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APRIL 1988 (USA)



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Feature: Cartridge Jam Protection

Benefit: Protects the cartridge from damage if cartridge jams. This is accomplished by sensing a current surge and then disabling the motor, thus insuring that the cartridge will not be damaged.

Feature: High Density Recording

Benefit: Storage capacity of 23 MB on a single cartridge.

Feature: Optional industry standard 1/2" tape interface.

Benefit: Operates with existing tape couplers and software. The drive operates as though it were a 1/2" tape drive without having to modify existing hardware or software.

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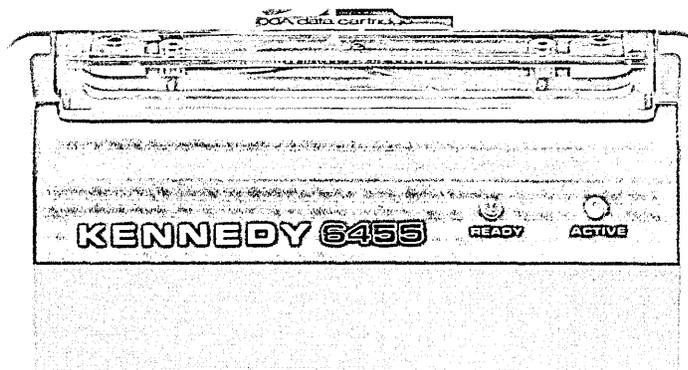
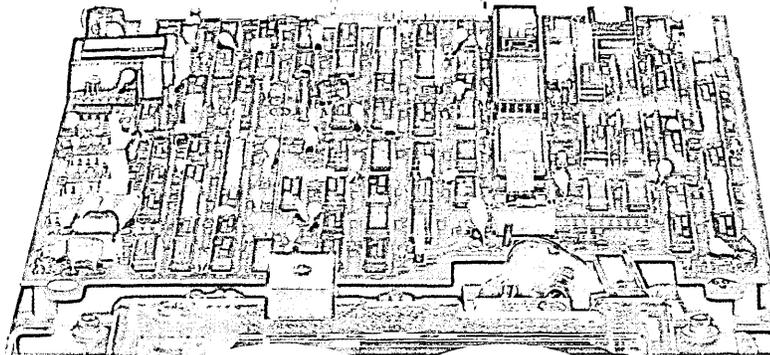
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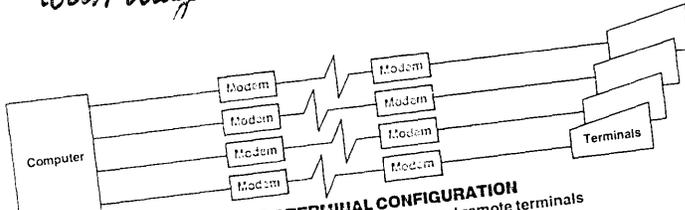


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CIRCLE 10 ON READER CARD

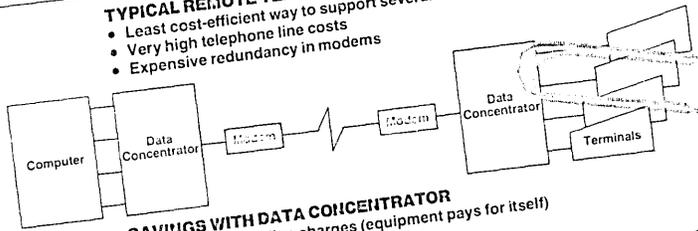
Don't buy a bunch of modems—even from us if what you really need is a Micro8000 Concentrator Modem!

*Roger:
It's been a knockout ad series, no doubt about it, but our sales people tell me the attached can best be explained with diagrams.*



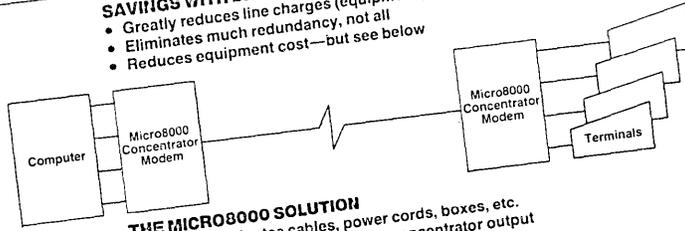
TYPICAL REMOTE TERMINAL CONFIGURATION

- Least cost-efficient way to support several remote terminals
- Very high telephone line costs
- Expensive redundancy in modems



SAVINGS WITH DATA CONCENTRATOR

- Greatly reduces line charges (equipment pays for itself)
- Eliminates much redundancy, not all
- Reduces equipment cost—but see below



THE MICRO8000 SOLUTION

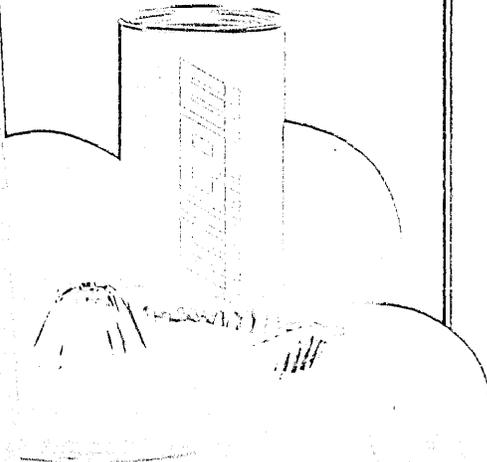
- Clean—eliminates cables, power cords, boxes, etc.
- Perfectly matches LSI modem to concentrator output
- Minimizes all costs—lines and equipment

Isn't there some way we can get this info across without botching up the ads?

Chris

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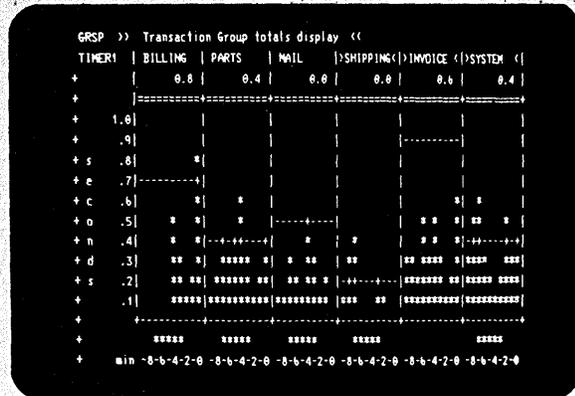
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RTA/IMS Moving Time Slot Analysis displays "Fixed Window" (right side of screen) and "Dynamic Window" (left side of screen).

if the response time for the selected transaction has exceeded your acceptable response time level.

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APRIL 1, 1984/\$3.00 U.S.A.
VOLUME 30 NUMBER 4
This issue, 181,730

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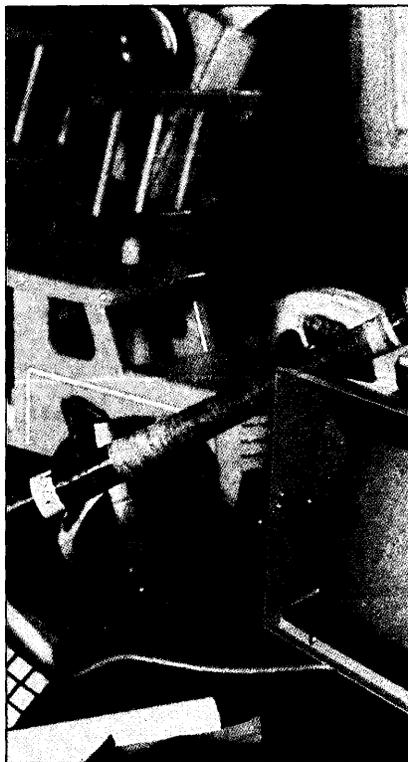
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An adequate budget and a qualified and committed staff in the dp training department are the key elements in the formula for success.

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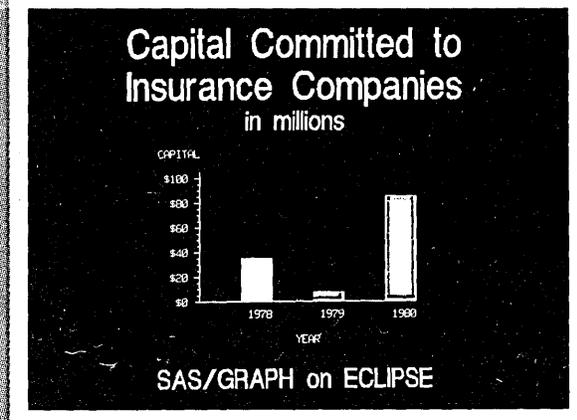
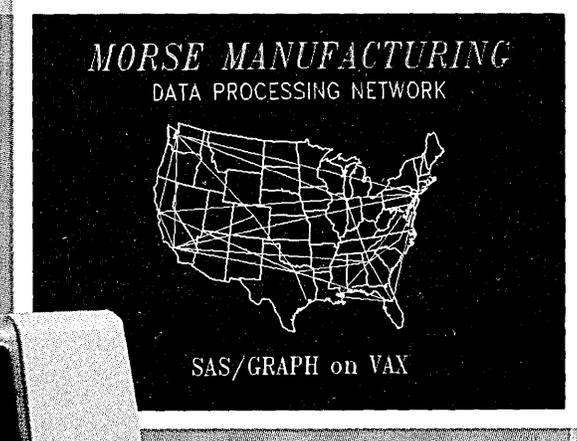
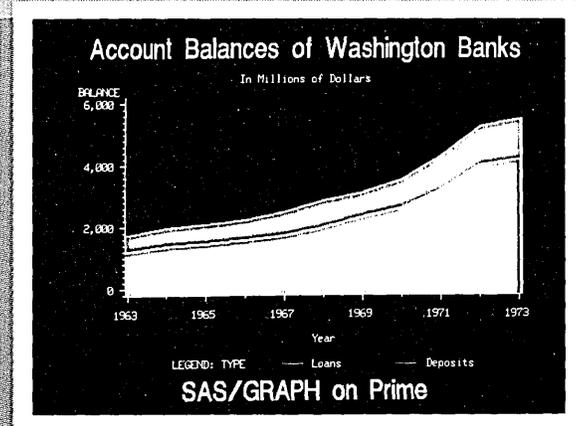
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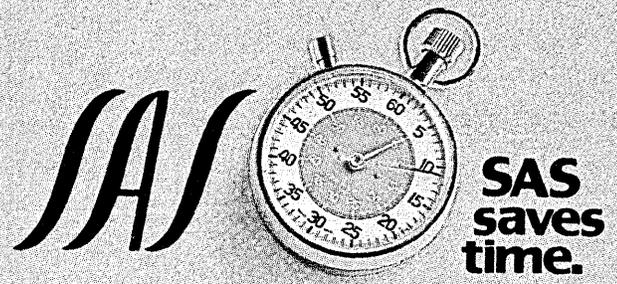


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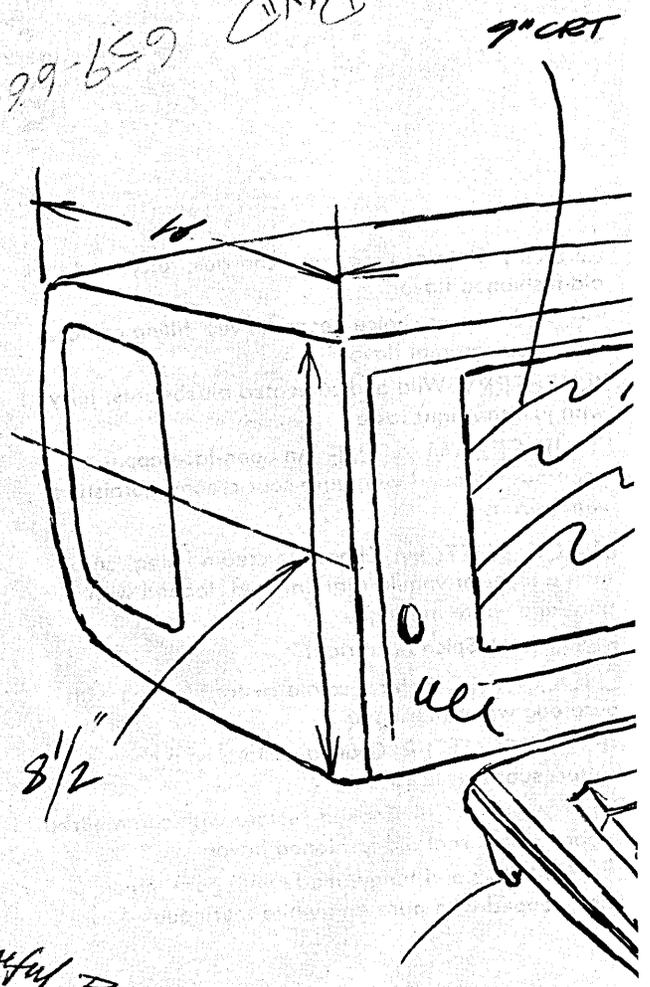
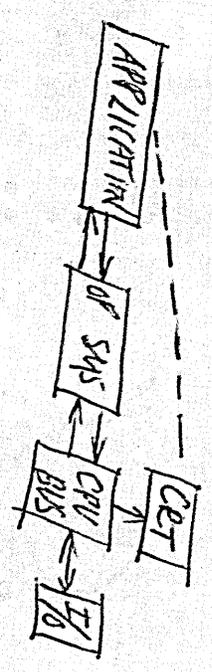
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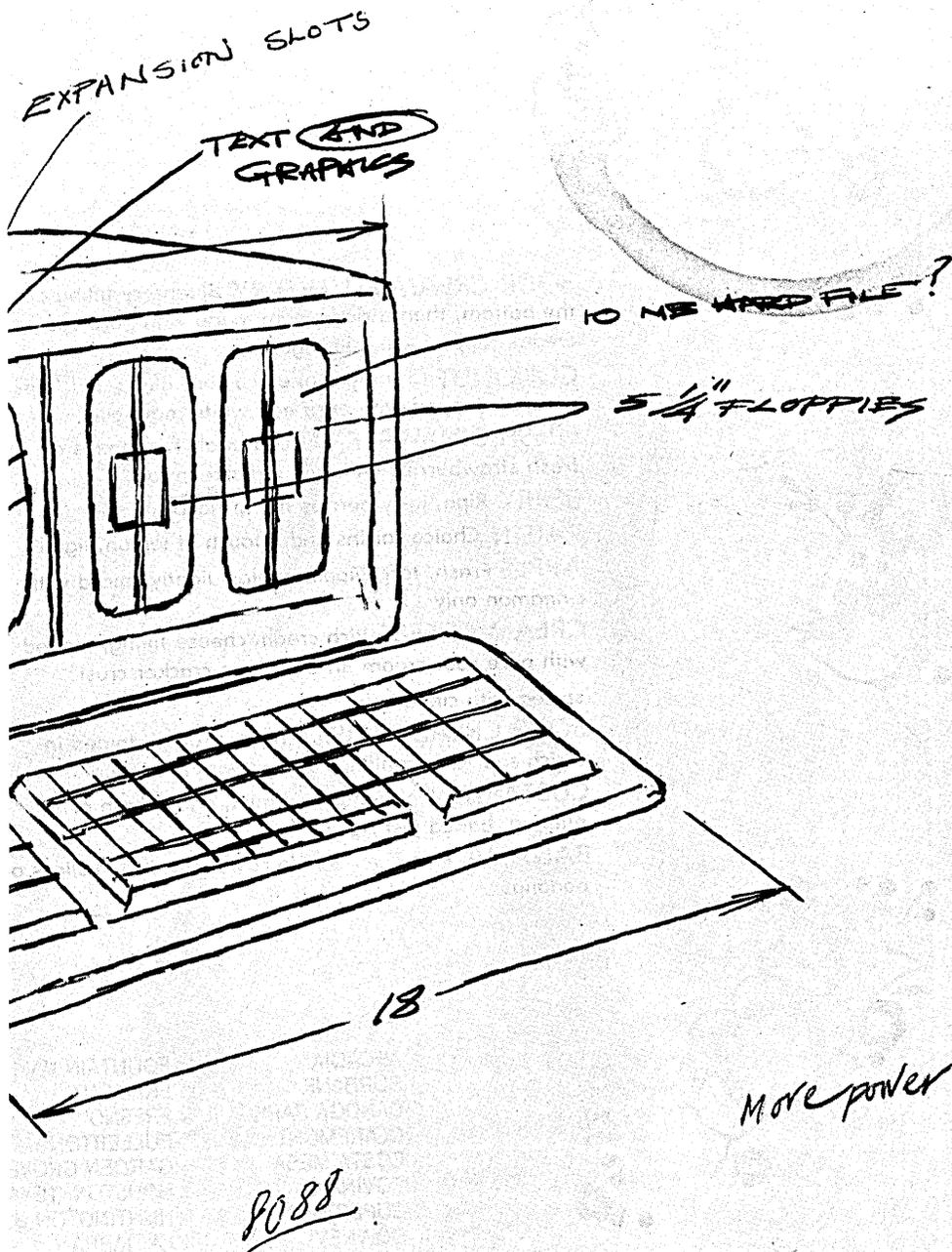
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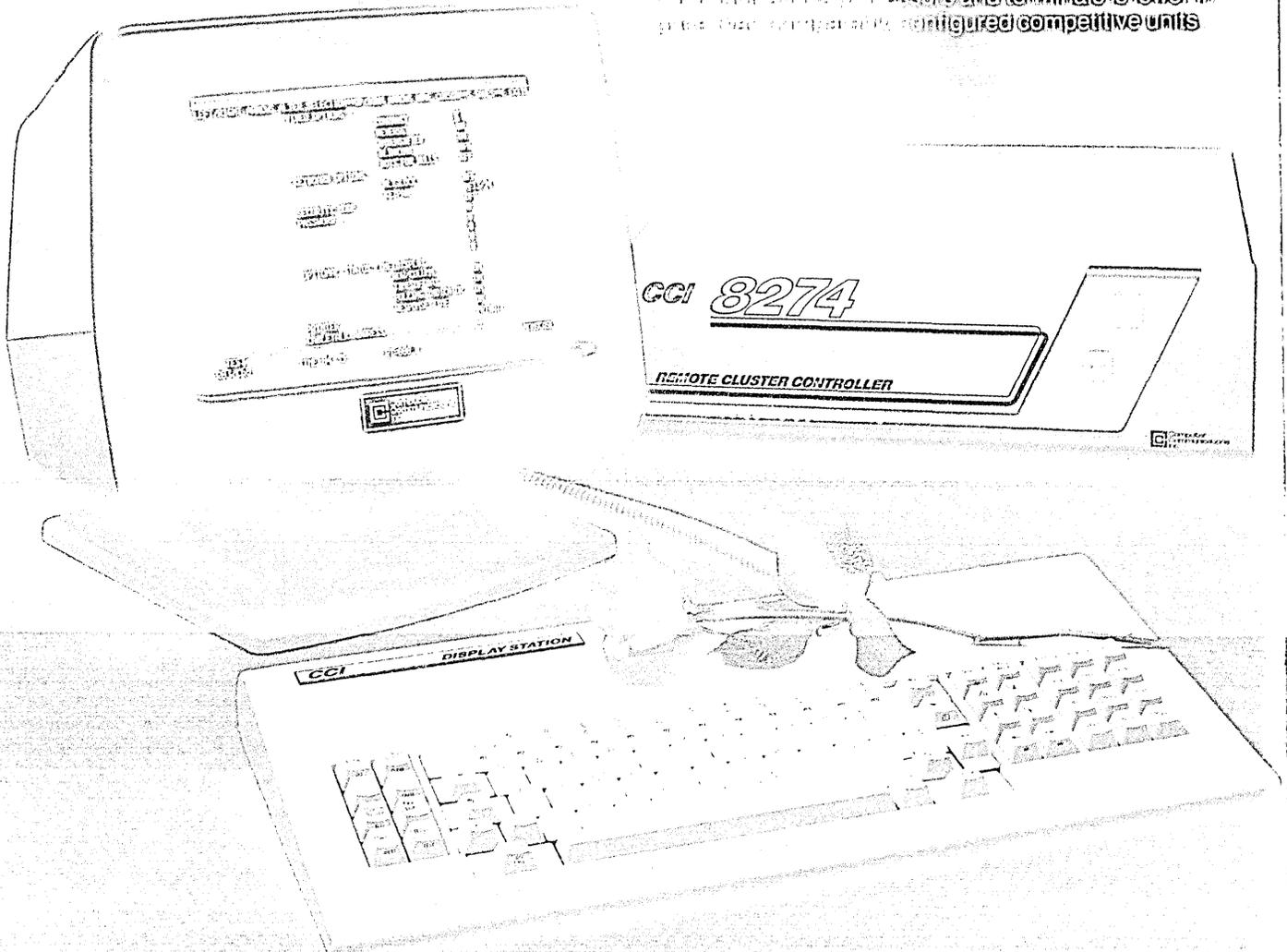
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CIRCLE 6 ON READER CARD

LOOK AHEAD

IBM TO UPGRADE DOS/VSE

Relief is in sight for DOS/VSE users who are running out of capacity on their 4300-class machines. A new version of the operating system, offering additional functionality and enhanced virtual memory management, is expected to be introduced in three or four months. Developed at IBM's Böblingen, West Germany, lab, the new software is expected to offer a smoother migration path into the larger MVS class of machines. It is estimated that some 50,000 machines are currently in the DOS/VSE fold.

3270 PC IS CATCHING ON

A recent survey of 25 large corporations by Boston-based Forrester Research shows the installed population of IBM 3270 PCs reaching the same level as PCs and PC/XTs in about 18 months. "They're crazy about the 3270 machine," says George Colony at Forrester. The users surveyed, however, seemed less enthusiastic about IBM's XT/370 machine, which is designed to offload CMS applications from IBM mainframes running the VM operating system. Colony predicts that IBM will sell only about 20,000 of the desktop 370s this year, fewer than the 35,000 other analysts have been expecting.

REHOSTABLE OS FROM DRI

Digital Research Inc., which brought the world the popular CP/M operating system, is working on another such package that will run CP/M, Unix System V, and MS/DOS applications. The Pacific Grove, Calif., company hopes to introduce the new software early next year for use on the Intel 286 and Motorola 68000 families of microprocessors. The operating system, which is expected to feature local networking and graphics functions, is also expected to run on proprietary chips from IBM and AT&T. Sources say the OS will be tailored to run on IBM's 3270 PC.

FAST LANS, LOWER PRICES

The high-speed local network business is heating up as challengers face off with Network Systems Corp., Minneapolis, whose Hyperchannel has long had the market to itself. Leading the fight at first will be Masstor Systems, Sunnyvale, Calif., which is readying a 50-megabit/sec. link for a late May introduction with prices as much as 60% below Hyperchannel's. Early next year should see Minneapolis startup Computer Networks Technology introduce a high-speed LAN with similar pricing. Also in the game is Ungermann-Bass, Santa Clara, Calif., which is looking for oem customers for its 50bps product. Pricing is said to be about 50% below that of Hyperchannel. Masstor and Network

LOOK AHEAD

NCR TOLERATES FAULTS

Systems, of course, have been suing each other lately (Benchmarks, January, p. 92).

Don't look for a formal introduction until next year, but NCR is working on a fault-tolerant transaction processing system to compete with Tandem Computer and others. The Dayton, Ohio, company is modifying its Virtual Resource Executive (VRE) operating system, maintaining compatibility with VRX applications, to handle the new tasks.

H'WELL'S NEW BRITISH PC

While it continues to sell Columbia Data Products' PC-look-alike personal computer in the U.S., Honeywell in Britain is gearing up to sell a more expensive machine from Future Technology Systems Ltd. of Ayrshire, Scotland. That firm's 16-bit personal computer is based on the 8086, runs MS/DOS and CP/M-86 concurrently, handles viewdata and telex communications, and emulates a variety of popular terminals. No word on when Honeywell will begin shipments nor how much it will charge.

END RUN AROUND SNA

Seeking to avoid some of the cost and complexity of IBM's System Network Architecture, a number of independent terminal suppliers -- ITT, Teletype, Memorex, and TIL Systems, among them -- are preparing to support the so-called display systems protocol, a fourth-level protocol that converts 3270 data streams to X.25 streams. In an X.25/DSP network, 3270 devices can communicate with several hosts without using many of the hardware and software products required under SNA.

RUMORS AND RAW RANDOM DATA

Look for AT&T to bring Olivetti's Linear Uno PC, or something like it, to the U.S. market.... Boeing Computer Services plans to market the Lotus 1-2-3 package as part of the Boeing EIS service....A new version of Apple's venerable model II computer, the IIc, is soon to be introduced as a fighting machine against IBM's PCjr. Price is expected to be in the \$1,000 or under range, though it may not be fully compatible with the IIe....Control Data is putting Unix up on its Cyber 800 series of scientific mainframes....Look for plasma-based terminal products to emerge from Telex and Burroughs, which have invested (20% and 80%, respectively) in a Burroughs spin-out called -- what else? -- Plasma Graphics Corp., Warren, N.J....Burger King has given Hewlett-Packard a whopping order for a worldwide network of distributed processing systems. No word if Nixdorf, which won a big order there four years ago, has been dumped.

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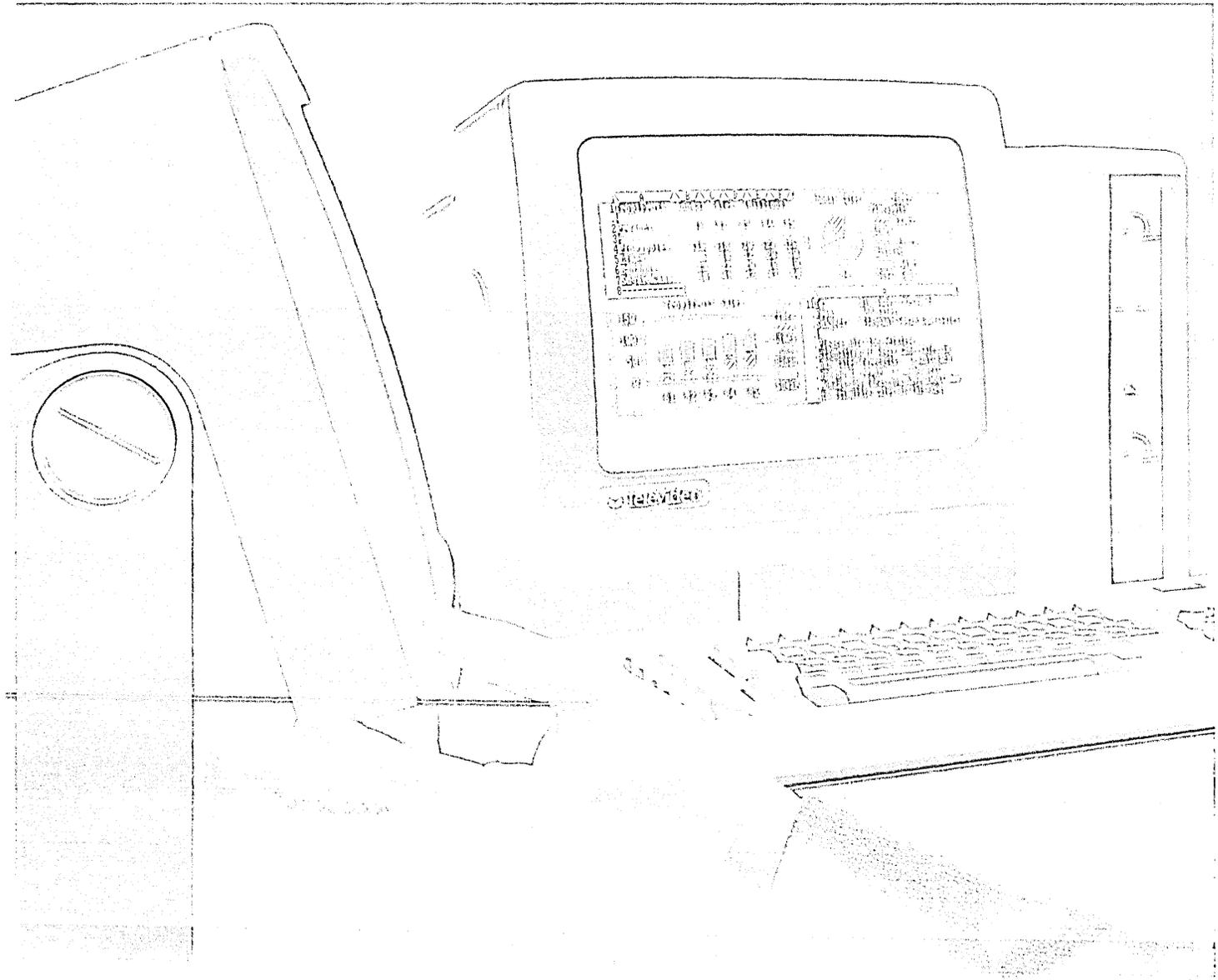
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CIRCLE 9 ON READER CARD



Below the system, IBM has a simple comparison and cost of the reference system.

