

COMPUTER

DECISIONS

JANUARY 1984

THE MANAGEMENT MAGAZINE OF COMPUTING

A HAYDEN PUBLICATION

MAKING IT BIG

Life without Ma Bell

Technological catch-up

Automating your data center

Personal computers in engineering

Andrew Grove on meetings

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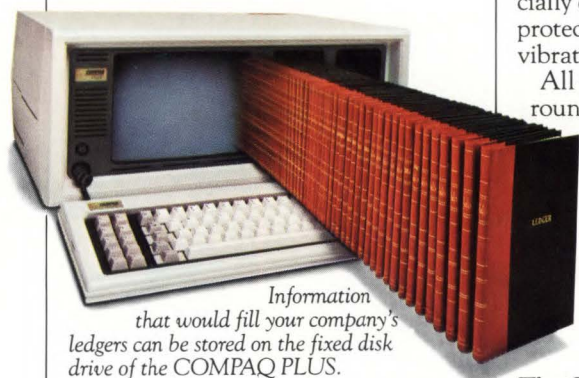
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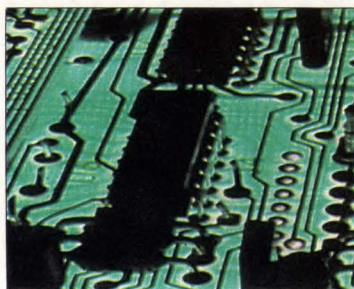
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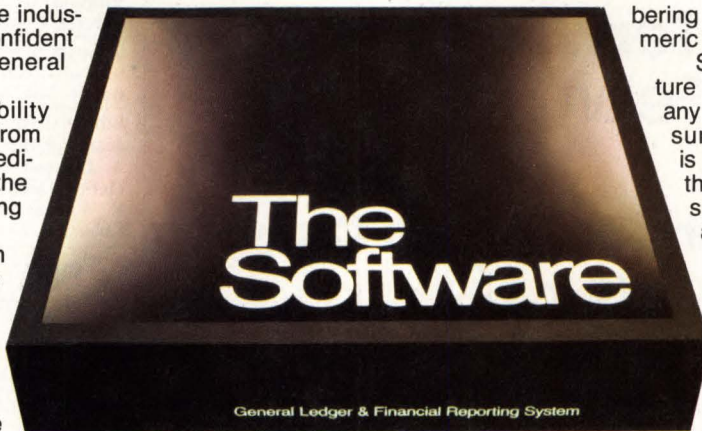
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Headquarters Office

10 Mulholland Dr., Hasbrouck Hts., NJ
07604, (201) 393-6000

Publisher/Vice President: **Don Huber**

Editor: **Mel Mandell**

Managing Editor: **Donne Florence**

Senior Editor: **David Whieldon**

Art Director: **Bonnie Meyer**

Midwestern Editor: **Jan Snyder**
P.O. Box 187, Lockport, IL 60441
(815) 838-5280

Microsystems Editor: **Susan Foster**
Western Editor: **Martin Lasden**
1307 S. Mary Ave., Sunnyvale, CA 94087
(408) 736-6667

Southwestern Editor: **Jennifer E. Beaver**
585 W. 39th St., San Pedro, CA 90731
(213) 548-7877

New England Editor: **Mary Miles**
175 Warren Ave., Plymouth, MA 02360
(617) 746-4441

Data-Comm Editor: **John Seaman**

Management Issues Editor: **David J. Kull**

Associate Art Director: **Lynn M. Holl**

Copy Editors: **Claudia Nalven**
John Rymer **Susan Trembly**

Staff Writer: **David R. Roman**

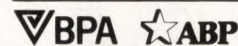
Editorial Support Staff:
Virginia M. Johnson, Supervisor
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Contributing Editors:

Gideon I. Gartner, **Joseph Hillhouse**
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Editorial Review Board:

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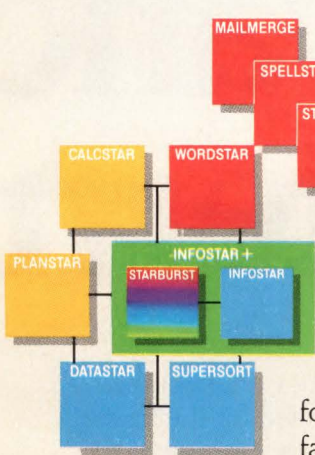
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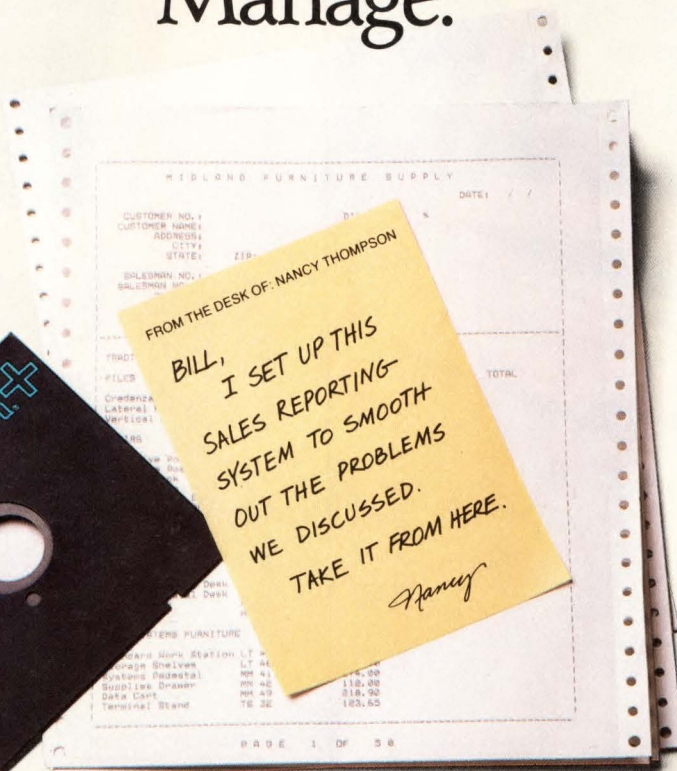
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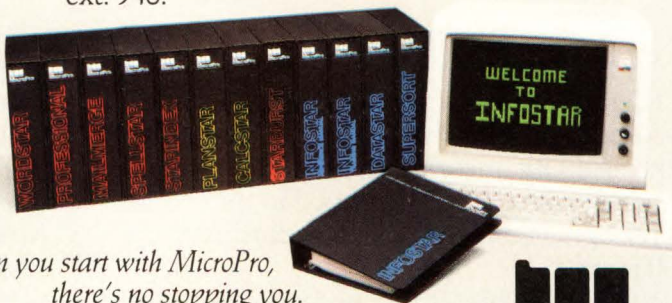
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INSIGHT

AT&T's brave new worlds

The big news on January 1 wasn't the emergence of George Orwell's "Big Brother." That sinister autocrat hasn't materialized. Rather, the birth of 1984 will be remembered for the launching of eight gigantic companies: "the new AT&T" and Ma Bell's offspring, Nynex, Bell Atlantic, Bell South, Ameritech, US West, Southwestern Bell, and Pacific Telesis. AT&T and its sibling rivals face two brave new worlds.

The divestiture by the world's largest corporation of three-quarters of its assets defies Orwell's vision of the future. Communications has been an increasingly diverse arena, and the Bell breakup advances the trend. (See "Now that the cord's been cut . . ." in this issue.)

Before the breakup, AT&T's dominance as *the* common carrier of information in the United States had begun to erode in the face of competition from aggressive suppliers of long-distance phone service, satellite services, and customer-owned communications lines. The breakup roughly doubles the number of AT&T competitors in the field. And even seemingly solid sources of long-distance revenues for the new AT&T can disappear in a flash. Ameritech, for example, is building an extensive fiberoptic network among its various facilities so that it can avoid paying heavy long-distance phone charges.

In addition, Ma Bell's own off-

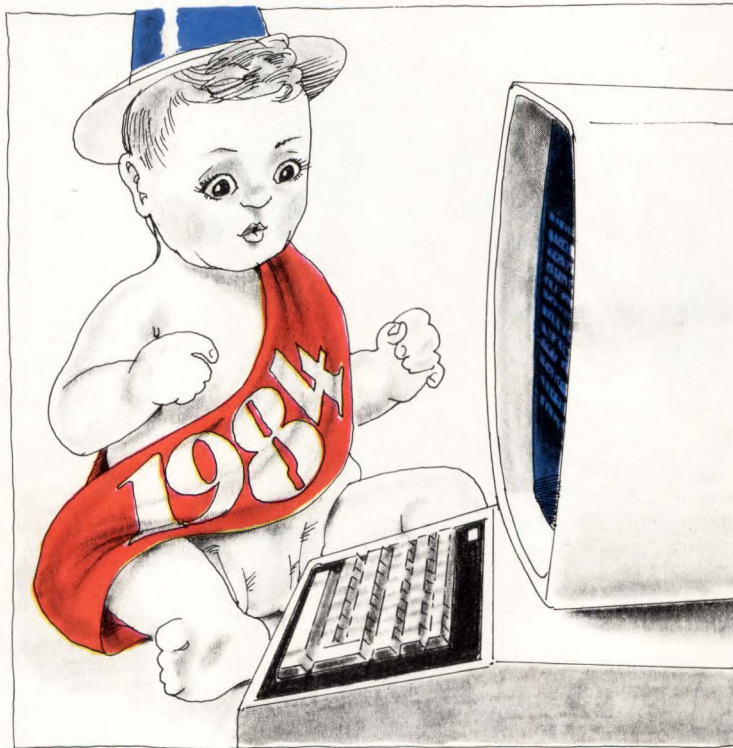


Illustration by Dan Culhane

ware, and training services. Indeed, IBM has become the promulgator of de facto standards to an extent not witnessed for more than 10 years. It's doing this by using previously verboten tactics: discounting, extensive buying of other manufacturers' subassemblies, and endorsements of third-party software.

A realignment of the major suppliers of computer equipment and services has already begun, largely prompted by Big Blue's marketing thrusts. Vendors that once were considered powerhouses may fade.

spring are competing with AT&T as suppliers of phone equipment. The stiff challenges facing the new AT&T were recognized by Wall Street when trading in the company's stock began in late November. Results for the new company were decidedly undecided.

In time, expect AT&T to assert its power as a vendor of communications services and equipment—and computers. The new AT&T retains Bell Labs, one of the world's foremost research organizations and a good bet to be a leader in advanced technologies. But in the face of IBM's hard charge into every market, AT&T will need all the muscle it can muster to make inroads into this second "new world."

No corporation is effectively challenging Big Blue's domination as a supplier of computer equipment, soft-

AT&T chairman Charlie Brown may disavow the notion that IBM and his corporation are headed for a collision, but we don't. As the use of personal computers explodes in corporations, the demand for truly open connections between giant computers, personal-computing workstations, and many peripherals will grow. The network—the sum of the parts—will be more important than the individual components. Data communications and information processing are becoming one, driving IBM and AT&T toward each other.

AT&T's challenges in communications and computers hold out promises of better machines and prices. But only astute users will cash in: AT&T's brave new worlds are yours as well.

John Rymer



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CIRCLE 6

NEWS & COMMENT

Are corporate micros underused?

Are personal computers in corporations being used to capacity? A new survey of managers and employees in Fortune 500 companies suggests that capacity has very different meanings to the two groups.

In the survey, 80 percent of the 100-manager sample said their organizations' personal computers aren't being used to full capacity. Only 12 percent said users were fully utilizing the machines.

However, the 100 users included in the survey disagreed. More than half (53 percent) said they use their personal computers as much as initially expected, and 42 percent said the machines are being used more than anticipated.

The survey was conducted last August for Control Data Corp. (Minneapolis) by Penn + Schoen Associates, a New York research house. It examines the beliefs and attitudes of 100 management-information systems (MIS) managers, 100 employees who use personal computers on the job, and 100 employees who don't use microcomputers at work.

Utilization is often raised as an issue in corporate personal-computer deployment. Indeed, some organizations require prospective users to project the number of hours they'll use personal computers before purchases are approved.

The managers in the survey clearly believe users can do a good deal more with personal computers. But managers don't seem to be overly concerned about taking action to improve utilization. Only 6 percent of the respondents said they are dissatisfied with their organizations' personal computers. Seventy-eight percent are satisfied.

The most popular personal-computing application among user re-

spondents was doing budgets, with "spreadsheet analysis" finishing a close second. As the accompanying chart demonstrates, employees are using their machines for a variety of tasks.

Fifty-nine percent of the sample said they've expanded their duties using personal computers. The managers haven't realized such impressive on-the-job gains. Only 11 percent said their workload had been reduced by personal computers, while 53 percent noticed no change.

Based on the responses from the three groups in the survey, Penn +

Schoen concluded that managers and employees alike don't fully understand personal computers in a corporate setting. Many managers and users need better insight into how personal computers can be integrated into existing information-processing systems in a tailor-made arrangement.

Of course, as a vendor of databases, Control Data's interest in the survey is in managerial and user attitudes toward databases. Among MIS managers, 46 percent said they didn't think their departments were using all available database services. However, 27 percent of the managers discouraged use of such services.

Most-popular micro applications

	Percent performing task	Hours saved		
		2	3-5	6+
Calculating budgets	63	64%	15%	6%
Spreadsheet analysis	58	65	15	10
Preparing lengthy documents	52	59	15	8
Reviewing records	32	59	24	10
Accounting	31	71	18	8
Market-analysis reporting	27	76	16	0
Interoffice memos	23	75	15	5
General research	22	72	6	17

IBM PC is conquering OA

Major vendors of office systems are moving to connect the IBM Personal Computer to their systems. The "PCing of the automated office" was one of the trends revealed at the recent Hammer/Seybold Forum on office systems and professional computing.

The IBM PC is "the most important development in office automation of the past five years," David Klein, executive vice president of NBI Inc., told the conference. IBM's machine is nettlesome for NBI, a

Boulder, CO-based supplier of word-processing systems. Klein said that some user organizations have more PCs hooked to shared-resource systems made by NBI than they do NBI workstations.

Tying office-automation systems to IBM mainframes is the other major thrust in current office automation. One vendor after another has revealed plans to tie equipment into IBM's various communications protocols or document-sharing schemes.

IBM standards are not the only ones gaining support. Executives from AT&T Information Systems (New York) and Digital Equipment

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CIRCLE 7

NEWS & COMMENT

Corp. (Maynard, MA) told conferees they are working on connections between their equipment and office systems made by Wang Laboratories, Lowell, MA.

In addition to the announcements of cooperation between computer-makers and office-system vendors, the conference featured some revelations. Julius L. Marcus, vice president and group manager of DEC, said the computer-maker will soon offer voice synthesis on its systems. Employees will be able to call in from outside of headquarters and retrieve electronic mail directly. But DEC does not plan to offer voice mail, which has not been successful in corporate America.

AT&T still has high hopes for its Picturephone service, which bombed some years ago. Frank Vigilante, president of AT&T Information Services' Product Planning and Development Division, also revealed that some of AT&T's bulkier desk-top terminals will be redesigned for compactness.

The Unix operating system for personal computers is apparently attracting much attention. Robert C. Miller, senior vice president of Data General Corp. (Westboro, MA), revealed that customers will soon be able to run Unix-based software with his company's Advanced Operating System. NBI also plans to offer systems that will run Unix.

Dark horse wins micro race

Ever heard of the Starlite HD-20 personal computer from Computershop? It won top honors in "The Personal Computer Price-Performance Guide," an analysis of 92 machines. The report was recently published by the Management Training Institute Inc., Rockville, MD.

The HD-20, an 8-bit machine with a standard hard disk, was rated above many better-known and better-selling machines, including those made by IBM, Apple Computer, Tandy (Radio Shack), and Digital Equipment Corp. (DEC).

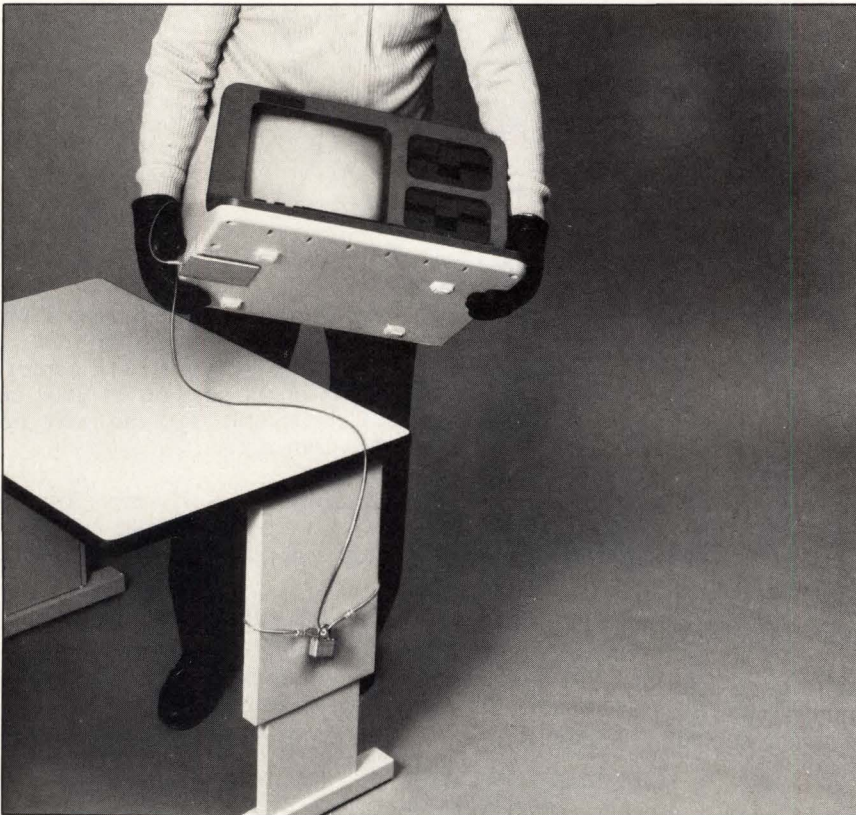
Each of the 92 personal computers in the competition was compared to a theoretical standard. The standard was a \$2,000 computer with an 8-bit processor, 64 Kbytes of random-access memory, 256 Kbytes of floppy-disk storage, a 12-inch monochrome display, and a keyboard with four function keys and a keypad.

The HD-20 achieved a rating of 2.90. The Kaypro 10 was second, with a rating of 2.71, and the Sanyo MBC 550 was third at 2.45. The Commodore Executive 64 was fourth, followed by Telcon's Nomis, the Kaypro II, the Pied Piper by STM, Telcon's Zorba, the NEC PC-8000, and the Toshiba T100.

The IBM Personal Computer XT finished 20th; it was rated slightly above the theoretical standard. The Franklin Ace, DEC's Rainbow 100, and the Radio Shack TRS-80 Model 4 were also rated slightly better than the standard. Personal computers with substandard ratings included the Apple IIe and III, the DEC Professional 350, and Xerox's 820-II.

The ratings do not weigh the availability of software, which would favor IBM. Also, each vendor's likelihood of survival was not taken into consideration. The competition placed a heavy emphasis on hard-disk capacity, portability, graphics, bundled software, and multiple processors. Personal computers with

Protecting personal computers



Worried about losing your personal computers or terminals? Theft Guard is an inexpensive way to secure them to a table or desk. Of course, a determined thief could make off with the table too, but this is less likely to happen in most offices. The cost is \$30. For more information, contact Computerized Manufacturing Consultants Inc. at (312) 940-0100.

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DATAPOINT

We sparked the revolution.

NEWS & COMMENT

16-bit processors, 128 Kbytes of memory, or a color monitor received extra points. If a display or keyboard was not included with the basic system, the machine lost points.

The Guide costs \$20. For more information, call The Management Training Institute Inc. at (301) 881-7666.

Walking fingers

The FM/3000 productivity systems for minicomputers, from Computer Solutions, can now be accessed by the touch-screen Hewlett-Packard 150 personal computer. Users can literally walk through the systems' menus and

databases with their fingers.

FM/3000 includes programs for manufacturing-resource planning, inventory control, accounts receivable, accounts payable, sales-order processing, and general ledger. A version for marketing is called FM/3000 Plus.

The HP 150-link package offers three new features: Browse, Help, and Executive Inquiry. Each can be activated via the touch screen. Browse lets a user scroll alphabetically or numerically through all the files in a database. Help can be activated at any point in an operation; its function is self-explanatory. Executive Inquiry lets users pose any one of 20 questions to the database.

A version of FM/3000 that runs on HP 3000 minicomputers costs \$40,000. FM/3000 Plus costs \$55,000. Timesharing is also available. For more information, contact Computer Solutions at (617) 229-2200.

Users rate small systems

Users of small systems aren't happy about the trend away from traditional on-site maintenance for small systems. According to a survey of 251 managers by Input, Mountain View, CA, managers would rather go the traditional route. Fourteen vendors were covered. Apparently, new methods of providing service that give users more responsibility dissipate the lines of communication between managers and vendors.

Responding managers said they need better service than vendors are providing. Software service did not rate as highly as service for hardware. As expected, managers gave low marks to documentation. Because documentation usually is given low priority during the product-development cycle, late delivery of documents is common and quality is generally poor. Another problem is that the documentation is usually written in technical language. Many managers said they need plain English. In an attempt to remedy this problem, some vendors have merged engineering and sales groups, creating documentation departments.

Respondents included company presidents, managers, and analysts employed by organizations with from \$1 million to \$1 billion in annual sales. Only 15 of the respondents were corporate officers. By far, the greatest number had the title of "manager." The survey was conducted last summer.

Service ratings on small systems

Vendors	Service image	Software service	Problem diagnosis
Autotrol	6.19	5.00	6.81
Burroughs	6.77	6.55	7.10
Computervision	7.32	6.21	7.32
Digital Equipment	8.03	7.30	7.87
Data General	8.03	8.56	8.10
Datapoint	7.65	7.27	7.45
Four Phase	7.40	6.65	7.60
Hewlett-Packard	7.70	7.05	7.37
Honeywell	7.40	6.50	7.67
IBM	8.25	7.79	8.21
Intergraph	7.15	6.22	7.45
NCR	7.57	6.27	7.43
Prime	8.05	7.27	7.55
Texas Instruments	7.35	7.40	7.84
All vendors	7.54	6.79	7.60

Small-systems users in the Input survey were asked to rate vendors on a scale of 1 to 10 in three categories: overall service image, ability to maintain software, and ability to diagnose and repair hardware problems. The chart lists the mean ratings. Reprinted by permission of Input.

Rolm looks ahead

Communications technology may be changing rapidly, but Rolm Corp. has designed its new digital switch to last through the end of the millennium. The CBX II private automatic branch exchange (PABX) will still be useful in the year 2000, the vendor claims.

The CBX II incorporates dynamically allocatable bandwidth, which accommodates communications between two network devices on up to 192 lines, each operating at 192,000 bits per second (bps). If two devices communicate at a higher speed, their transmissions will occupy more than one channel. For example, if two devices operate at 1 Mbps, six channels with a total capacity of 1.15 Mbps can be assigned to their communications. The system's aggregate limit is 4.4 billion bits per second. The CBX II is non-blocking.

The CBX II is designed to handle

(News continued on page 22)

More Gang for the Buck.

Business today is a streetfight where only the most productive survive.

So for all you streetfighters, we developed the **CompuPro 10™**. A computer many times more productive than networked personal systems. For the lowest cost per user of any high performance multi-user microcomputer on the market—25% lower than our nearest competitor.

CompuPro 10 is more productive because it gives four busy people all the power they need to run any of 3000+ commercially available programs. And even though they're sharing system resources, they'd never know it by the response they get. Or by how much work they get done.

CompuPro 10 has the lowest cost per user because it's got ten years of pioneering successes built into it. Plus nationwide on-site service and a full 12-month warranty behind it.

Performance, quality, and reliability like this are hard to find at any price. But you can find it for less at more than 60 **Full Service CompuPro System Centers** worldwide.

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Our ever-growing network of **Full Service CompuPro System Centers** offers full hardware and software support, system installation, customization, and training. Call (415) 786-0909, ext. 206 for the location nearest you.

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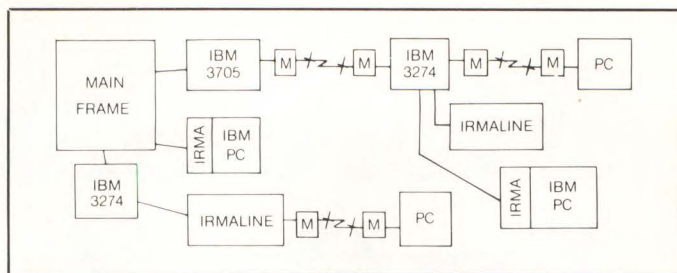
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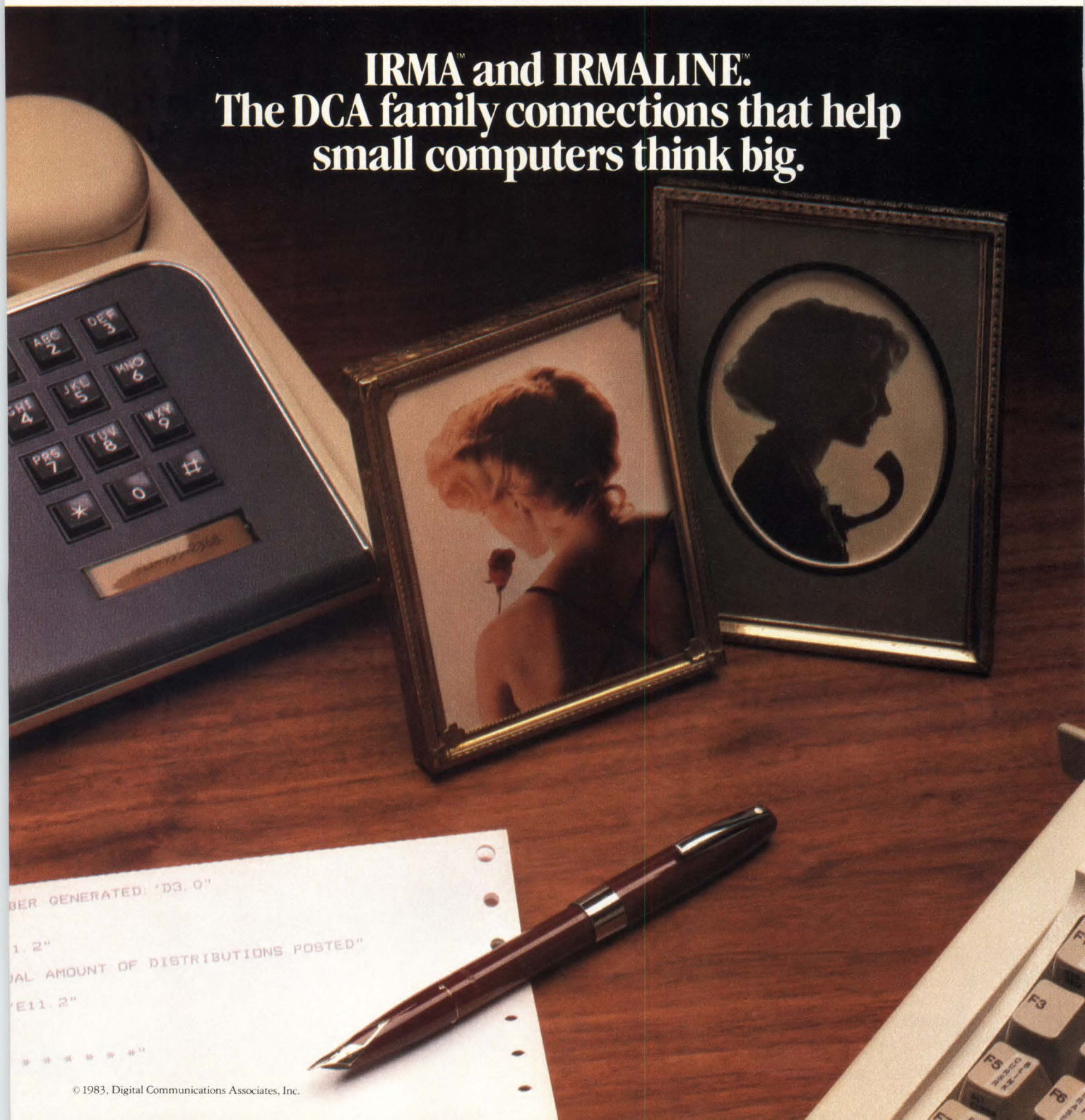
Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically—yours from DCA, home of the industry's first coaxial cable links between small computers and IBM 3270 networks.

IRMA™ is the Decision Support Interface™ that gets IBM Personal Computers and IBM PC XT's into the 3270 mainstream via direct attachment to 3274 or 3276 controllers.

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IRMA™ and IRMALINE™ The DCA family connections that help small computers think big.



IRMALINE™ does the same for remote IBM PCs, IBM PC XT's, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

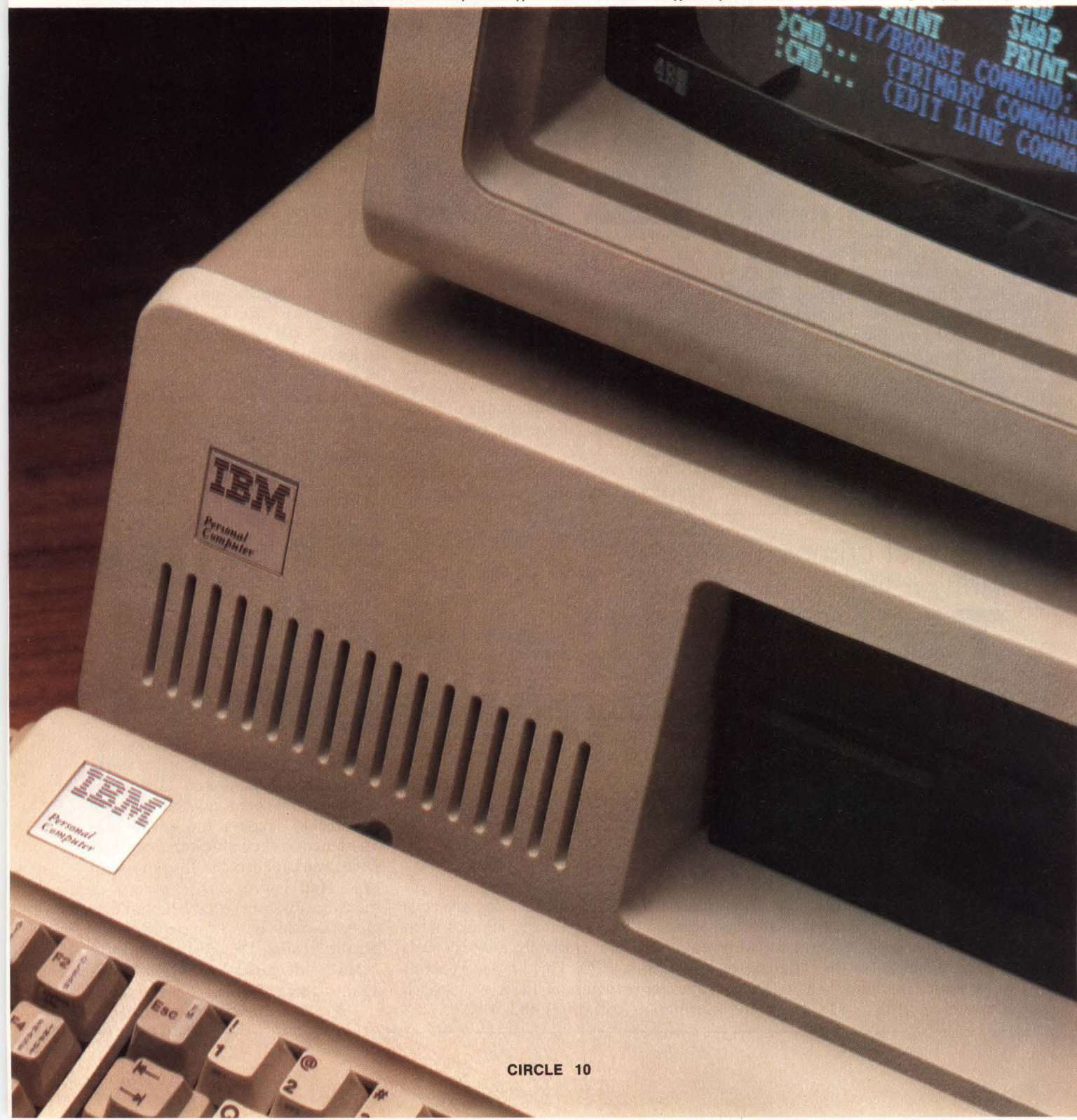
Both can go to work literally minutes out of the box. Both provide mainframe data access, selection and storage, and data communication back to the mainframe.

Put first things first. Find out more about the DCA first family of 3270 micro/mainframe connections. For information, write DCA, 303 Technology Park, Norcross, Georgia 30092. Phone (404) 448-1400, TLX 261333 DCA ATL. Or call us toll-free (800) 241-IRMA.

The new home of IRMA, IRMALINE and the rest of the TAC family.

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NEWS & COMMENT

(Continued from page 18)

integrated voice and data communications. Its distributed architecture integrates fiberoptic links, and it can be expanded modularly to support from 16 to about 10,000 users. Each CBX II comprises from one to 15 nodes. A single-node system supports up to several hundred users; expansion is accomplished by adding nodes.

Upgrades are available for users of the more than 13,000 Rolm CBX switches already installed. The cost will equal between 15 percent and 20 percent of the original purchase price.

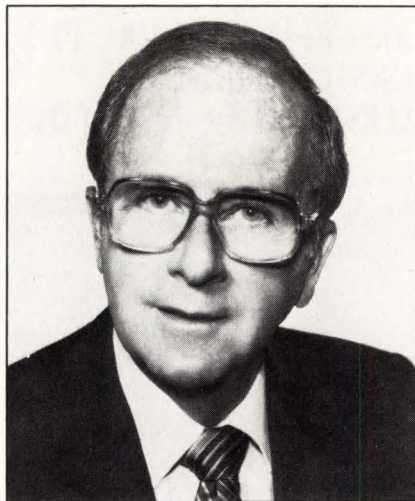
Prices for CBX II range from \$700 to \$1,000 per line, depending on which Rolm-made terminals are used. Three Rolmphone models are available for interface to the CBX II. In addition, the Cypress Personal Communications Terminal can be deployed with the system.

Rolm also announced Rolmlink, a 256-Kbps bidirectional pipeline from Rolmphones and Cypress terminals that operates on single twisted-pair telephone wiring. Rolmlink carries voice and data transmissions at 64 Kbps.

Costliest crime: theft of time

The most heinous crime against business is "time theft," which accounted for a \$137 billion loss last year. So says Robert Half, chief headhunter for Robert Half International, an employment agency with 80 offices. He bases his estimate of the value of stolen time on interviews with 330 executives about their hourly employees.

"Time theft is a national menace



Headhunter Robert Half calls theft of time a "national menace."

that has dire consequences both for companies and the entire country," says Half. The weekly theft of time averaged 4½ hours per employee last year, up from 3½ hours in 1970. Half believes his figure is conservative because it does not include the millions of employees above the supervisory level.

What constitutes theft of time? Half's list includes the following.

- Leaving work early
- Constant socializing with other employees
- Excessive personal phone calls
- Attending to personal business on company time
- Frequent and long coffee breaks
- Deliberately neglecting work

The problem for business is that all employees—even the bosses—are guilty of some of these crimes, particularly the last one on the list. Half makes no effort to estimate the value of extra work done without compensation by salaried employees, and he gives managers no indication of

which time-robbing crimes are misdemeanors and which ones are felonies.

Some of the "crimes" cited by Half that are serious enough to warrant dismissal are habitual lateness for work, running a personal business during company hours, and feigning illness to take unjustified sick days. Managers should be alert enough to detect such offenses and take action. Be alert on Mondays and Fridays—more time is stolen on those days than other days, says Half. Start with stern warnings to time thieves, and use more extreme measures if the problem persists, he advises. The key is usually stopping "ring leaders," who encourage other employees to waste time.

Half's figures may seem half-baked, but he insists they're serious—and conservative. To arrive at his figure of \$137 billion as the cost of stolen time, Half derives the average amount of time stolen by each employee at the companies surveyed. (Each of the 330 executives interviewed for the survey works for a company with at least \$25 million in annual revenues.) He multiplies that figure by \$8.15, which is the average hourly wage of production and non-supervisory workers on private payrolls, according to federal statistics. His average loss per week (\$34.64 per worker last year) is multiplied by 50 work weeks to produce the annual loss per worker (\$1,732). That figure is multiplied by 78.98 million, or 80 percent of the workforce in private industry.

Office workers are the worst offenders, says Half. Each office worker averaged 4 hours and 21 minutes of wasted time per week, compared to the weekly 3 hours and 43 minutes attributed to each blue-collar worker. Older workers are less likely to steal time, Half asserts, and 83 percent of the executives surveyed believed employees under age 30 were responsible for stealing the most time.

Half mitigates his fulminations against theft of time by encouraging

(News continued on page 26)

Don't reinvent the wheel

Before you order your programmers to create software for a special purpose, find out if another organization has already created what you need. Several software databases are available; a new one is International Software Database in Fort Collins, CO. This library contains information on more than 50,000 packages for machines of all sizes. A search can cost as little as \$25. For more information, call (303) 482-5000.

**Peat Marwick technology
has exploded the myths
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**It doesn't have to take
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Even the best-managed computer system can develop spaghetti code over the years. Changing demands and expanded requirements can make yesterday's state-of-the-art a state of confusion. And until now you haven't had a cost-effective way of replacing your system.

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Peat Marwick technology creates workable solutions for your business problems. Learn more about the advantages of systems development through the Structured Retrofit process. For a free brochure and case histories, send in the coupon or call 800-621-1776 (in Illinois 312-951-7692).

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Our exclusive technology allows us to actually establish a quiet electrical environment without creating any harmful side effects. So noise can't return to whittle away at the works of your computer.

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What's more, Oneac products run cool and quiet. And are plug-compatible with most modern computers.

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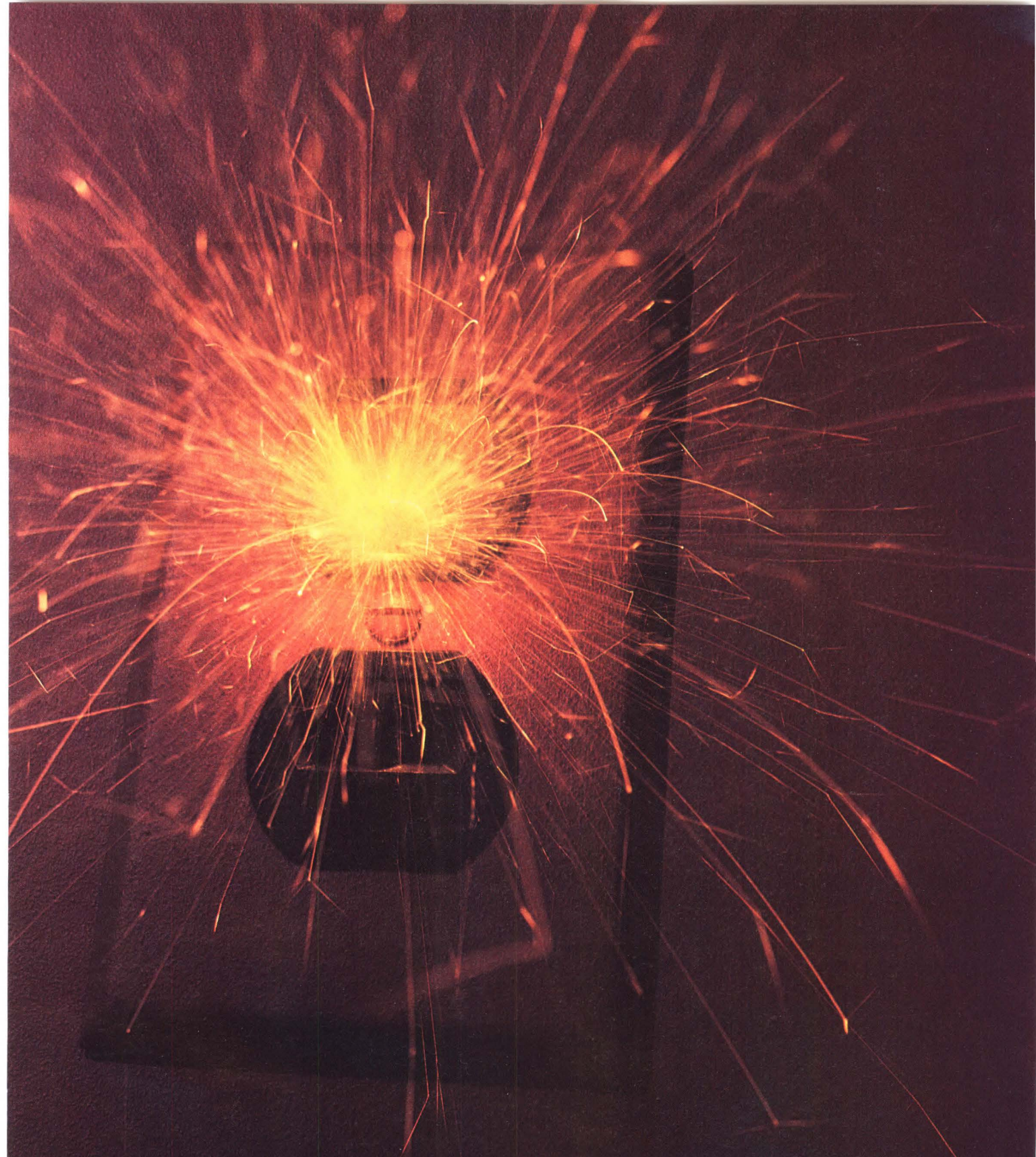
Already, many of the leading names in business computers have selected Oneac to solve their power problems. Shouldn't you put this same powerful protection to work for your computer?

We invite you to compare Oneac power conditioners with those from anyone else. Check their specs. Ask about noise. Ask about their track record with their customers.

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CIRCLE 12 FOR MORE INFORMATION
CIRCLE 13 FOR SALESPERSON'S VISIT

NEWS & COMMENT

(Continued from page 22)

managers to avoid treating employees like machines. "We are all entitled to engage in a reasonable degree of socializing at work," he says, "and being late once in a while is understandable."

IBM's new graphics

Continuing its aggressive moves into engineering and design graphics, IBM has announced a new system that produces images with the detail of photographs. The Model 5080 system uses up to 256 hues and gray shades.

The system's 19-inch monitor has more than one million addressable points. Many of the computations required to create three-dimensional



drawings can be done at the workstation without the assistance of a host computer. A tablet input device and either mouse or stylus cursor-control devices extend the flexibility of the system.

The Model 5080 is compatible with IBM's 3250 graphics system. A monochrome version (pictured) costs \$19,750. With a color display terminal and 16 colors, the price is \$24,750.

Space saver

One way to conserve valuable desk space is to hang the processing unit of your personal computer on the side of the desk. The System Sidekick suspends the central processing unit of person-



al computers made by IBM, Digital Equipment Corp., or Texas Instruments. The cost is \$79.95. For more information call Lintek Computer Accessories at (616) 241-4040.

Sony heads up wp honor roll

Text systems from eight vendors have received top honors on the Honor Roll of Word Processing Systems. The ranking of systems is issued annually by Datapro Research Corp., based on a survey of users.

The Sony Series 35 tops this year's

Honor Roll, followed by CompuCorp's Omega 60 and two systems from CPT. Ironically, the fifth finisher, Dictaphone, announced last October that it would stop manufacturing word processors.

The survey results reveal that a growing number of users are buying their systems, as opposed to renting or leasing them. This year, 46 percent of respondents said they had purchased multi-terminal systems, up from 38 percent the previous year. Users show little interest in adding communications capabilities to their systems, according to the results, even though such capabilities are becoming more readily available.

The latest listing is based on the ratings of more than 4,800 users of stand-alone and multi-terminal word-processing systems. The users rated systems on a number of points, including overall reliability, peripheral reliability, and performance vs. anticipated performance.

For a system to earn a spot on Datapro's list, it must be rated by at least 20 users, receive an overall-satisfaction rating of 3.2 on a scale of 4, and have no single score of less than 2.9 on the same scale.

Datapro's Honor Roll is part of "User Ratings of Word Processing Systems," a report that includes de-

(News continued on page 30)

The word-processing honor roll

	Number of users	Overall rating*	Lowest rating
Stand-alone systems			
Sony Series 35	20	3.7	3.4
CompuCorp Omega 60	85	3.7	3.3
CPT 8500 Series	86	3.6	3.2
CPT 8000/8100	216	3.5	3.1
Dictaphone Dual Display**	30	3.5	3.1
CPT 6000/6100	27	3.5	3.0
NBI OASys 3000	175	3.4	3.0
Multi-terminal systems			
NBI OASys 64	76	3.6	3.2
Philips 2002	49	3.6	3.1
NBI OASys 8	73	3.5	3.1
Wang WPS 20	22	3.5	2.9
A.B. Dick Magna SL	61	3.4	3.0

*Weighted average based on a scale of 1 through 4.

**Dictaphone no longer manufactures word-processing equipment.

A computer upgrade with Wang won't stunt your company's growth.

The best reason for choosing a Wang VS computer today may be tomorrow. Because unlike comparable IBM systems, the Wang VS line is a computer family with a smooth, proven and continuous growth path.

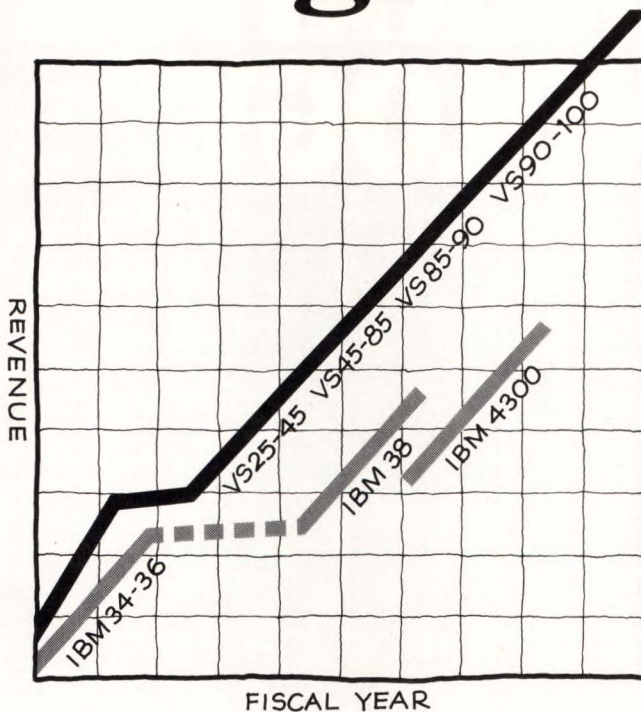
Consider. All Wang VS computers use a single operating system and single system software. Once your people are familiar with one Wang VS, they're already familiar with the next.

On the other hand, the IBM 34/36, 38 and 4300 all use different operating systems, different source codes and even different software. Upgrading from one to another is almost like starting over again with a whole new system.

A typical conversion from the IBM 34/36 to a Wang VS computer takes about two months. From then on, no other conversions are necessary.

Converting from the IBM 34/36 to the IBM 38 is a long and tedious process. And you face an even more difficult task going to an IBM 4300. That's time and money that a growing company just can't afford.

If you want to spend more time doing business, and less time getting ready to do business, choose the Wang VS computer line. It won't stunt your company's growth no matter how fast you grow.



For a demonstration of Wang VS computers, call **1-800-225-9264**. Or send this coupon to: Wang Laboratories, Inc., Business Executive Center, One Industrial Avenue, Lowell, MA 01851. CD-4

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Computer People.**

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"TIS™ is truly a remarkable software system. With TIS operating at both the Strategic and Tactical levels of our organization, we now have a sophisticated software system capable of evolving as the needs of the company evolve. As far as I'm concerned, TIS is giving Best Western International the kind of next generation technology we need."

—Keith Barlow

Best Western International is the world's largest lodging chain. In the fast-paced lodging business, total control of accurate and timely information is no luxury. It's a vital necessity. For this reason, Best Western demands advanced software that can grow as its needs grow.

The TIS Solution

After a careful evaluation of several systems, Best Western chose TIS—Cincom's powerfully integrated data base management and application development system and winner of the Associated Information Managers' (AIM) Outstanding Information Technology Award.

TIS was brought up quickly. It was first used in a Strategic capacity to implement corporate payroll and personnel applications. Now, TIS is being used in both Strategic and Tactical operations throughout Best Western International to develop applications for financial, marketing, supply and other functions. And, because the TIS Intelligent Query language provides easy access to corporate information, end-users are discovering that they can meet their own information needs without the aid of trained programmers.

TIS helped solve Best Western's immediate needs. More importantly, with TIS Best Western International now has a migration path to the future—with little concern for obsolescence.

Modern Technology For Modern Needs

TIS is a totally integrated application development and information processing system. Its entirely new architecture is designed to meet a wide range of needs. Designed for complex, high volume data base environments, TIS provides:

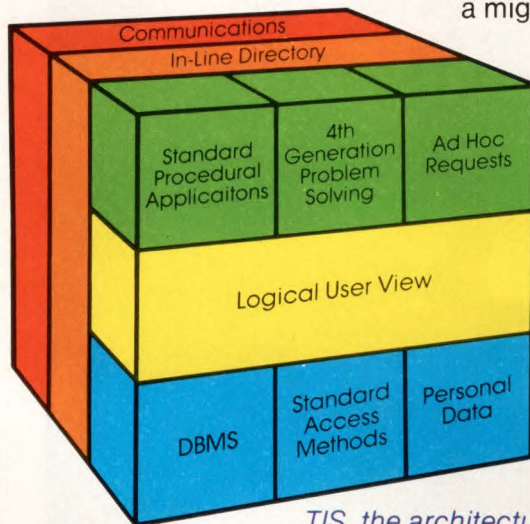
- Full in-line integration, so that one system can be used to meet the needs of all users with unprecedented security and control.
- A relational view of data which gives programmers and end-users complete data structure independence.
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- A new Data Manipulation Language so powerful only four commands are needed to handle even the most complex logical data base processing: GET, INSERT, UPDATE, DELETE.
- An Intelligent Query language to provide instant information to end-users for virtually all ad hoc needs.
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TIS, the architecture of the next generation of integrated data base technology.



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Excellence in Software Technology.

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NEWS & COMMENT

(Continued from page 26)

tailed ratings of 71 systems. The report costs \$25, and is available from Datapro Research Corp., 1805 Underwood Blvd., Delran, NJ 08075. The phone number is (609) 764-0100.

More portable and personal computers

Texas Instruments, long the leader in portable printers, has finally introduced a portable personal computer—or, as TI's vice president Eric Jones calls it, a *transportable* personal computer. Weighing about 45 pounds with two floppy-disk drives, the color version of the TI Portable Professional Computer cannot be carried comfortably under your arm. The monochrome version with one disk drive weighs 32 pounds.

Unlike many of the recently introduced portables, TI's machines,

which are assembled in Japan, are not compatible with the IBM Personal Computer. However, many of the packages popularly used on the IBM PC run in MS-DOS 2.1 versions on the TI machines. The new portables cost \$2,395 for monochrome, and \$2,965 for color.

Xerox has introduced a number of options that fit the TI Professional and portable computers. These are kits that expand internal memory to 768 Kbytes in 256-Kbyte increments; software that lets machines emulate a standard IBM 3276 Model 12 control unit/display station with a 3287 printer; and a numeric co-processor that accelerates calculation-intensive applications by as much as 100 times. A 10-Mbyte hard disk for the Professional was also announced, but hard disk will not be available on the portables until September.

Xerox Corp. has also unveiled its first portable computer, the Xerox 1810. The 5-pound unit can be car-

ried in a briefcase, and will run for up to 10 hours off a built-in rechargeable battery. The 1810 is the first member of the Xerox 1800 family, but there are plenty of peripherals to enhance it. On its own, the 1810 has 64 Kbytes of memory, a three-line, 80-character LCD display, a tape recorder with a microcassette, a Basic language compiler, and automatic-dialing capabilities that manage up to 30 numbers. It also has an alarm clock, which indicates Xerox's desire to meet all the business traveler's needs. The 1810 runs CP/M software, and costs \$2,195.

The Commuter from Visual Computer Inc. is another IBM PC-compatible portable. It weighs 16 pounds, and comes with 128 Kbytes of memory, a 360-Kbyte floppy-disk drive, the MS-DOS 2.1 operating system, and a keyboard that looks like the IBM Personal Computer's. Greater memory and storage are optional, as is an 80-character, 16-line LCD display. The basic model costs \$1,995. You can call Visual Computer at (617) 480-0000.

Televideo Systems has added a portable computer and a hard-disk desk-top system to its line of PC-compatible systems. The TPC II portable follows up the company's TPC I, an 8-bit machine that was not compatible with the IBM PC. The basic configuration with 128 Kbytes of RAM, one disk drive, and a 9-inch monitor, weighing in at 33 pounds, costs \$2,995. The hard-disk system, the TS 1605H, which is not a portable, is compatible with the IBM PC-XT. Televideo's previously announced TS 1605 is compatible with the IBM PC. With 256 Kbytes of RAM, the 10-Mbyte hard disk, a 360-Kbyte floppy, and a 14-inch display, the 1605H costs \$4,995.

The PC Traveler is also IBM PC-compatible. From Strategic Technologies Inc., the Traveler incorporates many rare features into its 26-pound bulk. The vendor claims its use of a plasma display is a first for personal computers. The display can be found when the lid portion of the



The color version of the TI Portable Professional Computer weighs 45 pounds and includes two floppy-disk drives.

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CIRCLE 16

NEWS & COMMENT

PC Traveler is opened up. A built-in printer, which prints 80 or 132 characters per line, is in the base portion of the unit. A special cartridge pack holds five floppy disks; floppies can be slipped in and out of the cartridge, which cumulatively has over three times the IBM PC's storage capacity.

Two 16-bit processors, Intel 80186s, are the heart of the unit. Dual processors in a personal computer are usually assigned separate processing responsibilities, but the Traveler's processors share responsibilities. Price: \$4,495. Call (404) 441-8070.

Several vendors of new desk-bound personal computers are also using the Intel chip. The best known is Tandy Corp., which has introduced the TRS-80 Model 2000, featuring the 80186 processor. Versions compatible with the IBM PC and XT are available. The PC-compatible 2000 with 128 Kbytes of RAM, two floppy

disks, and display, costs \$2,750. The XT-compatible version comes with an additional 10-Mbytes hard disk, and sells for \$4,250.

Although Dimension from North Star Computers uses the Intel chip, "it's not another IBM clone," according to Charles Grant, the company's president. Dimension is a multi-user system that can build a 12-workstation network. North Star says the cost per station is lower than the cost of individual IBM XTs, which a Dimension workstation resembles. The network would have additional capabilities for electronic mail, shared files and peripherals, and optional communications with an IBM mainframe, via an IBM 3270 controller. These features "add value beyond IBM compatibility," Grant says. A basic two-user system starts at \$7,000. Additional workstations can be added for \$1,500. North Star can be contacted by calling (415)

357-8500.

Mohawk Data Sciences also has different ideas for its personal computer, the Hero. Hero is designed for use within an IBM 3270 terminal network. Compatible with the IBM PC, it runs MS-DOS programs, but can also access host-based programs with the help of the Super 21 communications processor. Super 21 supports sharing of peripherals and communications with a host, but communications are restricted to user-written Hero programs. It also supports configurations of up to 16 Heroes or non-intelligent Mohawk terminals. Acting as a personal computer within an IBM host network, Hero "integrates an organization's information-processing activities," according to Robert Amman, president of Mohawk's Systems Division. One Hero workstation, with 256-Kbytes RAM, a 12-inch monitor, and

(News continued on page 36)

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DIRECT

NEWS & COMMENT

(Continued from page 32)

keyboard, costs \$2,950. Super 21 prices start at \$7,000. Hard or floppy disks are optional. For information, call Mohawk at (201) 540-9080.

The Logical L-XT from Logical Business Machines, another XT-compatible computer, comes with the Logical Natural Language. This language aids users in the development of applications and allows for the creation of files and reports, and for the arrangement of data-entry screens. With 192 Kbytes of memory, a 10-Mbyte hard disk, a single floppy disk, a monitor, and a language, the L-XT costs \$5,985. The company plans to add 50 Mbytes of optional storage to the system, but has not established a price yet. Logical Business Machines can be called at (408) 744-1290.

Sperry Corp.'s Sperry Personal Computer is compatible with the IBM PC, and can communicate with IBM and Sperry mainframes through standard and optional communications interfaces. The company offers an optional medium-resolution color display, and also has a high-resolution monitor that, it says, outperforms available color monitors. Seven versions of the Sperry Personal Computer are available, ranging in price from \$2,643 to \$5,753. Prices vary depending on the user's choice of floppy- or hard-disk storage, and the choice of display.

Wang has announced enhancements to its Professional Computer. One, the Wang PC Multistation, lets a Wang micro display multiple windows when used as a workstation on a Wang VS mini. It costs \$295. Another, Microsoft Windows, brings multiple displays to personal computers using MS-DOS. The windows are accessed and controlled by a mouse, which costs \$215. The upgrade for the windows is priced separately. PC Basic-2 brings Wang's 2200 Basic-2 programming language to personal computers for writing applications for the 2200. PC Basic-2 costs \$395. Finally, disk-based CP/M-80 emulation software lets users have the extra operating

system without having to plug another board into the back of their system. The software costs \$240.

Kaypro Corp. has also added features to its line of portables. Kaylink is a \$750 HASP station emulator

that lets any of the Kaypro portables—the II, 4, or 10—communicate with other micros, minis, or mainframes supporting the HASP protocol. Kaynet is a local-area network that connects up to 60 different

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CIRCLE 19

Kaypro machines—although the company recommends you keep the number closer to 25.

All of Kaypro's machines can be included in Kaynet, which costs \$195 per networked machine. Plus 88, a

modification to the Kaypro II and 4, adds the MS-DOS operating system to those units. Users can select, through software control, between the MS-DOS or CP/M-80 operating systems. A Plus 88 board costs \$400.

The Uniform program, which costs \$50, lets Kaypros read 15 different CP/M disk formats, in addition to the five formats they already read. The vendor has also introduced a desk-top machine, called the Kaypro Robie. Robie features the CP/M-80 operating system, and comes with two 2.6-Mbyte floppy-disk drives. It also has a built-in modem and clock/calendar, and comes with a 9-inch display screen. It is expected to cost \$2,295. For information on these products, call Kaypro at (619) 481-4300.

Kaypro scores in micro survey

When it comes to word processing on personal computers, smaller is apparently better. The top finisher in the ranking of 80 micros for only their word-processing capabilities was the Kaypro 10, a portable with a hard disk. The older Kaypro II finished fifth in the ratings, which were compiled by Auerbach Publishers, Pennsauken, NJ.

Surprisingly, several very popular personal computers fared poorly. The IBM Personal Computer, a widely used machine, finished 22nd. The other top 10 machines were the Columbia MPC, the Toshiba T100, the Sanyo MBC 1250, the Toshiba T300, the TRS-80 Model 4, the Eagle 1600 Series, the Cromemco C-10, and the Columbia VP.

The machines were evaluated according to many criteria, including price (which favors the low-cost Kaypro line). The top finisher in the price ranking was the Datamedia 932.

The personal-computer-as-word-processor study is the first of three to be published by Auerbach. Next is a survey of graphics and spreadsheet capabilities. Each report costs \$9.95, and the package of three studies costs \$25. The microcomputer ratings will be updated every six months. For more information, contact Auerbach Publishers at (609) 662-2070.



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By Susan Foster, Microsystems Editor

PERSONAL COMPUTING

Back up your data—or beware

Technical writer Jordan Gold has made a special New Year's resolution, in addition to all the standard self-improvement pledges. He's resolved always to back up his files.

He explains why: "While working on my last article, I accidentally erased 22 single-spaced pages of notes from a hard disk on my IBM Personal Computer—and I had no backup protection. Luckily, I had saved my hand-written notes, but they were not nearly as detailed as the ones I had entered into the computer. I was forced to plow through five 50-page notebooks filled with chicken scratch. My article took three times as long to write as it should have."

Gold's experience is not uncommon, nor is it limited just to writers who use their personal computers as word processors. Anyone can lose data for any reason—be it an incorrect entry, a static discharge, a dirty disk, or a hardware failure—and you never know when it might happen.

Here's what happened to Gold:

"It was 4:30 on a Friday afternoon. I had begun to delete 10 files from the main directory, after transferring them to a subdirectory. I meant to tell the computer to delete all documents labeled with the prefix 'STR' and the suffix 'doc.', but I accidentally instructed it to delete *all* documents with the suffix 'doc.' Because the computer has no 'are you sure?' prompt for instructions other than a total delete, I watched in horror as 40 important documents were wiped out of my computer."

Gold couldn't accept the finality of his mistake. He turned to Norton

Utilities. (This \$80 series of programs from Peter Norton Co. in Santa Monica, CA, performs various operations, such as recovering lost data or locating hidden files on disks in the IBM Personal Computer.) He tried the hard-disk "unerase" utility, but received a message explaining that the program couldn't read his disk. Finally, at 7 p.m., he called Peter Norton for help.

He was told that the Norton programs don't work on his disk, because his brand isn't fully compatible with

"I accidentally erased 22 single-spaced pages of notes from a file—and I had no backup."

Gold, technical writer

the IBM PC. He called the disk manufacturer, but by that time it was 8 p.m. and the offices had closed. Still optimistic about recovering his data, Gold kept his computer running all weekend. On Monday morning, a customer-service representative from the manufacturer told him quite clearly: "Once removed from the directory, a file cannot be recovered."

Get the message? If you're careless about backing up data, change your ways. Make a resolution to protect your files. Here are some of the ways you can do it.

Flexible disks. Floppy disks are an inexpensive form of backup. Although compatibility with hard-disk computers is not a problem for 5¼-inch floppies, they have their drawbacks. For one, cheap disks can

be defective and reject your data—so buy quality. Second, backing up data on floppies is a time-consuming, continuous process—it takes about six hours to copy 10 megabytes onto 70 floppies. The keyboarding can be hard on your wrists.

Still, floppies are the least expensive backup method. They cost about \$4 to \$5 apiece, and their storage capacity is increasing. In the near future, some floppies will contain as many as 3.3 megabytes of storage; you'll only have to use three to back up a 10-megabyte hard disk.

Magnetic-tape drives. More than twenty years ago, magnetic-tape cassettes were developed by consumer-electronics manufacturers as an alternative to audio records. Based on the technology for magnetic-tape cassettes, designers at 3M (St. Paul, MN) developed a backup cartridge with a removable ¼-inch tape. Only slightly larger than an audio tape, this system, the High Density Data Cartridge System, backs up 10 megabytes in 10 minutes, and has a storage capacity of about 67 megabytes. The system is compact, easy-to-use, and sturdy. Cartridge prices range from \$5 to \$10. Single-unit price of the backup system is \$2,600. Although presently used only in minicomputer systems, this method soon will be available for high-end personal-computing systems, a 3M spokesperson says.

One-quarter-inch streaming tape. Considered by some to be the Edsel of backup media, streaming tape didn't work very well when it was released for backup of Winchester-disk drives in 1980. Its performance has improved since, and many industry observers believe streaming tape will

(Continued on page 42)

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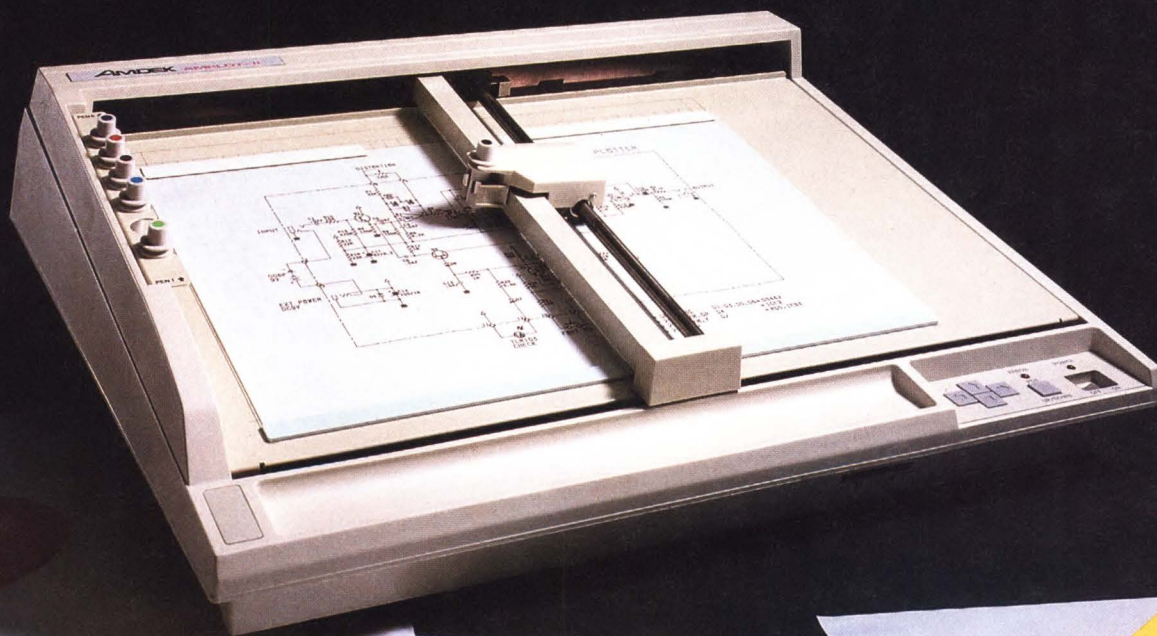
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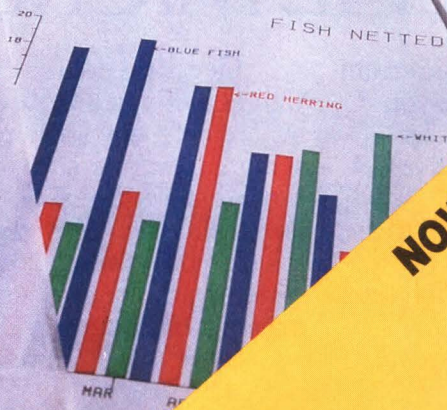
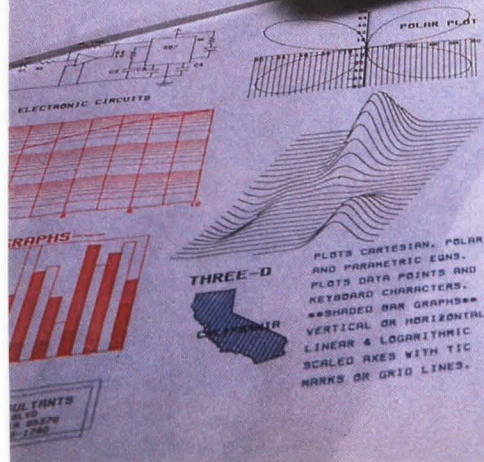
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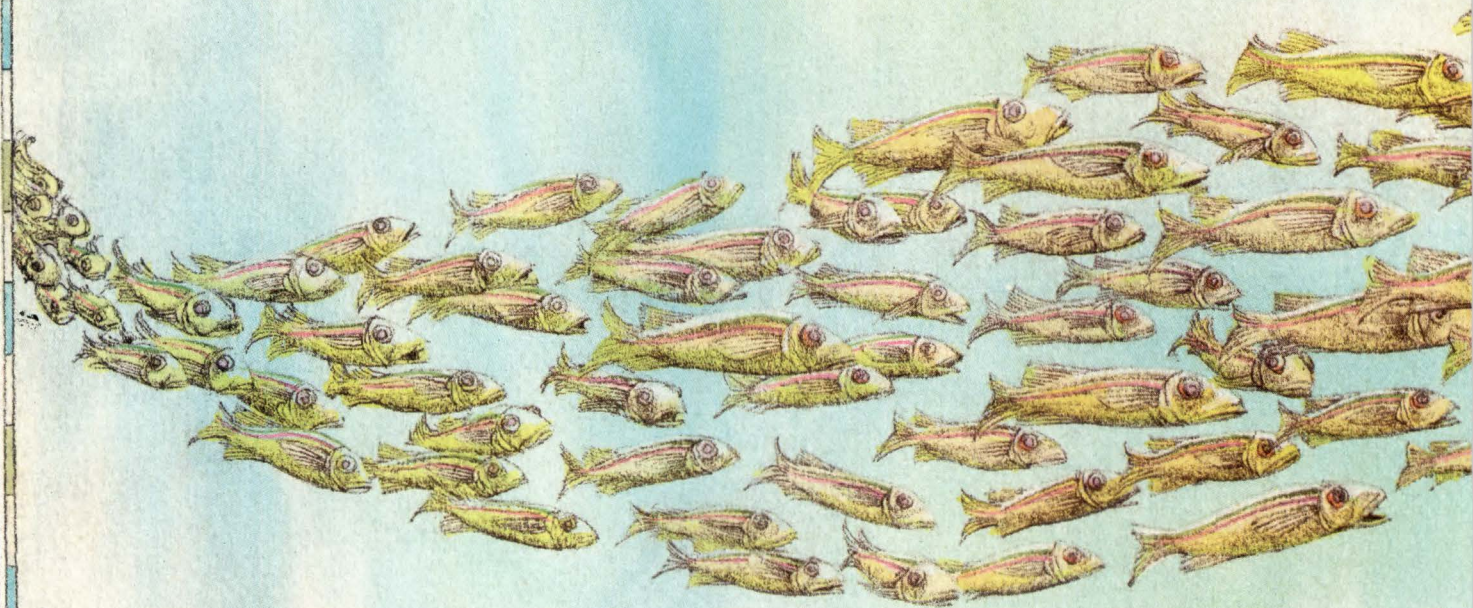
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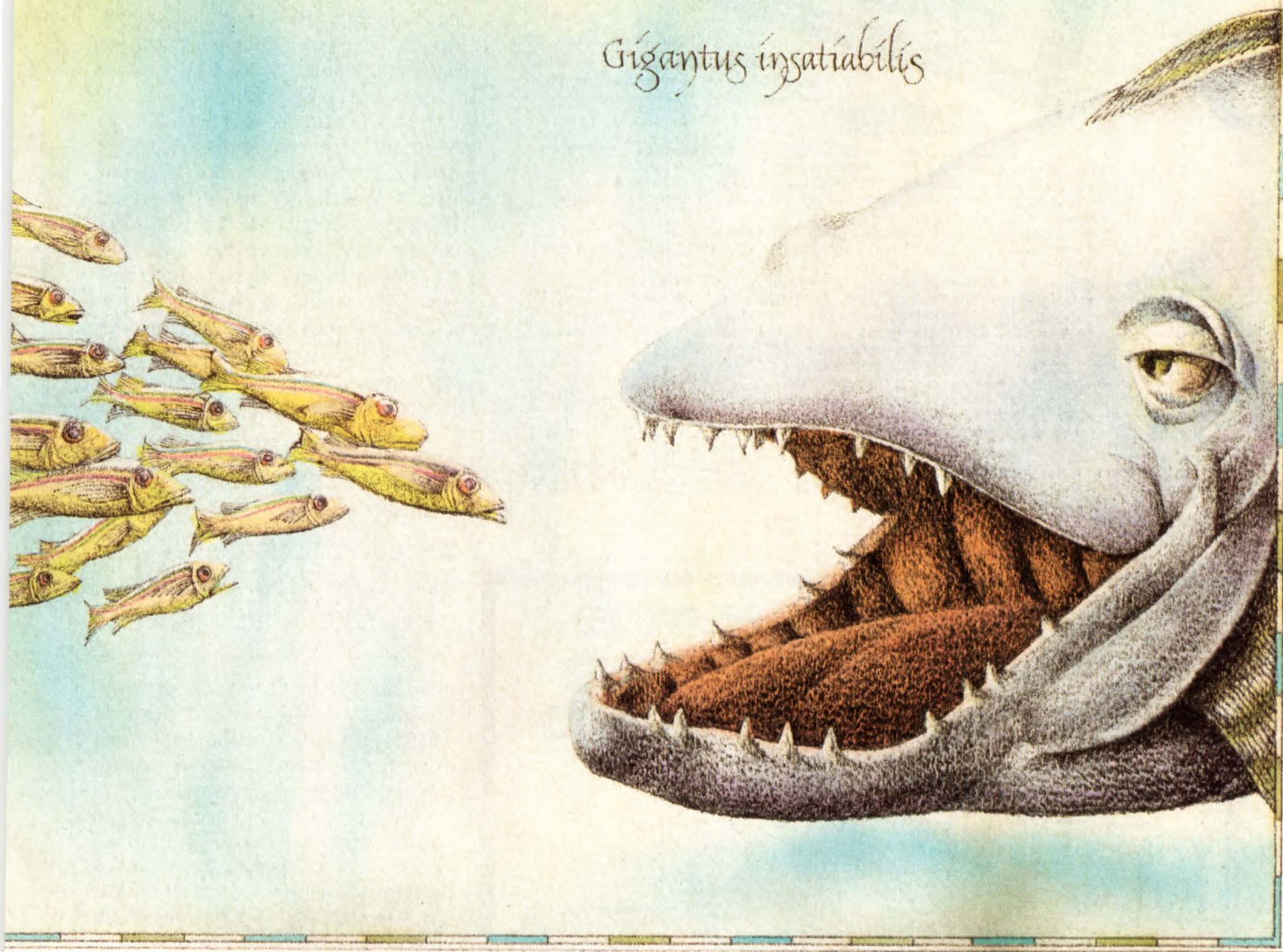
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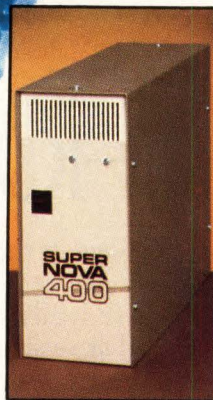
CIRCLE 22

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CIRCLE 23

PERSONAL COMPUTING

(Continued from page 38)

become a popular backup medium. Others foresee reliability problems as manufacturers set out to create the higher storage capacities needed to back up the latest Winchester-disk drives. For now, a hefty price tag hampers popular use of this medium — each tape costs \$30.

