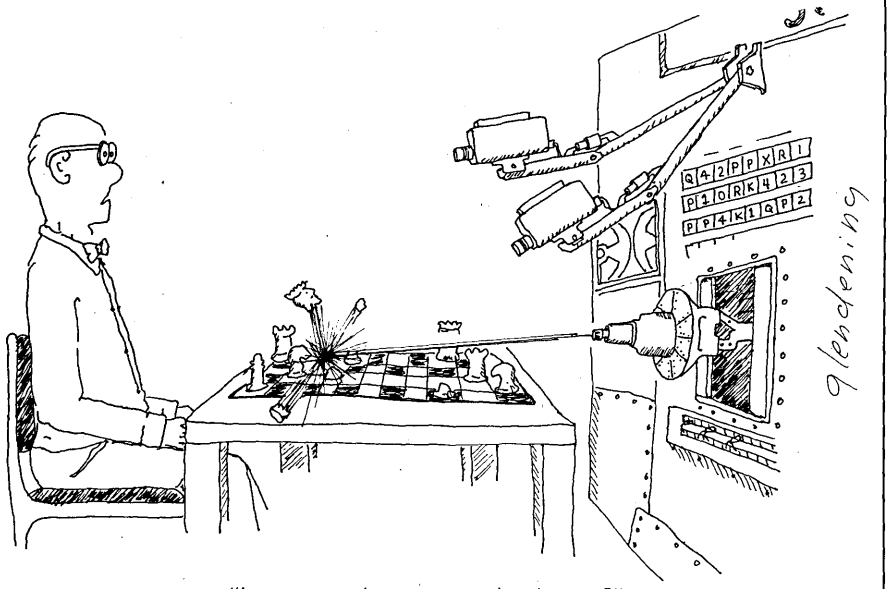
Next, the reader is shown how this simple circuit is incorporated into an interface unit for transferring parallel data from an intelligent device bus to the serial asynchronous line and vice versa. A block diagram and various registers with bit assignments are used to explain the operation. Details of the circuitry, with AND gates, registers, pin assignments, and timing diagrams, are relegated to an appendix. This is rather heavy going for one with no previous exposure, but, fortunately, it's an appendix.

The next two chapters describe two common media for transmitting asynchronous data: the 20 milliampere loop ("current loop") and voice grade telephone lines. For the latter, the book explains the need for a modem, without getting into the electronics of analog to digital conversion.

Finally, we are ready to learn about RS232C. This chapter, too, has some diagrams—electrical circuits with voltage sources, resistors, and capacitors—but the emphasis is on explaining the function of each lead or circuit on the RS232C interface used for asynchronous communications. In addition to the author's narrative, not one but two official definitions (U.S. and International) are provided for each lead.

As you can see, if all you need to know is that there are such things as interface standards, and that you have to be consistent if you want to hook things together, this book may be too detailed for your taste and interest.

The author states that the "book is intended for those who are about to design a data communication system, are about to purchase or program data communication hardware, or are just interested in knowing more about data communication." In this, the author succeeds admirably. I know of



"I suppose that means checkmate?"

CARTOON BY GLENDENING

© DATAMATION

no other book that covers this topic as well and, although an electrical engineering background is helpful, the book is reasonably approachable for anyone in data processing.

Following the description of RS232C, there are eight more chapters dealing with aspects of asynchronous communication. There is a good description of the public telephone system, a more detailed discussion of modems and their use on switched networks, and a description of automatic calling units. To get the most out of interface equipment, and to control line costs, multiplexors are often used. The book describes asynchronous multiplexors and shows how they are used under modem control. Finally, the use of redundancy checks for error detection is explained.

The next large section of the book deals with synchronous communication. The technique is described in much the same fashion as before: formatting issues, circuit diagrams, and additional RS232C leads. Then, the concept of protocols is explained and the most popular protocols are described: BISYNC, DDCMP, SDLC, and HDLC. These descriptions are certainly not detailed enough for a programmer to implement a protocol module, but they provide enough information to explain how these protocols work, their pros and cons, and to give the reader a good feel for the amount of overhead involved in each one.

A number of other topics are touched on. These include direct memory access (DMA) interfaces, packet switching, and microprocessor-based multiplexors. Some newer interfaces, RS-449, X.20, and X.21, are also described. Finally, the appendices supply useful reference information including tables of character codes, a list of Bell System modem options, and speed vs. distance tables for various interfaces.

This second edition maintains the standard set by the first. It is readable, thorough, and informative. It fills the gap between higher-level networking issues and the detailed hardware manuals mentioned above, and is worth reading by anyone who wants or needs to know more about data communications. Digital Press, Bedford, Mass. (second edition, 1982, 330 pp., $32).