Comparison of IBM PC and Reference System

With the help of IBM, you can find out how much you can save by upgrading to the IBM PC. The IBM PC is a more powerful computer than the reference system. It has a faster processor, more memory, and a larger hard disk. The IBM PC is also more reliable and has a longer life span. The IBM PC is a better investment than the reference system. It will save you money in the long run. The IBM PC is a better choice for your business.

Feature	IBM PC	Reference System
Processor	80286	8086
Memory	1 MB	256 KB
Hard Disk	10 MB	5 MB
Reliability	High	Low
Life Span	Long	Short
Investment	Low	High
Choice	Best	Worst

compatibles. the best software.

and has the standard—not optional—features you need to take full advantage of every job your software can do.

Study the chart at the left. It proves that TeleVideo—not IBM—offers the best hardware for the best price.

Note that TeleVideo's ergonomic superiority over IBM extends from fully sculpted keys and a comfortable palm rest to a 14-inch, no glare screen that tilts at a touch.

THE BEST MICROCHIPS.

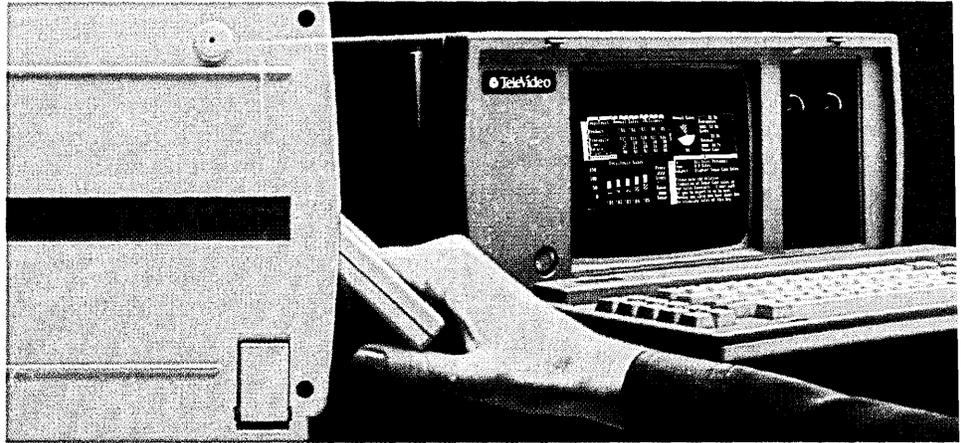
What is perhaps most impressive about the TeleVideo IBM PC Compatible can be found deep within its circuitry. We use the same 8088 central processing unit that runs an IBM PC. But we also employ new VLSI (Very Large Scale Integration) microchips that are designed and built exclusively for TeleVideo.

These interface more efficiently with the powerful 8088 and yield numerous benefits.



For example, our tiny custom chips do the work of many of the larger, more expensive circuit boards in an IBM PC. So we can offer a computer system that comes in one attractive, integrated case, is ready to run and occupies less desk space. A computer that edges out IBM's added-cost component system for reliability, ease of service and purchase simplicity.

Fewer circuit boards to cool also allowed us to eliminate the noisy, irritating fan IBM and most other PCs force you to put up with. And TeleVideo compatibles accept



THE BEST PORTABLE FOR THE BEST PRICE.

Features	TPC II	COMPAQ
High Capacity Storage	YES	NO
2nd Disk Drive	YES	OPTIONAL
Quiet Operation (No Fan)	YES	NO
Ergonomic Display	YES	NO
Communication Port	YES	OPTIONAL
International Power Supply	YES	NO
MS™ DOS 2.11	YES	NO
Graphics Display	YES	YES
Typical System Price	\$2995	\$3710

any IBM hardware options without modification.

THE BEST LINE.

But the Tele-PC is only one element of the TeleVideo IBM PC Compatible line.

The TeleVideo XT is the best hardware for users of popular IBM XT software who would appreciate an extra 10 megabytes of storage capacity along with the advantages listed on the preceding chart.

As the chart above demonstrates, our portable IBM compatible computer, the TPC II, is far and away better hardware than COMPAQ™ Better hardware—standard—at a better price.

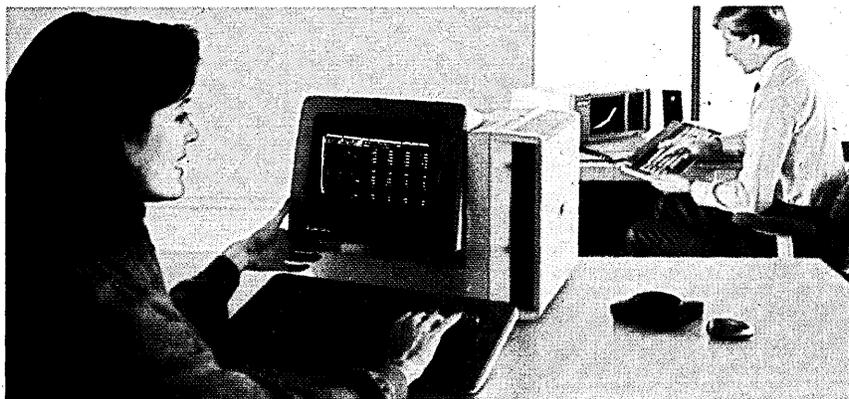
THE BEST MANUFACTURER.

The TeleVideo IBM PC Compatible line is made by the world leader in multi-user computer systems and the number one independent manufacturer of terminals.

Our compatibles are available at participating ComputerLand and Entré (call 800-HI-ENTRE) dealers or you may call 800-538-8725 for the dealer nearest you. In California, call 408-745-7760.

Before you invest, make a few simple comparisons. You'll find that TeleVideo—not IBM or COMPAQ—has the best hardware for the best software. At the best price.

IBM is a registered trademark of International Business Machines. MS is a trademark of MicroSoft Corporation. GW Basic is a registered trademark of MicroSoft Corporation. COMPAQ is a trademark of COMPAQ Computer Corporation.

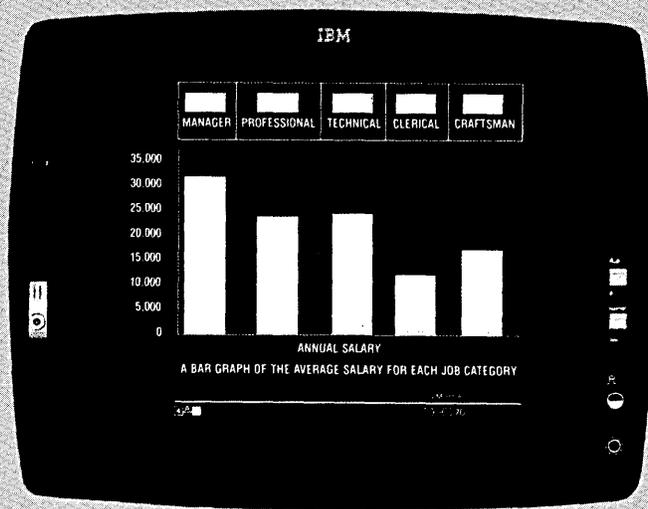
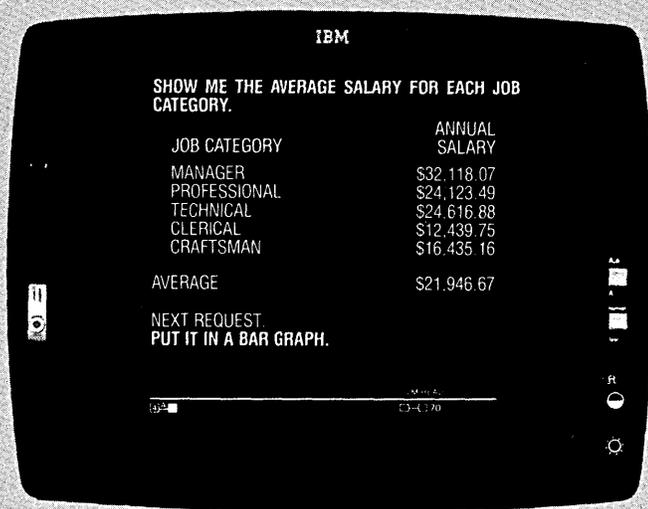


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Personal Computers
TeleVideo Systems, Inc.

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INTELLECT, the world's only successful *true* natural-language query system, is an ideal tool for your information center. INTELLECT's powerful information retrieval capabilities are so advanced that it understands questions and responds with answers as if you were talking to a knowledgeable colleague. Executives access data themselves—more easily than ever before—without learning any technical jargon or "computerese." It's so easy to use, it doesn't even have a training manual!

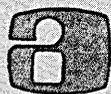
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it in finished color graphics in a matter of seconds. It's a live dynamic interface that fully integrates your existing database and graphic systems.

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CIRCLE 11 ON READER CARD

LETTERS

SPROUTING SEEDS AND VHLLs

The January issue scratched the surface of a very interesting and important issue: where are we headed with VHLLs (very high level languages)? Scott G. Abbey (p. 108) tells a fantastic success story while Steve Yates reports (p. 24) on a shop where a VHLL gained a foothold, struggled for a few years, and then died. It is reminiscent of the parable taught in Sunday school of seeds thrown around in different places. When seeds land on fertile ground and the sprouts are nurtured, a good crop grows; seeds thrown on hard ground may sprout but then wither and die.

In many businesses, a manager who finds a way to get a 10% gain in productivity from his department is treated like a miracle worker. Abbey reports productivity gains of 100% to 300% over standards in the computer industry with the use of VHLLs. Should he be considered a miracle worker to the 10th power? Where stands the army of consultants and efficiency experts that populate the business scene? It would seem that they should be beating down the doors of Abbey's shop to analyze all the elements of fantastic productivity gains. Likewise for investigative reporters from trade magazines such as DATAMATION!

Somewhere along the line someone should do an article entitled "Are Dp/MIS Managers the Chief Roadblocks to Software Productivity Gains?" My experience indicates an answer in the affirmative. The current generation of managers is mostly from the old school where low-level languages were the only game on campus. They have a poor comprehension of VHLLs and are basically scared. Many proponents of VHLLs have exacerbated the situation by coming on too strong. The technical and factual parts of the debate are often smothered by the heat of emotions, making the ground much too hard for the seeds of even the most powerful VHLLs to sprout very far.

Here's hoping you can reflect on some of these thoughts and give us more in-depth treatments of VHLLs in future issues.

HOMER A. HARTUNG, PhD
Senior Scientist
Philip Morris
Richmond, Virginia

THANKS ALL AROUND

Congratulations on another exceptional issue of DATAMATION! I believe I'm now in my 20th year of reading it, but it gets better all the time.

The piece on Alan Turing (December, p. 152) was fascinating. I read Alan's mother's biography back when it first came out, in the early '50s, and came to know many people who knew him during his stay at Bletchly Park. It is tragic to lose such a man.

John Seddon's piece on software (p. 235) was truly a tour de force. I wish I had been able to formulate my thoughts so well. And the review of John J. Callahan's book (p. 281) was just right!

Thanks for all the great essays DATAMATION continues to give to those in the trade.

FRANK WAGNER
Principal
Nandina Corp.
Corpus Christi, Texas

DESCARTES AND THINKING COMPUTERS

A great many articles have recently been written about computers and artificial intelligence.

The most significant question is not whether machines will ever be able to replace man at some jobs or if they will become humanoid; it is whether they can ever think. The final word on this is:

Cogito ergo sum—Descartes
Cogito ergo I sum—Computer

WILLIAM TROTTER JR.
Assistant Professor
Northern Virginia Community College
Sterling, Virginia

IBM'S INTEGRATED VOICE

Your January News In Perspective column on IBM's new National Distribution Division (p. 59) drew several erroneous conclusions.

You claim that IBM "... is not entirely satisfied with ... its new marketing organization," when, in fact, it has produced outstanding results. The average annual increase in domestic gross income exceeded 20% in the last two years.

It is also unfortunate that you drew your conclusions about employee morale by talking with a "former IBMer" since our surveys indicate that employee morale is very high.

Far from signaling a return to product-oriented marketing, NDD was formed to meet the explosive demand for data processing by smaller establishments and those operating in specialized fields. The demand is so great that we expect NDD to have the highest growth rate of any domestic marketing division this year. It will offer its product line—ranging from the IBM Personal Computer to the IBM 4300 processors—through a variety of innovative marketing channels, including IBM Product Centers, remarketers, dealers, and direct response.

Finally, anyone who thinks that there are ... three IBMs (S/370, S/34-38, and Personal Computer) and no two of them speak the same language" simply does not understand our product announcements of the past year. These announcements clearly underscore our commitment to provide customers with integrated solutions.

C.B. ROGERS JR.
Senior Vice President
and Group Executive
IBM
Rye Brook, New York

MISMANAGED MIS

Your January issue contains two articles that complement each other, i.e., "The Micro vs. the Applications Logjam" (p. 96) and "Decision-Oriented Information" (p. 159).

The latter article addresses the chief executive duty of planning, or should I say lack thereof. The annual plans for businesses seem to die in file cabinets after extensive collaboration and coordination of department and division heads with top management. Tactical and long-range strategic plans seem to take a back seat to the daily call for fire drills and systematic maintenance demands.

The logjam referred to in most companies covers both manual and edp systems. Its creation is based on several factors: inadequate analysis of needs, poor planning and its follow-up, the "empiri-

LETTERS

cal" syndrome, job security, lack of integrating manual and edp systems into either a master system plan or total management information system—to mention but a few.

Years ago, management relinquished and/or abdicated control of the business to the newfound automated experts and their machines—that is, the log-jams started, the businesses started into the "toilet," and technicians were entrusted with major managerial-business decisions. Now it is time for management to take back the reins of business, put together a management team of users and technical personnel to establish master system plans, and enforce them or their counterpart, integrated MIS!

JAMES S. MOYER
Independent MIS Consultant
Westminster, California

The article entitled "The Micro vs. the Applications Logjam" points out many of the pitfalls facing the end user of micros. It incorrectly leaves the impression, however, that for large transaction jobs a mainframe should be used and for little spreadsheets, a micro.

There are really two issues to address. One is the systems development technique to be used to solve a problem. The second is selecting the hardware and software environment to run the solution.

One of our recent clients was an insurance company that, for a number of reasons, had not implemented its own financial reporting on its fully loaded System 34.

With the use of an IBM PC XT, an off-the-shelf general ledger and accounts payable package, DBase 2, and Lotus 1-2-3, we were able to implement all the systems required. The G/L and A/P packages provide for interactive input and batch update/print jobs. DBase 2 provides for batch file transfer of month-to-date, quarter-to-date, and year-to-date figures from the G/L to the spreadsheet. Lotus 1-2-3 provides for inter-

active report design and batch report print requests. Total cost was less than \$12,000. Total time after delivery was one and a half months.

We are currently solving the reporting issues for a large nursing home. This time the solution consists of a four-user Altos 586 micro, off-the-shelf general ledger, accounts payable, and accounts receivable packages, and some custom software. The custom software is being developed using Digital Research's Pascal MT+, Access Manager (for true multi-user software with logical file and record locks), and Display Manager (for all the interactive screens).

In both cases, the micros have more than sufficient speed and storage capacity for the solution designed, including tight backup procedures.

It is said that 95% of the American public work for organizations of less than 40 employees. For them, the micro is the solution.

JAMES E. RAND, CPA
James S. Moyer Co.
Scarborough, Maine

TO THE BARD OF BAUD

Hic Thee—What a merry piece*
And many a wicked guffaw
Hath emanated loud and long
From office, boardroom, and washroom
Hence to the computer room
In boisterous response to thine article.

In full hath thy correspondent read it
At my boss's bidding
And many a fortnight hath it been
Since such hilarity was witnessed.

Forsooth—thou hath pegged them all
Even to the clown—the dear departed
jackanapes;
Methinks a nobler scribe than has been
since Chaucer or Bacon
Hath taken the prize.

This missile were not meant to editorialize

Save declare thy genius, oh unheralded bard

Equal to that of Avon.

*January, p. 166

VIRGINIA AMOS
Data-Tronics Inc.
Fort Smith, Arkansas

Your Shakespearean drama was very well done! Congratulations.

P.B. SCHOONMAKER
Houston, Texas

DING DONG DABBLER

In his otherwise interesting foray into abacus data processing (January, Readers' Forum, p. 266), Harry Brown omitted in his list of definitions a term I encountered during my own research into early oriental methods of calculation.

The term omitted from Brown's list is abacadabra (corrupted, it seems reasonable to infer, by careless early Italian adventurers, to the familiar abracadabra). The meaning of abacadabra was changed by necromancers who preempted the term for their own usually nefarious purposes.

My research disclosed that abacadabra was coined in 709 or 701 B.C. by Dr. Wan Ding Dong, senior member of the mathematics faculty of the Emperor's College of Traditional Oriental Computation (ECO-TROC). Dr. Wan used abacadabra as an appellation for "one who is a casual user of the abacus, a dabbler in the art/science."

ROBERT M. GORDON
President Emeritus

The Society of Research into Occult
Computational Methods in the Orient
Los Angeles, California

LIPS LOCKED ON ZIPLOC

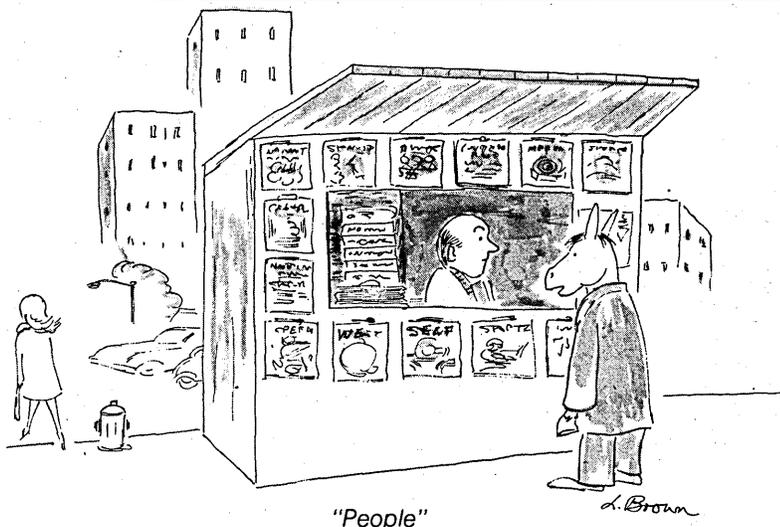
The article entitled "Evil Aliens Control IBM" by Freddy Smarm (April 1983, p. 153) recently came to my attention.

In it, the author refers to a planet populated by evil inhabitants, referred to as Planet Ziploc. Ziploc is a registered trademark of the Dow Chemical Company for "plastic bags," U.S. Registration 886,112.

We are concerned with maintaining our rights in the trademark Ziploc and preventing dilution of the mark which occurs when Ziploc is used to refer to things other than plastic bags originating from the Dow Chemical Company or under its authority.

Using Ziploc to refer to a planet, especially one where "there is no such thing as morality," encourages an improper and derogatory association in the public's mind, which we would certainly like to avoid.

SUSAN G. LEARMAN
Trademark Attorney
The Dow Chemical Company
Midland, Michigan



"People"

L. Brown

CARTOON BY L. BROWN

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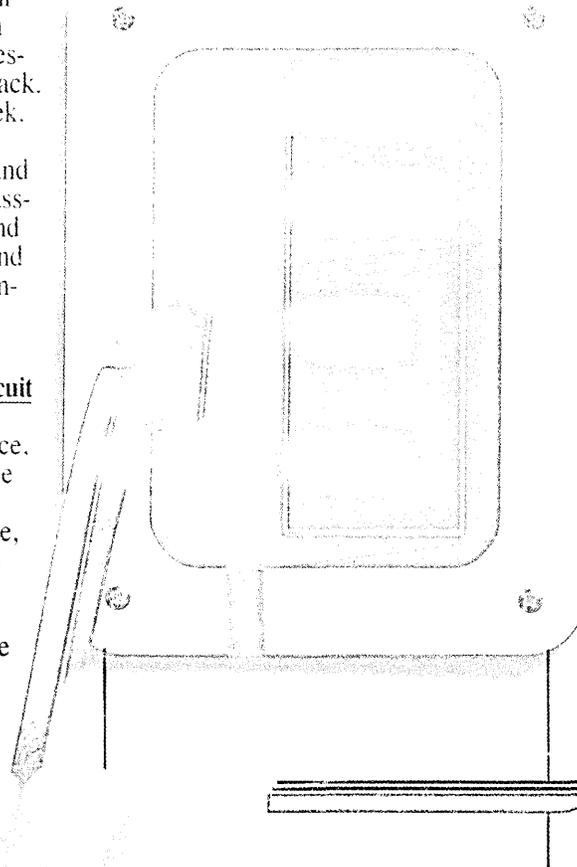
you best. Broadband or baseband coaxial cable. Or optical fiber. In fact, UniLAN helps you get more performance out of broadband than other systems. It not only provides variable message length, but it also compensates for loop delay, which dramatically reduces the idle time between messages, and makes for more efficient use of the bandwidth.

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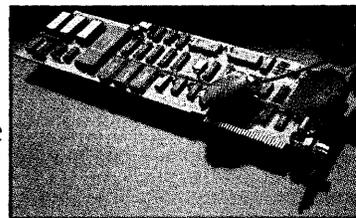
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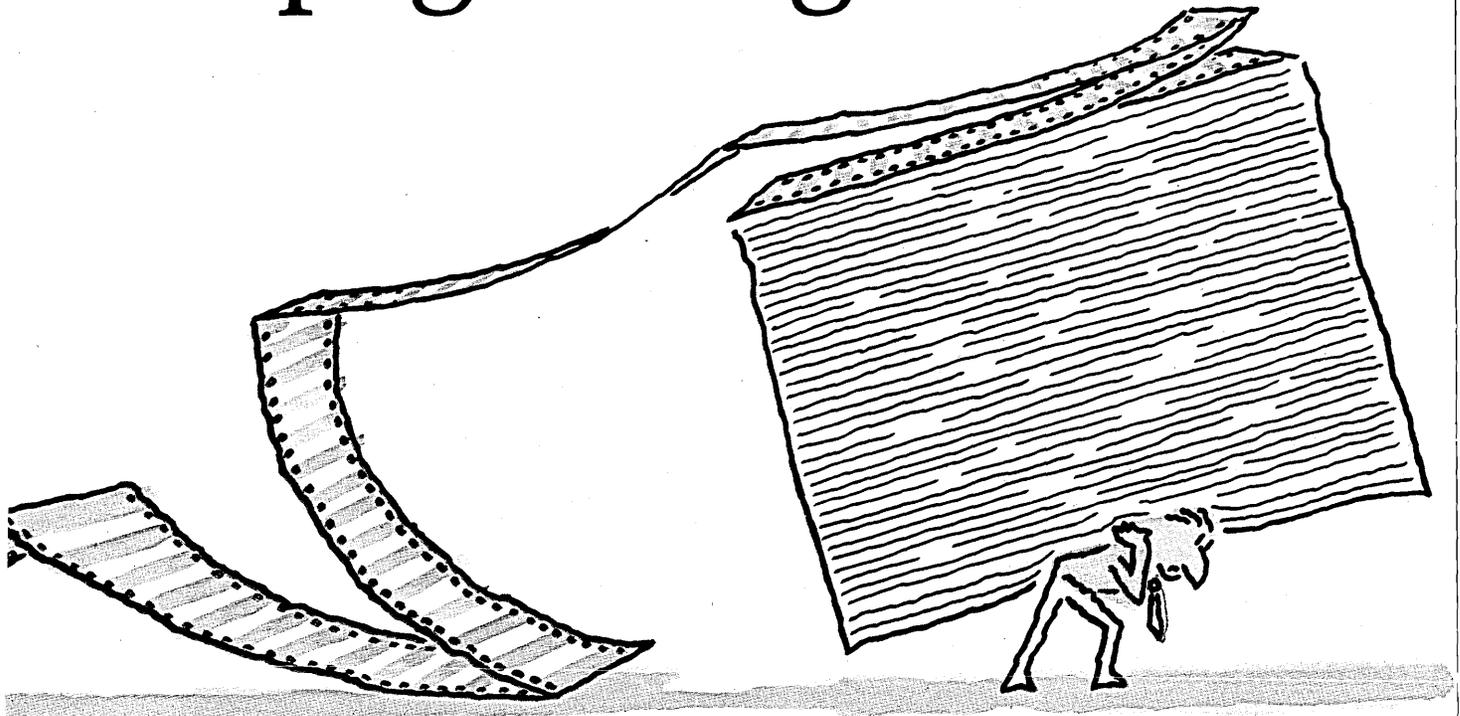
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It's automatic, online, in real time, with no hooks to the operating system and only one JCL change per job.

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causes no disruptions and requires no extensive retraining of personnel. Plus, distribution information is in the data base; it won't get lost and can be changed via simple, online screens.

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EDITORIAL

HOW THE MICRO MARSHALL EARNED HIS SPURS



ILLUSTRATION BY HARRY STAHL

The first rays of sunlight poke through the office windows in the sleepy town of Corporation. Crumpled memos, stirred by the day's first gusts of conditioned air, rustle in the wastebaskets. Most good citizens of this community are just getting to their workstations now. But here and there stubbled faces and wrinkled suits betray the shamefully sleepless, more likely than not victims of their own ambition.

Even though they're not as wise as the seasoned hands of the data processing department, most of Corporation's white-collar folk can manage their small herds of spreadsheets and draw their charts passably quick.

From time to time there's trouble, though. Some rustler will try to make off with a file that doesn't bear his brand. Or worse, every once in a while, a dude right out of business school, with an ego that hasn't been broken in, will think he can cut some code out of the herd that the old-timers have finally got settled. He'll ride his code into the open ranges, like some drugstore cowboy, mindless of the bugs. Sometimes the whole system will end up on Bootstrap Hill. And the old-timers will recollect how they were once young like that dude, with more spunk than saddle sense.

Now, even though there's storms, as we've said, Corporation's good users don't live in fear, because they've just sworn in a Micro Marshall to keep things right peaceable. For a long time, they reckoned they could get by without one. "There's already too much law and order," they'd say, standing around in the coffee saloon, which was often the only place someone could get things off his chest. "We settled this territory and built Corporation so as to have room for creativity. Bring in all them rules and regulations and you get to wonderin' why you ever spun off in the first place. Don't fence us in." It was brave and foolish talk, of course, but that's the way they spoke when they'd had a coffee or two.

Before they got a Micro Marshall, Corporation's folk would run to the dp department when they got in over their heads. Doc Sabbatical, the MIS director, would round up a posse and ride off the bugs that had terrorized micro homesteaders on the outskirts of the network. Doc was a grizzled pioneer and former professor who could remember when DOS was unexplored territory, and who loved to talk about the day they cut over to MVS.

Time moseyed on, and the homesteaders got more rambunctious. They traded in their 8-shooters for 16s and even a few 32s. The MBAs, always a wild lot, talked of building their own department empires, like some kind of Oriental potentates, with slave processors and Unix. The more adventuresome these folk got, the more trouble they got into. Tempers wore thin as an old pair of chaps. And so, before there was a gunfight at the 64K Corral, Doc, his foremen, and a passel of micro users held a parley. The upshot was the appointment of the Micro Marshall.

At first, there wasn't much trust of the Marshall. But one day the stagecoach brought a new package into town. The users all went for it like a pack of coyotes. And then files started to stray. At first it was a memo here and there, then a little spreadsheet. Then, sure as shootin', a vice president tried to save a model as hairy as PhD, and it went wherever the buffalo did. Nobody trusted the Marshall; they called Doc Sabbatical instead. But Doc couldn't help. His old Winchester had jammed and he had to tend his own spread. It was the Marshall who saved the day. He not only found a patch for the package that had gone bad, but found a way to round up most of the lost files, too. The Marshall had won his spurs.

Ever since, before any new package gets off the stagecoach at Corporation, the Marshall checks it out. There are more standards now, but there are still plenty of ways a user can get away from the crowd for a little adventure. And in the coffee saloon, the wildest talk you hear is a joke or two about Flight Simulator.