Disk cartridge drives. At \$50 to \$100 apiece, the rigid-disk cartridge drive is an expensive backup alternative. A Winchester-disk drive sealed in an enclosed chamber, it yields desirable short access times and high transfer rates. But if you try to transport a cartridge, you risk losing data.

One-half-inch tape reel drives. An old, reliable friend to the world of data processing, tape reels were large, cumbersome, and expensive

Data can be lost easily. Failed hardware, a static discharge, a dirty disk—many factors can make it happen.

prior to 1982. They're improving, however; such products as Tandon's TM951, a ½-inch streaming-tape reel drive for 5¼-inch disk-drive backup can store up to 50 megabytes.

One last product and technology to explore when assessing backup systems is the Mirror, from Corvus Systems (San Jose, CA). The Mirror lets you copy data from your Winchester-disk drive onto videotape cassettes through an ordinary video recorder. One two-hour cartridge holds up to 73 megabytes of information. The Mirror contains an error-detection system to ensure accuracy of stored data, and is available for \$790.

As of now, these are the backup systems most managers use. As storage methods for personal computers improve, so will methods of backup. Still, even though the methods available today may be time-consuming, expensive, or cumbersome, consider the alternative to backing up data. Can you afford to take that risk? □

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CIRCLE 112



by Jan Snyders, Midwest Editor

SNYDERS ON SOFTWARE

Making the most of "people" resources

Human-resource management has been a numbers game since the federal government began requiring slews of reports from companies. Any company with a government contract has to comply with the Equal Employment Opportunity (EEO) Act. Then there's the Employees Retirement Income Security Act, the Occupational Safety and Health Act, and state workers' (Continued on page 48)

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Vendor	Package	Equipment	Price	Circle
Alpha Syst. (617) 620-0983	Paying	IBM S/34 and S/38	\$11,000 to \$13,500	401
Computer Assoc. Int'l. (516) 333-6700	CA-Personnel Mgt.	IBM 370, 43XX, 30XX, and PCMs Data General	\$17,500/DOS \$19,500/OS and VM \$9,000	402
Computer Information Syst. (702) 736-4215	Personnel & Applicant Tracking Syst.	IBM S/34 and S/36	\$2,800	403
	Payroll	Same systems	\$2,800	
	Combined	Same systems	\$4,800	
Comshare (313) 994-4800	Profiles/3000	HP 3000	\$25,500	404
	Profiles Applications Library	Timesharing service	Based on usage	
	Distributed Profiles	Timesharing service	Based on usage	
Condata (215) 569-4240	Pas-Ryte/Pay-Ryte	Online: IBM under CICS; batch: IBM, Honeywell, Sperry, and Burroughs	\$18,000 to \$49,000	405
Convey Cos. (513) 461-4021	Ready	IBM 370, 43XX, and 30XX	\$15,000	406
Cortex (617) 237-2304	Cortex/HRM	DEC PDP-11 and VAX	\$10,000 to \$46,000	407
Cyborg Syst. (312) 454-1865	Payroll/Personnel	IBM, Honeywell, Sperry, Prime, Control Data, NCR, DEC, Data General, Hewlett-Packard, and Burroughs	\$45,000 to \$95,000	408
DP Consulting (304) 232-1655	Topps	NCR I 9000	\$20,000	409
		NCR V 8000	\$25,000	
Generated Syst. (312) 668-0506	Payroll/Personnel	Wang VS	\$15,000 to \$25,000	410
Genesys Software Syst. (617) 685-5400	Payroll Accounting	IBM 360, 370, 43XX, and 30XX	\$42,000	411
	Personnel Administration	Same systems	\$54,000	
	Benefits Mgt.	Same systems	\$110,000	

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SNYDERS ON SOFTWARE

(Continued from page 44)

and unemployment compensation procedures to cope with, not to mention the Internal Revenue Service.

Add those reports to the ones that help corporations make personnel decisions, and, in even the smallest companies, employee reports very quickly pile up to mountainous pro-

portions. Some of the reports take weeks, or even months, to prepare by hand. But personnel reporting is a natural application for computers: It involves pulling certain minutiae out of a number of files, and grouping them in separate reports. Human-resources software provides instant

information, reducing the overall expense of administering these tasks.

The most important function of these software packages is to keep track of a company's human assets. They track work records, educational experience, and all manner of job-performance data. "You don't realize

Software that manages human resources

Vendor	Package	Equipment	Price	Circle
Information Assoc. (716) 288-6900	Series Z	DEC VAX-11/7XX; IBM mainframes	\$45,000 to \$90,000	412
Information Science (201) 391-1600	InSci Human Resource Syst.	IBM 370, 43XX, and 30XX	\$46,000 to \$145,000	413
	InSci Payroll	Same systems	\$45,000 to \$120,000	
	InSci Personnel/ Payroll	Same systems	\$75,000 to \$230,000	
Integral Syst. (415) 939-3900	HRS	IBM 370, 43XX, 30XX, and PCMs; HP 3000; Prime 650 and up; Honeywell Series 60; IBM S/38	\$50,000 to \$250,000	414
McCormack & Dodge (617) 651-1010	H/R Plus	IBM 360, 370, 43XX, 30XX, and PCMs	\$49,500 to \$110,000	415
	H/R: Millennium	Same systems	\$49,500 to \$110,000	
MSA (404) 239-2000	Payroll Syst.	IBM 360, 370, 43XX, 30XX; Burroughs 2700 to 7800; Sperry 1100; Honeywell DPS 8	\$32,000 to \$97,000	416
	Personnel Mgt. & Reporting Syst.	Same systems	\$32,000 to \$293,000	
National Information Syst. (408) 257-7700	PRES	DEC System 10 and 20	\$15,000 to \$40,000	417
Pacesetter Software (609) 737-8351	Organization Map	IBM Personal Computer with 128-K memory	\$6,500	418
Personnel Data Syst. (215) 828-4294	Pass/Accu-Pay	IBM 43XX, 30XX, S/38; HP 3000; Burroughs; DEC VAX; Data General; Sperry; NCR; Honeywell	\$19,000 to \$160,000	419
RSA Products (201) 335-7800	Direct/3000	HP 3000	\$15,000	420
SMS Mgt. Syst. (312) 293-5699	HRMS	Sperry 1100	\$50,000	421
Software Int'l. (617) 685-1400	Human Resources	IBM 360, 370, and PCMs; IBM S/3, S/34, and S/36; Sperry 9030, 9040, and 1100; HP 3000; Wang VS	\$15,370 to \$21,800	422
Software Plus (609) 235-3611	HR/38	IBM S/38	\$30,000	423
Tesseract (415) 543-9320	PMS	IBM 370 and PCMs	\$60,000 to \$120,000	424



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SNYDERS ON SOFTWARE

how much information is available to you until it is computerized," says William H. Miller, vice president of administration at Kansas City (MO) Power and Light Co. With better information on hand, managers can do a better job of scheduling employee benefits and payments.

In some cases, the packages even help managers save money. Armed with current, pertinent information, they can apply tighter controls over the high costs of salaries and benefits. One package helped Toledo (OH) Hospital fix a busted labor budget, for instance. "The year before we went on our system, we ran about \$1 million over our labor budget," says David Mikola, director of management-information systems at the hospital. "The following year we were right on budget, so it appears we saved about \$1 million." The hospital's labor budget for the second year was \$80 million.

A software umbrella

Most of the new human-resource packages integrate information about payroll and personnel. Many organizations installed separate packages covering these two areas years ago. These older packages help manage their respective areas, but much

of the information in payroll is valuable to personnel managers, and vice versa. Arizona Bank, a Phoenix-based institution with \$2.5 billion in assets and 2,500 employees, and Burroughs Wellcome Co. a pharmaceuticals manufacturer in Research Triangle Park, NC, with 3,900 employees, both have installed packages to consolidate payroll and personnel.

At Arizona Bank, Information Science's Personnel/Payroll system eliminated the inevitable bottlenecks when information was transferred between payroll and personnel. Until last December, the department had separate software packages that weren't efficiently tied together says Gloria Heckman, assistant vice president and project director at the bank.

The bank replaced the older packages late last year, when it was reorganized as a bank-holding company. "We needed the flexibility to add subsidiary companies to the payroll and human-resource systems," recalls Heckman. "We needed systems that would interface."

InSci's combined personnel and payroll package runs on the bank's two IBM 3033 mainframes, which are linked to 1,500 IBM 3278 terminals. The system collects data on all

new employees for the human-resources and payroll departments. It automatically handles all tax and EEO reporting and produces a wide variety of reports on benefits and employment status for managers and employees.

Putting the personnel and payroll systems under the same software umbrella has simplified reporting. The package's report generator, which allows staff members to write their own reports, has boosted productivity in her department, says Heckman. And postdated transactions, which used to be the source of headaches, are now automatically processed. Previously, many transactions were traced manually, and important pieces of paper got lost in the shuffle. The InSci system has ended all that.

Eliminating duplications

Burroughs Wellcome wrote its own payroll system more than eight years ago, and subsequently added a personnel record-keeping system. "We had a tremendous duplication of effort," says Robert S. Whichard, payroll/personnel-system coordinator. "On the personnel side, we were maintaining three masters for each file in addition to what we were doing on the payroll side. There was no connection between them."

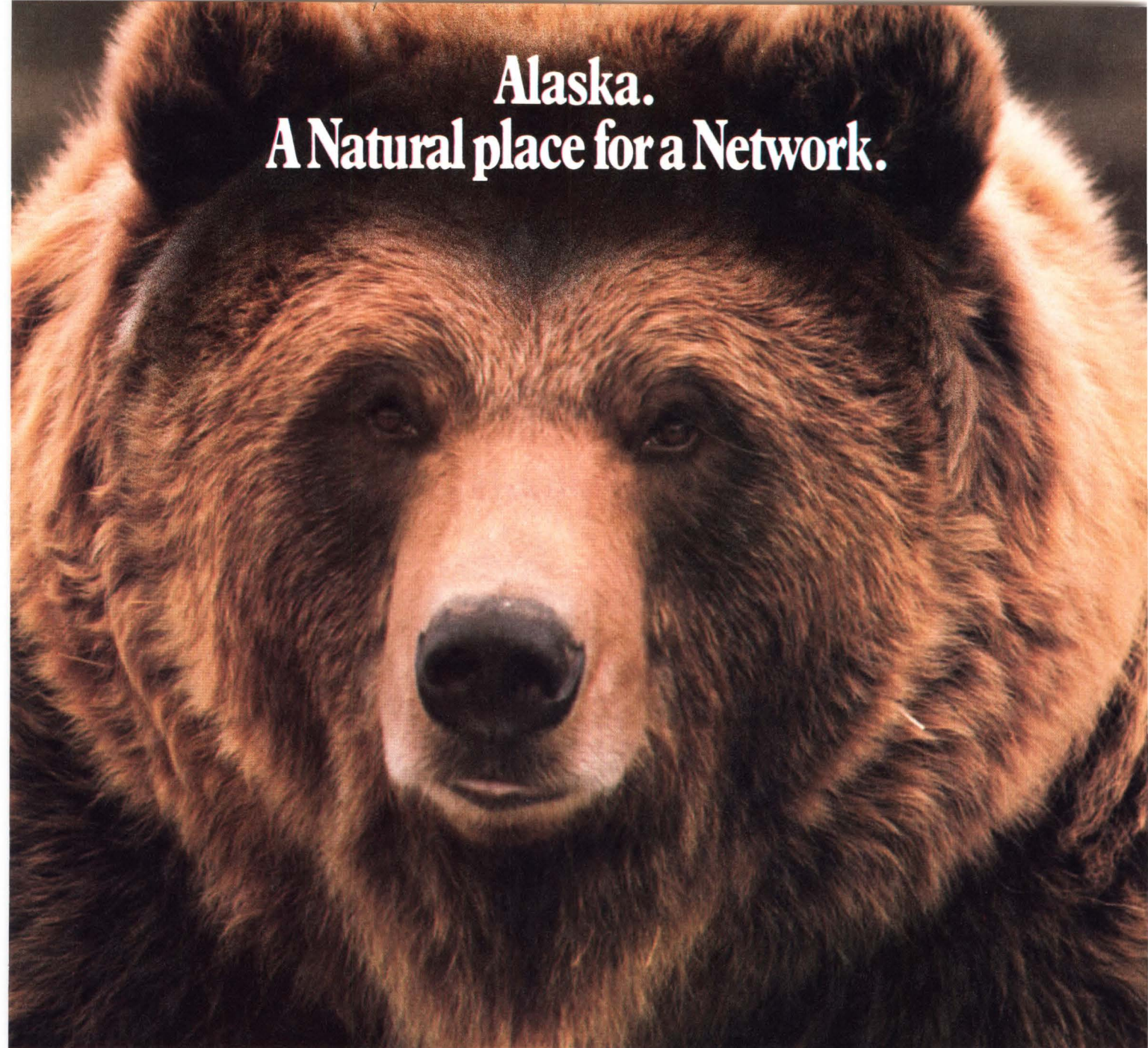
In April 1981, the drug company installed Personnel Management and Reporting System from Management Science America (MSA), and brought the functions together. The system operates on an 8-Mbyte IBM 4341 and a 24-Mbyte IBM 3081. Three hundred IBM 3270 terminals are linked online to the data center.

The software has eliminated the duplication of the past. The company has only one master file, containing personnel and payroll data. The package does the work of splitting payroll and personnel functions, explains Whichard. Payroll data are handled through his department, which is based in Greenville, NC. The personnel department, which is located at headquarters 110 miles

(Continued on page 54)



A human-resources software package enabled Burmah-Castrol to pare its personnel-department staff from four employees to one, says C. Russell Ditzel, personnel manager.



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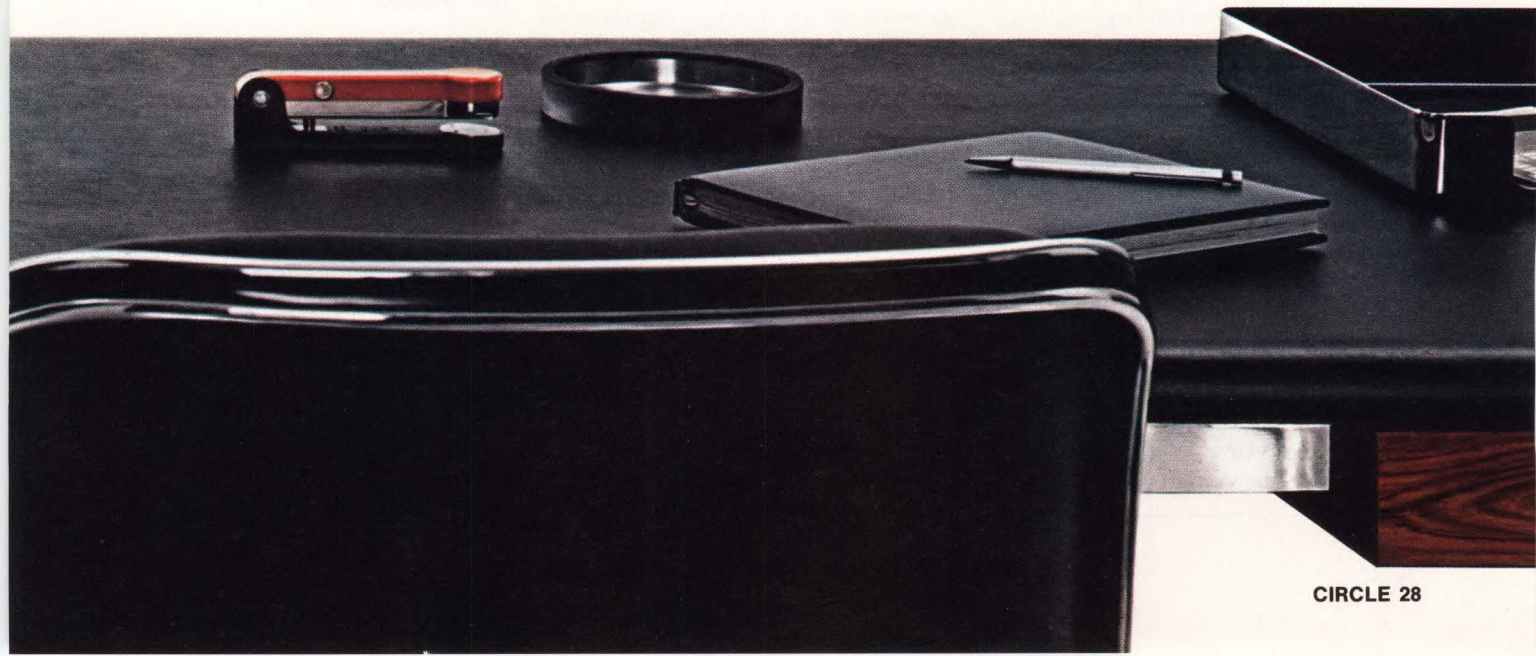
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SNYDERS ON SOFTWARE

(Continued from page 50)

away, maintains its own records, but Whichard's department handles all the processing. MSA's package integrates a report generator, enabling both departments to produce ad hoc reports. "We finally have centralized storage of data," says Whichard.

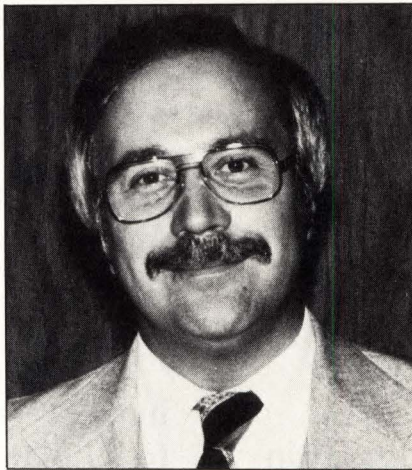
Controlling costs

The biggest personnel challenge for some organizations is managing part-time and special-status employees. A workforce of part-timers usually has high turnover, and the number of hours in a workweek changes from week to week. Special employees may earn considerably more than their salaries by working overtime in response to emergencies. For organizations with these kinds of employees, software can help keep personnel costs in line.

When Toledo Hospital discovered its million-dollar overexpenditure for labor, the cause was traced to part-timers and on-call staff, says David Mikola. "A hospital is open 365 days a year, 24 hours a day—and we couldn't operate without a lot of on-call and part-time help," he says. "But those costs are among the most difficult to control."

The 809-bed hospital uses Topps from DP Consulting, installed on a 1½-Mbyte NCR 9040, to manage its 4,200 employees. Before installing Topps, the hospital ran a human-resources application on the McDonnell Douglas Automation Co. (McAuto) timesharing service. Topps is used by the payroll, personnel, and finance departments. Using the package to anticipate shifts in staffing requirements for each section of the hospital, administrators hold the line on extra labor costs. Thus, if a specialist is no longer needed in a particular unit, administrators will be able to make a reassignment. Eventually, each clinical director will be able to make scheduling changes for each day and shift from an online terminal, says Mikola.

Mikola is installing a similar scheduling system for the nursing department. The system provides better



Maricopa Colleges' flexible-benefit program made computerized personnel records an imperative, says Ronald Bleed, director of computer services and management systems.

insight into the level of care each patient needs. For example, if a patient is listed in "good condition," staffers can safely assume he or she does not require constant monitoring. "But," says Mikola, "that patient may have two broken arms and two broken legs. In that case, he or she would need more than routine attention."

Mikola credits Topps with saving \$1 million, but the software's value to the hospital can't be fairly quantified by that initial saving, he says. In the long run, the system gives administrators better control over the only health-care expenses that are really manageable—labor costs.

Hospitals are not the only organizations with large numbers of part-time employees. Fast-food restaurants couldn't survive without part-timers, and that leads to a special set of personnel-management problems, says Ward Patrick, senior financial-systems analyst with Pizza Hut Inc., Wichita, KS.

"A [U.S.] Supreme Court ruling on company-furnished meals made the choice of our system easy," says Patrick. Part of the rationale for installing McCormack & Dodge's H/R Plus system was also the tax implications of rules on reporting employee tips, he adds.

With 4,000 fast-food restaurants

nationwide, Pizza Hut has special personnel-management problems. Last year, the company issued paychecks to some 150,000 workers, of which only about 37,000 were full-time employees. H/R Plus was installed in 1979, during an overhaul of the company's financial systems. The package, which runs on a 16-Mbyte IBM 3033 accessed by 40 online terminals, replaced a homegrown personnel/payroll system. However, some 300 reporting functions from the old system work with the new package.

H/R Plus was installed to smooth current operations, but also to prepare for a more flexible, diversified personnel-reporting system. The package will enable Pizza Hut to reshape the way employees are managed. For example, "position control" will be added to Pizza Hut's bag of applications this year, says Patrick. The system will integrate information about open jobs and the skills they require, speeding the hiring of new, qualified employees. This information will be merged online—management won't have to wait for a printed report. If the same information were manually collected and compiled, the job would take two weeks. "We purchased H/R Plus to give us a strong base of information from which we could develop other personnel/payroll applications and reports," says Patrick.

Indispensable tool

Many personnel managers believe they'd be unable to function effectively without the wide range of information human-resources software provides. "We couldn't do the job without our package," says Ronald Bleed, director of computer services and management systems at Maricopa Colleges, Phoenix, AZ.

Kansas City Power & Light had to work a little harder than most companies to get its human-resource system, but William Miller wouldn't do it any other way. When Miller was hired as vice president of administration in November 1978, the utility

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didn't deploy computers to help manage employees. But Miller concluded that effective administration of the utility's 3,000 employees was impossible without them.

Miller first installed an InSci human-resources package on the utility's 4-Mbyte Sperry 1100 Module 82. (It is connected to 350 Sperry UTS 400 terminals.) However, the package didn't run well on the Sperry system. An InSci employee proposed to build a system for the Sperry machine, and the result was the birth of SMS Management Systems, publisher of HRMS (Human Resources Management System).

Installation started in mid-1979. "We found that a great deal of our information on employees was inaccurate," recalls Miller. The data were corrected, new information was gathered for the personnel database, and employees were asked to help prepare profiles of themselves.

Personnel-department employees use the system for a variety of functions, says Miller, and they maintain it themselves. For example, the utility helps employees with career planning. Personnel staffers have also compiled an inventory of worker skills and career profiles using the system. On a more practical level, they use it to forecast manpower needs. Many of these functions require ad hoc reports, and the system can handle such requests, says Miller.

Human-resources software is particularly valuable to complex organizations. Says Brian Costello, assistant vice president for human resources at Hahnemann University School of Allied Health Professions, Philadelphia: "We couldn't dig out the information we need without this software. We'd have to hire too many people just to gather the data in time."

Hahnemann University comprises four colleges—a medical school, a school for allied health professionals, a graduate school, and a school of continuing education—as well as a 606-bed teaching hospital. Five hun-

dred faculty members work at the school, instructing 2,000 students, and 2,800 employees work at the hospital. There's a lot of crossover between the two "halves" of the institution: Many faculty members also deliver health care at the hospital.

"We didn't have a particular problem," says Costello. "But to manage an organization as complex as ours, you need to have timely access to accurate information." Costello was under one major constraint: The university's 4-Mbyte IBM 4341 is a batch-processing machine.

Costello installed Pay-Ryte/Pas-Ryte from Condata at the university. It currently batch-processes information. Costello works up a small report describing the information he needs. The management-information services department processes the request, and the report is returned later the same day or the following morning. The university plans to install Four Phase minicomputers in June that will give Costello direct access to the main computer.

Hahnemann University is using all of the Comdata system's modules. The first handles payroll, pumping out payroll checks and completing the associated tax, reconciliation, and check-register reports. The second module is a labor-distribution database. It generates a massive report



Burroughs Wellcome's payroll and personnel departments were doing double work before a human-resources package was installed, says Robert S. Whichard, payroll/personnel-system coordinator.

after each payroll, explaining how money was spent by classification and department. The third module helps Costello and his staff with their budget reports. The fourth module is a report generator that allows users to compile ad hoc reports. For example, if Costello needed the hiring dates, pay rates, dates of last salary increase, ages, and home addresses of the hospital's 55 registered nurses, he could get it within hours.

During the last recession, some industries dramatically reduced and realigned their workforces. This process has continued during the past year. In many cases, a corporation's responsibility for a worker who's been laid off doesn't end until months, or even a year, after the layoff.

Managers at the Electric Power Generation Operations Division of Westinghouse Electric Corp. in Lester, PA, used a human-resource package to help with a specific problem. The division manufactures steam turbines, and Welland J. Welsch, manager of employee services, laments: "This isn't a great business to be in these days." After three years of falling sales, the division's workforce had dropped from about 7,000 employees to about 3,500. The downturn in business increased the normal workload associated with layoffs. Welsch declines to reveal the number of employees who were laid off their jobs, but he says many more jobs were cut through attrition than through layoffs.

About a year ago, the division was converting from a manual system to Profiles/3000 from Comshare. Welsch's staff deployed the package to help cope with extra work generated by layoffs. The package is installed on one of two 2-Mbyte Hewlett-Packard 3000 minis at the division's headquarters. The personnel-relations department has five Hewlett-Packard 2645A terminals and one 2624D terminal linked online to the computers.

Layoffs caused two problems for Welsch's department. First, when an employee is laid off at Westinghouse,



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he or she retains company-paid medical coverage for up to a year. However, the employee must prepay a nominal fee to retain medical coverage for dependents. "Under our manual system, the monthly fees were recorded on cards," says Welsch, "but I'm sure we had some cases where employees forgot to pay, and lost coverage for their families."

Using Profiles/3000, Welsch's staff generates a list of employees who haven't paid the monthly fee *before* they miss their deadlines and lose coverage. "We send them a warning letter," says Welsch. "We're really helping these people this way."

The second problem is health-insurance conversions. At the end of the first year they are laid off, employees have the option of converting their health-insurance to a self-paid Blue Cross/Blue Shield plan. Profiles/3000 is used to notify employees facing expiration of their holdover benefits about the conversion option, says Welsch.

Overall, Profiles/3000 has dramatically cut the personnel-administration paperwork at the division. The first step in the installation was putting all of the employee data on the system, a major undertaking. Some of the employees have worked for Westinghouse for up to 40 years, and held many positions. These data formerly were recorded on cumbersome cards. Now, they are instantly available to personnel-relations staff members via the terminals.

Company records on employee benefits are also automated. Although the corporation provides free benefits to most employees, some benefits are optional. Each employee can have from six to 12 separate benefits. Profiles/3000 has helped Welsch's staff get a better grasp of the whole picture. "It has saved a lot of time maintaining records, and our information is much more accurate than it used to be," says Welsch.

The steel industry has been shrinking for years, but personnel management has become no less complex as a result, says Norman Yost, assistant

to the director of industrial relations at the Lukens Steel Division of Lukens Inc., Coatesville, PA. "We've got to do more than keep records," he says. "We've got to make workforce projections so that management can anticipate problems, rather than react to them."

With 2,300 employees, Lukens Steel manufactures steel used in capital goods. Pass/Accu-Pay from Personnel Data Systems Inc. is installed on the company's IBM 4341 for both personnel and payroll functions. About 400 IBM 3270 and 3278 terminals are used to access the computer.

As steel production dropped off during the past three years, Lukens cut its manufacturing workforce from a high of 5,000 to the current

"You don't realize how much information is available to you until it is computerized."

Miller, Kansas City P & L

level. The personnel staff was also reduced, from eight to four, but the department's workload remained the same. Without Pass/Accu-Pay, which replaced a manual record-keeping system in April 1982, the department would not be able to keep up with the work, says Yost. "That's a key point," he says. "We didn't install the package to replace people, rather we need it to get the job done with fewer people."

Pass/Accu-Pay was installed in sections. The first step was to convert the huge amount of information on each employee from hard copy to magnetic media. The second stage was benefits and union-related programs, and payroll was the third. According to Yost, the system is used at three levels. First, records are instantly available to managers. Second, the department can produce ad hoc reports. Third, and most important, the department can con-

struct business models. This capability is put to good use during labor-contract negotiations, and it is used to make those vital projections of the future. "We can determine which skills we're going to need during the next five years, and take positive steps to acquire them," he says.

Human-resources software can also benefit companies that face up-and-down business cycles at regular intervals. The Hotel Westcourt in Phoenix, AZ, installed the Payroll and Personnel & Applicant Tracking System from Computer Information Systems before it opened in 1982.

Hotel Westcourt has an average of 250 employees, and estimated revenues last year were \$5.5 million. During the summer months, business trails off, and the hotel scales back its workforce. The cycle reverses during the winter. The software packages help the hotel plan for those ups and downs, says Les Davidson, hotel controller.

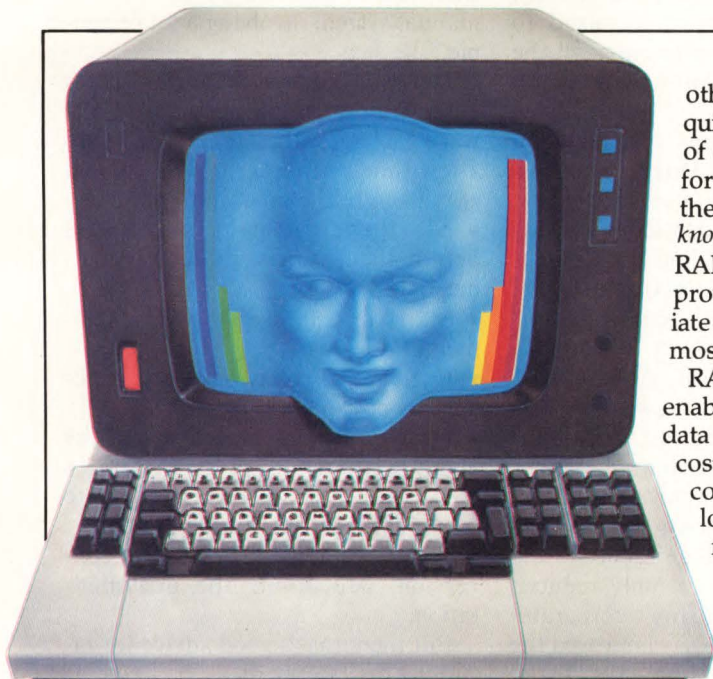
Installed on a 256-Kbyte IBM System/34, the packages handle all personnel record-keeping and reporting, payrolls, taxes, and benefits. The hotel also uses the packages to pair employees with the jobs for which they're best suited.

Maricopa Colleges faced the same circumstances, says Ronald Bleed. Earlier this year, as the colleges grew and additional staff was hired, bringing the total to 2,000 full-timers, Bleed's staff installed Series Z from Information Associates.

Growing staff was one challenge, says Bleed. A greater number of employees generates more information. Also, the colleges adopted a flexible-benefits program for employees that complicated record-keeping. The program gives employees a benefits menu with 50 choices. Employees are given a dollar amount, and allowed to put together a list of benefits up to that limit.

Government reports are a special problem for colleges, says Bleed. "The volume of data required by government agencies is tremendous," he says. "Most of the information could

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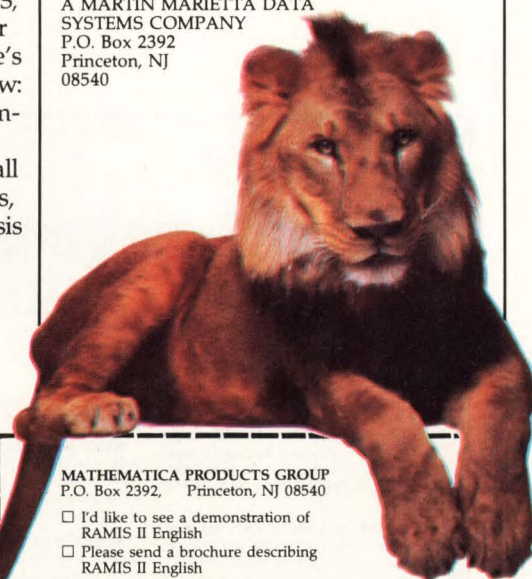
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SNYDERS ON SOFTWARE

not be processed manually."

The package is installed on two 8-Mbyte DEC VAX-11/780s—the college has a total of six, accessed by some 500 DEC terminals, including the special GIGI model and a variety of other models. Maricopa Colleges also has 500 personal computers, including IBM Personal Computers, DEC Professionals and Rainbows, and a variety of models from Apple and Tandy (Radio Shack). Series Z integrates personnel and payroll records.

Because they handle so many duties automatically, human-resources packages can help companies streamline their personnel departments. Burmah-Castrol Inc. (Hackensack, NJ), manufacturer of Castrol GTX motor oil and other petroleum products, reduced its personnel department from four staffers to one. "If an employee's job title changes, the system automatically updates all

relevant records, including benefit entitlements," says C. Russell Ditzel, personnel manager. "We used to need four employees to enter all the changes manually, but now we've got one."

Before the system was installed last February, says Ditzel, personnel information was hard to track. Burmah-Castrol, a subsidiary of Burmah Oil Public Trading Ltd., a British corporation, has 400 employees. It runs the HR/38 system from Software Plus Inc. on a 1½-Mbyte IBM System/38 with 26 IBM 5251 terminals. The software package has six modules, handling applicant tracking, compensation reporting, personnel demographics, administrative reports, benefits reports, and company-vehicle-usage reports.

The system has not only reduced the size of the company's corporate-support staff, it also has improved the accuracy of information, says Ditzel.

"A lot of bits and pieces of information tend to get delayed or lost in a manual system involving a lot of people," he says.

Despite all the benefits users gained from human-resource software packages, they report they'd do a few things differently if they could go through the installation again.

- Start the automation process before the database becomes cumbersome.
- Start training users before implementation.
- Evaluate as many software packages as possible.
- Educate managers and executives about the functions of the system.
- To avoid redundancies, evaluate data before setting up the system.
- Plan to cope with time lost to conversion, education, and documentation.

But then, that's good advice for installing any software. □

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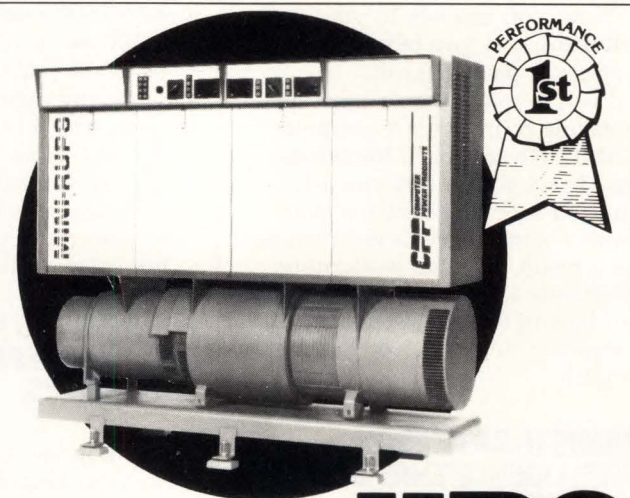
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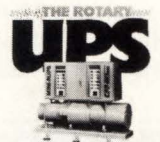
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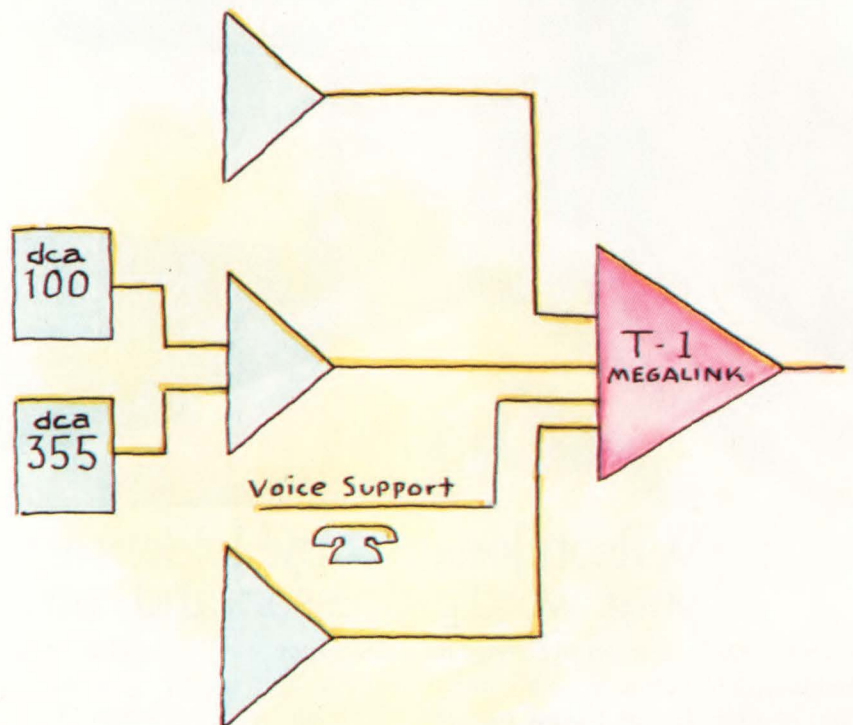
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by John Seaman, Data Communications Editor

DATA COMMUNICATIONS

Get smart: Pooled communications cost less

The next time you're asked to plan communications for a new branch sales office, you may be able to choose an "intelligent" site. So-called smart buildings, which give tenants access to "pooled" internal communications systems and other automated services, are an effective means of cutting costs.

Smart office buildings offer organizations communications facilities ranging from least-cost routing on a digital private automatic branch exchange (PABX) to simultaneous voice and data communications. One setup, Olympianet, provides coast-to-coast satellite communications between one large landlord's scattered holdings.

All of the services are available in a smart building for a monthly fee.

Organizations are liberated from the tasks of assembling and installing their own systems. Rather, a sophisticated system is installed by a landlord, and shares of the cost are passed to tenant organizations. In smart buildings, communications facilities are a utility, as invisible as plumbing and electrical wiring.

"A number of vendors are providing data-comm equipment and PABXs," says Leonard Cozza, general manager of Building Systems Co. (BSC), a smart-building-systems vendor in Farmington, CT. "We're trying to make it possible for tenants to get everything from one source." BSC also offers consulting services to tenants.

Organizations that are constructing their own buildings also might

consider pooling communications resources by offering them to tenants for a monthly service fee. BSC, Honeywell (Minneapolis), and Johnson Controls Inc. (Milwaukee) are among the vendors that market systems for new buildings.

Either way, the savings can be significant. Cozza won't outline the cost of his company's basic service because a number of variables can change the price. But he estimates that tenants leasing communications services in the two buildings pay up to \$4 per square foot less *per year* than they would for their own PABXs and related equipment.

Invisible utilities

Most smart buildings, in the lexicon of computers, are stand-alones. That is, they incorporate local communications and a host of building-maintenance systems. For example, many smart buildings have systems that automatically monitor security, cool and heat the air, manage energy usage, and even switch off the lights when employees leave for the day.

The Crystal Gateway II and III in Arlington, VA (owned by the Charles E. Smith Co.), are typical examples. Building Systems Co. recently retrofitted Crystal Gateway II with a communications utility. Crystal Gateway III, which was only recently constructed, has communications and computerized maintenance systems.

At a "response center" in the 14-story Crystal Gateway II, the building's communications services are demonstrated to prospective tenants. For example, a receptionist uses a Lexar telephone console from United



This operator is accessing a Lexar private automatic branch exchange that is part of an internal communications utility in her employer's building. The system was built by United Technologies' Building Systems Co.

DATA COMMUNICATIONS

Technologies to field incoming calls. The console is connected to a Lexar PABX. Each time the phone rings, a digital display tells the receptionist the caller's phone number, the correct time, and the number of calls

waiting in queue to be answered.

The same system directs outgoing long-distance calls to the least-expensive route and provides station-message-detail-recording (SMDR) reports, listing for each call the

caller's extension, the number dialed, and duration of the connection.

The system integrates a message-taking feature. If an incoming caller wants to talk to an employee who is away from his or her phone, the receptionist types a message into a display terminal. The message is stored in the employee's electronic mailbox for retrieval at any time.

BSC also installed a "data highway" through the heart of Crystal Gateway II. The facility is a fiber-optics communications link connecting electronic office equipment, data terminals, personal computers, and enhanced telephones on a high-speed, all-digital pathway.

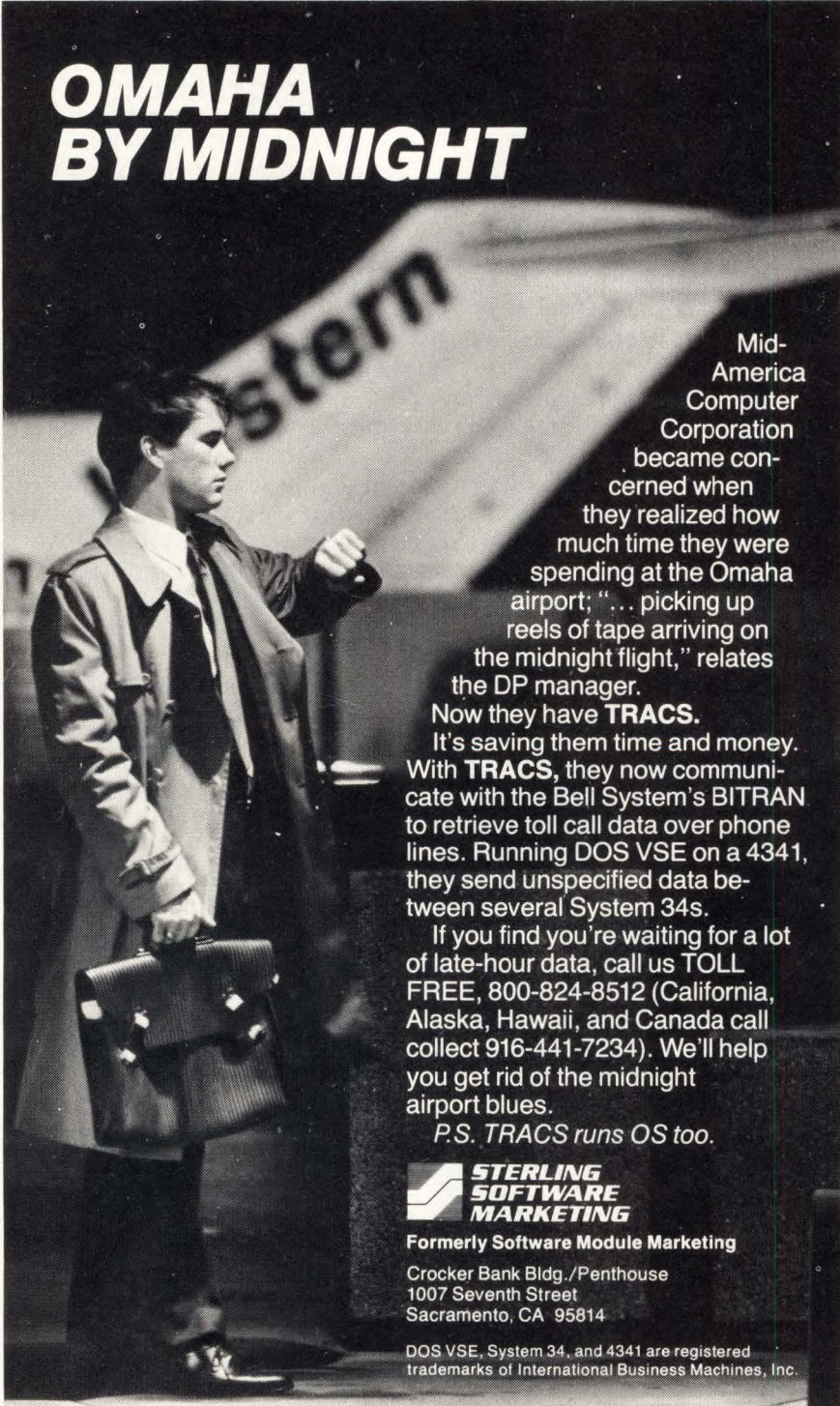
ADC/Telecommunications, one of the tenants housed in Crystal Gateway II, reports savings of about 50 percent on phone bills. "The SMDR feature is a great help in controlling our phone costs," says Cindy A. Miliano, sales coordinator for the seven-employee office. The company, a subsidiary of ADC/Magnetic Controls Inc., uses Crystal Gateway II's call-forwarding feature to route calls to the homes of sales representatives.

Holding the line on the costs of doing business is a vital issue for a branch sales office like Miliano's. Opening a branch office in a distant city can be expensive. More than one company has been set back by skyrocketing costs for basic services.

ADC/Telecommunications also leases office equipment from BSC. "We've got access to a high-speed copier that would have been too much of an expenditure for this office," says Miliano. BSC's computerized-office-services division offers its parent company's Lexar communications equipment for lease. The company also offers terminals from Lee Data Corp. (Eden Prairie, MN) and Digital Equipment Corp. (Maynard, MA), the IBM Displaywriter word processor, and high-speed copiers from IBM (Armonk, NY), Xerox (El Segundo, CA), or Kodak (Rochester, NY) to tenants.

United Technologies has an early lead in the equipping of smart build-

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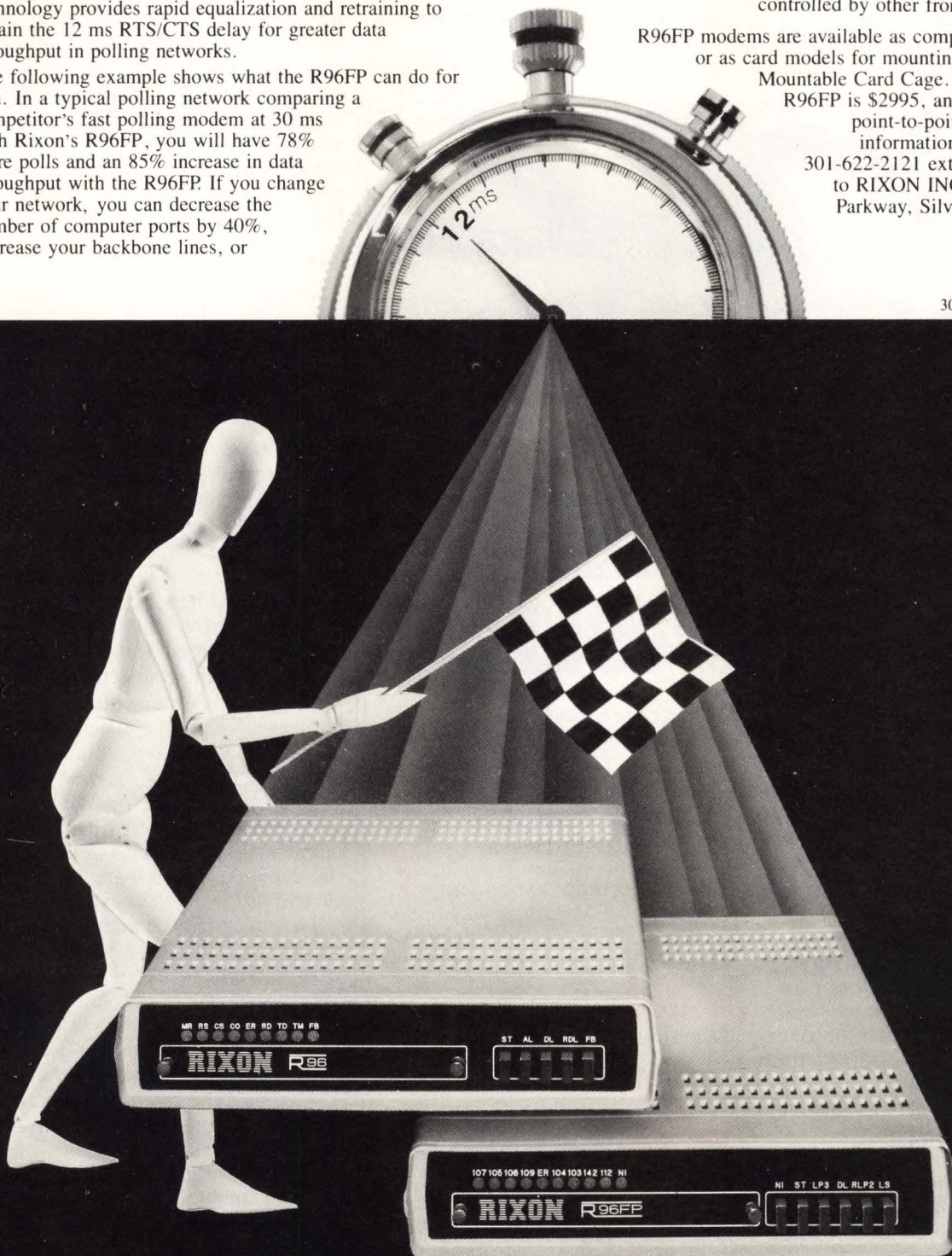
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CIRCLE 38

DATA COMMUNICATIONS

ings, but other vendors are also offering systems. Last year, Johnson Controls Inc., a building-management company, joined forces with two communications vendors, Rolm Corp. (Santa Clara, CA) and Mitel

Corp. (Kanata, Ont., Canada), to provide smart-building systems. Johnson Controls integrates building-automation and energy systems with Rolm and Mitel PABXs in the same way that United Technologies

integrates Lexar products with its offerings.

Honeywell and Ericsson Inc., a subsidiary of the Swedish Ericsson Group based in Greenwich, CT, concluded a similar pact. The two vendors will pool 150 technical employees in a joint smart-building project integrating Honeywell's building-automation and energy-management products with modified MD-110 Ericsson PABXs.

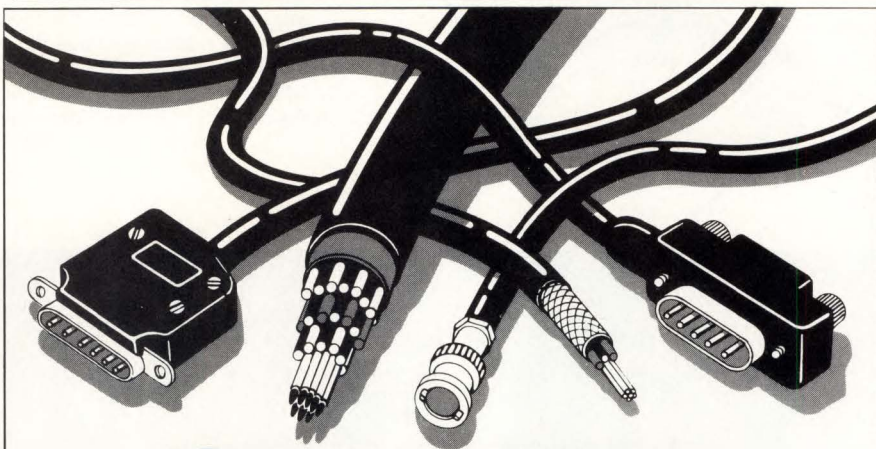
Network of smart buildings

Wray's words suggest the best in smart buildings is yet to come. Some real-estate experts believe communications and automated-maintenance services will become widely available in response to demands by tenants. They'll be landlord-provided services like heat and electricity. Olympia & York's Olympianet may provide a glimpse into this future.

Olympianet, which became available late last year, takes the concept of smart buildings one step further by linking the many buildings owned by the Toronto-based real-estate developer via satellite connection. Indeed, if stand-alone smart buildings are bad news for local telephone companies, Olympianet may chip away at the customer base of the new AT&T or other common carriers. The new network will even provide teleconferencing, a service that AT&T and the common carriers are hoping to cash in on during the next few years.

To implement the network, Olympia & York formed a joint venture with United Telecommunications (Westwood, KS), the third-largest telephone company in the United States. United Telecom retains a controlling interest in the venture.

Although the satellite link is certainly the flashiest feature of this system, Olympia & York will also offer tenants other communications services, including various PABX-based amenities. Olympianet and other smart-building services hold out the promise of enhanced communications services at a lower cost. It's a promise you should investigate. □



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CIRCLE 40

OFFICE AUTOMATION

And the race goes on—Part II

The era of office automation is, without a doubt, here. Once considered applicable only to large organizations, the need for and cost-effectiveness of OA are having an increasingly greater impact in smaller, single-site, companies. And typical of the U.S. marketplace—whether it be for pens, automobiles, or computers—as demand grows, more and more vendors spring up, offering the American buyer an enormous variety of products.

With all the choices that are bombarding you, how can you know what criteria to apply when deciding on a vendor? There are two important questions that small organizations facing potential growth should ask: Will the vendor survive in the current competitive climate? and, If so, will the vendor still serve our needs as our organization expands?

Last month, in Part I of this report, we addressed the importance to Fortune 1,000 companies of a vendor's five-year survivability, and reported the results of the first half of our survey. (We queried members of the Office Automation Society International, and received a total of 36 responses. In last year's survey of office-automation consultants and managers of OA projects, we received only 22 responses.) This month, we bring you the results of the second half of our survey, which considered the survivability of vendors to the smaller, single-site, companies.

The survey recipients were asked to check one of three ratings for each vendor named (there were 34 in all). The choices included "sure survivor," "likely survivor," and "not likely." In totaling the scores, a "weight" of 10 was assigned to each "sure survivor" vote, 6 to each "likely survivor" vote, and 2 to each "not likely." The high-

est possible score any vendor could attain was 360, but no vendor received that score because not all respondents rated every vendor. (In last year's survey, reported in the January and February 1983 issues, the highest possible score was 220.)

Keep in mind that this survey indicates knowledgeable users' *perceptions* on the survivability of vendors. It shows, by implication, which vendors will be favored enough by buyers to still be around in five years. Although it does not bear the imprimatur of any office-automation expert, it still merits attention. What users *think* about the equipment available to them will undoubtedly affect the market.

The chart that accompanies this second-half report provides total

The cost-effectiveness of OA is having an increasingly greater impact in the smaller, single-site, companies.

scores, as well as "sure survivor" votes, for suppliers to single-site companies. It also compares these with each company's scores in last year's survey.

The roster of "Top 10" vendors is surprisingly different from last year's list. In rank order of total scores, the winners are: Apple Computer (334); IBM (312); Digital Equipment Corp. (272); Wang Laboratories (256); Hewlett-Packard (230); Xerox (222); AT&T Information Systems (218); Kodak (192); Lanier (184); and Honeywell (182).

Moving up from last year's third-place spot, Apple Computer captured the top position, leaving behind such

giants as IBM, Digital Equipment, and Wang. It received 31 "sure survivor," four "likely survivor," and one "not likely" vote. Apple's success might be the payoff of superb marketing; it seems to have convinced the small-business market that its product is perfect for the needs of a small organization.

IBM's Personal Computer and Displaywriter have given it almost as strong a foothold in the small-business market, and the experts think Big Blue is there to stay. Their votes of confidence included 30 "sure survivor" and two "likely survivor."

Digital Equipment Corp. has also had a strong impact, as evidenced by its move from fifth place in last year's survey to third this year.

Wang's slip from second place last year to fourth place makes one wonder about the depth of its penetration into the single-site market. The votes for this company included 21 "sure survivor," seven "likely survivor," and two "not likely."

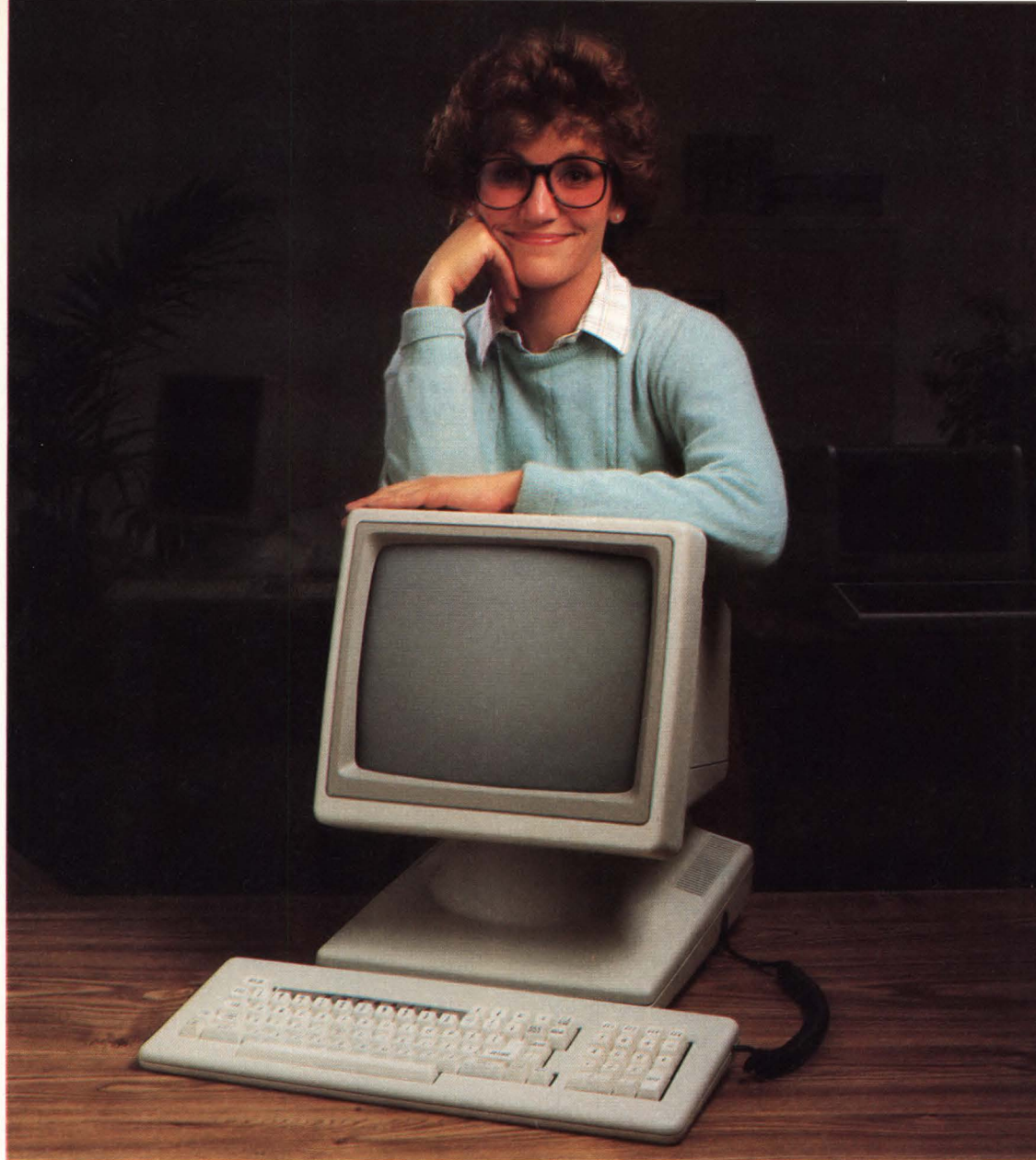
Surprisingly, Hewlett-Packard, which was not even in the "Top 10" last year, took fifth place. Sixteen "sure survivor," 11 "likely survivor," and two "not likely" votes were cast for HP.

Although it lost ground in the Fortune 1,000 race, Xerox moved up among the single-site suppliers from seventh to sixth place.

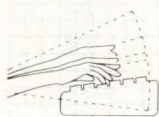
AT&T Information Systems is also moving in a positive direction—it jumped from ninth place last year to seventh in the current survey, and picked up 16 "sure survivor" and 13 "likely survivor" votes along the way.

A new addition to the survey, Kodak, stepped right into eighth place, while Lanier slipped from sixth in last year's poll to ninth place. Honeywell, which didn't make the "Top 10" last year, squeezed into the number-10 spot over 3M.

Noticeably missing from this



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OFFICE AUTOMATION

year's "Top 10" roster are Tandy (Radio Shack), CPT, and NBI. This change in the lineup, coupled with Lanier's drop in status, may indicate a future trend. As equipment con-

tinues to evolve, growing still more sophisticated, support and training will become increasingly critical aspects of servicing the small-business market. This will require vendor

companies of substantial size.

Therefore, the future may belong to those vendors who are already big fish—and will become even bigger by swallowing up the small fry. □

"Survivor" survey results for smaller users

Vendor*	Total score 1989	"Sure survivor" votes 1989	Total score 1988	"Sure survivor" votes 1988
Anaconda-Ericson	62	1	—	—
Anderson Jacobson	114	4	54	1
Apple Computer	334	31	162	10
AT&T Information Systems	218	16	128	10
Bell & Howell	172	11	—	—
Burroughs	180	7	70	1
CPT	160	7	124	6
Data General	170	8	70	0
Datapoint	152	4	76	1
A. B. Dick	134	3	78	1
Dictaphone**	194	9	112	2
Digital Equipment	272	19	152	12
Exxon Office Products	158	6	48	0
Hewlett-Packard	230	16	116	7
Honeywell	182	7	84	2
IBM	312	30	178	17
Kodak	192	11	—	—
Lanier	184	6	148	9
Motorola (Four Phase)	126	4	74	0
NBI	124	4	132	5
NEC	130	8	92	1
Nixdorf	88	2	60	0
Northern Telecom	162	8	74	2
Olivetti	138	5	92	2
Philips (Micom)	82	4	90	1
Prime	174	8	88	0
Raytheon (Lexitron)	90	1	78	1
Rolm	114	4	62	1
Royal	104	2	80	0
Sony	152	6	94	2
Sperry	122	3	58	1
Syntrex	98	3	74	0
Tandem	104	2	94	1
Tandy (Radio Shack)	230	14	160	10
3M	180	10	—	—
Wang Laboratories	256	21	172	16
Wordplex	84	2	26	0
Xerox	222	14	136	8

*These results show which vendors members of the Office Automation Society International think will be serving smaller, single-site, companies in five years. Vendors that received write-in votes from respondents include CPI, Kaypro, Siemens, and Texas Instruments.

**In October, Dictaphone announced its withdrawal from the word-processing business.

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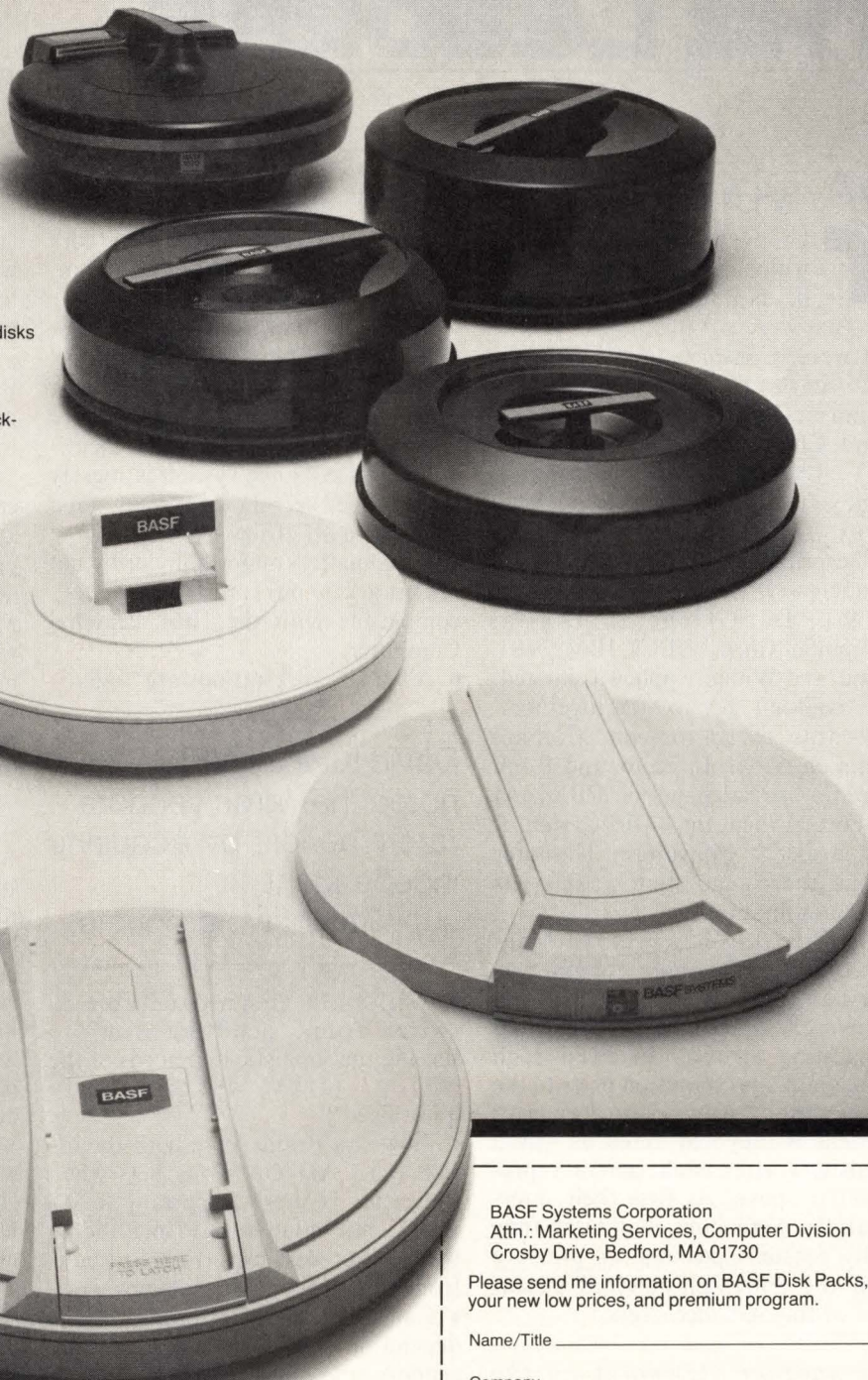
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For IBM: 100 and 200 MB 12-high packs, top and front-load single disk cartridges.