—William Stallings

SEMINARS

TAKE A BITE

New York's Big Apple Users Group will hold its third annual Apple Fair on Saturday, Aug. 21, at New York University from 10 a.m. to 5 p.m. The show will stress both business and leisure applications of Apple hardware and software. The program includes general business application lectures and classes on prepackaged software, plus lectures and hands-on activities in the realm of graphics, games, and education. There aren't any worms in this apple: the event is still free, and last year there were well over 3,500 attendees. NYU's Tisch Hall (where the event occurs) is located at 40 West Fourth St., New York City. Contact the Big Apple Users Group, P.O. Box 490, Bowling Green Station, New York, NY 10274, (212) 543-0435.

VECTOR PROCESSING

In this course, "High Speed Computation: Vector Processing," architectural and algorithmic issues will be covered in formal-theory parallel and vector computation. There will be presentations on four current vector processors and their applications to scientific and engineering problems. The course is given by the University of Michigan's College of Engineering as part of the Engineering Summer Conferences program. It is scheduled for Aug. 2 to 6 and the fee is $750. For more information, contact the university at 300 Chrysler Center, Ann Arbor, MI 48109, (313) 764-8490.

SUMMER IN MASSACHUSETTS

MIT is offering two sessions this August. The first is "Advanced Software Concepts—Operating Systems," which runs from Aug. 2 to 6. This program covers the

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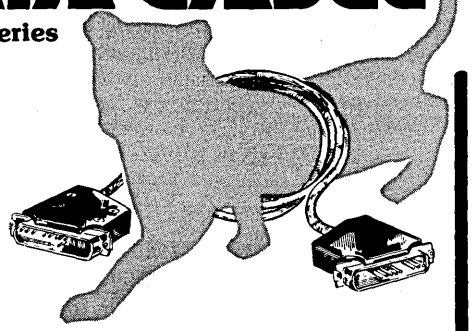

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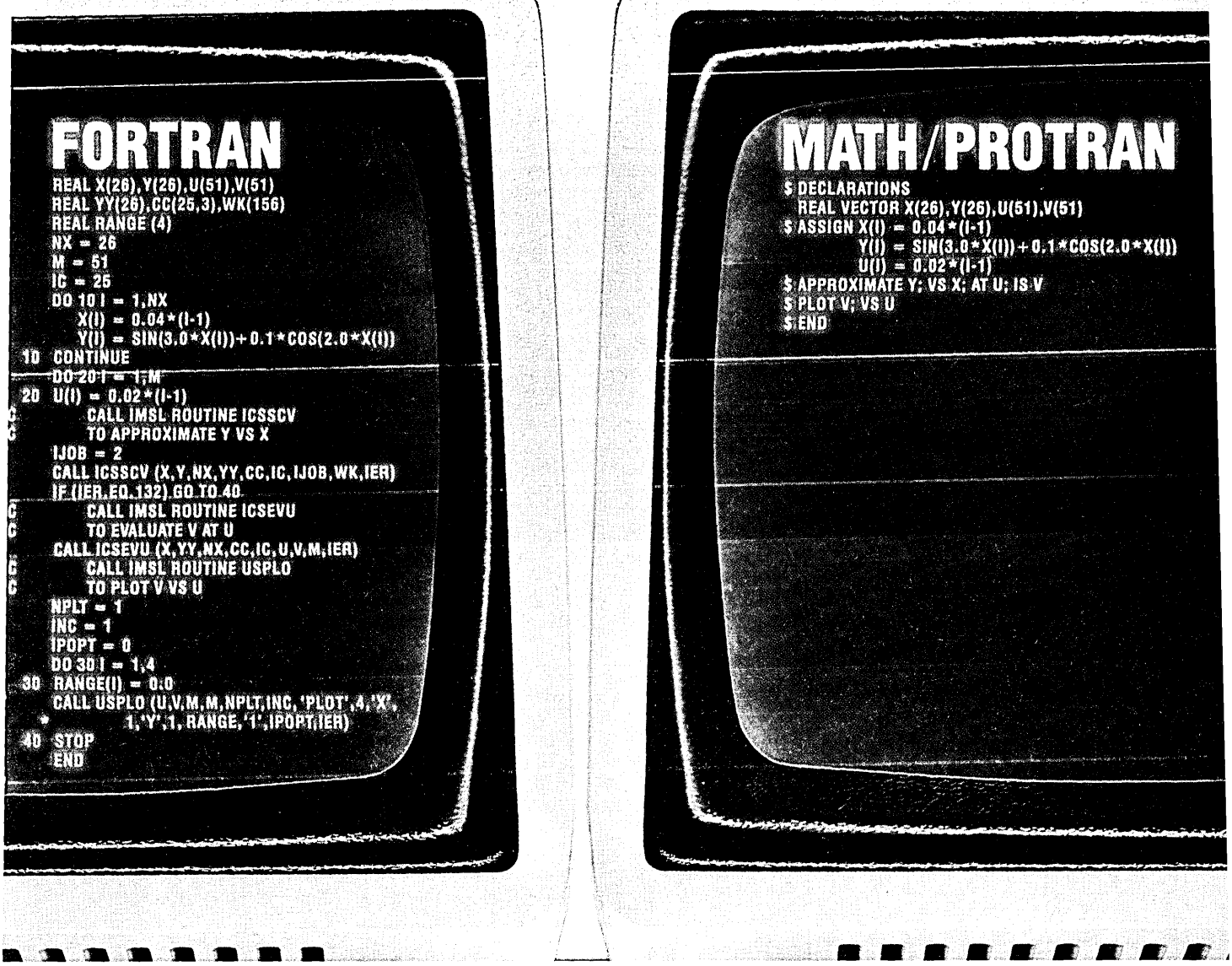