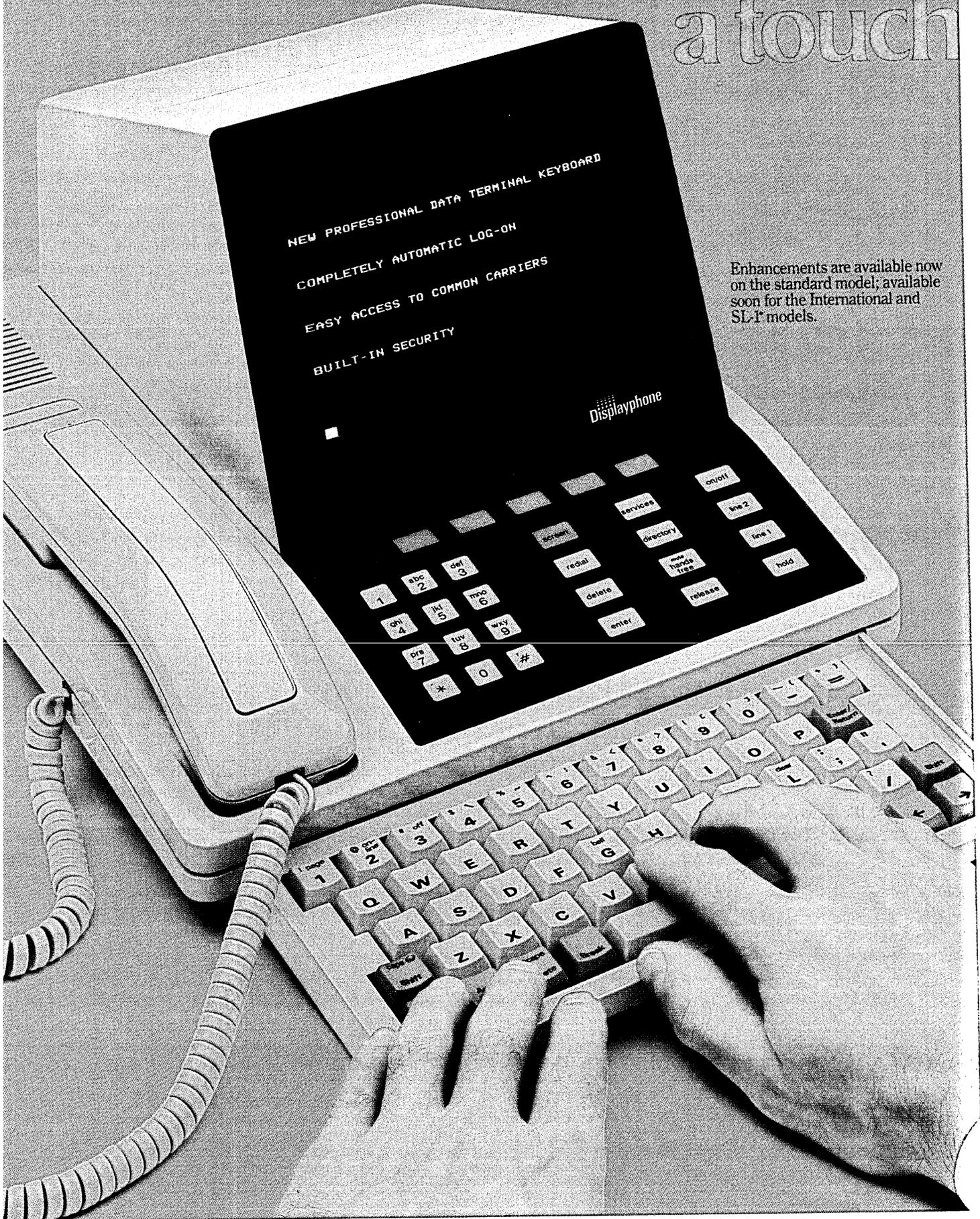
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Those who already have Displayphone terminals can quickly and easily upgrade them to benefit from these improvements. This is a perfect example of our commitment to Continuity, a key criterion of Northern Telecom's OPEN World*—a planning framework for the development of effective information management systems.

If you don't already have a Displayphone terminal, you should get in touch. Call 800/621-6476 (In Illinois: 800/572-6724; in Canada: 800/268-9079), or send in the coupon.

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INFOCUS

CRIES FOR HELP

Anxious corporate micro users seek group therapy.

by Philipp Maranoff

Two cavemen squat on their haunches and admire the world's first wheel, a huge stone affair lying flat on the ground.

"Nice table," says one.

"Yes," replies his friend, "but it's hell to lug around."

The joke is undeniably hackneyed, but its message is as true today as when it was first rendered in pen and ink by some long-forgotten cartoonist: an invention's ultimate impact rests not so much on its inventor's brilliance as on the public's ability to grasp its truest and best use.

The axiom finds contemporary corroboration in offices across the United States these days, as thousands of secretaries, professionals, and middle managers grapple with a twentieth-century version of the table wheel, the personal computer. As was undoubtedly the case with the first wheel, a sizable percentage of potential users possess little, if any, sense of just what a microcomputer can do or how to harness its power.

Indecipherable manuals, user-surly hardware, and media hype to the nth degree leave microcomputer neophytes baffled. More than a little responsibility for the confusion, anger, and abandoned hardware littering offices nowadays must be assumed by corporate managers who fail to look past the acquisition of the hardware and software system when bringing micros into the company. If management scrimps in the initial training or ongoing support provided to potential pc users, then the best microcomputer system money can buy becomes little more than a misuse of corporate funds.

"You can't give someone a \$5,000 machine and a software manual and say, 'Okay, see you in a week,'" intones a microcomputer training consultant, who makes a living out of the fact that lots of companies try to do just that.

Many data processing managers insist that they have no choice—they would be overwhelmed by all the inquiries. "There is no standard education package that goes with the acquisition of a pc," explains Jeff Harris, head of technical services at Levi Strauss, San Francisco, echoing explanations heard elsewhere. "It is financially impossible to provide a full level of support for every pc that's out there." Such a policy would seem to be a short-term response, though, until the squeaky wheels get loud enough to attract the attention of

senior management.

Not all companies are guilty of neglect. Firms in high-tech or data processing businesses usually make certain that the introduction of microcomputers is accompanied by sufficient initial training and a readily accessible and ongoing support system. Still others, motivated by a belated recognition that the system user is as important as the system itself, launch training programs intended to complement previously purchased pcs. Unfortunately, these enlightened companies are the exceptions that prove the rule: far too many on-the-job micro users are finding themselves buffaloes by the innocuous looking machines that have appeared, sometimes without invitation, on their desks.

And like a generation of computer users before them, the victims of rampant microcomputerization sought others for solace and relief. Fortunately for these tyros, microcomputer user groups already existed, though mainly for hackers and hobbyists to swap software and hold arcane discussions of architecture.

Across the country, more than 100 groups of corporate microcomputer users are gathering at night in college classrooms, vacant corporate conference rooms, and other semipublic places to hear about the latest software packages, share advice, and in general commiserate about their lot in life. As the head of one IBM-compatible user group in the Los Angeles area says, "Most managers say, 'Okay, I bought it for you, now what are you doing with it?'"

Personal computer user groups are more than just middle-aged versions of video arcade gatherings. User groups are usu-

Even in situations where corporate microcomputer support is available, user groups are critical.

ally machine specific, and then aficionados of IBM or Apple or Atari split off into Special Interest Groups, or SIGs. A typical IBM PC user group is made up of SIGs for investing, spreadsheets, word processing, and a dozen other subcategories. The Manhattan SIG on investing, for example, is so sophisticated that a software consulting firm, Monchik Weber, offers free office space for the meetings. "We learn quite a lot from these meetings," confides a senior corporate official.

Sorting through the myriad of new product announcements is another critical function of the user groups, according to participants. Since few companies can afford the full-time staff required to review the hundreds of spreadsheet, word processing, and database packages appearing on the market each hour, the user groups are an ideal place for kicking the tires, electronically. Vendors show their wares in a more

ILLUSTRATION BY TIM RAHLIN



IN FOCUS

sophisticated kind of Tupperware party.

"I get a lot of things right here by word of mouth," says Mike Lebo, an engineer with a San Diego-based maker of microwave communications equipment, indicating with a sweep of his arm the several dozen user group members who gathered a few weeks ago for a special session of the new package Creatabase. Not only are the meetings informative, Lebo says, but the evening sessions avoid conflicts in work schedules.

Even in the situations where corporate microcomputer support is available, user groups are critical. Cy Simons, a budget accountant with the Special Services Division of Pacific Bell Telephone in San Diego, recalls that he recently had trouble printing a spreadsheet from his IBM PC/XT. A telephone call to the Pac Bell pc user hot line resulted in useless advice to make sure the printer was plugged in. The solution eventually came from another member of the local user group: Simons had exceeded the maximum number of columns. "When you go to a user group, what might be a major question to you might be minor to someone in the group, and the answers just pop out," he says.

Simons says that user groups are a more efficient and accessible means of gleaned information than either more structured training or software manuals. The bulk of material presented in a formal class can be intimidating, he notes, while manuals can be virtually incomprehensible for the novice. Group affiliation can be particularly valuable early on, when "getting past the scared stage" is the major hurdle, he adds.

For workers drafted into the microcomputer revolution—those, for instance, who feel pressure to perform efficiently with their pcs at work—user groups are often more than a convenient alternative; they can be a last resort.

David Nussbaum, who heads two pc user groups in the Los Angeles area, recently polled his Studio City group on the level of support provided to pc users in the work setting. Nussbaum recounts the experiences of four clerical types whose jobs primarily involved word processing and data entry. Three said their companies explicitly refused to provide assistance in learning new software packages. "The attitude was, 'We hired you because of your computer experience, and even though we're moving you into a new area, you should be able to follow the manual,'" Nussbaum states.

User groups for business applications have advanced to the point where corporations encourage their formation. In other cases, non-dp users band together and organize to prod management into offering certain types of software, mainframe access, or whatever. Many pc users distrust

the dp department and insist on the separation of club from company. An uneasy truce between the warring factions may develop if someone from the corporate information center or other quasi-dp department environment acts as a club advisor.

At General Dynamics Corp.'s San Diego division, a club for pc users was organized and is headed by someone from the company's end-user support center Infonet. Implicit in these corporate-sponsored club arrangements is the awareness that as long as the company is providing meeting room space or other visible signs of support, and involves its dp staff with the club, communications, not hostility, will flourish.

As the evolution of microcomputers in large companies continues, dp managers and senior corporate officials realize that the user clubs are an important supplement to internal training, not a low-cost alternative solution to the problem.

Several companies, with the aid of consultants, are organizing sophisticated training programs that recognize that the novice pc users have a range of abilities, needs, and fears, and that support services must acknowledge the differences and offer a variety of solutions (see "The Lonely Micro," p. 101).

Engineers and other number-crunchers are most successful at coping

The fact that the majority of American parents are bringing up their children to be computer literate indicates greater acceptance of the new technology.

with the vagaries of microcomputer hardware and software, of course. The less analytical and numbers-oriented one is, the greater the resistance to the accommodations forced by the new technology, and the less the appreciation of its potential. This latter category is populated by workers who use the microcomputer predominantly as a word processor and by mid-level managers who look to their machines to fill a decision-support role.

The problems of inadequate training and support are far more serious obstacles in the case of users who do not feel much personal interest in microcomputing. If the necessary on-the-job assistance is not provided to this type of user, the odds are that help will not be sought outside the workplace.

A data processing specialist involved in the pc training effort at a major California bank gives a blunt assessment of the level of enthusiasm he frequently encounters: "So many of them are just plain banking or secretarial people who don't understand data processing and don't want to understand."

The director of office automation for the largest state agency in New Jersey offers a similar opinion. "You're not dealing with your typical class of data processing user," Bennett Landsman says. "They don't care what's under the hood."

Landsman, however, who also heads the IBM PC user group in Philadelphia, says proficiency and interest in microcomputing can be nurtured if care is taken, particularly in selecting the first groups of trainees. Landsman has seen some "very imaginative applications" when user interest is piqued, including the use of VisiCalc for word processing and a spreadsheet package for keeping inventory.

Landsman concedes that of the dozen employees in a typical microcomputing class he conducts for New Jersey's Department of Human Services, two students will become computer buffs, another five or six will learn to use the system in their work, and the remainder "will never pick it up."

It appears, however, that the natural human resistance to change is beginning to develop a few slight cracks where microcomputers are concerned. The fact that the majority of American parents are bringing up their children to be computer literate indicates greater acceptance of the new technology at all levels of society.

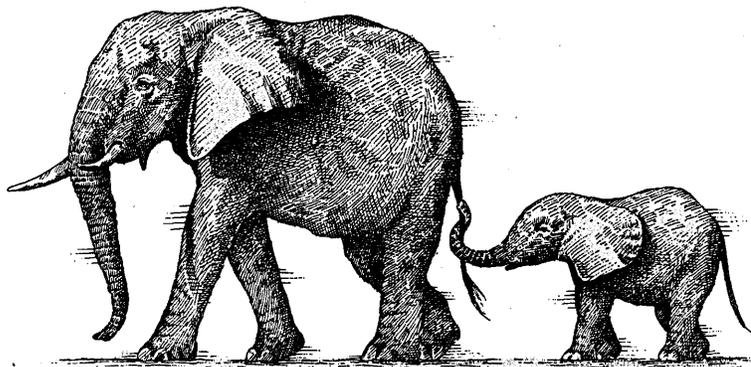
According to Joe Rigo, a writer of software manuals and founder of the IBM PC user group in New York City, the same secretaries who are frequently considered least receptive to microcomputers "are the ones who are hearing that they have to get a computer for their five-year-old kids or they'll be left behind in school. They might be anxious, but they want to get involved."

But getting involved is not always easy, even if the will to do so is there. John Field, a data systems officer with California First Bank who recently was put in charge of the institution's pc training effort, admits that the more than 100 users of Cal First's 20-plus IBM Personal Computers have yet to be instructed in "some very basic functions."

The potential consequences of this knowledge gap were illustrated recently when a Cal First employee found it impossible to get her machine to accept a VisiCalc program. Responding to her call for help, Field found that the woman had been attempting to load VisiCalc without booting the operating system. "And, she is one of the smarter ones," Field says. "She had read the manual and at least knew enough to try to load the program."

To meet the obvious need for additional training and support, Cal First employees currently receive a full day of instruction in VisiCalc or Creatabase and are then turned loose. In the future, Field hopes to put together a multimedia package dealing with both the hardware system and various software packages. The kit will include

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a manual of Cal First microcomputing standards, videotapes of software reps demonstrating various packages, and tutorial programs for the user. Certainly, unless something is done to redress the current lack of training and support, the goal that motivated the bank's acquisition of pcs might never be attained. "We got them because we wanted to do all these things on them," Field explains, "and all we're doing is word processing."

Just as important as nuts and bolts training for clerks, contends James Hanner, a micro consultant and founder of the Microcomputer Management Association, is conceptual training for the employees, usually mid-level managers who are expected to use microcomputers as decision-making aids. "Managers see the microcomputer as a tremendous productivity tool," he says. "But they need to know what to do with it, not how to do it." As the micros become more common, he adds, managers who purchase them will become more aware of both their limitations and their potential.

Indeed, some of the companies that became involved with microcomputing ear-

ly on have already built up impressive in-house training capabilities. A case in point is General Dynamics Corp., one of the nation's leading defense contractors and, as such, a longtime user and beneficiary of mainframe computers. The company's decision last year to introduce microcomputers throughout its western division was

Some veterans of microcomputer user group therapy now wonder if all the support may create information overload for novice users.

accompanied by an extensive and well-coordinated program of user training and support, provided by the in-house user assistance group Infonet.

Dorothy Kowalski, who heads the western division's Infonet in San Diego, says 350 pcs, mostly Apples, were installed throughout the division in 1983. This year IBM and Digital Equipment Corp. systems will be added to the mix, with the number of micros in the division expected to hit 700.

Infonet trained some 2,000 users last year, when the in-house instruction was opened to all comers, whether or not they used the machines at work. Though the training will be more restrictive this year because of excessive demand, Kowalski says, an additional 2,600 micro users will receive instruction.

Only careful planning keeps the support system on track. With a nod to economies of scale, separate microcomputer and mainframe training components were combined under the Infonet umbrella last year. Of the 20 Infonet employees supporting computer users, 13 are assigned to the microcomputer side. The training and support effort has existed for less than a year in its current form, but an impressive package of user services has already been assembled.

Once General Dynamics users, whether technical analysts, managers, or clerks, have attended introductory classes in pc use and have received instruction in specific software products, they can avail themselves of two drop-in centers where Infonet personnel are on hand during working hours to answer any microcomputer-related questions, a telephone hot line, a microcomputing newsletter, an interest-free loan, and the employee pc club.

The only weakness in the training effort Kowalski is able to identify is that users "might not have an application in mind right away, and a lot of people who don't use the machine right away lose the training." Generally, though, she is satisfied with the results thus far and boasts of some "very encouraging feedback" from users.

User group therapy for novice microcomputer users takes many forms, and several veterans now openly wonder whether all the support may cause another problem—information overload. Once adept at putting a pc through its paces running spreadsheets and databases, users sometimes become mesmerized. One New York City MIS vice president has already programmed his mainframe to record each database access by pc users, to monitor their interest. "When I see constant use, I begin to check to see if they are becoming information junkies," he says. Nussbaum of the Los Angeles pc user groups claims that two members of the North Hollywood user group became so engrossed with their micros that they neglected their businesses and eventually lost them.

Appropriately enough, one of the men, the former owner of a Volkswagen parts business, resurfaced as a tester for a local software house with his user group contacts. Who says group therapy doesn't help solve problems? *

Philipp Maranoff is a free-lance business writer and editor.



"It may just be a drop in the hat to you, sir, but it's booze to me."

CARTOON BY HENRY MARTIN

STABILITY

MULTI-TASKING

MAINTENANCE

MULTI-USER

ELEGANCE

PORTABILITY

PROVEN

COMPATIBILITY

HARDWARE INDEPENDENCE
COMPATIBILITY
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PRODUCTIVITY

MATURE
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RELIABLE

DOCUMENTATION
EASY TO USE
DEVELOPMENT

COMPATIBILITY
RELIABLE

EDUCATION
BUSINESS

EXPANDABILITY
MAINTENANCE
DOCUMENTATION
EVOLUTIONARY

SERVICE

DOCUMENTATION
EASY TO LEARN
EASY TO USE
PRODUCTIVITY
FLEXIBILITY
FAMILIARITY

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EDUCATION
INTERNATIONAL

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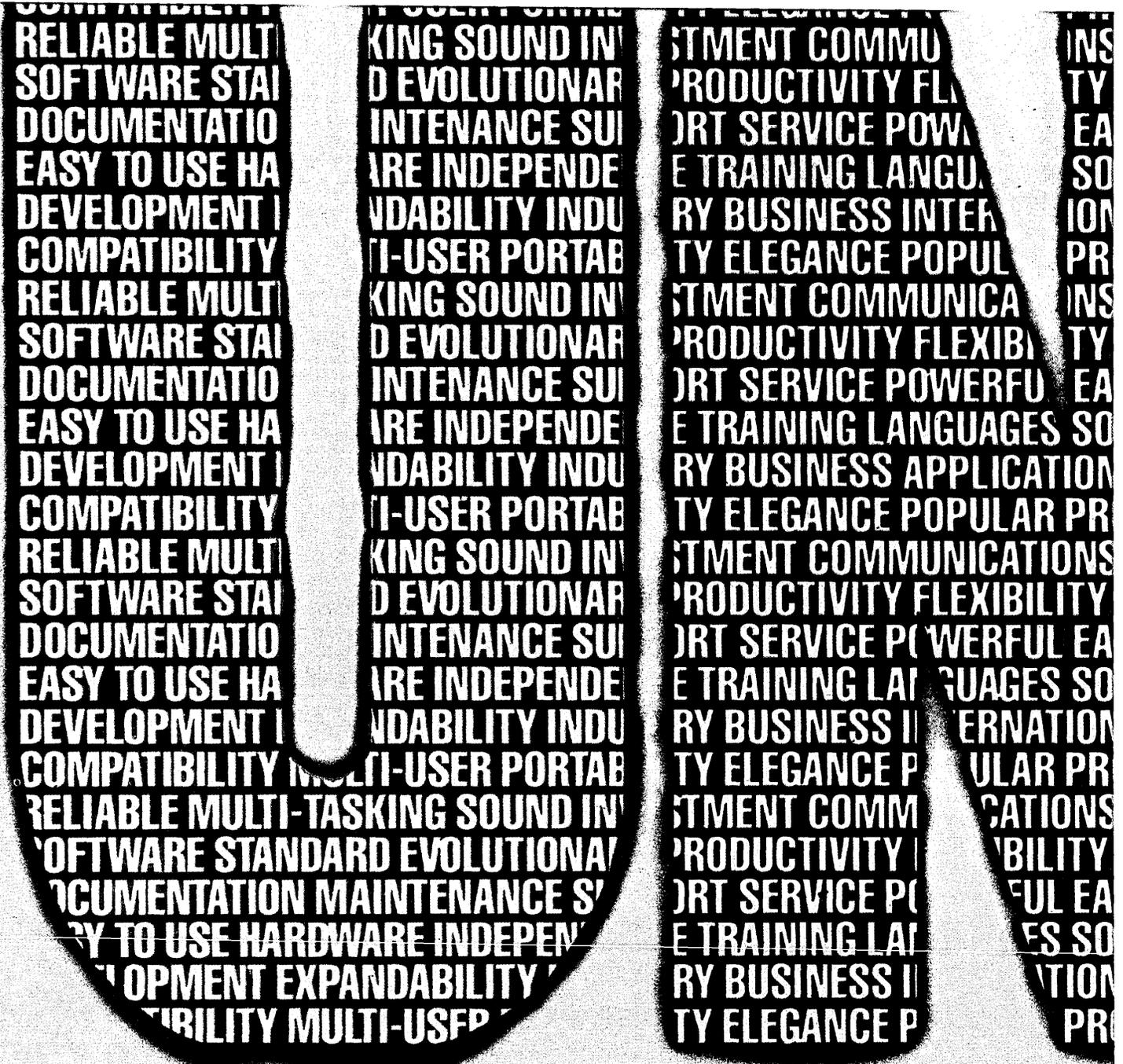
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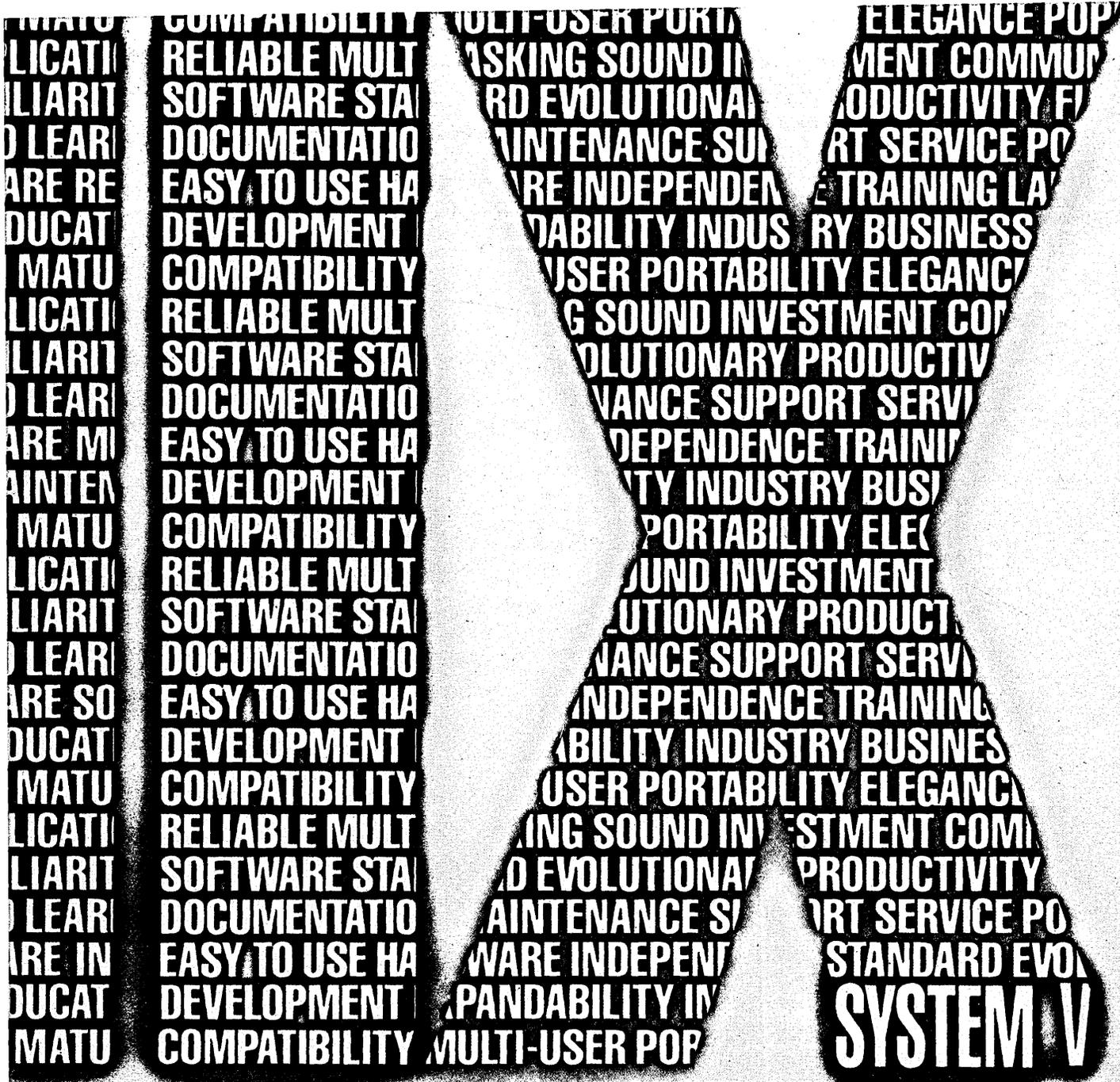
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NEWS IN PERSPECTIVE

SUPERCOMPUTING

CRAY & CDC MEET THE JAPANESE

U.S. supercomputer makers are not taking the growing Japanese challenge lying down.

by Jan Johnson

Like the ride of Paul Revere, the headlines of the *Washington Post* and *New York Times* galloped across the country: "The Japanese supercomputers are coming. The Japanese supercomputers are coming." The forecast for the U.S.? Grim.

It's true, the Japanese are coming, but it's not clear the new machines "will end U.S. dominance" in supercomputing. At least not anytime soon. The biggest problem facing computing professionals will be weeding emotion from fact over the next two years.

Who's at risk here at home? Because two of the new Japanese machines are IBM-compatible, some observers suspect the newcomers will pose more of a threat to IBM than to Cray Research, the leading U.S. supercomputer vendor.

Cray appears more protected because code for its machines is not portable and conversions are costly. The decision to leave Cray for the IBM fold will not be an easy one. As for FORTRAN written for the big IBM machines, that's another story. Replacing an IBM mainframe with a Japanese-made IBM-compatible machine promising Cray-level vector speeds might be an easier decision, says Raul Mendez, professor of mathematics at the Naval Postgraduate School, Monterey, Calif. The school owns an IBM 3083.

On paper the Japanese marketing strategy looks great, but Japan must eventually face the Big Blue marketing machine. IBM sells service and computer systems—emphasis on "systems"—not boxes and technology. Competing with IBM will not be the same as meeting Texas Instruments in the calculator and memory chip market. Should IBM feel threatened, sources predict, it will simply step up the pace of development at the high end and turn up the marketing pressure.

Cray Research is not so secure. If the Japanese are at the supercomputing door-step, Cray is the most vulnerable of all. It has fewer resources to fight with and, unlike IBM or Control Data, supercomputing is Cray's only business. A serious Japanese attack could severely limit Cray's

plans to expand its customer base beyond government agencies.

Leading the Japanese advance are Fujitsu Ltd. and Hitachi Ltd. Both are reportedly delivering machines in Japan and actively seeking American customers. Price is said to be competitive with Cray's XMP, ranging between \$9 million and \$11 million.

In classic Japanese fashion, the two firms have extracted the best features of IBM, Cray, and CDC architecture and combined them into one machine. The companies are offering supercomputing (vector processing) architecture married with an IBM-like, general purpose, scalar processor architecture.

Quips John Rollwagen, chairman and president of Cray Research, "I hope they copy us because if they do, they will be at least three years behind."

Lagging by about a year is Nippon Electric Co. While NEC also offers a supercomputer, it chose to marry it with a non-IBM-compatible, general purpose architecture. It is rumored NEC will run a Unix operating system, says Mendez, who was in Japan in November to run a set of benchmarks on the Fujitsu VP 200 and the Hitachi SA10.

"NEC looks like it may be the fastest of the bunch," speculates George Michael, computing research group leader at Lawrence Livermore National Laboratory, Calif. A Livermore group plans to go to Japan sometime late this year and run benchmark code on the NEC machine.

Benchmark results comparing the Fujitsu and Hitachi machines with Cray's

If the Japanese are at the supercomputing doorstep, Cray is the most vulnerable of all.

XMP already are rolling in. "Thus far, the data indicate that the XMP, the Fujitsu, and the Hitachi all run in the same ballpark," says Jack Worlton, a lab fellow with Los Alamos National Laboratory, N. Mex.

Worlton is analyzing benchmark data collected from several sources, including Cray Research in Minneapolis, the University of Tokyo, the Magnetic Fusion Energy Center at Lawrence Livermore, and the Naval Postgraduate School.

Most benchmarks involved one or more Lawrence Livermore loops. These are short problems, often five to 10 lines of code, designed to test how fast a tiny piece of a computer will go. Their results reveal more about vector performance, but little about scalar.