For Wang: Phoenix single disk cartridges, 80 and 300 MB storage modules, top-load single disk cartridges.



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FOLLOWING THE LEADERS

OA vendors roasted and rated

The party was exclusive—which means that one should be as interested in the vendors that were *not* invited as in those that were. Conspicuous by their absence at the first Hammer-Seybold Forum on Office Systems and Professional Computing were Burroughs, CPT, Exxon, Hewlett-Packard, Honeywell, NCR, and especially Xerox.

The primary OA vendors who did participate in the forum were: AT&T, Data General, Digital Equipment Corp. (DEC), IBM, NBI, Prime, and Wang. Apple was invited, but “couldn’t get its act together,” according to co-sponsor Michael Hammer. Mitel, Intecom, and Rolm shared a special panel on PBXs. At the Forum, the term “office systems” was stressed: Consultant Hammer claims there’s no such activity as office automation.

Held recently in downtown Manhattan, the three-day forum was unusual in that the co-sponsors, Hammer & Co. and Seybold Consulting Group, reviewed each participant’s presentation prior to the conference, and Hammer and Patricia B. Seybold acted as grand inquisitors after each vendor representative spoke. At first their interrogations were mild, but later they really roasted speakers, as pressure from the 250 high-powered executives in the audience grew.

For another viewpoint on the strengths of major vendors, see the “Office automation” column in this issue. Further details on the Hammer-Seybold conference will be published in a future “Office automation” column.

Here were some of the digs both the inquisitors and the audience directed at the vendors:

- IBM’s reason for pushing its DISOSS utility system is to sell more disk drives, on which it makes a lot of money. Also, the text-editing feature of the PROFS package is deficient.
- Wang’s Alliance system is merely an advanced secretarial system, not a solution to all office problems.
- DEC made a major blunder by not making its personal computers compatible with the IBM Personal Computer.
- AT&T’s workstations are “ugly.”

David Klein of NBI noted that large vendors rarely benefit by acquiring independent suppliers of wp products.

- Will Data General be able to switch from “peddling iron” to serving the sophisticated needs of the office? (DEC was similarly questioned.)
- How can Prime serve both the office and CAD/CAM markets when the latter is more important to it? Also, what value does Prime add to the word-processing terminals it buys from Convergent Technologies?
- Can large customer organizations depend on NBI (the smallest of the vendors who appeared) to remain in business?
- With so many OA vendors seeking connections to private branch exchange (PBX) makers, why did Datapoint abandon this important activity?

Vendors who were absent were roasted, too. Apple’s Lisa was termed “a collection of mediocrities.” Xerox was described as a company fruitlessly in search of another “home-run” product like its early copier. On a more positive note, Hewlett-Packard was praised as an upcoming power because of its recent offerings for the office.

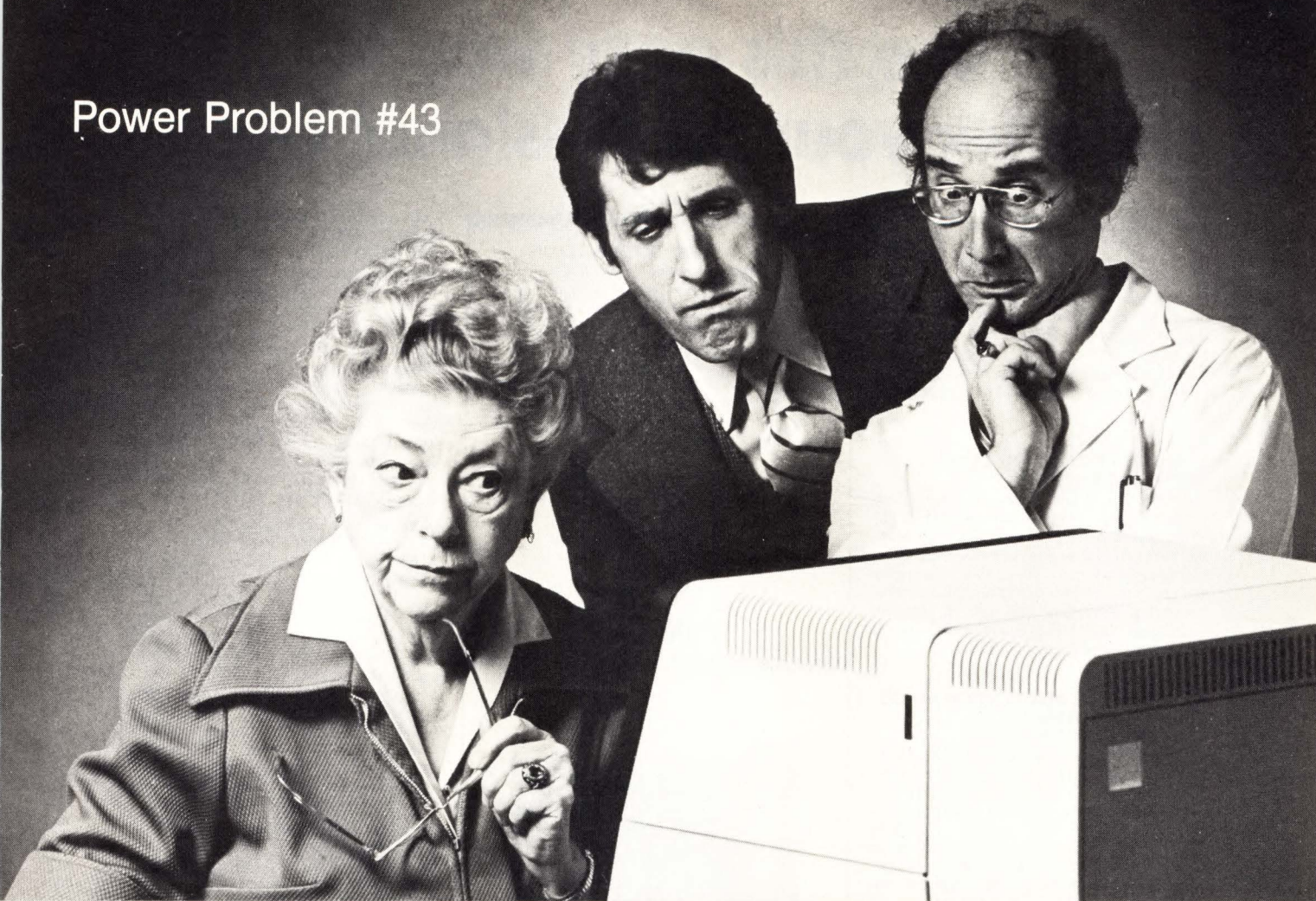
Representatives responded to the criticisms with varying degrees of aplomb. Frederick A. Wang, heir presumptive and executive vice president of Wang Laboratories, held up well under intense fire, especially when he claimed that Wang is making a major effort to improve service.

Frank S. Vigilante, president of product planning and development for AT&T Information Systems, was refreshingly humble and humorous, considering the traumatic divestiture AT&T is going through. To the surprise of most, he was the only representative who did not see IBM as his organization’s principal competitor. Instead, Vigilante cited the other suppliers of PBXs as AT&T’s major competitors. Another surprise was his announcement of AT&T’s plans to cooperate with Wang on document transfer.

Other plans to work with Wang were voiced by Julius L. Marcus, a vice president and group manager of DEC. He was candid in admitting to many of DEC’s past failings in OA and other markets. When asked if the introduction of the VAX desk-top model would not “butcher” DEC’s present offerings in personal computers, Marcus drew a big laugh with his response: “I would rather butcher myself than let someone else butcher me.”

David Klein, executive vice presi-
(Continued on page 241)

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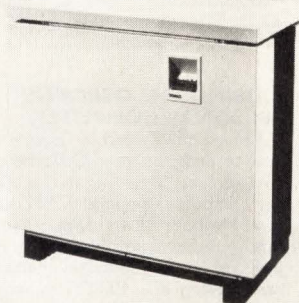
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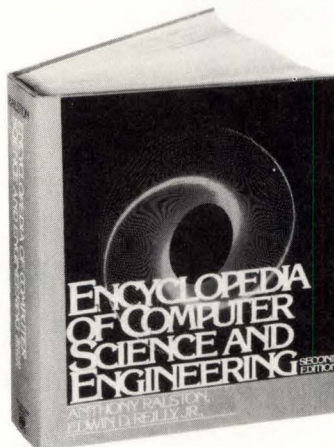
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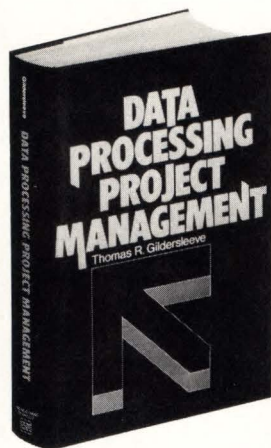
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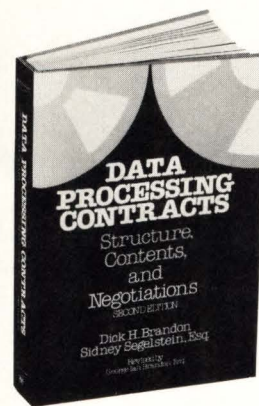
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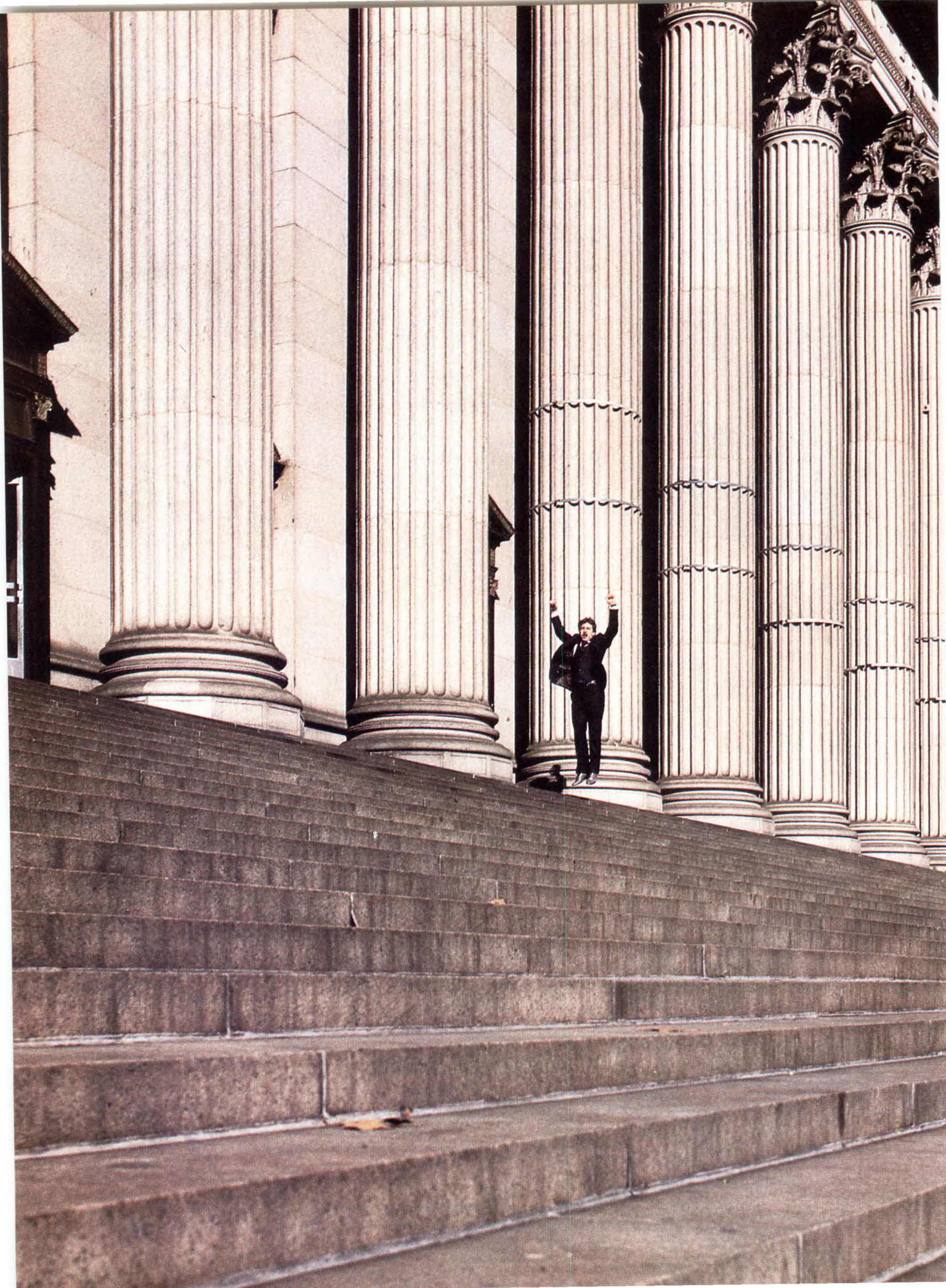


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MAKING IT BIG

Do you have what it takes to make the big time in corporate management? Ten MIS/dp managers who've made it tell how it's done.

by David Whieldon, Senior Editor

Striving to get the boss' job is the corporate version of the American Dream. Managers of management-information systems or data processing (MIS/dp) who yearn for the big time usually set their sights on their organizations' top information-processing jobs, branching out from data processing into data communications and office automation. However, if their drive is strong enough, they can make the jump to top general-management jobs.

The allure of the executive suite is strong for MIS/dp managers. In the most recent *Computer Decisions* Salary-Status Survey, more than 40 percent (42.8 percent) of respondents said they want to move into general management. Fifty-eight percent said they'd move to another organi-

zation for a greater challenge, and 45.5 percent would change jobs to get more autonomy, authority, or control.

Is it realistic for MIS/dp managers to dream of climbing the corporate ladder to a perch in general management? "The statistics aren't encouraging," says Eugene F. Bedell, director of MIS for FMC Corp., Chicago. "But MIS/dp managers with ambition, personality, insight, and training can reasonably shoot for top jobs." Robert L. Crandall, one of the 10 executives profiled below, even took a detour from a career in general management for a stint in information management. The experience certainly didn't hurt his climb to become president of American Airlines, Dallas.

MIS/dp managers might even have an advantage over others in the corporate hierarchy. As information-processing becomes a pervasive force in many organizations, MIS/dp

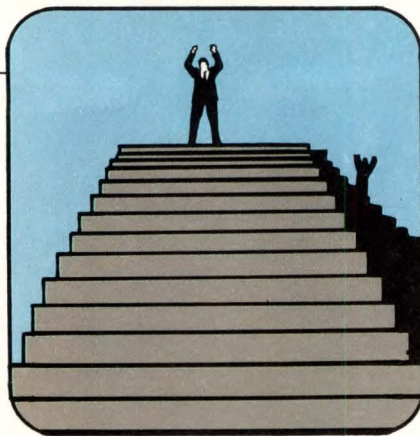
Photo by Edward Hardin

Making It Big

(Continued from page 77)

managers are helping each section of the organization meet its information needs. They could conceivably help marketing, research and development, manufacturing, or any of the individual cells that contribute to the functioning of the organism. In the process, MIS/dp managers can learn how work flows through the organization. This knowledge can be the foundation for a move upward.

Some experts believe the opportunities for MIS/dp managers are best in financial or service organizations, which are more dependent on information than are other organizations. "Movement from information management to the executive suite is more likely to happen in companies that fashion 'products' from information," says Herbert Halbrecht, head of an executive-search firm in Stamford, CT. Managers who



demonstrate broad professional skills and interests early have an advantage, adds Robert Half, who runs an executive-search firm in New York City. "Management selects future executives well in advance, based on maturity, education, attitude, and the ability to get a job done," he says.

There are many routes to the top, as demonstrated by the careers of 10 MIS/dp managers who've made the big time. Some got into MIS/dp through programming and systems analysis and worked upward from

there. Others started in general management, engineering, or even sales in one case, entered the information specialty through a side door, and then moved up. Several have made excursions back and forth between support and line functions. Those who rose to top general-management jobs expanded their jurisdictions beyond MIS/dp to administration of production, communications, facilities, and personnel.

There's no success-guaranteed formula, but certain professional and personal attributes are essential for a bid to win a top job, say experts. Broad knowledge of your organization's operations is one necessary trait. Business experience is vital. Good contacts, well-placed mentors, and advanced study or degrees will help. You must delegate responsibility for technical details, adds Eph-

Bonanza for women managers?

Growth opportunities abound in the world of corporate information processing, perhaps more so than in other fields. The chances for advancement also appear to be more equitable for women.

In the latest *Computer Decisions* Salary-Status Survey, 10 percent of the responding MIS/dp managers were women, up from 6 percent in the previous year. When executives like Donald P. Kelly of Esmark and Robert Crandall of American Airlines were coming up through the ranks, women occupied far fewer positions in information management. But as today's young MIS/dp managers advance in the corporate hierarchy, a greater percentage of them are women.

Take Sharon Kaminecki, director of information systems for the Environmental Affairs and Safety Department of Standard Oil Co. (Indiana), in Chicago. After earning bachelor's and master's degrees, she worked as an editor, programmer, and systems designer for four years at the Illinois Institute of Technol-

ogy, her undergraduate alma mater. At Standard Oil, she administers an annual budget of \$400,000, supervises three employees, and operates a system based on an IBM System/34.

One of Kaminecki's major projects was building an information system to help management cope with the risks for employees of exposure to hazardous substances. Using the same database, she's preparing safety literature for customers on hazardous products sold under the Amoco name. "The job requires strong technical skills," she says. But Kaminecki is not strictly a technical expert. She is responsible for the project's budget and organization, which are purely managerial functions.

Kaminecki has detected little discrimination in what she describes as a male-dominated company. "Some men feel uncomfortable about the presence of women managers," she says. "But my supervisors have been very helpful. Standard Oil is sensitive about equal opportunity and

sometimes seeks out women scientists and technicians for management positions."

The opportunities for advancement are good in a large company like Standard Oil, which ranked 10th on the 1982 Fortune 500 list. "Some dp managers here are more managers than technicians, and managers from other departments sometimes manage dp," she reports. Kaminecki hopes to work her way upward through the ranks: "There are a lot of opportunities here."

Kaminecki and managers like her might choose as their role model E. Nancy Markle, vice president of information services at the Federal National Mortgage Association in Washington. Markle started as an instructor at IBM, moved into programming and systems design, and then made the transition from technician to manager on the way to making it big. But then, Markle's rise can be an inspiration to all young line managers with an eye on the corporate High Sierra, male and female alike.

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Making It Big

(Continued from page 78)

raim R. McLean, an associate professor at the University of California at Los Angeles' Graduate School of Management. But above all, you must have the will to make the climb and accept the heavy responsibilities that come with high-level jobs.

Whatever the patterns and the strategies, the stories of these 10 managers yield advice that could prove valuable as you set out for the top.

Kelly of Esmark

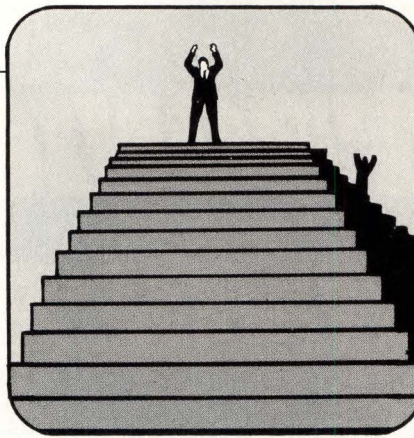
As president and chief executive officer of Esmark Inc., Donald P. Kelly is one of the most successful executives who started in MIS/dp. Esmark, a food-processing and consumer-products conglomerate, had sales of \$3.3 billion in 1982. It was No. 117 on the Fortune 500 list for that year, but is sure to move up on the list when its recent acquisition of rival Norton Simon Inc. is complete.

When Kelly started his career in 1946, data processing as it is known today didn't even exist. Kelly was involved in the processing of numbers, however, as a manager of tabulating at the United Insurance Co. of America, Chicago.

In that job, which he held until 1951, Kelly might have been called a pre-dp-er. He started tabulating as a student: "At that time, if you had no other abilities, you were relegated to the 'tab room' to do rudimentary tasks with punchcard equipment."

At the time, the first computers were being deployed in industry, and Kelly foresaw an opportunity. He joined A.B. Wrisley Co. as data-processing manager, and then moved over to Swift & Co., a meat processor, in the same capacity. He was promoted to assistant controller at Swift in 1953. During the next 15 years, Kelly moved up the ladder, starting with a promotion to controller, moving to vice president for corporate development, and landing on the board of directors as financial vice president in 1968.

When Esmark, a holding company of which Swift is a major element,



was formed in 1968, Kelly was named financial vice president and director, then president and chief operating officer, and finally president and chief executive officer. He recently added the title of chairman to his portfolio.

Kelly's road to the top has been long, and each step upward corresponded to a new opportunity, he says. "To aspire to general management, you have to see more than the technical side of your job," he says. "If you become a supreme technician, you're probably not broadening your knowledge. You might look up one day at 40 or 45 years of age believing that no one's ever offered you opportunities to advance. But the truth is you've never sought opportunities."

Early in his career, one project at Swift helped Kelly gain upward momentum. "We had to install 28 data centers over the whole spectrum of the business, worldwide. I worked with manufacturing people, sales people, and marketing people. I encountered managers and situations I'd never have been exposed to under any other circumstances."



Donald P. Kelly

That special experience gave him a rare opportunity to learn by listening, says Kelly. "Just listening, instead of always talking about equipment and software, broadens dp managers so that they become more acceptable to general business managers," he contends. This strategy will also acquaint you with the other members of the corporate-management team, he says. Like other highly specialized, technical disciplines, MIS/dp tends to become insular. Kelly warns: "All the brains in the world aren't in dp!" Get out into user departments, he advises, join professional organizations outside dp, and take positions in other departments if they give you power to participate.

Ultimately, each step toward the top should put you in a better position to take advantage of opportunities—and the occasional lucky break, says Kelly. "I've been very fortunate and successful, and I'm not sure which item came first." Inevitably, there will be failures, he adds: "Most of the setbacks you encounter are the result of overexpectation. Think of setbacks merely as part of the learning process."

Crandall of American Airlines

Robert Crandall's formula for success is a bit unusual, but it demonstrates the value of experience in information management. Crandall's career began with stints at Eastman Kodak, Hallmark Cards, and Trans World Airlines in various financial-management positions. He went into information management at TWA as a vice president of systems and data, and stayed in that job for six years before returning to finance at Bloomingdale's, the New York department-store chain. He joined American Airlines as a senior vice president of finance in 1973, moved to vice president of marketing, and has been president since 1980.

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CIRCLE 45

Making It Big

(Continued from page 80)



Robert L. Crandall

says a colleague. "Almost from the very day he came to American, he began to employ computer systems to better manage the marketing side of our business."

Crandall gets credit for enhancing American's computerized reservations system, called Sabre. Travel agents use terminals connected to the system to make reservations for a number of airlines. But Crandall expanded it to produce more decision-making data for American, more booking services for customers, and accounting functions for travel agencies. Sabre gives American a subtle competitive edge, simply because it is linked to the airline's central reservations system. (American's competitors says this competitive edge is unfair, and they've petitioned the Civil Aeronautics Board to make the system more equitable to all competitors.)

Bedell of FMC

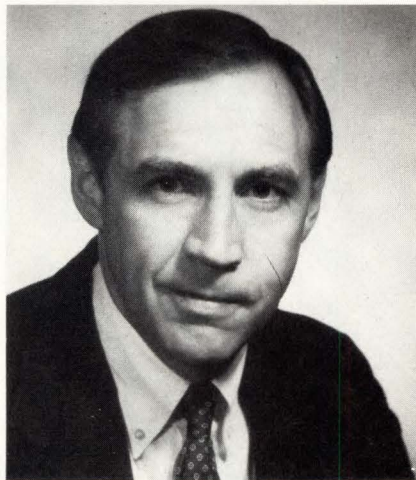
Eugene F. Bedell's career offers proof that MIS/dp, combined with an "entrepreneurial spirit," can be a stepping stone toward top management. Bedell leapt from MIS onto the board of directors of his last employer, Iowa Beef Processors Inc. In 1978, he joined FMC Corp., a Chicago-based manufacturer of industrial, transportation, and defense

equipment with about \$3.5 billion in sales last year, as director of MIS.

Bedell got into MIS/dp via sales. After graduating from Brooklyn Polytechnic Institute with a degree in industrial engineering, he sold time-sharing services for Interactive Data Corp. in 1968. From that job, he moved to Morgan Stanley & Co., a Wall Street bank and brokerage, running the corporate-finance-systems group. These jobs not only gave Bedell an education in programming and systems, but also provided valuable sales and general-business experience. "I was exposed not to just one company, as I might have been as a programmer, but to 100 companies," he says. "What I've learned about sales has helped me sell my ideas to management."

A knowledge of sales probably made the transition into general management a little easier for Bedell. From Morgan Stanley, he was hired as assistant vice president of MIS at Iowa Beef Processors Inc., overseeing 70 employees. Bedell rose rapidly at Iowa Beef, being named one of two group vice presidents and a member of the board of directors. He also had a seat on the corporation's executive committee. When he left to join FMC, Bedell's group accounted for \$1.4 billion in annual sales. Bedell remained on the board for three years after he joined FMC.

His rise at Iowa Beef was not due to his expertise in MIS/dp, says Bed-



Eugene F. Bedell

ell. Rather, he attracted the notice of the company chairman because he tried to understand the whole corporation's business. Currier Holman, the chairman, gave him a solid grounding in no-nonsense general management, says Bedell.

Moving over to FMC was a career homecoming of sorts for Bedell. He's working for a manufacturer of industrial goods—he has an undergraduate degree in industrial engineering—and he's back in MIS/dp. Bedell administers a budget of \$100 million and a gamut of information services taking in telecommunications and a corporate-information center as well as data processing.

Bedell's career also demonstrates the value of advanced academic degrees. Bedell has a master's degree and a Ph.D. in industrial engineering, and he believes they've helped.

Peterson of Security Pacific

It's been said that politics is the art of human happiness. DuWayne J. Peterson heartily endorses that notion. Peterson is executive vice president and administrator of the Automated Data Processing Group at Security Pacific National Bank, Los Angeles. Political acumen was essential to his rise, he says. "You have to play politics to your advantage," he advises. "That's a turnoff for some managers, but it's a way to get where you're going. Politics is getting things done through other people. You'll probably never achieve your goals if you don't learn when to play hardball and when to bend."

Peterson believes that an executive can't perform well if he or she isn't well-connected. Managers should establish a power base below them, but also curry favor in high places, he says. "It's a good idea to get plugged in as high as you can," he says. "Then you'll have someone on your side when you're attacked by rivals. You'd better understand that, deal with it, and enjoy it. It's part of being a manager." Peterson delivered these

(Continued on page 86)

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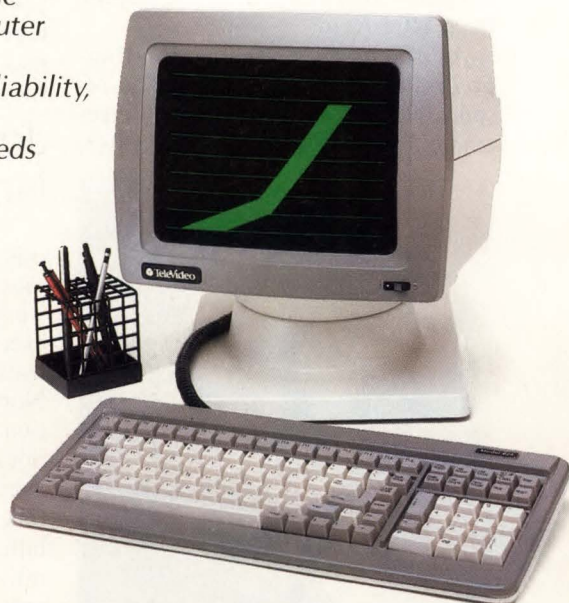
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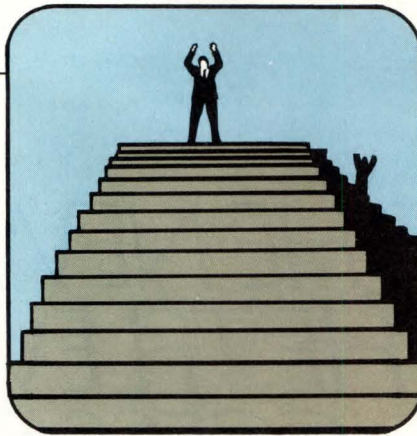
(Continued from page 82)

comments at the September conference of the Society of Information Management in San Diego.

According to Peterson, managers must prepare both themselves and their bosses before they can move upward. He outlines several key steps in this process: First, MIS/dp managers must let go of their technical know-how. Too many managers use their technical knowledge as a "security blanket," he says. "You must learn to speak and write clearly," he says. "You can't communicate using jargon." For Peterson, that meant transcending his background in industrial management. After graduating from the Massachusetts Institute of Technology, in Cambridge, in 1955, with a bachelor's degree in industrial management, Peterson worked at Ford Motor Co. as a systems manager, and at Honeywell Inc. helping to design and market computer systems.

In 1970, he moved to Citibank as vice president of systems development and data processing. He held that job for three years before moving to RCA Corp. as staff vice president of management-information systems. He joined Security Pacific in 1977. Peterson also has an MBA degree from UCLA.

As the bank's top information-processing executive, Peterson is responsible for data processing, electronic banking and funds transfer,



and telecommunications. His group comprises 3,200 employees, and has a yearly budget of more than \$100 million. But he also sits on the bank's corporate-policy board, a position that expands his influence beyond the information arena.

He couldn't have risen to such heights at Security Pacific without preparing for his own succession, says Peterson. "Train the people working for you," he advises, "test them as managers. One of the best moves you can make is to build up their management skills and promote them. You're preparing the organization for your own promotion by doing so."

Of course, MIS/dp managers also have to demonstrate their credibility to top management. "You've got to run a no-surprises operation," he says. "Even if you take risks with projects, you have to demonstrate that you're in control—that you can put together budgets and processes and make things happen when you say they'll happen."

Jones of Norfolk Southern

Tying your fortunes to a railroad in this day and age may seem like a bad move. However, the strategy has worked pretty well for Jack L. Jones, executive vice president for administration at Norfolk Southern Corp., Norfolk, VA—the new transportation holding comprising the former Southern Railway Co. and Norfolk & Western Railway Co. In 1982, Norfolk Southern had revenues of \$3.5 billion, the highest net income—\$411 million—among the nation's transportation companies, and a 17 percent growth rate—tops among the transportation brethren. That's not a bad record in an industry that's sup-

posed to be sidetracked.

Like a small but growing number of MIS/dp executives, Jones has extended one foot into general management. (His latest promotion came a little more than a year ago.) He oversees everything from Norfolk Southern's MIS facilities, which have an annual budget of about \$36 million, to photocopiers to the corporation's medical departments, personnel management, and labor relations.

Jones attributes his rise to general management in part to a team-player outlook. "Even though my technical background is quite strong, I consider myself a railroad manager first and a computer technician second," says Jones. "Outside of MIS, I speak in one- and two-syllable English words. It's one of the primary skills a manager must have to relate to key players in the corporation."

Thus, even though his background is technical, Jones fervently believes in plain-sense dealings with users. He deploys task forces that comprise users as well as technicians to accomplish specific objectives. All members of the team, from the working levels of departments, sit down together and "walk through" the project, whether it's an automated rail yard, a word-processing system, or an electronic-mail setup. "We meet every week or two to assess progress and problems," says Jones. "And yes, we expose MIS problems at these meetings—everything is open, honest, and up-front with the users." As a result, users regard MIS as a member of the team, worthy of trust.

Many management experts believe MIS/dp professionals hurt their chances to rise by insisting on "elegant" technical solutions. Jones advises against such an approach. Getting the job done must be the be-all and end-all. "You have to apply common sense and business judgment. I look for simple solutions to problems. My question always is, 'What is the least I can do to accomplish a goal?' Then when you tie processes together, you don't have to unbolt and unbend too much metal."

Jones' career in information-pro-



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Making It Big

(Continued from page 86)



Jack L. Jones

cessing began when he was "plucked up" by the U.S. Air Force in 1951. He arrived in time to help assemble and test the first Univac computers, in Philadelphia. In that job, he worked with programming pioneer Grace Hopper in software development, and completed two years of graduate study at MIT.

After leaving the Air Force, Jones worked for the Automotive Engineering Division of Chrysler Corp. From that job, he moved as a civilian to the Air Force's Air Materiel Command, where he helped develop a common programming language for the IBM 705 and Univac 1105 computers.

In 1963, Jones moved from the Air Force to Southern Railway. Among his accomplishments for the railroad, he led early efforts to use minicomputers to automate rail yards. Productivity in the yards rose by 40 percent after the systems were installed. In all, Jones' group helped to automate 38 rail yards. It also installed a system that provides dispatchers with graphic representations of the schedule for the next six to eight hours, and suggests alternative routes.

When Norfolk Southern was formed, Jones was charged with integrating Southern's decentralized data-processing operations with Norfolk & Western's centralized operations. It was an "interesting challenge," he says.

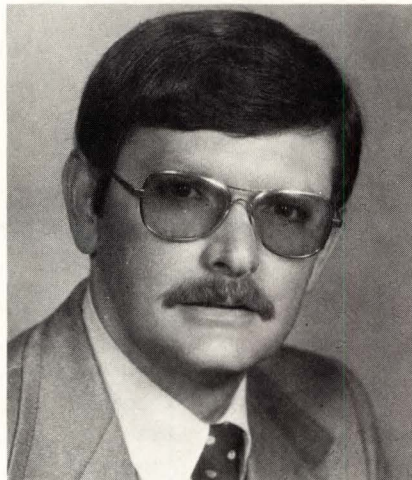
Umbaugh, Southern California Edison

One way MIS/dp managers can arrive in the executive suite is via strategic planning, as the careers of Robert Umbaugh, of Southern California Edison Co., in Rosemead, and George M. Perry of Investors Diversified Services Inc., Minneapolis, demonstrate. Umbaugh was given an opportunity to display his abilities on one very large project. His performance boosted him into position as vice president for administration of the nation's eighth-largest public utility.

The project was nothing short of remaking the dp operation. "When I joined Edison [as an executive assistant in 1971] it was at the bottom of the pile in regard to strategy," Umbaugh recalls. "My first job was to lay out the dp department's first master plan. Developing and executing the plan set me and my colleagues apart from those who had gone before us."

In his current position, Umbaugh oversees about 2,400 employees in dp, facilities management, security, procurement and warehousing, fleet operations, and administrative services, with an annual budget of about \$140 million.

A graduate of Penn State University with majors in biology and English, Umbaugh got into Fortran programming by accident at



Robert Umbaugh

AT&T's Bell Laboratories. He got the job when an abbreviation of "English," referring to his academic degree, was mistaken for "engineering." After leaving Ma Bell, he did a stint as manager of technical training at the Redondo Beach, CA, branch of TRW Corp. From TRW, Umbaugh went to Computer Usage Co., which he says was the first software house incorporated in the United States.

Umbaugh is another believer in the principle of technology transcendence. "Managers should concentrate on using technology for business purposes, not for its own sake," he says. "In fact, dp is about the only functional specialty where you can get away with this mistaken attitude."

"MIS/dp managers with ambition, personality, insight, and training can shoot for top jobs."

Bedell, FMC

At the stops along his career path, says Umbaugh, he picked up valuable technical knowledge and experience. But he never let them eclipse the communication skills he learned in his undergraduate English studies. "There's no substitute for writing and speaking well if you want to move up," he says, "and oral presentations are most important."

How can managers immersed in highly technical work maintain a broad perspective? Umbaugh has a simple strategy: Read. "I'm disappointed in persons who stopped reading when they left college," Umbaugh says. "If you don't read, you must depend solely on personal observation. So you can't grow very much."

If he could do it all over again, says Umbaugh, he'd learn more about finance, which he believes all managers must master. He studied finance in postgraduate courses and read up on capital needs, cash flow, value analysis, and leverage. (Continued)

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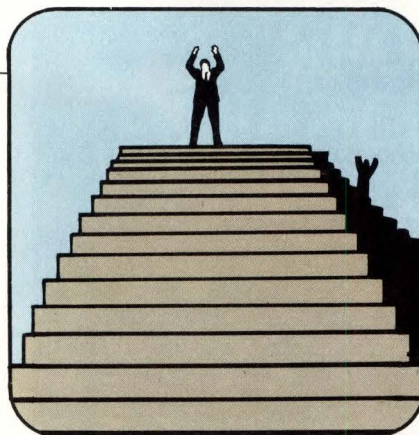
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Perry of IDS

George M. Perry, corporate vice president for strategic planning and development at Investors Diversified Services, Minneapolis, also worked his way into the executive suite as a planner. "Top management believes dp managers are limited by a back-office perspective," he says. "But if managers in MIS/dp do their jobs right, they do a lot of strategic planning. They're already conditioned to think strategically, so they're good candidates for jobs close to the nerve center of the corporation."

Perry concedes that this route to the corporate staff doesn't exist in some organizations. However, in computer-dependent corporations like IDS, it's wide open. IDS, which is scheduled for acquisition by American Express Inc. (New York) this quarter, is a securities and financial-management company with sales last year of more than \$1.2 billion and nearly 2,000 employees.

Perry joined IDS as vice president for information systems in 1979 and was promoted to his current position in 1983. He's stayed in insurance and finance throughout his career, starting as a programmer at Travelers Insurance Co. in 1965. Perry recalls his superiors saying to him: "We don't know what a programmer is, but how would you like to be one?" Before leaving Travelers as a second vice



president, Perry set up a nationwide financial network, which was a pioneering project.

In 1970, Perry made a brief excursion into "fast insolvency," starting an automated-typesetting company. His next move was to Equimatics, a software house established by Equitable Life Assurance Society, New York. Next, as vice president of dp,

"There's no substitute for writing and speaking well. Oral presentations are most important."

Umbaugh, So. Calif. Edison

Perry helped make Home Insurance Co. a leader in database utilization "before the industry realized its potential." He implemented an early distributed-processing network there in 1975.

Perry believes aspiring executives must have the courage to take risks, within reason, of course. "Always volunteer for new assignments," he says. "Be willing to experiment. If you trust your employer, take on new projects without worrying about how they will affect your current ambitions and political power. A certain percentage of these experiments will bomb, and you should prepare for that possibility. When you succeed, your work will attract the favorable attention of management."

Perry's list of former employers belies a certain stability in his career, he says. He believes any manager hoping to move into general management must stick to an *industry*, not so much a specific company. "You really lose out by hopping from industry to industry," he says. "You don't

build up good business credentials. Being a generalist is fine, but you've got to stick to a framework. It's better to work for three banks than a bank, an aircraft manufacturer, and an oil producer."

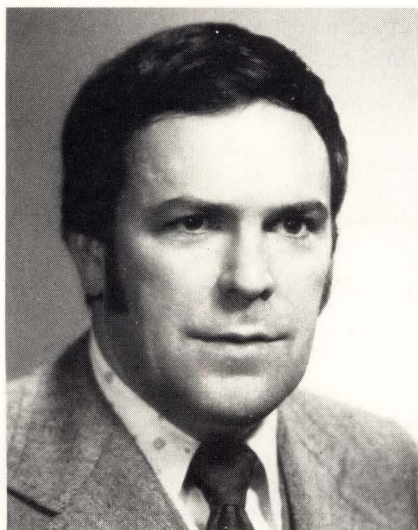
Kahn of Goldman Sachs

Alan D. Kahn would undoubtedly dispute Perry's belief in the industry-specific career. "Sometimes I think I've had too many jobs," muses Kahn, who is vice president of systems and computing at Goldman Sachs & Co. (New York), a major bond underwriter. "But then, it doesn't seem to have hurt me!"

Kahn has jumped from one "wonderful experience" to the next during the last 23 years. After college, the Army, and odd jobs, Kahn joined a subsidiary of the Rand Corp., that had been set up to automate the U.S. Air Force's Strategic Air Command, as a programmer trainee. The year was 1960. When the project was finished, Kahn had risen to systems manager, but he decided to try something new. He joined Trans World Airlines in New York as a senior programmer. There, he learned about flight operations and data communications, eventually moving into middle management.

In 1966, Kahn moved to Citibank, New York, to set up the bank's first online, multi-host system for handling securities purchasing by customers. After four years at Citibank, he left to found a small consulting firm with two partners, selling service packages. A few years later, Kahn began a stint on Wall Street as head of systems and development, and later head of operations, at The Depository Trust Co., a New York-based "utility" founded by the Securities Industry Automation Association. The Depository helps to eliminate the logjam of paperwork in the "back offices" of brokerage houses by automating security-ownership records and bookkeeping.

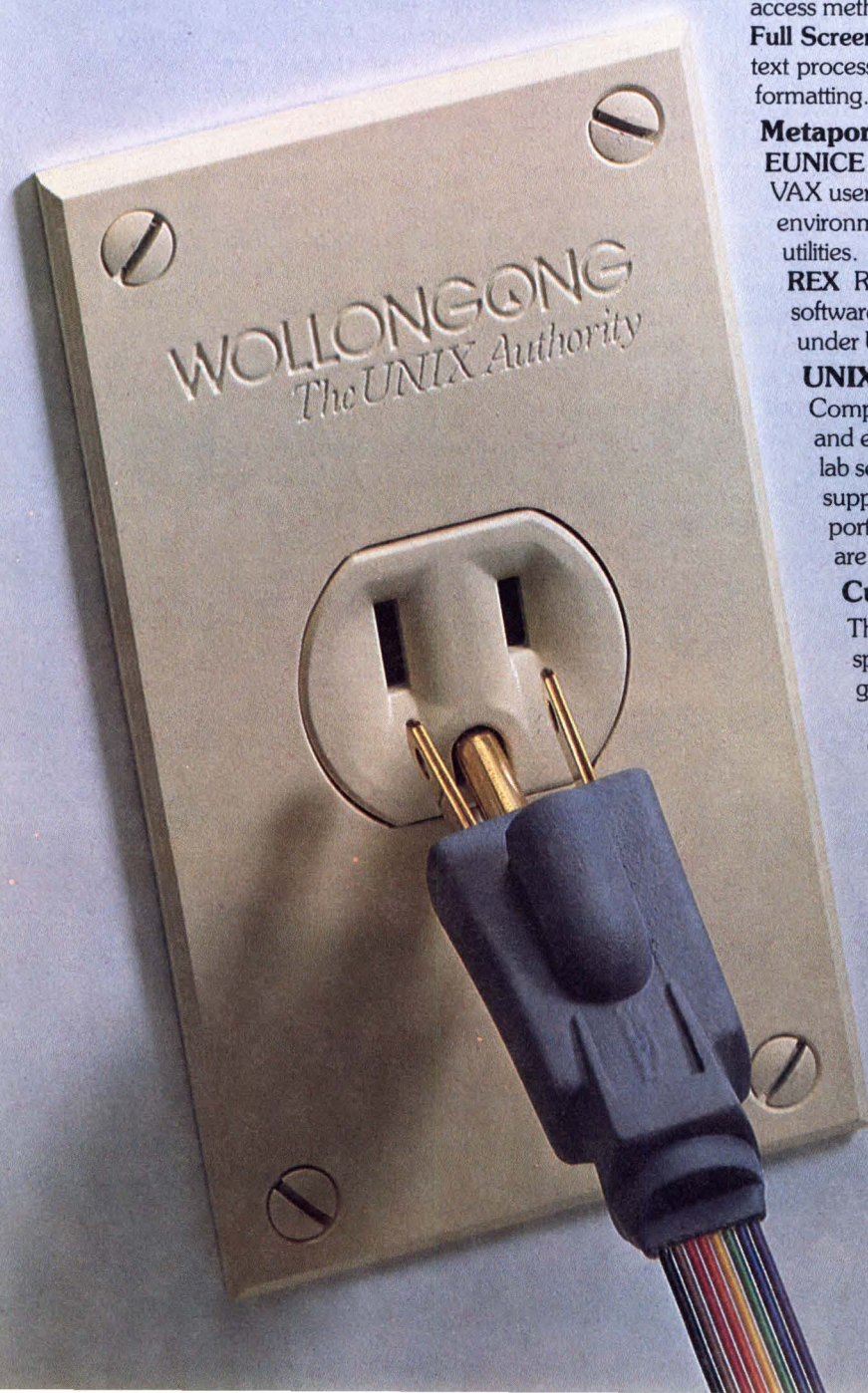
Moving uptown to the *New York Daily News*, Kahn became vice president of dp, the first, he says, of any



George M. Perry

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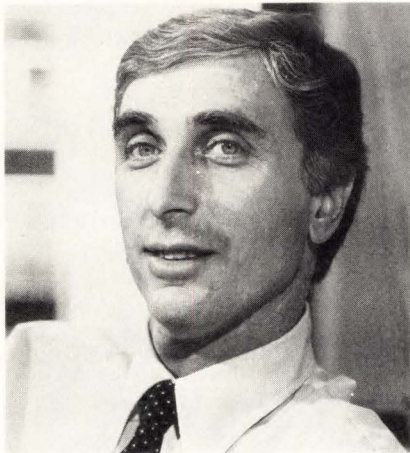
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WOLLONGONG

Making It Big

(Continued from page 90)



Alan D. Kahn

newspaper in the country. At the *News*, he was responsible for automated typesetting, and thereby had a hand in the "manufacture" of the company's product. But Wall Street lured him back when he was sought for the Goldman Sachs job. At the underwriting firm, Kahn supervises a large variety of cpus and peripherals, along with 250 employees, and has an annual budget of about \$30 million.

"There's no single, clear route to the top," says Kahn, in a masterpiece of understatement. About half the computer executives he knows rose through the ranks of one organization, he says, but just as many hopped their way like he did. The route to the top is not important, Kahn asserts. Managers who have the ambition and mindset to climb will be successful. "Don't think of yourself as a dp manager. Instead, tell yourself that you're a banker if you're in banking, a broker if you're in a brokerage house, and so on." The line where MIS/dp stops and general management begins is always blurred, he adds, and dp-ers have many opportunities to get more involved with the business side of their companies.

MIS/dp managers should think of themselves as pure managers. "Believe that you can do the job, that you can change things," he advises. Top management longs for candidates willing to take responsibility and get the job done. "Executives are glad to find someone who's strong," he says.

Vetter of Illinois

How important is a track record of stability to moving upward? The careers of Kelly and William M. Vetter Jr., manager of the Bureau of Information and Communications Services for the State of Illinois, indicate that there's something to be said for stability. If ever a manager stuck to his last, it's Vetter. He worked for an insurance carrier for 23 years and then had to be persuaded by executive searchers to jump ship.

Vetter sounds like an oral historian of dp as he tells of programming a Univac 1 at the Franklin Insurance Co., Springfield, IL, in 1958. "You couldn't buy software then," he says, "you had to build it." From software builder, he progressed through jobs as analyst, lead analyst, and project leader. When Franklin established a subsidiary to supply dp services to outside customers, Vetter headed up the marketing effort, with responsibilities equivalent to those of a vice president.

Vetter hoped to be appointed vice president of dp, but that promotion never came. Nonetheless, from his position as head of the service bureau, Vetter delved deeper into the work of his company. In addition to keeping abreast of changes in MIS/dp, he studied the intricacies of insurance. Over the years, he's obtained credentials as a Certified Life



William M. Vetter Jr.

Underwriter (CLU) and become a Fellow of the Life Management Institute (FLMI), sponsored by the Life Office Management Association (LOMA). He also writes *CDP* after his name, to show that he has a Certificate in Data Processing.

"You can't begin to learn everything, but it's good to go on," he testifies. "Continued learning shows the boss that you have broad potential and that you're putting forth extra effort." The CDP certification isn't required by any company or government agency, but it's part of the foundation of a good resume, he adds.

Someone else was impressed with Vetter's record. Three years ago he got a call from the lieutenant governor of Illinois, who had picked up Vetter's name through the state's executive-recruiting program. "I'm not looking for a job," protested Vetter. "We're not looking for somebody who's looking for a job," was the reply.

During the next six months, Vetter was interviewed by several officials—and finally by Governor James R. Thompson himself. As head of the bureau, Vetter holds the top MIS/dp job in the nation's fifth-largest state. Vetter's boss reports directly to the governor.

Vetter is responsible for seven IBM mainframes—IBM 308X and 33XX machines—and an Amdahl V-8 with a total of 110 Mbytes of memory. Data-storage facilities encompass about 300 disk drives of the IBM 3350 and 3380 types plus two IBM mass-storage devices. This formidable facility handles the information needs of about 70 state agencies. If it were a commercial service, the State of Illinois' data-processing facilities would be among the 10 largest in the nation.

Vetter does a lot more than oversee the state's data processing. He is responsible for voice and data communications on close to 5,000 video-display terminals around the state, radio equipment, and telephones on 535 trunk lines. "A lot of exciting things are going on in communications," he says. "For example, we're

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CIRCLE 51

Making It Big

(Continued from page 92)

looking at ownership of equipment and lines as communications costs rise." These two functions, dp and telecommunications, are supported by a budget of \$80 million to \$85 million a year, says Vetter.

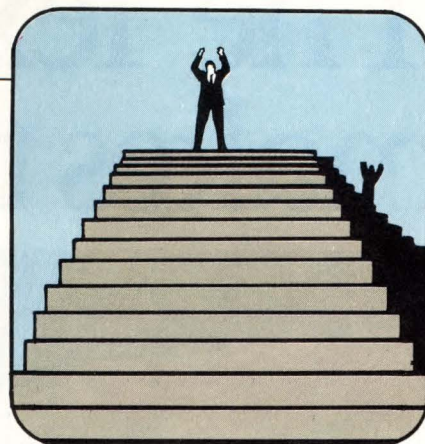
Sitkin of Aetna

"I've grown to the point where I can make a difference in my organization, and the company's rewarded me." With those words, Irwin J. Sitkin capsulizes his career in data processing at Aetna Life & Casualty Co. (Hartford, CT), where he's been working since 1954. In that year, he was tapped to be IBM supervisory clerk-trainee No. 2. Today he's vice president for corporate administration, a title that embraces both information systems and facilities management.

Sitkin arrived at Aetna's Casualty Hollerith Department with a degree in economics from the New York State College of Agriculture at Cornell University. But rather than working with combines and cultivators, he found himself operating sorters and learning how to program the IBM 650, the earliest medium-scale computer. His first mentor was a life-actuarial student who had written a casualty-insurance program that began a "miracle" for his com-



Irwin J. Sitkin



pany, according to Sitkin.

Over the years, clerk-trainee No. 1, who had appeared on the scene just a week before Sitkin, became technically adept, but not so managerially competent. Sitkin, on the other hand, moved from programming his department's computers to a job as systems analyst and then into supervisory and managerial positions. Now he oversees about 3,400 employees and 20 mainframes of the IBM 3081/3083 family and four Amdahl computers. Aetna has a total of about 40,000 employees and annual revenues of about \$15 billion.

Sitkin is one of those rare executives who doubles as an MIS/dp executive and a member of general management. He was the first manager from dp to be promoted to assistant secretary at Aetna, and he now meets with the corporate-management committee. He's responsible for providing an array of services to the carrier's employees. The operations he oversees include a print shop, file department, a mail service big enough to serve a small city, copying and facsimile machines, 600 company-owned and -leased offices and the interior finishing of them, four corporate aircraft and their facilities, an auditing department of 100 professionals, and one of the largest cafeterias in New England, serving 9,000 meals daily.

In the final analysis, if you have the verve and the courage to emulate these 10 executives, you're already one or two rungs up the ladder. But because management may view you as a technician, you may find some of the rungs above you splintery and difficult to grasp. It's a long climb, and you'll sometimes have to stretch your knowledge and abilities to keep moving. Upward ho! □

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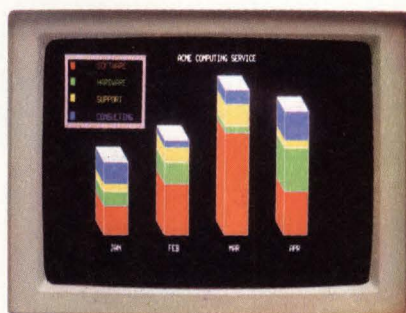
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Playing Technological Catch-Up

Information technology has evolved into an indispensable composite of strategic tools. In today's competitive marketplace, it has the power to boost the fortunes of aggressive underdogs and end the reign of complacent leaders.

by Martin Lasden, Western Editor



A man in a dark suit and red tie is running on a path covered with fallen autumn leaves. He is captured in profile, moving from left to right, with a determined expression. The background is a soft-focus landscape of trees with autumn foliage in shades of orange, yellow, and brown. The lighting suggests a bright day, with some highlights on the man's suit and the path.

Plotting against each other within highly competitive market niches, corporations are employing brand new strategic tools. Tools said to be potent enough to displace complacent leaders and boost the fortunes of aggressive underdogs. These include such devices as portable computers and terminals, point-of-sale terminals, automatic-teller machines, database management systems, decision-support systems, and sophisticated telecommunications equipment. The intention is to out-maneuver, out-guess, and out-service the competition. And the basic component behind all this paraphernalia is, of course, information technology.

That more and more companies are seeing the implementation of such technology as the way to beat the competition is perhaps the most telling indicator that the information age has arrived. What's at stake is no longer *just* enhanced efficiency, or productivity, or number-crunching prowess. It's the power to realize higher profit margins, increase market share, and attain a bigger piece of the action at the expense of one's competition, thereby reducing your vulnerability to the fickle marketplace.

"I'm not afraid to say it," declares Gregory L. Parsons, an assistant professor at Harvard Business School and author of a book tentatively titled: *Computers and Competition: Winning with New Technology*. "The long-term viability of companies in

Technological Catch-Up





businesses such as finance, retail merchandising, and publishing will be severely threatened in the next few years if they do not exploit the benefits of information technology."

Inherent in such bold predictions is the sense that MIS/dp has finally outgrown its rather tarnished reputation for promising more than it delivers. Technological breakthroughs that have produced cheaper, more powerful, easier-to-use systems have done much to help MIS/dp realize that change. But that's not all there is to it—the availability of technology is one thing, knowing how to use it is quite another. And now, more than ever, corporations are gaining that knowledge. They are learning how to apply the technology to make a difference—a difference dramatic enough to win a bigger piece of the action.

To be sure, this is a recent phenomenon. To appreciate just how recent, one only need scan the literature on the subject.

For example: In 1980, *Competitive Strategies* (Free Press), by Michael Porter of Harvard University's Graduate School of Business Administration, was published. In that book, Porter describes a number of ways in which businesses can gain competitive advantages, but he hardly says a word about information technology. That is an oversight, Porter now acknowledges, and in a book to be published sometime in the near future, he hopes to set the record straight. "In my own mind," he says, "there are two ways to overtake a leader. One is to alter the ground rules by which the leader enjoys a competitive edge. The

other is to redefine the boundaries within which the leader plays. In either case," Porter adds, "information technology can play an important role."

The leaders may use the technology to maintain or enhance their leads, and if the traditional balances-of-power remain relatively unchanged, then the impact of the new strategic tool might be minimal. But if Porter is right—if the rout of entrenched leaders can be accomplished with the deployment of information technology—then the business world really is at the threshold of a new age. If, suddenly, those long-standing balances are thrown into disarray, if the underdogs are suddenly winning where they couldn't win before, and if those victories are coming on the heels of a new online-system deployment, then the power of those systems cannot be denied. It'll no longer be a war just of words, marketing savvy, or financial acumen. It'll be a war of information technology.

Consider this: Can Hertz, which has dominated the car-rental industry for over four decades, be overtaken? Number-two-ranked Avis has always said that it tries harder. But within the last few months, there's been a new twist to that old slogan, with an advertising campaign that talks more about whiz-bang technology than about cars.

"Only Avis offers the technological leadership that delivers state-of-the-art services like rapid return," declares one magazine ad. "It's designed to make car renting faster and easier than ever for you . . . Rapid return is the first and only automated self-service car-return system in car-rental history." (Continued)

Technological Catch-Up

(Continued from page 101)

Around the same time that Avis' new ads were hitting the streets, Avis' president, Joseph V. Vittoria, plugged his company at a travel-industry conference of the American Automobile Association in Hong Kong. Again, the thrust of the pitch was technology.

"Some of you may have seen our rapid-return check-in system at work at many of the major U.S. airports," Vittoria said. "This stand-alone unit handles more than 20 percent of the check-ins during peak periods at the 38 locations where it's now in place. You just punch in your vehicle number, mileage, and gas reading. In about 35 seconds, you receive a computed report for your expense account. There's no need to wait in line because, thanks again to Wizard (the name given to Avis' online, real-time computer system, first implemented in 1972), the rapid-return terminal already knows all the check-out details of your rental."

The roots of such heated-up competition can be traced back to the mid-'70s, when a ruling by the Federal Trade Commission allowed car-rental companies to compete more equally for airport business. And an article by Carol J. Loomis—"The rumble in car rentals"—in the March 7 issue of *Fortune* magazine last year described just how fierce the competition has gotten. "It's war out there in the rental-car business," Loomis wrote.

"Recently in an employee mailing, Avis (No. 2) cartooned Hertz (No. 1) as a corpulent turkey. Hertz's answering slam: 'Infantile.' At No. 3, National, the mood is stern: 'I'll be damned if we'll let them take market share from us,' says an executive. Budget (No. 4) charged Hertz last year with 'sabotaging' an ad campaign, and Hertz has sued Avis, alleging that it 'desperately' stole Hertz employees and trade secrets." And to compete, they've even tried to top each other with free gifts—luggage, toasters, TVs.

The attendant advertising campaigns speak for themselves. "Avis announces more free gifts and more



time to get them." "National Car Rental expands free-gift offer." "Now you get more free bag and baggage from Budget." "Hertz beats the competition on every level. We beat them with gifts if you rent a little. We beat them with gifts if you rent a lot..." And so it goes. But within the fray of such gift-giving wars, as Loomis points out, there can be no winners. Only losers, who would squander their profits on a campaign with no future. Quality of service rather than free luggage is the key to long-term success. And in this regard, there is a growing consensus that information technology will play an increasingly important role. Clearly, with the deployment of its rapid check-in terminals, Avis has a head start in exploiting the potential,



Being the last bank in California to have automatic-teller machines contributed to Bank of America's image as a "sleeping giant," says Peter Hill, senior vice president of consumer delivery systems.

but as Vittoria noted in his Hong Kong speech: "In the not-too-distant future, we expect some of the other major companies in our industry to have state-of-the-art computer capability."

He's right. Directly on the heels of Avis is fourth-ranked Budget. Over the last few years, this company has made impressive gains in market share with an image and a name that price-conscious customers have warmed up to. It is to solidify and expand upon those gains that Budget, within the next three months, plans to implement its own automated check-in technology.

Executive vice president Clifton Haley claims this technology will demonstrate "even more dramatic" capabilities than the Avis system. He is reticent about giving details, but when asked what could be done to improve on what Avis has, he offers several ideas. First, he says, the terminals could be immediately deployed throughout a renter's entire network of agencies rather than just a few. Second, a special slot could be created in the machine to accept any traveler's credit card. Another idea is to give the machine the ability to provide a detailed report of each transaction, rather than just a cash-register receipt. And yet another is to give customers using the terminal the ability to make additional car reservations in any city throughout the country.

"I have to give Avis credit," Haley admits. "The fact that it is the pioneer in using online technology gives it a learning-curve edge. But only recently has that become important. Five years ago, the technology wasn't as good and consumer awareness wasn't as great. However, that's changed. Now, if we weren't close to implementing our own system, we would have a serious liability.... Avis has done it, but we'll top it."

Avis, though, shows no sign of standing still. Speaking in Hong Kong, Vittoria outlined his own vision for the future. "Rapid return will eventually be adapted for vehicle

(Continued on page 106)



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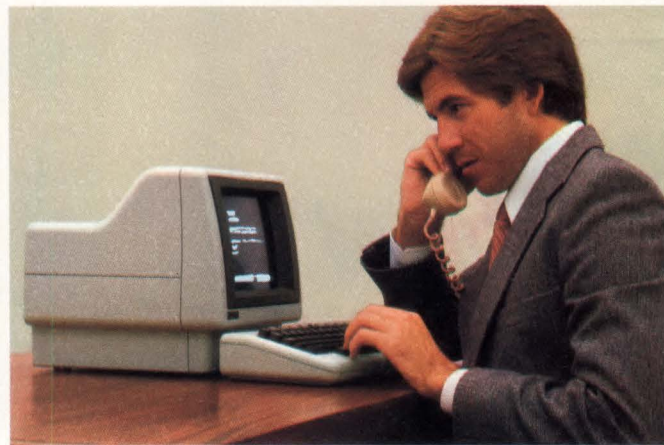
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|-----------------------|---------------------|
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| 2 - Calendar | 12 Database Inquiry |
| 3 - Basic WP | 13 ListKeeper |
| 4 - Personal Filing | 14 Telex |
| 5 - Word Processing | 15 Other Names |
| 6 - Text Processing | |
| 7 - Basic Graphics | |
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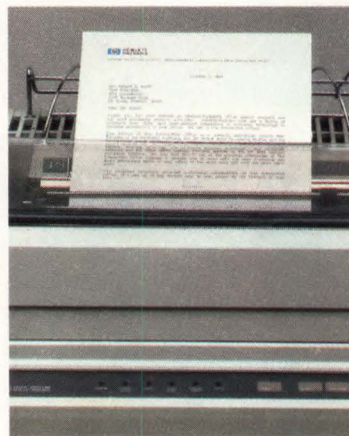
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New desk management software makes it easy for busy executives to handle electronic mail, calendar functions, filing and memos.



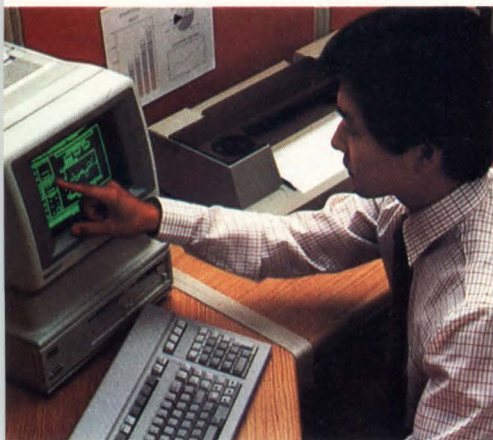
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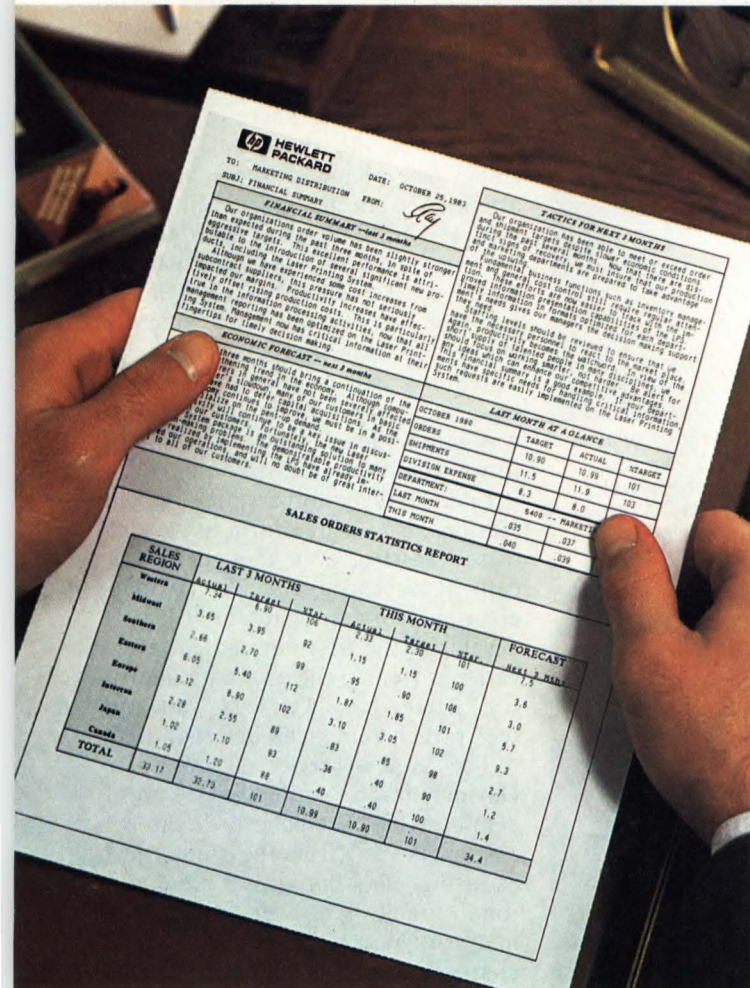


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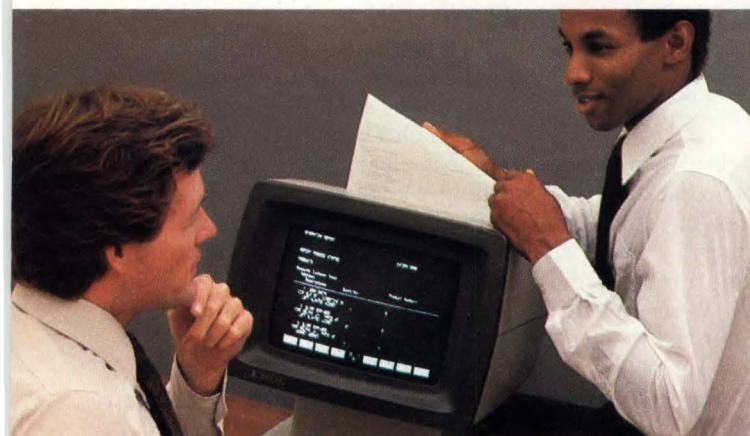


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Technological Catch-Up

(Continued from page 102)

check-out," he said. "There's already a slot designed into the unit for acceptance of credit cards. Later this year, Avis will test-market automated check-out units in the New York metropolitan area . . . Think of it. Once you've made a reservation, you'll be able to walk up to a stand-alone machine, insert your credit card, punch in answers to a couple of simple questions, and your rental agreement will be issued. Then you'll proceed directly to your car, and drive away. And you'll be able to make this automated rental at any location, and go straight to your car at any location in the car-rental company's network." Vittoria added: "The-rent-a-car industry's self-service units won't necessarily be limited to car-rental locations. There's no reason why they can't be situated at high-traffic locations anywhere—like shopping centers, hotel lobbies, remote airline terminals, or office complexes."

The car-rental companies hope to gain another, more subtle benefit than simply making service quicker and more convenient for the customer. By tapping into the online information that comes through the customer terminals each day, both Avis and Budget will be able to plan the growth of their businesses much more precisely. They will be able to cull up-to-the-minute information on which services are being used most, for example, and plan the purchase of their car fleets accordingly. Thus, the terminals will become the antennae through which a rather powerful decision-support system can operate.

It is an ambitious vision. But not everyone is rushing into it. Hertz, the number-one car renter, gives no indication of doing so. Commanding approximately 35 percent of the market share, Hertz pioneered the whole idea of car renting back in 1918, before there ever was an Avis or a Budget. This head start has been a tremendous advantage for Hertz. But, as far as implementing state-of-the-art technology goes, Hertz has not been the front-runner.

These days, the mood at Hertz is



"We're not looking at what everyone else is doing to catch up. We just want to manage our business well."

Cook, F.W. Woolworth



"We believe that within two or three years, we'll be able to overtake Merrill Lynch in multi-service accounts."