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analysis and design of current and future operating systems. The material presented will range from theoretical issues to detailed "pushing the bits" considerations. Students will design, implement, and test operating system components on MIT's computer system. The second program is "Key Aspects of Information System Technologies: Database Systems, Telecommunications, and Performance Evaluation." This course takes place Aug. 9-13, and will present an overall view of information systems, focusing on data management software techniques, telecommunications, and performance evaluations. Both programs assume the student has a "general familiarity" with computer systems. The courses are priced at $1,250 and $1,300, respectively. For details, contact MIT, Office of the Summer Session, Room E19-356, Cambridge, MA 02139.

FIS

"Financial Information Systems: The New Generation" is a three-day conference presented by the National Institute for Management Research (NIMR), July 28-30. The application of new computer equipment, software, communications approaches, and management technologies as tools for all aspects of new integrated financial information and management systems is the conference's focal point. On the first day, plenary sessions will give an overview of financial systems; day two features workshops on case studies and new developments; and day three presentations will examine auditing information systems for security, how to incorporate automated auditing tools, the roles of internal and external auditors in government and industry, and a present and future outlook. Contact NIMR, P.O. Box 3727, Santa Monica, CA 90403, (213) 450-0500.

CAD/CAM

The University of Missouri-Rolla is offering a course on "Integrated Computer Aided Design, Analysis and Manufacturing" Aug. 9-13. The course deals with the design and manufacture of mechanical parts and structures via a computerized system that integrates the steps in the design and manufacturing processes. Students will have access to the university's computer graphics system, an industrial robot, and an experimental robotic vision system. Registration is available in two forms: students can attend only the first day overview ($195) or all five days ($595). No previous experience with computers or processing is required. Information is available from Martha K. Fort, coordinator, Engineering Continuing Education, 111 Engineering Research Laboratory, UMR, Rolla, MO 65401, (314) 341-4943.

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The 64-page 1982 Publications Catalog describes 150 books, publications, surveys, and training aids available to bankers. Resource material in the areas of accounting, finance, operations, payments services and systems, security, human resources, trust, tax, audit, and community banks is included. BANK ADMINISTRATION INSTITUTE, Rolling Meadows, Ill.