Dieter Fuus, a member of the magnetic Fusion Center's computing staff, went to Japan late last year and ran 14 Livermore loops on the Fujitsu VP 100 and the Hitachi SA10. The VP 100, a slower machine than the VP 200, averaged 80.3 megaFLOPS'

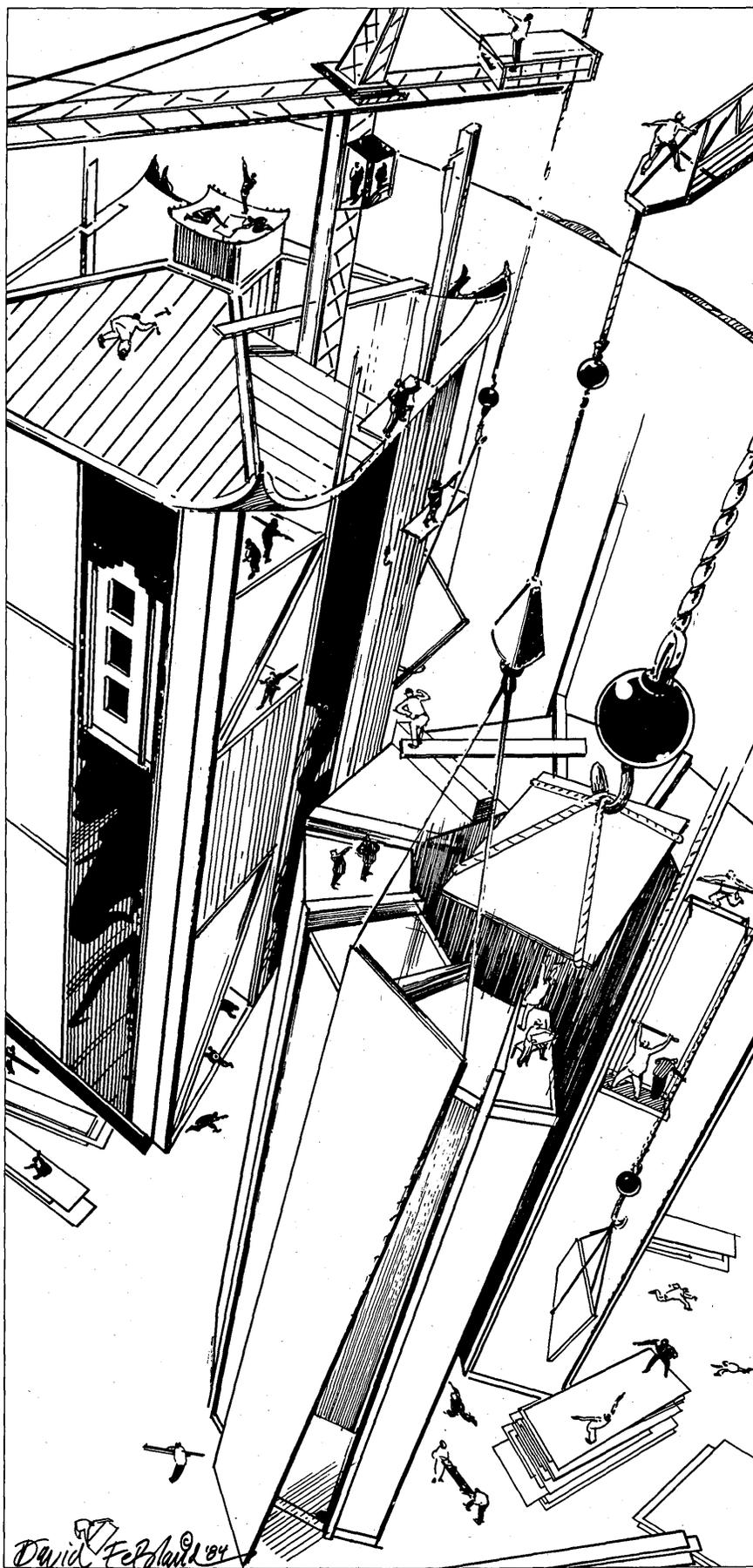


ILLUSTRATION BY DAVID FEBLAND

(floating point operations) per second for the entire run; the Hitachi averaged 100.2 MFLOPS. In a January 1984 benchmark of the same loops, the XMP reportedly averaged 68.6 MFLOPS.

At about the same time, Mendez with the Naval Postgraduate School was in Japan running a different set of benchmarks on the Fujitsu VP 200 and the Hitachi SA10. His XMP results came off the system installed at NASA-Ames, Moffett Field, Mountain View, Calif.

Mendez randomly selected five fluid dynamic applications, each about 1,000 lines of code. Unlike the Livermore loops, Mendez's programs included a mix of medium-length vector operations and some scalar operations. Two of his programs ran unmodified; the other three included hand-inserted directives or code changes to improve vector performance. A detailed explanation of Mendez's results, which were to appear in the March publication of the

Compiler performance appears to be as critical, if not more, as hardware specs to continued U.S. dominance in the supercomputing game.

Society for Industrial and Applied Mathematics, indicated Fujitsu's and Hitachi's machines performed as well as The Cray XMP.

Although sources warn against drawing sweeping conclusions from these early benchmarks, a consensus seems to be forming around two issues. One is that Fujitsu and Hitachi appear to offer as good a vector machine as Cray's XMP.

No problem. Cray's lived through that kind of competition before. It happened when Control Data introduced the Cyber 205. Sales response demonstrated that more supercomputer customers wanted a "balanced" machine, one capable of handling scalar and vector operations, fast I/O, and large problems. Last year CDC installed eight 205s and Cray installed 16 of its machines. This year, CDC again plans to install eight while Cray plans on 20 to 22.

The other issue is compiler performance. The purpose of the compiler is to go through code, automatically break it apart, and put it in the most efficient form for processing. The more vectorization a compiler does automatically, the less human attention is required. Fujitsu's compiler appears to do more things automatically and to produce higher levels of vectorization than the Cray compiler.

One of the Fujitsu product's alleged strengths is its ability to automatically handle "if" statements, to name one example. It's no secret that Cray's current compiler has a hard time with "if" statements. It requires a programmer to streamline code for maximum throughput.

NEWS IN PERSPECTIVE

"It sees those things and just gives up," says David Kuck, professor of computer science, University of Illinois. Kuck is considered one of the world's leading FORTRAN compiler designers.

Cray's compiler is based on 10-year-old technology. Although it has received a steady stream of enhancements, there are those, even inside Cray, who admit the compiler needs a major makeover. Kuck has offered his technology more than once, but was turned down, a victim of the NIH (not invented here) factor, say those close to Cray. Meanwhile, industry sources say Kuck has met with warmer receptions at Control Data and ETA.

Curious about who is behind the fancy Fujitsu compiler? It's a team of 50 to 60 software designers, led by none other than former Kuck students. The students were Japanese citizens trained at the University of Illinois. Once again, American technology looks back at American vendors from inside foreign products.

In comparison, Cray has less than 12 people—one source recalled only

"It sees those things and just gives up," says David Kuck at the University of Illinois.

three—working on its FORTRAN compiler. Sources say, however, that Cray will soon release Version 14 of its current FORTRAN compiler, CFT. Word is that some types of code may run about 25% faster than with previous versions of the program. Cray claims it is working on a new FORTRAN compiler, appropriately called NFT, to be delivered sometime in 1986.

In a last word about benchmark results, Worlton cautions computer industry observers not to take the performance ratings too seriously. In his opinion, the ratings "reported thus far are not statistically meaningful. No valid conclusions can be drawn."

More important, he says, "none of the data presented thus far is based on a valid workload characterization." He urges those interested to assemble their own benchmark example, drawn from their own applications, and conduct their own benchmarks.

"The jury is still out," the Los Alamos researcher states.

One company that has already done that is Nippon Telephone & Telegraph (NTT). In Sept. 1983, in Japan, Cray went up against Control Data, Fujitsu, and Hitachi and won a letter of intent from NTT to buy an XMP. Toshiba also chose Cray last year for internal use.

It takes more than fast vector processing to bring success in the supercomputer marketplace, reminds Cray's Rollwagen. It takes overall system performance; software support, such as debug routines;

A CALL TO ARMS

The general trend these days is the less government gets involved in business, the better. That's not where it's at in the supercomputer industry. There, the government cannot do enough.

"There's no question the government is falling down on the job," says Sidney Fernbach, a leading consultant and chairman of the IEEE's Scientific Supercomputer Committee. "We need to provide adequate interest to ensure the manufacturers of the supercomputers know there will be a market for their products. The government should commit to buying a dozen supercomputers specified to have significantly increased performance in 1987."

The IEEE committee recommended that course of action in a report last fall. It also called for direct government funding to industry and university laboratories with advanced research programs in hardware, as well as government support of all technologies needed for the development of supercomputer systems and designation of a lead organization to coordinate the roles of federal agencies which are dependent on supercomputer systems. These actions, the report contends, are vital if the U.S. is to remain number one into the next century.

"I think the government has to make this commitment to buy the supercomputers," Fernbach says. "Otherwise Cray and ETA [the Control Data spinoff responsible for CDC's supercomputer production] won't be there. The government has to stir up interest and enthusiasm."

That's not all Washington could do. According to Nobel Laureate Kenneth Wilson of Cornell University, the government must also shell out much bigger bucks than it plans to now. Wilson told the recent IEEE technology policy conference that the current allocation of \$20 million in the FY '84 budget is one fifth of what the industry needs. A cool \$100 million would show that the government is willing to lead the struggle against the Japanese.

"The goal of the group working on supercomputers is to expand the U.S. economy," Wilson told his audience. "Congressional action is crucial. It would feed into the training of the next generation of supercomputer designers and operators. Building creativity is more important than struggling with all the stupidities that go on in this town."

Wilson's basic message was that if

and a healthy supply of useful application programs to bring home the gold, he claims.

Rollwagen and others wonder if the Japanese have built themselves into a hole by mimicking IBM 370 architecture, a design that has certain drawbacks. One of those is limited data transfer rates. Input/output speeds are a critical consideration to

the government doesn't give the industry some kind of a high sign very soon, the supercomputer industry will be on the critical list for a long time.

There are others who don't think the current scene is so tragic, or that stupidities are the only thing that play in Washington.

"Cray and CDC aren't positioned well for hotshot competition because they're not vertically integrated like the Japanese companies," says George Michael of Los Alamos National Laboratory. "But [Seymour] Cray multiplies our capabilities by a large factor. He's damn good. So is Ken [Wilson]. I'm glad he's using his influence to alert people to the problem."

"Congress and the agencies are ready to go to work with us if we give them something specific. If it's vague, it makes politicians uneasy. They're the only ones allowed to be vague. There's also too much hysteria going on. And the reporters are doing it. If they write an article about supercomputers, there's a lot of glamour attached to it. They write down to the audience. I think they think if they don't sensationalize, their readers won't read."

The readers certainly have enough to pick and choose from these days. Following a *New York Times* piece on how the Japanese were whipping up on the poor old U.S., the *Washington Post* came back with a story questioning whether those doom-sayers knew what they were saying. There's plenty to go around in this one.

"There's some exaggeration going on, but not a hell of a lot," Fernbach says. "People in this country don't awake to real problems unless hysteria exists. They're very complacent. Even now the president's people don't understand the extent of the problem. Congressional people are much more sympathetic."

"Some of these people are self-motivated because they depend on the government for funding. [Wilson told the IEEE conference his funding runs out in June]. They do have personal research problems to solve. But they're not completely selfish. They all have the big picture in mind."

"There's no hysteria with the Japanese, the Crays, and their colleagues," Michaels says. "There are just a few knee-jerk types who say we're in grave peril. I didn't think there would be hysteria, but there is."

This is by no means the last of it, either.

—Willie Schatz

oil companies with reams of seismic data to feed into a system.

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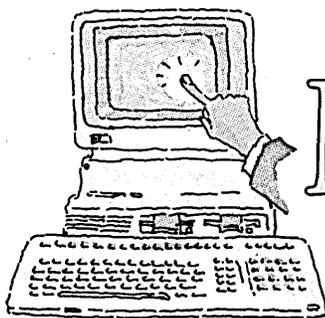
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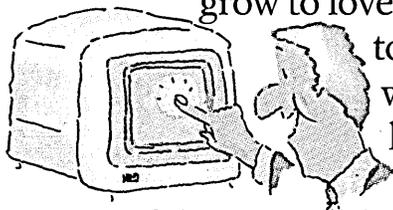
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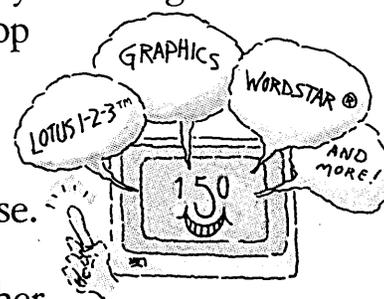
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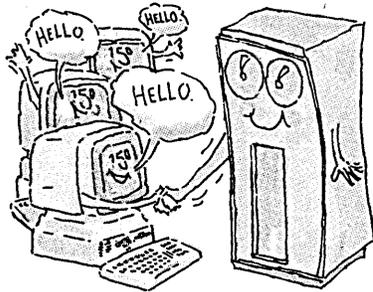
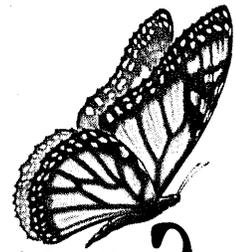
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NEWS IN PERSPECTIVE

/sec. As for memory, Rollwagen speculates IBM's cache memory size may be a drawback when doing large scientific problems. "In scalar mode, if the Japanese depend, as IBM architecture does, on cache memory, as soon as the problem exceeds the limits of the cache memory the system slows down significantly. The Livermore loops can all be run very nicely in IBM's cache memory. The results won't be meaningful until a problem of some size is run."

Another unknown in Rollwagen's mind is how the Japanese married IBM ar-

chitecture to Cray architecture. "In scalar mode, the Japanese machine is an IBM machine. Then when vector instructions are to be used, it goes to a vector functional unit," he ponders.

By definition, to move from IBM-like scalar to Cray-like vector means a new set of instructions and new commands, points out Rollwagen, "and that breaks the compatibility barrier. That, in itself, is not terrible, it just says it is not as simple as having an IBM machine with scientific capability." The details have yet to be revealed.

Like Worlton, Rollwagen is reserving judgment until he sees the results from a real problem. "It sounds wonderful to be easy-to-use, extremely fast, and highly efficient. I don't think it's as easy as that. The only way anyone is going to know is to put a real problem into a real system and see how long it takes to get the answer."

Clearly American supercomputer makers face a challenge. If they were standing still, they would be passed up by the aggressive Japanese. No question about that. But U.S. supercomputer vendors are by no means standing still.

Control Data, with its marketing and investment connection to Engineering & Technology Associates, is developing two new product lines, according to Larry Jodsaas, CDC's vice president of computer systems.

There is the 205 follow-on, whose development ETA has taken over from CDC. Taking its name from its performance goal, 10 gigaflops, the GF10 is expected to be an eight-processor system, each processor performing three to five times faster than a single 205 processor.

Neil Lincoln, the lead architect for the 205 who moved to ETA, will abandon 168 bipolar gate arrays used in the 205 for

"The only way anyone is going to know is to put a real problem into a real system."

20,000-gate CMOS technology for the GF10. Delivery of the machine is expected sometime in 1986 ("ETA Leaves Home," Oct.).

The other product line is CyberPlus, a superfast scalar machine that has its roots in Control Data's government-oriented signal processing systems. Deliveries are to begin in the third quarter of this year.

CyberPlus is a massive configuration of interconnected processors. Up to four rings, each ring containing up to 16 processors, can be connected to a Cyber 170 Series 800 computer. Control Data is marketing the system as a multiple parallel processor system, capable of 16 billion calculations per second. Prices range between \$735,000 to \$1.5 million.

If vector processing is required, explains CDC's Jodsaas, data can be passed from the CyberPlus through the Cyber 800 to a Cyber 205. He describes it as a back-end scalar machine and back-end vector machine sharing an 800. The two back-end processors cannot share a common compiler, however, and therefore cannot run the same applications.

Should Control Data build a common compiler, then it might have a system more competitive with Cray's. Jodsaas claims CDC is working on such a compiler.

Cray Research has not been standing still either. It is supporting three product line programs. "Seymour [Cray] is pretty



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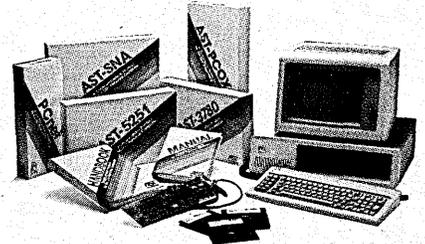
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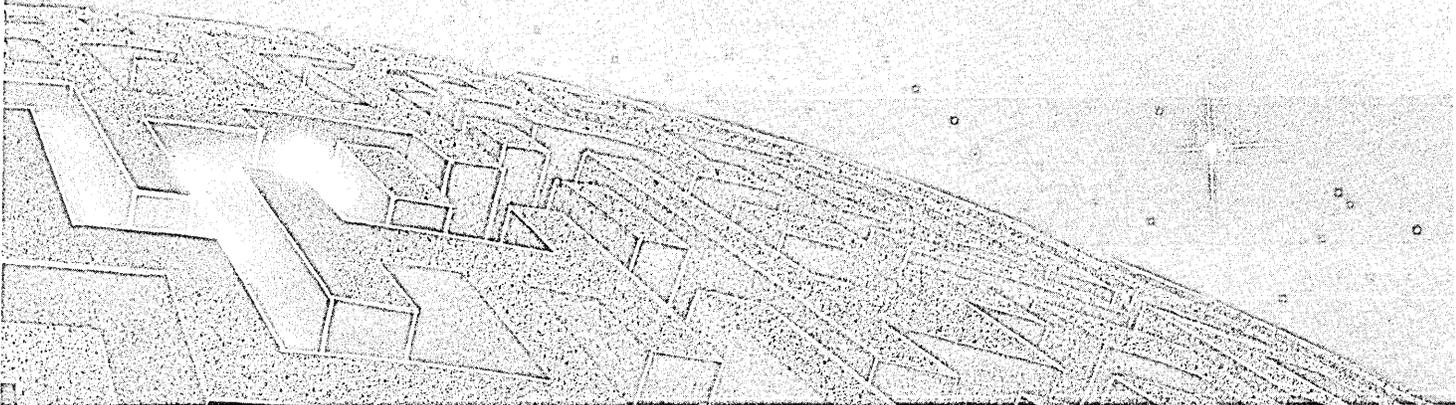
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NEWS IN PERSPECTIVE

much disengaged from the Cray-2," reveals Rollwagen. "There are close to 100 people working on the pre-production Cray-2 team."

He admits they have run into design glitches, but expects to install the first Cray-2 at an unidentified site by year-end. The Cray-2 has been described as a Unix-based, four processor system with a 32-million-word memory and a 4nsec cycle time ("Seymour Leaves Cray," Jan. 1982).

As usual, Seymour Cray is off on his own, designing the Cray-2 follow-on. Don't look for it until sometime after 1986. It is expected to be a 16-processor, gallium arsenide (GaAs) version of the Cray-2. Supporting Seymour's effort is a 12-person, in-house GaAs chip development team. The team has come up with a proprietary process and expects to be a source, but not the sole source, of GaAs chips for future machines. The capital investment for the GaAs facility "is made," says Rollwagen.

Meanwhile, Steve Chen, designer of the two-processor XMP, is working on the XMP follow-on. "There is no question that Steve and his group will be able to provide Cray-2 performance within two years," claims Rollwagen. "There are people now who would argue that the XMP is no slouch compared to the Cray-2 for certain applications." Look for an announcement sometime in 1986.

Supporting Chen is a development team of about 24 people and an inhouse silicon facility with a development team of about 10. The silicon group is working on large-scale (1,200 and 2,400 gates per chip) ECL gate arrays.

When asked where Cray's relationship with Fairchild stood, Rollwagen admitted, "Fairchild has been a big disappointment. We probably have a closer relationship with Motorola now."

Like Control Data, Cray is moving in the direction of multiple parallel processors. The Cray-2 and the XMP "introduce the idea of multiprocessing [spreading one problem across several processors]," says Rollwagen. Recent benchmarks demonstrate the performance of only one cpu in the XMP, claims Rollwagen. He believes the XMP's potential has yet to be demonstrated.

"We have hooks in the compiler and the operating system to allow programs to run in the multiprocessing mode," he says, but a programmer has to manually partition the problem. Over time, Cray will be building automatic partitioning capabilities into its compiler.

Widespread use of parallel processing is thought to be 10 years off, agree Rollwagen and ETA's Lincoln. Sources acknowledge that the Japanese are also working on the parallel processing problem. America is thought to have the lead in parallel processing technology. The challenge is to keep that lead.

MICROCOMPUTERS

IBM IS CLOSING THE DOOR

On the PC add-on market, that is, where independent suppliers are facing what some say is an inevitable shakeout.

by R. Emmett Carlyle

Few survive the end game.

A good analogy might be the game of chess. The beginning of the game brought the explosion that created the IBM PC industry. During the complex maneuverings of the middle game, value-added software and hardware vendors have proliferated. Now as we approach the end game, the poorly placed pieces are ready to tumble from the board; those commanding the center are ready to determine the final plays.

The nature of the end game, of course, is profit. It becomes only too clear who the winners and losers are. So far IBM has been generous: the company has created in its PC line an open architecture from as-

"Large corporate users have begun to take their destiny into their own hands," says Dick Munn.

sembled parts bought from others, and has left plenty of room for contributions from independent software vendors (ISVs) and oems.

Peter Labe, analyst at Smith Barney Harris Upham & Co., says cogently that IBM's unaccustomed attack of benevolence was based on one very potent fact: "There was not a glaring or latent customer demand for the PC . . . rather there was a product available for which the demand had to be generated."

Up to this point, the typical PC customer has been the passive, though willing, recipient of the whole selling phenomenon. PC owners have watched in awe as retailers, distributors, ISVs, and oems multiplied like rabbits. Night after night they have witnessed Charlie Chaplin's pile of software packages grow in his hands like Jack's beanstalk.

"But things are changing," says Dick Munn, president of the Ledgeway Group, Lexington, Mass., which recently mounted a study of the PC blitz of large users. "Large corporate users have begun to take their destiny into their own hands.

They are setting up their own service and support operations and their own computer stores in-house."

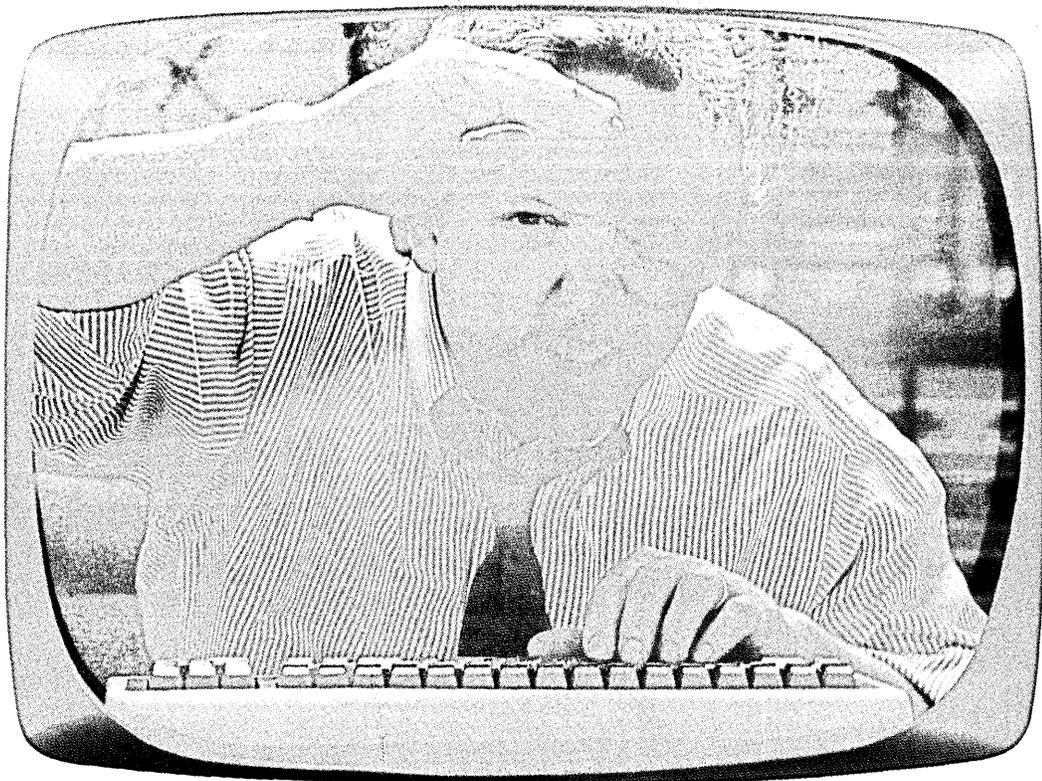
Munn discovered that 53% of those polled already had their own PC demo centers, and soon 21% of them would have their own computer stores. Most significant of all, he discovered that the PC buying decision is now largely under centralized MIS department control. Only 12% of the PCs are bought by individual end users.

As this central control is enforced, the PC is inextricably drawn into the messy world of protocols, database, and native IBM operating systems. Munn says that 12% of his respondents were already part of a network. "That number will grow to 53% over the next 18 months." IBM's mission is clear: if it wants to control the end game and milk the cash cow it has created it has to steer the PC back into the core of its mainstream business, adding value where it can.

Though IBM won't reveal the exact figures, corporate end users are believed to account for a fast growing 25% of PC family members that are sold. As George Colony, president of Forrester Research, Boston, points out, "They offer the prospect of stability following the shifting sands on which IBM has built its business." Nobody knows for sure, but some quarters believe that 50% of IBM's PC business could have gone to the ISVs and oems that helped create it. By their very nature these independents are fickle, and can shift their allegiances like the breeze. Right now IBM is the best, perhaps only, game in town; but a number of "generic" processors will emerge by year's end that not only run all the PC software, but CPM and Unix too—all concurrently (see related story). Semiconductor companies, such as Motorola, that will supply these boxes are in a position to engage in a pricing war with IBM, and conceivably steal its low-cost producer mantle. By all accounts they'll be in a position to provide a very alluring oem box for independents to adorn.

In addition, these independents face the uphill struggle of marketing their wares in IBM's proprietary software domain, and increasingly in direct competition with IBM itself. By some accounts from 80% to 90% of all independent software vendors, many of them tiny concerns, have been drawn into the PC marketplace. Colony, for one, expects many of them to fail as the pressure increases and the pieces begin to tumble from the game.

Seen through IBM's eyes, many of these ISVs and oems are not defensible business centers, and the industry leader appears set on attaching its PC phenomenon to a much steadier rudder, the corporate end user. According to leading independent software companies such as Lotus Development Corp., this trend will result in IBM drawing in the reins and taking greater control of the PC in the future.



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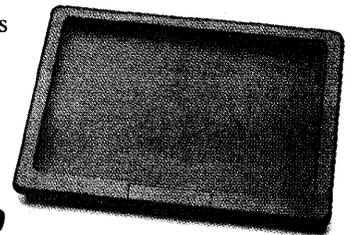
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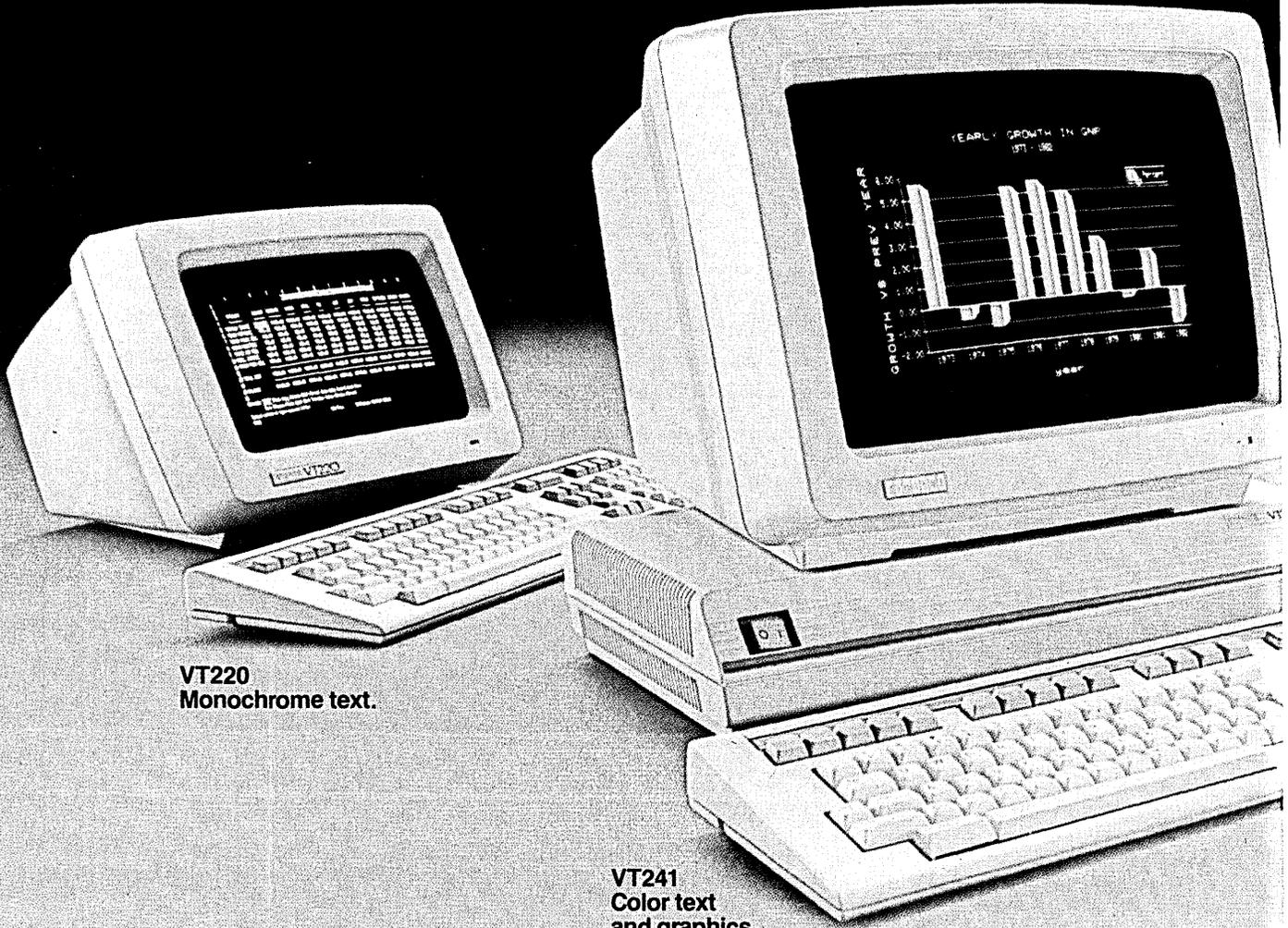
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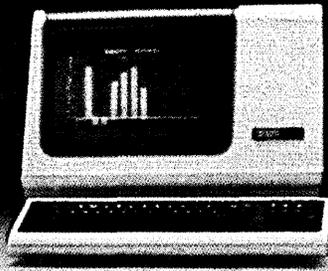
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Lotus president Mitch Kapur warns other ISVs that they are "at the mercy of IBM" and should watch out for three strategic moves from the giant. IBM will make future PC parts proprietary. It will make more of the machines itself (currently the only thing manufactured by IBM for the PC are the three blue letters on the front). Finally, IBM will become a major PC software developer in its own right, in part by introducing its own operating system.