Plumeri, Shearson

expressed with carefully phrased skepticism. "There's no question that Hertz is putting a lot of effort into information technology," says vice president of market research and planning, Thomas Werbe. "But whether rapid return is the maiden's prayer, I don't know. I can tell you this, however: From our own market research, we've learned that customers using Avis' terminals are taking a

lot longer than 35 seconds to complete transactions. There's a certain amount of impersonalization in these changes, too. . . . You ask why Hertz doesn't have rapid-return machines now. One reason is that we believe human contact is still very important for our customers. There are always going to be situations that the machines can't handle, where personal attention is needed to expedite the process." Still, Werbe concedes, car renting is a fast-changing business, and if self-service terminals were to catch on, Hertz would undoubtedly change its tune in a hurry. "We're watching rapid return very closely," he says. "And if we thought that Avis was gaining market share because of it, we would respond very quickly."

Like Hertz, number-three-ranked National is also lukewarm to the idea of self service, even though historically it has been no slouch on computerization. (As far back as 1968, it developed the first automated reservation system in the car-rental industry.) Here, too, it's "let's wait and see" rather than "let's dive right in."

The issue is service, according to David Johnson, National's vice president of MIS. "We believe we can get customers away from the counter just as fast as Avis but with a more personal touch. However, it's also a matter of perception, and if a lot of customers begin to perceive the rapid-return terminals as faster, then we probably will feel compelled to respond."

On being first

To what extent car-rental companies lock horns in a war of technology has yet to be seen. But with the shadows of such a war already on the horizon, it is clear that each of the four leading contenders has staked out a position. On the one hand, Avis and Budget have decided to dive right in, hoping for early gains while the high-tech paraphernalia is still a relative novelty. Hertz and National, on the other hand, have decided to watch and wait and let somebody else test the waters. Each strategy has its merits—while there are potential

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Technological Catch-Up

(Continued from page 106)

competitive advantages to being first, there are also potential advantages to waiting and learning from the other guy's mistakes. Ultimately, of course, it comes down to a question of perceived risk.

How harmful, for example, was it for the Bank of America—the nation's second-largest bank—to be the last California bank to install automatic-teller machines (ATMs)? That's debatable.

It's true that being last with ATMs went a long way toward creating the negative image the bank has of being a "sleeping giant," acknowledges Bank of America's senior vice president in electronic banking, Peter Hill. And there is reason to suspect that B of A did lose the business of younger customers opening up accounts in the late 1970s. But it's also true that since it decided to commit its resources to ATMs about four years ago, deployment has been rapid. This year, it expects to have the largest ATMs network of any bank in the state.

Another debatable point is how significant Merrill Lynch's current lead in offering multi-service accounts is. When the New York-based brokerage house introduced its Cash Management Account (CMA) five years ago, it shook up the financial-



services community considerably. A triumph of information technology as much as anything else, the CMA allows customers to trade securities, write checks, invest in mutual funds, enjoy a line of credit, and earn interest on any uninvested cash at money-market rates—all within one account. And if it's any indication of how successful CMA has been, banks and brokerage houses all over the country have since jumped into the fray with their own central-asset accounts. Among them is Shearson/American Express. Its contribution to the marketplace—Financial Management Account, or FMA—is less than two years old.

"Merrill Lynch's head start may be an advantage," acknowledges Joseph Plumeri, an executive vice president at Shearson. "But, you know, when CMA was first introduced, the product was so new and creative, a lot of people couldn't understand it. We think we're in a good position," Plumeri adds, "and we believe that within two to three years we'll be able to overtake Merrill Lynch."

Currently, Shearson has about 50,000 customers signed up to its FMA, whereas Merrill Lynch has 900,000. That's a sizable lead for Merrill Lynch, but it should be noted that the potential market is estimated at 17 million, so there's lots of room for a competitor like Shearson to catch up.

It's not always OK to be the runner-up, however. For certain applications in certain marketplaces, being first can represent a tremen-

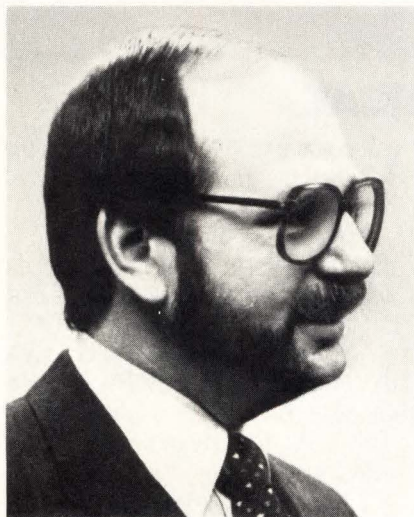
dous edge. As Harvard's Parsons warns: "If someone else does it first, you may end up so far behind you'll never catch up."

Over one such edge in a particular industry, formal complaints have already been filed. Competitive airlines are charging that United and American use systems that give the two an "unfair" advantage. The systems, called Apollo and Sabre respectively, let travel agencies—some 50,000 at last count—book flights at the touch of a few keys. Though agents can actually use these systems to make reservations on any airline, the other airlines charge that a powerful bias severely hampers their ability to compete. Specifically, they say that when an agent gets a visual display of what's available from a United or American terminal, the United or American flights always get the most eye-catching positions on the screen.

"The Civil Aeronautics Board's staff is investigating the anticompetitive bias and problems created by the computer-reservation systems," Alan Pollock, director of public affairs, told *Computer Decisions* several months ago. He promised that the Board "will draw up guidelines that redefine the systems and make them more competitive."

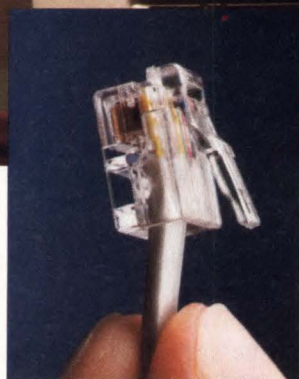
In the meantime, other airlines are making do as best they can. TWA, for one, has come up with its own alternative—Program Airline Reservation System (PARS)—that it's trying to turn travel agents on to. But, because American and United committed significant resources to their systems four years before TWA did, it is unlikely that TWA will ever catch up. It's very difficult to dislodge a competitor's terminal once it's on a travel agent's desk.

In recognition of this principle, Pan American has opted for a strategy of cooperation rather than confrontation. Staging an impressive comeback after suffering through several very lean years, Pan Am is trying to establish the best connection through the automated systems that are already out there. "We've worked hard to ensure that our



"It's not a question of catching up with anyone. It's a question of serving our own needs."

Berger, Barnes & Noble



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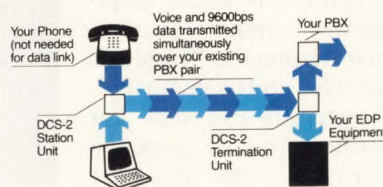
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CIRCLE 56

Technological Catch-Up

(Continued from page 108)

flights get the best possible position on those systems," says James Harding, Pan Am's vice president of communications.

But it's more than just a question of securing a good position, Harding says. It's also a question of developing a good connection. Through American's Sabre system, for example, an agent can actually tap into Pan Am's computers either to corroborate what Sabre is saying or provide additional information—information like the cost of a complex international itinerary.

Actually, at this writing, the software is still in development, but when it's completed, Harding notes, travel agents will be able to quickly determine the lowest price for an extended trip abroad. All the agent will have to do is key in where the customer wants to go—say, Spain, Portugal, Italy, and France—and the system will automatically compute the cost, figuring into the calculation all the complex rules of international pricing. It's not a cheap system to build, and there is no guarantee that more business will be gained by it. And yet, declares Harding: "We know it will have a positive effect."

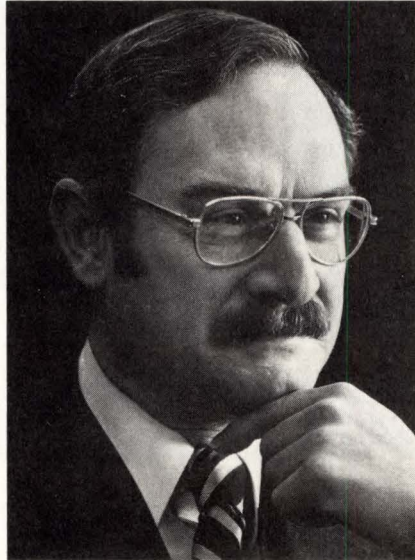
Operative assumption

Clearly then, the operative assumption is: If you can get them into your computer, you can get them to buy more of what you're selling. But with some companies it's more than just an assumption. It's documented fact.

Such is the case for American Hospital Supply Inc. in Evanston, IL. Like Johnny Appleseed, company sales reps—as far back as the mid-'70s—were traveling from one hospital administrator's desk to another, planting their terminals. Terminals directly connected to the company's order-entry system in Evanston. For the administrators, this is a quick and convenient way to order and keep track of purchases. For American Hospital Supply, it's a way to lock in its customers—because if you use its terminals, you have to buy its products. And it is that sort of power that

has allowed American Hospital to dominate the marketplace.

"I know of some competitors who have since tried to challenge American Hospital by offering alternative systems," says Parsons, who has



Robert Gould, president of Fidelity Brokerage Services Inc., believes that if his company hadn't built a system that offers direct access to the stock market, staying in business would have been difficult.



Clifton Haley, executive vice president of Budget Rent A Car Corp., says his company's automated check-in system will demonstrate "even more dramatic" capabilities than the Avis system.

studied the case. "But the administrators didn't want to learn a new system. And they certainly didn't want more terminals on their desks."

Another company that credits its success to a computer system that locks in its customers is Boston-based Fidelity Brokerage Services Inc. Founded in 1979, Fidelity has already become the second-largest discount brokerage house in the country—just behind Charles Schwab Inc. Expressing his regard for the \$8 million system built to help achieve that end, company president Robert L. Gould declares: "Without the system, we wouldn't have a prayer."

The system directly connects brokers to the stock market so that they can query and trade without having to hunt down scribbled-up pieces of paper or make time-consuming calls. That makes Fidelity's brokers more productive, and eliminates the need to purchase services from outside computer companies, Gould notes. But, it's Fidelity's success in selling the system to banks that has really made the competitive difference. To date, about a hundred of the nation's largest banks are tapping into Fidelity's system through terminals. As Gould describes the arrangement: "If my terminals are there, they deal only with me."

It's that sort of arrangement that illustrates how, in no uncertain terms, information technology can play a central role in helping a company get and keep a bigger piece of the action. But there are also other ways that the technology can be put to effective use—ways that perhaps aren't so blatantly related to improving market share, and that can have that effect, nevertheless. In fact, any productivity-boosting device will ultimately make a company more competitive, if for no other reason than that it frees employees to do a better job with more sales-oriented responsibilities. That is what John Scallan maintains. As manager of business-systems development for the Firestone Tire and Rubber Company—another organization on the

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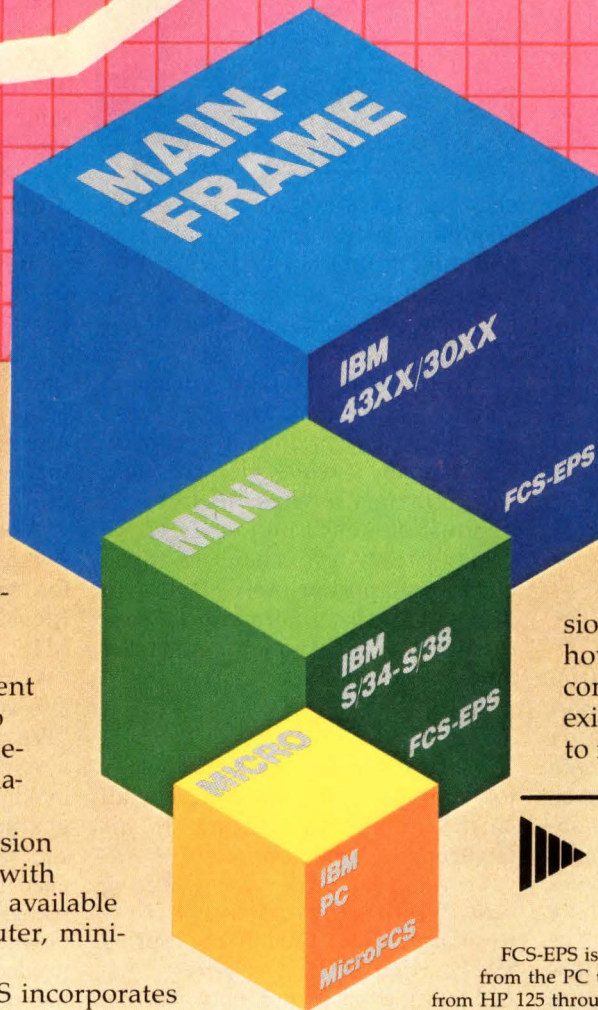
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Technological Catch-Up

(Continued from page 110)

comeback trail—Scallan oversees the installation of sophisticated point-of-sale terminals to over 1,500 of the company's auto-care outlets.

The automation in itself does not mean more lube jobs will be sold. But circumstances may very well turn out that way. "The terminals will provide a couple of advantages for us," Scallan explains. "First, they will allow the store managers to better manage their territory. Managers will be able to tell customers what's available without leafing through a bunch of catalogs. And second, they'll give the managers more free time. Time to be more sales- and service-oriented rather than administration-oriented."

One intriguing question—the subject of much debate—is: To what ex-



Massachusetts Mutual is projected to earn a \$6 million profit after losing a total of \$32 million in 1980 and 1981. The difference between then and now is that now, Massachusetts Mutual has Magnet.

"The system has been crucial in helping us determine what to charge our clients," says John Lowenberg, the company's senior vice president of information services. "Before, our information wasn't up-to-date, so we couldn't react fast enough to adjust our rates appropriately. But with Magnet, all that information is captured online, and now we can react much more quickly."

Inadvisable assaults

When deploying one's technology for strategic gain, however, not all battles are worth fighting. In his forthcoming book, *Competitive Advantage: Techniques for Creating and Sustaining Superior Performance*, (The Free Press, Spring 1984) Michael Porter writes: "Attacking a good leader may worsen, not improve, a challenger's profitability if the umbrella provided by the good leader is lost in the process. A challenger may not want to attack the leader at all if industry structure is attractive and the leader is a good leader." One might conclude, therefore, that just as aggressiveness is a favorable combat trait, so is judiciousness. And that's a point with which Barnes & Noble Bookstores Inc. would agree.

Compared to retail book-selling chains like B. Dalton Inc., which has

been a pioneer in the use of inventory control and point-of-sale technology, Barnes & Noble is given little credit for being a technological innovator. In fact, the company's own dp manager observes: "We're in the stone age by comparison." But Bruce Berger, the company's chief financial officer, maintains that Barnes & Noble hasn't automated to the extent that B. Dalton has because its needs are different. "We don't sell books in the same way that B. Dalton does," he explains. "Many of our books, rather than being reorderable, are specially priced close-outs from the publisher. So, it would be of no advantage to us to develop a system that would track their sales on a day-by-day basis."

Though Berger maintains that there is no need for a full-blown point-of-sale system, he does recognize a need to better track the stock that is reorderable—about 25 percent.

Another company whose image suggests a less-than-startling record for innovation is F.W. Woolworth's Inc. Kathleen Cook, vice president of MIS, echoes Berger's sentiments. "We're not looking at what everyone else is doing to catch up," she says. "We just want to manage our business well." Like Berger, too, Cook is looking at point-of-sale technology guardedly. "POS is very expensive," she says, "and we definitely don't need it in all our stores." Cook also recognizes that there are parts of the business where new technology is needed. "We're not in trouble or losing money," she notes, "but in the years ahead we'll have to modernize our stores and continue to grow."

The power

True, there are some battles that are not worth fighting. Battles that either cannot be won or won't yield valuable booty. But of the battles that are being waged now in business for bigger market shares, profits, and pieces of the action, an increasing number are hinging ever-more critically on the deployment of information technology. □

Many companies are seeing the implementation of information technology as the way to beat the competition.

tent are market-share gains attributable to the use of decision-support systems? In his book, *Decision Support Systems: Current Practice and Continuing Challenges* (Addison Wesley, 1980), Steven L. Alter observes: "The development of modeling and data-retrieval technologies is not inexpensive, and the immediate benefits are not always clear. The justification for much of the initial work is necessarily based on pure faith. It is difficult to quantify the benefits from such efforts, even after they have attained momentum." Arguing that there is a connection between increased profits and the workings of a decision-support system is, necessarily, based on circumstantial evidence. But, as time goes on, the evidence is becoming overwhelming. Take the case of Magnet, the \$20 million online decision-support system at the group life and health division of Massachusetts Mutual Life Insurance Co. This year, Massa-

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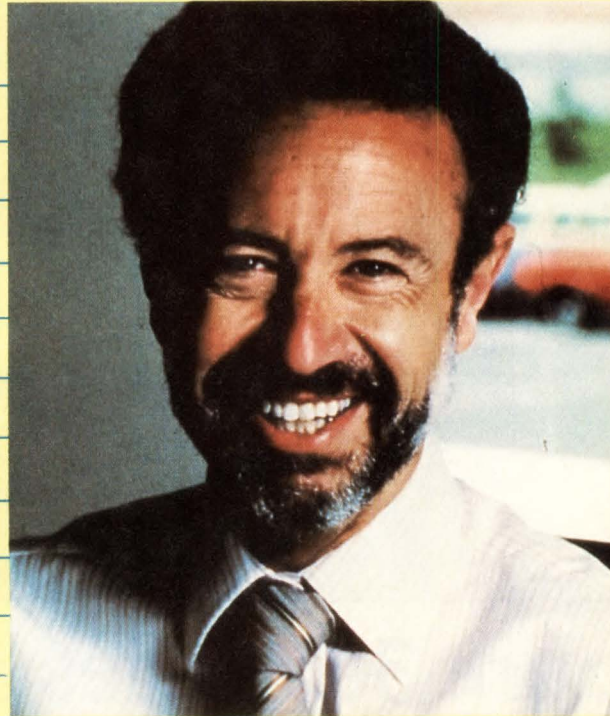


Photo courtesy of Intel Corp.

THE BUSINESS OF MEETINGS IS BUSINESS

Rather than avoiding meetings, you should make better use of these media of productive management.

by Andrew S. Grove

Meetings have a bad name. One school of management thought considers them the curse of the manager's existence. A study found that managers spend up to 50 percent of their time in meetings, and implied that this time is wasted. Peter Drucker once said that if a manager spends more than 25 percent of his or her time in meetings, he or she is guilty of malorganization,

and William H. Whyte Jr., in *The Organization Man*, described meetings as "noncontributory labor" that managers must endure.

But there is another way to view meetings. A big part of a middle manager's work is supplying information and know-how—imparting the preferred method of handling matters to the groups under his

or her control or influence. A manager also makes and helps to make decisions. Both kinds of managerial tasks can only be completed during face-to-face encounters, and therefore only during meetings.

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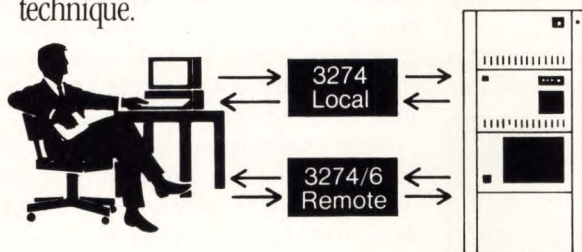
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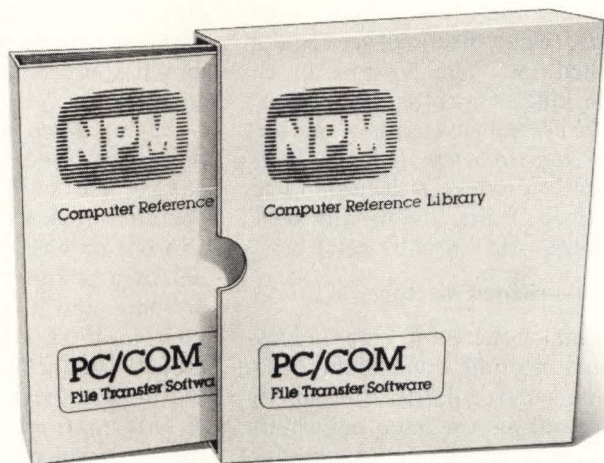


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Andrew Grove

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rather using the time spent in them as efficiently and effectively as possible.

The two basic managerial roles produce two fundamental kinds of meetings. In the first kind, called a *process-oriented meeting*, knowledge is shared and information is exchanged. Such meetings are regularly scheduled. The purpose of the second kind of meeting is to solve a specific problem. Sessions of this sort, called *mission-oriented meetings*, frequently produce a decision. They are ad hoc affairs, and usually aren't scheduled—they usually can't be.

Process-oriented meetings

To make the most of a process-oriented meeting, you should aim to infuse it with regularity. The employees attending the meeting should know how it will be run, what kinds of substantive matters will be discussed, and what will be accomplished. A meeting should allow you to handle transactions as if you were setting them up for batch processing on a computer. The same time and effort it takes to set up batch transactions can take care of management tasks that are similar.

Moreover, given the regularity of the session, you and the other attendees can begin to forecast the time required for the kinds of work to be done. Hence, a "production-control" system, as recorded on various calendars, can take shape, which means that a scheduled meeting will have a minimal impact on the work of other employees.

At Intel, we use three kinds of process-oriented meetings: the one-on-one, the staff meeting, and the operation review.

A one-on-one at Intel is a meeting between a supervisor and a subordinate, and it is the principal way their business relationship is maintained. The meeting's main purposes are mutual learning and exchanges of information. By talking about specific problems and situations, the supervisor teaches the subordinate his or her skills and know-how, and suggests ways to approach problems. At the same time, the subordinate provides the supervisor with detailed information about specific tasks and problems.

Regularly scheduled one-on-ones are highly unusual outside of our

company. When I ask a manager from another company about the practice, I usually get an "Oh no, I don't need scheduled meetings with my supervisor [or subordinate]; I see him several times a day . . ." But there is an enormous difference between a casual encounter between supervisor and subordinate—or even a meeting to resolve a specific problem—and a one-on-one.

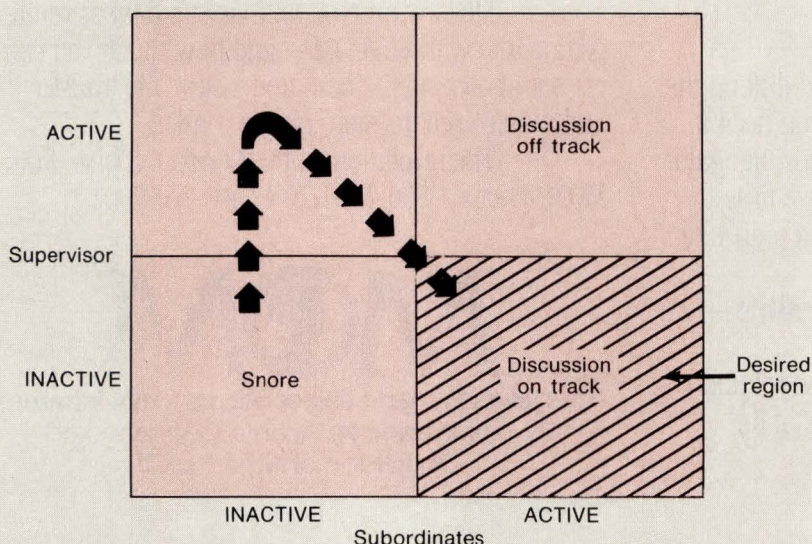
When Intel was a young company, I realized that even though I was expected to supervise both engineering and manufacturing, I knew very little about the company's first product line, memory devices. I also didn't know much about manufacturing techniques, my background having been entirely in semiconductor-device research. So two of my associates, both of whom reported to me, agreed to give me private lessons on memory design and manufacturing.

These sessions took place by appointment, and demanded that the teacher/subordinates make preparations. During each session, the pupil/supervisor busily took notes, trying to learn. As Intel grew, the tone and spirit of these initial one-on-ones endured and grew.

Who should have a one-on-one? In some situations, a supervisor should meet with all those who work under him or her, from professionals to production operators. But more important are one-on-ones between supervisors and each of the professionals who directly report to them. These meetings are our subject.

How often should you have one-on-ones, or how do you decide how often an employee needs such a meeting? The answer to these questions will depend on the *job- or task-relevant maturity* of each of your subordinates. In other words, how much experience does a given subordinate have with the specific task at hand? This is not the same as the subordinate's age or level of general experience. The most effective management style in a specific instance varies from very close to very loose supervision as a subordinate's task maturity increases. You should have one-on-ones fre-

The meeting matrix



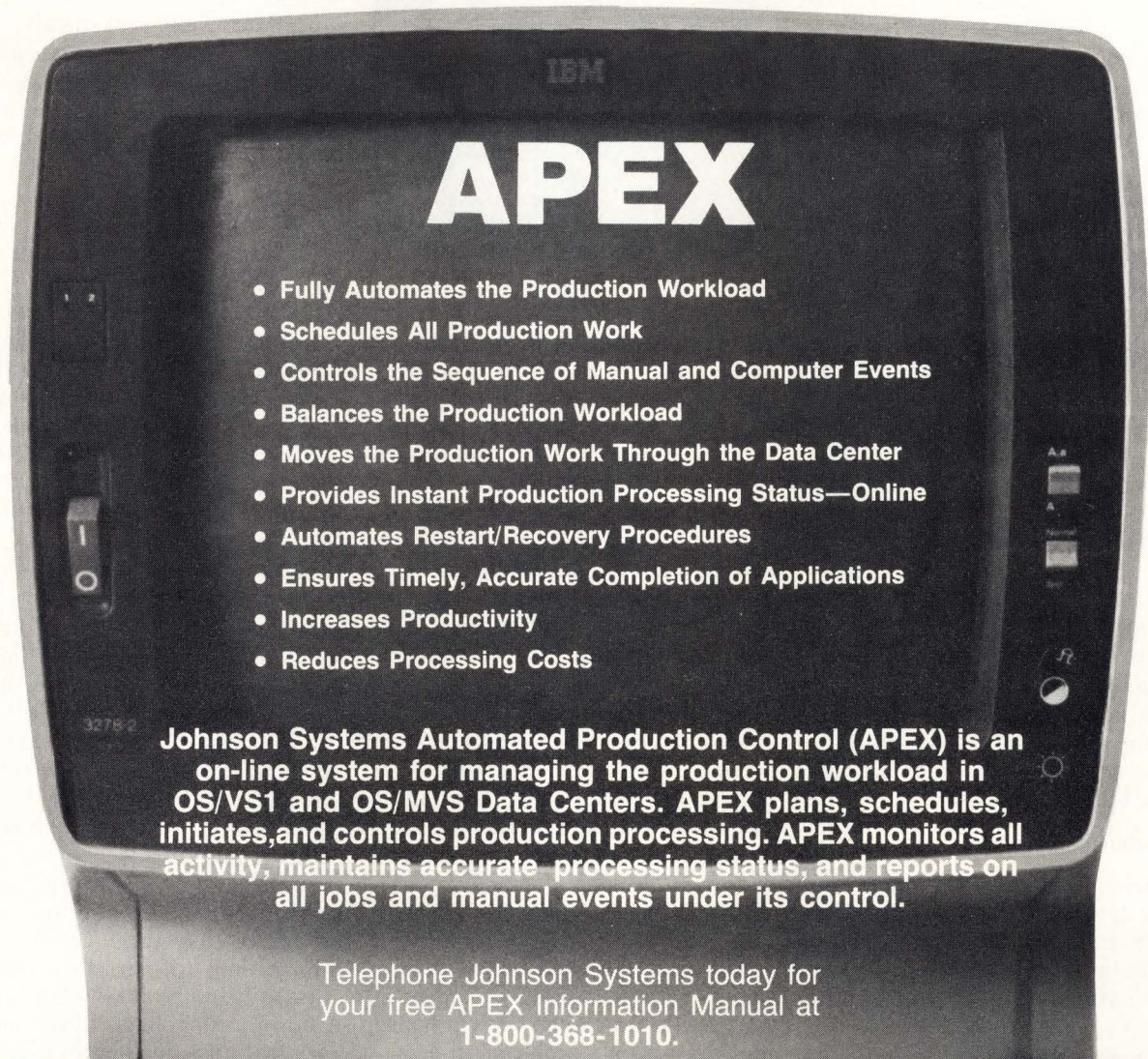
At a staff meeting, the supervisor should strive to keep the discussion on track, and let the subordinates work out the issues.

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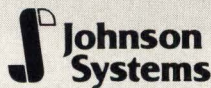


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quently (perhaps once a week) with a subordinate who is inexperienced in a specific situation and less frequently (perhaps once every few weeks) with a veteran at the task.

Another consideration is how quickly circumstances change in a job. If you're managing online computing, for example, the pace may be so rapid that you'll need to have frequent one-on-ones to keep up with what's happening. But for managers responsible for batch processing, life may be quieter, and less frequent meetings may suffice for a given level of task-relevant maturity.

How long should a one-on-one meeting last? There really is no answer to this question, but the subordinate must feel there is enough time to broach and get into thorny issues. Look at it this way: If you have a big problem you want to kick around with your supervisor—the person whose professional interest in the matter is second only to yours—would you want to bring it up in a meeting scheduled to last only 15 minutes? Certainly not. A one-on-one should last an hour at minimum. Anything less tends to make the subordinate confine him- or herself to simple or superficial problems that can be handled quickly.

The subordinate's turf

Where should a one-on-one take place? In your office, or somewhere else? You should have the meeting in or near the subordinate's work area, if that's possible. You can learn a lot simply by going to a subordinate's office. Is he or she organized? Does the subordinate repeatedly have to waste time looking for pertinent documents? Does he or she get interrupted all the time? And in general, how does the subordinate approach his or her work?

Indeed, the one-on-one should be regarded as the *subordinate's* meeting, with its agenda and tone set by him or her. There's a good reason for this. Somebody needs to prepare for the meeting. If you've got eight subordinates, you'd have to prepare eight times. But each subordinate



will only have to prepare once.

Each subordinate should prepare an outline, which will force him or her to think through in advance all of the issues and points that could come up. Moreover, with an outline, the supervisor knows at the outset what is to be covered and can therefore help to set the pace of the meeting according to the "meatiness" of the items on the agenda. An outline also provides a framework for supporting information, which the subordinate should prepare in advance. The subordinate should then walk the supervisor through the material.

What should be covered in a one-on-one? You can start with performance figures, the trend indicators used by the subordinate, such as incoming-order rates, production output, or project status. Emphasis should be on indicators that signal trouble.

The meeting should also cover anything important that has happened since the last meeting: current hiring problems, people problems in general, organizational problems and future plans, and—most importantly—*potential* problems. Even when a problem isn't tangible, even if it's only an intuition that something's wrong, a subordinate owes it to you to speak up. By doing so, he or she will trigger a look into the organizational "black box." The most important criterion governing matters to be talked about is that they be issues that pre-occupy and nag the subordinate. These are often obscure and take time to surface, consider, and resolve.

What is the role of the supervisor in a one-on-one? You should facilitate the subordinate's expression of what's going on and what's bothering him or her. You are there to learn and to coach. Peter Drucker sums up the supervisor's job very nicely: "The good time-users among managers do not talk to their subordinates about their problems, but they know how to make the subordinates talk about theirs."

Ask one more question

How can you bring problems to the surface? By applying Grove's Principle of Didactic Management: *Ask one more question!* When the subordinate has said all he or she wants to about a subject, ask another question. Try to keep the flow of thoughts coming by prompting the subordinate with queries until *both* of you feel satisfied you've gotten to the bottom of a problem.

I have some mechanical hints for effective one-on-one meetings. First, both the supervisor and subordinate should have a copy of the outline and both should take notes about the discussion of it. The notes serve a number of purposes. I take notes in just about all circumstances, and most often end up never looking at them again. I do it to keep my mind from drifting, and also to help me digest the information I hear and see. Because I take notes in outline form, I am forced to logically categorize the information, and therefore absorb it.

Equally important is what "writing it down" symbolizes. Many one-on-ones lead to a decision requiring action on the part of the subordinate. When he or she takes a note immediately following the supervisor's suggestion, like a handshake, the act implies a commitment that something will be done. The supervisor, also having taken notes, can then follow up at the next one-on-one.

A real time-saver is using a "hold" file where both you and your subordinates accumulate important, but not altogether urgent, issues for discussion at the next scheduled meeting. This file applies the production



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principle of batching to meetings, and saves time for both supervisor and subordinate by minimizing the need for ad hoc contact—like phone calls, drop-in visits, and so on—which constitutes the interruptions we considered earlier.

You should also encourage the discussion of heart-to-heart issues during one-on-ones, because these are the perfect forums for getting at subtle and deep work-related problems affecting subordinates. Is the subordinate satisfied with his or her own performance? Does some frustration or obstacle gnaw at him or her? Does he or she have doubts about where the job is headed? However, be wary of the “zinger,” which is a heart-to-heart issue brought up at an awkward time. More often than not, these come near the end of a meeting. If you let that happen, the subordinate might tell you something like he’s unhappy and has been looking for a job, and give you only five minutes to deal with it.

Long-distance telephone one-on-ones have become necessary because many organizations are spread out. But these can work well enough with proper preparation and attention: The supervisor must have the outline before the meeting begins, both parties should take notes, and so on. Because you can’t see the other participant in the meeting, note-taking can’t work in the same way as it does in a face-to-face meeting. Exchanging notes after the meeting is a way to make sure each participant knows what the other is committed to do.

One-on-ones should be scheduled on a rolling basis—set up the next one as the meeting taking place ends. Other commitments can thereby be taken into account and cancellations avoided. If the supervisor uses a set schedule for a one-on-one, such as every second Wednesday morning, and if the subordinate’s vacation happens to fall on that date, the meeting is not going to occur. By scheduling on a rolling basis, this can be easily avoided.

What is the leverage of the one-on-one? Let’s say you have a one-on-one

with a subordinate every two weeks, and it lasts one and a half hours. Ninety minutes of your time can enhance the quality of your subordinate’s work for two weeks, or for some 80-plus hours, and also improve your understanding of what he or she is doing. Clearly, one-on-ones can exert enormous leverage by helping to pool information in a common base and encouraging subordinates to work in a way that complements your style. Also, one-on-ones are the only way efficient and effective delegation can take place.

A subordinate’s teachings are absolutely essential if the supervisor is to make good decisions. During a recent one-on-one meeting [before the current economic upswing began], my subordinate, who is responsible for sales, reviewed trend indicators of incoming orders. Although I was

“A meeting is nothing less than the *medium* through which managerial work is performed.”

vaguely familiar with them, he laid out specific information and convinced me that our business had stopped growing. Even though the summer is usually slow, he proved that the slowdown was not seasonal in nature.

After we pondered the data for a while and considered their relationship to other indicators of business activity in our industry, we came to the reluctant conclusion that business was indeed slowing down. This meant we should take a conservative approach to near-term investment—no small matter.

By sharing his base of information with me, my subordinate and I developed a congruent attitude, approach, and conclusion: conservatism in our expansion plans. He left the meeting having decided to scale back growth in his own area of responsibility. I left having decided to share what we had

concluded with the business groups I supervise. Thus, this one-on-one produced substantial leverage: The sales manager affected all the other managers who report to me.

To digress a bit, one-on-ones at home can help family life. As the father of two teen-age daughters, I have found that the conversation in family “meetings” is very different in tone and kind from what we say to each other in other circumstances. The one-on-one makes each of us take the other seriously and allows subtle and complicated matters to come up for discussion. Obviously, no notes are taken, as we usually go out for dinner at a restaurant, but a family one-on-one very much resembles a business one-on-one. I strongly recommend both practices.

Staff meetings

A staff meeting is one in which a supervisor and all of his or her subordinates participate, and which therefore presents an opportunity for interaction among peers. Peer interaction—especially decision-making by a group of peers—is not easy. Yet it is a key to good management. The approach to decision-making that we advocate depends on a group of peers working well together.

Staff meetings also create opportunities for the supervisor to learn from the exchanges and confrontations that may develop. I get a better understanding of an issue with which I am not familiar by listening to two people with opposing views discuss it than I do by listening to only one side.

My first experience with staff meetings dates to my early professional years. Everyone in my group worked on an isolated aspect of a problem or on a different problem altogether. I was supposed to be the supervisor, but I found that others in the group often were more familiar with the work of a certain researcher than I was. Thus, a group discussion of any subject tended to get more detailed and more heated than an exchange between me and one other specialist. But these meetings were

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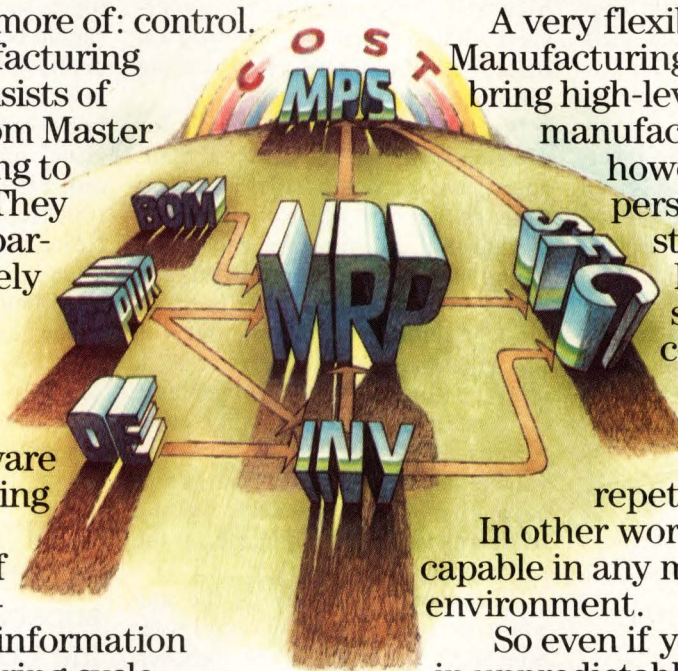
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Andrew Grove

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also more rewarding than one-on-ones between me and a specialist.

What should be discussed at a staff meeting? Anything that affects more than two of the people at the meeting. If the discussion degenerates into a conversation between two employees working on a problem affecting only one of them, you should break it off and move on to a topic that will include more of the staff, while suggesting that the two continue their conversation later.

The question of structure

How structured should the meeting be? Should it be a free-for-all brainstorming session or a controlled forum with a detailed agenda? Most meetings should be controlled, with an agenda issued far enough in advance to enable subordinates to prepare for the meeting. But meetings should also include an "open session"—a period designated for the staff to bring up any topic. During

"We should not be fighting the existence of meetings, but rather using the time spent in them more efficiently."

this part of the meeting, housekeeping matters can be disposed of and important new issues can be given a tentative first look. If it's justified, you can plan for a more formal discussion of an issue in the scheduled portion of a future meeting.

What is the role of the supervisor in the staff meeting—a leader, observer, expeditor, questioner, decision-maker? The role, of course, combines all of these. Please note that *lecturer* is not included on the list. You should never use staff meetings to pontificate, which is the surest way to undermine free discussion and, hence, the meeting's basic purpose.

The accompanying chart shows that the supervisor's most important roles are being a meeting's moderator



and facilitator, and controller of its pace and thrust. Ideally, the supervisor should keep the meeting on track, with the subordinates working through the issues.

Staff meetings are ideal media for decision-making if the gathered managers have worked together for a long time. In that case, the formal, as well as informal, authority of each individual has been well established, and everybody knows who likes to spout off, who tends to daydream, and who has expertise in a particular area. A staff meeting is like the dinner-table conversation of a family, while other forums of interaction at work, involving employees who don't know each other very well, are like a group of strangers having a meal at the same table.

The operation review is the medium of interaction for employees who don't otherwise work together. The format should include formal presentations, in which managers describe their work to managers who are either superiors or peers. The basic purpose of an operation review at Intel is to foster continued teaching and learning among employees separated by several organizational levels—employees who don't have one-on-ones or staff meetings.

This is important for both junior and senior managers. The junior manager will benefit from the comments, criticisms, and suggestions of the senior manager, who in turn will get a better feel for problems from the employees who are most familiar with their details. Such meetings are also a source of motivation: Managers making the presentations will want to leave a good impression on both their supervisors and on their outside peers.

Who are the players at an oper-

ation review? The organizing manager, the reviewing manager, the presenters, and the audience. Each has a distinct role to play if the review is to be a useful one.

The supervisor of the managers making presentations should organize the meeting. He or she should help the presenters decide which issues should be addressed, which topics should be left out, which ideas should be emphasized, and how much detail should be provided. The supervisor should also be in charge of housekeeping (the meeting room, visual materials, invitations, and so on). Finally, he or she should be the timekeeper, scheduling the presentations and keeping them moving along.

Although it's hard to judge in advance the time needed for any discussion, the supervisor has presumably had more experience than subordinates running meetings. In any case, the supervisor should pace

"Staff meetings create opportunities for the supervisor to learn from the confrontations that often develop."

the managers making presentations using inconspicuous gestures, so that a manager making a presentation doesn't suddenly run out of time without covering all relevant points.

The reviewing manager is the senior supervisor and the target of the review. This player has a very important, although more subtle, role to play. He or she should ask questions, make comments, and impart the appropriate spirit to the meeting. He or she is the catalyst needed to provoke audience participation, and by example, encourage free expression. The reviewing manager should never preview the material because that will prevent him or her from responding spontaneously. Because the senior supervisor is a role model for the junior managers at the meeting, he or

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Andrew Grove

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she should take this role extremely seriously.

The managers presenting reviews—a group of project supervisors, for example—should use visual aids like overhead transparencies as much as possible. People are endowed with eyes and ears, and the simultaneous use of both definitely helps them understand the points being made. But care must be taken because all too frequently, a presenter gets so obsessed with getting through all of the visual material that the message is lost as the charts are flipped.

As a rule of thumb, I recommend a limit of four minutes of presentation and discussion per visual aid, which can include tables, numbers, or graphics. The presenting manager must highlight whatever he or she wants to emphasize with a pen or pointer. However, a presenter must also watch the audience like a hawk. Facial expressions and body language, among other things, yield

"The one-on-one meeting should be regarded as the *subordinate's* meeting, with its agenda set by him or her."

clues about whether the audience is getting the message, or whether a topic is unclear and should be explained again. These signs also tell the presenter whether or not the presentation is boring and should be speeded up.

The audience at an operation review also has a crucial part to play. One of the distinguishing marks of a good meeting is that the audience participates by asking questions and making comments. If you avoid the presenter's eyes, yawn, or read the newspaper, it's worse than not being at the meeting at all. Lack of interest undermines the confidence of the presenting manager.

Remember that you are spending a big part of your working day at the



review. Make that time as valuable for yourself and your organization as you can. Pay attention and jot down ideas you've heard that you might try. Ask questions if a point is not clear to you and speak up if you can't go along with an approach that's being recommended. And if a presenter makes a factual error, it is your responsibility to go on record about it. Remember, you are being *paid to attend* the meeting. It is not meant to be a siesta in the midst of an otherwise busy day. Regard attendance at the meeting as what it is: work.

Unlike a process-oriented meeting, which is a regularly scheduled affair held to exchange knowledge and information, the mission-oriented meeting is usually ad hoc and designed to generate a specific output, frequently a decision. The key to success is the chairman, or leader of the meeting. Very often, no one is officially given the chair, but by whatever name, one employee usually has more at stake in the outcome of the meeting than the others.

The manager who holds the chair, either by design or default, usually calls the meeting, and most of what he or she contributes should occur before the meeting begins. All too often the leader shows up as if he or she were just another attendee, hoping that matters will develop as desired. When a mission-oriented meeting fails to accomplish the purpose for which it was called, the blame belongs to the chair.

Thus the leader must have a clear understanding of the meeting's objective—what needs to happen and which decision has to be made. The absolute truth is that if you don't know what you want, you won't get it. So before calling a meeting, ask yourself: What am I trying to accom-

plish? Then ask, is a meeting necessary? Desirable? Justifiable? Don't call a meeting if all the answers to those questions aren't yes.

An estimate of the dollar value of a manager's time, including overhead, is about \$100 per hour. So a meeting involving 10 managers for two hours costs the company \$2,000. Most expenditures of \$2,000 must be approved in advance by senior staff—like buying a copying machine or making a transatlantic trip—yet a manager can call a meeting and commit \$2,000 worth of managerial resources at a whim.

Determine the purpose of a meeting before committing your time and your company's resources. Even if you're just an invited participant, you should ask yourself if the meeting—and your attendance—is desirable and justified. If you don't believe it is, tell the leader. If a meeting makes no sense, get it called off early, at a low-value-added stage, and find a less costly way (a one-on-one meeting, a telephone call, a note) to pursue the matter.

Assuming the meeting does need to take place, and you're chairing it, you've got obligations. First, you must identify who should attend and try to get those employees to come. It is not enough to ask employees and then hope for the best; you must follow up and get commitments. If an invited employee can't make it, see to it that he or she sends a subordinate with the power to speak on his or her boss' behalf.

Limit the guest list. If more than six or seven employees attend, the meeting will be more likely to bog down. Eight employees should be the absolute cutoff. Decision-making is not a spectator sport—onlookers get in the way of what needs to be done.

The chair is also responsible for maintaining discipline. It is criminal for you to allow employees to waste everybody's time by being late. Wasting time really means wasting the company's money, and the meter is ticking away at the rate of \$100 per hour per employee. Don't worry about confronting the late arriver—

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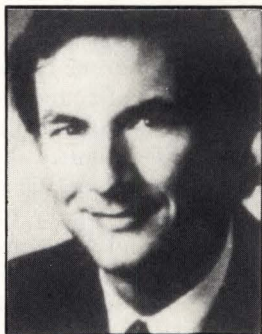
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77 minutes



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IN SEARCH OF EXCELLENCE On this tape Peters reveals the eight simple (and successful) management practices of top corporations, with specific examples. One of Peters's most controversial tenets is that "thinking small" is appropriate for corporate America.

52 minutes



Denis Waitley, Ph.D. is a national authority on high-level performance and personal development. A distinguished educator, Dr. Waitley has counseled executives and leaders in every field, from Superbowl and Olympic athletes to Apollo Program astronauts.

THE WINNER'S EDGE Dr. Waitley explains the techniques that can help you make winning a habit, how people who want to be winners must learn to work sharper, not just harder.

41 minutes



Kenneth Blanchard, Ph.D. is President of Blanchard Training & Development, Inc., a California human resources development firm.

Spencer Johnson, M.D. is Chairman of Candle Communications Corp., publisher, lecturer and communications consultant.

THE ONE-MINUTE MANAGER The authors explain how to get good results in such little time (one minute). This approach provides people with less stress and more success. Hear the secrets of this simple, effective technique.

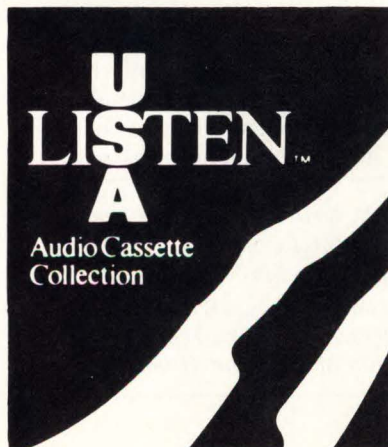
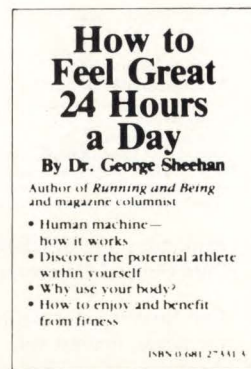
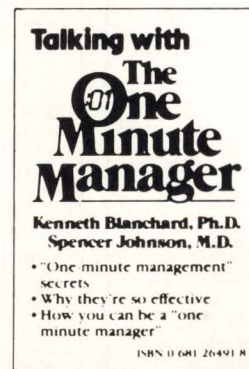
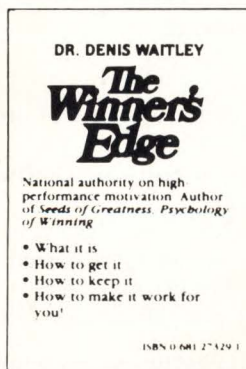
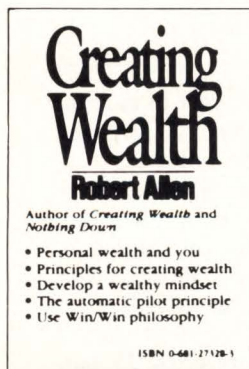
47 minutes



George Sheehan, M.D. is a physician, educator, and former college track star who now, more than 40 years out of college, still runs 30 miles each week. He is author of five best-selling books on running and health.

HOW TO FEEL GREAT 24 HOURS A DAY Hear Dr. Sheehan tell how being in good physical shape is only one element of feeling great. Sheehan shares his seven rules for feeling great. He shows how to discover the potential athlete within yourself.

47 minutes



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Andrew Grove

(Continued from page 124)

just proceed on schedule without him or her. Just as you would not permit a fellow employee to steal a piece of office equipment worth \$2,000, you shouldn't let anyone walk away with the time of your fellow managers.

Finally, as leader, you're responsible for logistical matters. You should, for example, make sure that all necessary equipment is in the meeting room. You should also send an agenda to attendees that clearly states the purpose of the meeting, as well as the role each participant is expected to play to get the desired result. An example of such an agenda follows.

To: Manager, Data Center
Manager, Software
Manager, Marketing
Vice President, MIS

From: Project manager

Subject: Project Status Meeting

Friday, Jan. 16

11 a.m. to 1 p.m.

Santa Clara Conference Room 212

Teleconference connection to

Phoenix Conference Room 4

Purpose of meeting: To decide
if online order-entry project should
be terminated

Agenda

11 to 11:30 a.m. Review of project
(Project manager)

11:30 to noon Software (Software
manager)

Noon to 12:30 p.m. Review of
options, including preferred
choice (Project manager)

12:45 to 1 p.m. Discussion (All)

This may seem like too much regimentation, but that depends on your point of view. If the chairman forces you to show up at a meeting prepared and on time, you might consider him or her a drill sergeant. But if you show up on time, ready to work, and the chair doesn't and isn't, you'll probably begrudge that person for wasting your time. It's the same in a hospital operating room. Some professionals working there may not like a surgeon insisting on precision, but I am one patient who much prefers a

disciplined operating room to any other kind.

After the meeting, the leader must nail down exactly what happened by sending out minutes that summarize the discussion that occurred, the decision that was made, and the actions to be taken. It's very important that attendees get the minutes quickly, before they forget what happened. The minutes should also be as clear and as specific as possible, telling the reader what is to be done, who is to do it, and when. All this may seem like too much trouble, but if the meeting was worth calling in the first place, the work needed to produce the minutes is a small additional investment (an activity with high leverage) to ensure that the full benefit is obtained from the meeting.

Ideally, a manager should never have to call a mission-oriented meeting, because if all runs smoothly, ev-

**"When a subordinate
has said all he or she
has to say about a
subject, you should
ask another question."**

everything will be taken care of in regularly scheduled, process-oriented meetings. In practice, however, if all goes well, routine meetings will take care of about 80 percent of the problems and issues; the remaining 20 percent will still have to be dealt with in mission-oriented meetings.

Remember, Drucker said that if managers spend more than 25 percent of their time in meetings, it is a sign of malorganization. I put it another way: The real sign of malorganization is managers spending more than 25 percent of their time in ad hoc, mission-oriented meetings. □

Andrew S. Grove is president and a founder of Intel Corp. This article is excerpted from his book High Output Management. Copyright © 1983 by Andrew S. Grove; reprinted by permission of Random House Inc.

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SOFTWARE FOR A SMOOTH-RUNNING DATA CENTER

The accelerating pace of today's dp department demands that it, too, enjoy the speed, precision, and savings afforded by automation tools.

by Jennifer E. Beaver, Southwestern Editor

Until recently, many management-information service/data-processing (MIS/dp) departments have been so busy automating other departments that they've neglected their own needs. After all, marketing, finance, accounting, and sales are not the only operations that benefit from automation. "It's like the old saying: 'The shoemaker's children go without shoes,'" laments Arthur Aschauer, a Phoenix, AZ-based consultant.

Despite increased demand for and reliance on their services, managers of information

systems often use antiquated housekeeping methods. To this day, many time- and labor-intensive chores—preparing data, checking errors, scheduling and reviewing jobs, handling output—are done manually.

Not only are manual procedures slow, they're imprecise. It's virtually impossible to track resources accurately without automation software. But that's only one way these tools smooth

operations. Some packages eliminate reruns caused by forgetful or distracted operators. Others, after a crash,



restore a system so quickly that users don't even know it's been down. Still other tools pare off half the time involved in job runs.

Dennis Slepak of Flying Tiger Airlines (Los Angeles) remembers when a user could come to the data center, drink a cup of coffee, relax, and chat for a few minutes, while a report was being printed. Now that competition for time has intensified, that decade-old scenario has become the stuff of memories. "We're pumping more work through our processors than we ever have," says Slepak, supervisor of production services. "We can't afford to have people waiting around anymore."

Flying Tiger, a large cargo airline, recently joined the host of overnight mail deliverers. To get this new endeavor off the ground and maintain the quality of its regular cargo service, Flying Tiger automated its data center with a series of production aids from University Computing Co. (UCC).

Running under MVS on the airline's IBM 3033 mainframe, the UCC programs help critical information reach its destination without the restrictive and possibly dangerous delays caused by manual procedures. The airline's pilots rely on the frequently updated weather reports collated by the system. And the program's automatic

inventories of 747 and DC 8 parts allow a pilot in flight to radio ahead to the airport and have a required part waiting when the plane lands.

UCC-7, a particularly beneficial program that manages production workflow, boarded Flying Tiger in 1981. "Before UCC-7, users running jobs out of sequence wasted a lot of money on reruns. UCC-7 chains jobs together; you schedule one and the rest follow," explains Slepak. "The alarm-clock feature automatically runs certain jobs at certain times of the day; I don't have to worry about an operator taking a phone call and forgetting all about a job."

Because fewer operators are required to maintain schedules, Flying Tiger has let attrition reduce its support staff by 50 percent to only 14 people. According to Slepak, the UCC products let fewer people do more work than the large staff had done.

To be a successful profit center, the dp department must account for its resources. Accurate information is essential for effective use and growth of the monitoring



Data-Center Software

(Continued from page 129)

system, and for planning resource requirements for current and future workloads. Justifying hardware and software upgrades and prioritizing schedules are other tasks that demand accurate resource monitoring.

Without automation these jobs are difficult, perhaps even impossible, to accomplish with any degree of effectiveness. "Using tracking tools lets a manager be objective. The tools let managers deal with problems factually rather than fancifully," comments Aschauer.

Major long-term projects can be kept on schedule only by carefully analyzing equipment and personnel. At Arizona Public Services (Tucson), the ongoing development of a new customer-information system means ongoing resource tracking for Bob Hortenbach, senior planning and control analyst at the state's largest utility.

Using the project-planning and -control system from Nichols & Co., Hortenbach measures the exact time operators take to insert code and determines the impact various delays would have on a project. Accurate resource tracking lets Hortenbach budget his operators' time—and his own time—wisely.

The recent recession forced businesses to stretch their resources. Though most organizations have recovered from the economic downturn, many, like Augsburg College (Minneapolis), still maintain strict budgets.

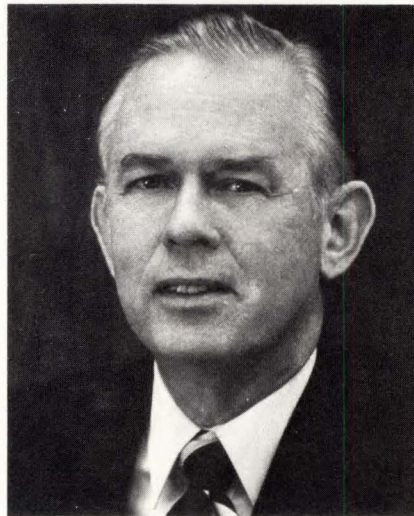
At Augsburg, the belt-tightening extends to the computer center, where administrator Dan Cruickshank wants permission to buy 13 additional terminals. His center processes financial data and payroll for the four-year college, and registers and schedules classes for its 1,350 students.

To prove to the purseholders that his equipment is overtaxed, Cruickshank installed Job Accounting/38. Geared specifically for the IBM System/38, this program from New Generation Software helps managers detail information they need to record, report, and bill for the use of



"Choosing not to automate the data center is like letting the shoemaker's children go without shoes."

Aschauer, consultant



"A company's survival may depend on the data center's ability to react quickly. Productivity tools help streamline dp operations."

Bradley, UCC

computer resources. Cruickshank hopes the program, installed in May, will give him the backup data he needs to justify new purchases.

ARSAP is another resource-management tool designed for DEC operating systems. From Gejac Inc., ARSAP helps managers monitor projects and helps users account for use of equipment and other resources. Managers can quickly tell which projects or users take up the most re-

sources. The updated version, which runs on DEC PDP-11 minicomputers, leases for \$2,995 yearly.

Finally, Mort, an online-transaction monitor from Automation Design Inc., measures response times at an IBM 3278 terminal without altering the performance of the processor. Mort operates on an IBM Personal Computer connected to the host as a 3278 terminal. It works independently of any application, software, or line protocol. Mort reports data-entry, elapsed, think, and response times, as well as key and transaction counts. Price: \$2,495.

Faster, more accurate scheduling

Big operations centers run hundreds of jobs every day, thousands every week. Maintaining job schedules on papers taped to terminals or relying on the memories of operators, who someday may leave the company, are sloppy business procedures. Yet many managers use these methods and are embarrassed by the costly reruns and delayed reports caused by missed deadlines.

Edward J. Mitchen, data-center supervisor at Commonwealth Edison in Chicago, claims he hasn't missed a single deadline since installing an Automated Data Center System (ADC2) two and a half years ago. Considering that Commonwealth schedules 1,200 jobs a month, that's an impressive record. From Cambridge Systems Group, ADC2 speeds production by starting a second job as soon as the first is finished. It eliminates time-consuming manual-collation and review procedures.

ADC2 lets Mitchen save 13 hours every two weeks, when he processes Commonwealth's 16,000 payroll checks. Before, the payroll ran 43 consecutive times; now, four job streams run concurrently. "We used to rely on the console operators' memories to get the job done; now we let the scheduler package do the work," says Mitchen. "We don't have to worry about gaps left by a change in shift or in personnel."

At Inland Steel (East Chicago, IN), ADC2 reduced the number of

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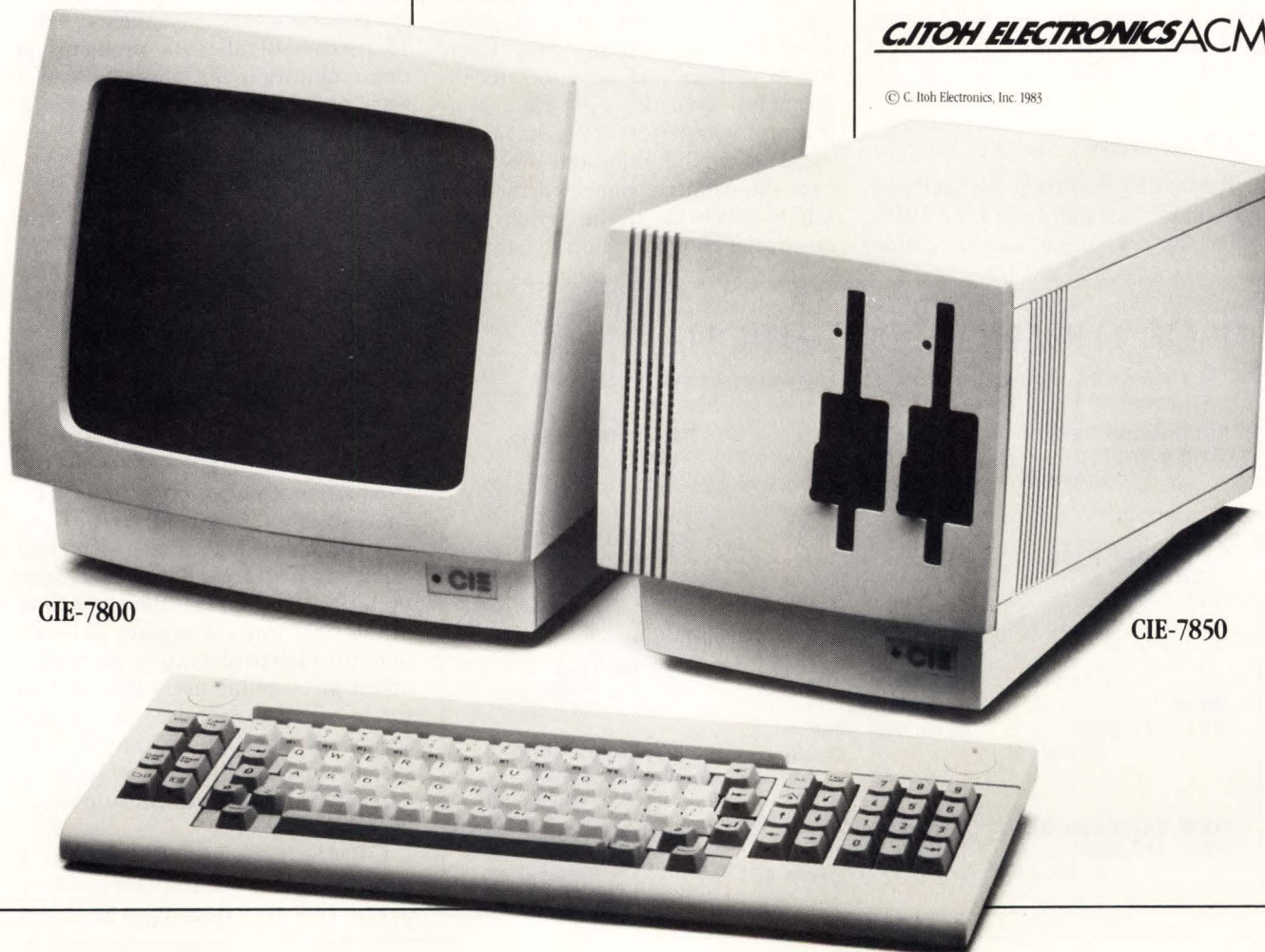
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CIE-7800

CIE-7850

Data-Center Software

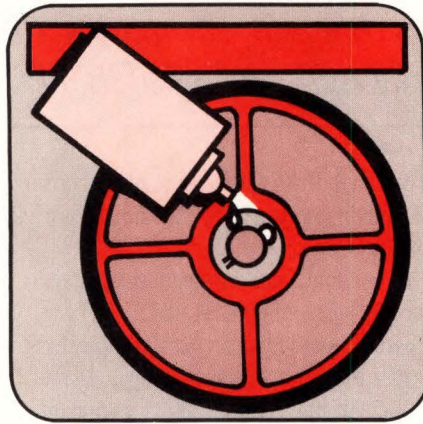
(Continued from page 130)

workers required to monitor the daily scheduling of 1,500 jobs. The company saved money—and increased efficiency—by cutting its support staff of 60 by 15 people. “Our manual system was very cumbersome,” says Stan Hearnard, computer-control scheduler. “Operators referring to a printed list frequently would run a job twice or not at all. As new operators were hired, it became harder and harder to keep track of operations.”

At Allstate Insurance (Chicago), 25 file-cabinet drawers full of paper job schedules are destined for the scrap heap, thanks to the Data Center Management System from Value Computing Inc. The program’s scheduler automatically lists special instructions for each procedure, no matter how obscure or infrequent. The complete package includes scheduling, online database maintenance, automatic job submission, and online job tracking. Price: \$39,000 for VSI and \$64,000 for MVS.

Swift recoveries

Restarting a system manually after a crash worked well in the 1960s, when there were few users to clamor



impatiently for the system to get up and running again. Now too many people depend on smooth data processing for the dp staff to waste time eyeballing the dump and reloading the operating system.

At Teachers Insurance in New York, restoring the system after it catches an error and ejects, or dumps, the bad data used to take anywhere from 30 minutes to an hour. “Users would call up and scream,” recalls Simcha Druck, systems programming advisor. “We have 150 users in our building and others all over the country connected by eight CICS networks. If the system goes down, the company literally stops.”

One would imagine that chaos would be the order of the day when the system caught seven errors. Surprisingly, none of the users even noticed. V/Safe and V/Snap, two programs from VM Systems Group, prevented crashes by catching errors, ejecting data, and restoring operations automatically. Another recovery tool, Dumpmaster, from Macro 4 Inc., traps CICS transaction dumps and writes them on a disk file where they can be examined and debugged easily. This means no more overnight delays while the CICS dumps are printed; there’s no need to maintain two dump files and switch back and forth between them. A one- or two-year lease costs \$3,000 per month.

Speedy recovery is also the claim of Datacheck Recovery, which cuts through the elaborate procedures needed to restore operation after a system check. The package can solve 75 percent of all data problems in three minutes if the culprit is a software error, claims the vendor, Software Corporation of America.

Supercharged batch processing

Despite the trend to online processing, batch workloads are increasing 30 percent to 40 percent a year, claims Maria Smith, UCC vice president. A new UCC tool that automates batch production makes the process more efficient.

The newly introduced Report Processing and Tracking component, a subsystem of UCC’s Automated Production Control System (UCC-7), includes report-distribution, report-archive, and online job-status reporting features. It helps ensure that a report lands on the right desk at the right time. It negates the need to rerun a job to recreate a lost report, and it gives online users information for handling exceptional or unusual situations. The UCC-7/RPT subsystem costs \$9,500 and will be licensed only in conjunction with UCC-7.

CPMS from H&W Computer Systems streamlines retrieval of batch reports. Because the spool

For more information

The data-center automation packages mentioned in this article are available from the following vendors.

Automation Design
(312) 670-2660
Circle 444

Macro 4
(201) 895-4800
Circle 448

Pacific Int’l. Mktg. Grp.
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Circle 452

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(415) 941-4558
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Circle 449

Software Corp. of America
(703) 471-1545
Circle 453

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- Parameter mid-string and string search functions
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- Parameter subscripting
- Global communication between macros
- Macro expansion loop control
- Count, length and type parameter-attribute functions

Extensive Macro Libraries

Memory Constant Declarations:

- Integer
- Character
- Four-byte Integer
- Hexadecimal
- Floating Point

Relocatable object module generation

Fast assembly directly to disk

Program segmentation:

- Selectively assemble individual subroutines
- Global and local scope of symbols

The Linker

Produce executable binary files from relocatable object modules

Link routines from library files

Link subroutine re-assemblies

Define a new origin for previously assembled code

Invoke at assembly time or by command

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- Transcendental functions
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- Multiple-precision integer math
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AAA, incidentally, stands for "absolutely astounding" software.

Softalk magazine had this to say: "ORCA's true destiny is to assemble creations of the greatest sort: programs so big we don't even tend to think of them as programs but rather as part of the soul of the machine. ORCA would be a good assembler to get you started on the great American Arcade Game..."

Softalk, May 1983

The Editor

Co-resident screen editor:

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The System

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HAYDEN SOFTWARE

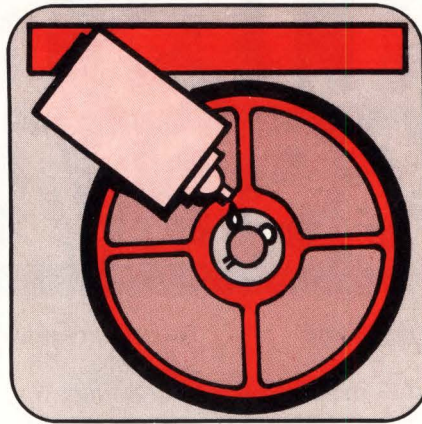
Data-Center Software

(Continued from page 132)

function allows reports to be accessed from a crt, information on batch reports is available faster; there's no waiting for list compilations, test results, or deliveries. CPMS allows users to submit and check their own batch jobs; thus, it reduces the workload of the data-processing department. CPMS operates under VSI and MVS operating systems with CICS/VS Release 1.4 and above. Site licenses cost \$5,880 and include one year of maintenance.

Before you run out and snatch up some of this nifty software, heed the advice of Layne Bradley, acting vice president of marketing at UCC. "Departments tend to hold on to old patchwork procedures, and slap new automation software on their equipment. That only lets them process their problems faster. You must define the tasks before you automate them."

Bradley emphasizes the importance of defining the way data are



entered into the system, how they're handled, and how they're tracked. "In many organizations, procedures for handling these tasks were set up years ago; now no one looks at where the data come from or where they go," says Bradley. "The manager who set up the system may have quit three years ago." UCC provides consultants and tools to help analyze data-handling procedures. "We map

out where you are and where you want to go, and identify all the bottlenecks," Bradley explains.

Before trying to generate your data faster, you might want to clean them up. The Data Expediter from Pacific International Marketing Group minimizes confusing redundancies by ensuring that each datum has only one definition, checking for rearranged or synonymous data, and setting up standard business abbreviations. Data Expediter costs \$11,500; a rental of six months or more costs \$595; a one-month trial costs \$100.