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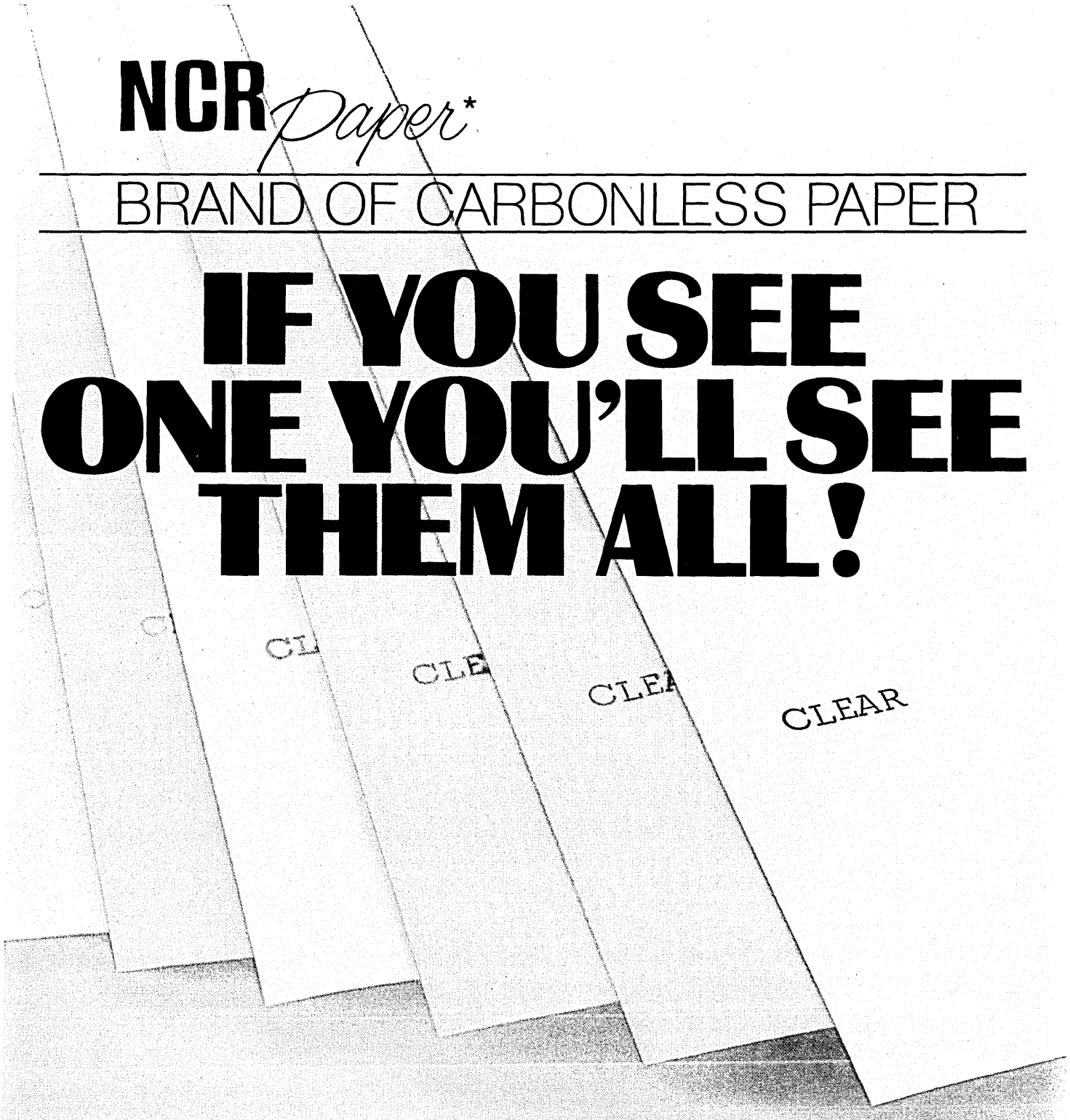

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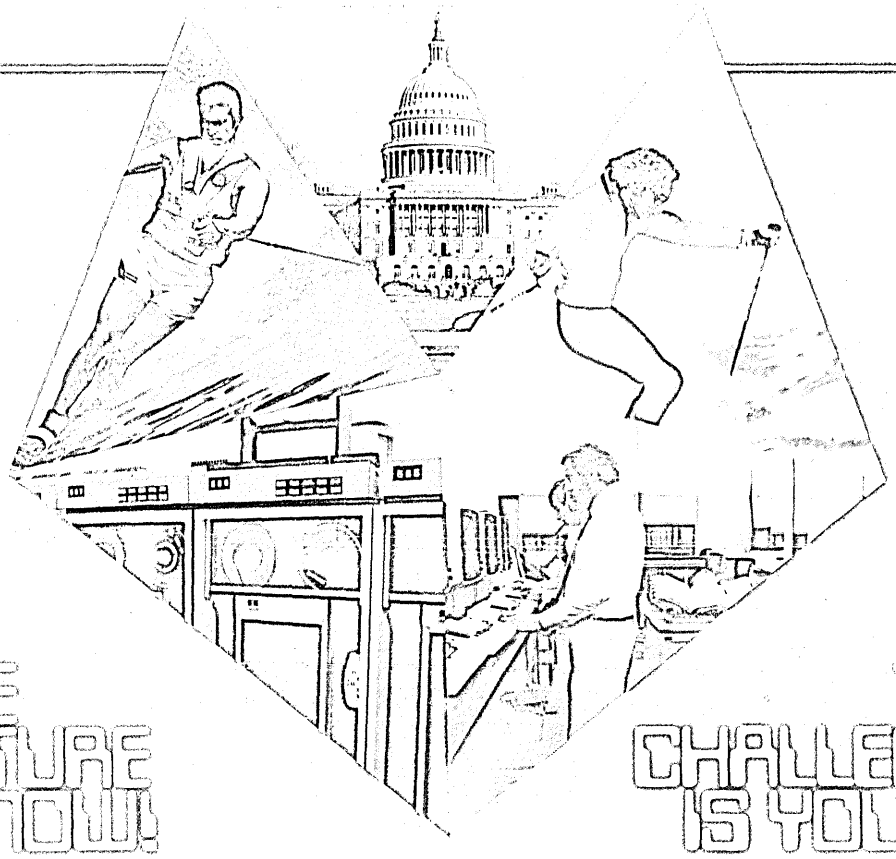