All three claims seem to be panning out to some extent. The clearest pointer was last October's announcement of the PC

Independents face the uphill struggle of marketing their wares in IBM's proprietary software domain.

3270. Each IBM division is expected to absorb the PC in its own way and sell the integrated result direct to its target accounts. The Kingston 3270 group will be followed by the banking terminals, cash register, small business, and System 36 and 38 groups, for example. This seems to herald a return to marketing by product segmentation, say sources (see "IBM's New NDD," January, p. 59).

The proprietary trend was very apparent with the PC 3270. The machine fea-

tured IBM's own native "windowing" software, which flies in the face of products offered by VisiCorp, Microsoft, Digital Research, and others. Digital believes that IBM would have chosen its Concurrent DOS windowing software if it had been available in time. IBM did take DRI's compilers, languages, and GSX graphics standard and will write further software for the machine. It's too early to tell whether VisiCorp and Microsoft will write software for the PC 3270.

In addition to the new software, IBM also created a new custom keyboard arrangement for the PC 3270, which is designed to receive future generations of office software.

Details are beginning to emerge of IBM plans to reduce its dependence on outside suppliers of peripherals for the PC. The company's Lexington, Ky., plant is in the process of being modernized to build a line of new printers. Sources reveal that similar in-house manufacturing will be ramped up at IBM's Boulder, Colo., plant, only this time for hard and soft disk drives that have been in such short supply recently. Suppliers such as Miniscribe and Seagate, with 50% or more of their business dependent on IBM, stand to be the big losers.

On the software front, IBM has now augmented Microsoft's MS/DOS with a Unix operating system, which sources predict

will soon run on the PC 3270 under its reputedly VM/370-like control program.

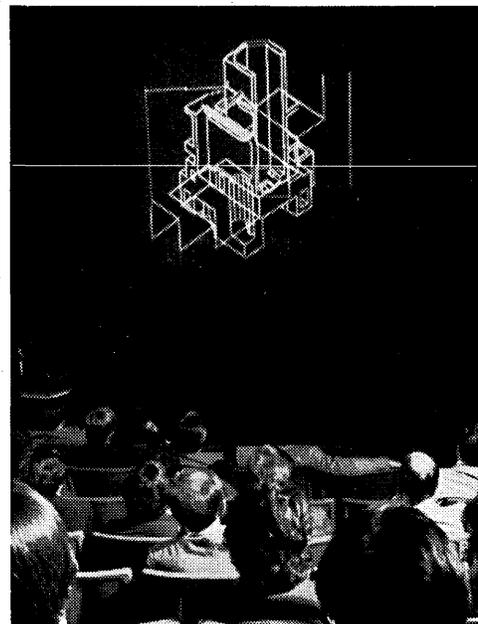
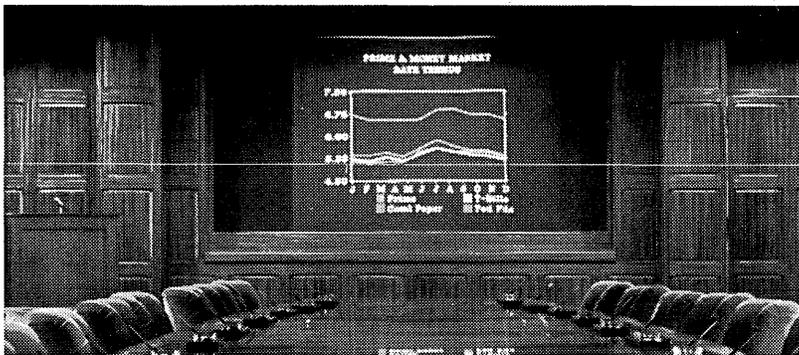
The signs are clear; the free ride is over. As the PC percolates through corporate America, only those independents with marketing savvy, money, and solid distribution will be able to flow with it all the way. Only a tough few can survive the end game. *

BREAKING THE LOCKS

New system software techniques are giving users freedom of choice in picking microcomputer hardware.

by R. Emmett Carlyle

It's been called the "I gotcha" syndrome. A user buying hardware from one vendor usually, must buy software from the same source because of the intimate interdependency of the two system components. Ever since the industry's early days, users have



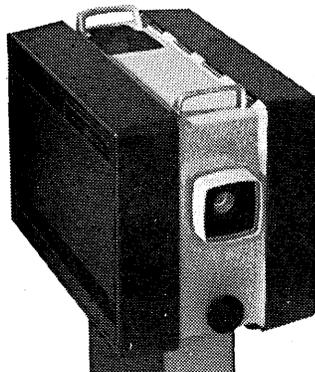
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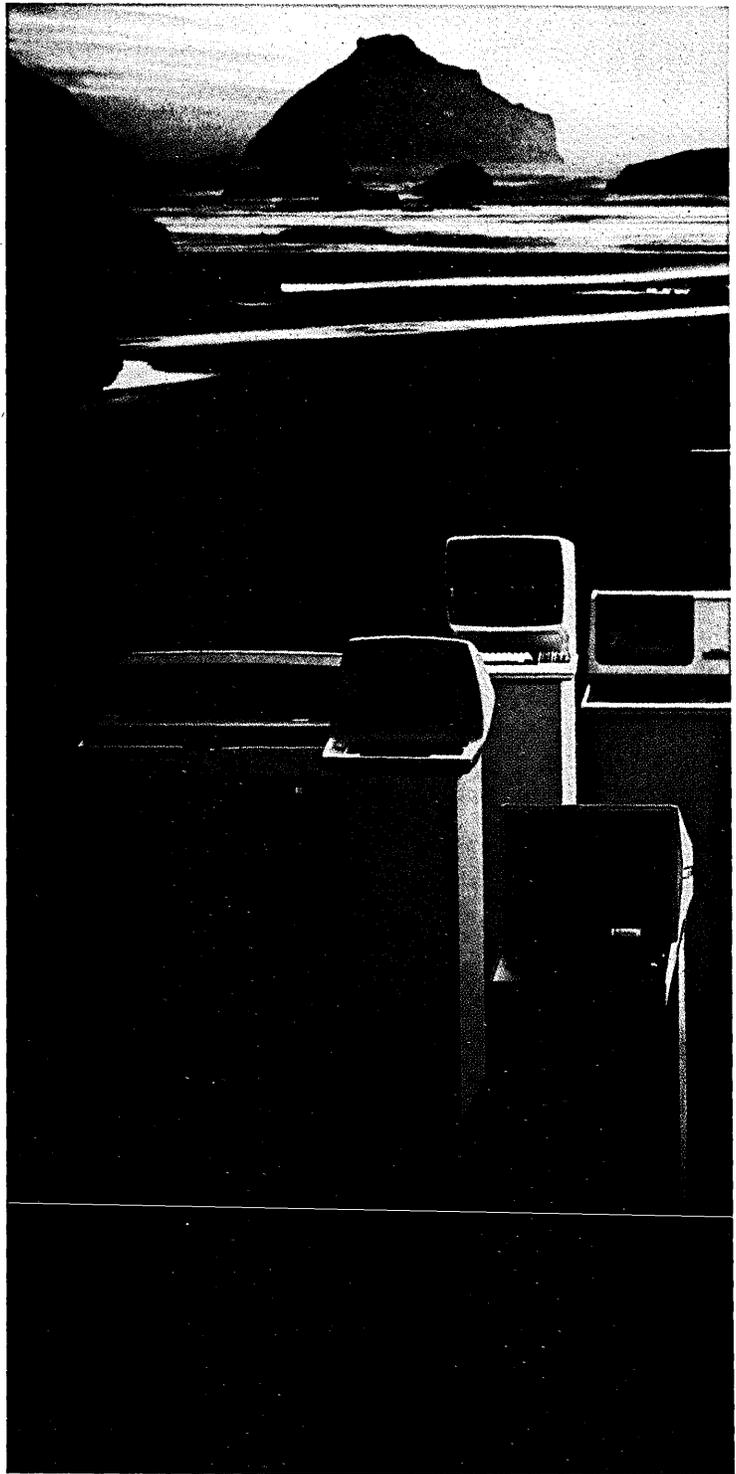
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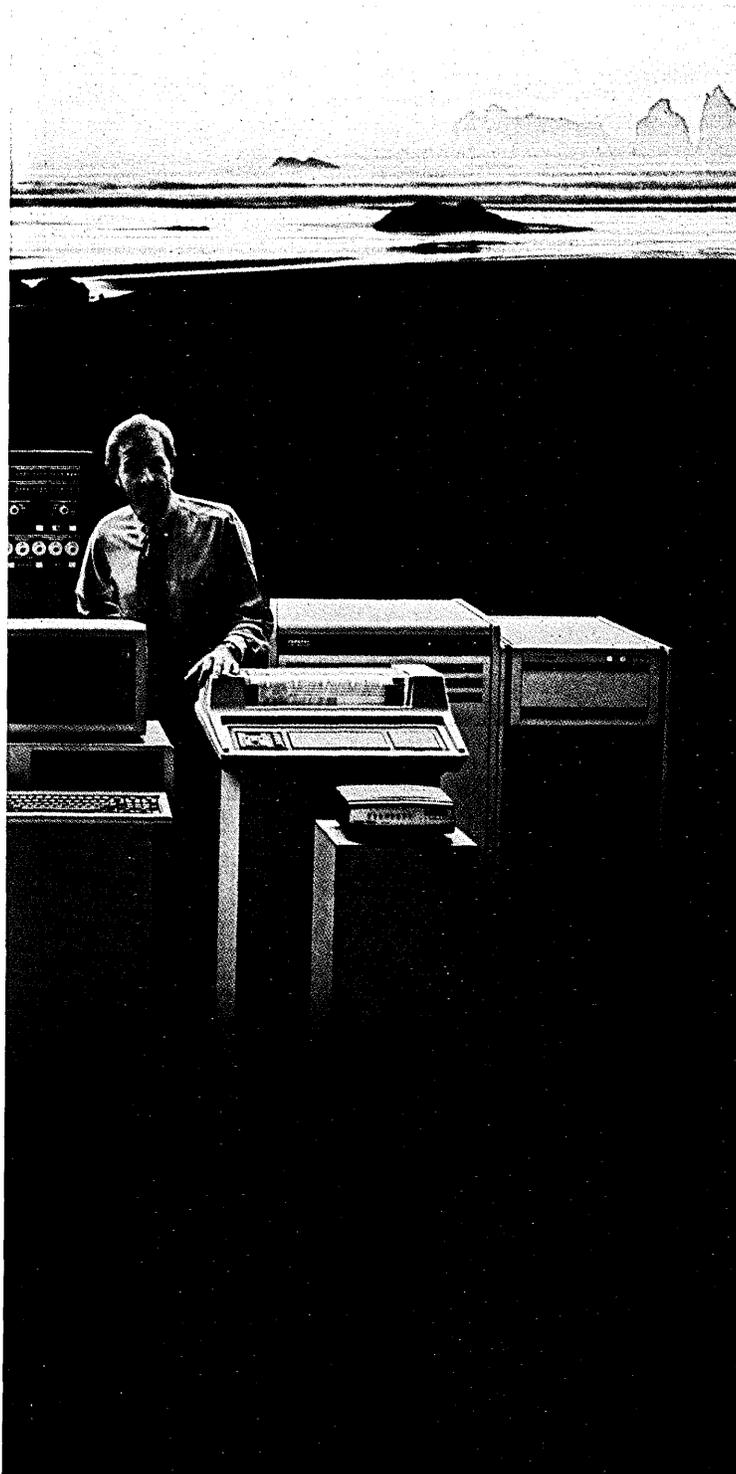
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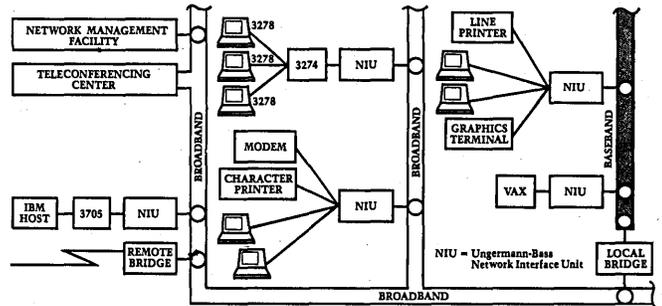


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NEWS IN PERSPECTIVE

generally been faced with buying their system software—operating systems, compilers, and utilities—from a single source.

"It's a scenario without too much choice," says Jack Scanlon, vice president of computer systems at AT&T Technologies. "We put hundreds of man-years to get our software on a system and for all practical purposes we are locked in."

The plug-compatible hardware industry broke the hardware monopoly held by computer makers but did little in the software arena. "Since we couldn't move our software to different hardware, the best we could do was to slide pcm hardware under our software," Scanlon adds.

For the past 20 years IBM has maintained a consistent software interface for its customers by rigid control of its hardware architecture. Replicas of the System/360 architecture, varying little from the original except for greater processing speed, have appeared with regularity over the years, and IBM's customers have collectively been trapped to the tune of \$1 trillion worth of software development effort.

Through it all, IBM's theme was that software consistency could only be achieved by an enforced hardware consistency. Thus the customer's business decisions came to be based on the perpetuation of one standard hardware architecture.

But technology changes, and so does the basis for making decisions. The state of the art in software and computer science is evolving—no less inside IBM than anywhere else. Several software develop-

"A single compiler could take as much as two or three years to write," says John Rowley of Digital Research.

ments have emerged, demonstrating the ability to move easily from one hardware architecture to another. Outside IBM we have Unix on numerous machines, CPM as a standard for the various 8-bit micros, and MS/DOS in the 16-bit arena. Inside IBM, sources point to the development of various Pascal-like compilers, including work at its Yorktown research lab on a system known as PL/8, which reputedly runs across the 370; one for the Motorola 68000; and an IBM processor known as the 801, which will be featured on the upcoming Trout mainframe series, probably as a file or I/O processor.

This twofold emergence of "portable" operating systems and what Scanlon refers to as "nifty" new compilers will have the effect of "insulating applications software from hardware details," he says, thereby changing the basis on which critical business decisions are made in the future.

"Looking ahead, we can see that business will act more from the software interface it can see, and a lot less from the



JOHN ROWLEY: "We can see that business will act more from the software interface and less from the hardware."

hardware that sits behind it," adds John Rowley, president of Digital Research Inc. (DRI), the Pacific Grove, Calif., software company that has pioneered much of the new compiler and operating systems technology. Of course this has always been true, but in the past a customer's programs and his hardware have been much more intimately intertwined. Not only did hardware have to be consistent, but so did generated compiler output as well. "Compilers were usually written from scratch, one for each type of hardware architecture with little or no overlap. A single compiler could take as much as two or three years," Rowley explains.

It's worth noting that several vendors have created pieces of portable systems software as a defense against their own internal problems, and not initially with some commercial application in mind. "Unix," says Scanlon cheerfully, "was created to insulate our applications programmers from our bunch of microprocessor designers who delight in obsoleting this year the micro we put out last year!"

IBM's Pascal/VS compiler, developed at its Los Gatos and Santa Teresa labs, was created to get around the problem of writing and checking programs on current mainframes prior to the availability of their successors. Sources explain that when the new hardware became available, the back-end code generator of the compiler would be modified to generate code for the new machine. The idea, of course, was that the majority of the software and the system could be easily portable from one architecture to another.

DRI claims it has gone beyond this traditional approach to produce a new family of "standard" compilers. The key to the company's approach is the creation of a

new common front end for all its compiled languages. The front end is written in the structured language, which was used to create Unix, so it can be "rehosted" to other cpus and operating systems, DRI designers say.

By offering the same front end in several environments, the user's source program compatibility is assured. The new C compiler front end converts the syntactic constructs of the user's source language—Basic, FORTRAN, or PL/1, for instance—into a common intermediate language. This intermediate language is then accepted by a universal back-end module that is developed for each new cpu. The module then emits native machine code.

The new technique offers numerous benefits. "Easier maintenance of the compiler front end is one," says Rowley, "since one set of C code serves many different environments. But above all, a compiler for a new language is much simpler to develop using this scheme." The DRI president claims that DRI can now generate a new compiler in a matter of months, not years as before.

The first DRI product to be created with the new compiler technique is a

Motorola's VME/10 and Intel's 8086 microprocessor families are expected to be among the first to take advantage of DRI's C-based compilers.

FORTRAN-77 for the Intel 8086/8088 series. "But new compiler front ends are currently being developed for all of our other compiled languages: Pascal/MT+, CBASIC, PL/1, and C itself," adds Rowley.

DRI's prowess hasn't gone unnoticed by the industry's heavy hitters. IBM and Motorola each have licensed DRI's new compiler technology: IBM for its PC 3270, and Motorola for its new VME/10 processor.

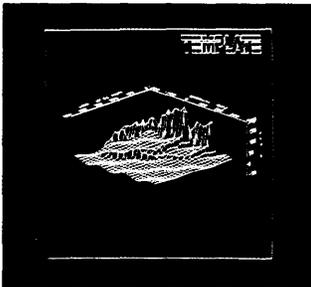
"What has really excited these big names is what happens when you combine the new compilers with the portable operating systems that are emerging: CPM at 8 bit, MS/DOS at 16 bits, and AT&T's Unix System 5 at 32 bits," says one source. "Clearly the possibility now exists for a user's application program to travel from desktop to mainframe level unhindered, thus breaking down the classic midi, mini, and micro barriers," he explains.

"Here, again, DRI seems to be ideally placed," says Ken Bosomworth, president of the Norwalk, Conn., research house, International Resource Development. "They created CPM at both 8-bit and 16-bit levels, and in addition have produced their Concurrent DOS, a multitasking operating system that provides IBM PC/DOS support, as well as windowing, LAN support, and graphics.

"Think what would happen when

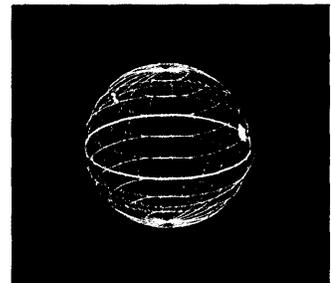
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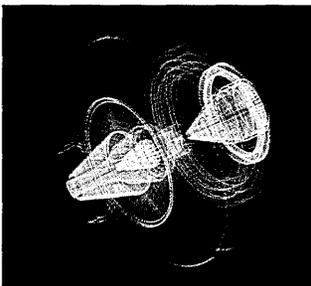
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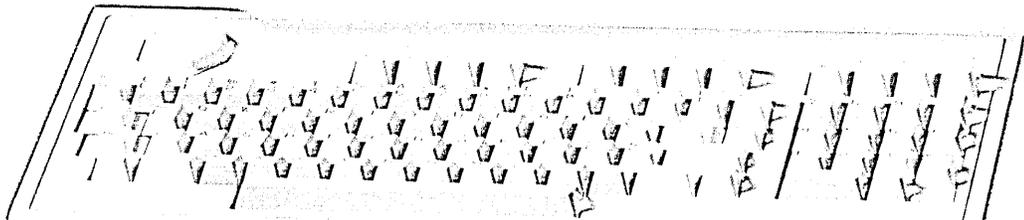
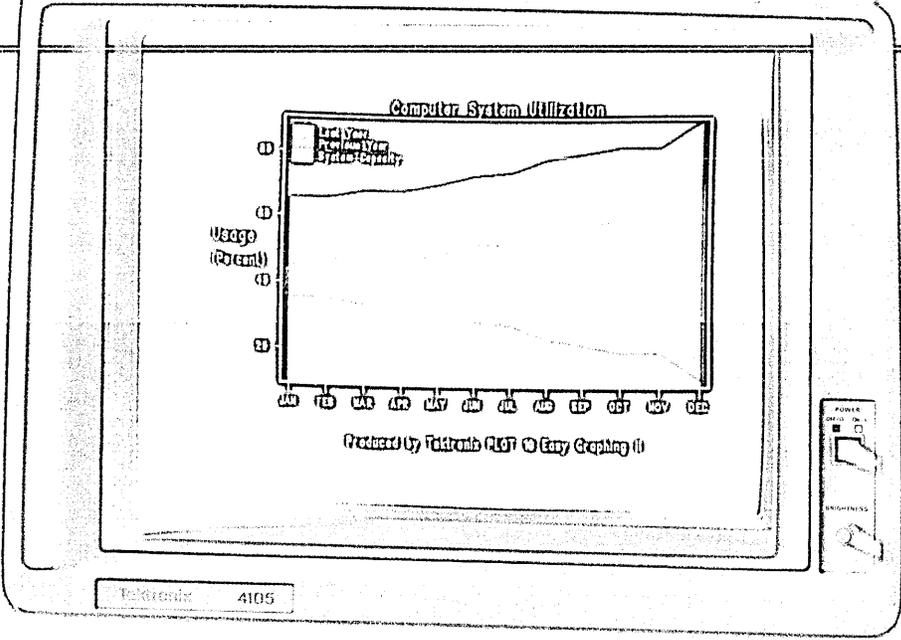
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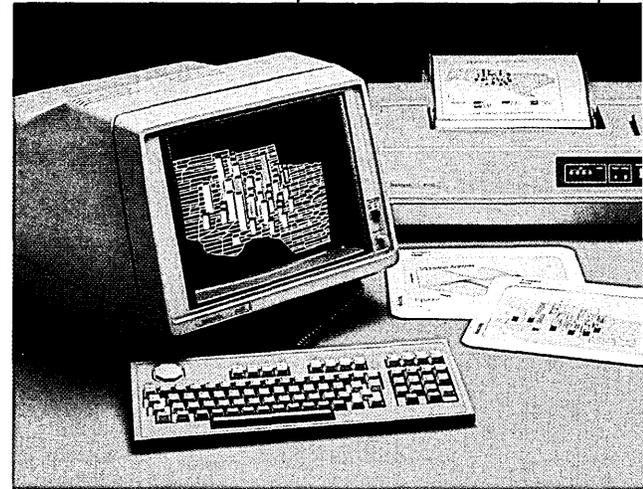
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you put this lot together with Unix System 5 and put the new compilers and languages in between," Bosomworth enthuses. Motorola has done just this and recently signed a deal with DRI calling for the software company to move all its new compilers and Concurrent DOS to the VME/10 processor running under Unix System 5. "The development should be completed by year-end," says Tom Beaver, director of Motorola's microsystems operations. Sources reveal that similar deals with Intel—Unix System 5 on the 286 processor—and with IBM and

AT&T—for projects involving their proprietary silicon—have been hatched, but Rowley maintains a resolute "no comments."

Now, in one breathtaking sweep, Motorola's VME/10 (built from the 68000 family) and Intel's 286 will be able to run CP/M, MS/DOS, Unix, and the compilers simultaneously to become what one source calls "generic" processors. "Following portable operating systems and compilers, they become the third step to freedom for users that have been locked into one hardware architecture for years," he says.

The immediate impact of this breakthrough could be far-reaching. DRI's aim, in a nutshell, is to make as many software packages as possible available on a variety of hardware. A vast number of software packages currently available only on one box—say, the IBM PC—can be made available on many boxes, nullifying IBM's edge, reducing the need for IBM compatibility, and calling for new measures from the giant to protect its market share.

Portable software and processors also offer a big boost to oems, resulting in less time to market and reduced risk, says AT&T's Scanlon. The bottom line should be a flowering of new applications, but this is only one half of the equation. "Remember that portable operating systems and nifty new compilers free the hardware architects too," says Scanlon. He is betting that this will result in reduced instruction set architectures, plus the "possibility of thinking anew about the computing problem."

The net result, according to Scanlon, will be an "end to the long reign of hardware tyranny," and the emergence of Unix as a portable standard.

For Rowley's part, this is all too simplistic. "There's a long way to go before we achieve true portability. Acceptable standards must also arise in the graphics and database areas." Around 18 months ago a group of vendors including Intel, DEC, Xerox, and DRI itself pledged their support for a graphics kernel standard—VDI (for virtual device level interface)—and this proposal is now being debated by ANSI. So far DRI is the only company to have implemented VDI in software (in a product called GSX), though versions from other software companies, including archrival Microsoft, are believed to be in the works. Rowley says that GSX has been bought by 50 vendors so far, including IBM for its PC 3270.

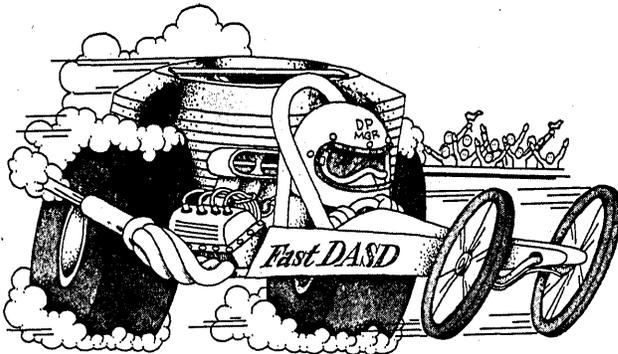
More important, a GSX package for use under Unix would bring a graphics standard to that potentially explosive operating system market. Apparently, there is no dominant graphics standard under Unix yet, and GSX is being pushed heavily by DRI to capture a leading position there.

With a graphics standard, the user at last would have applications portability and could build powerful file handling systems. "Of course, once the user has collected all his data he must decide what he wants to do with it. Does he buy a database? Would he rather build one? The DBMS arena is where our portable road show will make its next stop," promises Rowley.