Because automation tools that enhance productivity are generally invisible to those who authorize expenditures, getting upper management to put cash on the line may take a

Despite increased demand for information, many MIS/dp departments still use old housekeeping methods.

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little strategic planning. "There's a back-office mentality that has difficulty dealing with the increased cost of dp, even though the data center is essential to the entire business," comments consultant Aschauer.

One way to convince upper management of the need for productive tools is to take advantage of the free one-month trial period many vendors offer. "A company's survival may depend on its operations center's ability to react quickly," says UCC's Bradley. "We tell upper-level management we're selling business solutions, not technical support." A cost/benefit analysis of the trial period should catapult the purseholders into pro-automation beliefs.

When all else fails, remind top management that the competition's data center is automated—and that it pays to keep up. Manual dp procedures blunt an organization's effectiveness; a faster, smoother flow of information sharpens its competitive edge. □

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PERSONAL COMPUTERS LET ENGINEERS RETIRE

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"If anyone had told me a year ago that I'd be using a personal computer for the kinds of analyses I do, I wouldn't have believed it," says James Hall, a staff engineer working on large electrical systems for Rocketdyne, a division of Rockwell International in Canoga Park, CA. According to Venture Development Corp., a Wellesley, MA-based research house, 50 percent of all portable computers are used for scientific and engineering applications.

Hall's primary tool is an IBM Personal Computer running a circuit-design package from Spectrum Software called Micro-Logic. (The program also runs on the Apple II.) He uses it to design and test circuits instead of, or in conjunction with, both breadboard prototyping and modeling on a giant Control Data Corp. Cyber via timesharing.

Hall finds several advantages to working on his own machine. Not the least of them is convenience. The shared mainframe often is booked to capacity, he notes. And even when he does have open access, the Cyber often takes just as long to solve a problem as does the personal computer.

In one case, an engineer analyzed on the Cyber the effects of starting up a 40,000 horsepower turbine. Meanwhile, Hall ran the same



THEIR OLD TOOLS

by David Kull, Management Issues Editor



Photo by Bill Oliwa

1983 was a very good year.

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Personal Computers In Engineering

(Continued from page 137)

problem on his IBM PC, arriving at "an almost identical answer" in about the same time—45 minutes. "Even though the IBM PC runs much slower than the mainframe, my time spent at its keyboard setting up a problem and getting the answer is never significantly longer, sometimes not longer at all," he says.

Testing high-energy circuits on the personal computer eliminates the risk of damage to valuable components or injury to technicians during a live test. "It's easy to use," he says. "If you want to put a million-volt diode on a model, you just tell the computer, 'This entry is a million-volt diode.'" And, as far as the computer's concerned, it is.

Many times Hall uses his computer to test circuits that have already been designed. In one case, a high-energy laser displayed some unusual faults in a live test. Rather than risk the equipment with continued operation, Hall put the questionable circuit on the personal computer, dis-



covered the problem, and modified the design. He also uses the program to double-check design work submitted by subcontractors. But he also does considerable work from scratch. "In the last year, I've probably built more circuits on the personal computer than in the lab," he says.

Hall emphasizes that he is not a programmer. He uses programs created by others, and acknowledges having had difficulties with poorly

supported ones. With one in-house program, for example, the documentation was scant and its creator no longer worked for Rocketdyne. Hall and other engineers struggled with the program for a week before getting it to perform.

The same problem can occur with commercial software. As engineering programs for personal computers proliferate, buyers should carefully consider how closely a package meets their needs, how much it allows for custom tailoring, and how well it is supported by the vendor.

Timothy O'Connor—whose consultancy in Union Lake, MI, specializes in helping engineers and architects get the most from computing—recommends that buyers obtain the source code for commercial programs whenever possible. This would allow them, perhaps with the help of a veteran programmer, to verify the accuracy of a program's structure and modify it if necessary. "If I'm spending \$300 on a program, I want to be sure it will do the job," O'Connor says.

He concedes that vendors may be reluctant to part with their products' code. If it's not available, he suggests, buyers should at least ask for a trial period. Talking to engineers who have used the package will also help determine how well it delivers.

Paul Hazan, of the applied-physics laboratory at Johns Hopkins University in Baltimore and chairman of the IEEE (Institute of Electrical and Electronics Engineers) committee on personal computing, suggests engineers seek a balance between ease-of-use and flexibility in their software. Generally, the more flexibility afforded, the more skill required. He advises individuals to consider this trade-off when selecting their software. "The important issue in engineering is not that personal computers are cheaper, faster, and smaller, but that they are accessible," Hazan says. "Personal computers accommodate a large user community—but many engineers are not programmers."

Some commercial packages give

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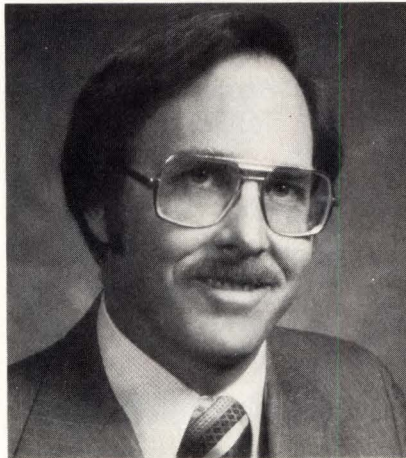
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Personal Computers In Engineering

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nonprogrammers considerable latitude for customizing their applications, Hazan notes. TK!Solver from Software Arts, for example, allows users to set up equations defining a problem, enter known values, solve for unknowns, and display results in several forms. Built-in functions for sine, cosine, net present value, and internal rate-of-return calculations aid in use. The basic package automatically converts units of measurement. TK!Solverpacks, additional applications aimed at such specific disciplines as mechanical engineering and designed to work with the basic program, include other frequently used equations and models.

Other technical packages for the personal computer perform specific functions. LSF—The Least Squares Curve Fitter from Prentice Hall—which runs on the IBM PC, for example, automatically fits a first-, second-, or third-degree least-squares curve to a dataset of up to 300 coordinates input by the user. The PSI Reliability Prediction Program from Elliam Associates runs on the IBM PC and under CP/M. It calculates the mean time between failures for



"If I'm spending \$300 on a program, I want to be sure it will do the job."

O'Connor, O'Connor Consulting

electronic hardware by subassembly, assembly, and total system.

Most engineers probably could find at least one task that could be done profitably on the personal computer. Would that justify the cost of one? It might. One engineer who recently purchased TK!Solver, for example, has used it only a few times in four months and believes he's already gotten his money's worth. The engineer uses the basic package on his

IBM PC to perform ballistics calculations he would have found difficult, if not impossible, to do any other way. The results help him make decisions on projects in which mistakes would be costly. The security the calculations provide justifies the cost of the software, he believes.

Adding applications

All users want to do as much as they can with their computers, of course. (The aforementioned engineer performs spreadsheet analyses in addition to his standard tasks.) According to Tim O'Connor, some engineers put themselves in a bind by purchasing a personal computer for one purpose and then deciding to add applications that the machine can't handle. They can avoid this pitfall by purchasing a flexible machine. Personal computers that accommodate the CP/M operating system have a wide range of available applications. And, more and more developers are creating programs to run on machines with MS-DOS. There are even microcomputer versions of popular minicomputer operating systems. O'Connor warns that there are variations of these operating systems and that programs purportedly written for any of them may not be compatible with a user's version. (See "Broadening your personal computers' horizons" in this issue.)

Page Highfill, president of Highfill, Smith Associates, an architectural and engineering firm in Richmond, VA, believes technical users should not worry about squeezing a lot of applications onto their personal computers. Many first-time buyers, he feels, opt for an overly expensive machine out of fear—to try to compensate for a lack of knowledge or cover a future contingency.

"The primary aim should be to give as many potential users as possible access to simple, straightforward applications," Highfill contends. "If I had \$4,000 to spend on personal computing, I'd buy two \$2,000 machines rather than a single model with a lot of horsepower."

Each of the five employees in



Page Highfill, president of Highfill, Smith Associates, Richmond, VA, believes engineering firms should aim for wide accessibility to personal computers. "If I had \$4,000 to spend, I'd buy two \$2,000 machines," he says.

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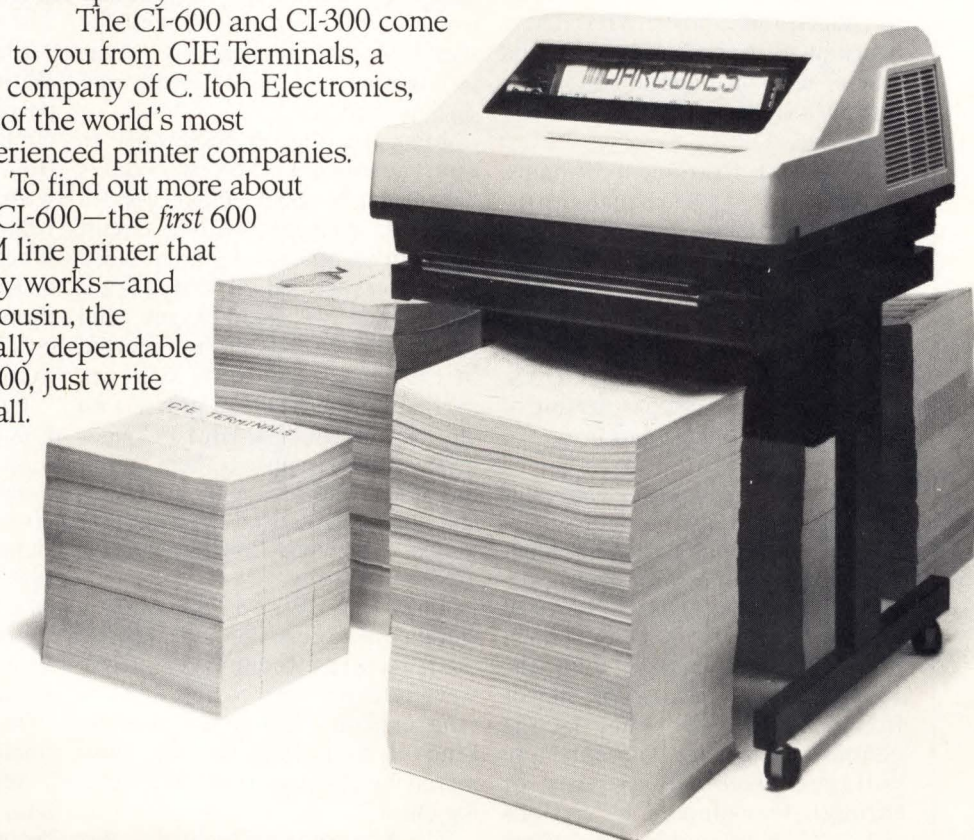
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Personal Computers In Engineering

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Highfill's firm—two architects, an engineer, a graphic artist, and a secretary—has a TRS-80 Model 4. They use the computers for engineering calculations, energy analyses, specifications drafting, financial planning, word processing, and lettering. The employees produce the drawings themselves with the help of a stand-alone drafting and design

system from Design Futures Inc. of Orlando, FL. It costs around \$35,000 with a plotter.

Creating professional-quality drawings with a plotter may well require such a costly outlay. However, users of personal computers can find plotters within a wide range of costs and capabilities. The M260 from Strobe Inc., for example, works

on any computer with an RS-232 serial port. It carries eight pens, draws lines with 500 points per inch, and costs \$995.

Computer-aided drafting and design (CADD) requires a considerable amount of computing power. Consequently, use of personal computers for the task is not widespread—but it's growing. There are problems to

Personal instruments transform the lab

The personal computer has not only become an aid for simulation, design, and numerical analysis, it's also entered the laboratory as an adjunct to instrumentation. Personal computers specially configured with software, peripheral modules, and plug-in boards are increasingly being used to control experiments, and to collect and analyze data. These instruments provide flexibility and ease-of-use not found in traditional testing systems—and they're less expensive.

Northwest Instrument Systems, where the term "personal instrument" was coined, offers a variety of hardware and software that turn an Apple or an IBM Personal Computer into a host of laboratory devices. Other vendors jumping on the bandwagon include Keithley DAS, a recently announced partnership of Keithley Instruments and Data Acquisition Systems.

The transformation of computer into specialized instrument is sometimes done through peripheral modules and sometimes with plug-in circuit boards. The DT2801 series of circuit boards from Data Translations Inc., for example, allow the IBM PC to sample analog signals from many sources. They let the computer measure currents and voltages produced directly or through transducers by various physical phenomena, including temperature, pressure, and force. The computer times the readings, controls processes through digital-to-analog output, and stores and

analyzes acquired data.

The latest in the series, the DT2808, at \$495, provides enough features to render strip-chart records obsolete and end manual reading and logging of instruments in most laboratory settings. The top-of-the-line DT2818 (\$1,695), which allows simultaneous readings from several sources, is useful for such high-level applications as materials and structural testing and seismic studies.

John Hartung, a researcher in anesthesiology at New York's Downstate Medical Center, uses an IBM PC equipped with a circuit board in his studies of cranial blood flow. An experimental animal is administered hydrogen, oxygen, and an anesthetic. Four probes inserted in the brain react with hydrogen carried by the blood to produce an electric current. The IBM PC picks up the signals, converts them to digital form, and stores them. Later, statistical analyses on the computer indicate the blood-flow pattern created by the drug.

The experiment probably couldn't have been done with earlier measurement techniques. "The waveforms are very complex," Hartung explains. "They are not the kind of data that we can read merely by placing a ruler on an analog chart."

The Computerscope from RC Electronics in Santa Barbara, CA, also converts analog to digital. It's based on a Franklin personal computer and, for \$3,495, includes soft-

ware that lets it act as a frequency meter, digital voltmeter, transient recorder, signal averager, and pulse-rate meter.

A circuit card plugged into the main unit handles data acquisition and, with the help of a software library, directs the machine to the proper instrumentation function. The computer accommodates four cards, allowing four test channels. With two cards installed, the computer simultaneously simulates a circuit under test and acquires data from the response. Most software is written in machine language, providing the speed needed for many functions, but accessing of data and instrument control can be handled through Basic or Pascal. Scientists can program test control, for example.

Curt Wade, an audiologist in Lompoc, CA, uses the Computerscope to measure the effects of sound on patients' brainwave patterns. The computer acquires the signal and digitizes it. Then, Wade uses the machine's software to analyze the results. Previously, he used a storage oscilloscope to collect the EEG waves and a \$10,000 signal averager to help analyze them. "That \$10,000 box is now a footstool," Wade says.

Wade uses the Computerscope for a variety of tasks, including testing of hearing aids and calibration of auditory tests. He figures the device replaces about \$40,000 worth of instruments and equipment in his laboratory.

Product Design: Rich Thompson
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Personal Computers In Engineering

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be overcome. Because drafting and design usually require a professional's attention over an extended period, a personal computer employed for that kind of work may have to be dedicated to it.

Tim O'Connor points out another drawback to using personal computers for CADD: The process' chief productivity benefits come not from the professionals' ability to draw lines mechanically, but from their ability to retrieve and modify what's been drawn before. Particularly when several professionals work on the same project, it helps if they can quickly update and share background drawings.

The hardware is developing rapidly, and observers see continued advances. James Jackson, data-processing advisor to APEC, the professional society of consulting engineers (Dayton, Ohio), sees great promise in the use of personal computers for CADD. "Features that you want but don't see now will probably be available next year," he says.

The mainframe connection

One popular practice is for an engineer to solve part of a problem on the personal computer and connect to the central computer for problems the personal computer can't handle. This approach is useful not only for CADD but for a range of engineering applications. According to Paul Hazan, the personal computer fits well into the role of adjunct to minicomputers and mainframes.

Rocketdyne's James Hall sometimes divides a circuit analysis between his IBM PC and the CDC Cyber. But, he points out, few of his programs run on both machines, so he can't transfer a problem from the personal computer directly to the mainframe. If he's been working on the IBM PC, though, much of the preliminary work needed to transfer the problem to the Cyber will have been completed.

There is a trend toward simplifying translations from one computer level to another while broadening the range of technical programs for per-

sonal computers. As personal computers have gained power, they have acquired the ability to handle programs that have become well established on larger machines. Data General, for example, offers its Desktop Generation—personal computers that execute programs originally designed for DG's 16- and 32-bit minicomputers. And Digital Equipment Corp. offers MicroVAX I, which provides the VAX minicomputer architecture yet fits under a desk. The company says it plans to put the architecture for the VAX line on a microchip.

Hewlett-Packard, long established in technical and scientific computing, recently introduced the HP 9000 Series 500, a line of 32-bit personal computers with basic prices ranging from about \$25,000 to about \$35,000. The systems will run such high-powered applications as simulation and design, and will handle HP's version of the System III Unix operating system from Bell Labs.

APEC also provides mainframe-to-microcomputer software migration for its series of programs on energy and electrical-system analyses. Consulting engineers have familiarized themselves with the series over years of use on large machines. According to APEC's James Jackson, the newer personal-computer



"If anyone had told me a year ago that I'd be using a personal computer for the kinds of analyses I do, I wouldn't have believed it."

Hall, Rocketdyne

versions run on 8-bit machines with 64 Kbytes of memory, CP/M, and 8-inch single-density disks—usually the TRS-80 Model 2 or TRS-80 Model 12.

The versions of the APEC packages configured for microcomputers are identical to the versions for mainframes and minis. The primary difference is that the lower license fees for the microcomputer versions—ranging from \$125 to \$850, plus APEC membership fees—make the packages feasible for personal computing.

Remote computing services offer another avenue for easy transitions between computing levels. Boeing Computer Services, for example, is expected to release this month the first of a series of microcomputer systems that will connect with its remote computing service. A personal computer based on DEC PDP-11 architecture will anchor Boeing's Micro/8400 family of workstations. Software will provide compatibility with applications that run on Boeing's large mainframes.

The first package will afford links to BCS' Ansys, GTStrudl, Nastran, and Stardyne, all used for structural design and analysis. A user can configure a problem for one of these applications on a personal computer, do some local processing, and dial up the service for number-crunching or other analyses requiring a lot of power. The arrangement saves on connect-time and processing charges. The personal unit will also run any of the many technical programs written for the PDP-11. Hardware for the system costs about \$20,000, with the software running near \$700.

STSC, another remote computing service, recently began offering APL* Plus/PC, which runs on the IBM PC. The package, priced at \$595, provides transparent portability of applications written in technical language from a personal computer to the service's mainframe APL* Plus system.

For \$50, Geisco provides the Timesharing Interface Package, which allows easy transfer of files

from an IBM PC to the service's mainframes. An IBM PC might collect data in a lab overnight, for example, and a scientist can send them to the mainframe with a touch of a button.

Personal computers can also help engineers with their nontechnical chores, such as report writing and project management. HPM from Harvard Software, for example, helps users schedule and manage complex projects. Geoffrey Potter, director of manufacturing for Mozaic Technologies in Billerica, MA, uses the package to manage the engineering on the graphics workstation his company is producing. He enters the parameters of each task, and the program converts the information into a time chart. It automatically recalculates the plan to account for modifications made along the way. According to Potter, a key benefit is credibility.

The personal computer can also help in a design engineer's search for components—often a time-consuming chore. Micro-Index, a retrieval program from Inacom, lets users access the company's file of more than 400,000 component descriptions, which are updated every two months. The designer locates products listed under the supplier's name, and under generic or specific terms. Then the designer contacts the vendor for detailed specifications or retrieves them from Inacom's microfiche.

Multifunctional packages, such as 1-2-3 from Lotus Development Corp. and MBA from Context Management Systems, merge spreadsheet-analysis, word-processing, and graphics features. They let users move rapidly from numerical analyses to written and graphic reports—a handy feature for many engineers. These programs are primarily for business uses, however, and may not provide the speed, number-crunching ability, or sophisticated graphics necessary for technical applications. Still, particularly when used with a hard disk for added speed, they may do the job.

Again, this brings up the issue of

flexibility versus ease-of-use. Linking applications on hard disk or through a mainframe connection allows engineers to perform many tasks at their own keyboards. But the effort and skill needed to create the connections, or simply employ them, may reduce

efficiency. As engineers use personal computers for more and more tasks, they and program developers will create easy translations from micros to mainframes. The personal computer will become an all-in-one tool for science and engineering. □

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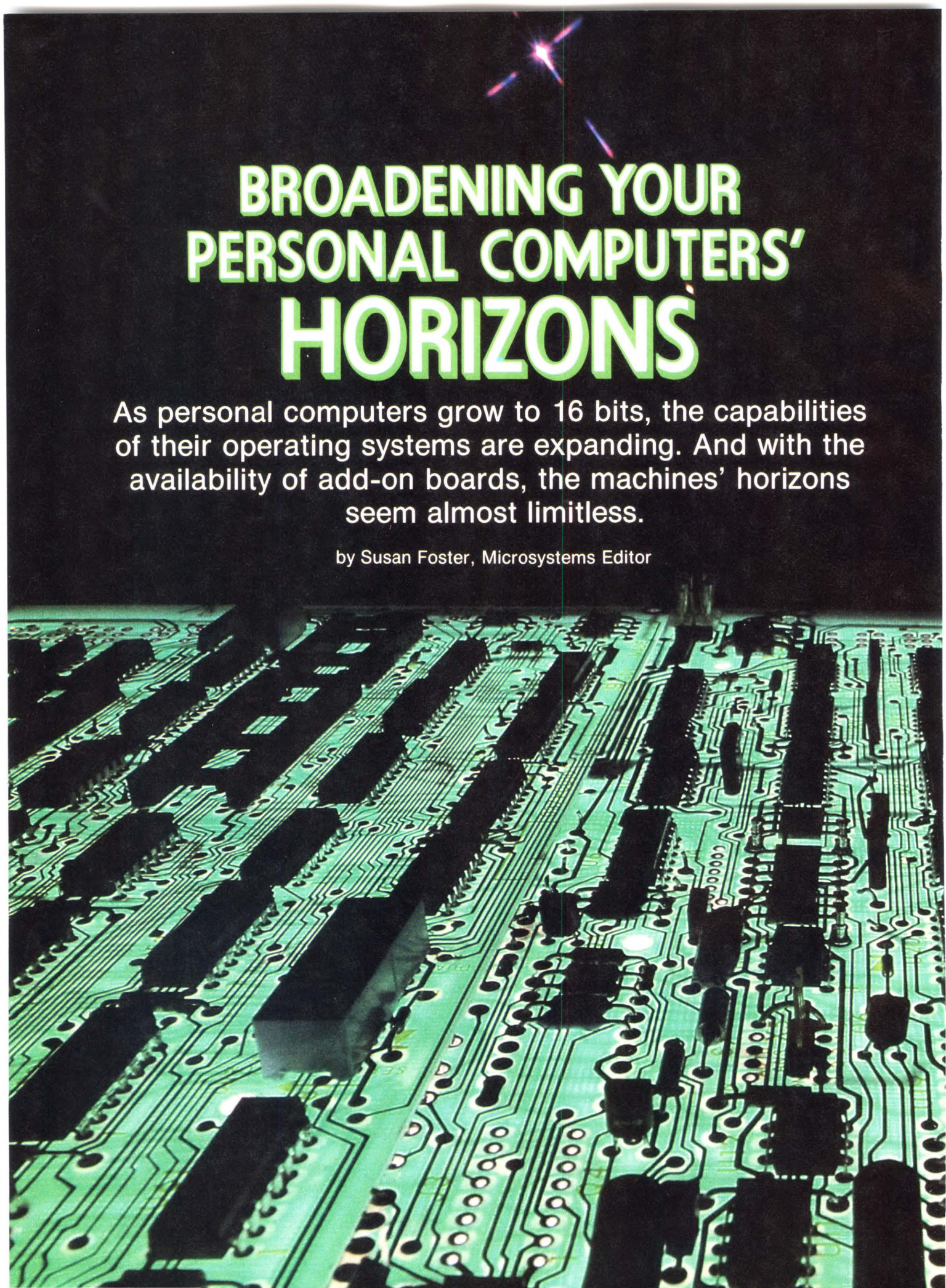
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BROADENING YOUR PERSONAL COMPUTERS' HORIZONS

As personal computers grow to 16 bits, the capabilities of their operating systems are expanding. And with the availability of add-on boards, the machines' horizons seem almost limitless.

by Susan Foster, Microsystems Editor

There was a time, when it came to choosing an operating system, that the sky was not exactly "the limit." A manager's choice of an operating system was crucial—mostly because the operating system would determine what application software was available. Although this is still true to some extent (there is not a wealth of application software for Xenix systems, for example), the problem is fading into the sunset. The 16-bit personal computers now available all offer far more powerful operating systems than their 8-bit predecessors. These systems can run on, and utilize software written for, another major brand of computer. And though many users wonder

which will be the next dominant operating system, it really doesn't matter since they are becoming interchangeable.

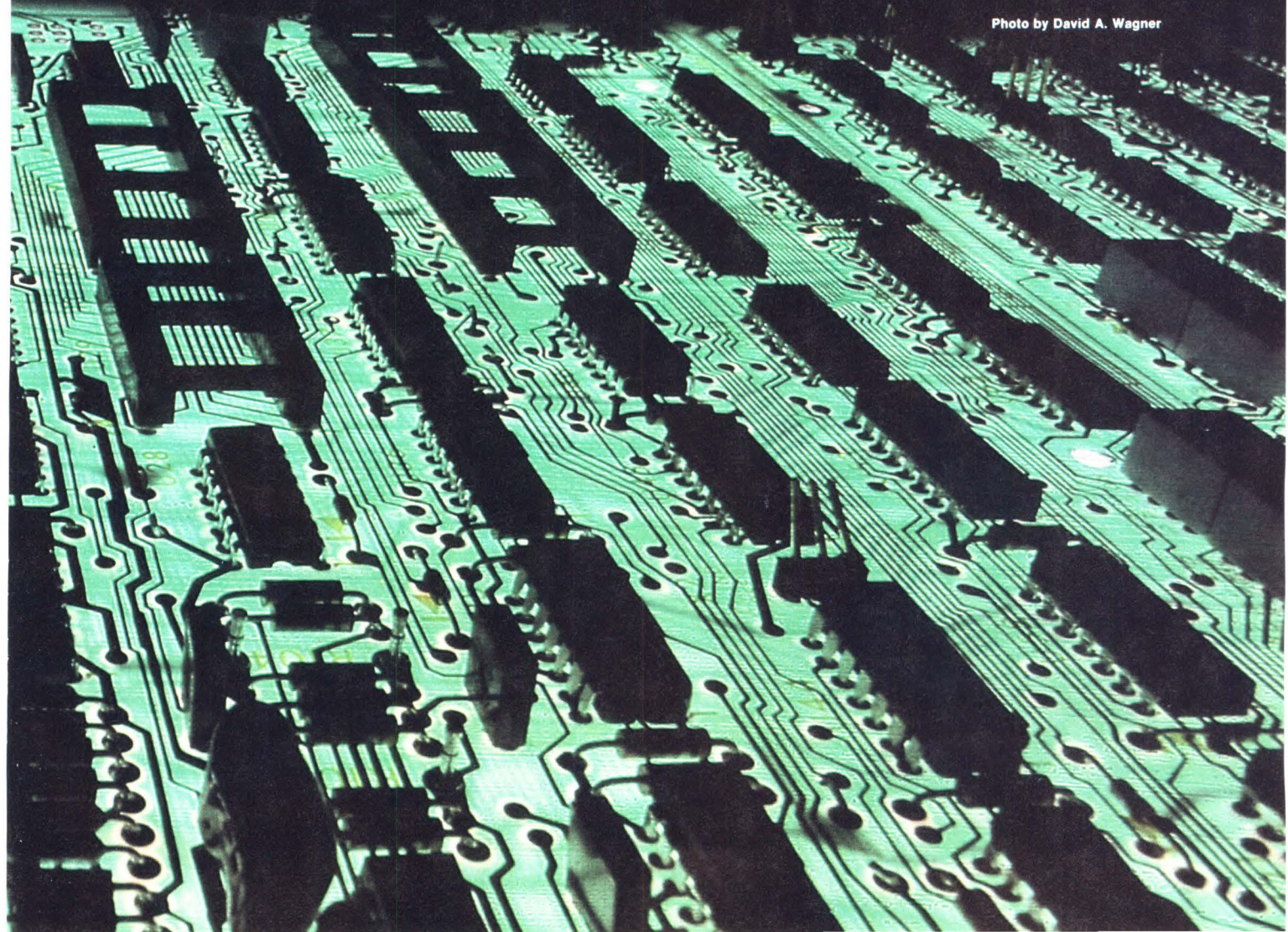
An operating system is the part of a system's software that manages the resources of the computer, and allows the user to concentrate on specific applications without worrying about how the hardware will accomplish its tasks. (Operating systems are therefore often described as "transparent" to the user.) The major functions controlled by the operating system include the management of files, software, input/output (I/O), peripherals, memory, and

central-processing-unit (cpu) time. To put it plainly, a computer's operating system "decides" when certain functions will take place, as well as whether or not capabilities are being used to the fullest.

Each of these computing "managers" has its own personality: Some are friendlier than others; some are more capable than others; some are elitist in purpose. Some, like Bell Labs' Unix, were born in the world of minicomputers. Others, like CP/M, were spawned in the 8-bit sphere. One system—Unix—threatens to dominate the systems-software galaxy, while others—such as Pick—may never achieve the recognition due them. But all serve as the gateway to interaction with your personal computer.

The first generation of personal computers was based on 8-bit

Photo by David A. Wagner



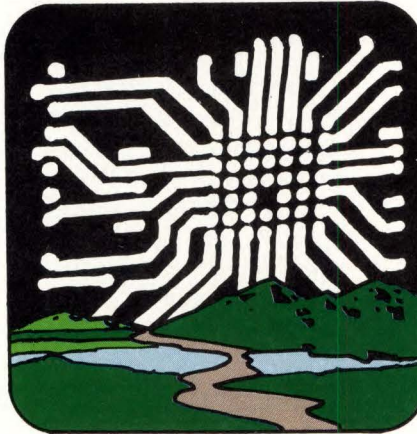
Broadening Horizons

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microprocessors that could directly address only 64 Kbytes of memory. This limited the capabilities of the operating systems, which required a substantial amount of that memory. Many of the limitations have been overcome with add-on boards that increase capacity on the 8-bit machines. The problems are nonexistent on the more powerful, more capacious, 16-bit personal computers.

With the increased capacity levels, feats that previously were only imagined can now be performed. CP/M-based software will run under Bell Labs' Unix. Unix software will run under CP/M. PC-DOS will run CP/M-86 software, and vice versa. The Pick operating system has been simulated under PC-DOS, CP/M 2.2 under Unix, and other operating systems on PDP-11, Motorola 68000, and Zilog Z8000 processors. Apple's Lisa runs CP/M 2.2 and Unix, in addition to its own operating system.

Such versatility may be yours through add-on boards, which slip into expansion slots in the computer. A board provides all the capabilities of a particular operating system, and is



less expensive than buying another personal computer that houses an operating system with the additional features you need. Quadlink, for example, from Quadram Corp., Norcross, GA, is functionally equivalent to an Apple computer. Once installed in an IBM Personal Computer expansion slot, it allows Apple software to run on the PC. (A board that permits Apple computers to run software written for the IBM PC will soon be available.)

Although the possible combinations keep multiplying, the question

of which operating system to buy is by no means irrelevant. Each one still costs money. You still have to be sure that you have the right amount of memory and mass storage. And since some systems are single-user and others multi-user, you must also investigate them in consideration of overall information-resources strategies and goals.

Finding a suitable system in the fog of questions and considerations can be a formidable task. There is still much confusion over which operating system does what, along with a lot of controversy over which system—if any—is best. For a clearer picture, let's take a look at the major players in the operating-systems standoff.

The choice will be yours

Originally developed for professional programmers, Unix (Bell Laboratories, Murray Hill, NJ) now has many variants that operate on many types of computers—from personal computers to mainframes. One market-research firm, Input (Mountain View, CA), estimates that there are over 10,000 "Unix installations," more than half of which are actually Xenix—Microsoft's (Bellevue, WA) version of this operating system.

Unix may be powerful, but many users also consider it very unfriendly. It has obscure commands and gives infrequent warning messages. However, it does offer a form of built-in electronic mail, along with a flexible, hierarchical filing system. Oasis and MS-DOS also have hierarchical file structures.

A hierarchical file structure is one of the two basic ways in which operating systems organize information. The other, on systems like CP/M and the p-System, is called a sequential file structure. Both terms—hierarchical and sequential—refer to how the computer searches for files and interconnects them.

In a sequential structure, the computer searches for files starting from the beginning of its directory, until it finds what it is looking for. This is a relatively simple operation, and does

Nothing can stop Microsoft

Microsoft—originator of MS-DOS—is not only securing a lead over Digital Research—originator of CP/M—in the sale of operating systems, but is heading for the dominant position in the vending of software for personal computers. This is the primary conclusion of a recent report from Strategic Inc., a research and consulting organization in San Jose, CA. The report also indicates that Microsoft's Multiplan is moving ahead of Visicorp's Visicalc, the daddy of all electronic-spreadsheet packages.

Michael Killen, president of Strategic, not only sees Microsoft taking the lead from Digital Research, but also sees Digital "in disarray, with no coherent plan to challenge Microsoft, and a fragmented product line." He claims

that the CP/M originator is making little headway with its CP/M-86 on IBM's Personal Computer and other machines; IBM is selling Concurrent CP/M to large customers, however. CP/M is being ignored by many software developers, who reportedly are aiming their efforts at MS-DOS and Bell Labs' Unix.

Killen says Microsoft's strategy is to control the market not only in operating systems and languages, but in major applications as well. In pursuit of this goal, Microsoft is challenging Visicorp and Lotus in integrated software. It is also the supplier of the Basic language used on many popular machines.

The report, called *Digital Research/Microsoft—The Real Issues*, costs \$950. To obtain a copy, call (408) 243-8121.

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Broadening Horizons

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not require too much memory. If there are only a few files on the system, this type of organization will not slow down the system significantly. But when the number of files increases, this system will become slower as it searches. And it becomes very difficult to maintain data security, since the computer must look over every file until it finds the one it needs.

A hierarchical file structure, on the other hand, provides data security by locking users out of whole sections of files. It is organized like a tree, with the root file at the top. Starting with the root file, the computer will search for other files according to the path shown in its directory. Such a structure requires more memory than a sequential structure, but it is faster.

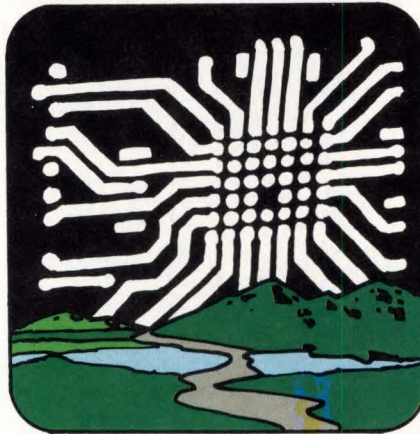
Under Unix, which really exploits this file structure, everything—even input and output devices—is treated like a file. This means that once experienced with Unix, a user can do a lot of work with just file-processing commands. Corporate users looking to solve multi-user problems, however, should be aware that for every version of Unix, there's another version—some 35 in all. And there are no guarantees on compatibility.

Safety in numbers?

There are essentially two kinds of Unix "clones": those licensed from Bell, and those written independently but in conformance with the Unix manual. Xenix is the most popular licensed version, while Unos (Charles River Data Systems, San Jose, CA), Idris (Whitesmith's Ltd., Concord, MA), and Coherent (Mark Williams Co., Chicago) are among the most popular unlicensed ones.

Coherent is the least-expensive clone, available for the IBM Personal Computer for \$500. It is also available for the Z8000 and 68000 microprocessors, as well as DEC's 8086 and the PDP-11. Idris will run on a 128-Kbyte 68000-based machine with a minimum of 5 Mbytes of hard disk.

Those considering Unix—or a reasonable facsimile—should note that



these are large operating systems. The fuller implementations require at least $\frac{1}{4}$ megabyte of internal memory, with 5 or 10 Mbytes of hard-disk storage available. These operating systems are expensive when compared to some of the others. (Coherent may be only \$500 for the IBM PC, but CP/M has recently been reduced from \$200 to \$60 for the PC.) Also, there is not yet a tremendous amount of applications software available under Unix. This is a temporary, but very real, problem.

With the growing demand for an operating system that can be downloaded from a mainframe to a micro, Pick (Pick Systems, Irvine, CA) is seen by some as a competitor to Unix. Initially designed for business use, it has had many successful supermicro implementations. These followed implementation in the mid-'70s on Microdata minis.

Pick is the only operating system with a built-in relational database management system, and is being offered in conjunction with products from Datamedia Inc. (Camden, NJ), Altos Computer Systems (San Jose, CA), Fortune Systems Corp. (Belmont, CA), Applied Digital Data Systems (Palo Alto, CA), and General Automation (Anaheim, CA). Pick has recently been implemented on the IBM Personal Computer and the IBM 4300 supermini—a development you should monitor if the micro-to-large-computer connection is one of your corporation's goals.

Also designed for business use, Oasis (Phase One Systems, Oakland,

CA) already has a large European following, and is becoming known as an attractive option for smaller companies. This system, which allows multi-tasking, has recently been redesigned for 16-bit multi-user personal computers and can serve up to 32 users simultaneously. It handles shared, public, or private files, using passwords and privilege-level security. It also has automatic record locking, which prohibits more than one user from changing a particular record at the same time. The system has been implemented on 8086- and 8088-based computers, and more recently on 68000-based systems. A fair amount of applications software is available for it.

CP/M (Control Program/Monitor), from Digital Research, Pacific Grove, CA, took off in 1976 when its vendor licensed it to several companies that were offering floppy-disk-based products. It has been through many incarnations, and offers tremendous compatibility among—but not limited to—personal computers from Tandy/Radio Shack, Heath, North Star, Cromemco, Vector Graphic, Xerox, Wang, and Osborne, and any Apple outfitted with a Softcard. (Softcard is Microsoft's plug-in board that fits into an expansion slot of an Apple II, thereby bringing CP/M to the machine.) Today, CP/M is available for microprocessors other than those of the 8080 family and offers a very large body of applications software.

CP/M's documentation, however, has long been considered inaccurate and disorganized, and friendliness is not one of this operating system's strong points. If you are about to make a serious mistake—for example, wiping out an entire disk—CP/M gives no warning. However, the latest CP/M version (3.0) is reportedly more friendly.

Until recently, CP/M's lack of friendliness wasn't a significant shortcoming. Like Unix, this system was originally developed for professional programmers, who didn't need friendliness. It was also originally in-

(Continued on page 154)

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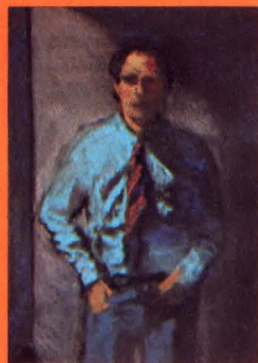
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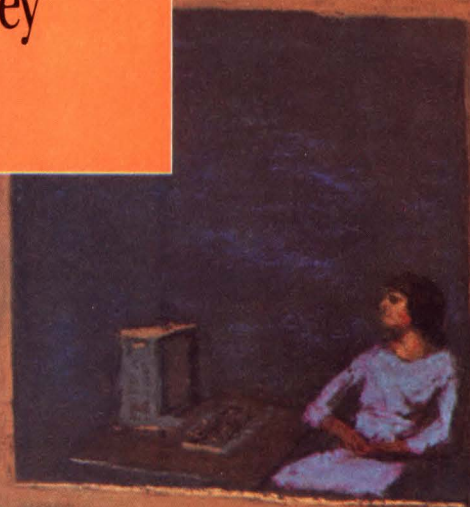
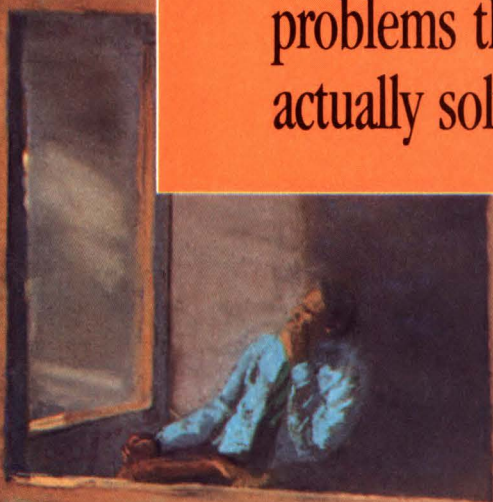
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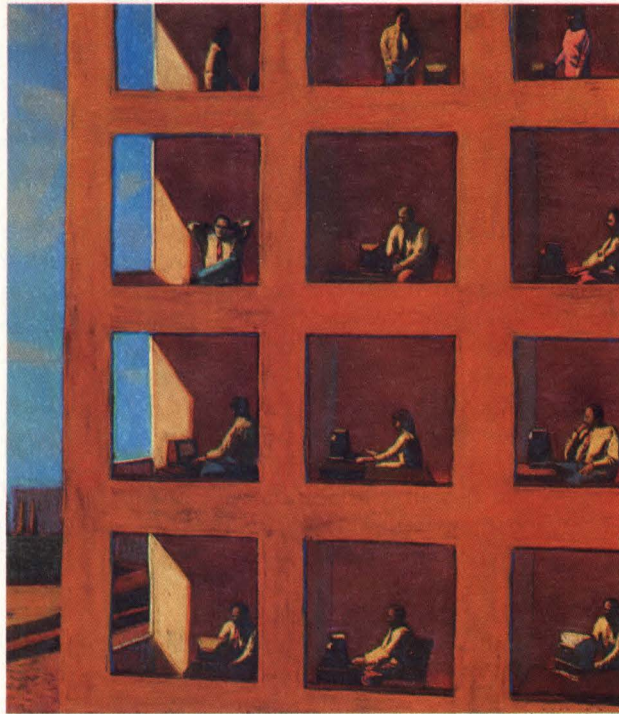
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Broadening Horizons

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tended as a single-tasking system. This might still be fine for 8-bit machines, but at the 16-bit level, a user might wish to, for example, edit one document while printing out another.

Although CP/M itself does not permit multi-tasking, Digital Research's newer offspring—MP/M and Concurrent CP/M—do.

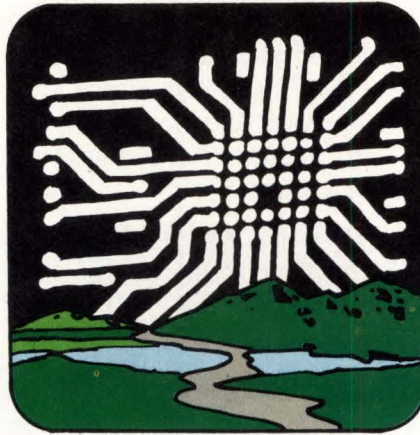
Multi-user, multi-tasking, upwardly compatible MP/M allows up to 16 users to perform tasks at the same time. Concurrent CP/M Version 2.0 allows up to 256 separate jobs to run simultaneously. Of course, there is a practical limit to the number of tasks run, since each additional process divides the cpu's time among that many more tasks, there-

Each operating system has its own personality. Some are friendlier than others; some are more capable than others.

by reducing the amount of computer time each task is allotted. Concurrent CP/M also ensures data integrity through certain functions built into the operating system that are known as "lock file," "lock record," and "test-and-write record."

CP/Net is an option that supports multiple users on multiple computers, with one of the machines functioning as the master node in a classic star-network configuration. This local-area network is much like a phone network, having a controller with branches connected to each device.

Another of the major systems, MS-DOS (Microsoft, Bellevue, WA)—called PC-DOS on the IBM PC—is easier to learn than CP/M and Unix. (Its documentation is easier to follow than most OS documentation, too.) MS-DOS 2.0 provides an online help feature and, perhaps most important for the corporate user, an upwardly compatible path to Xenix. Microsoft has also extended the capabilities of the system with a feature



called Microsoft Windows. It supports sophisticated graphics-based integrated software packages.

Unlike Xenix, MS-DOS does not have multi-user or multi-tasking capabilities, nor does it have, yet, as much applications software as CP/M has, though there has recently been a flood of new software for this system. So if your corporation isn't already committed to IBM PC hardware, there is little reason to commit to PC-DOS. Bluebird Systems (Carlsbad, CA), however, grants multi-user, multi-tasking capabilities via SuperDOS, the company's proprietary IBM PC operating system.

Another multi-user, multi-tasking system—this one for the PC's big brother, XT—has been introduced by Science Management Corp., Bridgewater, N.J. The Thoroughbred/OS supports three terminals and one printer, and allows simultaneous processing of several applications. Its price: \$795.

PC Technologies Inc., Ann Arbor, MI, also has a multi-user system for the XT. Known as Xtender, and packaged as a circuit board and floppy disk, the system permits up to five terminals to operate concurrently off the XT. Xtender costs \$3,995.

MBos/5, a system from Bos National, Dallas, gives multi-user capability not only to the XT, but to the PC as well. With it, up to two inexpensive crts with full file-sharing capabilities may be added, and any program or system ever written in Bos/MicroCobol will run immediately on a PC or XT without recompile-

lation or relinking. MBos/5 with runtime MicroCobol sells for \$1,050.

With all the multi-user operating systems available for IBM's products, it seems only fair that Digital Equipment Corp. computers have one too. SMM-300 is the first such system for DEC's Professional series of personal computers. Developed by Structured Data System, a United Kingdom-based firm, the system is being distributed exclusively through Advanced Computer Techniques Corp.'s Creative Socio-Medics Corp. (New York).

The basic SMM-300 system supports up to three users; with the inclusion of two Real Time Interface boards, it can support a total of seven

Like Unix, CP/M was originally developed for programmers, a group that didn't require friendliness.

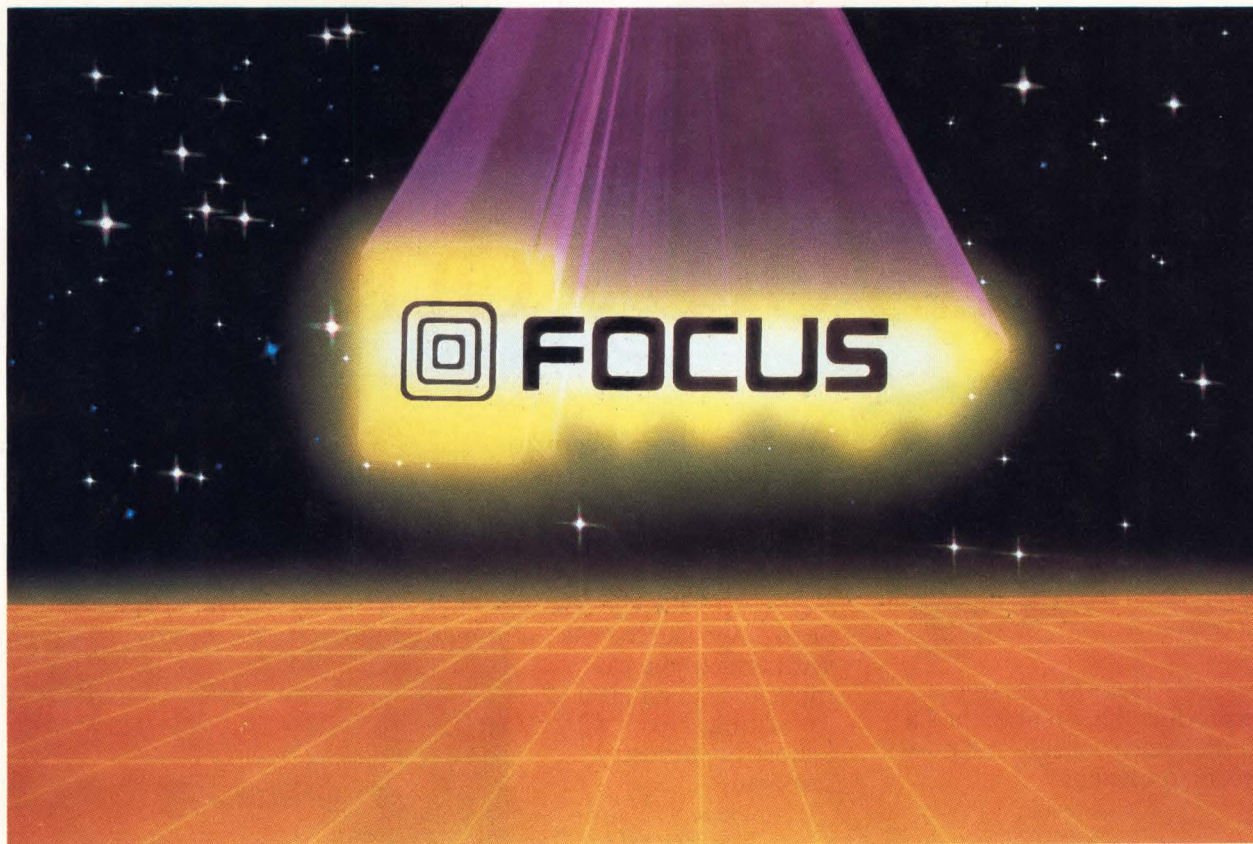
users simultaneously. Single-license fee for SMM-300 is \$1,400. Quantity discounts are available.

The only operating system that was designed to be portable is the UCSD p-System, from Softech Microsystems, San Diego. Although IBM sanctioned it as the sole operating system on its Displaywriter word processor, the p-System has received little acclaim. It is a slow system designed for single-user situations. (It is mostly used with UCSD Pascal, which is widely accepted in universities as a teaching language.) Most applications written under this system are for Apple computers, which offer a version of UCSD Pascal.

No discussion of operating systems would be complete without mention of the multi-tasking offering found on Apple's Lisa System (Apple Computer Corp., Cupertino, CA). This operating system, which is similar to Unix, has intertask communications, and allows two tasks to share one

(Continued on page 158)

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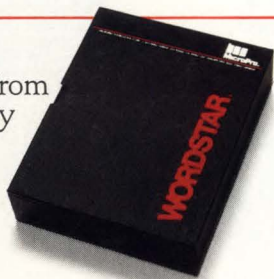
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Broadening Horizons

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data file. Although Lisa's operating system commands almost 2 megabytes of memory, including the applications, it is considered very friendly. It is also, however, considered very slow.

Corporate computer users are be-

ginning to need greater communications capabilities for working with company databases and local-area networks. They are also beginning to use higher-capacity hard disks with various backup methods. (See the "Personal computing" column in this

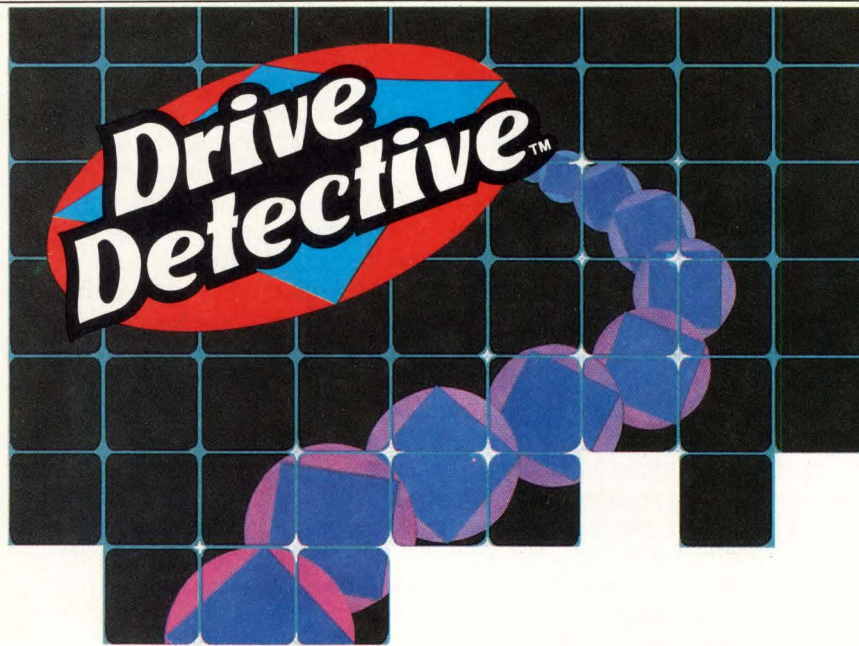
issue.) The systems software will have to accommodate these changes in hardware and application software.

One important upgrade will be in better file management and protection. If a user has gone to a hard disk because of an increase in the number of files, he or she needs a better way to manage those files. So we may see more hierarchical file structures.

Both the Apple II ProDOS and the Apple III SOS operating systems have hierarchical organizations. Users of these systems who have personal databases of, say, 200 files on hard disk can subdivide them into categories. Previously, the computer would have had to check all the file names when looking for a particular file. Now, the user need only specify the major category and the desired subcategory, and the machine will find the file quickly. This capability was also recently added to DOS 2.0, Concurrent CP/M, and the DEC P/OS (Digital Equipment Corp., Maynard, MA).

Another development to watch is more transportability of applications software between operating systems. An interesting version of this feature comes from Convergent Technologies Inc. (Santa Clara, CA), with its NGen family of intelligent workstations. (You may see these products under other labels, for example, Prime Computer, Gould, Burroughs, and A. B. Dick.) Different operating systems can run concurrently on the same machine with CTOS—the company's multi-tasking distributed operating system—but as application processes. Users can therefore have access to applications software written for CP/M and MS-DOS, which run as tasks under CTOS.

As personal computing burgeons in corporate America, vendors are fast finding ways to overcome the incompatibilities arising in a game with too many players and too many different kinds of equipment. In the future, users will no longer have to wonder which operating system to use, but how many operating systems, and in what combination. □



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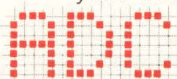
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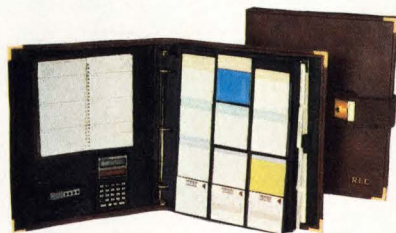
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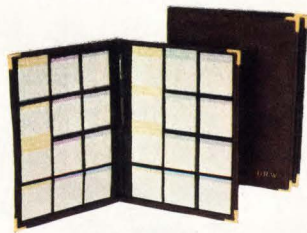
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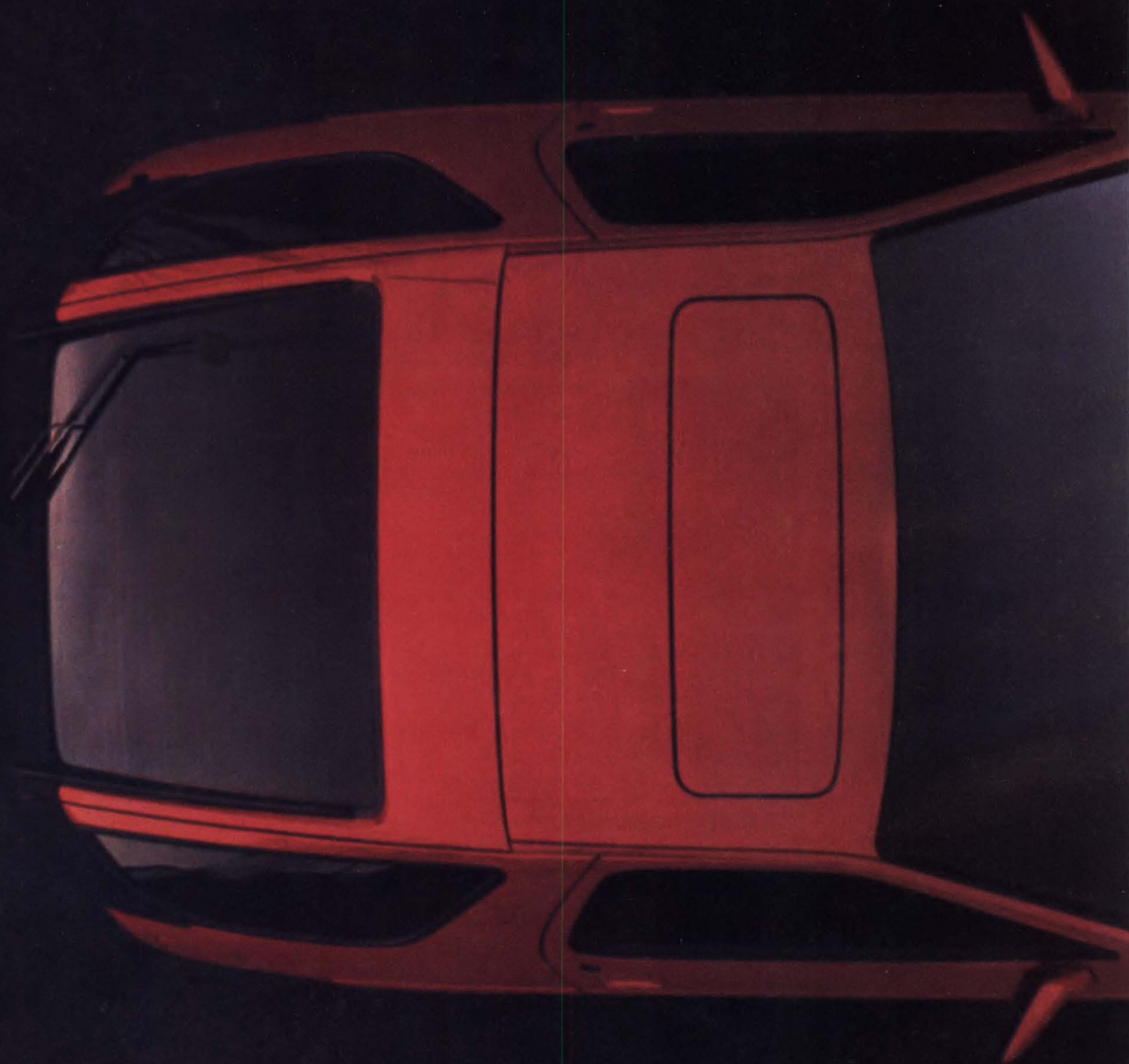
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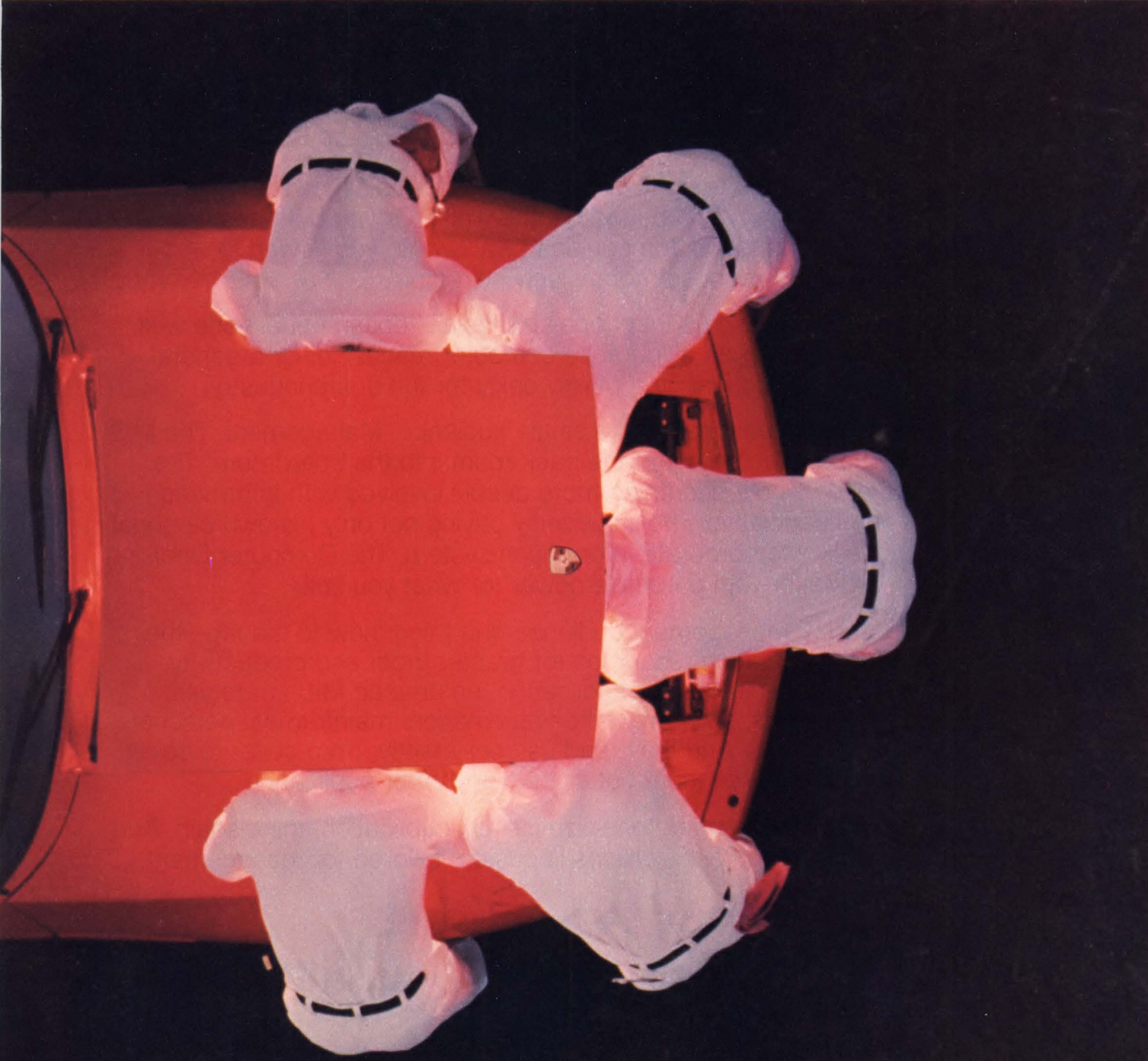


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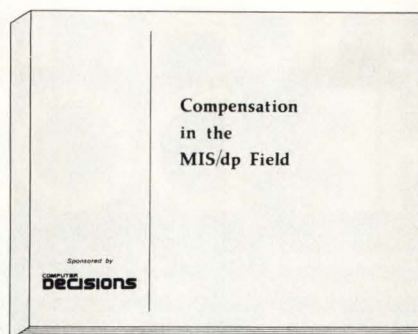
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BUYING COMPUTER SUPPLIES CHEAPER BY THE DOZENS

The most popular sales device of the '80s has to be the catalog. Shoes, coats, undergarments, food, sporting goods, briefcases, office furniture—in short, almost any item for home, office, or business—can be ordered through a catalog. An MIS/data-processing department could order software, peripherals, storage cabinets, or workstations from a catalog, but what it is most likely to purchase that way is computer supplies.

Nearly every supply vendor sells its tape, disks, and forms, along with a range of other products, through a catalog. So has the catalog craze hit the computer room? Well, yes. But the catalog's success indicates a failing, according to Sigmar Tullman, the director of marketing for computer products at BASF Systems Inc. in Bedford, MA.

"Through mass mailings, catalogs flutter down to the end user," Tullman says. "Their success, which is dependent upon end-user purchases, just indicates how difficult it is for

companies to organize their purchases. Very few companies have centralized their buying."

Centralized buying consolidates a corporation's purchasing and gives it the advantage of quantity discounts, which fragmented purchasing does not offer. But organizing corporate purchasing is formidable work that many companies prefer to skip.

Widespread use of personal computers, some of which may have been brought into a company without corporate approval, further complicates organized buying. But, notes Tullman, "minicomputers are as difficult to locate and sell to as microcomputers. Within a company, they can be all over the place. There aren't many Fortune 500 companies that have organized their buying practices for those machines either."

"The procurement discipline of most large end users is very fragmented," says Scott Cochran, director of North American sales for Verbatim Corp. of Sunnyvale, CA. "Most people just buy supplies as they need them. There's no consolidation, and an awful lot of money is wasted."

One way a company can organize its buying is by signing a national-contract agreement with a supply vendor. The contracts typically describe what, and how much, a company will buy from the vendor over the next year.

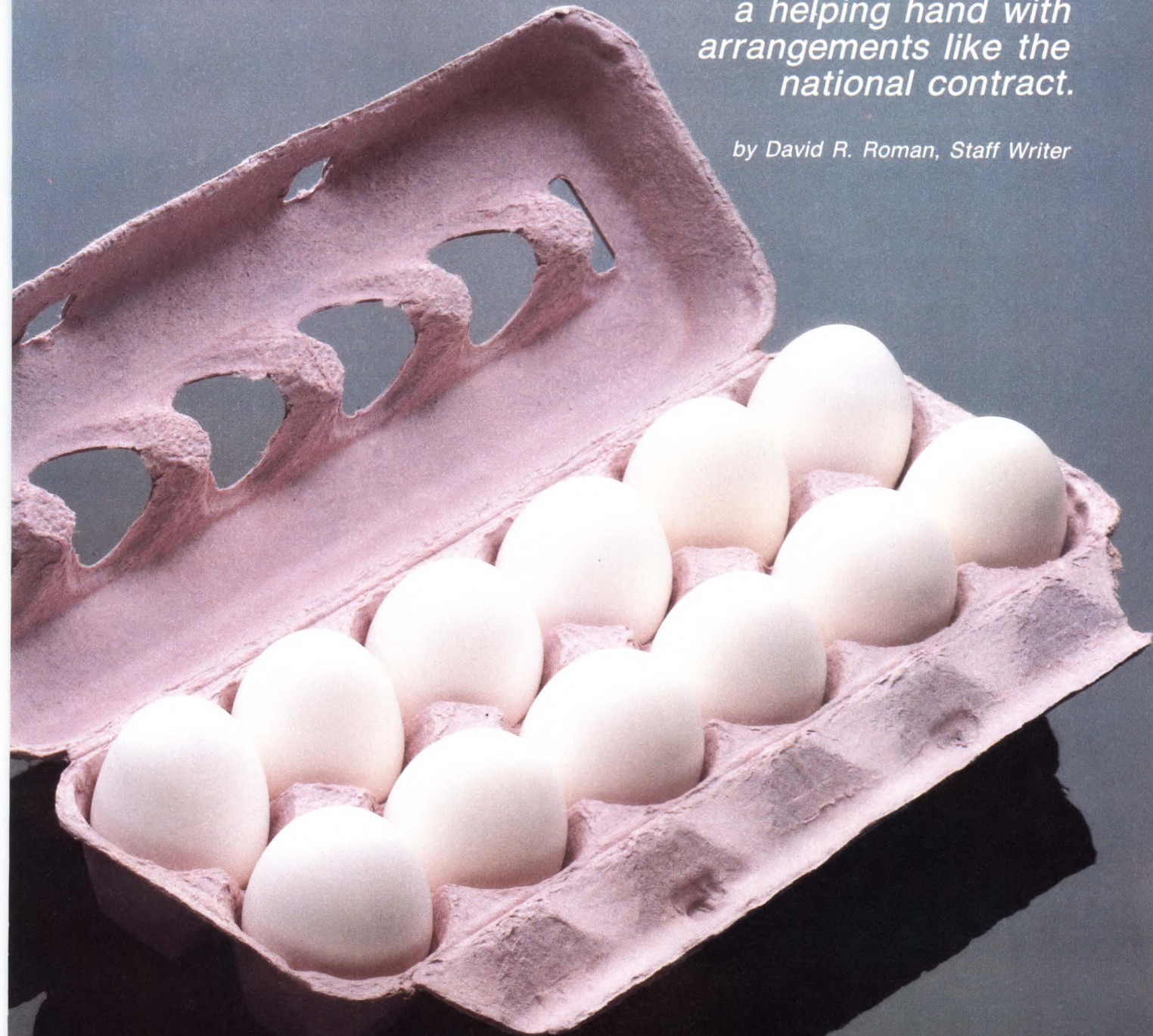
Companies avoid national contracts for a number of

reasons—some good, some bad. The organizational effort they require is not the only obstacle. William Howard, the corporate director of performance and productivity for Fairchild Industries Inc. in Germantown, MD, doesn't want to sign a



Consolidating supply purchases is more economical than piecemeal buying, and it helps a company get a better handle on corporate needs. It takes a greater organizational effort, but the supply vendors are extending a helping hand with arrangements like the national contract.

by David R. Roman, Staff Writer



Buying Computer Supplies

contract that all of Fairchild's divisions would be compelled to follow. "We don't want to sign an edict that defines the purchases of an operating unit," he says. "Even if it might be cheaper, we stay away from it. Our divisions are relatively autonomous, and because it's their money they're spending, the commitment to a vendor has to come from them."