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READERS' FORUM

THE HUMAN SIDE OF SOFTWARE

That software is a new art form as well as a new form of engineering is well known to computer games manufacturers. In the world of business, however, anything that smacks of art tends to be passed along to the Department of Employee Welfare and Community Relations. Art is kept as far as possible from the areas where people analyze business data, make decisions, or just routinely process information. Yet art is about life, and business is very much a part of life—sometimes full of drama and suspense, though often dreary. In a large corporation it is true that the humdrum aspect of business predominates for most people. Only at the higher executive levels are the thrills of merger, takeover, launching, and spinoff experienced. The middle ranks handle routine decisions and the endless detail of accommodating conflicting demands to ill-defined objectives. Operating people and middle management use computer services the most while top management uses them the least. It is easy to present top management with data processing in an imaginative, dramatic way, though this is seldom done. At this level the work is so interesting that human interest packaging can be regarded as a frill. But to dramatize or even make palatable the software that handles order entry, prints bills of materials, and produces actual vs. budget reports is much more important—and more difficult. But it can be done.

With interactive systems it becomes possible to enrich people's work experience. Consider an order-entry clerk processing a stack of customer orders at a terminal. If the system is well designed it helps him or her do the work more quickly, but the smoother it goes, the more boring it becomes. But suppose, after entering the order details, this message flashes on the screen:

Message 1—THIS GUY HAS NOW BOUGHT OVER ONE MILLION WIDGETS FROM US SINCE HIS FIRST ORDER IN JANUARY 1959. SPECIAL INSTRUCTIONS?

At this point the clerk can insert a congratulatory message on the invoice or even give special instructions to the shipping department to tie a red ribbon on the case. If this kind of episode occurs fairly frequently but irregularly, psychologists tell us that the order clerk will receive strong "reinforcement" that will motivate him or her to work with keener interest. People who are bored to death operating an automatic punch press for an eight-hour shift will happily pull the lever on a one-armed bandit from sunup to sunup, so enthralled that they forget family, friends, and primary biological needs.

Returning to our order-entry clerk, Message 1 constitutes reinforcement—a reward for effort and an inducement to go on working—because it relieves boredom and gives the clerk an opportunity to be creative. Even stronger reinforcement is provided by an offer to participate in management work, as in the following:

Message 2—GROSS MARGIN ON THIS ORDER ONLY $5.23. LIKE TO CONSIDER SUBSTITUTIONS?

Here the clerk is invited to consider alternatives and make a decision—within suitable constraints of course—in an area that would normally be entirely the province of the sales department. The system would have to be designed to help him make the right decisions.

At the end of the day the following message might appear on the screen:

Message 3—GROSS MARGIN ON ORDERS SO FAR THIS MONTH $20.035. GOOD GOING! YOU ARE IN THE RUNNING FOR A BONUS.

On reading this, the clerk—if the dangled carrot is juicy enough—might decide to carry on working just a bit longer, say, until dawn. Computer systems can be designed to give direct feedback on performance. Many job designs do not provide direct feedback, which is one reason why they do not produce the intended motivation.

Enrichment of this kind cannot usually be built into the system by the designer. But the designer can give the system learning ability so that its users can teach it such tricks. The most effective kind of learning, for computers as well as people, is on-the-job learning. When we install an operating system we select perhaps a hundred or more options that are then locked in. This is like classroom teaching of a primitive kind. The teacher (systems programmer) makes the student (computer) learn by rote. However, in an interactive system, what we really need is for the users to adapt the system to the particular needs of the organization which they, and they alone, are familiar with.

The system designer may be brilliant, but he doesn't live with the system. Those who do are frequently inarticulate or have been conditioned by the organization not to get involved with specialists and managers. The Japanese have developed an elaborate system of training and motivation whereby workers can make an impact on quality and cost through participation in Quality Circles. As software designers we can help achieve similar results, without a management revolution, by providing systems with on-the-job learning capability. This is difficult and costly, but well within the state of the art.

Consider again our order-entry system. Suppose that at the outset the system displays no such messages as Messages 1, 2, or 3, but at the end of a day's work, before log-off, the system will offer a menu of navigational aids through the database that the user can explore, and perhaps a few ideas to stimulate thought. It also offers a tutorial session on how to make the system respond to user-specified triggers and gives the phone number of a system special-

st. The facilities offered may be very limited. No matter. A "win-low" has been opened whereby the user can participate creatively n the use of a system. (From now on I shall call the hitherto passive ıser a "participant.") And, management, please note the follow-ng advantages:

1. When you buy the system you state what information is o be made available to which participants. In other words, you ontrol the size of the window that is opened.