These are heady days indeed for Rowley and his team at DRI. They've offered users a glimpse of an intoxicating new world, free of restriction. Hardware and software partners can now uncouple and explore their own individual natures. After their first taste of freedom, there may be no turning back. *

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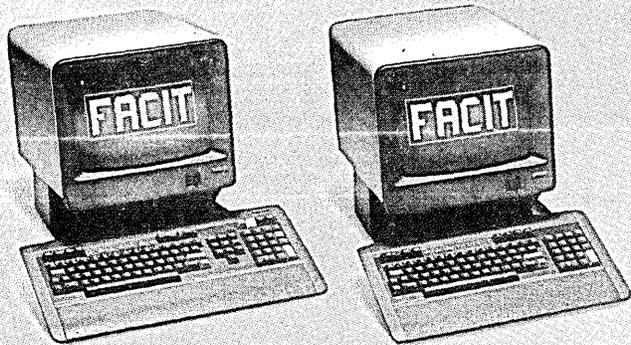
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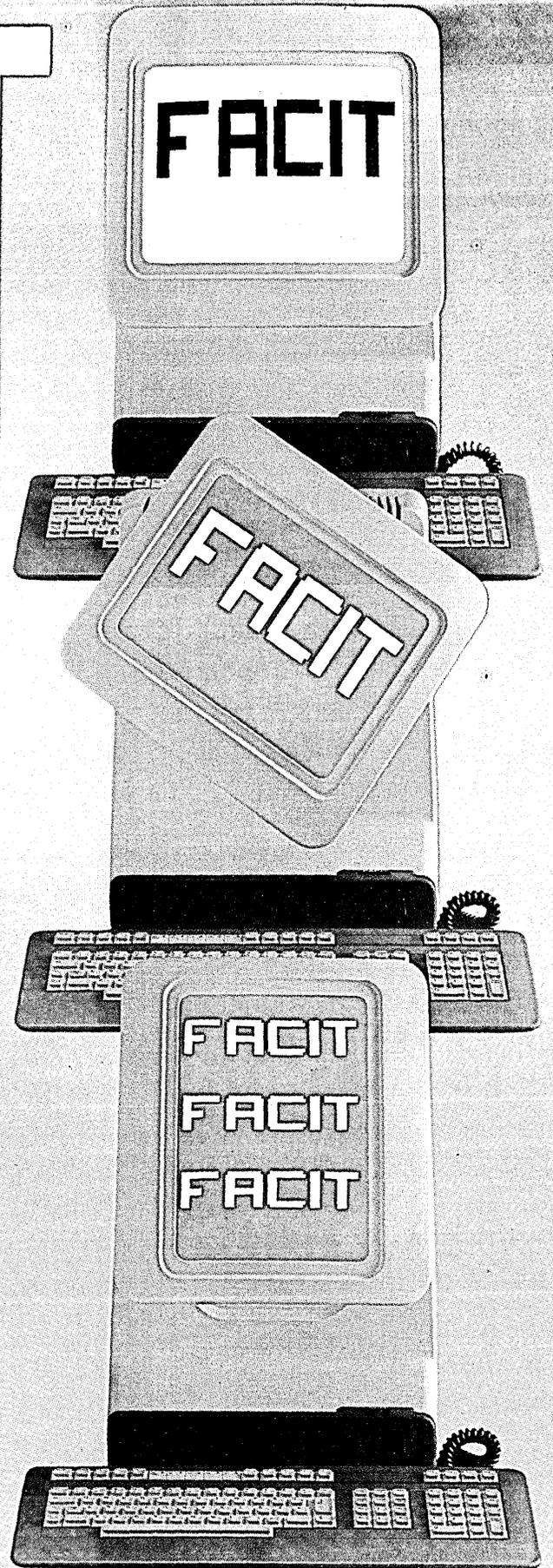
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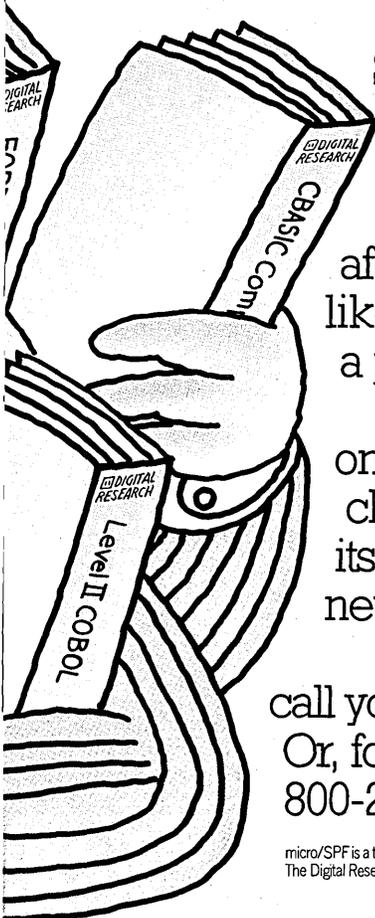
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NEWS IN PERSPECTIVE

INDUSTRIAL POLICY

AGREEING TO DISAGREE

In the ongoing industrial policy debate, the first formal Republican salvo totally rejects Democratic proposals.

by Willie Schatz

They're playing the same game. They're just trying to change the name.

"People don't like the term 'industrial policy,'" says Rep. John LaFalce (D-N.Y.), chairman of the House Subcommittee on Economic Stabilization of the Committee on Banking, Finance, and Urban Affairs. "So now we're calling it 'industrial competitiveness.'"

They can call it what they want, but the song remains the same. It's all about whether American industry is falling apart, who's causing that state of affairs, and what to do about it. Ask two people in Washington what they think and you'll get three opinions.

The Democrats, with LaFalce leading the way, took an early lead in this game. His subcommittee conducted extensive hearings for six months and heard 125 witnesses before producing a 73-page report on "Forging an Industrial Competitiveness Strategy" (January, p. 48). That document

The Republicans are putting their faith in the legislative process.

begat H.R. 4360, the "Industrial Competitiveness Act," and H.R. 4361, the "Advanced Technology Foundation Act."

For four months the Democrats had the issue to themselves, at least on paper. Not anymore. This is now a two-party contest.

The Republicans released their answer last month. It took them nearly as long as the Democrats. Their first draft was circulated last Sept. 7; the fifth and final one wasn't approved until Feb. 29.

Produced by the Task Force on High Technology Initiatives, the 27-pager is called "Targeting the Process of Innovation." It's subtitled "A Republican Agenda for U.S. Technological Leadership and Industrial Competitiveness." You'll notice that "industrial policy" is nowhere to be found.

Not in the title, anyway. But that's what it's all about. The Republicans spent about one-third the pages the Democrats did

discussing the issue, but the two parties do agree on one thing. Something needs to be done—and not later, but now.

"Our objectives are the same," says Rep. Ed Zschau (R-Cal.), former Silicon Valley executive and chairman of the Task Force. "We want to maintain and enhance our industrial competitiveness and enhance our technological base. We just disagree on how to do it."

Do they ever.

The Democrats want a Bank for Industrial Competitiveness (BIC) and a Coun-

cil for Industrial Competitiveness (CIC). The BIC would purportedly help both mature and emerging industries secure financial packages for the capital required for modernization or innovation. The Bank's participation would be limited to no more than 30% of any financial package. The money would be doled out only on condition that it be used as part of a strategy to make the receiving firm a world competitor, whatever that means.

The Council is designed to be a consensus-building forum where business, la-

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bor, and government can meet and devise strategies to improve U.S. industrial competitiveness. No one is quite sure how to tell if that's happening, however.

The Democrats are off to a good start, having steered H.R. 4360 through the Economic Stabilization subcommittee by a 13-9 party line vote. That bill was scheduled to go to the Banking Committee early last month. Hearings on H.R. 4361, which would produce an Advanced Technology Foundation LaFalce likens to "a civilian DARPA" (Defense Advanced Research Pro-

jects Agency), were scheduled for mid-March. Subcommittee markup was then planned for early April.

The Republicans are also putting their faith in the legislative process. In fact, that's all the specific action they endorse.

"They were thinking about what LaFalce wrote when they did this," a congressional source says. "I think they went this way to make it very distinctive. Anything controversial they cut out of the fourth draft."

"The creation of new technologies

and innovation can't be forced," the Republican report says. "Innovation can only be fostered by an economic environment that encourages individuals and activities.

"We believe that the proper role of government in promoting U.S. technological leadership and industrial competitiveness is to 'target' the process by which new ideas and products are developed—the process of innovation. That is, our government should focus on creating an environment in this country in which innovation, new ideas, and new companies are likely to flourish and in which firms in mature industries can mature."

Four things have to happen before that fertile climate becomes reality: 1) a strong commitment to basic research; 2) incentives for investors, entrepreneurs, and innovators to provide capital and take personal risks; 3) a strong educational capability, particularly in the sciences; and 4) expanding market opportunities.

"That seems to be a great many of the things I've been calling for," LaFalce says. "Targeting the industrial and innova-

The GOP plan suggests amending the Copyright Act to include semiconductor designs and masks.

tive processes has to be the keystone of industrial policy."

So far, so good. Now the digression begins.

The Republican agenda contains 14 legislative initiatives that the party thinks Congress should take this year to get the process of innovation on its way. They imply that all of them can actually come to pass. Of course, they add the caveat that none of these will be worth a damn unless the budget deficit is reduced. They imply that that can happen, too. Don't hold your breath for either.

"This is more of a road map than an end point," Zschau says. "We didn't make recommendations unless we had a solution. Of course, if we don't address the budget deficit, which is obviously the hardest issue of all, we'll be back in the economic pits.

"Our approach rings truer than theirs. I can understand objecting that it doesn't go far enough. It's true we didn't address certain things, because we didn't think the timing was good. But the theme is right."

Among other things, the Republicans want the following: 1) increased federal appropriations for civilian basic research; 2) a 25% tax credit for corporate funding of basic research in colleges and universities; 3) modified antitrust laws requiring that R&D joint ventures be judged by their competitive effects and reducing the potential liability from treble to actual damages; 4) making the R&D tax credit permanent and





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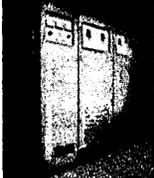
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NEWS IN PERSPECTIVE

making it applicable to software and startup companies; 5) amending the Copyright Act to include semiconductor designs and masks; and 6) offering tax credits and enhanced deductions to corporations contributing state-of-the-art scientific equipment and related services to universities and colleges for educational purposes.

"I think a lot of these things are needed," LaFalce says. "We need to look at the antitrust laws. Our report calls for that. But I have grave reservations about using the tax code. It's inefficient and tosses money around all over the place. Companies call everything they do R&D and the government pays for it.

"Where we part company is that Ed [Zschau] doesn't believe we need a place where we can bring together various sectors and discuss their problems. He doesn't believe we need a bank, either."

That's putting it mildly.

"In its enthusiasm to help, Congress must avoid the temptation of promoting direct government involvement of targeting 'winners' and 'losers' in American industry," the Republicans write. "The House Economic Stabilization Subcommittee recently passed a bill which proposes forming a Council on Industrial Competitiveness and an associated Bank for Industrial Competitiveness. These new agencies would be charged with formulating a 'broad industrial strategy' providing billions of dollars [\$8.5 billion, to be exact] in federal funds to targeted companies.

"We believe such a scheme would be doomed to failure. Bureaucrats in Washington, D.C., shouldn't be given the job of picking between opportunities and dead ends. Besides, politics would undoubtedly play a major role in the decisions. The history of federal handouts indicates that the money is often given to the industries and regions who are best represented in Washington rather than on the basis of merit."

LaFalce counters, "We've got banks ad nauseum. The government's got \$600 billion in federally guaranteed loans outstanding now. The administration wants billions for the Export-Import Bank. That's strictly a subsidy to big business."

Administration witnesses were unmoved when talking to LaFalce. Richard McElheny, Assistant Secretary of Commerce for Trade Development, and Manuel Johnson, Assistant Secretary of the Treasury for Economic Policy, had numerous unkind words in their testimony for the BIC and the CIC. "In sum," McElheny told the subcommittee, "the Council represents overkill. It takes the concept of temporary national commissions or councils to the extreme."

"That argument is totally absurd," LaFalce says. "The CIC isn't in the business to be nice guys. It's only for the sake of competitiveness. If Reagan thought having

a national commission was such a good idea [when he created the Commission on Industrial Competitiveness, supposedly a temporary body], why is 'centralized planning' a bad idea when it's called a council on competitiveness? This issue is going to be around a lot longer than a year."

No lie. It isn't going to be resolved without bipartisan action, either. On paper, the Democrats are much more specific than the Republicans. But neither one is going anywhere without the other.

"We've opened the general debate on industrial competitiveness," LaFalce says. "The Republicans are always talking about us picking winners and losers. Well, from that standpoint, I declare myself a winner. I want more victories, though."

Don't put LaFalce in the "W" column just yet.

"Some things he supports. That means he's already on my side," Zschau says. "I'm not sure whether it's 1/14, 3/14, or 7/14. But at least it's something. If you ask me if the BIC and CIC will pass, they may. If you ask me will they work, the answer's no."

"It's only ideological prejudice that causes people to oppose me," LaFalce contends. "There's nothing incompatible in what Ed and I are calling for. He's incompatible in rejecting me. I'll have to make him see it my way. It won't be easy, though."

Nothing is in this game. *

SOFTWARE

MAKING SOFTWARE "EASY"

With a shakeout looming, pc software vendors are looking to natural language front ends to make their products less intimidating to users.

by Michael Tyler

Steven Jobs points to a slide on the wall behind him. It shows a typical bell curve, a small fraction of which is filled in. That, the chairman of Apple Computer tells his audience, represents the 5% of the "knowledge workers" in this country who own and use personal computers.

Two days later a front-page story in the *Wall Street Journal* describes in great detail how a "glut of computer software may lead to an industry shakeout."

Can a mere 5% penetration of the potential pc market cause a shakeout? The

answer, quite simply, is that it can't. "The only people who get shook are the ones who deserve to be," says Esther Dyson, president of Rosen Research, New York, and editor of the *RELEASE* 1.0 newsletter.

Says Mitchell Kapor, president of Lotus Development Corp., "The stakes are high and there is a lot of room for growth, but the market is much less forgiving than it used to be."

The key problem—the mistake that most vendors about to be shaken out will make—is that current applications software is about as easy to use as a sports car. The power and capabilities are there for the experienced user, but the novice—the 95% of knowledge workers who do not yet have pcs—may find the early going rough.

"The people who have already bought computers and software are the technically minded innovators at their companies," Jobs says. "They were willing to put up with the 20 to 40 hours it takes to master current software, but their less technical peers in the mass market will not be."

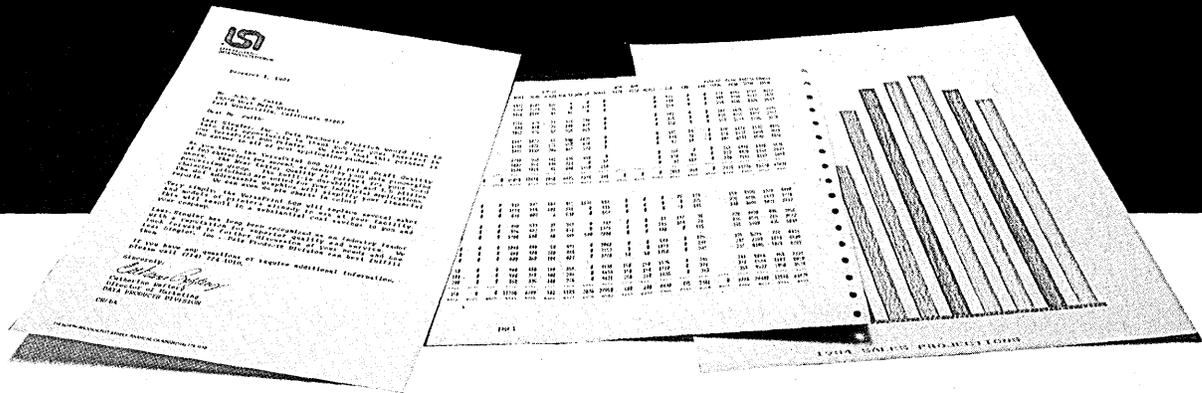
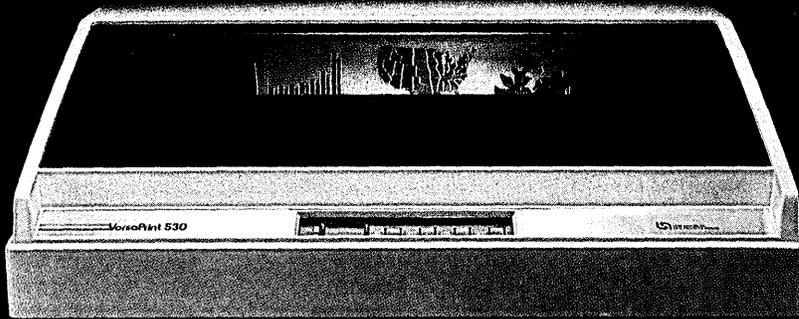
Thomas J. Gregory, president of Boston-based software vendor Ovation Technologies, notes that "today's professional does not have the time or interest to learn complicated technical terminology or extensive commands. Over and over we hear users ask for 'easy to operate,' 'user friendly,' 'logical English commands,' and 'true integration.' In essence, users want a system that acts human and performs computer."

For many users, the issue boils down to a simple cost justification. "A company that buys \$400,000 of microcomputer software may have to spend \$1.5 million to train users," says Martel Firing, a founder of Noumenon Inc., an Alameda, Calif., software vendor. "Most companies can't afford to take the time or the money to train people, and the software may not make the company any money or reduce its costs. Those will be the only criteria and if the software falls short the whole pc market will go down the tubes.

"Ultimately, the market will go to vendors who best understand the needs of the users," he adds.

Unfortunately, some vendors note, understanding the needs of the users and being able to meet them are not the same thing. "Industry people are alert to new advances in technology, but new users have expectations of glory far beyond what we can do now," says Kenneth Scott, senior vice president of Microrim Inc. in Bellevue, Wash. "They saw HAL in 2001 over 15 years ago and figure we're way past that today. It's a formidable hurdle to reach these users without them getting frustrated at the current software."

Even the current emphasis on windows, menus, and data swapping applications falls short of the mark, vendors admit.



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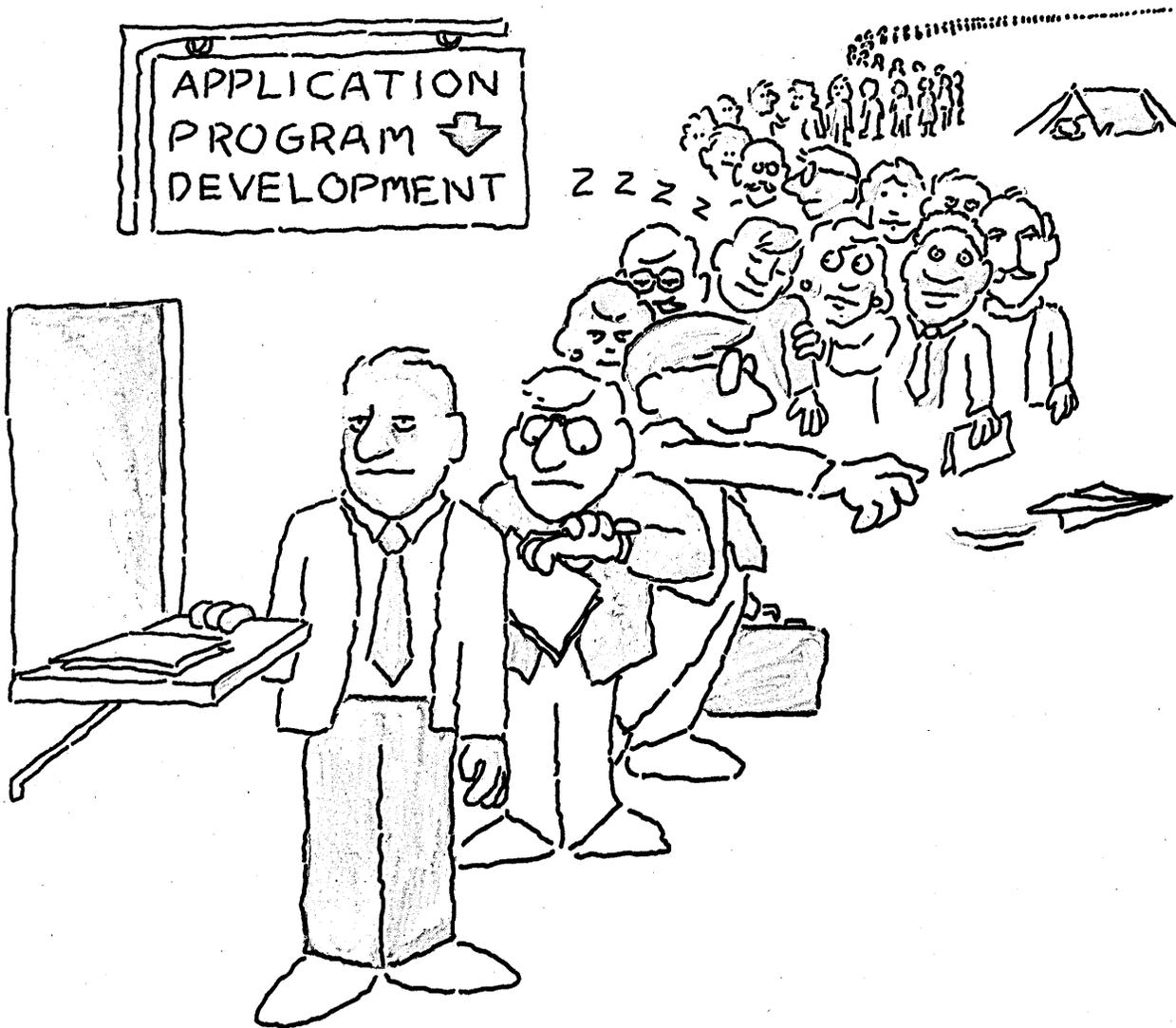


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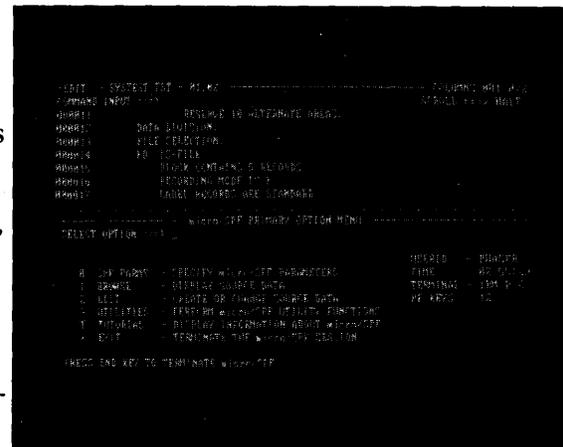
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NEWS IN PERSPECTIVE

"Windows are a pacifier to the naive," Scott says. "They are transitional vehicles that just get in the way later. We don't mess around with menus, for the same reason."

Firing tends to be more sympathetic to windows, arguing that they "are fundamentally very good," but that the current technology is just a gimmick. "The windows are too small and could only make sense on a 10,000-character screen." As for menus, he says, "I detest them. I wish to stamp menus off the face of the earth."

The basic problem with all these approaches is that the software is still one step removed from the user's way of thinking.

"Most companies cannot afford to spend the time or money to train people to use micro software, and the software may not make any money for the company."

"Any time a person has to translate a problem into a set of procedures you have an uncomfortable situation," says David M. Saykally, president of Context Management Systems, Torrance, Calif. "We need to develop seamless interfaces so that when you sit down to work you shouldn't be constrained by the computer."

Larry Harris, president of Artificial Intelligence Corp., Waltham, Mass., adds, "You need a technological quantum leap ahead of current micro and timesharing environments before the average business professional can really use it. English is the only language the user knows."

Several vendors, however, have already taken significant strides toward the use of natural language in microcomputer software. Texas Instruments sells a natural language option to its Professional Computer that enables users to compose English queries for remote databases, with the software translating the query into the code needed to access the database. Microrim recently introduced Clio, a conversational language option to its R:base 4000 database management system. Like the TI product, Clio translates English requests into formal database inquiry commands. Salvo, a product from Software Automation Inc. in Dallas, acts as a DBMS with natural language query facilities and a fourth generation application generator. And Intellect, a conversational query language from Artificial Intelligence Corp., now runs on IBM PCs connected to mainframe Intellect installations. A standalone version will be out by year-end, the company claims.

Opinions differ on whether these natural language systems will catch on in the short term. Harris says, "There are already some vendors who have natural language query products like Intellect. I think we'll see many more before too long. English environments will be in more common

use in 1985."

But Noumenon's Firing, who says his Intuit integrated applications package requires virtually no training, says, "Don't kid yourself. Nothing out there is artificial intelligence yet."

Robert S. Leff, president of Softsel, a leading micro software distributor based in Inglewood, Calif., charts a middle course. "There's nothing there now, but in six months products will begin to come out that address this area. Artificial intelligence-oriented products are the most likely types of software to be successful in the next year.

"Look at intelligent databases," he says. "Now they have natural language query. Soon you'll be able to build your own database as you go along. You won't have to design the whole thing at the beginning, laying out all the fields and all the records, and specifying all the relationships there are."

Context Management's Saykally agrees. "It's evolutionary. By the end of 1984 and early in 1985, you'll see some significant steps ahead that will change the way we work."

Others are not so sanguine. "Yes, we need a natural language capability in developing applications for database management packages, but at this point there is more hoopla and attention than actual im-

plementation," says Thomas O'Connell, a consultant with Advanced Office Concepts in Bala Cynwyd, Pa.

"The advantages of natural language systems are offset by help facilities that are inbred into packages in several levels, by more complete and better written documentation, and by other easy-to-use technologies like voice input and touch screens. We may see natural language go right out the window."

Kenneth Scott of Microrim retorts, "Natural language on a micro is a signifi-

"You need a technological quantum leap ahead of the current micro and timesharing environments before the average business professional can really use it."

cant leap. It's the process by which the software learns what the user is all about, not the way you learn about the software. Programs must become adaptive. We ought to expect sophistication in the use of the new tool, and if we do, the customer will find ways of using it that none of us can possibly have foreseen. If we don't build that sophistication into our new products, the industry will suffer because customers won't put up with it." *

TAKING THE LOW ROAD

"No programmer has ever done a lick of work in his life," says Martel Firing, a founder of Noumenon Corp. "Being engineers, they reengineer the customer to fit their programs. It's much harder to reengineer the program to fit the customer."

Firing believes that other vendors are mistaken in choosing to use combined software applications, menus, windows, mice, and other facilities that entice users. "They're all trying to outfeature each other. They get fascinated with what they can do with some hardware instead of concentrating on what the customer wants. It's like building Ferraris and Porsches when the biggest demand is for Fords and Chevys."

Noumenon's first product, Intuit, is obviously intended to reach the "Ford and Chevy" market. "It's industrial strength software, not toothpaste or a hit record," Firing says. "Like heavy machinery, you buy it only if you need it and only if you get some financial or economic advantage out of it."

In keeping with that belief, Intuit takes over the IBM PC on which it runs (no need for PC/DOS) and provides applications such as word processing, a spreadsheet, database management, and so on. No "modes" separate applications, he says, so that calculations can be performed within documents and files can be pulled directly into spreadsheets.

Intuit breaks from the current wisdom in what it does not use: "It's got no menus. No windows. No formulas. No mice. No metaphors. Metaphors are a crock anyway." Firing and company president Michael C. Mead are trying a new marketing approach as well. "We're not selling to the dp guys to resell," Mead says. "We're selling to the end-user department. So we're going to advertise in the accounting trade books for accountants and in the insurance trade press for insurance companies and in the bank trade press for banks, and so on."

The marketing strategy comes from the founders' experience in heavy industry. "We're not software guys," Mead says. "We're used to selling equipment to business, and that's the way we're treating software."

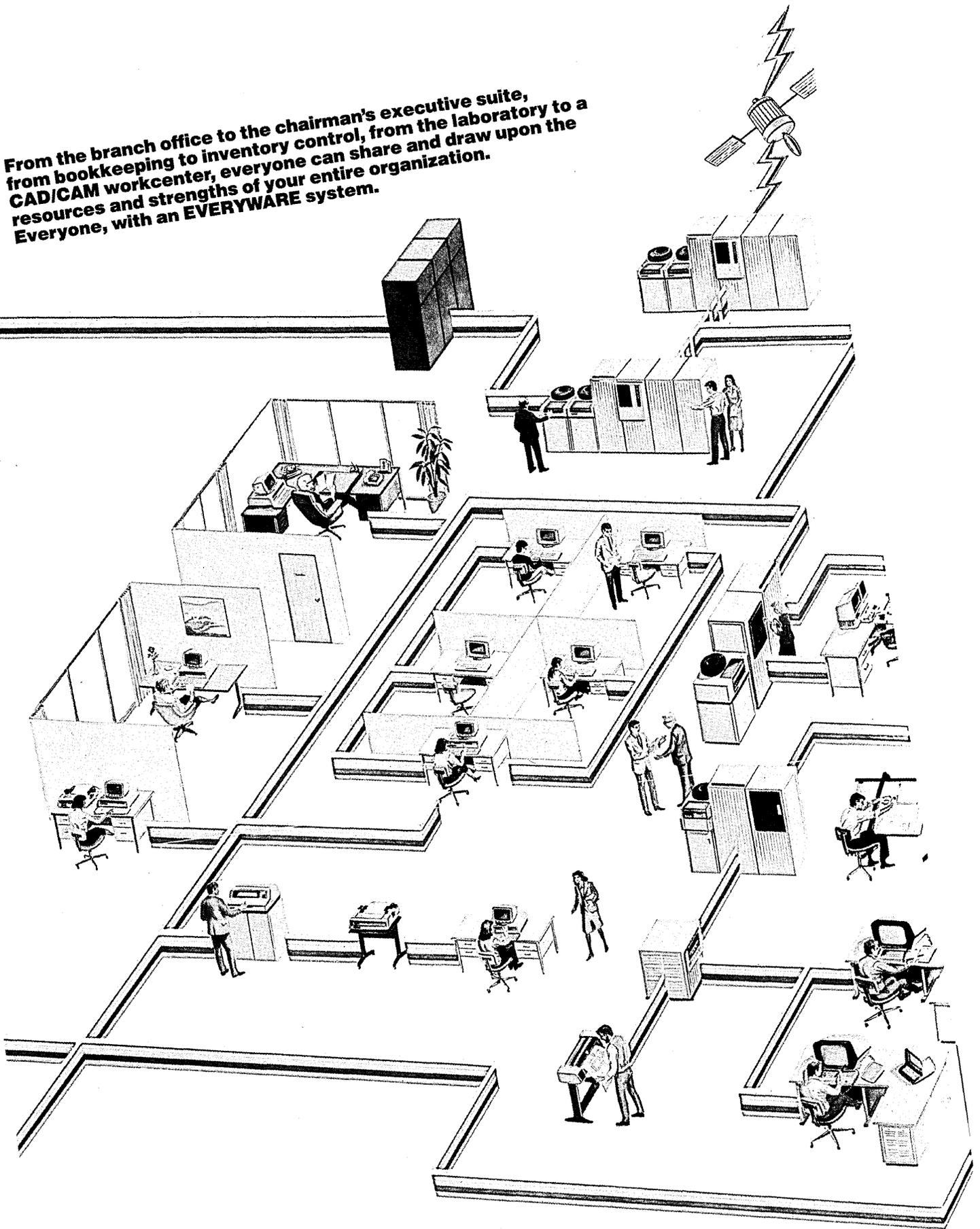
Firing got his start writing the program two years ago, when he worked as a market researcher dealing with high-technology clients. "I did one client study that showed there was really nothing on the market, so I closed my business and went to work on it." To this day Firing remains the entire engineering staff at Noumenon, which is based in Alameda, Calif. Intuit will cost \$400 and hit dealer shelves April 28, he says. "Noumenon," incidentally, is Greek for "perceived by the mind but not by the body."
—M.T.