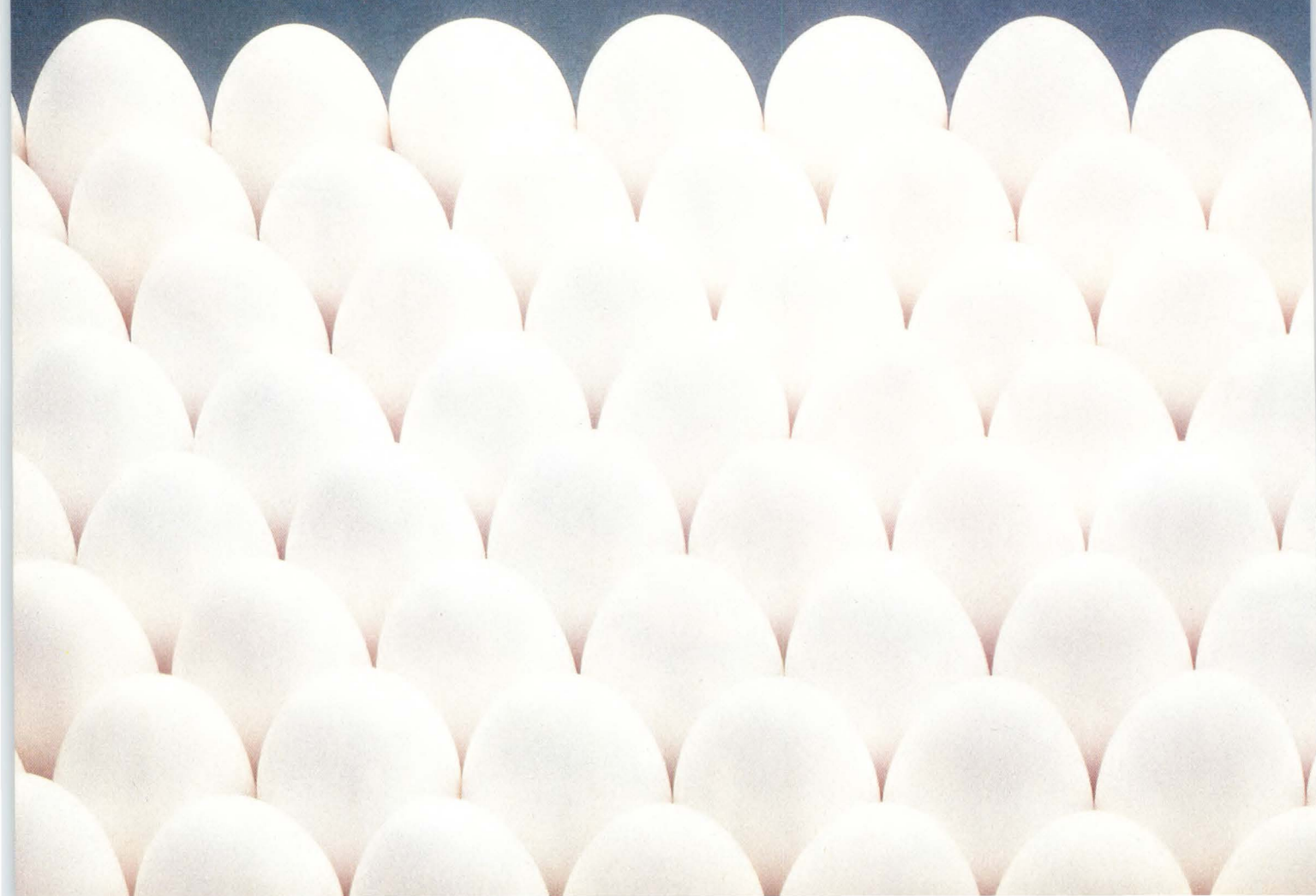
Supply vendors have probably heard every gripe ever leveled against the national contract. And the complaints haven't fallen on deaf ears. The vendors are flexible when it comes to contracts. The terms of the agreement are almost always open to discussion, and other

services or conveniences are likely to be thrown in just to sweeten the pot.

"We try to make it easy for our customers to buy our supplies," says William Choquette, accessories marketing manager for Digital Equipment Corp.'s Installed Base Group, which is based in Merrimack, NH. "We try to be as accommodating as we can by building flexibility into the contract." DEC has three different setups for national contracts that control supply purchases. "A company can buy its supplies from us and keep its inventory in one location," says Choquette. "Or it may want to control its purchase orders

through a central location and give them to us every month, so we make 12 shipments a year to one location. The third way is to have each subsidiary place individual purchase orders against a national contract, in which case we ship to each location."

Moore Business Forms, the forms manufacturer based in Glenview, IL, offers national contracts that conform to the customer's wishes. "They can range from a totally mandatory program, where employees have no alternative but to buy through the national contract, all the way down to one that's totally voluntary," says Van Lazaroff, the manager of



national accounts for Moore. "We have contracts that the home office endorses, but we have no guarantee that outlying locations will participate in it. We get varying degrees of support, and it's all based on the customer's decision." Moore even arranges for some customers buying under national contracts to use the company's catalog as its ordering channel.

Customers can also participate in Moore's forms-management program, under which the vendor coordinates and streamlines a company's entire forms operation, from design to procurement and, finally,

retention of documents. The program costs extra for both contract and non-contract customers, but its existence indicates the range of services vendors are willing to offer to please buyers and secure business. And the closer a vendor gets to a company's operations, the better informed it will be about that customer's needs, and how to meet them.

Contracts with Texwipe Co. Inc., the cleaning-supply maker of Upper Saddle River, NJ, are accompanied by customer-controlled delivery schedules. "That's appealing to customers who are conscious of their inventories," says Susan Brogi, office manager of the

sales-and-customer-service department for Texwipe. "They don't want a year's supply of an item to hit their doors all at once and then just sit there. They may not have room for large inventories. So we let them set up product deliveries to arrive when they want. There's a comfort in knowing that a product has been ordered, and that it will reach you on a certain date." Texwipe will centralize a customer's billing whether it ships supplies to a single location or to various locations.

Some supply manufacturers sell very few of their products directly to the end user; they rely instead on a national



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Buying Computer Supplies

(Continued from page 167)



"We try to make it easy for our customers to buy supplies from us."
Choquette, DEC

network of distributors to sell their goods. The 3M Co. out of St. Paul, MN, operates this way, and so offers no national contracts for supply sales, although it is one of the biggest, and best-known, manufacturers of disks and magnetic tape. Verbatim also depends on distributors, but it is beginning to offer national contracts to companies if one of its distribution outlets cannot compete against the prices of another manufacturer/distributor.

Even while vendors are waging campaigns to sign national contracts, they realize that these contracts are not necessarily the best way for everyone to order supplies. Scott Cochran of Verbatim says that consolidated purchasing "is not going to work in all instances. It might create a hang-up in some organizations. The success of a contract depends on how well-structured a company is and how well it actually plans to disseminate the supplies it orders."

Lee Pryor, chairman of Pryor Corp., the Chicago-based supply seller, agrees that "there are lots of cases where supply contracts won't work, but there are also many cases where they will. They take a lot of hard work and discipline, but they definitely work." The extra effort is worthwhile, in the vendors' view, but the buyers themselves aren't sure. Paul Merchant, the corporate direc-



"National contracts take a lot of hard work and discipline."
Pryor, Pryor Corp.

tor of purchasing for national and international agreements for Allied Corp., Southfield, MI, says that the savings a company may see by buying under a national contract vary from item to item. The more expensive the item, the better the chance for substantial savings. For this reason, he concentrates on consolidating the purchases of hardware, not supplies.

Fine-print pleasures

The opportunity for discounts is a company's primary motivation to consolidate purchases. Vendors cite possible savings that vary from less than 5 percent up to 30 or 40 percent



"No two national contracts look exactly alike."
Merchant, Allied Corp.

of purchase price, depending on the item and the size of the purchase. That's a strong motivator, but other factors come into play, too. An IBM spokesman mentions the reduced administrative costs for the purchaser of handling just one supply contract, as opposed to several. Scott Cochran says, "The convenience of a contract and the accessibility it gives to a supply are as important as the cost savings in some instances."

Some contracts set the prices at which supplies will be purchased throughout the year, so a buyer can take advantage of a price that might otherwise be pushed up. If a national contract specifies that the vendor must pay for all deliveries, a customer saves there also. "A company not only gets control over purchasing and the cost of purchases with a contract, but it gets a better grasp on what's going on throughout the entire company," says Texwipe's Brogi.

A company also acquires a favored position with a supplier once it becomes a national customer. "As the quantity of your purchases becomes more significant, your account will become more significant to a vendor," says Sig Tullman of BASF. "You'll be more visible, and that visibility brings with it an appropriate level of service." The new influence gives customers leverage they didn't have when dealing with local suppliers.

Eli Lilly & Co., the pharmaceutical manufacturer headquartered in Indianapolis, enjoys the national contracts it has established with suppliers over the years because the company grows to rely on a product and its manufacturer. "It's easier to stay up to date this way," a Lilly spokesman says, "because you already have information on the supplier, and it's flowing into a central source."

The contracts are advantageous to vendors, too—as might be surmised, given the efforts they make to nail them down. Since most national contracts are arranged on an annual basis, and since customers are asked to either estimate or guarantee a cer-

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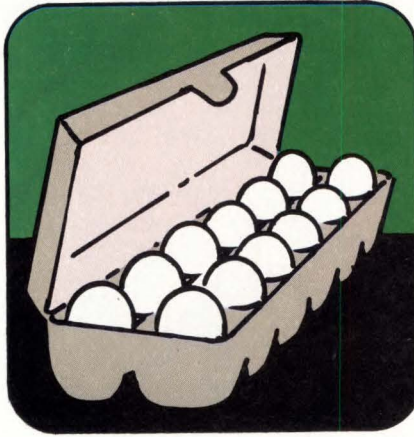
(Continued from page 170)

tain dollar amount in purchases, vendors can then count on that business. Under contracts in which divisions or subsidiaries are required to participate, the vendor has more than an introduction to a potential customer. That's a certain sale.

Contract cold feet

Though contracts between buyers and sellers have the makings of a happy marriage, many buyers are still cagey about rushing into them. What is it about the contracts that makes users wary? William Howard of Fairchild Industries feels that, once signed, they are restrictive and dictatorial. He has arranged a few supply contracts, "but," he says, "I never commit to a vendor that has a minimum-purchasing requirement. Our agreements are based on estimates, so the divisions don't commit to buying a certain amount. And they are never required to buy their supplies through the contract. They can buy from whomever they want. If they choose to buy from a local supplier, that's acceptable."

Ray Kolley, the operations-control manager for Monsanto Co., the St. Louis chemical manufacturer, understands a division's desire to buy locally. "They have a valid point," he says. "There are good ramifications to buying from local sources." It enhances a company's reputation in the local business community, he says, and it's better to be across town, rather than across the country, from a supplier if you have an urgent need



for some supplies. And if a local supplier's prices are a little higher than what a customer would pay under a national contract, the difference would not be that great, Kolley says. "The divisions are under budget restraints. They can't buy frivolously."

Suppliers solve this problem for customers when they arrange for one of their local distribution points to serve an account. "We can offer local service to individual divisions or subsidiaries throughout the country," says Moore's Lazaroff. Of course, the size of a vendor's distribution network would define just how local the vendor's local service is. Kolley at Monsanto insists that his suppliers be based right in St. Louis. "Many customers demand a local inventory of products from their suppliers," says Cochran of Verbatim. "A supplier's position is much stronger if he can offer a local source."

All of Texwipe's products are shipped from a single location in

northern New Jersey. But even without a distribution network, it tries to expedite the ordering process. "Some customers require all of their divisions to place their orders through headquarters," says Brogi. "We try to arrange contracts so that the guy in Boise doesn't have to wait two weeks for his supplies by ordering that way. He can call us up, and if he has his company's permission, he can order his supplies against a contract, and we can send it right out to him."

The desire to deal with a local supplier is so strong in some divisions that they spurn the national contracts their parent company has set up and buy from the local suppliers anyway. Lee Pryor says that some divisions that are under supply contracts from

"Most companies buy supplies as they need them, which wastes a lot of money."

Cochran, Verbatim

Pryor Corp. buy from local suppliers instead. "We also have customers who are under national contracts to one of our competitors, but instead of buying from them, they buy from us. If our local suppliers have struck up personal relationships with them, the customers want to stay with their regular source."

Some of the customer's stipulations can be met by the vendors, while others are out of the question. If a company prefers to sign contracts only with the manufacturer of the supplies, then the seller can only offer its original products. Ray Kolley at Monsanto also wants to test the supplies he's going to be using before he sets up a national contract. "We won't accept any contracts on paper that we haven't brought into the shop and run on our equipment," he says. "Sometimes companies are reluctant to give us a large amount of paper, but we generally get enough to run a good test through the printers."

(Continued on page 174)

Discount directory

Not all suppliers are big enough to offer national contracts, and not all organizations are big enough to take advantage of them. But many suppliers offer their products at a discount to any buyer, regardless of the order's size. The who, what, where, and how much of these discount purchases are cataloged in the "Directory of Discount Computer Supplies" published by Di\$count America Guide.

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Buying Computer Supplies

(Continued from page 172)

Buyers also tend to shy away from exclusive agreements with a vendor that would then become the company's only source for a particular supply item. Howard doesn't like such contracts for Fairchild, for example, "because I'm not convinced everyone would benefit. Every time we look at an exclusive contract and accept a bid from a vendor, one of our divisions points out a different supplier who offers the product for less."

Paul Merchant at Allied stays away from exclusive contracts for another reason. "We always order supplies from at least two vendors, and sometimes from as many as four," he says. "Our divisions can order from anyone they like. It breeds competition. And we don't want to put all our eggs in one basket. This way we're covered if one supplier goes out of business." Merchant also feels no compunction about getting rid of a vendor he isn't happy with. He has managed to fashion contracts that



William Howard, corporate director for Fairchild Industries, bypasses the savings offered by national contracts because he doesn't want "to sign an edict that defines purchases."

suit Allied's needs. "There are no two that look exactly alike," he says. "There's no standard arrangement."

The vendors seem to agree. Their

national contracts do not all look the same, and the choices they leave up to the customer give plenty of leeway to construct comfortable contracts that buyers can live with. Sig Tullman of BASF thinks large corporations are starting to come around to national contracts. "They aren't simple to manage," he says, "but large companies want to know what's coming in house and how it's being used. The companies that have this information are in the best position to capitalize on it by organizing their supply requirements."

Van Lazaroff also detects a higher awareness of national contracts and their value to a corporation. "From both the sales end, and the purchasing end, many companies are moving toward national contracts," he says. "On the purchasing end, some organizations are developing staffs that handle nothing but these contracts. They are recognizing that this may be the way to go." □

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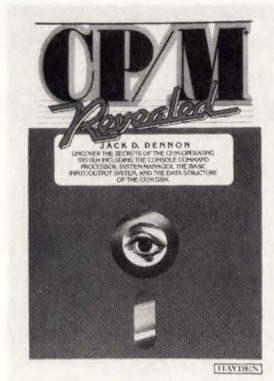
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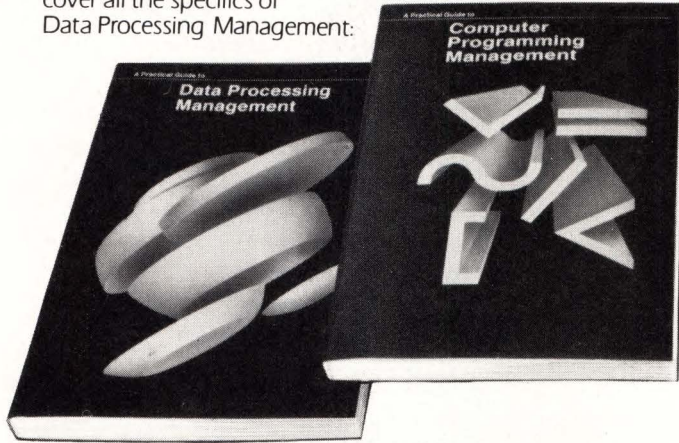
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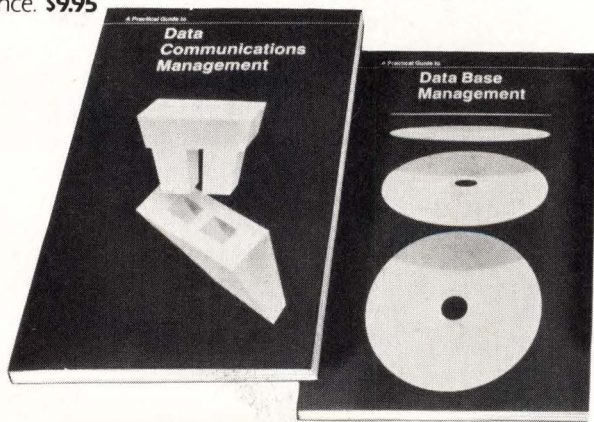
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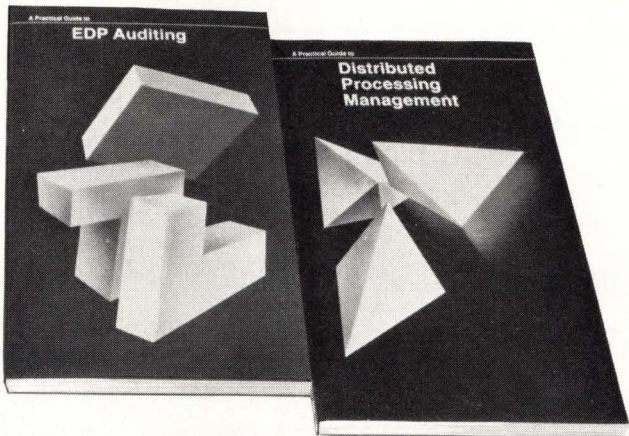
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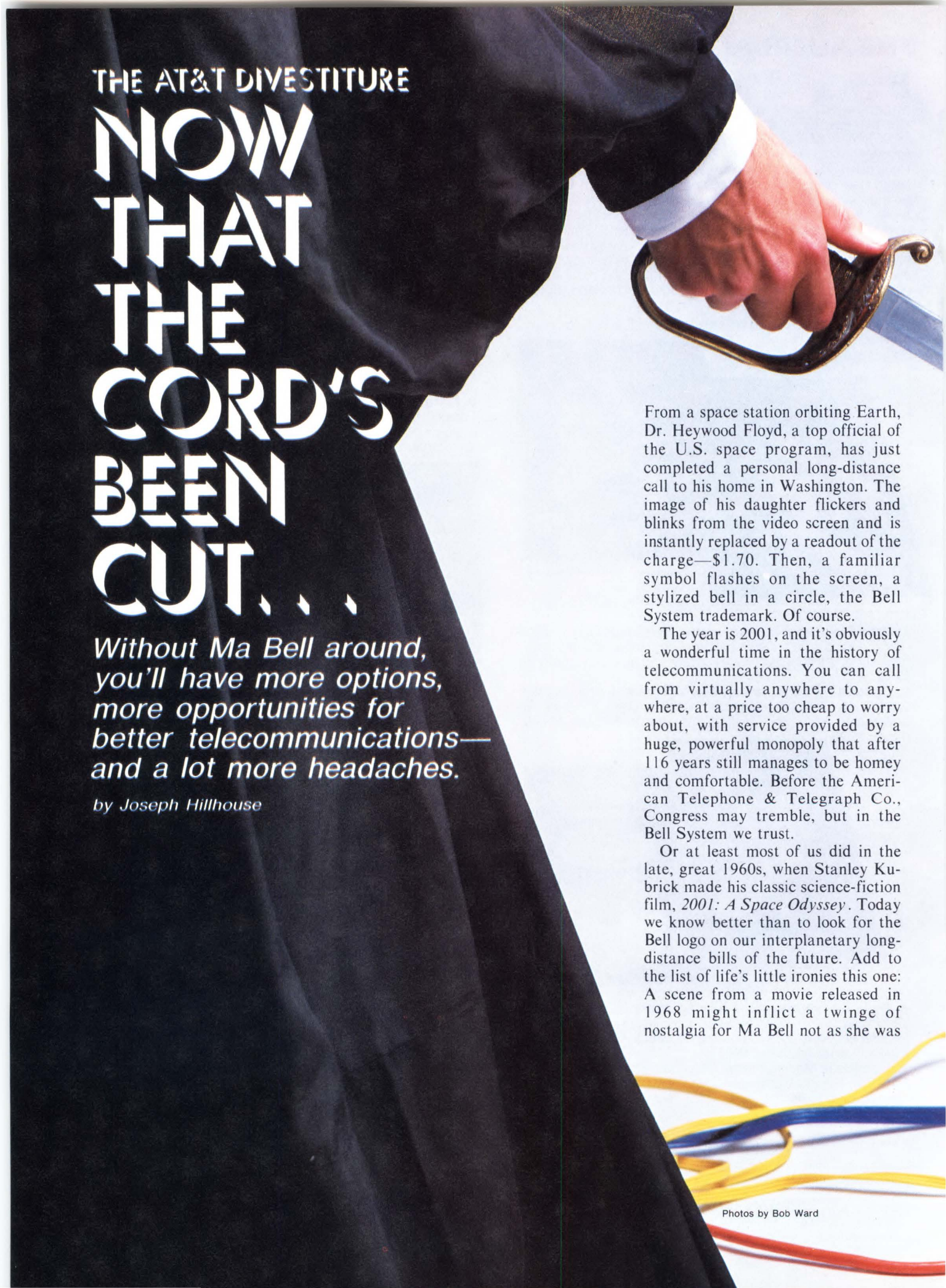
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A black and white photograph of a hand in a dark suit jacket and white shirt cuff, holding a sword with a curved hilt. The hand is positioned in the upper right quadrant. The background is a light, textured surface. At the bottom right, there are several colorful, flowing ribbons in yellow, blue, and red. The overall composition suggests a dramatic or symbolic act, possibly representing the 'cutting' of a cord or the end of an era.

THE AT&T DIVESTITURE

NOW THAT THE CORD'S BEEN CUT...

*Without Ma Bell around,
you'll have more options,
more opportunities for
better telecommunications—
and a lot more headaches.*

by Joseph Hillhouse

From a space station orbiting Earth, Dr. Heywood Floyd, a top official of the U.S. space program, has just completed a personal long-distance call to his home in Washington. The image of his daughter flickers and blinks from the video screen and is instantly replaced by a readout of the charge—\$1.70. Then, a familiar symbol flashes on the screen, a stylized bell in a circle, the Bell System trademark. Of course.

The year is 2001, and it's obviously a wonderful time in the history of telecommunications. You can call from virtually anywhere to anywhere, at a price too cheap to worry about, with service provided by a huge, powerful monopoly that after 116 years still manages to be homey and comfortable. Before the American Telephone & Telegraph Co., Congress may tremble, but in the Bell System we trust.

Or at least most of us did in the late, great 1960s, when Stanley Kubrick made his classic science-fiction film, *2001: A Space Odyssey*. Today we know better than to look for the Bell logo on our interplanetary long-distance bills of the future. Add to the list of life's little ironies this one: A scene from a movie released in 1968 might inflict a twinge of nostalgia for Ma Bell not as she was

back then, or even a year ago, but as she was supposed to be 17 years from now.

Something happened on the way to the millennium. At the stroke of midnight on January 1, the era of the American telecommunications monopoly was over. AT&T was officially stripped of the 22 Bell telephone companies and the national network through which it had reached out and touched 80 percent of our lives.

Divestiture has unleashed powerful forces for change in a \$100 billion

communications system in the world," he says, "and I think the pieces will yield a lot less than the whole."

Even the optimistic observer almost inevitably warns of a grueling transition, a time during which uncertainty will shadow most of the major decisions facing telecommunications managers.

"After a couple of years of chaos and disorder, and a lot of hue and cry, we're going to strike an appropriate balance in telecommunications," says John Haven Chapman, executive director of telecommunications and information-policy research at the Columbia Graduate School of Business in New York. "But it's going to be a difficult few years."

Just as the divestiture took a giant company and broke it into eight smaller—but still very large—companies, the settlement of the U.S. De-

partment of Justice's antitrust suit against AT&T resolved a giant issue only to raise a host of others. Some of the nagging questions have been around for a while. Divestiture didn't create them; it pushed them to the surface. Nevertheless, the search for answers has taken on a new sense of urgency and, in an election year, political intensity.

Even now, Congress is poised to undo or delay much of what the Federal Communications Commission (FCC) has done to redistribute the burden of compensating local telephone companies for their part in providing interstate long-distance service. Congressional efforts to protect residential customers, single-line and small-business users, and AT&T's long-distance competitors from the rigors of the FCC's access charges have further scrambled an already chaotic situation.

Until one side or the other prevails at the federal level, telecommunications managers will have to juggle a number of additional variables when making key economic decisions. Even then, more than a few important issues will remain to be settled by 50 state public-utility commissions. In

industry already rushing headlong into the future on the twin engines of deregulation and technological innovation. For managers of the voice and data networks so crucial to American corporations, it will be a thrilling and anxious ride.

Misgivings about the wisdom of breaking up Bell already haunt Anthony Palermo, director of network planning for RCA Cylix Communications Network, Memphis, TN. Palermo believes divestiture will be good for his company, a specialized satellite data service, but he questions whether it served the nation's best interests. "We had the best



AT&T Divestiture

(Continued from page 179)

the meantime, planning and budgeting for telecommunications will be reduced to setting broad ranges and second-guessing the powers that be.

"I'm trying to figure out the extent of the injury—and I'm not the only one," says Philip S. Freeman, manager of telecommunications in North America for British Airways in New York. "Before I do anything, I need to know what kind of increased costs I've got to offset."

Congress may come to the rescue of the residential customer, but big businesses will have to rely on technology and competition for economic relief. More important, network managers will have to rely on their own savvy and abilities to take charge of planning and maintenance to get the most out of the post-divestiture market. How much the network costs—and how much it is really worth to the corporation—will depend on their expertise, their understanding of the role of communications in corporate strategy, and their ability to act as the integrator of last resort.

"When management asks me if divestiture is good or bad for us," says Robert E. Bennis, manager of communications systems at Westinghouse Electric Corp., Pittsburgh, "all I can really say is that in the short run, it's not going to be easy."

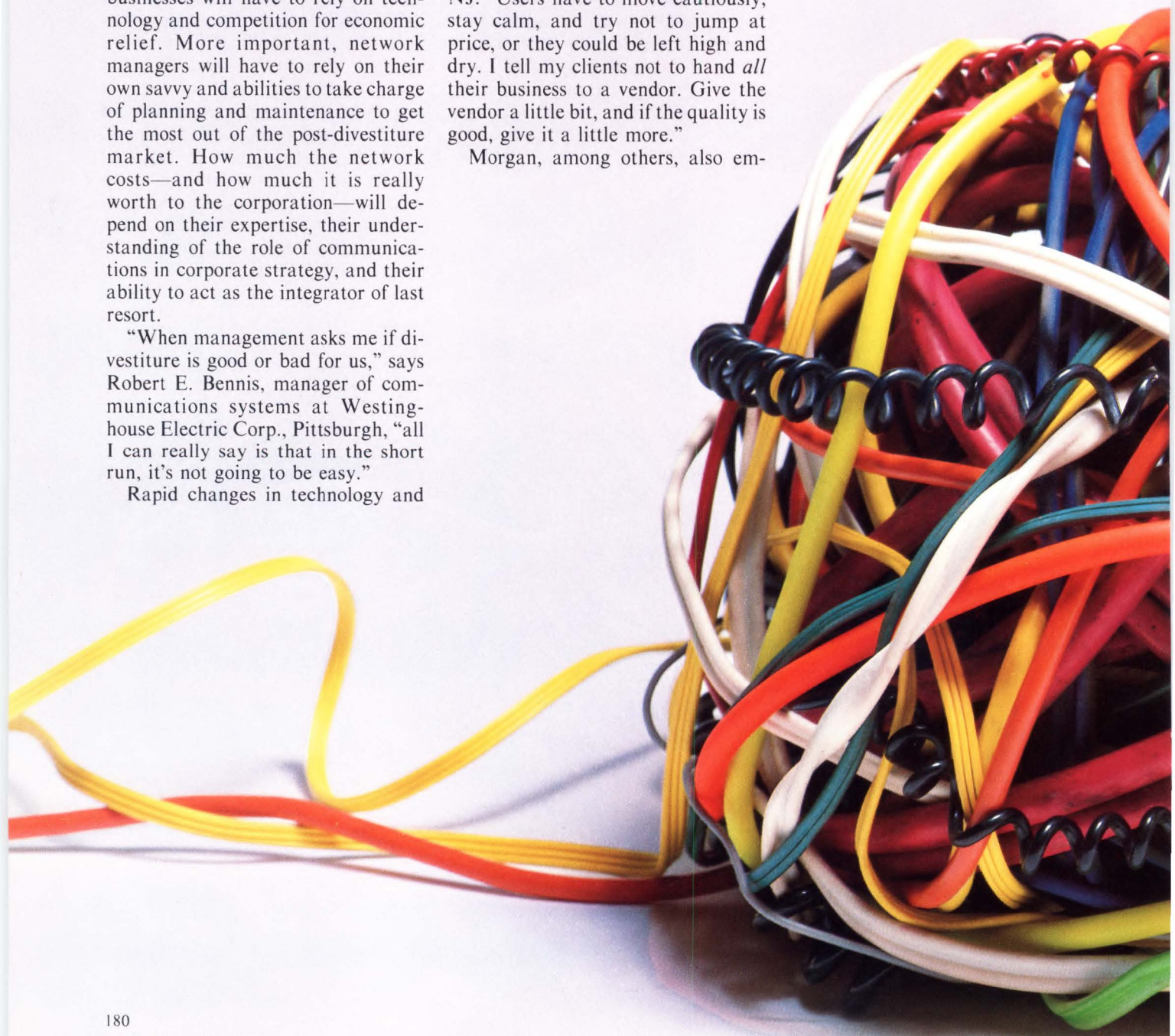
Rapid changes in technology and

the proliferation of equipment vendors, common carriers, and enhanced data services add another layer of complexity to the network manager's job. Deregulation has already created a potentially paralyzing array of options and opportunities. As competition stiffens, a vendor's ability to survive may become as important as the price and performance of what it has to sell.

"The poor user is going to be inundated with offerings," says James H. Morgan, a consultant in Morristown, NJ. "Users have to move cautiously, stay calm, and try not to jump at price, or they could be left high and dry. I tell my clients not to hand *all* their business to a vendor. Give the vendor a little bit, and if the quality is good, give it a little more."

Morgan, among others, also em-

phasizes the importance of building flexibility into a network to keep up with the volatile technology. As analog telephone systems give way to integrated voice-data digital systems and telephone handsets are replaced by electronic workstations, the ability to adapt will be well worth the additional up-front expense, he believes. "I think a user should be willing to pay 10 percent or even 20 percent more for a flexible network," Morgan says. "It will be less expensive in the long run."



There are limits to what a corporation can do to avoid higher costs, anyway—especially if it wants to take advantage of new applications. Lewis L. Haring, a vice president at Chase Manhattan Bank, New York, argues that the expanding use of communications to connect personal computers to databases in remote locations, for instance, will undoubtedly drive total costs upward under any circumstances for corporate users.

The cost of doing more with tele-

communications will be loaded on top of higher spending for basic services. "The cost of local voice-grade loops and plain old telephone service is going up," Haring says. "Companies that are seriously looking at developing their own facilities will have to plan on greater capital spending. There's no doubt their telecommunications budgets will increase."

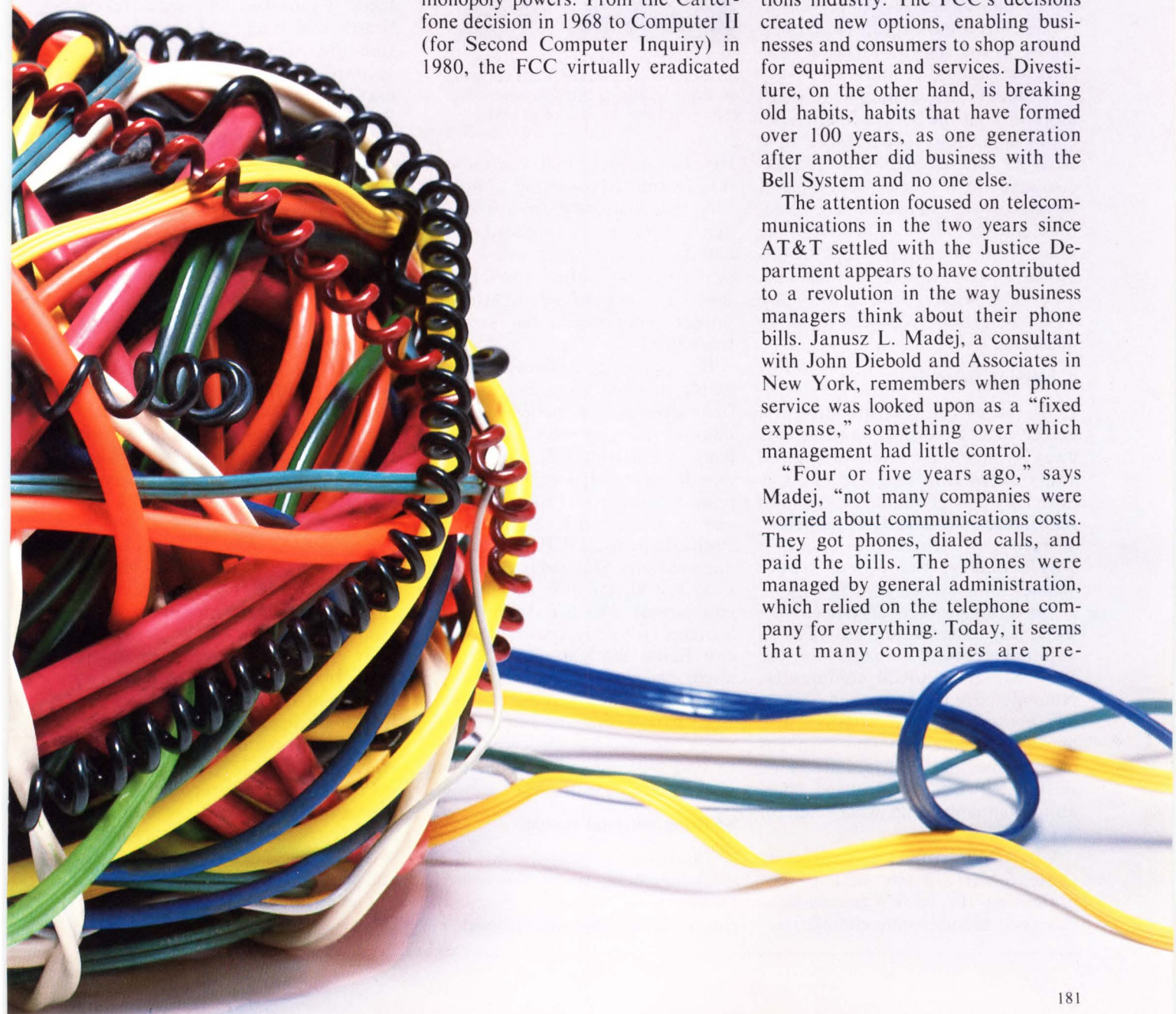
With hindsight, divestiture can be seen as the inevitable last step in what for a dozen years or more had been a gradual stripping away of AT&T's government-sanctioned monopoly powers. From the Carterfone decision in 1968 to Computer II (for Second Computer Inquiry) in 1980, the FCC virtually eradicated

the regulatory barriers to competitive entry into the markets for on-premises terminal and switching equipment. In the meantime, the commission opened the door to terrestrial and satellite carriers offering specialized private-line services. Eventually, after being sued by MCI Communications Corp., the FCC agreed to license alternative dialup long-distance telephone services.

The AT&T breakup, however, represents more than just another increment in the progression toward a fully competitive telecommunications industry. The FCC's decisions created new options, enabling businesses and consumers to shop around for equipment and services. Divestiture, on the other hand, is breaking old habits, habits that have formed over 100 years, as one generation after another did business with the Bell System and no one else.

The attention focused on telecommunications in the two years since AT&T settled with the Justice Department appears to have contributed to a revolution in the way business managers think about their phone bills. Janusz L. Madej, a consultant with John Diebold and Associates in New York, remembers when phone service was looked upon as a "fixed expense," something over which management had little control.

"Four or five years ago," says Madej, "not many companies were worried about communications costs. They got phones, dialed calls, and paid the bills. The phones were managed by general administration, which relied on the telephone company for everything. Today, it seems that many companies are pre-



AT&T Divestiture

(Continued from page 181)

occupied with reducing costs."

Another New York consultant, Robert Self, agrees that management is beginning to see the need for exercising greater control over the telephone, although he states the problem more forcefully. "The phone bill, traditionally, is the worst-managed expense in American business," asserts the author of *Long Distance for Less* (Market Dynamics, \$75), a detailed comparative guide. He suggests that no more than 20 percent of all businesses manage their phone systems efficiently. For some small businesses, 40 percent of phone costs are the result of abuse or failure to use the right mix of long-distance circuits, he adds.

Although Self admits that small users without the budget to hire telecommunications experts are in a bind, he believes divestiture has encouraged them to kick the habit of relying on Bell sales and service representatives. "It's not just Bell," he says. "Half of the sales reps in this industry were waiters a year ago. You very seldom find a sales rep who can provide answers to tough questions."

A blessing incognito

To the extent that divestiture is perceived as a blessing, however, it is usually seen at some distance and traveling in disguise. This is especially true of national companies that in the past have had the luxury of dealing with the Bell System as a single entity, through a single contact.

Until this year, for instance, New York Telephone acted as AT&T's national account manager for the Wall Street financial community. Not only have the banks and brokerage houses lost their intermediary, but the loss comes at a time when tens of thousands of employees are being shifted between the divested operating companies and what's left of AT&T.

Chase Manhattan's Lewis Haring is dead certain the task of coordinating the bank's communications will become more complicated.



"It's possible the people involved in divestiture anticipated the problems and are trying to provide solutions, but we'll have to wait and see."

Ayres, Boeing

He also suspects that confusion at AT&T and the operating companies will cause some short-term deterioration in service. "A corporation with national requirements will have to deal with more entities now," Haring says. "You may be able to arrange a single point of contact, but it will cost you more."

But single-site businesses, as well as big national ones, can expect to find managing the phones more complicated this year than last. A company in Portland, OR, for instance, that does a strictly local business, and relies on former Bell System services and products, will have to deal with Pacific Northwest Bell, AT&T Communications (formerly known as Long Lines), and, if it has any leased equipment, AT&T Information Systems (formerly known as American Bell). Without going too far afield, the same company could pop over to US West—Pacific Northwest Bell's parent company and one of the seven regional holding companies—to find business- and mobile-phone systems and consulting services.

Splitting national systems

The situations growing out of the disengagement of AT&T from its former local telephone companies can become even more involved. For

example, Boeing Corp., the Seattle-based aerospace manufacturer, begins the new year with a private long-distance network that once was simply all Bell but now has key switching functions performed by AT&T and two separate operating companies.

Boeing's Electronic Transfer Network (ETN) is unusual because it uses a mix of on-premises and central-office switching. Most ETNs rely entirely on on-premises private automatic branch exchanges (PABXs), but the number of lines feeding into Boeing's facilities in Seattle and Wichita, KS, makes the standard arrangement impossible, according to M.U. Ayres, general manager of network services for Boeing.

"There isn't a PABX with the capacity to handle what we've got," Ayres says. "We have 11,000 lines in Seattle and about 7,000 in Wichita. We also provide a great deal of access to the central-office switch from other locations in the Puget Sound [Seattle] area—about 25,000 to 35,000 lines altogether—though the numbers change daily."

After divestiture, the central office, or Centrex, switches remained with the local operating companies in Washington State and Kansas. But the leased PABXs at the two smaller hubs, in Philadelphia and Vienna, VA, were inherited along with the rest of AT&T's "embedded" equipment by AT&T Information Systems. In light of the arm's-length, competitive relationship between AT&T and its former local companies, it hardly comes as a surprise that Ayres is worried about coordinating service and maintenance of the ETN—which carries half of Boeing's long-distance phone traffic, internal messages, and "incidental data."

"It's possible the people involved in divestiture anticipated the problems and are trying to provide solutions," Ayres says, "but we'll have to wait and see."

The estrangement of AT&T from

(Continued on page 186)



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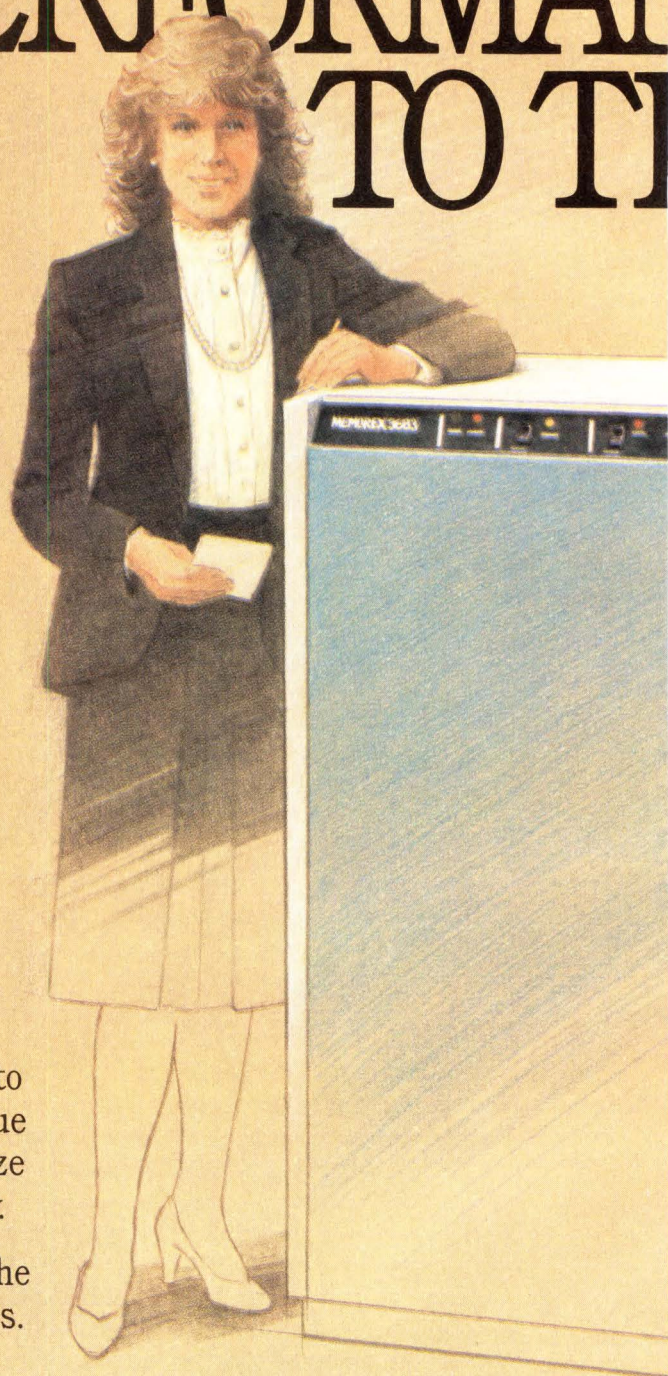
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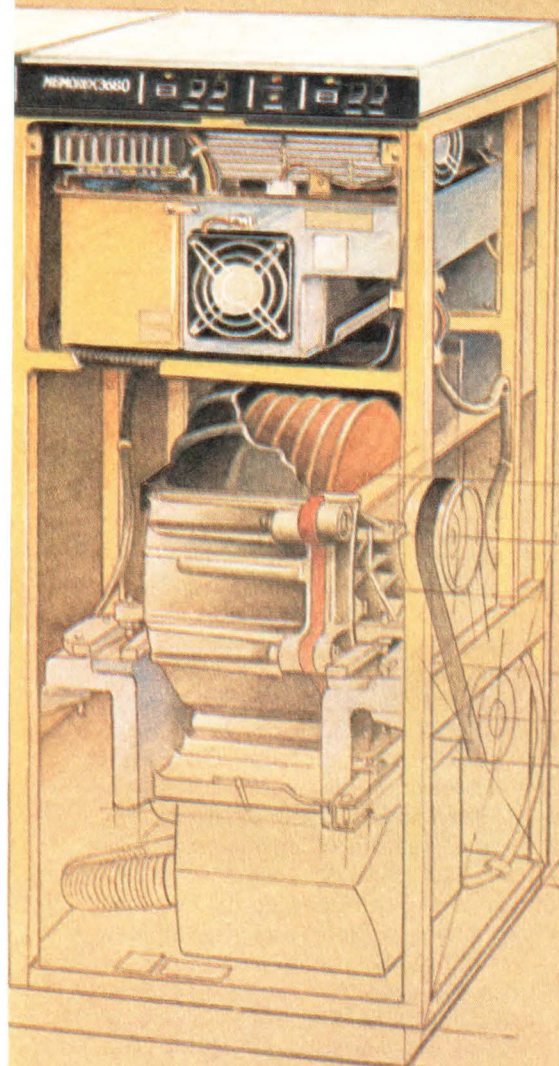
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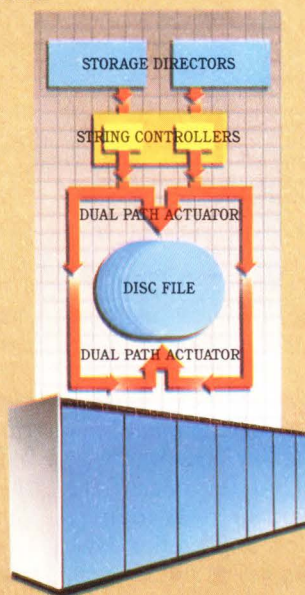
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AT&T Divestiture

(Continued from page 182)

the local operating companies is already causing complications for private-line users, asserts Richard Montoro, a vice president in voice communications for Paine Webber, the New York brokerage house. "Smaller problems are turning into catastrophes," he says. "It's becoming more and more difficult to manage leased lines and point-to-point networks. There isn't a lot you can do about it: The operating companies are looking at AT&T like it's a furry beast rather than Mother Bell."

The access conundrum

The breakup of the Bell System is arguably the biggest event in telecommunications since the utterance, "Watson, come here. I want you." And the controversy surrounding the FCC's access-charge order is unquestionably the biggest thing since the breakup announcement. Billions of dollars hang in the balance.

For managers of the networks so crucial to American corporations, divestiture will be a thrilling, anxious ride.

If, for instance, Congress succeeds in voiding or delaying the FCC's access charge on residential subscribers, long-distance users can expect to pay about \$2 billion more this year than they would have otherwise to make up the lost revenue. If the commission's plan for redistributing the access burden among the common carriers gets tossed out as well, AT&T's competitors will be in a far better position to continue undercutting its long-distance prices and chipping away at its enormous market share.

In the meantime, the FCC is experiencing doubts of its own, and has pushed back the effective date of the access charges from Jan. 1 to April 3. The extra time will be used to examine tariffs and carrier-access



charges filed by AT&T and the local telephone companies. From this review could come some relief for users of short-haul private lines and multi-point networks, as well as users of AT&T 800 (In-WATS) service. It could also act as a moderating influence on long-distance rates.

Of course, most of the controversy has grown out of the FCC's plan for phasing in access charges on residential phone lines over the next six years. The plan would require consumers to pay their local phone companies a flat monthly fee—\$2 this year and rising to about \$8 by the end of the decade—for access to the interstate network. The theory behind the plan is that the phone company has to provide the connection and so should be paid for it, even if the customer never makes an interstate toll call.

Businesses haven't been spared by the plan. Most standard business lines would get hit immediately with a monthly charge of up to \$6 under the FCC's plan, and WATS and private lines would be subject to a \$25 surcharge on each "closed" end (an end at which traffic can be routed through a PABX or switchboard back into the public network). Nevertheless, most businesses seem to accept and support what the FCC is trying to accomplish—cost-based pricing—though they might find it difficult to embrace the method.

"The FCC has developed a reasonable approach to moving toward a cost-based type of competitive market," says Robert Bennis of Westinghouse. "You can argue about exact dollar amounts, but no one has come up with a more workable way."

Support for the FCC among business users might be explained, in part, by the expectation that rates for

various long-distance services will come down once long-distance rates no longer need to subsidize the local telephone companies. (Under the pre-divestiture system, about a third of AT&T's long-distance revenues, or \$11 billion of \$33 billion annually, went to subsidize local service.) But business support might also be attributed, in part, to a firm belief that whatever Congress cooks up will be even harder to swallow.

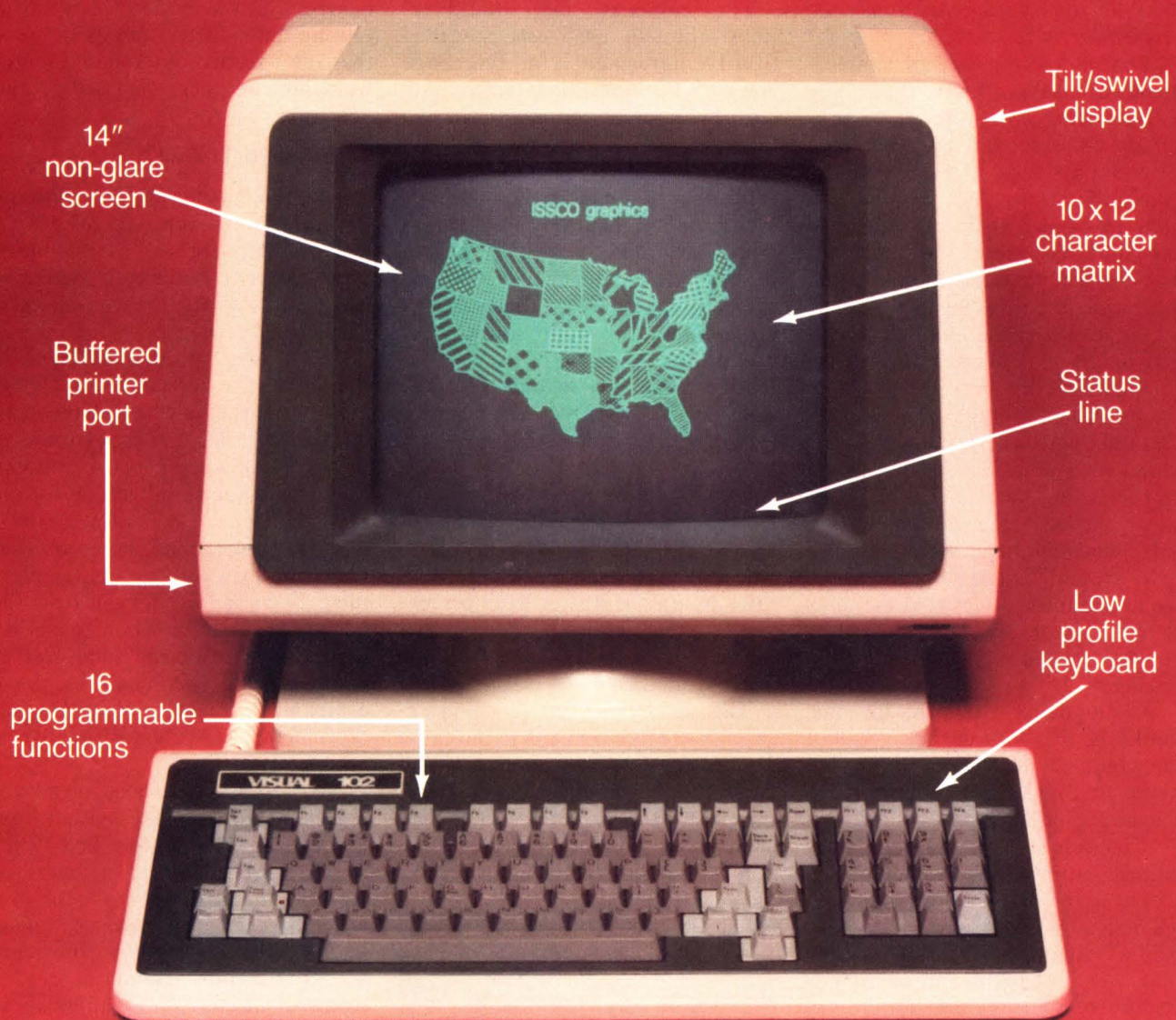
Congress, so far, has lived up to its advance billing. The House, undeterred this time by AT&T's vaunted team of lobbyists, passed a bill in November that would exempt residential and single-line business customers from the access-charge order. The legislation, sponsored by Rep. Timothy Wirth, a Colorado Democrat, would make up the loss in revenue by continuing the subsidy—though at a reduced level—of local service through long-distance rates. The Senate is expected to act favor-

Divestiture is breaking habits that have formed as one generation after another did business with Bell and no one else.

ably on a similar measure that would impose a two-year moratorium on the levying of residential access charges. And, while the Reagan administration has said it doesn't like either version, that doesn't mean the president will veto whatever emerges from the House-Senate conference. He's up for reelection this year, too.

Both sides warn of dire consequences if the other side prevails on this issue. Both sides evoke "universal service"—the goal of making the telephone available and affordable to as many American households as possible—in their arguments. On the one hand, Ellis Woodward, a spokesman for Congressman Wirth's telecommunications subcommittee, says that legislation was needed to correct an inequity—making people pay for

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AT&T Divestiture

(Continued from page 186)

access whether they use it or not—and to remove a direct threat to the ability of some consumers to pay for telephone service.

"The philosophy is very simple," Woodward says. "First, there is a long-standing commitment to preserving universal service, a commitment dating back to 1934 and the Communications Act. Second, we want to ensure that long distance pays its fair share of the total cost. And we feel that the FCC's action could violate both principles."

On the other hand, the FCC warns that unless it is allowed to "reform network-pricing practices," high-volume business users will abandon the public network, shrinking the network's revenue base, causing rates to soar. Not that the commission wants to, or thinks it can, eliminate "bypass" schemes altogether. The object is to prevent "uneconomic bypass," the use of alternatives that can only compete favorably with the public network because of distortions in pricing.

Westinghouse's Bennis, for one, thinks the FCC has the better half of the argument and notes, somewhat wryly, that he has the "onus of being a bypass user" already.

"Congress is really saying, 'Let's protect the residential customer and sock it to the business users' . . . and it's not a reasonable way to make policy," Bennis says. "Rather than that, let's go back to the way it was [before divestiture] and spoon-feed the user and forget about the benefits of competition. Let's just turn back the clock."

Turning back the clock

Turn back the clock: That's what AT&T's long-distance competitors are hoping Congress will do for them. The other intercity carriers have been drawn into the congressional camp by the hope that legislation will forestall a substantial shift in access costs from AT&T to them. Such legislation could, for example, prevent a doubling of the revenues MCI, the nation's second-largest long-distance company, is required to pass along to

the local telephone companies in 1984.

The legislative plan would restore—through 1985—the so-called ENFIA agreement (for Exchange Network Facilities for Interstate Access) as the basis for access charges levied on the "other common carriers," or OCCs, such as MCI and GTE Sprint, and on the resellers, such as U.S. Telephone Inc. of Dallas and Combined Network Inc. of Chicago. It would enable AT&T's competitors to stabilize their rates, at least, while the dominant carrier would have to re-think its plans to reduce prices for regular Message Toll Service (MTS) long-distance calling and for Wide-Area Telecommunications Service (WATS), AT&T's bulk discount option.

AT&T Communications has already indicated it might be forced to withdraw proposals to lower MTS rates by an average of 10.5 percent and WATS rates by an average of 6.9 percent if the FCC's access-charge order is scuttled.

The specialized carriers and resellers were late converts to the cause of congressional intervention and broke a united front of major industry and user organizations when they switched over. In fact, Eugene Eidenberg, senior vice president for regula-

tory and public policy at MCI in Washington, says his company has no quarrel with where the FCC is trying to take the industry. It was the way that the commission proposed to get from here to there that led to the defection.

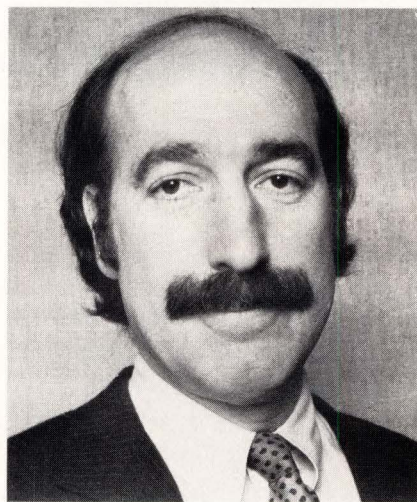
Is this the right road?

"We fundamentally agree with the commission's long-term policy goals," Eidenberg says. "It's the two- or three-year transition that's so badly screwed up that we think it needs to be revisited."

The ultimate goal, as set forth in the divestiture agreement, is a long-distance market in which all the long-distance carriers have equal access to the local-exchange network and pay the same usage-sensitive rate for the right to connect. AT&T's competitors are complaining, however, that under the FCC's access-charge plan, they are being forced, right from the beginning of the transition, to pick up a bigger share of the total cost of compensating the local telephone companies without enjoying any improvement in the relative quality of access.

No one's arguing about the advantages that AT&T brings with it from the bygone days of Ma Bell. They make up an important part of AT&T's tactical response to the constant barrage of commercials promising long-distance calls for 50 percent off. Some network managers, it seems, don't even want to think about experimenting with circuits from other carriers. AT&T offers 11-digit dialing, instead of 22 or 23 digits; it can process calls from rotary telephones, still about 40 percent of the market; it has automatic number identification and answer supervision to determine the origin of a call and when a connection is actually made; and it is connected to the central office by a superior four-wire trunk instead of a two-wire line.

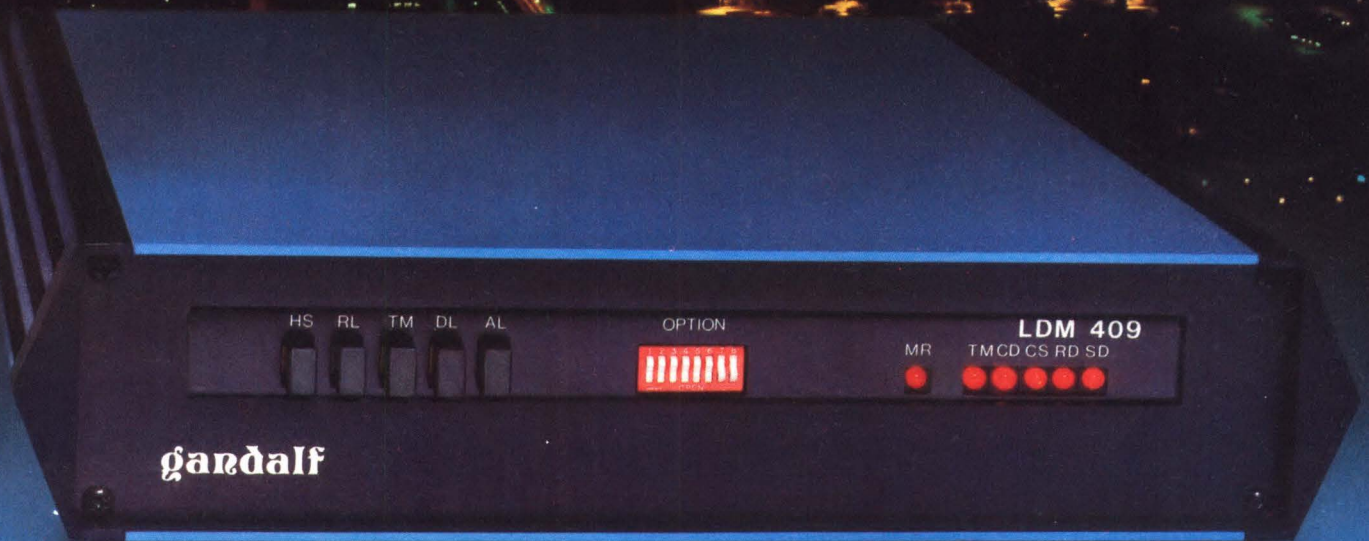
What's at issue is how much these advantages, which taken together constitute "premium access," are worth. When the FCC revised its original access-charge order in July,



"We fundamentally agree with the FCC's long-term policy goals. It's the two- or three-year transition that we think needs to be revisited."

Eidenberg, MCI

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AT&T Divestiture

(Continued from page 188)

it raised the value of premium access in 1984 from \$1.4 billion to \$2.2 billion (or from \$56 million to \$87 million if you figure what part of the total AT&T would have paid anyway, based on its 96 percent market share). But the other carriers still aren't satisfied. They put the value at from \$5 billion to \$8 billion, and they worry that the FCC's schedule for phasing out this surcharge, though subject to adjustment, fails to take into account the likelihood that real progress toward equal access will run behind the September 1984-to-September 1986 timetable set under the divestiture agreement.

In the first year, AT&T's contribution to the exchange carriers would have been relieved of \$3.3 billion, the total amount of end-user access charges, if the FCC's plan had been implemented on schedule. At the same time, Eidenberg estimates that MCI's monthly access cost, per line, would have increased from \$234 to \$425, or more than 80 percent. In addition, the total contribution to the telephone companies, about \$170 million in 1983, would have about doubled because there is a constant increase in the number of connecting lines.

The additional burden would severely curtail MCI's ability to compete aggressively, Eidenberg says, and cut deeply into capital spending, now about \$1 billion a year. MCI's booming rate of growth—about 60 percent of its plant is less than two years old—would slow to a relative crawl, Eidenberg says. This growth would slow at a crucial time, he adds, because the market for dial telephones is just about to open to the other common carriers.

Actually, concern about the impact of the access-charge plan on MCI was registered the day the plan was announced, as MCI's stock plunged \$4.875 to \$15.25, a \$1.1 billion loss in value. Nor has the situation escaped the attention of the FCC. Doubts about the reasonableness of the local telephone companies' proposed access charges on long-distance carriers were a major



factor in the commission's decision to delay implementation of the order until April.

"If divestiture results in misapplied access charges, it could be a disaster," says Columbia University's John Chapman. "If the operating companies are allowed to gouge the interexchange services, MCI and the other carriers could begin to lose profitability and competition would suffer badly."

What does the FCC want?

Eidenberg draws a similar conclusion, but he suggests that MCI will come through the squeeze in pretty good shape. The real vulnerability, he thinks, lies elsewhere. "MCI will survive," he says, "but a lot of other companies, principally the resellers, say they won't. So the question becomes, 'Does the FCC really want competitive telecommunications?'"

Resellers buy transmission capacity "wholesale," or in bulk, and sell it "retail," or by the call. They live and die in the margin between what they pay for a call and what they can turn around and sell it for. In recent years, that margin has been fat enough to entice hundreds of new entrants into the long-distance phone business. Interstate resale isn't regulated anymore, so it's impossible to keep track of how many companies are out there leasing WATS and foreign-exchange (FX) lines (an FX line is a local business line in another exchange connected directly to the telephone by a dedicated private line) and reselling calls to other companies in the building, on the block, wherever.

There's little doubt, however, that the combined impact of divestiture and the access plan will significantly

narrow the margin for resellers. William G. Milne, general counsel for U.S. Telephone in Dallas, estimates that WATS access will cost about 50 percent more because of the \$25 surcharge and that the new usage-sensitive access charge on resellers' private lines—the same charge assessed on the OCCs—would produce an increase of 100 percent. And that's not the end of it: While the reseller's costs will be going up, AT&T's prices for MTS and WATS service will be coming down.

"The resellers are getting squeezed at both ends," Milne says, "and, depending on how much of a margin a reseller has to begin with, it could be forced out of business."

Meanwhile, the impact of the access-charge plan is expected to be a good deal less severe on the remote-processing and computer-timesharing companies, like GE Information Services (Geisco) and Automatic Data Processing (ADP), and the value-added carriers, like GTE Telenet, Tymnet, and ADP's Autonet. These "enhanced service" providers were specifically exempted, for the time being, from having to pay the higher carrier-access charges imposed on the OCCs and resellers because the FCC determined that the potential "tenfold" increase in the access burden would be unreasonably disruptive. The commission, however, left open the possibility of revising the system in the future to establish identical access charges for enhanced services and common carriers.

Impact of new tariffs

Although apparently satisfied with the FCC's handling of their situation, the enhanced-service companies hardly escaped scot-free. They still must pay the same access charges imposed on private corporate networks and, under tariffs filed by AT&T and the operating companies, can expect the underlying cost of transmission to rise as much as 10 or 20 percent, according to Warner R. Sinback, manager of telecommunications affairs for Geisco in Rockville, MD.

(Continued on page 194)

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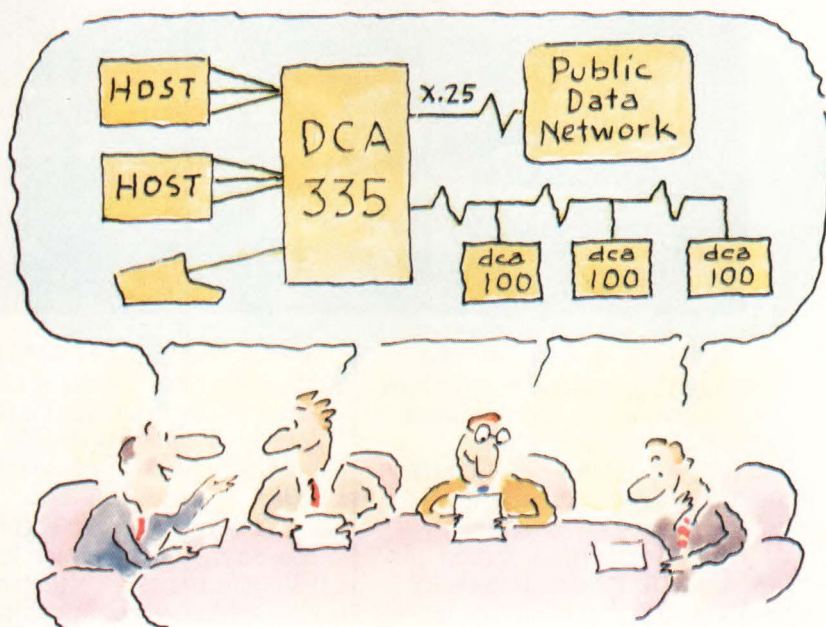
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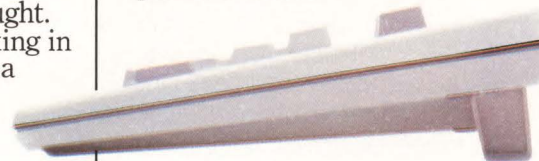
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Display Memory Configurations (Plus 25th message/status line)	24 lines by 80 characters	(2) 24x80 or (1) 48x80 or (1) 24x158	User-Definable up to 96x80
Scrolling	Standard Scrolling	Smooth, Jump or Horizontal Scrolling Split Screen	Smooth or Jump Scroll Split Screen
Transmission Mode	Conversation Mode	Conversation or Block Mode	Conversation or Block Mode
Editing	Limited	Full Editing & Protected Fields	Full Editing & Protected Fields
Visual Attributes: Reduced Intensity, Blink Blank and Reverse Video. Underline also on ADM 12 and ADM 24E	3 Embedded 1 Non-Embedded	5 Embedded or Non-Embedded, plus Full Screen Reverse Video	6 Embedded or Non-Embedded, plus Full Screen Reverse Video and Highlight
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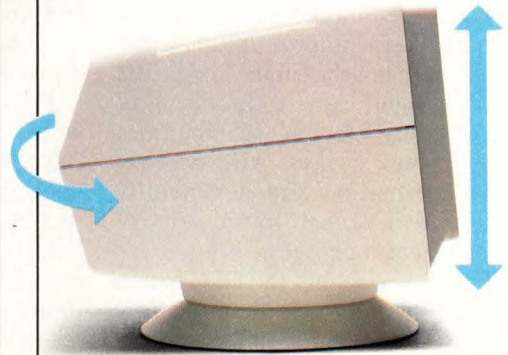
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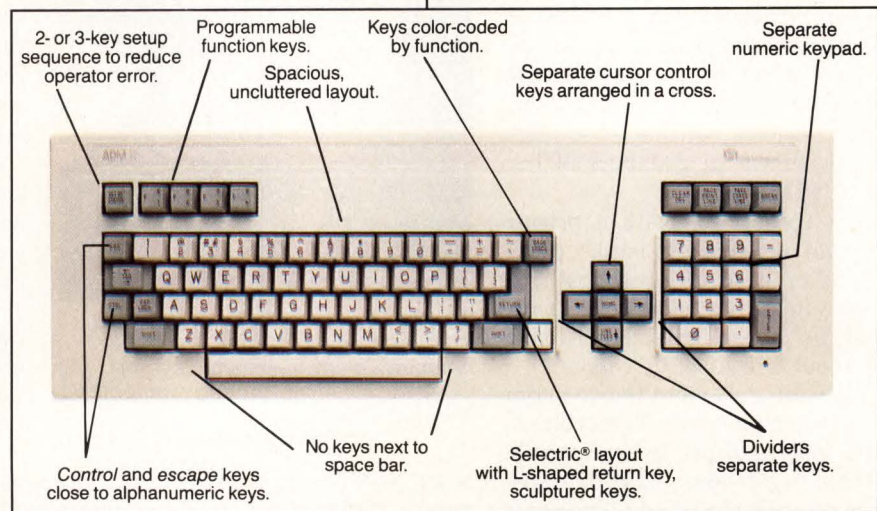


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AT&T Divestiture

(Continued from page 190)

Sinback is careful to distinguish between the impact of the access charges and the impact of the tariffs. The two are not the same. The tariffs reflect a significant restructuring of the way private-line services are priced, Sinback says, with accelerated depreciation and a generally higher rate of return "folded in" with the new access charges.