2. Participants will be much less inhibited about asking a nachine for information than about asking a manager who is al-vays looking at his watch and who doesn't have the answers any-vay, but won't admit it.

3. The participant makes his own rules, sets his own objec-ives, even awards himself praise and admonition (within the limits of the window opened by management), without having to squirm hrough a performance appraisal interview.

4. If you wish, you can reward employees not only for neasured performance, but for creativity in system use.

ASK FOR A PERIOD OF TRIAL USE

Obviously systems designed in this way will cost a lot more than conventionally designed systems. The payoff will come in terms of productivity, quality, motivation, and creativity. But how can you evaluate the software package? You have to rely on descriptions that tell you, more or less flamboyantly, what the system can do. You can ask for a demonstration and a period of trial use to find out whether the claims made are true. But usually only vendors of games tell you what you will feel when you play.

The designer of business software needs to convey, likewise, the human impact of his product. To do this for a sophisticated market requires imagination, experience of real-life business situations, and a dramatist's flair for capturing them. The designer should, in fact, create scenarios for his products as a first step in design. These may have to be modified, perhaps drastically, as the system develops.

If the budget permits, the final version should be captured on film or videotape. Now you, as the software buyer, should observe your people as they make a trial run of the system, and talk to them afterwards to gain an impression of what they felt as they sat before the witching screen. Did their attitude change from indifference, perhaps fear, to active enjoyment? Or did they finish the session more turned-off than when they started? If you can do it discreetly, perhaps you should make a videotape of them as they work. Then you can compare your reading of the observed human behavior to the scenarios presented by the vendor. (Of course you should also study the output and the efficiency of the system. Some of the system's products may be the result of creative developments made by the participants themselves.) In other words, you should evaluate a whole new dimension—the human dimension—of the software.

Suppose you have evaluated the system in terms of results, efficiency, and the human dimension. If you are satisfied and can negotiate reasonable terms, the next step would normally be to sign a tersely worded contract and pay up. In return for this you would eventually receive a reel of tape, an instruction book, the services of an installer, and perhaps a few training sessions. You sometimes get the source code but because you don't understand it, it doesn't help you much. The instruction book tells you what the package will do in response to your inputs. If you have any trouble the supplier will fix it provided the contract you signed has maintenance provisions. It's just like buying a machine. But it shouldn't be. It should be more like hiring the services of a professional.

Let's talk about the system's functions (perhaps we should say responsibilities). Among its mechanical functions might be: "to keep records of the client's customers, products, and customer orders in the form prescribed by the client, subject to receiving correct input as described herein and subject to the restrictions set forth in paragraph . . . below."

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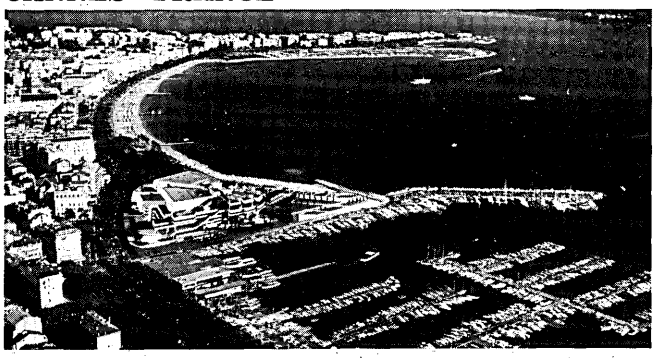

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READERS' FORUM

with the way software can cause employees to behave in a more involved way, even when performing apparently humdrum functions. So among the system's behavioral functions we might find: "to provide stimulus and guidance to the client's employees in the setting of performance objectives, provided such objectives can be given quantitative or logical expression in terms of the aforesaid records in accordance with the rules stated in paragraph. . . ."

If software were specified in terms like these, one result might be a spate of lawsuits for nonperformance, particularly in regard to the behavioral specifications. Vendors would resist committing themselves to behavioral functions on the grounds that these, unlike the mechanical functions, are the responsibility of management. Let's take a simple example to illustrate this. Suppose the management of a school decided to invest in a coin-operated soft drink dispensing machine. To describe the expected mechanical performance of the machine you might say that whenever an appropriate coin is inserted and button A is pressed, a can of Wallop is dispensed within one and a half seconds; that the machine, if properly loaded, is capable of delivering 850 cans of Wallop per hour; and that the expected mean interval between failures is 28,000 Wallops. While all this is of interest to the school, management's real goal is to induce the children to stay on the school premises during recreation breaks and, in particular, not to visit the corner grocery store. This behavioral objective is of far greater importance than the mechanical performance of the machine, although the machine must perform adequately if the behavioral objective is to be met. But the suppliers of the machine would not dream of specifying any such behavioral result, at least not in writing. Why should software vendors be any different from soft drink vendors? I believe the answer is that it is in the long-term interest of the software industry to get involved in the behavioral aspects of its products, just as it would have been in the interest of the automobile industry to get involved in the safety and pollution aspects of its products before being forced to do so.