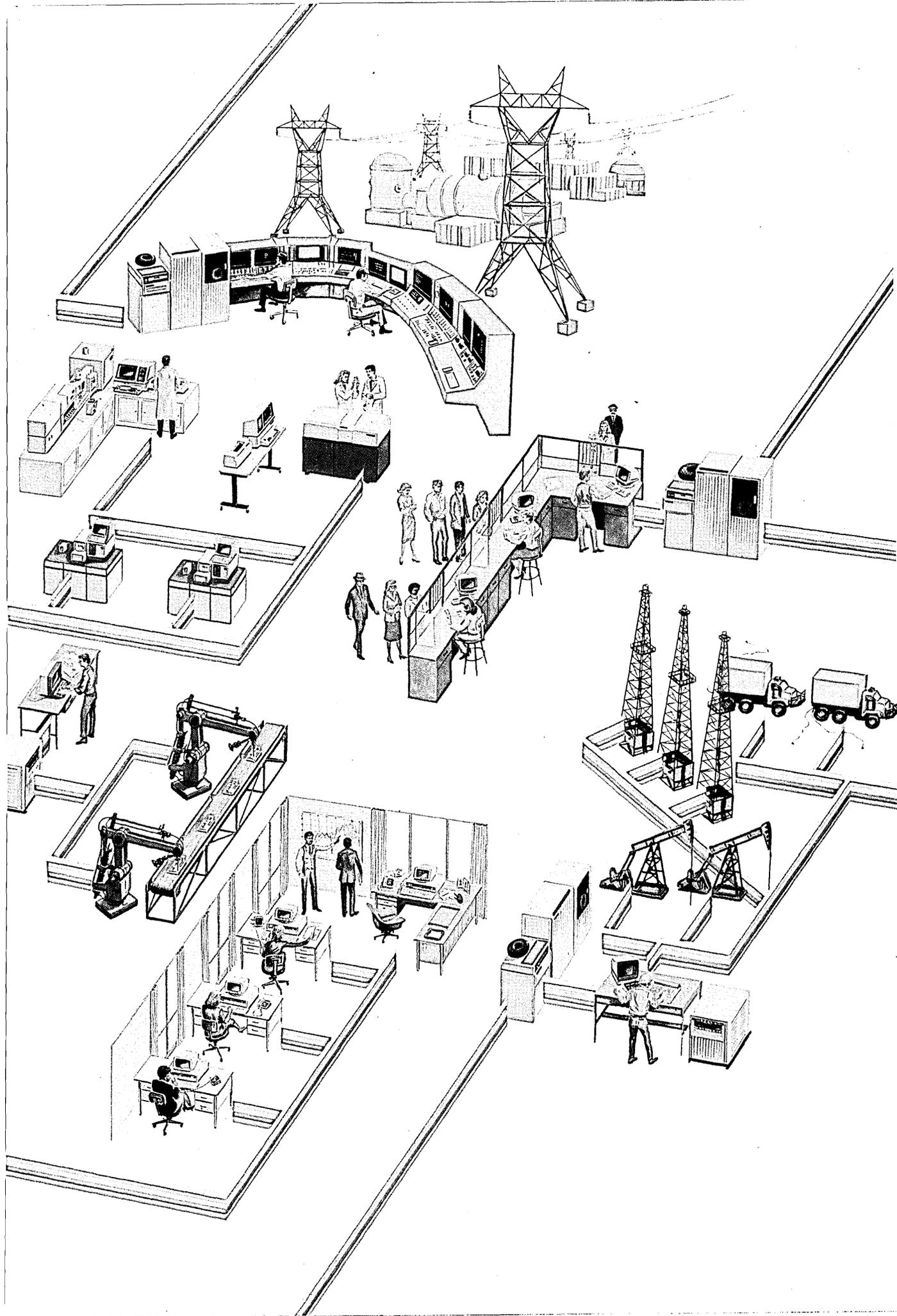
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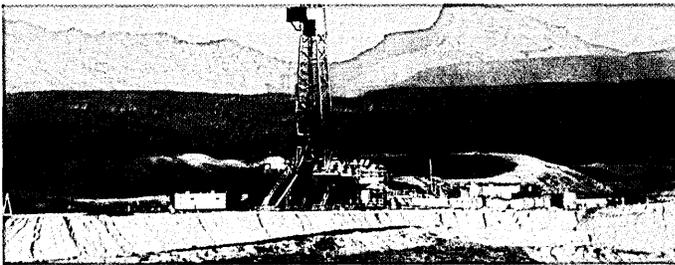
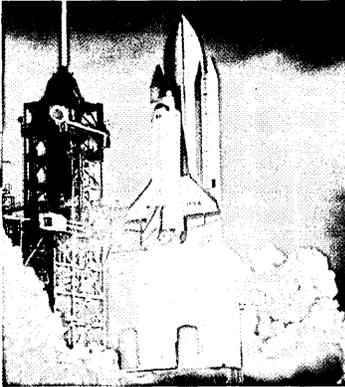
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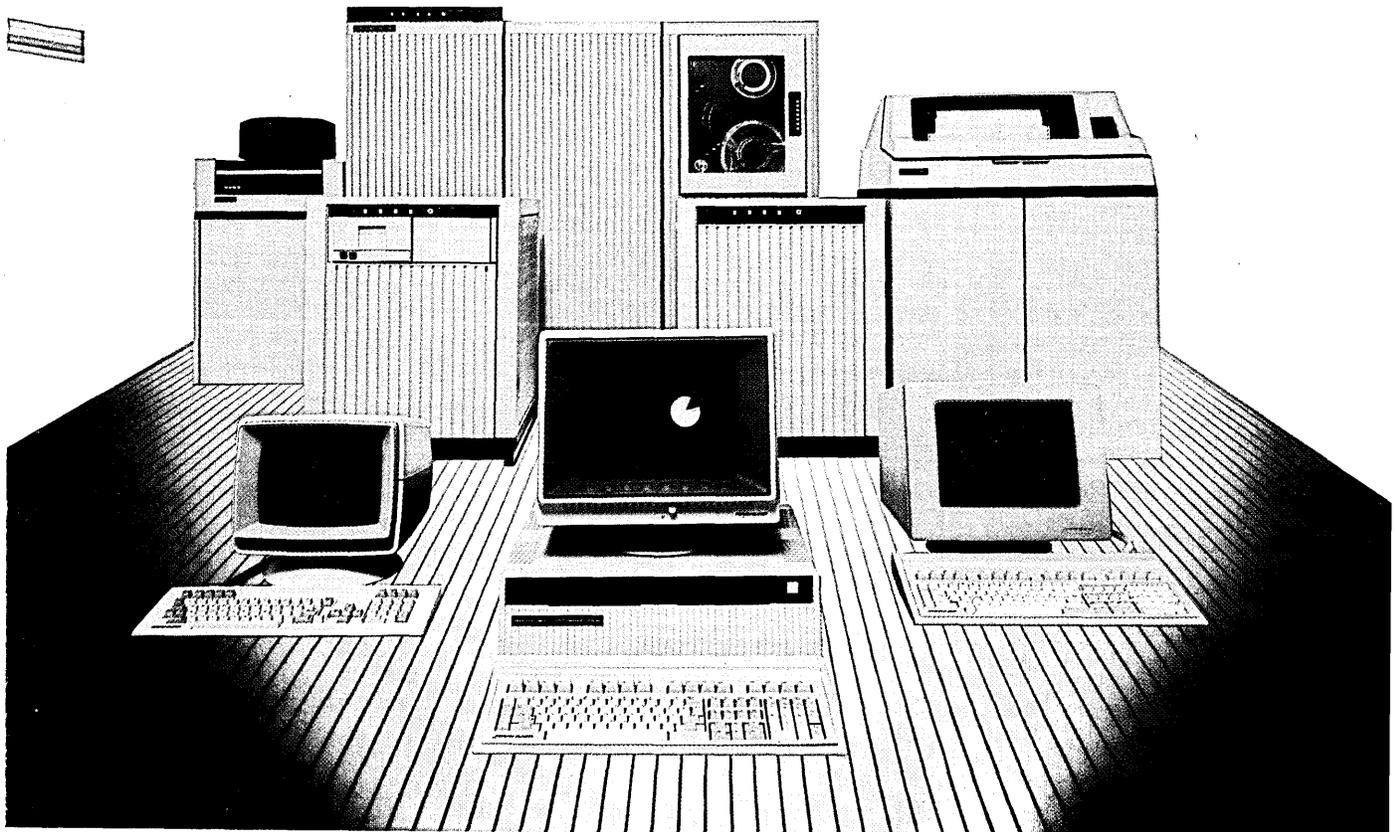
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these systems have to become part of your existing processing environment. EVERYWARE products offer the ability to coexist with systems from other manufacturers. This has been achieved in three ways. First, by Perkin-Elmer's commitment to an industry standard operating system. Second, through our commitment to compatible languages. And finally, by our support of all of today's and tomorrow's major communications protocols. As a result, EVERYWARE computers can share information with other systems desk-to-desk, room-to-room, across town and across continents.

**The portability problem.
The Perkin-Elmer solution:
EVERYWARE products.**

The capability to efficiently port your software is another benefit of EVERYWARE products. From computer to computer, department to department, your programs retain their value, protecting your investment. You can develop software on an EVERYWARE computer in

one system and port it to other EVERYWARE computers anywhere in your organization. For example, you can write software on a desktop micro-computer and run it on a supermini. And because EVERYWARE hardware supports an industry standard operating system, you have access to a vast library of third party software.

**The expansion problem.
The Perkin-Elmer solution:
EVERYWARE products.**

Perkin-Elmer offers one of the broadest ranges of computers in the world. It extends from 32-bit superminis to desktop workstations. So you can expand at your own speed, adding the power you need, whenever you need it. As more capacity is required, you simply connect additional processors. You can grow board-by-board, or by adding complete computer systems. Because of the built-in compatibility, there is no need to re-write your applications software. Existing programs continue to run without major alteration.

NEWS IN PERSPECTIVE

OFFICE AUTOMATION

OAC FIGURES DOWN

The Los Angeles Office Automation Conference failed to bring in as many buyers as had been hoped.

by Robert Crutchfield

What if they held a conference and nobody attended?

While that wasn't exactly the case at the Los Angeles Office Automation Conference in late February, it was close. Exhibitors were sorely disappointed at the show's poor draw of attendees. The conference, which is sponsored by the American Federation of Information Processing Societies (AFIPS), was estimated to have drawn only about 15,000 people, including exhibitors and press, compared to last year's figure of almost 19,000 in Philadelphia.

Whether the lack of attendance was due to declining interest in office automation or to other, geographically oriented

Some observers speculated that the show's location, downtown Los Angeles, may have hurt it.

factors was hard to tell. AFIPS itself declined to release official attendance figures, although conference chairman Stephen Abraham said the numbers were actually larger than those recorded in 1983. However, when pressed for actual figures, Abraham would reveal only that a total of 1,702 people had signed up for all three days of seminars. He said the comparable 1983 figure was 1,700.

As for the total number of attendees and exhibitors at the show, AFIPS marketing director Ann-Marie Bartels said it is now the association's policy not to release attendance figures.

"Our feeling is that numbers are not as important as the quality of the conference attendees," Bartels stated, adding, "It is not our policy to disclose numbers."

Despite the unwillingness on the part of AFIPS to disclose official attendance figures, one association source unofficially pegged conference attendance at 15,100. That was down from 18,998 in 1983, and 18,991 in 1982, the source claimed.

Some of the 154 exhibitors agreed with Bartels that the show did attract quality attendees—those who could make buying

decisions—but many others expressed disappointment with the show's turnout.

Three reasons were expressed by exhibitors for the small showing. One was the holiday. OAC '84 fell on Presidents' Day. Another was that the show competed with SoftCon, a privately sponsored show in New Orleans. The third reason was the conference's location: downtown L.A.

"The holiday hurt us," one exhibitor remarked, asking to remain anonymous.

Another vendor added, "Over the years attendance has dropped. Maybe it's because there are more shows to cover."

While some exhibitors were displeased with attendance, others thought the show was a success. One exhibitor noted there were "less people at the conference, but more people able to make buying decisions visiting the booth."

Another exhibitor said his company was "pleased with floor traffic in the morning, but it was slow in the afternoon."

Besides the holiday, location, and conference competition, another reason for poor attendance cited by an AFIPS official was an alleged failure of AFIPS' public relations firm to adequately promote the conference. An AFIPS official said that the rationale for choosing the Los Angeles Convention Center in the downtown area for the conference was that the location should have attracted more than 20,000 office workers from surrounding businesses to view the exhibits. But with the mass exodus from the downtown area starting at about 3 p.m. to avoid rush hour traffic, that kind of turnout never materialized.

One exhibitor that received a good deal of attention was Apple Computer Inc. Hundreds of exhibitors and attendees alike lined up to get a hands-on demonstration of the new Macintosh computer. Approxi-

Apple Computer gained much attention with a roomful of Macintosh computers available for hands-on use.

mately 30 people at a time filed into a room where they were given a quick demonstration before getting a chance to try it out on their own. An estimated 600 people viewed the demonstration and spent some time using the computer.

The IBM booth was also crowded. But on the whole, attendees didn't have to wait long to try equipment out at the various exhibits. The aisles were thinly populated during the three-day conference.

While attendance was light, Abraham said most of the seminars were sold out, and he estimated 3,000 people were on hand to hear David T. Kearns, president and chief executive officer of Xerox Corp., give the keynote address on opening day.

When asked if he felt office automation deserved a separate show, Abraham

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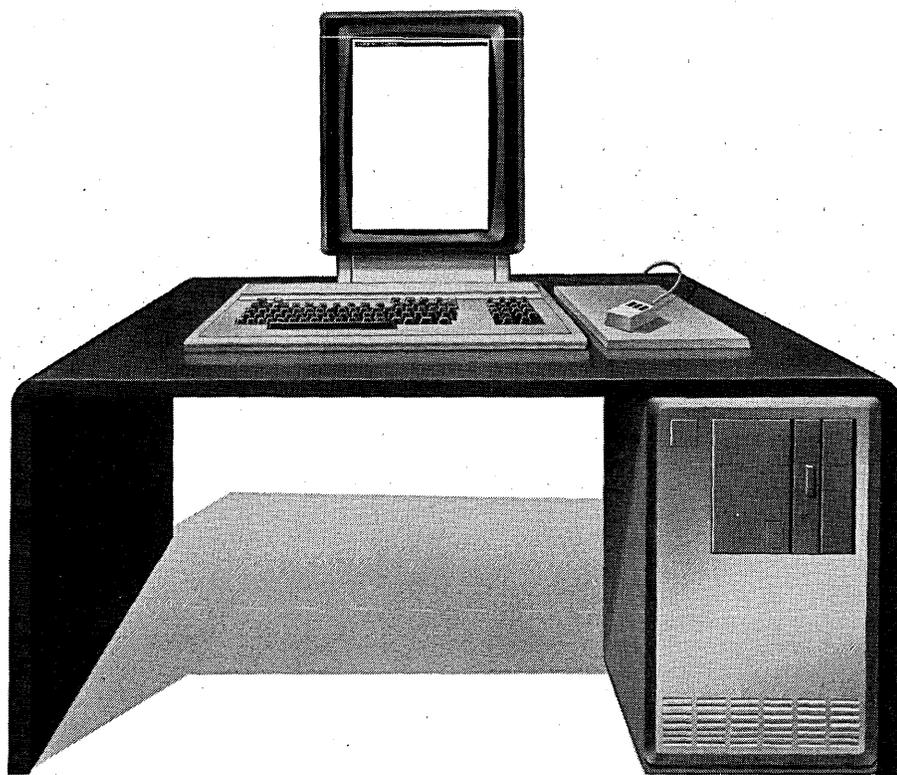
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CIRCLE 33 ON READER CARD

If you don't we can c



PERQ IS A TRADEMARK OF PERQ SYSTEMS CORPORATION. UNIX™ IS A TRADEMARK OF BELL LABORATORIES. ETHERNET™
TRADEMARK OF XEROX CORPORATION. PERQ 2 IS A JOINT DEVELOPMENT PRODUCT OF ICL AND PERQ SYSTEMS CORPORATI

As you can probably tell from the picture, this is an advertisement for one of the world's most advanced graphics workstations. It's called PERQ 2.

Now imagine that instead of looking at this ad in a magazine, it was up there on PERQ's screen.

The headline's wrong.

Too large, perhaps. Or in the wrong place. PERQ can change that at the push of a puck.

The wrong typeface, maybe? PERQ

a full implementation on PERQ of the UNIX™ operating system. This *de facto* international standard gives access to the large body of UNIX-compatible applications.

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like this ad, change it.

PERQ can model in 3D, for example, or function as an electronic airbrush, or magnify sections in detail. Again, not enough words, we're afraid.

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The picture's wrong.

Hardly does PERQ justice, does it? Well, you could ask PERQ to turn the picture upside down, or back to front, or inside out, or bring it to life and animate it...

There aren't enough words.

An unlikely complaint. But we could fill dozens of ads this size with details of all the applications PERQ offers for CAD/CAM, structural analysis, 3D modelling, drafting, simulation, circuit design, electronic publishing, and so on and so on.

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The whole ad's wrong.

Of course it is. Why on earth should you be interested in a computer that can simply shove around the component parts of a magazine ad?

But there again, next time you're designing and laying out a technical report, or analyzing structural stresses, or planning a new highway, wouldn't it be nice to be able to test your work, modify it, and improve it as easily as PERQ can change the page you're looking at right now?

No wonder PERQ 2 has already changed one thing absolutely: the standard by which all future graphics workstations will be judged.



We should be talking to each other.

NEWS IN PERSPECTIVE

replied, "Yes."

OAC '85 will be held in Atlanta, and conference organizers expressed optimism that next year's show would "surpass" the "success" of OAC '84.

Meanwhile, it was learned that the Softcon show, which was dedicated to software products and marketing, drew far fewer dealers than had been promised by the show's promoters. "It was about 75% exhibitors and about 15% end users and practically no dealers, which was who [the promoters] were after," commented David Saykally, president of Context Management Systems, Torrance, Calif.

The poor attendance at Softcon and OAC and the cancellations of several other planned trade shows for 1984 have prompted speculation that the computer industry has been saturated by such gatherings. The National Computer Conference and the Comdex series of shows continue to do well, but the time may have come for show promoters to think carefully about future events. *

EMPLOYMENT

A BID FOR HIGH TECH COS.

San Diego is striving to take a piece of the action away from Silicon Valley.

by Edith Myers

San Diego may have lost out to Austin, Texas in the competition to be home to the Microelectronics and Computer Technology Corp. (MCC), the 14-company consortium trying to beat the Japanese to the fifth generation computer, but it is not out of the race to be the U.S. high-tech community.

Recent newcomers to the area include Aerojet General Corp., Fujitsu Microelectronics, Northern Telecom Ltd., Oak Industries Inc., Oak Systems, Signal Companies Inc., and TRW. San Diego County boasts more than 412 commercial and business parks, and there is room for many more.

It is this room and the ability it affords to start building with the latest in materials and design concepts that will enable the San Diego area to eventually surpass Silicon Valley, Research Triangle Park, Austin, and others as a high-technology center, claims Millard Archuleta, whose company, Millard Archuleta Associates, AIA, Los Angeles, designed the newest San Diego high-tech complex, the \$200 million

San Diego Tech Center. It is located at the junction of Interstate 5 and Interstate 805, just north of San Diego.

The center is located in an area called Sorrento Ridge, which has already been developed into industrial sites. Its developer, the Naiman Company of La Jolla, Calif., was the Ridge's first developer. The new center, opened last November, ultimately will cover 38 acres.

"There's a long way to go before we achieve true portability," says Rowley.

mately will cover 38 acres.

"We're a dimension ahead of Silicon Valley in expression of the high tech of the 1980s," says Archuleta. "We're able to use materials that were not available, had not been developed when most of the campus-like Silicon Valley complexes were developed."

"We've created slicker looking buildings that really reflect what is going on inside," says Jack Campbell, an Archuleta Associates architect who worked on the project.

Archuleta said use of new metal insulating facing materials not only made it possible to streamline the buildings' looks but made it feasible to build them faster. From ground breaking to opening, construction of the San Diego Tech Center took less than a year. "With concrete you'd have to add a month and one half to that."

Archuleta believes in omitting superfluous ornamentation in his high-tech buildings. "A building is a machine and less is more. There is a trend now toward post modernism, recalling past architectural styles, using period architecture with modern embellishments. This is the anti-



MILLARD ARCHULETA: "There is a trend now towards post modernism, recalling past architectural styles, but that is the antithesis of high tech."

thesis of high tech, which is enclosing space in a more planned, directed way to solve productivity problems and traffic and circulation problems in a direct way." edges of technology."

With the San Diego Tech Center, Naiman has tried to provide the "soft edges" in the forms of restaurants, parks, and physical fitness facilities. These amenities include more than 1,000 trees, a half mile jogging path, outdoor swimming pool, tennis and volleyball courts, a lake, a 195-seat dining pavilion with Japanese and American food, aerobic exercise center, and a 3,500 square foot health club with weight training rooms, saunas, spas, and experts who will work with employees in reducing stress.

First Interstate Mortgage Co., a subsidiary of First Interstate Bancorp, provided the \$55 million for initial construction of the center. Donald C. Alford, FIMC vice president, said the loan was the largest the firm has made in San Diego since its San Diego office was opened 20 years ago.

"The market for office and research and development space in San Diego remains strong. Sorrento Valley [in which Sorrento Ridge is located] is becoming the most active area for new projects of this type. Funding a loan of this magnitude

One industrial park offers a half mile jogging path, swimming pool, tennis and volleyball courts, as well as a 3,500 square foot health club.

while the economy is relatively weak, demonstrates our confidence not only in the project, but also in the San Diego economy in general," Alford says.

Megatek Corp., a computer graphics firm that is part of United Telecom's Computer Group, was the center's first tenant, leasing 40% of available space. Megatek occupied its space before phase one construction was complete. Says a spokesman for Megatek, which has 520 employees, "In the high tech world, you're under a lot of stress and your working environment makes a great deal of difference."

Connecticut General Life Insurance, another early tenant, will move its computer operations into the center in the near future.

San Diego has much going for it in its bid to attract high-tech companies: mild climate, many recreational opportunities, proximity to the inexpensive labor pool in Mexico, and a college student population of 125,000. The value of products manufactured in the area increased 75% in the last five years, and indications suggest that this growth rate is accelerating. *

NEWS IN PERSPECTIVE

BENCHMARKS

NEW MAINFRAMES: Claiming performance gains of from 5% to 14%, IBM announced a new series of 308X mainframes that provide identical functionality but no field upgrade path from current systems. The 308XX family consists of the 3083 EX, BX, and JX; the 3081 GX and KX; the 3084 QX, and the 3082 X. The units carry the same prices as the earlier machines without the X appellation, and soon will replace the earlier machines entirely. Current users of the earlier units will not be able to upgrade to the 308XX series in the field, however. The new computers use thermal conduction module technology to improve machine cycle time from 26nsec to 24nsec and to merge the system controller and central processor functions. Concurrently, IBM announced that it would no longer provide testing for any applications for the 14-year-old OS/VS1 operating system. The move effectively freezes the program and further opens the way for MVS/XA. IBM announced new releases of MVS/XA and XA's data facility product, enhanced versions of MVS/SP JES 2 and 3 V1 R3, and a new release of the MVS/370 data facility product. IBM noted that it will still support current OS/VS1 users even though it prefers for users to migrate to MVS.

TO BUY TYMSHARE: The McDonnell Douglas Corp. and Tymshare Inc. finally concluded their mating dance late in February, with McDonnell Douglas agreeing to buy the Cupertino, Calif., data communications firm for \$307.5 million. That works out to \$25 per share, which McDonnell Douglas will pay in cash, executives from both companies said. The St. Louis aircraft manufacturer had been stalking Tymshare since early last fall as a complement to the McDonnell Douglas Automation Co. (McAuto) subsidiary. McAuto designs computer software and services for hospitals, factories, engineering firms, and other concerns. Company executives saw Tymshare—and particularly its Tymnet data communications network—as an attractive company because it would allow McAuto to market its services more aggressively. Tymnet links 400 cities in 42 countries. McDonnell Douglas had agreed in November to offer \$31 per share to buy Tymshare, but backed out a month later when it apparently decided the price was too high.

IBM'S SOFTWARE: The industry leader last year sold \$2.3 billion worth of applications and systems software, a gain of 35.9% over the previous year, according to the company's annual report for 1983. The company said software revenue growth has shown a compound annual growth rate of 42% over the past five years. Sales of peripherals, including the relatively unchal-

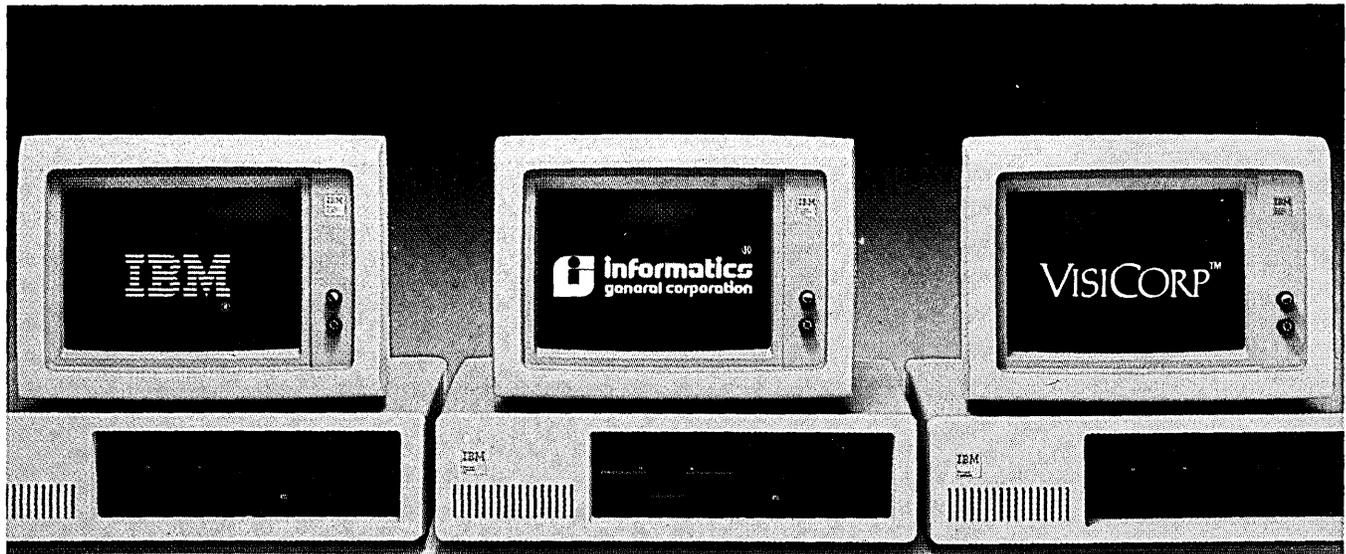
lenged 3380 disk drive, jumped 87.4% over 1982, to \$6.2 billion worldwide. In the U.S., peripherals purchases totalled \$3.67 billion, up 113.7% over the previous year, according to the report. Rental revenues for peripherals were down, however, falling 11% to \$4.78 billion, so that overall peripherals business was \$10.98 billion. That exceeded the firm's business in processors—\$10.74 billion—and office systems and workstations, at \$8.03 billion. Total revenues for the corporation were \$40.2 billion. Purchases of office systems grew nearly 60% over 1982, the company said, noting that in that category are included the PC line and small computers of other types. Rentals of office machinery, however, fell 18%, giving that segment an overall growth rate of only 24.5% over 1982. In other information provided by the annual report, it was learned that IBM Credit Corp. bought \$848 million in installment purchase agreements from IBM in 1983 as well as \$334 million in products for term-lease customers. The company also revealed that it invested \$588 million last year in program product development.