"I don't know what the FCC had in mind," Sinback says, "but the new tariff structure really obfuscated the access-charge effect. If you look at what the access charges would have done by themselves, they're minor players. They represent less than a third of the total increase."

Moreover, the new rate structure is heavily skewed in favor of long-haul point-to-point circuits, according to Sinback and other telecommunications managers. The average increase has been calculated at 15.3 percent, but the impact on short-haul point-to-point lines and multidrop networks will be much greater. (And the rates for some long-haul circuits will actually drop.) Anthony Palermo of RCA Cylix expects the price of leased private lines, which the company uses to connect customers to its backbone satellite network, will increase more than 90 percent at distances of less than 10 miles.

For a corporation with a private multipoint network—a bank's automatic-teller network, perhaps—the cost of supporting each node is expected to more than triple, rising from about \$36 to \$133 a month.

AT&T officials point to two major factors in explaining the favorable tilt toward long-haul private-line tariffs. The first is obvious: The \$25 surcharge on each closed end represents a bigger percentage of the total cost of a short-haul circuit. But they also suggest that the rates for various private-line offerings needed upward adjustment to bring them into line with the actual cost of providing service. The FCC, it seems, is not entirely convinced.

Although the commission has complained in the past about private-line users' paying too little, it is now con-

cerned that businesses that depend on less competitive short-haul services may be forced to pay too much. Those tariffs are under review.

Fine-tuning by the FCC, however, won't reverse the trend toward substantially higher costs for private lines and networks. As the FCC approach of cost-based pricing takes hold, more and more corporations may have to re-evaluate and reconfigure their networks.

"In the future, it's going to become a very expensive luxury to have dedicated service 24 hours a day," says Paine Webber's Montoro.

Paine Webber has already decided to abandon a system of private long-distance tie lines because the cost of operation is no longer competitive



"There's too much loaded on—the brick and mortar of the telephone company plant, for instance—for Centrex to remain broadly competitive with the PABX."

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with WATS, says Montoro. The switch could save \$10,000 a month under the old rates—more, once new rates are in place. The brokerage house will also take a hard look at its voice ETN network and eventually may dismantle it, as well.

Olin Corp., another big ETN user, and one of the earliest, may replace some of its private lines with WATS, and use multiplexers—devices that concentrate traffic from low-speed lines into high-speed lines—to reduce

from 16 to eight the number of trunks between its hubs in Stamford, CT, and southern Illinois, near St. Louis. Still, Eleanor Luce, director of management-information systems at Olin, anticipates paying more this year to operate the network, which services some 60 locations, because of the new access charges. And she's not pleased.

"We're going to spend an additional \$500,000 to do no more than we're doing now," Luce says. "It's an additional expense that's not covered by additional sales, and it's going to be on top of whatever other increases we have to pay."

Cost-saving options

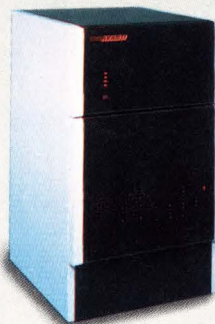
How can corporations reduce, or even dodge, such hefty increases in costs? At Westinghouse, with its \$65 million domestic-communications budget, Bennis hopes to cut a potential 15 percent to 18 percent increase in networking costs to under 10 percent by changing the mix of circuits and services. For instance, Bennis says, he may shift some traffic from the private network to other media, like satellite and AT&T's high-speed, high-volume terrestrial digital service.

Westinghouse is one of "30 or 40" corporations with an EPSCS (for Enhanced Private Switched Communications Systems) network—AT&T's most advanced offering—and Bennis expects to have the option in the future of sharing facilities with other users. Or it may become possible, he says, to lease "raw" bandwidth from the common carriers and then break it down and use it any way the company chooses.

Bennis doesn't foresee wholesale abandonment of private networks, however. There are still some price advantages over MTS and WATS, he says. More important, the private network can be tailored to accommodate new technology and specialized services. "If we hadn't had the price incentives in the past," Bennis says, "technology probably would have driven us to private systems anyway."

(Continued on page 198)

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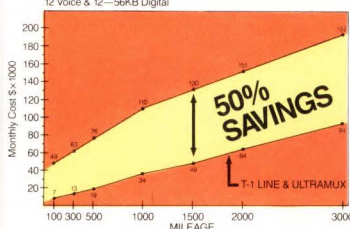
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Data Sync ☐ Async ☐			
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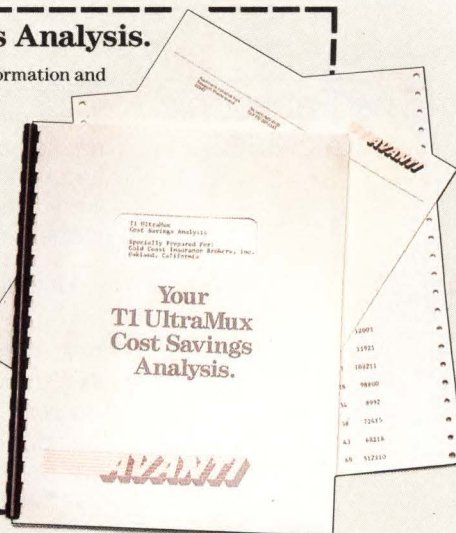
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AT&T Divestiture

(Continued from page 194)

Once the exchange carriers have developed methods of measuring the flow of traffic from private systems into the public network, access charges could actually drop for some users. Kathleen B. Levitz, an attorney-adviser in the FCC's office of policy and planning, describes the \$25 surcharge as an interim measure, a form of "rough justice." She admits that it fails to discriminate between the private network that leaks a lot of traffic through its PABX (hence the expression, "leaky PABX") and the one that leaks very little or none.

Until it is possible to measure the amount of leakage, she says, the surcharge prevents businesses from using private lines simply to avoid paying access charges. "We don't want someone building a private network just because we've allowed the phone companies to price interstate services in a wacky way," she says.

Other services that have become staples in business communications, most notably WATS and Centrex, are under pressure from the FCC. WATS rates are being scrutinized by the commission as part of an ongoing review that could lead eventually to a unified MTS-WATS tariff structure. Such a unified structure would be a setback not only for resellers, but also for many business users of WATS.

Centrex threatened

Centrex, which uses central-office switching for a customer's internal communications, is in immediate danger from the FCC's access-charge plan. In a Centrex system, every phone is tied directly to the exchange carrier's central office, and the FCC has proposed assessing an access charge against every line. In a PABX system, on the other hand, many phones can be tied to the central office with a single trunk, with the access charge applied only once. The access-charge burden on a Centrex system might thus be 10 times greater than on a PABX system with trunks capable of connecting 10 phones to the central office. A branch office with 50 phones, for instance, would pay the charge five times or



50, depending on whether it uses a PABX or a Centrex system.

Despite entreaties from Centrex users and the telephone companies, the FCC has rejected the idea of adopting a "trunk equivalency" approach to access charges on Centrex. Instead, the commission has decided to treat Centrex lines in place or on order as of July 27, 1983, as if they were residential rather than business lines. Lines ordered after July 27 would pay the full business access charge of up to \$6 a month this year.

The FCC's compromise is seen by many as postponing the demise of Centrex, but not preventing it. Some experts question whether Centrex could remain competitive with the PABX under any circumstances. William T. Rush, telecommunications consultant and partner in Coopers & Lybrand in New York, calls the access-charge order just "the final nail" in the Centrex coffin.

"There's too much loaded on," Rush says, "the brick and mortar of the telephone company plant, for instance, and Bell labor charges, for Centrex to remain broadly competitive with the PABX."

Rush and others, however, believe that Centrex still offers advantages in specific situations—Boeing's ETN network might be an example—and some experts suggest that divestiture might have given the Bell operating companies an opportunity to broaden Centrex' appeal. Harry Newton, a consultant and publisher of *Teleconnect* magazine, points out that Centrex has failed to keep pace with PABX technology, in part, because of a conflict in AT&T's mission, he suspects.

As a producer of both PABXs and central-office switches, Western Electric, AT&T's manufacturing

arm (now named AT&T Technologies), may have had little incentive to outfit Centrex with features like data switching that have become almost commonplace for PABXs, Newton says. Competition could eliminate that problem as the former Bell operating companies look more and more to independent vendors for office switches, as well as customer-premises equipment. (One independent vendor, Northern Telecom, reported last year that the Bell operating companies were already well on their way to becoming its major customers for large central-office switches.)

Ultimately, of course, what happens to Centrex could affect not only the Centrex customer and telephone company but the general ratepayer as well. A relatively sudden mass abandonment of Centrex would, presumably, force the telephone companies to look elsewhere to recover their stranded investment. The FCC recognizes the problem, but in large measure has left it to the state utility commissions to devise solutions for their separate jurisdictions. In fact, whether Centrex continues to be a viable option may be decided state by state.

Economics and Technology Inc. (ETI), the Boston-based research and consulting firm, identifies two policy options for state regulators that could salvage Centrex. In its newsletter, *Trends in Communications Regulation*, ETI suggests that the states are free to adopt trunk equivalency as the basis for setting intrastate access charges and to counteract the impact of interstate access charges with offsetting reductions in overall Centrex rates. The latter move, ETI says, can be justified as preventing a double recovery of the cost of interstate access, which traditionally has been lumped into Centrex rates anyway.

The double-recovery issue saddles state regulators with a tough choice between protecting the Centrex customer base and maintaining, for the time being, the subsidy of residential service through inflated Centrex rates. Intended or not, one of the side

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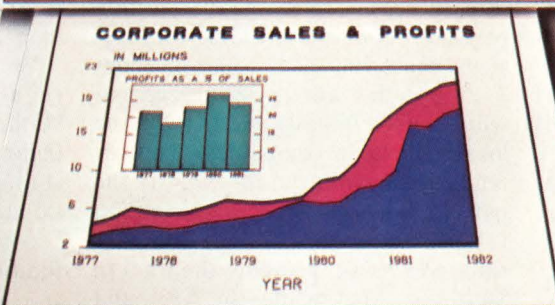
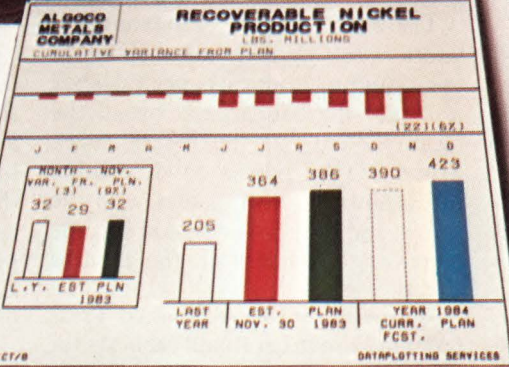
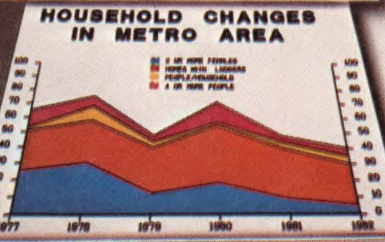
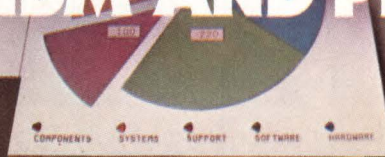


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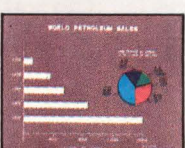
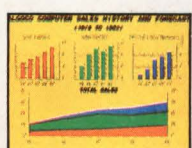
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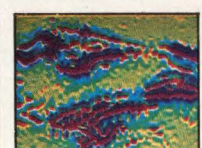
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AT&T Divestiture

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effects of the access-charge plan, therefore, is that it forces the states, especially the "liberal" states, to re-evaluate their rate structures and policies. And the FCC knows it.

States' "social engineering"

"A lot of the state commissions don't subscribe to the idea that the customer who incurs the cost should pay it," says FCC staff attorney Levitz. "They subscribe to an approach based on the value of a service to the user. They figure the phone is worth more to a business customer than to a residential customer, and they use the rate structure to do some social engineering."

In the past, Levitz says, some of that "social engineering" has been accomplished by setting Centrex rates above the estimated intrastate cost of providing the service. Now the states can make use of that revenue cushion to soften the blow of the FCC access-charge plan on Centrex, she says, but it would mean higher rates on other services.

Plain old higher rates

Plain old telephone service will almost certainly cost more in the future—probably a lot more in some states—no matter which side wins the various arguments growing out of the access-charge plan. Access charges, intrastate and interstate, are only part of the problem. In Texas, for instance, Southwestern Bell proposed an increase in the basic monthly residential rate from \$9.30 to \$24.90, or \$15.60, of which \$4 would pay for intrastate access. (Interstate access charges were not reflected in the request.) The balance of the increase, \$11.60, has nothing to do with access charges.

ETI argues that Congress would have to intervene across a wide range of policy issues to protect consumers from significantly higher telephone rates. Congress would have to block faster capital recovery by the telephone companies, curb new investment in telephone-company plant, and cut the rate of return on investment, according to ETI. Addi-



"When management asks me if divestiture is good or bad for us, all I can say is that in the short run, it's not going to be easy."

Bennis, Westinghouse

tionally, intrastate long-distance competition, which tends to force down long-distance rates, might have to be curtailed to allow the continued subsidy of basic local service.

The role played by the state regulators in setting rates and policies in telecommunications has been pushed well into the background by all the recent activity at the federal level. Much of the power to determine rates, however, still resides with the states, and that power should become increasingly evident in the months ahead.

A survey by the Associated Press (AP) in November found requests for rate increases totaling \$6.7 billion pending before state utility commissions. Rate increases totaling about \$1.5 billion—about 38 percent of what was originally sought by the local telephone companies—had already been approved in 1983. If the pattern holds, another \$2.55 billion (38 percent of \$6.7 billion) in higher rates will result, bringing the total to \$4 billion. Meanwhile, the AP found the phone companies in 18 states seeking approval of intrastate access charges totaling \$934 million.

Typically, the state commissions control rates by giving the telephone

companies less than they ask for. In the future, however, state regulators may place greater emphasis on the problem of achieving an equitable distribution of the revenue burden. For instance, more and more states may replace flat monthly rates with some form of measured local service to shift an increased share of the total cost to heavy telecommunications users. In New York State, measured usage is already required for businesses located in the major cities, and most residential customers can choose it as an option, says Richard S. Hesser, deputy director of the communications division of the New York Public Service Commission.

The idea of measured local service tends to provoke a chilly response from residential and business users alike, Hesser says. But measured service can actually cut the phone bill of a residential customer who uses the telephone sparingly. It has other advantages, too. Hesser points out that a telephone-company central office, like an electrical power plant, is engineered to meet peak demand, requiring the phone company to invest in capacity that goes unused most of the time. The sharper the "demand spike," the greater the inefficiency and wasted expense. Measured local service could be used to smooth out the demand curve by forcing those customers who contribute most to the peak to pay the most for the additional investment. At the same time, of course, it generates more revenue.

Does all that make measured service the wave of the future in the local loop? Hesser will only say maybe. "The telephone industry and some regulators think it is," he says. "Other regulators think it isn't. . . . If technology produces central-office equipment that can handle more traffic at the same cost, call volume will become less important in determining total cost."

Troublesome technology

Technological advances are the undoing of even the most carefully considered government regulatory efforts. In recent years, the regula-

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AT&T Divestiture

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tory framework for telecommunications has been subjected to endless review and revision as technology has outrun one set of circumstances and assumptions after another.

The FCC's Computer II decision is a good case in point. Because of the increasing difficulty of distinguishing between telecommunications, which the FCC was supposed to regulate, and data processing, which it wasn't, the commission gave up trying to classify various services and types of equipment as belonging to one or the other. Today, telephone-terminal equipment and enhanced data services are no longer under tariff, and the FCC actively regulates only basic transmission.

A different, perhaps more difficult, sort of problem arises from the development of sophisticated techniques for bypassing the local telephone companies. The FCC insists the threat of abandonment by major telecommunications users is very real

as long as there is heavy cross-subsidization of local service through the inflation of long-distance rates. Congress, on the other hand, would perpetuate the subsidy and raise the break-even point for bypass systems

Even the optimistic observer inevitably warns of a grueling transition, an uncertain time for network managers.

by hitting them with a surcharge like that imposed by the FCC on leased private lines. Is there a regulatory solution? Is there a threat?

As time goes on and bypass technologies mature, corporations that rely heavily on communications are expected to engage in at least some bypass as a way of gaining control over network costs and performance.

It's not unusual for major banks and other financial-service companies, among the leaders in exploiting new information technologies, to employ one or more bypass methods even today. Chase Manhattan Bank moves data from several locations in Manhattan over its own loops of coaxial cable. In the future, the bank plans to integrate voice, data, and video on its cable system and is considering an integrated voice-data digital-microwave link between Manhattan and Long Island, according to Chase Manhattan's Lewis Haring.

New York's Citicorp, winner of the prize for boldness in the pursuit of communications independence, services its various banking divisions with a satellite-based network that provides coverage of the 50 states and Puerto Rico. By the end of the year, Citicorp plans to have satellite earth-stations in 10 cities, with microwave systems and, in New York, fiberoptic

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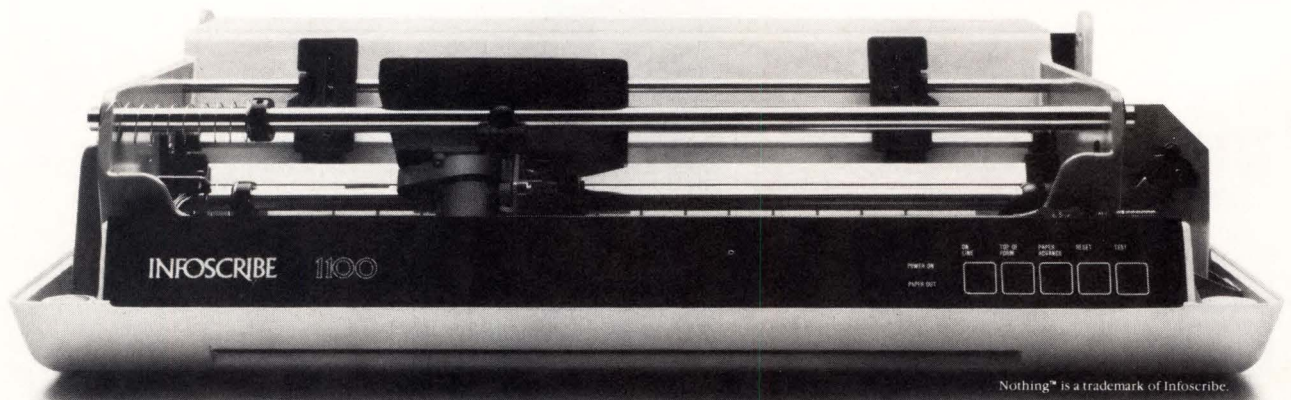
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cable, to overleap the infamous "last mile" of the local loop.

The real boom in bypass, however, is at least a few years away, in the opinion of some experts, including consultant William Rush of Coopers & Lybrand. Rush thinks the local telephone companies will be ready for that boom if the regulators give them a chance to compete.

"The operating companies understand their vulnerability," Rush says, "and unless their hands are tied by regulation, you'll find them to be smart and competitive. They won't make it easy for bypass to come in, not on the basis of cost. And the economics have to be right. It all boils down to cost."

When a big organization does decide to make the bypass investment, it will rarely, if ever, end its relationship with the phone company. Most bypass systems meet specific needs or take advantage of specific opportunities. New York State, for in-

stance, hopes to knock \$2.6 million off its annual phone bill of \$120 million by erecting microwave links between the capital city of Albany and the cities of New York, Buffalo, and Syracuse. Westinghouse, adapting the same technology to quite different situations, has erected one microwave network to service locations in and around Pittsburgh and another in Puerto Rico. Westinghouse hopes to save \$500,000 to \$1 million a year, but still has a \$6 million annual bill from Bell of Pennsylvania.

The real competition will start after alternative transmission services begin to make bypass readily available to companies that don't want to invest in their own facilities. Some of these technologies, like direct satellite, are still in their infancy. Digital termination service—a promising high-speed data-transmission system based on cellular microwave, the same technology as mobile telephone



systems—is barely out of the experimental stage. Cable television's potential as a medium for carrying high-speed data has been largely ignored except in New York and a relative handful of other cities. In fact, once the cable company is set up to carry switched, two-way traffic, a customer could send voice as well as data through the system. The cable company probably wouldn't be licensed to carry voice traffic, but it might not be able to tell the difference.

"Corporations are doing it right now," says *Teleconnect* publisher Harry Newton. "They don't tell the

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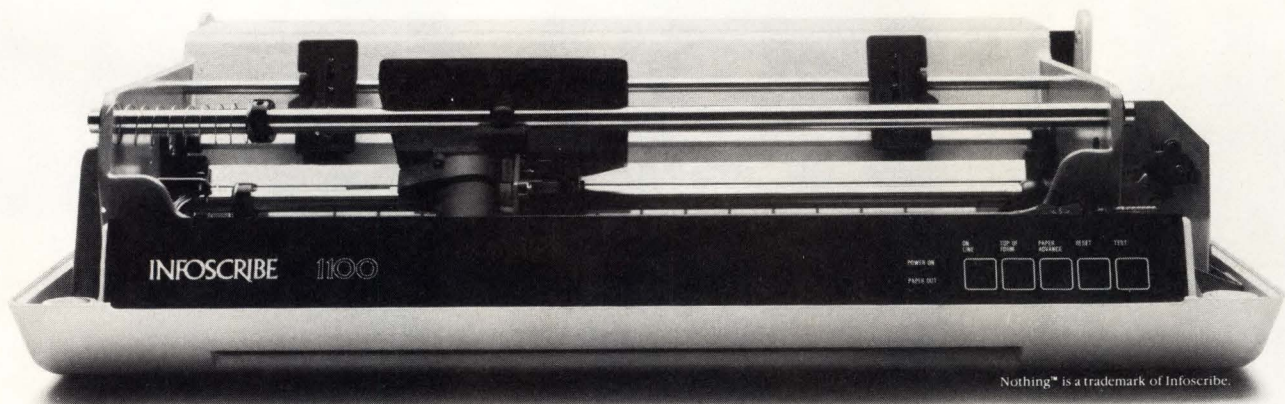
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AT&T Divestiture

(Continued from page 203)

cable company, and it probably would be an invasion of privacy if the cable company tried to figure out just exactly what it was carrying."

Perhaps the ultimate in a shared bypass system, the Teleport planned for the New York metropolitan area will combine satellite and fiberoptic systems for fast, efficient communications. Teleport's satellite farm on Staten Island will be connected to switching stations in Manhattan and Jersey City, NJ, by fiberoptic cable, with additional loops to provide direct service to some high-volume users in Manhattan. Teleport, a joint project of the Port Authority of New York and New Jersey, Merrill Lynch & Co., and Western Union, is expected to come online sometime around 1990.

Passionate shoppers

In the meantime, everybody from AT&T to the divested operating companies may be competing for a

share of the bypass market. Things could get bitter. Months before the actual breakup, the word was out that AT&T was making the rounds of major business users, encouraging them to opt out of the local loop. The

Single-site businesses, as well as national ones, can expect to find managing the phones more complicated now.

operating companies themselves may have to offer bypass as an option to hang on to some important customers.

At British Airways, Philip Freeman can hardly wait for the fun to begin. Freeman says his airline and its competitors will explore the alternatives. They'll move cautiously because they need to maintain common

standards and because they depend on communications for everything from bookings to cargo control.

But Freeman is eager for the opportunity to shop around. "I want out of the local loop," he says, "and so does everyone else. We need reliable services that are going to function day and night, every day of the week. But the quality of the local circuits in New York was never anything to brag about, and our [national and international] data networks suffer as a result."

Competition in the interstate long-distance market had a five-year head start on divestiture, but the Bell breakup has amplified the siren song of "long distance for less" to megadecibel volume.

AT&T, of course, begins the new era with more than the lion's share—about 96 percent—of this \$40 billion market. But as AT&T's competitors become as easy to dial up as AT&T, and as AT&T's customers become

WHAT TO LOOK FOR WHEN IT TRIES TO GET ITS F





"We're going to spend an additional \$500,000 to do no more than we're doing now."

Luce, Olin

aware of actually having a choice, the dominant carrier may find it's not really everyone's preferred carrier.

Barring any dramatic swings in fortune, however, cutthroat competition could actually produce some big winners without any big losers.

As consultant and author Robert Self observes, if AT&T loses 5 percent of its market share, that would double the combined position of its competitors and still leave the lion with 90 percent of the market—or more. "For the foreseeable future," says Self, "AT&T will have 90 percent or better because most people don't think they have any reason to try someone else."

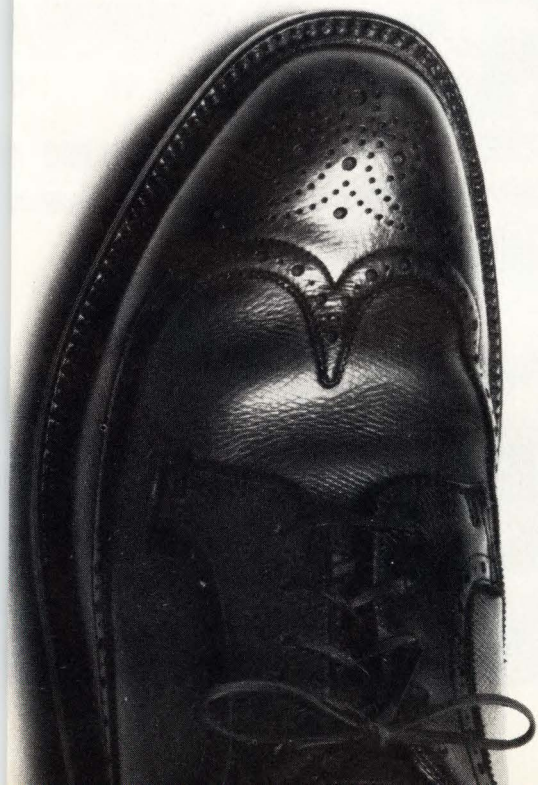
This is definitely a buyer's market, especially for corporations headquartered in major cities. Besides MCI, there are four other sizable OCC's—GTE Sprint (formerly Southern Pacific Communications), ITT, Western Union, and Satellite Business Systems. Two resellers, U.S. Telephone and Combined Network, rank among the top five long-distance companies after AT&T, and, of course, there are the innumerable medium-sized and small resellers—anywhere from 400 to 600 of them, according to Self.

As was the case before divestiture, the customer will be able to pick a mix of long-distance services. But equal access, once accomplished, will make it easier to use them all. Sending a call over the customer's preferred carrier will be as simple as calling on AT&T has always been, and the customer will have access to any other carrier by dialing a four-digit code.

This convenience may have a price, however. As the quality of access improves, the other long-distance carriers will have less incentive to compete on the basis of steep discounts off AT&T rates. The FCC access charges, if implemented, could also nudge the rates of companies like MCI and Sprint, the third-largest long-distance carrier, upward. On the other hand, AT&T's customers stand to lose that 10 percent reduction in AT&T rates if Congress succeeds in blocking the access charges.

(Continued on page 208)

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AT&T Divestiture

(Continued from page 205)

The rush to sign up customers has been paralleled by a big push to expand capacity. Sprint and MCI have both invested in satellite transponders, and MCI is in the process of laying 4,200 miles of fiberoptic cable in a network connecting the major eastern cities. MCI plans to repeat the feat on the west coast, while other carriers, following MCI's example, have been negotiating for railroad rights-of-way along which to put down fiberoptic networks of their own.

In perhaps the most ambitious venture of its kind, Southern New England Telephone Co. (SNETCO)

"The operating companies look at AT&T like it's a furry beast rather than Mother Bell."

Montoro, Paine Webber

has formed a partnership with CSX Corp. to build a fiberoptic network of up to 5,000 miles that would run through 20 eastern and midwestern states, primarily along CSX railroad rights-of-way, and reach more than 60 percent of the U.S. population. The partnership plans to sell capacity to carriers and big business and government users, with SNETCO under contract to maintain the network. One of two former Bell System companies in which AT&T held only a minority interest, SNETCO, unlike the Bell operating companies, is unrestrained by the divestiture agreement and could jump into the long-distance market on the strength of its interest in the fiberoptic network.

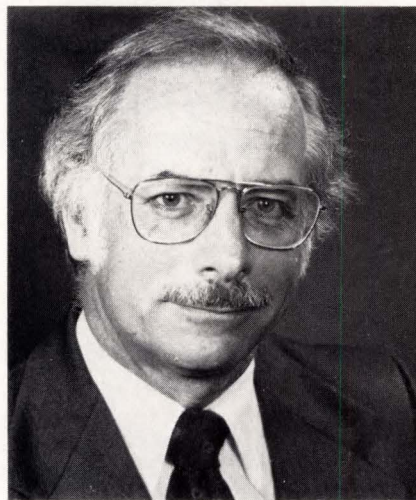
Even the bigger resellers are getting into the act, as they reach out to microwave companies as part of their strategy to reduce their dependence on AT&T's WATS and private lines. Long-distance carriers like U.S. Telephone, Combined Network, and Lexitel Communications have entered into agreements with Times Mirror Microwave—whose parent company publishes *The Los Angeles*

Times, among other newspapers—and other microwave networks to lease transmission capacity. Eventually, some observers speculate, Citicorp and other companies with sophisticated private networks may be offering excess capacity for sale.

For the time being, an overload of capacity seems like a good reason to get into the interstate long-distance market. After all, no less a player than Satellite Business Systems arrived that way. Originally a provider of dedicated services to high-volume business users, SBS introduced its Skyline dialup service near the end of 1982, after the high-speed data-communications business failed to develop as rapidly as expected. Eventually, however, an overload of capacity throughout the industry could start to drive some weak sisters out again.

"A three- or four-cent game"

From a carrier's point of view, a glut of capacity can only be bad for business, an encouragement to engage in the sort of brutal competition and commodity pricing that has plagued the airline industry since it was deregulated. As Shelly Fishman, a division manager for industrial relations with AT&T, said during a forum on telecommunications last fall, this sort of price competition is



"Innovative services may be where the glamour is; but MTS-type services may be where the money is."

Johnson, Rand

never rewarding.

"The commodity game," he said, "is not a good game to be in. It's a three- or four-cent game, and if you get stuck in it, you're going to have to keep your prices down."

From the customer's point of view, such an eventuality could be a real boon, forcing the long-distance carriers to cut rates, improve services, or both. But, if it triggered a drastic shakeout in the industry, the customer could end up paying more.

Attempts to open telecommunications to competition haven't always produced the intended results. For instance, back in 1975, Richard E.

"The phone bill, traditionally, is the worst-managed expense in American business."

Self, consultant

Wiley, then the chairman of the FCC, was sorely disappointed when MCI and Southern Pacific Communications filed proposals to offer what were essentially dialup long-distance telephone services, instead of the sort of innovative private-line business services the FCC was hoping for when it licensed them. He saw in their actions "something of a breach of faith."

Where the money is

Seven years later, Leland L. Johnson, a senior economist at the Rand Corp. in Santa Monica, CA, took note of the situation in his report, "Competition and Cross-Subsidization in the Telephone Industry." He commented: "Innovative services may be where the glamour is; but MTS-type services may be where the money is."

The glamour-or-money choices Johnson was talking about can certainly be made by providers of interstate toll service. But what about intrastate service? The divestiture agreement was supposed to foster wide-open competition to provide toll

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AT&T Divestiture

(Continued from page 208)

service within states as well as between them. But in most cases, there's little money and certainly no glamour in providing this shorter-haul service. And there probably won't be much competition, either.

The agreement worked out by AT&T, the Justice Department, and U.S. District Judge Harold H. Greene carved the country into LATAs (for local access and transport areas) and prohibited the local telephone companies from providing toll service between different LATAs—even within the same state. AT&T and the other interexchange carriers are supposed to compete for this business. That was the idea, anyway. But Lee L. Selwyn, president of ETI, says the idea "is a vision, a pipe dream."

According to Selwyn, "What's needed for intrastate competition is a market. You're going to have competition in states with two or more major population centers, but you generally won't find it in states without some big cities, or even along low-density routes in states that do have big cities. You're not going to have competition between Peoria and Springfield in Illinois or between Scranton and State College in Pennsylvania."

Calling short-distance

The distance between two cities is also a factor, says Richard Hesser, the New York Public Service Commission staffer. Because switching makes up such a big part of the total cost, Hesser says, there isn't much difference in the actual expense of completing a long or short call, but the carrier is permitted to charge more for the longer-distance call, anyway, to make the rates "understandable." As a result, long-haul toll calls tend to be overpriced, he says, and short-haul calls, underpriced.

Low-density, short-haul routes, therefore, will more than likely be serviced by AT&T, the "default" carrier for intrastate as well as interstate long-distance service. The fact that the AT&T network is already in place makes it the natural choice and,

of course, makes the other interexchange carriers that much less eager to compete.

The advantage of being the established carrier belongs to AT&T on inter-LATA, or interexchange, routes and to the local telephone company on intra-LATA toll routes. Toll competition is permitted intra-LATA—the entire state of New Mexico is within a single LATA—but on the high-density routes that might attract competitors, the local telephone company still has the advantage of having a comprehensive network in place. Selwyn says that, with a call from Dallas to Fort Worth, for instance, the cost of getting to and from the central offices on the two ends would, in most in-

If divestiture is perceived as a blessing, it is usually seen at some distance and traveling in disguise.

stances, eliminate any competitive advantage an intercity carrier might have had over Southwestern Bell.

Just the hassle of going through the regulatory process may be enough to inhibit entry into the intrastate market. For a small interstate reseller, it might mean having to submit to regulation for the first time. For one of the OCCs or a large reseller, it means having to deal with a separate regulatory body in each state.

"AT&T must deal directly with all the state commissions for the first time; this has forced a dramatic increase in the number of lawyers working for AT&T," says FCC staff attorney Levitz. "If this is giving AT&T a headache, you can just imagine what it would do to the OCCs."

Resellers, with their minimal capital requirements and ability to set up quickly, are probably the likeliest source of competition for AT&T in the short run. New York had 10 re-

sellers and one private-line carrier operating in-state last fall, and Hesser expects another 10 will join them eventually. Both MCI and GTE Sprint have filed tariffs with the New York Public Service Commission, but chose not to put them into effect after the commission imposed an ENFIA-like charge for intrastate access.

The situation can vary radically from state to state. Texas and Florida were both well ahead of New York in opening the intrastate toll market to competition. In fact, U.S. Telephone cut its teeth competing in Texas, the first state to end monopoly long-distance service within its borders, before going on to become an interstate reseller. In Colorado, on the other hand, the law requires—for the time being—that only regulated monopolies provide interexchange service.

There's always AT&T

No matter what state you're in, if you want to place a call from the farm to the feed store in the next county, there's always AT&T, even if there's *only* AT&T. "Some parts of this country," Hesser says, "may never have competitive intrastate long-distance service."

The success or failure of deregulation as a policy is determined, ultimately, by the degree to which business rivalry eliminates the need for government oversight and intervention. Where competition is strong, regulation should be unnecessary.

Outside of some libertarian capitalist's vision of the second coming of laissez-faire, it is hard to imagine a more convincing example of how well deregulation can succeed than the transformation of the telephone-equipment industry since the Carterfone decision.

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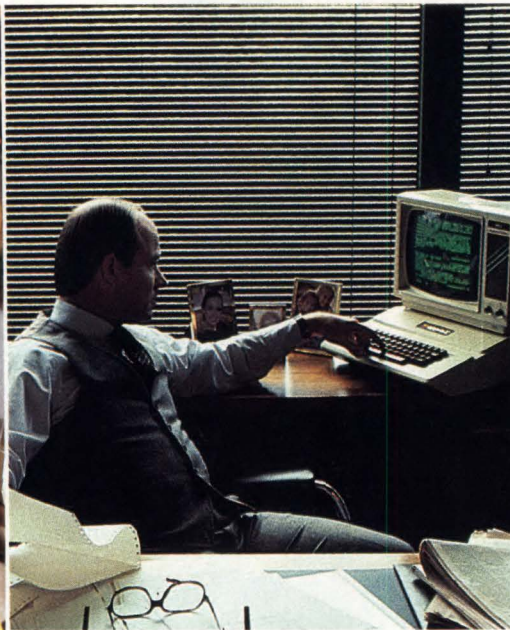
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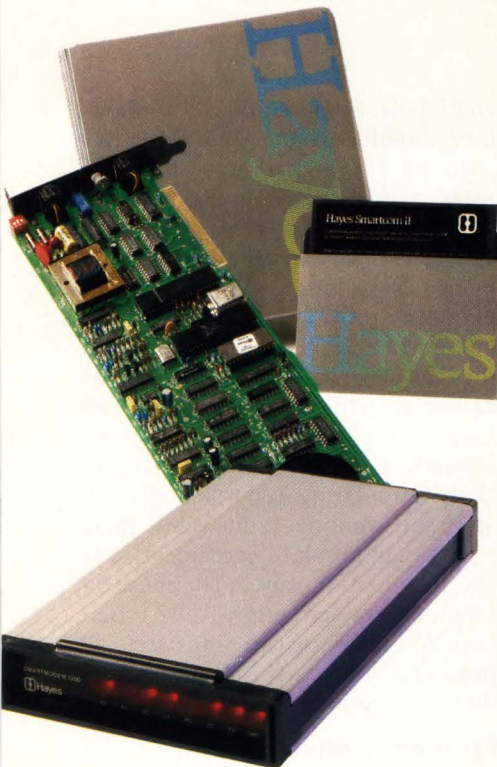
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AT&T Divestiture

(Continued from page 210)

such features for the end user, plus a number of fully automated management tools—least-cost routing, call-detail recording, toll restrictions, and automatic call distribution. It could have been made by AT&T Technologies, but there's no dictum that it be made by AT&T's manufacturing arm.

Columbia's John Chapman is unequivocal on the subject of deregulation as it applies to customer-premises equipment (CPE): It has benefited all classes of users, he says. "The deregulation of CPE has been a strong plus. Even the residential user can get options like memory dialing and cost-control devices like digital read-out. And for business," he adds, "it has resulted in these benefits and eliminated a major source of cost. Regulation is costly and unnecessary unless it's needed as a counterbalance to monopoly, and CPE is highly competitive."

The erosion of AT&T's position as the "total communications supplier" has been most pronounced among sophisticated users. Consider, for instance, what has happened to AT&T in the PABX market. It once had a virtual 100 percent share of that market; now it has at least 41 competitors, according to the September 1983 issue of *Teleconnect*, and its share for this year has been estimated at about 25 percent, down from nearly 40 percent in 1981. By 1985, Rolm and Northern Telecom are expected to pull nearly even, with about 18 or 19 percent apiece versus 20.4 percent for AT&T.

Can terminals be far behind?

AT&T's competitiveness as a PABX supplier affects more than its ability to sell switches. The sophisticated digital PABX will probably control many of the integrated voice-data office systems of the future. AT&T is no longer legally restrained from entering data processing and office automation as a full-fledged competitor, so selling switches may mean selling intelligent terminals and, one day, maybe personal computers. The success of some of the



company's new communications services—its packet-switched data service, for example—might also depend, to some degree, on its strength as a provider of in-house communications-support systems.

And the competition gets tougher all the time. Deregulation of the communications industry opens exciting new opportunities to outsiders, especially a big computer company like IBM. Not only does IBM have its own value-added network and a one-third interest (with Comsat and Aetna) in Satellite Business Systems, but last year it acquired a sizable chunk (about 20 percent) of Rolm. The world's biggest computer company could someday offer a complete line of communications products.

Finally and most importantly, the Bell operating companies are no longer a captive market for AT&T-built products. For a few years, they can make demands on AT&T Technologies and Bell Laboratories, but the operating companies and their regional holding companies are under no obligation to buy from AT&T. This represents a tremendous, if not unprecedented, loss in market power. The seven holding companies, with assets ranging from about \$15 billion to \$20 billion and projected revenues for the year ranging from \$7.4 billion to \$9.8 billion, are among the nation's largest utility companies and still embrace 80 percent of the U.S. market.

In their dealings with the former parent company, the operating companies give every indication of being independent, aggressive, and utterly unsentimental. They are expected to be fierce competitors for AT&T Information Systems—which has suffered through its first year and will depend heavily on revenues from the inherited embedded-equipment base

AT&T Divestiture

(Continued from page 213)

to get through its second—and only fickle clients of AT&T Technologies. In fact, William Hegge, telecommunications administrator for Northwestern Mutual Life Insurance in Milwaukee, worries that the operating companies could put so much demand pressure on the “independent” vendors that it might disrupt relationships with customers who are used to buying from them directly.

Much of the power to set rates still resides with the states; this will become increasingly evident this year.

“Divestiture has made some strange bedfellows,” C.J. Many, director of market operations for New York Telephone, admitted to a group of Wall Street telecommunications managers late last year. He went on to poke a little fun at IBM for having been “in bed” first with Mitel, another leading PABX manufacturer, and then with Rolm. (IBM broke off an earlier arrangement with Mitel when it decided to buy into Rolm.) But Many made it clear that New York Telephone and Nynex, its new parent company, don’t intend to spend much time in the sack with AT&T.

“When we divest AT&T from our corporation,” he said, “we gain the right to go out and look at any manufacturer and any technology. We have the right to pick and choose, and we’re going to pick the products that solve the problem, not the products of any one manufacturer.”

New options for users

Realizing the benefits of aggressive competition will take aggressive, informed management—management that can see beyond day-to-day operations to set long-range goals that support larger corporate strategies. As telecommunications systems become more sophisticated, the network



manager’s value to the organization will depend more and more on his or her grasp of high-level technical and economic issues.

Even basic-service management is changing. Microprocessors are performing many routine network functions and enabling managers and technicians to exercise greater control over costs and the allocation of resources. With an up-to-date PABX or “hybrid key” system, for instance, management today can control the assignment of trunk capacity among various groups of users, an ability once reserved to the local telephone company. A feature like call-detail recording makes available information about calling patterns that can be useful in selecting the mix of long-distance circuits and in controlling abuse. And least-cost routing, another common feature in modern telephone systems, not only routes each long-distance call over the most cost-effective circuit, it gives management, in some circumstances, the option of using WATS lines and other discount services without inviting abuse. The delusion that “WATS is free” persists, but if employees don’t know they’re using WATS, they won’t be tempted to abuse it, the reasoning goes.

“If you can get away with it, there’s no need for employees to know what mix of circuits you have,” says Robert Self. He adds: “In some ways, managing the telephone is still not a science as much as an art.”

An artful science

Science has added a lot of new wrinkles to the practice of this art. New York State, for instance, hopes to save \$2 million a year through the use of a new system of access codes that restrict calling by 80,000 state

employees. Some corporations, however, might forgo the savings possible through the use of access codes, rather than jeopardize good relations with a highly motivated work force. How an employer makes use of technology to influence the behavior of employees obviously will depend on circumstances. Where abuse is rife, it may be necessary to wield data on calling patterns like a weapon, relentlessly tracking and confronting abusers. Under less extreme conditions, circulating reports might inspire sufficient restraint. While there is less than absolute agreement as to the extent of misuse and abuse of long-distance circuits—Robert Self says WATS abuse can range up to 50 percent of total cost—no one seems to doubt the seriousness of the problem.

Crisis management

In the period immediately following divestiture, the fine points of managing employees will probably be overshadowed by the struggle to cope with general, industry-wide confusion. For the organization that has traditionally relied on AT&T for end-to-end service, service management could become crisis management pure and simple.

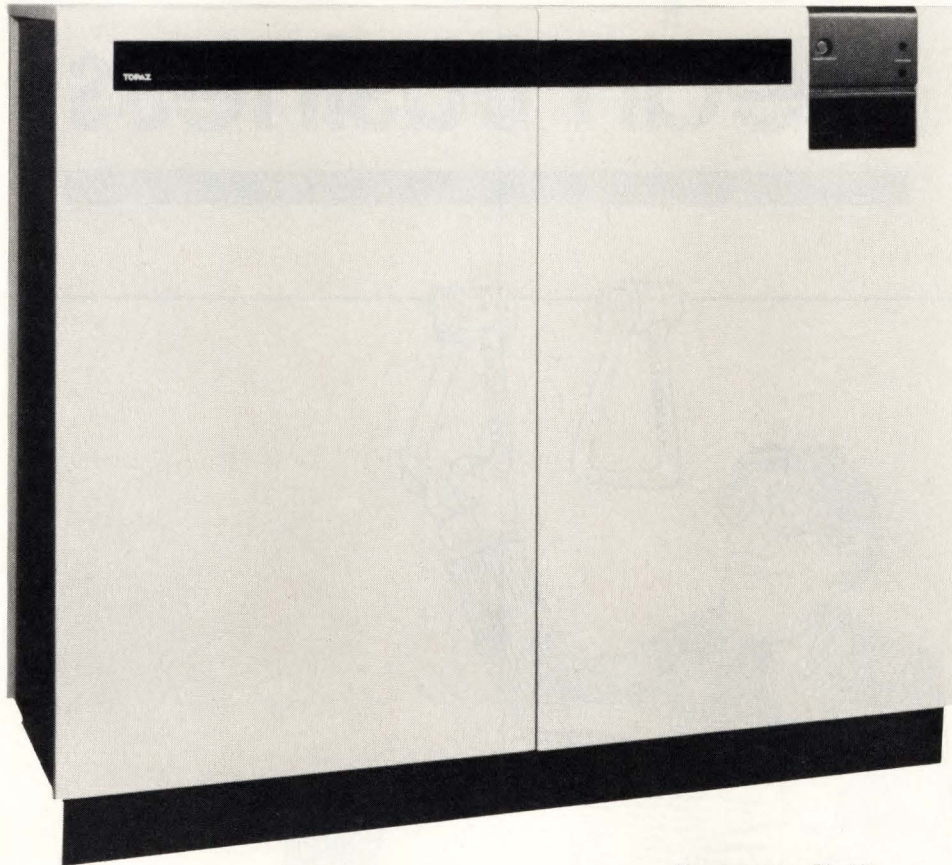
Teleconnect’s Harry Newton

The real competition will start after vendors make bypass available to companies that shun buying systems.

warns that business users should be prepared “to spend a fortune” on network maintenance and diagnostics if they want to avoid long, costly service disruptions. He also predicts that companies that haven’t invested in telecommunications expertise are going to suffer for the oversight. “Companies that don’t make the effort and the investment are going to pay more than they should, and they’ll have more problems,” Newton says. “It’s a

(Continued on page 218)

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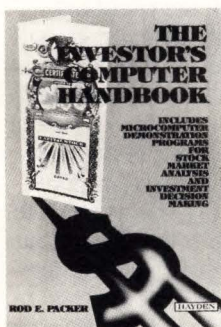
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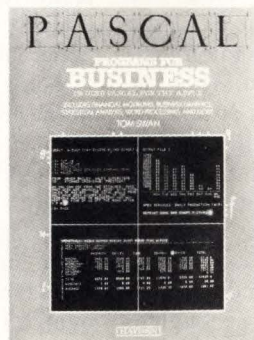
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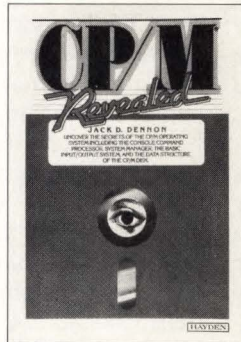
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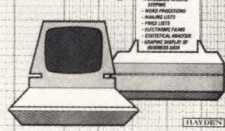
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AT&T Divestiture

(Continued from page 214)

no-win situation. The phones are going to go down more often. The data lines are going to go down more often. Dp will be screaming more than usual."

Organizations without much experience in telecommunications management will be tempted by package deals designed to replace the old arrangement with AT&T. For the time being, paying the new AT&T or someone else for comprehensive network management may actually be necessary to escape chaos. But the additional security will cost the user the power to pick and choose among components and services and the chance to put together a network with the best performance for the

The FCC access charges could also nudge upward the rates of MCI and Sprint, the third-largest long-distance carrier.

price. Nothing ventured, nothing gained.

A riskier but potentially more rewarding scenario has the organization picking up where AT&T left off. For large, experienced corporations, like Boeing, the risk is negligible. Boeing began to develop a skilled team of telecommunications managers and technicians about 10 years ago; today, about 300 people, including network engineers and software specialists, work in communications for the giant aerospace company, according to M.U. Ayres of the network-services group.

Boeing appears to be among a small minority, however. Author Self points to the typical discrepancy between data-processing and telecommunications staffing to illustrate the situation. "In a company with a telephone budget and data-processing budget that are about the same," Self says, "you'll find any number of people managing data processing and one person, if anyone, managing telecommunications."

Part of this legacy of dependence on AT&T, moreover, is a critical shortage of experienced telecommunications managers. Many companies are turning to consultants or borrowing staff from data processing to make it through the transition. But Newton, for one, expects to see businesses pirating managers from one another amid "an explosion" in the number of incompetent communications consultants. William Hegge of Northwestern Mutual Life Insurance believes staff shortages will slow the pace of adjustment to divestiture and of progress, generally, at many companies. "The whole process will need more people," Hegge says. "There aren't enough to go around . . . and most companies won't have enough to do what they want to do."

Cross pollination

The idea of borrowing from data processing has at least two strong points to recommend it. First, the technical background of many data-processing managers is becoming increasingly applicable to communications. At the same time, such a move is seen as contributing to a trend toward the unification of all information technologies under the heading of management-information systems or something similar. "Telecommunications is gradually melting into MIS/dp and office automation," says James Morgan, the consultant. "Joining telecommunications and data processing is no longer a bold step. It's a common thing to do."

On the other hand, Harry Newton cautions against expecting a data-processing manager to move into telecommunications without some difficulty. It takes six to nine months, he says, "to turn a dp guru into a telecommunications professional, despite what the dp gurus may think."

Coopers & Lybrand's William Rush is also restrained in his enthusiasm for such a move. Rush acknowledges the technical strengths that data-processing managers bring to telecommunications, but he thinks these managers tend to underestimate the complexity of modern

telecommunications. Moreover, he insists that technical skill won't be enough to make a good telecommunications manager in the future. "Too often," Rush says, "there's a vacuum between senior management and service management. The telecommunications manager understands the technology, and the senior manager understands where the business is going, but there's no middle ground."

The gulf between the two levels of management causes problems on both ends, Rush says. The network manager without insight into corporate strategy is less likely to pull together systems that provide optimum support to that strategy. And the senior manager who fails to recognize the importance of communications to the corporation may hinder investment and, ultimately, damage competitiveness.

Janusz Madej of John Diebold and Associates also sees a tendency by some top managers to take communications for granted. "If you go to top

Companies that haven't invested in telecommunications expertise are going to suffer for the oversight.

management and ask for \$2 million for a new telephone system," he says, "you're probably going to hear, 'I've got no problem with the telephones.'"

In the future, Rush says, it will be up to the telecommunications manager to translate corporate needs into systems and to explain to senior management why those systems are indeed necessary. There will be a continuing need for day-to-day service management, as well, Rush says, but the "reactive mode" of operating telecommunications systems has got to end. And some of the old-timers may have to go, too, he says.

"As the environment changes," Rush cautions, "some communications people are not going to make the transition." □

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MASTER YOUR SALESMANSHIP

Your idea for a new system is strong, and you have the talent and resources to carry it out. But senior management won't buy the idea unless you present it right.

by Robert W. Ericson

As long as you're a data-processing manager, you're in the sales business. One day you're convincing the steering committee that the warehouse needs a more comprehensive information system. The next, you're outlining the cost benefits of automation to the budget director. As manager of information systems you sell unusual products—you sell ideas.

Selling intangibles is more difficult than selling material goods; your customer, top management, can't kick the tires or test the brakes. To convince the purseholders to buy your ideas, you must learn the basics of persuasion and presentation.

The first rule of selling is to know your product and know your customer. Do your homework before you present your idea. Decide if your plan will fit in with corporate goals and procedures. Decide whether you want to direct your presentation to a top executive or to a line manager. Ask yourself: "Who will have to fund this effort?" and "Who will get the credit for success or the blame for failure?"

Consider your timing. Your approach should mesh with the organization's budget cycle. If your plan, for example, is designed to complement another system already approved, wait until that system is oper-

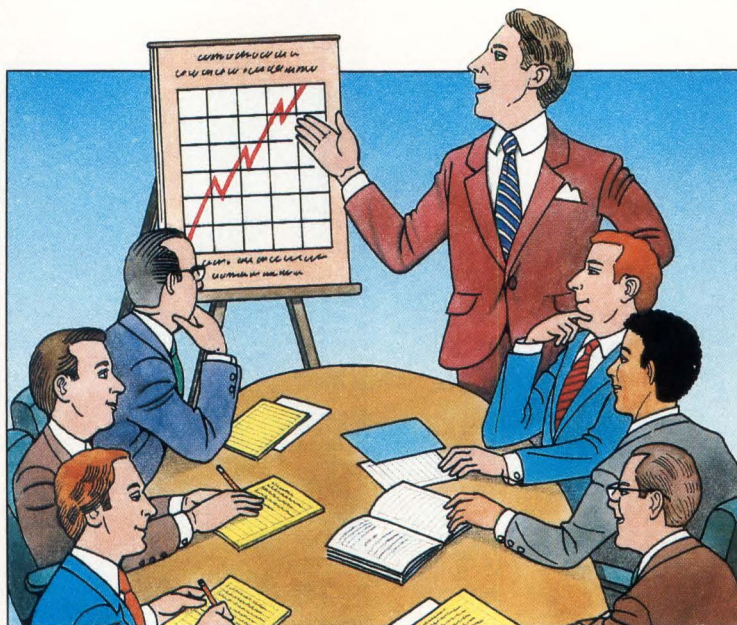


Illustration by Everett Davidson

ating before presenting your own idea.

Most importantly, consider the users' viewpoint rather than the data center's. In a formal proposal, outline the business tasks the system will support and describe how it will do its job. Explain why the system is needed and provide costs of development, implementation, and maintenance. Schedule each step of the implementation and devise a plan for phasing out the current system. Finally, analyze savings and payback time.

The first impression

According to one school of salesmanship, you have one minute to whet the appetite of your audience. Statements such as "I can save you hundreds of thousands of dollars" sound like slick "get-rich-quick" schemes, even if they're true. Try to

open with statements that entice the listener, such as "I think I've found a way to reduce our inventory while ensuring that we don't run out of supplies. The investment should be paid back within six months, after which we should realize a profit." This approach will encourage the audience to listen thoughtfully to your proposal.

Once you've captured your customers' attention, you must work to keep it. Make

them feel at ease and confident in your ability to deliver what you say you will. When delivering your presentation, refer to your past successes and avoid using computer jargon. Make eye contact with your customers.

Another way to keep your customers' attention is to listen to them. If the warehouse manager, who ran out of parts halfway through the last production schedule, leans forward and nods at the phrase "ensure we don't run out of supplies," you know where to focus the rest of your presentation.

Even if the purseholders are receptive to your idea, convincing them that your plan will work can be difficult.

If you have consistently kept your promises in the past, management is

(Continued on page 224)

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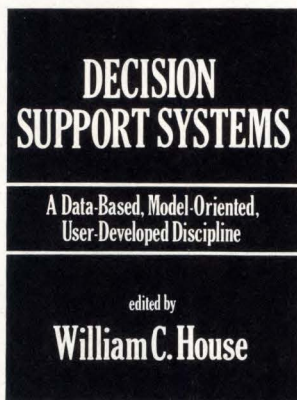
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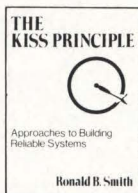
A Data-Based, Model-Oriented, User-Developed Discipline

Edited by William C. House

1 • Decision Support Systems is the latest buzz word in our industry. What is it? What can it do for our operation? How can we implement it? Petrocelli suggests that you let the experts in Decision Support Systems give you the answers to your valid questions. In this one volume you will have the opinions and experiences of Ralph H. Sprague, Jr.; Hugh J. Watson; Steve Alter; John D. Baxter; Arthur M. Geoffrion; Richard F. Powers; Eric D. Carlson; Peter G.W. Keen; G.B. Davis; James L. McKenney; Daniel Robey; William Taggart; Robert H. Bonczek; Clyde W. Holsapple; Andrew W. Whinstone; G.R. Wagner; Jean-Claude Larreche; V. Srinivasan; and Jerry W. Durway. Professor House has provided introductions to each of the book's two parts, discussion questions on the

various aspects of DSS, and an extensive bibliography. *You owe it to yourself and to your organization to read this book before you tackle a Decision Support System.*

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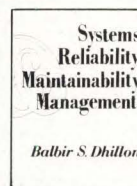


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by Ronald B. Smith

2 • The idea behind this book is to offer useful and practical ideas and approaches on how to develop good application systems. In a sincere effort to "keep-it-simple", the writing style is composed of non-technical language. Approximately one-third of the book is composed of charts and illustrations. Part I updates and defines the KISS principle as it applies to data processing and describes the system development process (SDP). Part II deals with alternatives to conventional application development techniques.

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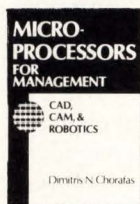
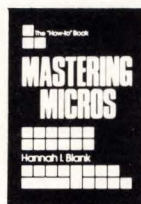
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Master Your Salesmanship

(Continued from page 220)

more inclined to trust you now. But a good track record won't compensate for a faulty presentation. Three techniques will help you prove your credibility.

Address your audience's needs in a nontechnical, results-oriented manner. The fact that you patched a Cobol program to an existing software package to create a cost-effective system will probably do little to convince anyone outside the data center of your idea's merits. Stress how the system will serve the recipient—how it will reduce costs, save time, smooth operations, and so on.

Help the audience visualize your concepts through the use of charts, diagrams, and mock-up reports. Try to create a scenario with which the audience can identify. Then show how the new system will prevent or solve a problem in the scenario.

Finally, cite authorities. Perhaps a market leader or major competitor has recently automated its inventory. Or maybe a noted and respected authority has advocated a similar system. Relate your proposal directly to long- or short-range plans for the company and demonstrate how it will help achieve these goals.

No matter how brilliant your idea and how well organized your presentation, you can count on your audience to raise objections. If you've taken the time to know your customers, you can anticipate their objections and deal with them before they surface.

If, during the course of your presentation, an objection does surface (and it will), deal with it immediately. You should even solicit disapproval so you can counter it before it grows to unmanageable proportions. Statements such as "How does that sound to you?" often provide the opportunity for valuable feedback. Look out for tacit objections. The manager who stares out the window with folded arms will hear little of what you say unless his or her resistance is broken down.

Dealing with objections is easier if you learn to recognize them. The three categories of objections include



"Don't take objections to your ideas personally, and don't argue with the objector. Your goal is to install a new system—not to be your own hero," says author Robert W. Ericson.

concerns, opinions, and prejudices. Concerns are the lowest level of objection—they are not based on analysis or strong emotion. They are usually expressed casually. "I don't think our operation is large enough to automate," or "Wouldn't a computer system be too expensive?" are objections that require a direct and informative response.

To deal with concerns, you must show respect for the individual's opinion; give a simple, logical explanation and get on with the presentation. Example: "Frequently, automation requires a large number of transactions to justify its purchase. However, in this instance . . ."

Opinions are more difficult to handle; they are usually based on experience or analysis. The objector has a vested interest in his or her opinion. A manager may say: "Every time I work with dp, the job costs three times as much and takes five times as long as projected," or "If you put the job schedule on a personal computer, we won't be able to tie it in with finance or inventory control."

These objections have a factual basis. They deserve a thorough explanation. Cite authorities, use visual aids, and give practical reasons for excluding alternative methods.

Objections based on prejudice are

frequently the most difficult to overcome. They take the form of "As long as I'm manager, there'll never be a computer in this warehouse. I've worked here for 20 years, and no black box is going to take over my job."

In these instances, it's very easy to get trapped into an argument. The best way to handle such an emotional response is to restate the objection: "You believe you may lose your job if we bring in a computer?" Acknowledge the client's emotional attitude. Once the customer lets off steam, he or she will respond to your presentation more rationally.

The worst thing you can do is to take objections personally. Stick to the issues and don't argue, or you'll further alienate the objector. Your goal is to install a system—not to be your own hero.

The closing is the most important, yet most frequently neglected, part of a sale. This is when you ask the customer to sign on the dotted line. One closing technique is to get the manager's commitment on one feature of the system. You can close with something like: "I think we agree that orders entered in marketing should trigger inventory control in the warehouse." Save the technical details for later.

Another technique is to force the manager to choose between two alternatives. "If we were to establish the system, would you want to summarize the work by product line or would divisional totals be adequate?" Any reply implies some degree of commitment on the manager's part.

Saying "Here is my idea; take it or leave it" will guarantee failure. A new system demands a large investment and changes the way people work. Those whose jobs are affected by the project will want to be involved in its design. Make them part of the team effort. □

Robert W. Ericson is a senior professional-services consultant for Keane Inc., in Boston. He also lectures on management issues to professional and academic groups.

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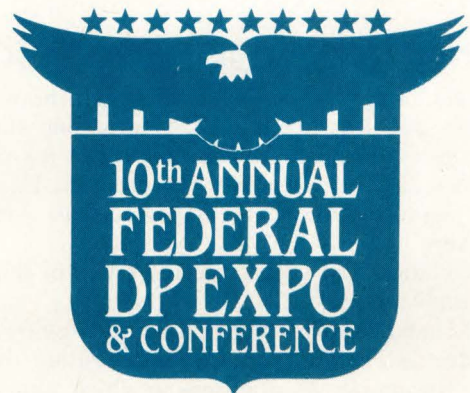
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by Mary Miles, New England Editor

YOUR CAREER

Thinking styles revisited

Anyone who has followed the "Thinking styles"* series through the last six issues has a pretty good understanding of the different ways people operate. Robert M. Bramson and Allen F. Harrison, authors of *Styles of Thinking: Strategies for Asking Questions, Making Decisions, and Solving Problems*, believe that understanding your own and others' thinking styles can help you be more effective on the job.

Examining the different styles of thinking can also help you persuade co-workers to cooperate with your professional goals.

What are the typical ways managers try to influence their peers? Realists tend to approach others in a straightforward, no-nonsense manner. "Here are the facts," they say. "This is my opinion." Their technique is to get people to agree on an idea and bring it to fruition through a concrete plan of action. Analysts influence others through logical, careful explanation,

and the use of data that support their arguments. They present themselves as eminently sensible, reasonable people, and expect that others are the same way. Pragmatists exert influence by showing their own enthusiasm. Being adaptable and given to tactical thinking, a Pragmatist's methods are likely to be flexible.

Idealists influence others by appealing to broad goals and high standards; they rely on receptivity to make people agree with them. Synthesists try less than anyone else to influence others, partly because they understand how hard it is to reach true agreement and partly because they believe that several realities may exist simultaneously. Their tactics include debate, pointed argument, and a structured exchange of wit.

Most of us analyze others based on what we think we know about ourselves. Because everyone is different, our means of persuasion and manipulation don't necessarily work on everyone else. When trying to sway an associate's opinion, follow two

rules of thumb: Learn his or her motivations, values, and style of thinking, and apply persuasive techniques that work for that particular mindset.

Influencing Idealists. Idealists believe in laudable goals, high standards, and good works. When trying to persuade Idealists, appeal to their high values. Don't interpret their tolerance for alternative viewpoints as a lack of inner fortitude. Idealists are not easily influenced; they can be extremely firm, even rigid.

Ask for help. Whenever possible, tap the Idealist's developmental strength. Idealists like being helpful; they are motivated by the chance to help solve someone else's problem.

Appeal to high standards. Focusing on long-range goals and high standards is likely to be an effective way to grab the Idealist's attention.

Keep in touch. Keep in mind that Idealists aren't likely to make quick decisions. They need to be prodded gently toward a decision. Don't pressure them, but keep in contact with them. Idealists respond best to a personal, relational approach.

Avoid conflict. Remember, Idealists believe we can all agree as long as we set our goals high enough, broad enough, or far enough in the future. Don't risk letting them think you're not taking them seriously; in other words, play down that choice but skeptical witticism.

Influencing Analysts. All you have to do to influence Analysts is to meet them on their own ground. Approach them in exactly the way they would approach others—as if the world were populated only by sensible, rational people. That approach is not as easy as it sounds. Analysts are much better at it than the rest of us, and their sharp eyes are always peeled for imposters. Here are some tips.

(Continued on page 228)

Putting your style to work

Each of the five thinking styles (Synthesist, Idealist, Pragmatist, Analyst, and Realist) is used by everyone at different times to different degrees. Chances are that most of us use one style predominantly, and assimilate strategies from other styles. Here are some ways to use your styles to communicate, make decisions, and solve problems more effectively.

1. Understand your preferred styles of thinking, their advantages and disadvantages.
2. Understand how your thinking styles are useful. You should acknowledge and respect your strengths, rather than wish you were different.
3. Recognize the situations in which your strengths will be most effective.
4. Use your strengths purposefully when the situation calls for them.
5. Accept and enjoy your just rewards when your efforts are successful.

More and more, personal computers in large organizations are dramatically improving productivity. But there's also a problem involved with this improvement. People are using many different, often incompatible microcomputers, yet they still need to share information, programs, and peripherals.

It's as if everyone had an automobile, but no highways leading to their destination. No traffic signs to follow. No rules of the road. The result? Mass confusion.

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YOUR CAREER

(Continued from page 226)

Learn to love the great stone face. Making the right impression at the very first transaction can put anyone in a receptive frame of mind. Unfortunately, Analysts aren't much for giving feedback; you never really know where you stand with them. Don't be thrown off balance by their disconcerting facade. Go ahead with your presentation. Generate your own feedback; at critical points in your presentation, pause, change your tone of voice, and ask: "Does that make sense?"

Do your homework. Never make a report or presentation to Analysts in a slipshod, quick-and-dirty manner. Remember, for them, thoroughness and accuracy equate with competence.

Let them data you to death. Not only do Analysts require a lot of data from you, they also need to present you with their own data. It is their way of demonstrating their own competence, which is important to them. They'll tell you more about a subject than you'll ever want to know. Let them. *Look for the theory.* Almost everything Analysts say is connected to a broad theoretical base, but you'll seldom get them to admit it. If you can discover an Analyst's underlying theory, your chances of getting heard are improved.

Influencing Realists. The hardest part about dealing with Realists is flagging their attention. They focus so sharply on the ultimate reality of a situation that they can't see anything else—including *your* view of reality. *Get to the point.* State your case, say what you have to say, and let the chips fall where they may. Not only will you get the attention of Realists, you'll get their respect.

Be concise. Say less than you think is absolutely necessary. Realists often stop listening as soon as they've made a judgment, good or bad, about an issue at hand. If you don't get to the point immediately, you may never get to it at all.

Be firm. Most realists respect only people like themselves—those who seem to know what they are doing,

are forthright, and stand up for themselves. They have little respect for namby-pambies, or people who are long-winded or insecure.

Encourage appropriation. Realists recognize a good idea when they see one. They are notorious appropriators. When they see something good, they suck it up vampirically.

Take control. The worst move you can make with Realists is to make them feel they've lost control over events. Similarly, it makes them nervous to see you out of control. Let them see you use a firm hand.

Influencing Pragmatists. Pragmatists are the easiest (and most enjoyable) people to influence, especially if you are amenable to the old philosophy, "Win a few, lose a few." But if you take yourself too seriously, Pragmatists won't take you seriously at all. The cardinal rule for dealing with Pragmatists is: Don't be heavy.

Idealists like to be helpful; they are motivated by the chance to help solve someone else's problem.

Let them be likeable. No matter who you're trying to influence, never threaten his or her sense of importance, competence, and popularity. When talking to Pragmatists, get them to reveal their feelings and opinions; Ask, "If you were in my shoes, what would you do?"

Take a marketing stance. Pragmatists understand the value of a quid pro quo approach to life; they are open to new situations and ideas. They like selling to others and they enjoy being sold. A good opening line is: "Have I got a deal for you!"

Expect to compromise. Pragmatists never expect to get everything they want, and they know you aren't going to get everything you want, either. For them, finding the productive middle ground is a fascinating game.

Influencing Synthesists. If you

think "influencing" means "convincing," then, when it comes to Synthesists, there are only two words of advice: Forget it! Contradiction itself makes the most sense to Synthesists. Even persuasion is hard, because of Synthesists' penchant for creating new ideas. They have a burning need to uncover their own answers. But you can try a few techniques.

Make a case for specifics. To stop Synthesists from talking concepts for a while, you must cajole them into getting specific; make them think it is worth their while to do so.

Don't bother them with facts. Because Synthesists love to speculate and hypothesize, sometimes you have to let them have their fun. To a considerable extent you have to suspend your own practical judgment and sober, structured reality, and just concentrate on listening to all the blather. At least, they'll appreciate your attention.

Fighting. Sparring, teasing, matching wits—these are some of the best short-term ways to influence Synthesists. But the work is hard if you're not used to it.

Play around. Given Synthesists' sometimes far-out ways of solving problems, a valuable way to influence them is to capture the essence of their unconventional and nonlinear thinking. That calls for an approach that is unstructured and free-form, and that involves playing with ideas.