One of the most common causes of system failure is defective input: garbage in, garbage out. The system designer should not throw up his hands and point his finger at management. He should help management by designing a system that motivates employees to provide good input; and the motivation should be part of the system's functional specification. Suppose we still get garbage in spite of an excellent motivational design? Well, though this is no consolation, it was probably a mistake to buy the system in the first place. The scenarios weren't studied carefully enough; nobody noticed the warning signs of apathy during the trial runs; maybe the participants weren't even consulted; maybe management didn't think it necessary to consult them. Maybe the kids kept going to the corner store because they enjoy thumbing their noses at teachers.

YOU CAN'T ENGINEER BEHAVIOR

This brings us to a vital point: you can't engineer human behavior, and if employees sense that you are trying to do so, they will exert all their ingenuity to beat the system. As Douglas McGregor pointed out over 20 years ago, most managements base their actions on a set of assumptions about human behavior, whether they realize it or not. If you are a follower of theory X, no amount of human-engineered software will hide that fact from your employees. Indeed, you may find that the very flexibility of the system is used to foil you. You would be well advised to stick to rigid systems that give you control above all. But if your management philosophy is based on theory Y (and your people perceive it as such), then you will trust your employees to take responsibility and you will encourage them to show creativity even though at times the results are unexpected. In this kind of climate, the human side of software becomes a potent force for the release of enthusiastic effort. Software can help enrich boring jobs if it:

- allows participants to view the whole system, of which they are a part,
- allows participants to get fast feedback about the contribution they are making through their interaction with the system,

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- allows participants to structure their jobs according to their particular styles of working,
- allows participants to set their own goals and to know when they have reached them, and
- allows participants to be inquisitive, to browse and to design their own psychological rewards; in short, to enjoy their work.

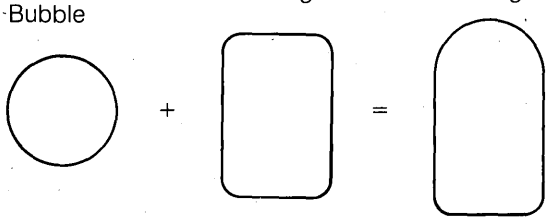
When the buyers of business software put these points on their selection criteria, we can expect to see some interesting changes in our profession.

—Edward R. Lawrence
Monterrey, Mexico

THE BUBTANGLE

As a data processing practitioner, I have had it with incompatibilities. Compilers are incompatible, operating systems are incompatible, database managers are incompatible, and even the "process" symbol (Yourdon/DeMarco Bubble vs. Gane/Sarson Rectangle) for structured analysis is incompatible. I can't do anything about the operating systems or compilers but I do have a suggestion about the "process" symbol. I hereby propose the Bubtangle, a standardization of the structured analysis "process" symbol.

Fig. 1
THE BUBTANGLE



The Bubtangle offers the data processing community the following advantages:

- It integrates the best features of both the bubble and the rectangle.
- It is an internationally recognized symbol.
- It sounds better then recle.
- It is upwardly compatible (unlike COBOL-80) and does not obsolete the current investment in bubble/rectangle technology.
- It would permit the use of bubbles or rectangles at lower levels of decomposition, thus keeping all existing diagrams current.
- The industrial tooling necessary to create millions of Bubtangle templates is available due to the depression.
- It will eliminate the bubbles vs. rectangles struggle, and permit analysis teams to focus on other issues.
- Bubtangles are permissible for Nolan Stage 4/5 companies.
- The Bubtangle is 75% of a rectangle and 50% of a bubble, yielding a 125% Bubtangle.
- It is nonprocedural, user friendly, and relational.
- It provides a meeting ground for proud bubble people and rectangle people.
- It is Ada-compatible.

Undoubtedly, there are dozens of other advantages to standardized use of the Bubtangle, and I'd welcome any further insights.

—Bernard Boar
New Brunswick, New Jersey

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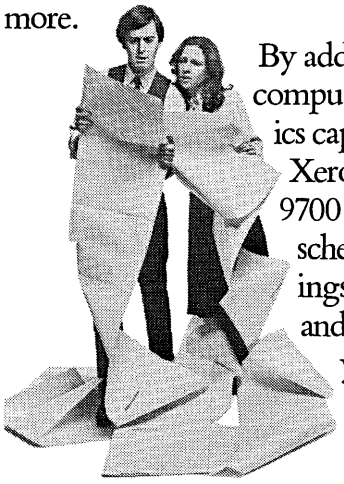

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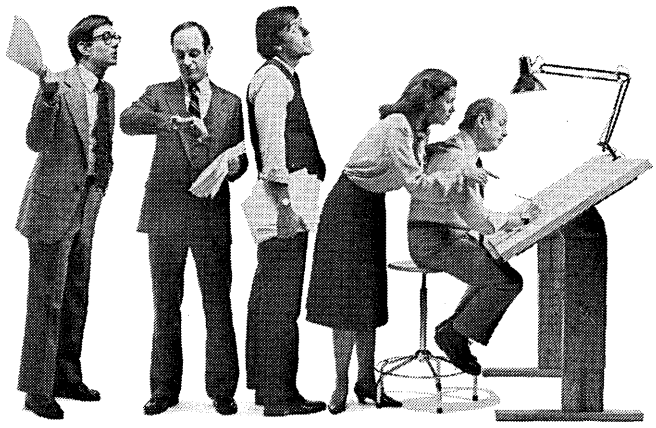

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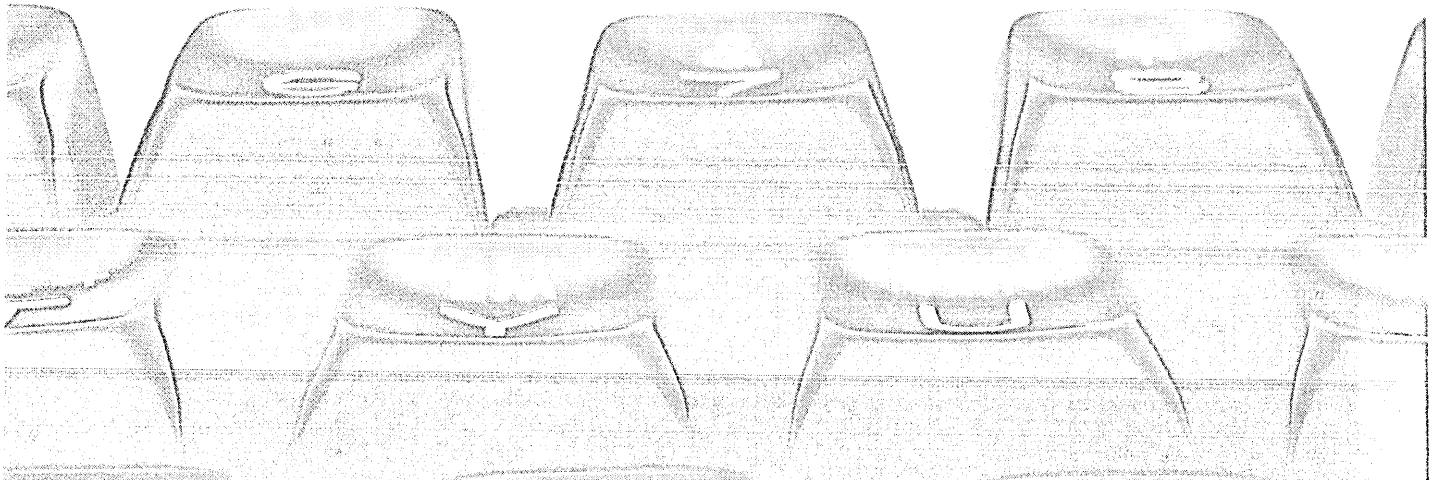
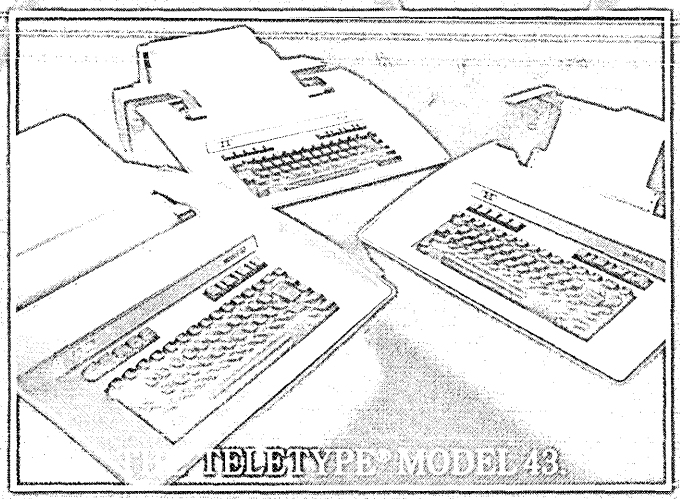


THINK AGAIN.



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CIRCLE 3 ON READER CARD