Is all this advice nothing but techniques for manipulating people? Yes! But what's so bad about that? If manipulating means getting the job done in a purposeful way, you need to do so. If "manipulation" is just another word for "application of method," then these techniques are methods of improving your ability to work with others toward a common goal. The well-intentioned and enlightened use of method in human relations can only work to the good. □

* Excerpts from *Styles of Thinking: Strategies for Asking Questions, Making Decisions, and Solving Problems* (Doubleday, \$13.50), by Robert M. Bramson and Allen F. Harrison. Copyright © 1981 by Allen F. Harrison and Robert M. Bramson.



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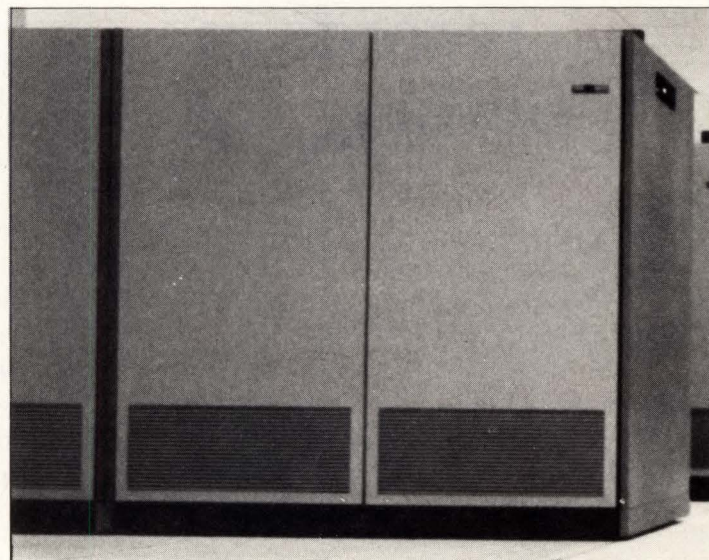
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SHOW PREVIEW

Office Automation Conference

The 1984 Office Automation Conference, appropriately dubbed "Office Automation and You," is for anyone involved in office automation. From February 20 through 22, professionals, managers, and users alike will gather at the Los Angeles Convention Center to see this extensive exhibition of the offerings of more than 150 major vendors.

The keynote address will be given by David T. Kearns, president and CEO of Xerox. He will discuss how to include "the human element" in office-automation plans. He also will discuss the future impact of today's office automation.

The OAC '84 program features more than 45 sessions in five program "tracks" of direct interest to managers and administrators; technology managers and planners; analysts, consultants, and implementors; product designers and developers; and users. The offerings include the following.

- Who Should Control Office Automation: A debate between Irving Margol, Security Pacific National Bank, and Allen N. Smith, Atlantic Richfield.
- Office Automation: Overview and Update: Amy D. Wohl, Advanced Office Concepts.
- Professional Computing in the Office: Patricia B. Seybold, The Seybold Consulting Group.
- The Business of Personal Comput-

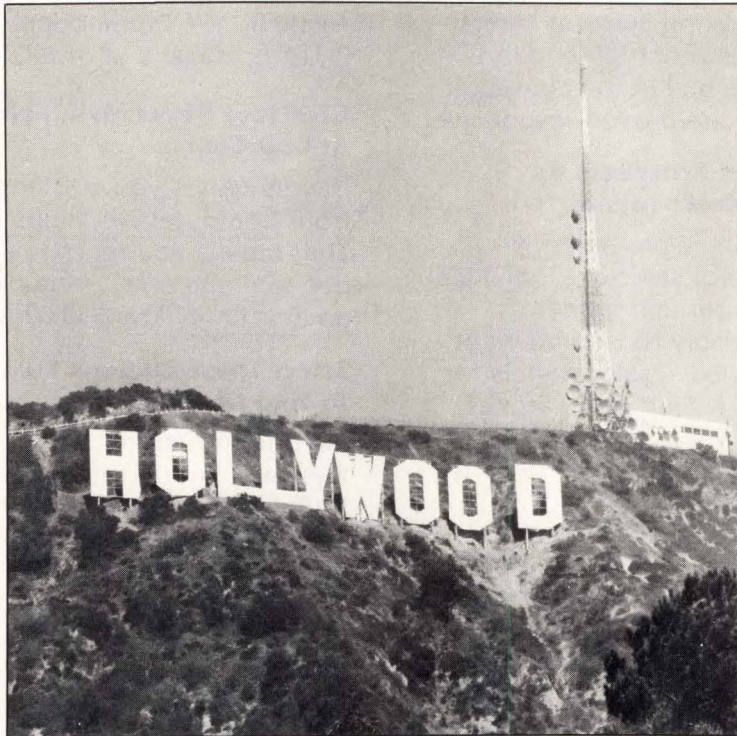


Photo by Frederic Lewis

ers: John Sculley, Apple Computer.
• Voice Mail: Caroline Watteuw, Office of the Future.

In addition to the regular conference program, a series of half- and full-day professional-development seminars and an executive program are planned. A first for the OAC program, these sessions will focus on the increasing importance of senior-management participation in the planning and directing of office automation.

The registration fee for full-day seminars is \$75; for half-day seminars the fee is \$45. Participation in the executive program is by reservation only, and is limited to corporate officers.

Some of the topics covered in the seminars will be:

- Personal Computers in the Office: What to Know and What to Ask:

Marty Gruhn, The Sierra Group.

- Network Design and Strategies: Jean-Paul Thomas, Thomas Enterprises.

- Creating an Information Center for Support of Management: Richard C. Cole, Computer Results.

- Integrating Personal Computers into the Corporate Setting: Arnold M. Roberts, ADC Associates.

- Strategic Planning for Integrated Systems—Avoiding the Pitfalls: Thomas Johnson, Nolan, Norton & Co.

Some of the subjects raised in the executive program will include:

- Management Issues in the Advanced Office Systems Field: John J. Connell, Office Technology Research Group.
- Managerial Productivity and Its Measurement: Paul Strassman, Xerox.

The conference program also includes six industry-specific luncheon workshops that will focus on the application of office automation in aerospace, entertainment, health care, energy, finance, and law. Also, a free career-planning workshop, "Plotting your computer career," will be offered to help information-processing professionals plan.

OAC is sponsored by the American Federation of Information Processing Societies, 1899 Preston White Dr., Reston, VA 22091; the phone number is (703) 620-8952. Registration fee is \$125. □

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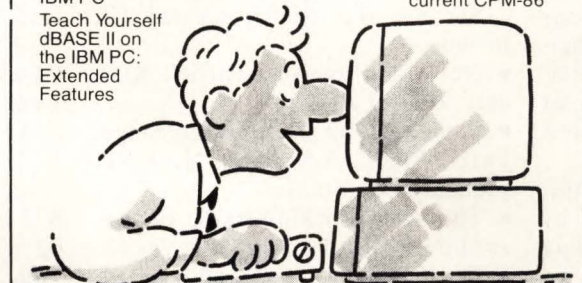
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CIRCLE 109

SHOW PREVIEW

Softcon

Just prior to the colorful celebration of Mardi Gras, New Orleans will be jazzing itself up for Softcon—one of the first international conferences addressed specifically to the needs of software buyers.

With an estimated 1,700 booths, Softcon is surpassed in size only by the National Computer Conference and Comdex. The conference is a trade-only event; attendees are expected from all corners of the computer industry. Softcon will be held February 21 through 23 at the Louisiana Superdome, a huge arena. (Indeed, the Houston Astrodome could fit inside the Superdome.) Show hours are 10 a.m. to 5 p.m. daily.

Softcon's exhibits will cover the full spectrum of software products, including fully integrated business systems and telecommunications packages. The focus will be personal-computer software for business applications. Softcon will provide a great opportunity for users to see the latest products in software technology.

Seminars, speakers, workshops, and panel discussions moderated by the editors and publishers of leading trade publications are all part of Softcon's package. These sessions will address concerns such as technical standards, user interfaces, hardware compatibility, and future trends in software. Steven Jobs, co-founder and chairman of Apple Computer, the keynote speaker, will



Photo by Ewing Galloway

discuss his views on the future of software.

The conference is divided into three categories: technical issues, software merchandising, and software publishing and development.

Some of the issues discussed will include:

- Network Protocols: Patrick Kencahy, *Digital Review*.
- Standards for Data Interchange: Peter Bono, American National Standards Committee.
- The Micro to Mainframe Bonanza: Edward Bride, *Software News*.
- Evaluating Software Packages: Paul Gillin, *Computerworld*.
- Software Packaging and Documentation: What You Don't Know Can Hurt You: Stewart Alsop, *Infoworld*.

Other workshops at Softcon will cover the following subjects:

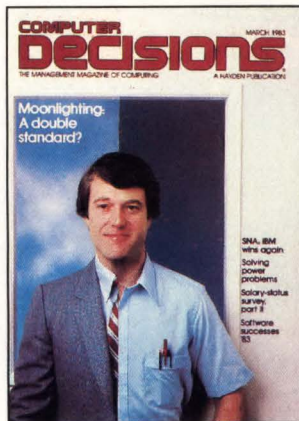
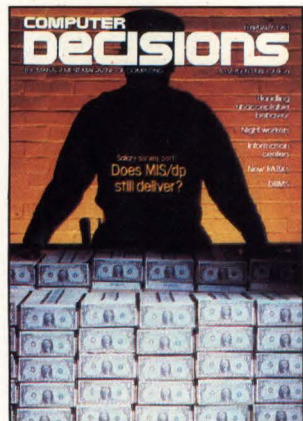
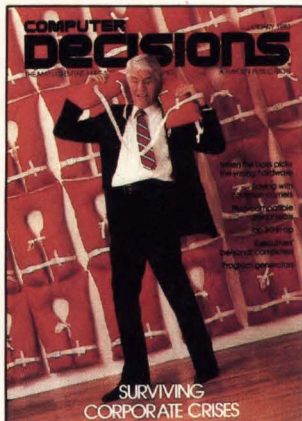
- Trends in Integrated Software for Personal Computers.
- Artificial Intelligence.
- The Next Generation of Business Software.
- Software for Portable Computers.
- Choosing a Winner in the Battle of Operating Systems.
- New Directions in Software.
- The User Group Phenomenon.

Following panel discussions, roundtable sessions will enable attendees to participate in discussions, talking individually with the speakers.

If you find time to do some sightseeing, the city of New Orleans has much to offer. Famous, of course, as the birthplace of jazz, it has been called "America's European Masterpiece."

Softcon has been organized by a committee of the software industry's leading executives, including Daniel H. Fylstra of Visicorp, William H. Gates of Microsoft Corp., Mitchell Kapor of Lotus Development Corp., and Ben Dyer of Peachtree Software Inc. The exhibition is produced and managed by Northeast Expositions, 822 Boylston St., Chestnut Hill, MA 02167. The phone number is (617) 739-2000. Admission to Softcon, which includes registration fee, exhibit-floor pass, panel discussions, seminar workshops, and Steven Jobs' keynote address, is \$195. A special exhibits-only badge, good for all three days, is \$30. Conferences begin at 8:30 a.m. daily. □

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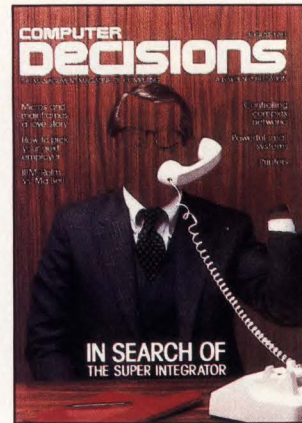
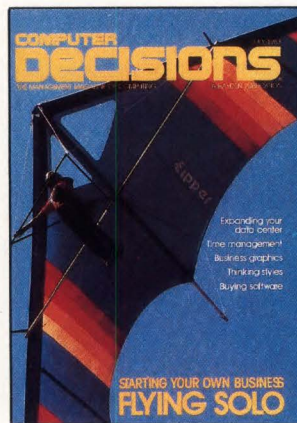
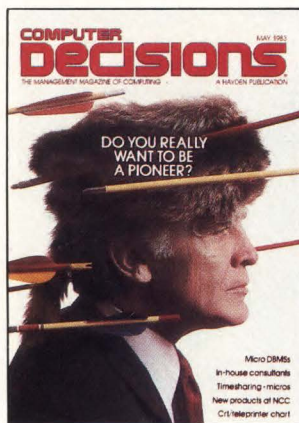
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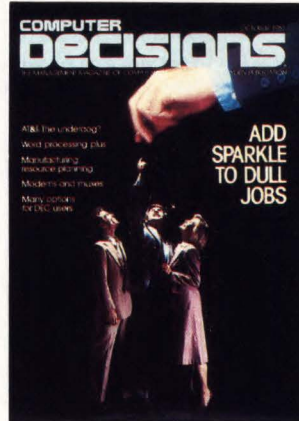
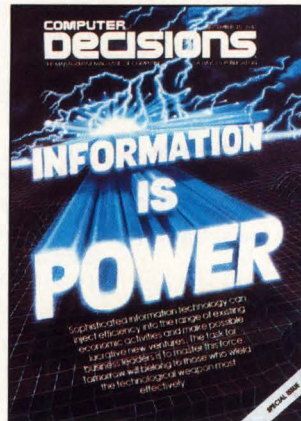
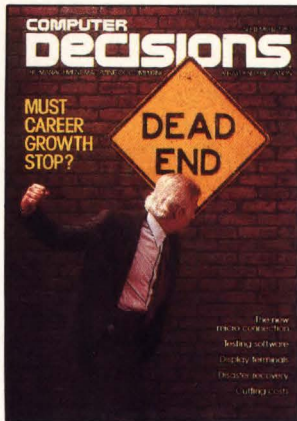
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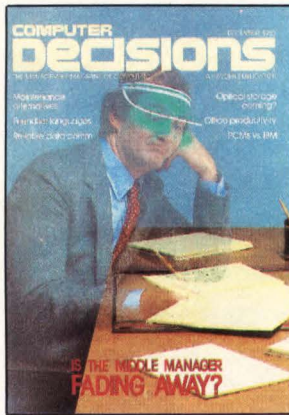
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Coming next month

How to recruit successfully: How can you build a quality staff without spending a lot of time recruiting?

Database management systems roundtable: Top user experts tell how to get more out of your DBMS today and in the future.

Personal-computer peripherals, Part I—data-output devices: An exploration of the alternatives in printers, plotters, monitors, and special tools.

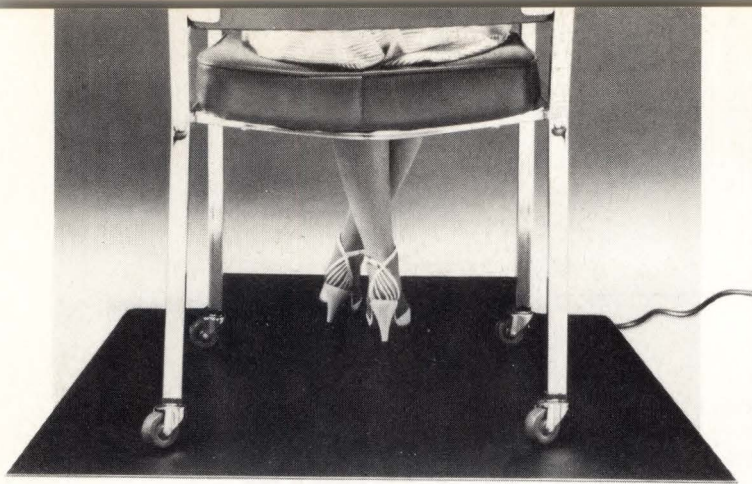
Salary survey, Part I: A sampling of 15,000 managers tells you how you're doing.

Managing your corporate pension portfolio on a personal computer: Here's how personal computers can help financial managers fine-tune corporate portfolios.

Are your systems growing obsolete? How to plan to avoid obsolescence.

The check is in the mail: Do "white lies" help managers get ahead, or are they a risky strategy that will leave you behind?

In February *Computer Decisions*.



YOU CAN'T FIGHT STATIC SITTING DOWN.

Static electricity exists everywhere in an office environment—it's not just confined to a few square feet around a CRT. And when you consider that someone casually walking past a terminal can generate enough charges to trigger a major malfunction, it's clear that a small anti-static mat is hopelessly ineffective in protecting sensitive computers.

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CIRCLE 117

LETTERS

Let users test-drive software

The article, "Test-drive your software" [September], is interesting but fails to mention a very important aspect of developing software: testing the user-system interface.

The technical integrity of a software program is not sufficient to guarantee its success. The match between the software's user-system interface and its intended users is also critical for success. Too often, software systems fail to increase productivity as much as had been expected because the system's intended users cannot understand how to use it. Other systems, designed for utterly unsophisticated users, may prove "too easy" for a given user population; those users will be frustrated by unnecessary commands and keystrokes.

We strongly suggest that our clients who develop software also develop guidelines that will allow them to test that software's user-system interface. Only then will they be able to guarantee the success of their systems.

Richard Koffler
President

Publisher/Editor-in-chief
The Office Systems Ergonomics Report
Santa Monica, CA

Thoughtful gesture

As a long-time reader of *Computer Decisions*, I've enjoyed many of your articles on both technical and managerial subjects. One I have especially appreciated is the six-part series "Thinking styles" [July through December 1983]. In fact, I have kept it for reference.

Charles W. Evans
President
Organization and Human Resources
Houston, TX

Additional packages for project management

It is always gratifying to see the topic of project management addressed in depth, as it was in your three-part article, "Sure-handed project management," in the November issue. However, in addition to PAC I, which was mentioned in the accompanying vendor list, AGS Management Systems offers three other major project-management systems. These are: PAC II, available for IBM, Burroughs, DEC, Honeywell, Sperry, and Wang hardware; PC/70, available for IBM/OS and IBM/DOS hardware; and PAC III, available for IBM and DEC hardware.

We will gladly provide additional information about any of our systems. Those interested should write to: AGS Management Systems, 320 Walnut St., Philadelphia, PA 19106; or call (215) 265-1550.

Lawrence M. Light
Vice President, Marketing Services
AGS Management Systems
Philadelphia, PA

Address letters to the editor to *Computer Decisions*, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604.

FOLLOWING THE LEADERS

(Continued from page 72)

dent of NBI, gave a forceful presentation. In response to doubts about NBI's survivability, he stressed his company's determination to go it alone—without being acquired by a large vendor. He noted that vendors—like AM International, 3M, and Pitney Bowes—rarely benefit by acquiring independents like NBI, which supplies word-processing products.

Lawrence Seligmann, executive vice president of Datapoint, defended the divestiture of the vendor's PBX operation, stating that PBXs require too much investment. He claimed that Datapoint is now besieged by PBX vendors who want to tie into its successful ARCnet local-area network.

Roland Pampel, senior vice president of Prime Computer, saw no conflict between commitment to CAD/CAM and to OA. He claimed that

position of dp managers.

Yet, the major overall impression one received from the conference was that most vendors are trying very

hard to tie into IBM's products, especially its Systems Network Architecture and the IBM Personal Computer. □

Most vendors seem to be trying very hard to tie into IBM's products, especially its SNA and IBM PC.

many customers want to offer word processing and other office functions to engineers. He also defended the purchase of Convergent Technologies' NGen word-processing terminals, claiming they have been specially modified to meet Prime's needs.

In spite of a strong presentation, Robert Miller, senior vice president of Data General, built little confidence in the audience. But most criticism went to IBM's James T. Boyle, director of the communications-products division, who had to follow Big Blue's well-known policy of not revealing what's ahead. IBM was criticized for offering too many OA products and for seeming to be more concerned with bolstering the



They offer PROFS under VM.

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NO	AUTHOR	STAT	DATE	TIME	SUBJECT
01	Smith		09/01/82	08:35	Office Automation system
02	Lukens	PASS	10/05/82	10:48	.. FOR YOUR INFORMATION ..
03	Burns	DLET	12/05/82	13:15	IBM Announcement
04	Wang		01/05/83	17:08	Electronic Mail System

System Features

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- In Israel, IBS, Ltd. Herzeliya, Pituach Tel: 052-70364

DATA COMMUNICATIONS

Fax exchange

The 3M Facsimile Exchange is a store-and-forward communications controller. It receives messages from fax terminals and sends them to other terminals. It can hold documents for after-hours routing and can collect documents from slow-speed machines and send them at high speeds to a high-speed machine or another exchange. Manual redialing for multiple transmissions is not necessary. The Exchange keeps records for management and accounting purposes. Price: \$43,000. Disk options store 900, 1,800, or 2,700 documents at standard G3 compression ratio.

3M, P.O. Box 33600, St. Paul, MN 55133.
(612) 733-9534. **CIRCLE 201**

Message centers

The Autotas CMC EMS (corporate message center/electronic message storage) stores up to 10,000 messages. When a call comes in, any information or instructions regarding the person being called can be displayed on the operator's screen. Messages are entered into the computer and forwarded directly to individuals, who can get their messages via small portable printers which can be hooked into any phone jack. Price for the CMC is about \$60,000 for a four- to six-position

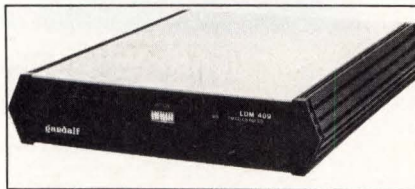


system. Printers are under \$160 each, depending on quantity. A lower-cost 800-message system can be obtained with Can-Print software, an IBM Personal Computer or some compatibles, and the printer. The software is \$350. The Autotas/ACD (automatic call distributor) queues up to 96 calls on up to 40 stations and automatically distributes them so operators don't have to determine the next call in sequence. Basic price: under \$20,000.

Candela Electronics Inc., 550 Del Rey Ave., Sunnyvale, CA 94088.
(408) 738-3800. **CIRCLE 202**

Mid-range modem

The LDM 409 is a low-cost, medium-distance modem particularly suitable for data transmission within metro-



politan areas. It can transmit data at 9,600 bps at distances from 25 to 200 miles, depending on the carrier. Features include diagnostics and an automatic adaptive equalizer. It operates in constant carrier mode on four-wire voice-grade lines or four-wire loaded or unloaded twisted pairs. Price: \$1,175.

Gandalf Technologies Inc., 1019 S. Noel, Wheeling, IL 60090.
(312) 541-6060. **CIRCLE 203**

IBM network items

The Integrated Network Architecture Binary Synchronous Communications Transport System (INA/BTS) and Asynchronous Terminal Controller (INA/ATC) are compatible with IBM 3270 terminals. They are expandable, do not interfere with hosts, require no additional programming, and allow flexible configuration. The INA/BTS manages one or two links operating under the 3270 BSC protocol. It supports multidropped attachments. Each terminal control unit can have up to 32

displays or printers. Price: from \$995. The INA/ATC allows asynchronous ASCII terminals to communicate with an IBM or IBM-compatible computer using 3270 BSC or SNA protocols. It interfaces up to 24 asynchronous terminals to a host over one synchronous line at up to 9,600 bps. It supports over 100 different types of crts, hard-copy devices, and personal computers. Price: from \$8,950. Megalink is an efficient bit synchronous time-division multiplexer that provides voice and data transmission as well as network management and diagnostics. Trunk speeds are from 50 to 2.048 Mbps. Megalink comprises its own stand-alone network or can be integrated into any Digital Communications Associates network. It supports two to 128 ports operating at speeds from 50 to 256 Kbps. Price: from \$3,800. A Network Control Concentrator for the INA series collects and integrates exception reports from the network processors and allows the operator to specify which control terminals and log printers are to receive those messages. Price: \$4,995.

Digital Communications Associates Inc., 303 Technology Park, Norcross, GA 30092.
(404) 448-1400. **CIRCLE 204**

Multiplexer for IBM

The CCM cable multiplexer, for the IBM 327X display systems, supports up to 32 Type-A terminals and printers over a single coaxial cable to a 3274 controller. In simple point-to-point configuration, distances can be extended up to 7,872 feet. In multi-story buildings, terminal clusters on different floors can share a single multiplexed line. The CCM is available in stand-alone and four-nest versions supporting eight to 32 devices in eight-port increments. Price: \$1,100 to \$3,350. The multiplexers can also be leased for one to five years. Five-year lease price is \$26 monthly for the stand-alone, \$90 for the 32-port unit. **Codex Corp.**, 20 Cabot Blvd., Mansfield, MA 02048.
(617) 364-2000. **CIRCLE 205**



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Wilson Jones

DATA COMMUNICATIONS

PC/LAN interface

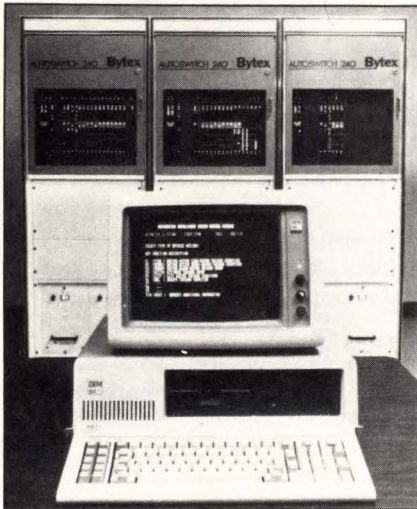
An interface connects the IBM Personal Computer and PC XT to the Pronet local-area network, a 10-Mbyte-per-second token-passing ring for use in networks up to several kilometers in length with up to 255 nodes. It will allow the IBM PC user to transfer files under MS-DOS to and from machines such as the DEC VAX-11 and IBM 4341. Price: \$595.

Proteon Associates Inc., 24 Crescent St., Waltham, MA 02154.
(617) 894-1980.

CIRCLE 206

Switch control

The Bytex Intelligent System Control Console, using the IBM XT, is an option for the Autoswitch electronic matrix switch. These switches provide tech-control patching, switching, and monitoring functions in distributed



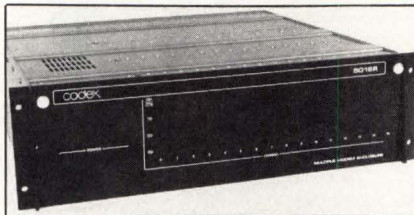
data-communications networks. The ISCC option may be used in place of or in addition to the standard ASCII System Control Console. Price is \$12,900.

Bytex Corp., 2 California Ave., Framingham, MA 01701.
(617) 879-5050.

CIRCLE 207

Modem products

The Bell-compatible, intelligent 5212 Automatic Calling Unit Modem communicates with any personal computer, dumb ASCII terminal, or front-end processor. It features automatic dialing and unattended-call answering, and it incorporates a full range of communications software. There are three



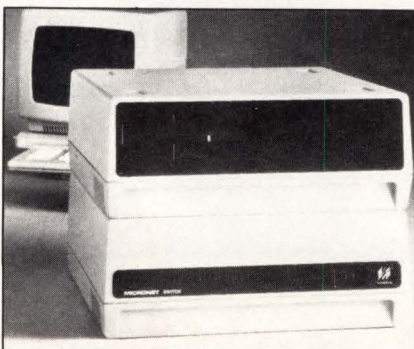
versions; a stand-alone model is \$645 or can be leased. Two multiple-modem nest enclosures are available for the 5000 series of modems. The 5008R eight-card enclosure, which has an additional slot for an Automatic Calling Unit, is \$1,500. The 5016R lower-powered nest, which houses up to 15 modems and the ACU, is \$750. A family of 8500 Series Data Service Units operates with the Dataphone Digital Service Network. The Model 8500B interface is the functional equivalent of the Bell DSU 500 with switch-selectable synchronous data rates of 2,400, 4,800, and 9,600 bps. Price: \$725. Model 8556, operating at 56 Kbps, is \$810.

Codex Corp., 20 Cabot Blvd., Mansfield, MA 02048.
(617) 364-2000.

CIRCLE 208

Information and message systems

The Micronet Message Switch is a desk-top store-and-forward system that operates as a network node, stand-alone, front end, electronic mailbox, and data-collection system at speeds of 50 to 56 Kbaud. It accommodates up to 24 ports and all popular protocols, unifying diverse terminals, protocols, and networks into a single system. It's available either as a hardware/software system or unbundled. Price is from \$65,000 to \$95,000. The Micronet 85 Office Information System is a multiple workstation system for general business use. It



has communications software and can function as an executive workstation, electronic-mail terminal, word processor, or personal computer. Software includes spreadsheet and graphics. Up to four workstations can be linked with the system. An icon-based user interface allows file maintenance or communications functions to be performed with only two keystrokes. A basic configuration costs \$19,500. The Micronet 12 Message Terminal is designed to replace mechanical or electromechanical Telex terminals. Operators can send and receive messages without extensive training. It also functions as a feeder terminal in a corporate communications network and serves as a variety of other message functions. This desk-top unit with 12-inch crt also features custom formats and log-on procedures, preprogrammed access formats, text editing, and auto-dial, -redial, and -answer. Price: under \$2,500.

Sidereal Corp., 9600 S.W. Barnes Rd., Portland, OR 97225.
(503) 297-5531.

CIRCLE 209

Data security and network controller

The LC76CF Data Security Unit for 56-Kbps circuits protects data transmitted over synchronous communications links. It gives the user a transparent cryptographic device that is self-synchronizing, independent of data format and character set used. Single-channel configuration is \$8,900; dual-channel and redundant configurations are \$15,800. A stand-alone network controller makes the DEC system/20-based IDX-3000 local data-network system available to the rest of the asynchronous data networks. Price: \$6,500.

M/A-Com Linkabit Inc., 3033 Science Park Rd., San Diego, CA 92121.
(619) 457-2340.

CIRCLE 210

Floppy-disk information: A 32-page booklet from Maxell (Moonachie, NJ), written in laymen's terms, explains the use of floppy disks in microcomputers.

CIRCLE 211

Record management: "File Management Systems," a booklet from Bell & Howell (Chicago), describes some ways to solve problems of traditional paper filing systems.

CIRCLE 212

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SECURITY

File protection

Aegis, online protection software for IBM CICS Level 1.4 or higher, controls access to accounting and financial files, customer lists, and employee records. Price: \$17,500. Aegis controls which operators and terminals may access specific files and programs, and at what hours and days. Features include a log of all activities, including unsuccessful attempts to sign on, DES encryption of security profiles and user files, forced signoff, save and restore functions, and decentralized security administration by application. **Cornell Computer Corp.**, 363 Seventh Ave., New York, NY 10001. (212) 594-8543. **CIRCLE 231**

Series/1 security

RSS, which runs on IBM's EDX operating system, is a communications package that protects both remote and central Series/1 computers from unauthorized access. Price is \$3,500. **H&A Computer Products Inc.**, 30

Hotelling Place, San Francisco, CA 94111. (415) 434-3517. **CIRCLE 232**

DEC monitor

With the Contrl package, managers or trainers can observe the activities of DEC VAX or RSTS/E system users without their knowledge. All input and output are displayed on the screen of the manager, who can also enter data. Thus, managers can watch new users run programs, interactively correct mistakes, and demonstrate procedures. Price: \$900. **Clyde Digital Systems Inc.**, 3707 N. Canyon Rd., Provo, UT 84604. (801) 224-5306. **CIRCLE 233**

Access control

The D-2000 Access Control Security Management System guards and records personnel traffic and monitors alarm contacts for fire, intrusion, and various environmental conditions. It monitors up to 4,200 card holders in a

network of 64 reader/terminals. One operator can monitor all of the system's activities. Unauthorized entry attempts are both recorded in hard copy and noted audibly with a voice synthesizer. A series of passwords restricts access to data files and programs at varying levels. Price: \$16,335.

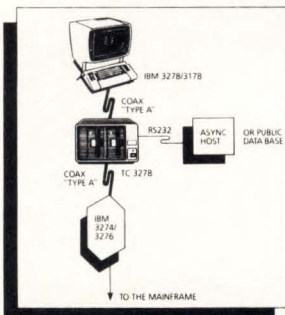
Cardkey Systems, 20660 Bahama St., Chatsworth, CA 91311. (213) 998-7560. **CIRCLE 234**

Data encryptor

Datascryptor III prevents unauthorized access to computer information during transmission, securing data over point-to-point, wide-band circuits at rates of up to 112 Kbits per second. Price: \$4,995. It permits key management and diagnostics to be controlled from the front panel and remote diagnostics to be performed unattended.

Racal-Milgo, 8600 N.W. 41st St., Miami, FL 33166. (305) 592-8600. **CIRCLE 235**

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CIRCLE 130

ONLY THE WORLD'S BEST WORD PROCESSOR COULD GENERATE WORDS LIKE THESE.

"PIE:Writer, outscored every other word processing program for microcomputers...(It) crams an incredible amount of power into a small and inexpensive package...PIE:Writer beat four out of six dedicated word processors."

Arthur Naiman
"Word Processing Buyer's Guide"
McGraw Hill Book Company

"PIE:Writer is hard to beat...There is little I can't do with it...Do not fail to check out this program if you are a first time purchaser."

James Martellaro
Peelings II

"All in all, PIE:Writer is one of the most thorough word processing packages available...it can perform many functions in addition to word processing...PIE:Writer just may be the best buy."

Peter Olivieri
"Softalk"
March 1983

Why are some of the most respected authorities in the field of software saying all these nice things about PIE:Writer"? The answer is easy.

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Don't confuse our use of the word simple with unsophisticated. PIE:Writer offers features and capabilities far beyond any other word processing programs for microcomputers. And that goes for most of the dedicated word processors as well. Here are just a few:

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But don't take our word for it. Or the expert's either, for that matter. Try PIE:Writer for yourself and enjoy the ease and excitement of writing with the world's best word processor.

Available at your local retailer or call 1-800-343-1218 (In MA 617-937-0200). Hayden Software, 600 Suffolk St., Lowell, MA 01853.

	Operating system(s) and/or machine(s)	Price	Overall Score
CPT 8100	dedicated word processor*	\$15,000	94%
Dictaphone Dual Disp.	dedicated word processor*	\$13,500	85½
PIE:Writer:	Apple II, IBM PC	\$149.95 \$199.95	84½
WordStar	CP/M†, Apple II, IBM PC	\$500	80
Easywriter	IBM PC**	\$175	35

- A tutorial section that easily acquaints you with the features of the program in step-by-step transactions.

*Includes word processing hardware & multistation support. †Requires additional CP/M Hardware for your personal computer (\$200-600 extra). CP/M is a registered trademark of Digital Research. *VisiCalc © is a registered trademark of VisiCorp. **Very similar program called Easywriter Professional, available for the Apple II.

PIE:Writer

HAYDEN SOFTWARE

SOFTWARE

Manager advisor

SAS/OR is a management strategy tool aimed at minimizing costs and maximizing productivity. It runs on IBM 370, 30XX, 43XX, and compatibles under OS, VM/CMS, DOS/VSE, and SSX. It has procedures for scheduling projects and solving linear optimization models as well as tools for planning distribution strategies, solving transportation and assignment problems, evaluating investment profitability, and determining product mix. First year license fee is \$3,000 for SAS/OR; basic SAS software, costing \$7,500, is also required.

SAS Institute Inc., Box 8000, Cary, NC 27511.

(919) 467-8000.

CIRCLE 213

Power spooling

BIM-PDQ enhances DOS/VSE power spooling by retaining a copy of the Power Queue File in virtual memory and satisfying all read requests for these records without performing any

disk input/output. PDQ also intercepts accesses by other software accessing the queue, such as online program editors and terminal-printer spooling systems. The result is almost instantaneous response to queue-display requests and improvement in other disk-access response time. An Auto-Del option automatically deletes jobs left in the Power Queue longer than a user-specified time limit. Price: \$2,000 purchase or \$1,000 per year, or \$100 per month. With the Auto-Del option, prices are \$2,600, \$1,300, and \$130 respectively.

B I Moyle Associates Inc., 5788 Lincoln Dr., Minneapolis, MN 55436.

(612) 933-2885.

CIRCLE 214

Support for 4381

MVT is a DOS/VSE-compatible operating system that supports the full 16 Mbytes of memory on IBM's 4381. It allows the processor to use the full high-speed buffer. The system also supports the 4361, including usage of S10F and full utilization of real storage

on 12-Mbyte models in System/370 mode and ECPS:DOS/VSE mode. Price ranges from \$600 to \$900 per month, depending on cpu. On-site conversion is about \$3,500.

Software Pursuits Inc., 444 Market St., San Francisco, CA 94111.

(415) 392-7171.

CIRCLE 215

Manufacturing control for IBM

A Capacity Management System, running under IBM operating systems VM, DOS/VSE, and MVS, is for mainframes supporting ANSI '74 Cobol. This package for managing manufacturing capacity consists of several modules—capacity requirements planning, operation sequencing with networking, and operation sequencing without networking. Price: \$20,000 to \$65,000.

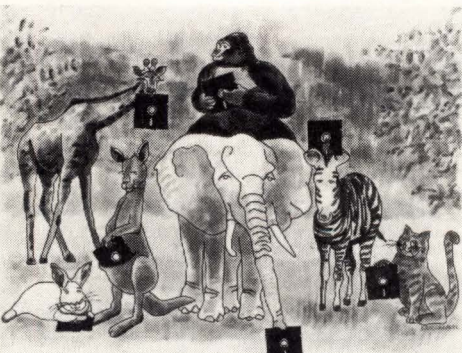
Manufacturing Management Systems, 7010 Ardmore, Houston, TX 77221.

(713) 749-5755.

CIRCLE 216

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Other Useful Computer Accessories

When the read/write head on your computer is dirty, this can cause you a lot of grief. Now, with CE Head Cleaning Diskettes, you can clean the read/write heads on the diskette drive in just 30 seconds. Each kit contains two head cleaning diskettes, an order solution for 30 cleanings. Order # 5-CLF for 5 1/4" drives and order # 5-CLF-16 for 5 1/4" drives. Only \$25.00 each. Also available from CE are 3M data cartridge. The DC100A data cartridge is a small version of the DC200A data cartridge. The DC100A contains 140 feet of 0.150" tape in a package measuring 2 1/4 x 3 1/2 x 0.5 inches. Cost is \$14.00 each. The DC200A is a pre-loaded tape cartridge containing 300 feet of one mil thick by 1/2" computer tape. The DC200A costs \$18.00 each. The DC200XL is an extra length data cartridge with 450 feet of tape. It is the same size and interchangeability with the DC200A. The DC200XL provides a total storage capacity of 34.5 million bits at 1800 BPI. The cost of the DC200XL is \$22.00 each. If you need extra mini-diskette envelopes, CE sells super strong and tear-resistant "Type A" envelopes for \$12.00 per 100 pack. Use order # TCE for a 100 pack of 5 1/4" diskette envelopes. Remite-Comet 7P 11 letter quality printers are available in single or parallel versions for only \$529.00 each.

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M41A	1.49
M51A	1.49
M13A	1.79
M13AB	1.59
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M33A	1.79
M33A	1.79
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M16A	3.69

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51401	1.89
00096	1.59
51410	1.89
51418	1.89
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00140	2.49
52410	2.79
52416	2.79
51801	2.59
52801	3.69

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88880	2.49
88880	2.49
88880	3.14
88880-1024	3.14
55880-RH	1.94
55880-10RH	1.94
55880-16RH	1.94
55880-RH	2.69
55880-10RH	2.69
55880-16RH	2.69
55880-96RH	2.79
55880-96RH	3.74
55880-96RH	4.34

Memorex diskettes for as low as \$1.94 each

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3062	1.94
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3102	3.14
3104	3.14
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3501	3.74

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FD-106	3.24
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FD-111	3.29
FD-112	3.29
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MFD-12	2.09
MFD-13	2.09
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MFD-15	2.84
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Prime graphics

Info-Versagraph is a graphics package that is integrated with the Info relational data management system for Prime systems. Graphs can be plotted from a library of over 100 predefined templates, can be modified for specific requirements, may be completely new designs including free-form graphs, or may be any combination of these. Any groups of elements from an Info data file can be singled out for graphing. The graph may be viewed on a graphics terminal from Tektronix, Ramtek, or Seiko, or on a crt with graphics device from Digital Engineering, Data-Type, or Autograph, or via an HP, Printronix, or Versatek printer/plotter. Price is \$10,000 for Prime 150-9950 systems and \$8,200 for 2250 systems; Info Revision 9 is also required.

Henco Software Inc., 100 Fifth Ave., Waltham, MA 02154.
(617) 890-8670.

CIRCLE 217

Decision support for IBM, Wang, and HP

Version 2.40 of FCS-EPS decision-support system is available for IBM and Wang systems. There is also an HP3000 version of FCS-EPS. One feature of Version 2.40 is an Internal File Manager system that creates a "Timesharing Environment." Price: from \$43,000. The HP3000 version starts at \$25,000. The company also has a MicroFCS modeling package for the IBM Personal Computer and XT and most IBM-compatible hardware. This software has communications and graphics capabilities. Users can create a model on the micro and upload it to a mainframe or mini without program changes; information may also be transferred downline. Price: \$2,000.

EPS Inc., One Industrial Dr., Windham, NH 03087.
(603) 898-1800.

CIRCLE 218

Accounting on S/36

A complete range of financial and accounting packages is available for the IBM System/36. The packages consist of General Ledger and Financial Reporting, Accounts Payable, Accounts Receivable/Cash Management, Fixed Assets, Payroll/Personnel, and Human Resources Manage-

ment. A 25-year lease fee for the General Ledger is \$24,000, the Human Resources package is \$15,000, and the others are \$19,000 each. There are discounts for lease of multiple packages. The entire set can be leased for \$69,500, a saving of \$45,500. A General Ledger and Financial Reporting System with real-time capability is available for the IBM 4300 and 303X. Price: \$52,000 to \$100,000 for DOS and OS. Also, an Accounts Payable system with online real-time capabilities for mainframes can be leased for \$23,900 and up.

Software International Corp., One Tech Dr., Andover, MA 01810.
(617) 685-1400.

CIRCLE 219

Sequel spreadsheet

Realcalc is an electronic spreadsheet that provides financial planning tools for the Reality and Sequel business systems. Users can also access any information from the Reality relational database system. The system is de-

signed for nonprogrammers, and users can design their spreadsheets according to their needs. Price: \$1,595.

Microdata Corp., 17481 Redhill Ave., Irvine, CA 92714.
(714) 250-1000.

CIRCLE 220

Cobol tool

Data Expediter, for IBM OS mainframes, ensures consistency of Cobol program data elements for data administrators. It automates many functions that were previously done manually. It audits compliance with naming conventions, documents Cobol source programs, and eliminates redundant data names. This tool creates a graphic display of a Cobol data definition and works with all data dictionaries. Price: \$11,500 for perpetual license. It can also be rented on a monthly basis.

Pacific International, 6033 W. Century Blvd., Los Angeles, CA 90045.
(213) 215-0964.

CIRCLE 221

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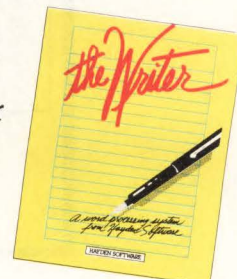
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*Runs on the Apple II, II+, IIe, the IBM PC and compatibles.

HAYDEN SOFTWARE



SOFTWARE

System/38 utility

Superzap/38, for IBM System/38, permits direct access of records in any database file. It verifies security clearance and then displays records which have been requested by key or record number. Users may then scroll forward or backward, modify the record, or delete it. All logical views are then automatically updated. Price: \$750.

Ventura Computer Systems, 1411 Kuehner Dr., Santa Susana, CA 93063. (805) 483-8440. **CIRCLE 222**

Unix interfaces

Sofforms is a package for creating and displaying data-collection forms. It runs on all of Bell Laboratories' Unix operating systems, Unix look-alikes, and systems that support C. The designer can freely paint the screen, tailoring the user interface to suit the individual application. Another package, the Menu System, provides a user-friendly interface to the operating

system's command language. Users can build and display menus in front of any program on any Unix or look-alike on any terminal and do not have to learn a new language or data-file format. Each package is \$500 on a single-user system and \$1,000 on a multi-user system.

Softest Inc., 555 Goffle Rd., Ridgewood, NJ 07450. (201) 447-3901. **CIRCLE 223**

VAX packs

Version 2 of the VAX-11 database management system, running under VMS, has additional security, performance, and control features, such as security schemas, batch retrieval, and several utility commands. License fee is \$20,000. A runtime-only version, which executes applications developed with the complete version, is \$4,000 after purchase of a full DBMS license. The VAX-11 Application Control and Management System is a transaction-processing package for

complex interactive commercial and industrial applications. It consists of two components: VAX-11 ACMS/AD is for developing and maintaining applications, and VAX-11 ACMS is for monitoring and controlling execution of applications developed with VAX-11 ACMS/AD and those developed with existing VMS tools. This package can be used in combination with data management software. Price: \$15,500. Components may be purchased separately: \$5,500 for the ACMS and \$10,000 for the ACMS/AD as an upgrade where an ACMS license is already present.

Digital Equipment Corp., Maynard, MA 01754.

(617) 897-5111. **CIRCLE 224**

Business Basic enhancements: Data General (Westboro, MA) has added four features to its interactive Business Basic language: logical-file database structure; print spooling; I/O calls; and utilities, subroutines, statements. **CIRCLE 225**

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RESEARCH REPORT

MICROCOMPUTER OPERATING SYSTEM STRATEGIES

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- Discusses user perceptions of operating system elements including data management, and the interface between applications software, programming tools and DBMS.
- Details past and future impact of Xerox Dynabook and Smalltalk developments on products such as Apple's Lisa, Quarterdeck's DESQ, Visicorp's VisiOn, etc.
- Establishes the product-planning parameters for future micro product offerings, and reviews probable adherence to these parameters by AT&T's future 32-bit micro, IBM's rumored "4301" and other upcoming products of significance.
- 237 pages; 42 exhibits; published September 1983; price \$1,650.00.

For free descriptive literature and a detailed table of contents, contact:

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SERVICES

Shared applications

Two order-and-distribution packages are available on Geisco's Honeywell-based Mark III service or its IBM-compatible Mark 3000 service. Licensing is also available. Price: \$14,000 to \$30,000 monthly for remote services, or \$300,000 purchase. Dispatch 2000 is for warehousing operations such as order entry, shipping, billing, and inventory. It also provides for control of these activities from corporate headquarters. Dispatch 3000 adds capabilities such as general ledger and employee records, making it a complete distribution-management system. Price: \$50,000 to \$60,000 for remote service; modular purchase is \$150,000 to \$425,000. Geisco also offers a shared applications capability that allows clients to integrate their processing capabilities and software with the Mark III service. It provides real-time transaction-level communications between hosts. Also, client micros can be linked to Geisco's application software and worldwide teleprocessing network. A typical order-entry system costs \$10,000 to \$30,000, including processing, storage, and communications.

Geisco, 401 N. Washington St., Rockville, MD 20850.
(301) 340-4387.

CIRCLE 226

VM performance

VMap Analysis helps VM installations identify or confirm performance problems and recommend possible solutions. The service comprises a one-time analysis of a single system running VM/370 or VM/SP with guest operating systems, CMS, or both, as well as follow-up answers to questions that might be raised. Fee: \$875.

The Adesse Corp., P.O. Box 515, Ridgefield, CT 06877.
(203) 431-3071.

CIRCLE 227

Training courses

A Computer-Based Training consulting service is available through the Phoenix Courseware Group. Phoenix provides development of courses without programming as well as updating of course material. Consultants can analyze problems and help plan and design courses for individual projects or an entire series, on either a

short- or long-term basis. Consulting services range from \$200 to \$500 per day, depending on length of contract and services to be performed.

Goal Systems International, 5455 N. High St., Columbus, OH 43214.
(614) 888-1775.

CIRCLE 228

Staffing support

Triple-I Skills Management is a staffing and consulting service that provides data on skilled MIS professionals while helping a company assess its long- and short-term personnel requirements. A company has the opportunity to offer a permanent position to a prospect after a work-agreement period, during which the employee's performance can be observed. The employing company pays only for the individual's productive time. The cost is \$25 to \$75 per hour.

Information Industries Inc., 1500 Charterbank Center, Kansas City, MO 64105.

(816) 421-6969.

CIRCLE 229

NCA software

The NCA/NET network permits remote computing with NCA's software products. The Maxcim manufacturing/financial system is available now in the western states. It can be used for the planning, analysis, and control of manufacturing operations. Cost is \$1,500 per month per port.

NCA Corp., Computer Services Group, 388 Oakmead Pkwy., Sunnyvale, CA 94086.
(408) 245-7990.

CIRCLE 230

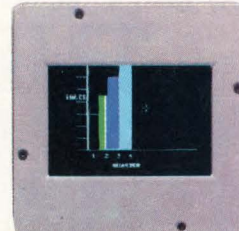
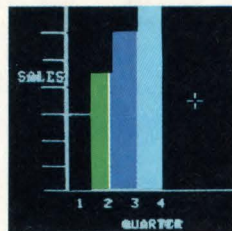
Static control: A brochure from ACL Inc. of Elk Grove Village, IL, tells about the nature and cause of electrostatic charges and describes how to static-proof surfaces in the computer environment.

CIRCLE 261

Oasys 64 communications: A bi-synchronous 3270 option allows NBI's (Boulder, CO) Oasys to communicate with IBM mainframes.

CIRCLE 262

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The Producer from Hayden Software lets you produce low-cost, professional business presentations.

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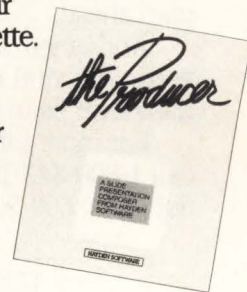
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*Runs on the Apple II, II+, IIe, the IBM PC and compatibles.

HAYDEN SOFTWARE



PERIPHERALS

Ergonomic systems

The PTS-1000/4000 family of IBM 3270-compatible products consists of three interactive displays, three control units, and five printers. A 12-inch monochrome terminal, 15-inch monochrome terminal, and 13-inch color display support a full line of peripheral devices. The R1076 display terminal/control unit supports up to seven additional terminals; the R1074 cluster-control unit supports up to 32; and the R4074 cluster controller offers additional capabilities, such as local format storage, extended memory, and increased communication speeds. All three offer remote and local configurations. Also in the PTS-1000/4000 family are a screen printer, matrix printer, line printers, and correspondence printer. All system components offer three coaxial-cabling options. A typical small cluster remote system with four displays and a 150-cps matrix printer costs \$13,170. A system with 18 displays and two 150-cps ma-



trix printers is \$42,820.

Raytheon Data Systems, 1415 Boston-Providence Tpk., Norwood, MA 02062.
(617) 762-6700.

CIRCLE 236

Dual-host controller

Model 311 is a 3274-compatible controller with two concurrently operating interfaces so display stations can be switched between two IBM-compatible mainframes through keyboard commands. It can also be configured for application redundancy or host-backup capabilities. The 311 supports

up to 32 display stations and printers. Price: \$14,215, or \$591 monthly for three-year lease. A File Transfer Utility provides Lee Data's Series 700 workstation users with bidirectional mainframe-to-PWS file-transfer capability, adding IBM-compatible personal-computing capability to the company's IBM 3278- and 3178-compatible terminals. Users can select from supplied transfer routines or create their own. Cost is \$125 per unit



on the PWS; with a \$500 unit on the mainframe, programmers can reorder the data for the PWS.

Lee Data Corp., 7075 Flying Cloud Dr., Minneapolis, MN 55344.
(612) 828-0300.

CIRCLE 237

Executive terminals

The Executive 10/102 display terminal has a 14-inch tilt and swivel display and is a plug-for-replacement for the DEC VT 102 and 131. It has 132 characters per column and a keyboard layout similar to the DEC terminals. Price: \$995. The Executive 10/25 features a 16-bit terminal processor, smooth scroll, 132-column display, and editing features. Price: \$1,045.

Esprit Systems Inc., 100 Marcus Dr., Melville, NY 11747.
(516) 293-5600.

CIRCLE 238

Compatible printer

A near-letter-quality 7-by-9 dot-matrix printer is plug-compatible with the IBM 3270. The tabletop ISI Model 487 accepts continuous forms; it has a demand-document feature; and a control panel provides access to the ISI 487's programmable memory. Price: from \$3,950.

Interface Systems Inc., 5855 Interface Dr., Ann Arbor, MI 48103.
(313) 769-5900.

CIRCLE 239

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appointment

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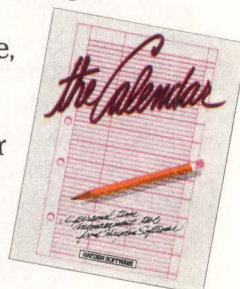
The Calendar's multi-window design makes it easy to keep track of all your business appointments, make schedule changes, and plan ahead.

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For more information, see your local retailer, or call 1-800-343-1218 (In MA 617-937-0200). Hayden Software, 600 Suffolk St, Lowell, MA 01853.

*Runs on the Apple II, II+, IIe, the IBM PC and compatibles.

HAYDEN SOFTWARE



Daisywheel printer

A tabletop letter-quality bidirectional printer is plug-compatible with IBM's 3287 and can be attached to a Telex 174/274C/276 or IBM 3274/3276 controller. It accommodates both plastic



and metalized printwheels of 127 or 96 characters and prints up to 80 characters per second. Line spacing, character spacing, and print positions are operator-selectable. Price: \$5,350.

Telex, 6422 E. 41st St., Tulsa, OK 74135.

(918) 627-1111.

CIRCLE 240

Lab recorder

The Series 200 X-Y Recorder has 11 switch-selected input ranges and eight timebase ranges to drive the pen beam at speeds from 200 seconds per inch to 1 second per inch. A patented Houston Instruments' feature eliminates electrical noise. Price: \$1,500.

Houston Instrument, 8500 Cameron Rd., Austin, TX 78753.

(512) 835-0900.

CIRCLE 241

LAN display

Braegen's Model 8521 low-cost display station can access personal-computing power over an IBM-3270-compatible local-area network. It's functionally equivalent to an IBM 3278 Model 2 and is compatible with Braegen's 8500 controller series, which supports up to 120 peripheral devices. The display has a keyword or code security system and allows users to lock their displays. Price: \$1,700.

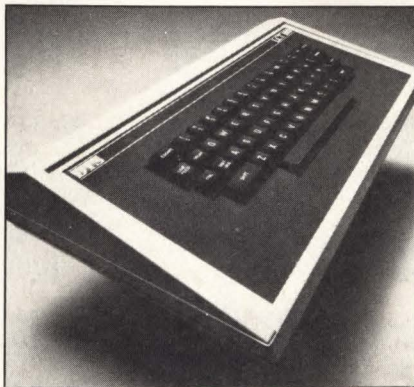
The Braegen Corp., 525 Los Coches St., Milpitas, CA 95035.

(408) 945-1900.

CIRCLE 242

Affordable terminal

A 9-by-12 dot-matrix terminal, the LCT-1000, is housed in a keyboard. It features 80 graphics symbols, 16 switch-selectable baud rates, RS170-like composite video interface,



and automatic line feed. Twelve different video attributes can be used on the screen at the same time. Price: \$400.

Data Terminal Service Inc., 715 Rankin Rd., Albuquerque, NM 87107. (505) 345-1611.

CIRCLE 243

LSI-11 subsystem

Model 850 is an 84-Mbyte disk drive subsystem for Plessey Series 6600/6700 and other LSI-11/23-based systems. It has an 8-inch disk

drive designed to replace several 14-inch disk drives, providing emulation of up to five DEC RK06 or one RK06 and two RK07 disk drives. The rack-mount chassis is 5¼ inches high. Price: \$10,800 with a controller and \$7,900 without.

Plessey Peripheral Systems Inc., 17466 Daimler Ave., Irvine, CA 92714. (714) 540-9945.

CIRCLE 244

Smart printer

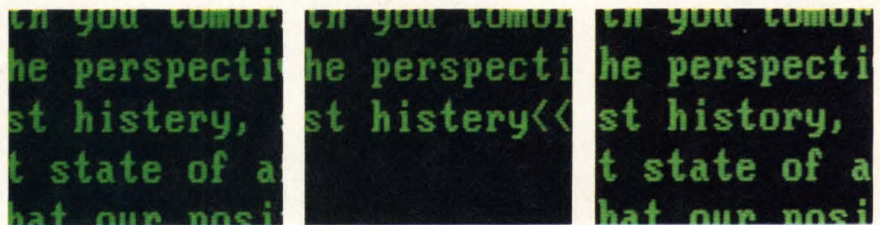
The DTC Style Writer, a daisywheel printer with advanced hardware and software features, works with most personal computers via a standard parallel interface. It has 35-Kbyte buffer memory expandable to 67 Kbytes. It offers word-processing and graphics capabilities, letter-quality printing, and a wide variety of print styles. It also features self-diagnostics. Price: \$899.

Data Terminals and Communications, 590 Division St., Campbell, CA 95008.

(408) 378-1112.

CIRCLE 245

FOR JUST \$50 YOU CAN REWRITE HISTORY.



With The Speller from Hayden Software, incorrect spelling is a thing of the past.

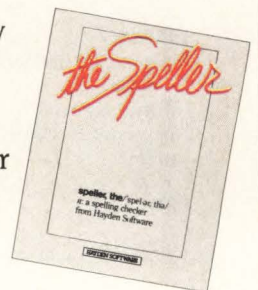
Its 20,000+ word dictionary automatically checks your spelling and makes corrections. Which means that your letters, papers and reports will be letter perfect time after time.

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COMPUTER DECISIONS

MICROSYSTEMS

Modem for Apple

Micromodem IIe and Smartcom I are a modem and communications package for the Apple II, II+, IIe, and III. The modem allows the Apple to communicate over phone lines with other computers and timesharing or information services. Smartcom I offers a menu to make reaching the other computer easier and more efficient. The program accommodates up to six disk drives and several printer-interface cards. Price is \$329 for the full package. Smartcom I alone is \$119 to current owners of the Micromodem II.

Hayes Microcomputer Products Inc., 5923 Peachtree Industrial Blvd., Norcross, GA 30092.
(404) 449-8791.

CIRCLE 246

Mainframe-PC link

With any of three software tools, data from an MSA system running on an IBM mainframe can be downloaded to an IBM Personal Computer or PC XT, where users can prepare charts, spreadsheets or reports, or perform other activities. Information can also be uploaded to the mainframe. Executive Peachpak II provides integrated analysis, graphics, spreadsheet, reporting, and data management. Price: \$3,000 to \$6,000, depending on number of units. Administrative Peachpak, a word-processing package, is \$1,500 per unit. Graphics Peachpak, for producing multicolor graphs, costs \$3,000 per unit.

Management Science America Inc., 3445 Peachtree Rd. N.E., Atlanta, GA 30326.

(404) 239-2000.

CIRCLE 247

PC communications

PC Express is a package that transforms the IBM Personal Computer into a communications workstation providing PC-to-PC communications, electronic mail, access to mainframes, and automated telephone-management capabilities. It offers synchronous and asynchronous protocols, provides 327X and VT-100/52 emulation, and allows the user to access IMS, CICS, TSO, SPF, or any software running under SNA. PC Express I, which does not offer 327X emulation, is \$895. PC Express II is \$1,295. A software package called PC-to-PC 4800 Baud, when used with the PC Express, permits

synchronous communications between IBM PCs at 4,800 baud over voice-grade lines. Price: \$350.

Intelligent Technologies International Corp., 151 University Ave., Palo Alto, CA 94301.

(415) 328-2411.

CIRCLE 248

Versatile PC pack

Number Cruncher, for the IBM Personal Computer and XT, Compaq, and Columbia computers, is a business-productivity system that includes functions of spreadsheet, data management, information management, text editing, and applications generation. Although all the functions are integrated into one system, no one function is dependent on another for its operation. Number Cruncher costs \$395 and includes a number of learning aids. A Foundation module provides a database management system that users can operate within minutes. **Pyramid Data Ltd.**, P.O. Box 10116, Santa Ana, CA 92711.

(714) 639-1527.

CIRCLE 249

Micro drive

Amdisk III is a 3-inch dual disk-drive system compatible with the Radio Shack Color Computer. It provides up to 624 Kbytes of double-density formatted storage. Price: \$599.

Amdek Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007.

(312) 364-1180.

CIRCLE 250

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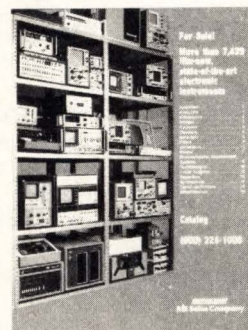
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CIRCLE 135

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CIRCLE 136



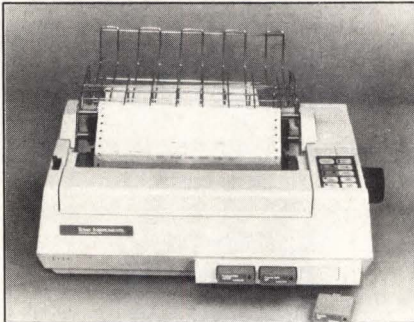
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CIRCLE 137

MICROSYSTEMS PLUS

Dual-mode printer

The Omni 800 Model 855 dot-matrix printer operates with all major personal and professional computers. It provides both letter-quality printing for word processing and 150-cps draft-quality speed for data process-



ing. Font styles can be selected with the touch of a button, and up to three can be used simultaneously. Users can control form feed and spacing and set form length and compression. A metering tractor allows an inch tear-off from the last printed line. Price: \$935 for friction-feed model and \$995 for tractor-feed.

Texas Instruments, P.O. Box 402430, H-669, Dallas, TX 75240.
(214) 680-5001.

CIRCLE 251

Televideo software

Telesolutions II is a kit of three packages for Televideo's TS 803 and 1603 personal computers. Telecalc is a spreadsheet for financial planning and business calculations. Telewrite is an executive-level word-processing package that operates with all commonly used printers. Telechart is graphics software that supports printers and plotters including Epson and Okidata. Price: \$795 for TS 803 and \$595 for TS 1603. An 803 system with this software costs \$2,495, and the 1603 is \$2,995.

Televideo Systems Inc., 1170 Morse Ave., Sunnyvale, CA 94086.
(408) 745-7760.

CIRCLE 252

Network for MS-DOS/Unix

Paxnet is local-area-network software providing distributed processing for IBM Personal Computers and other 8086-based computers. It runs under MS-DOS 2.0 and is compatible with Bell Laboratories' Unix and mixed MS-

DOS/Unix operating systems. It allows sharing of all devices and files and supports up to 255 personal computers, printers, or gateways to other networks. Unlimited license is \$250,000. License for 500 nodes is \$50,000, plus \$50 for each additional node. Basic license is \$10,000 plus \$200 per node.

Phoenix Software Associates Ltd., P.O. Box 207, North Easton, MA 02356.

(617) 238-0168.

CIRCLE 253

Carrying cases

Lightweight, impact-resistant cases for transporting personal computers have a foam lining that can be custom-cut to fit the shape of any computer, including components and accessories. Expansion modules with re-



movable shelves can be inserted to increase storage capacity and provide storage compartments. The 14-by-21-inch LF Series comes in three heights and starts at \$165. The 9½-by-14-inch LC Series, also in three heights, starts at \$110. Expansion modules are \$75 and \$108.

TSE Inc., 541 E. Hector St., Conshohocken, PA 19428.

(215) 825-8202.

CIRCLE 254

Uninterrupted power

An online Micro-UPS system regulates voltage, eliminates noise, and provides battery reserve during power outages. It has an internal 10-minute battery or can be used with external 48-volt batteries for up to several days. It maintains output value even when powering nonlinear loads such as switching power supplies, so other sensitive equipment can be connected in parallel with switching supplies. It can be placed on a table or rack-

mounted. Price: from \$1,450.

Gould Electronics, 2727 Kurtz St., San Diego, CA 92110.

(619) 291-4211.

CIRCLE 255

Personal features large disk storage

The AM-1000E desk-top microcomputer has 256 Kbytes of standard memory expandable to 512 Kbytes. It features a 30-Mbyte 5¼-inch Winchester disk drive, and subsystems may be added up to 120 Mbytes. The system can be expanded to support up to seven simultaneous users plus a printer.

Alpha Micro, 17332 Von Karman Ave., Irvine, CA 92714.

(714) 957-8500.

CIRCLE 256

TRS spreadsheet

Target Plannercalc, for the TRS-80 Models 4, III, and I, is an electronic spreadsheet for small businesses. Using plain-English formulas, it allows creation of financial models to meet individual needs and performs a wide variety of mathematical operations. Price: \$100.

Tandy Corp./Radio Shack, 1800 One Tandy Center, Fort Worth, TX 76102.
(817) 390-3700.

CIRCLE 257

Procurement pack

Procurement Program is a database system for managing all aspects of purchasing goods and services. The program is menu-driven, and it offers six general report formats. It's written in CBasic and requires CP/M 2.2, 64 Kbytes of memory, two disk drives, and a 132-column printer. Price: \$500.

Powertronic Systems Inc., P.O. Box 29109, New Orleans, LA 70189.

(504) 254-0383.

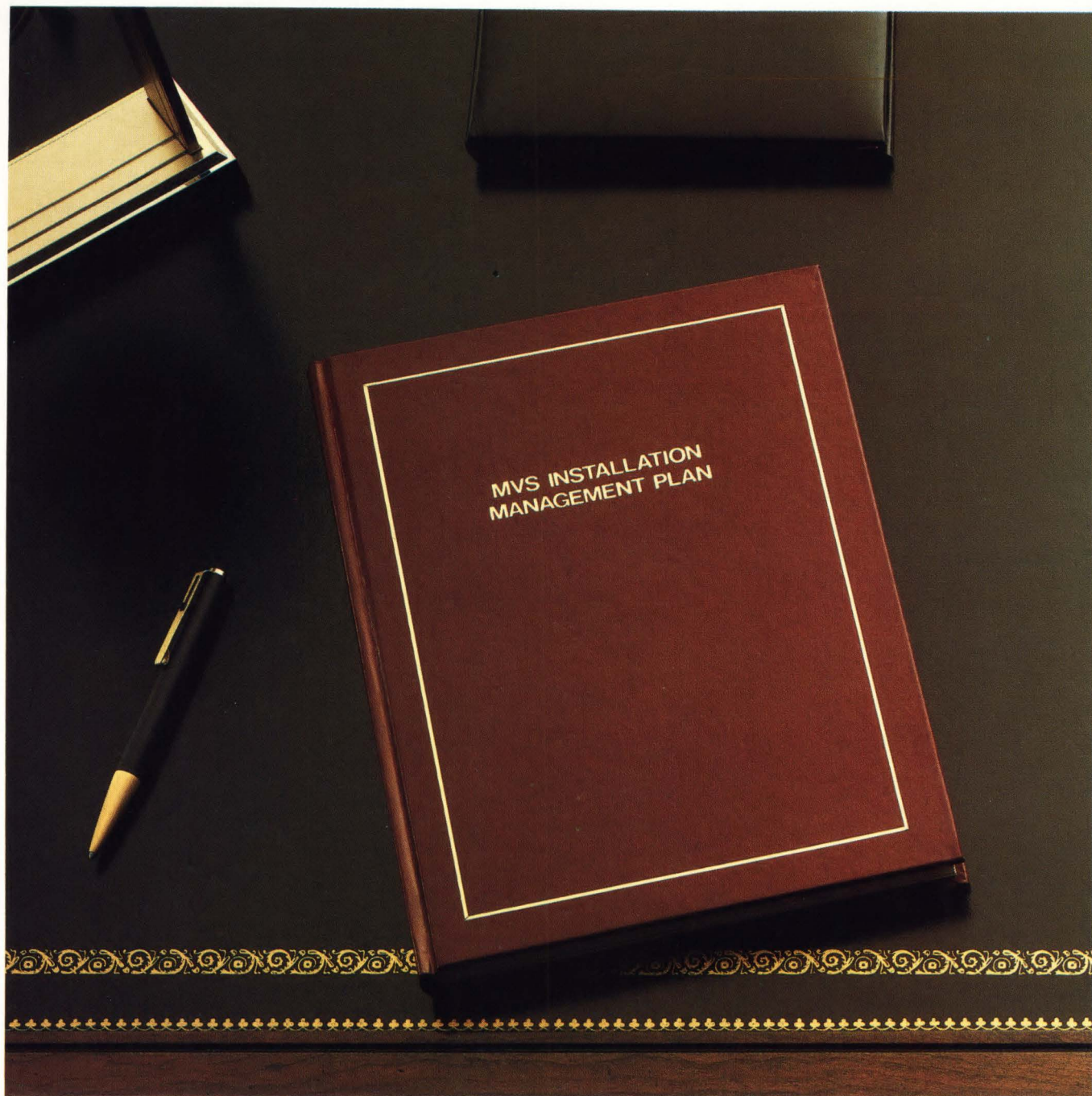
CIRCLE 258

Storage for printouts: A line of edp shelves from Panel Concepts (Santa Ana, CA) is available in five styles and a variety of widths and finishes. All shelves are 16 inches deep.

CIRCLE 259

Relational DBMS for IBM: CA-Universe, which runs on DOS/VS(E), VM/CMS, and OS/MVS, offers extended screen-design and development facilities and enhanced help functions. It's from Computer Associates of Jericho, NY.

CIRCLE 260



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CIRCLE 170



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