BIG BUY: Electronic Data Systems Corp., Dallas, has won a \$350 million, 8-year contract to supply the Navy with computing services under what is called the Inventory Control Points project. The deal involves 15 IBM 3081 mainframes, 54 smaller computers, and a variety of software packages. EDS won the contract over Sperry and Honeywell, which were eliminated during benchmarking competition. IBM is also to provide disk and tape drives and up to 6,850 model 3178 crt terminals, according to an EDS spokesman. EDS will act as an integrator, combining equipment and software from some 20 vendors, including Cullinet, Applied Data Research, Pace Applied Technology, and Harris Corp. The mainframes and small computers will replace many systems already in use at the Navy's Aviation Supply Office in Philadelphia and the Ships Parts Control Center in Mechanicsburg, Pa. Meanwhile, EDS has sued the state of Kentucky for \$12 million, charging that the state wrongfully terminated a \$27.5 million contract with EDS. The contract was for automation of a food stamp program and was awarded last May. The state has claimed EDS did not have an IBM 4341-based system up and running sufficiently by a deadline of Dec. 1, 1983. EDS has charged that "understandings" it had with previous state officials were not executed after a change in state government.

JAPANESE DEAL: NEC and Honeywell were expected to sign a 10-year oem agreement giving Honeywell access to NEC's large-scale mainframes for marketing in the U.S. and perhaps other countries. For the first five years of the contract NEC will sup-

ply 150 of its S 1000 mainframes, after which follow-on models will be shipped. The deal would follow a year or so of reported talks between the two companies about marketing of NEC hardware. Honeywell has apparently had a hard time developing large-scale machines and is eager to sign on with NEC. Ironically, NEC was once a licensee of Honeywell's mainframe technology. The talks came to light last year after it was learned that General Electric Information Services Co. (GEISCO), which is a large Honeywell user, was considering switching to NEC machines. GE is a large user of Honeywell mainframe gear, both in its timesharing subsidiary and in other corporate divisions.

CRTS AND HEALTH: The issue of alleged health hazards from crt terminals continues to simmer, the latest fuel being a claim by 9 to 5, the National Association of Working Women, that a cluster of pregnancy problems has been discovered among crt operators at United Airlines. Meanwhile, computer industry and other trade groups have strengthened their efforts to block local and state legislation that would regulate employers' use of the machines. The 9 to 5 group, based in Cleveland, has called on the National Institute for Occupational Safety and Health (NIOSH) to begin a "full and immediate investigation" of the United Airlines situation. The labor group claims its vdt hotline, a toll-free number that collected some 6,000 calls in six months, helped identify a suspicious group of abnormal pregnancies among workers who sit at crts from seven to 10 hours a day at the airline's San Francisco reservation center. While 9 to 5 says it has no solid evidence that crts emit dangerous radiation, the labor union claims the crt issue is causing "widespread anxiety" among female and male workers and that "offices are clearly turning into factories." Crts "exaggerate" automation's negative effects and contribute to office stress, the group said at a New York press conference which drew national television coverage. 9 to 5 said it had not received any comment from NIOSH, which it had also called upon to begin a national tracking effort on crt-related complaints. To counter 9 to 5's efforts, computer trade group CBEMA, the American Banking, American Electronics, Air Transport, and American Insurance Associations have banded together to fight proposed crt regulation bills in state legislatures. Sources say their efforts have been particularly forceful in Ohio where a bill is being readied that would require minimal ergonomic standards for crt operators. CBEMA, whose members include IBM, Honeywell, Sperry, and many other leading manufacturers, has formed the Information Age Institute whose mission, among other things, is to propagate the trade group's stand on the crt issue.



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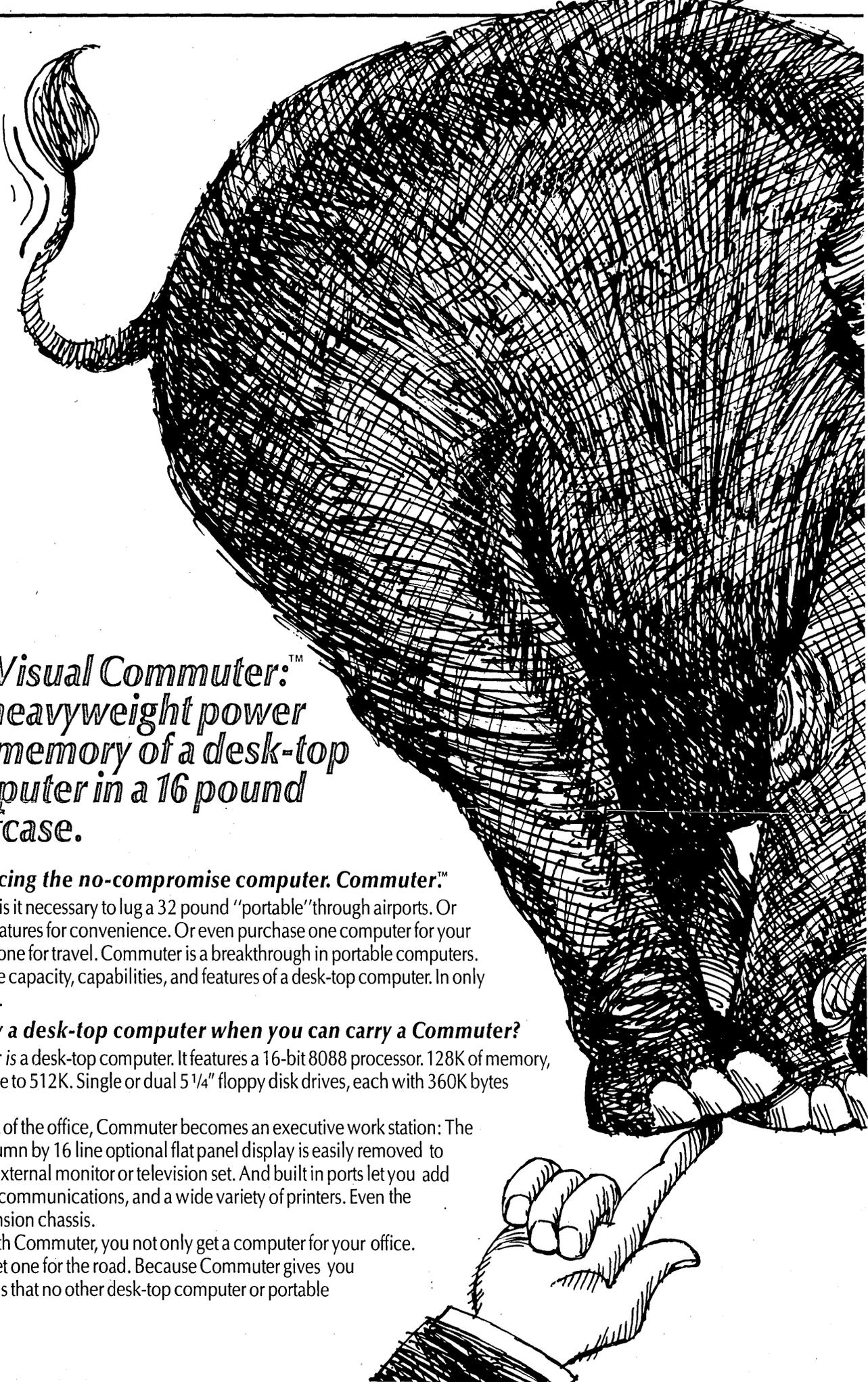
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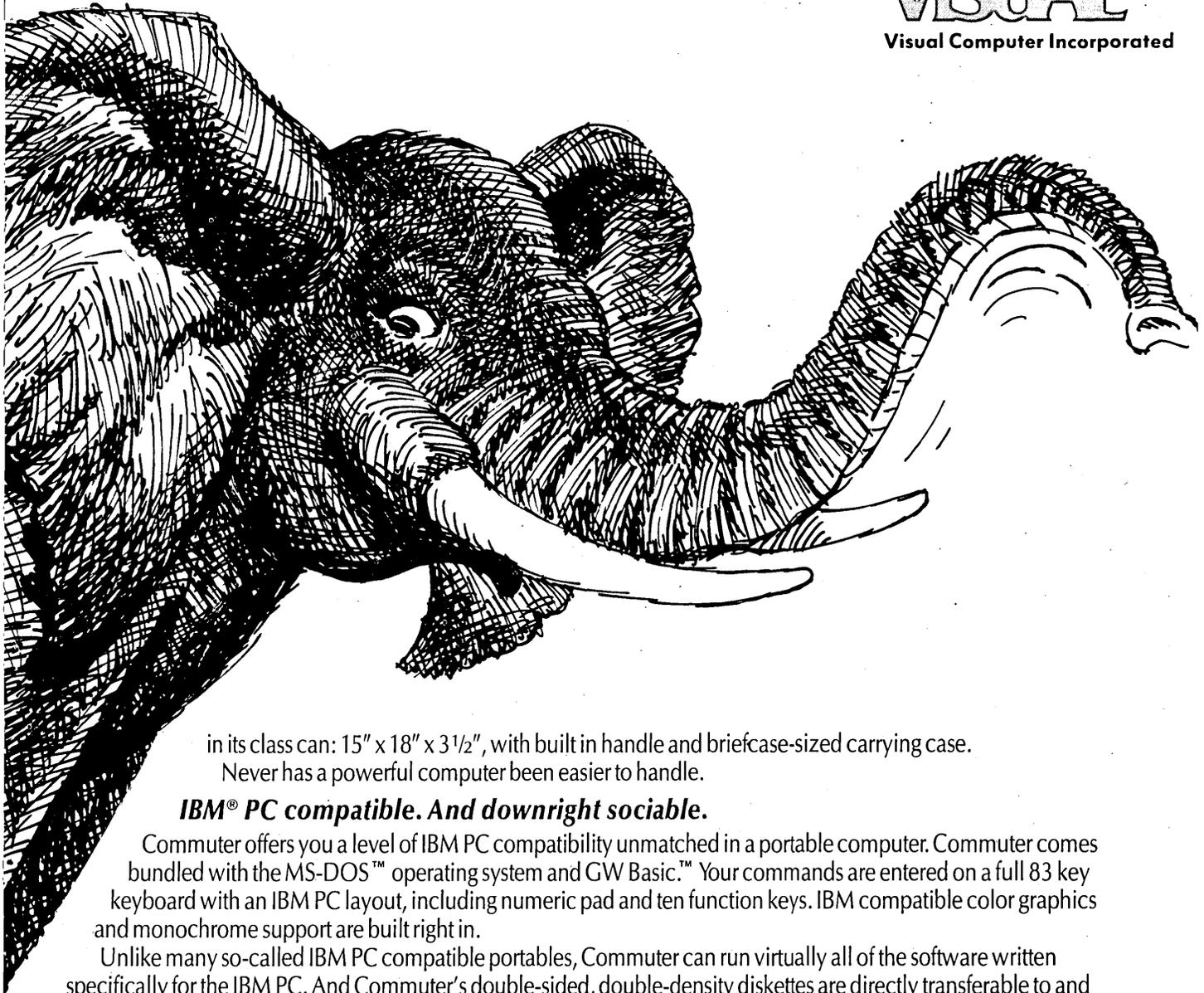
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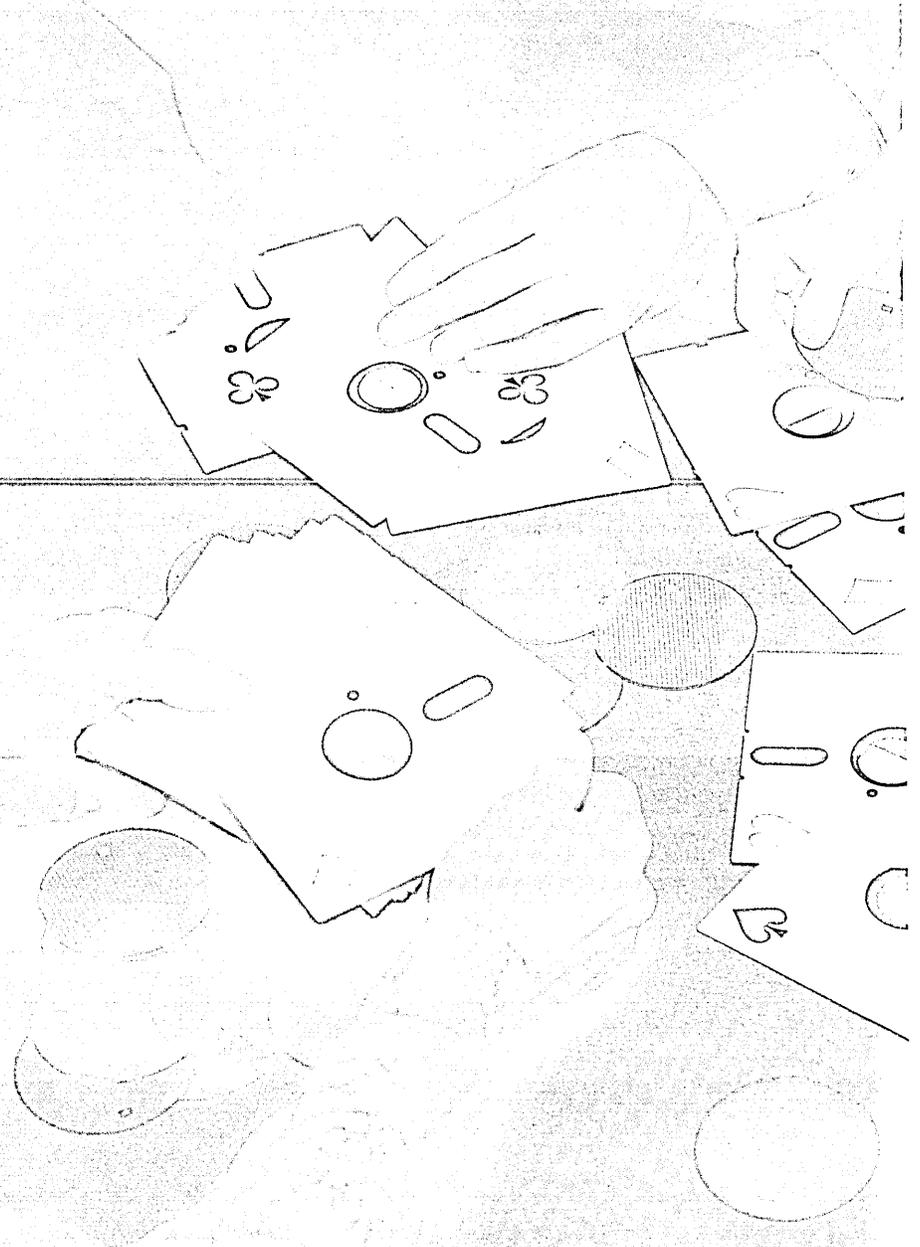
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CIRCLE 37 ON READER CARD





Micro managers have been appointed mainly to contend with craziness.

partment was being bombarded with questions about micros. Many of the brokers were charging ahead, buying their own personal computers and then asking corporate headquarters for advice and support. Some of Shearson's top producers reported spending 200 hours becoming familiar with pcs before making a purchase decision.

But there was no way to measure the depth of interest until Jack Weingarten was hired to head a new department called Advanced Technology. Weingarten, formerly in charge of office automation at Chase Manhattan Bank, decided his first task should be to send out a discrete questionnaire to Shearson's branch managers: "Do you own a personal computer?" "Are you interested in buying a personal computer?" He was flabbergasted by the reaction he got. Demand for personal computers, which had been simmering for months, suddenly "went through the roof," Weingarten recalls.

"We didn't even send the survey directly to the brokers," he says. "We were afraid of generating too much interest."

As it happened, however, Shearson's 4,500 brokers got wind of it. Shearson organized a discount buying program, and by the end of 1983, some 350 brokers had ordered IBM PCs. By early 1984, orders were pouring in at a rate of three a day, with as many as 20 orders waiting on Weingarten's desk some Monday mornings. And the department was getting as many as 125 calls a day from users needing support.

That level of response is far from unique. Microcomputers have arrived at large companies, and they've brought plenty of baggage. MIS departments are discovering that they need people who can answer questions from users and would-be users; separate the fly-by-night suppliers from the reliable ones; write policy and strategy for long-range integration of micros with companywide systems; recommend hardware and software; make training films and other aids for new users; write and rewrite communications software; and cope with the politics that accompany the micro revolution.

It is a fruit salad of duties, which is one reason why micro managers come from all walks of life, including purchasing, vending, consulting, data processing, engineering, and business school. There are even a few who started in the stereotypic basement bestrewn with Apple components.

SEEKING A MICRO MANAGER

In fact, employers often don't know what talents they seek when hiring a micro manager, says Irene S. Nesbit, a consultant in Princeton, N.J., who has observed the phenomenon in large corporations. "They specify three or four

START THE PRESSES

As soon as a person falls in love, it seems, the first thing he or she wants to do is tell the world about it. One good way to do this is with a newsletter.

In-house microcomputer newsletters are usually put together by the micro manager, with the help of some of the company's personal computing enthusiasts. Styles range from patchwork photocopy to corporate slick. Comments differ too; where one starts at the beginning (with the question, "What is a personal computer, anyway?"), another starts at the intermediate level by reporting on whether "all floppy disks are created equal."

Several letters feature advice columnists. "My Apple II sometimes gives me I/O Error messages for no apparent reasons," writes one frustrated user. The columnist's advice is to overcome the Apple's moodiness by stripping it down.

Inevitably, hearts get hung on sleeves in the classified section, with its cryptic messages of unrequited affection ("Hayes Smartmodem for sale. Used six times.") The classifieds also have their share of solicitations—veiled ("We're very excited about our IBM PC and we'd like to hear from anyone else who shares our interests.") and unveiled ("Lust for List").

In addition, the newsletters provide

a forum for constructive criticism of the micro industry. "The demo shows some graphics," reads one evaluation. "It is unclear how this is done, as neither the primer nor the reference has any reference to graphing." The reviewer goes on to note that "the documentation is inadequate. There is a reference manual that instantly irritates. It is poorly bound with a plastic spine and has insufficient white space to be comfortable to read. Most of all, there is not enough information. . . ." Are you listening, software vendors?

Finally, there are brickbats for uncooperative retailers: "In at least one instance [the store] has refused to honor the employee discount. According to an employee [the store] had taken her order for an IBM PC in April, citing delivery in June. Early in June she was notified that her computer was coming in, but would only be available if she paid full price. [The store] claimed its action was taken because the company had not paid any of its computer bills since January. This was refuted by the company controller, who stated that 50% of the outstanding bills had been paid. Is it likely that retailers are unwilling to honor the discount because IBM PCs have proved hard to get and they are able to sell them at full price?" —T.M.E.

years' experience," she says, "but experience in what? Traditional dp experience would be helpful, but ultimately the job might not fit into the traditional MIS department."

For instance, Jonathan Copulsky was until recently manager of information services at Time Inc.'s corporate manufacturing and distribution division. His background is in financial planning, and he was first hired by Time to work in the controller's office. Copulsky reported to the director of finance and administration for the division, but worked closely with managers on all facets of their information needs, often coordinating with MIS on projects.

His duties were myriad: editing a personal computer newsletter; working with MIS in planning and implementing all systems in his division, from mainframes to micros; and helping to train and support people who use terminals and standalone computers.

In 1983, Copulsky used Lotus 1-2-3 to replace the division's budget and estimating system. A PCOX package (hardware and software from CXI Inc., Cupertino, Calif.) enables budgeters to move data between micro and mainframe. Copulsky estimates that the new system can save Time Inc. about \$250,000 in annual timesharing costs.

Copulsky was recently promoted to the position of director of business technology. He advises Time Inc.'s magazine group on the management of information resources, and continues to work with micro users.

An MBA from Stanford, Copulsky came to the job without formal technical training. In fact, most micro managers say a dp or MIS background is useful, but not necessary. What does seem to be necessary is the ability to keep your head when all about you are losing theirs.

"What do micro managers do? Go crazy," laughs James Haner, founder of the Microcomputer Management Association in Los Angeles, a year-old professional group. Haner, a certified data processor who now is an independent consultant, formerly worked as manager of office automation for a large financial institution.

Haner's point is that micro managers have been appointed mainly to contend with craziness. Impatient personal computer users have wreaked havoc with corporate planning, and most companies are having to react quickly to a situation not of their making. Some companies are only reluctantly going along with the micro craze, although their reluctance has not dampened enthusiasm.

E.F. Hutton's attitude typifies the

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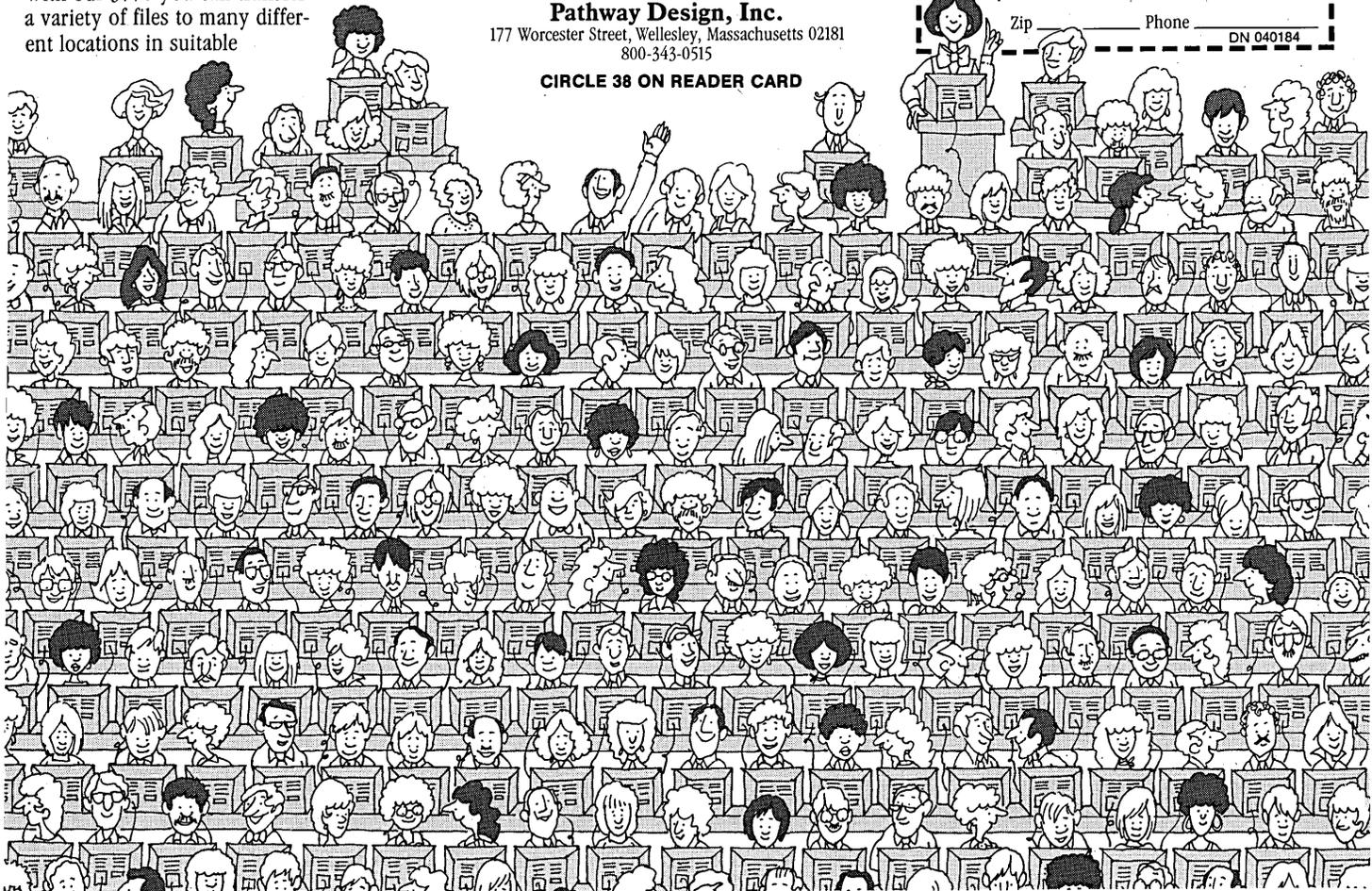
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CIRCLE 38 ON READER CARD



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CIRCLE 39 ON READER CARD

The growing complexity of the industry may be making the micro manager's job more technical.

grudging approach ("Office Automation Without Micros," Nov., p. 176). The company did not endorse or purchase personal computers, but was nevertheless forced to set up a department to help support brokers in the field who had made the leap, according to Lee Greenhouse, who was hired by the MIS department to deal with the swelling ranks of micromaniacs.

"The firm is a believer in the personal computer as a tool of last resort," says Greenhouse. What Hutton had in mind was a \$40 million branch information processing system, built around Data General minicomputers. Hutton's communications people spent two years analyzing the company's needs and planning the system. Users in the field, however, couldn't wait for its implementation.

"We've been steering people away from standalone computers. But we have to deal with the people who have a need in advance of what the firm's been doing," says Greenhouse, who was formerly an independent consultant specializing in strategic planning. While Hutton develops its integrated BIPS, Greenhouse is busy putting out fires—operating a micro support center, publishing a newsletter, evaluating micro products, helping gung-ho computer buyers to come to terms with the real capabilities of the micros.

Brokerage firms are in the vanguard when it comes to dealing with the personal computer explosion, because their field representatives are independent and fairly sophisticated, and the industry has an insatiable hunger for number-crunching. But they are hardly alone.

Marty Butler was an independent vendor selling micro products to big companies when he noticed the trend toward the corporate micro manager. When he began calling around Boston, trying to gauge the degree of interest in forming a micro managers' professional group, he was surprised at the response. Butler discovered micro managers at virtually every type of manufacturing and service firm.

Butler's Microcomputer Manager's Association now boasts 85 members who meet monthly to discuss management issues—the care and training of executives, data security, and that all-encompassing issue, control. It is similar to, but independent of, micro management groups in New York and Los Angeles.

IT'S NOT A USERS' GROUP

"It's definitely a management group, not a users' group," Butler explains. "For instance, we had a guy from United Technologies come and tell us how they cope with micros. We wanted more input from the manufacturing compa-

nies, to try to keep a balance among the membership."

Butler has since quit selling micro products and devoted himself full time to the MMA. He arranges meetings and seminars and is working on an electronic bulletin board for MMA members. Most likely the board will be used to extend discussions on issues of most concern to micro managers: integration, standards, security, training, and, inevitably, the relationship with MIS.

The 85 or so members of the Boston MMA, Butler says, all work for large corporations. Not all of them, however, come from the MIS department.

"I've seen it every way," Butler says. "A few have many years' experience in corporate, some have a data processing background. Then there's the person with the Apple at home, who just seemed to know all about micros when everybody started asking about them."

"Most report to the MIS director," Butler continues. "When the micro manager is hired from the top, there doesn't seem to be much competition within MIS. When that's not the case, there is friction."

Nesbit says the friction results from a struggle for control. "Every Monday the boss says to the MIS department, 'You're controlling these things, aren't you? You've got to control these micros.'" If the situation with micros does get out of hand, MIS inevitably gets the blame, Nesbit points out.

The control issue appears in a variety of guises. First of all, the micro manager must control the diversity of equipment, and impose some sort of conformity on the users. As Greenhouse pointed out in his first issue of the Hutton Personal Computing newsletter: "It is crucial that we take a 'system' approach—not a haphazard 'shotgun' approach."

For most micro managers, systemization means recommending a product. For example, Philip Druck was hired at Morgan Stanley by the MIS department. His title is manager of microcomputers, and one of his first actions was to recommend the IBM PC—in a company where some 50 Apples already were installed.

Similarly, Shearson's Weingarten quickly recommended the IBM Personal Computer, for two reasons: to take advantage of the plethora of compatible products and to negotiate volume discounts from IBM.

Those economies of scale are important. Originally thought of almost as novelties, personal computers and peripherals have begun to show up on the bottom line, says Druck, who recently resigned from Morgan Stanley to form his own company. "Two years ago, corporations fooled themselves into thinking that personal computing was

inexpensive," he says. "Now, with the number of peripherals needed and personal computers becoming bigger-ticket items, it is clear it is not."

Cost justification remains a sticky point, most micro managers say. "I find it difficult to cost-justify purchases of micros," Copulsky admits. "But there's an intuitive sense that they're very valuable."

Another way of controlling micros is to initiate an evaluation program. Having an expert evaluate products, micro managers point out, cuts down on the time and the number of errors that result from users' efforts to sort their way among the thousands of products on the market. Most micro managers have at least been able to recommend one or two hardware manufacturers. But sifting one's way through the innumerable applications packages and peripheral products on the market is a full-time job in itself, as Druck learned.

ASSESSING SOFTWARE IS WORSE

"Mixing and matching components is almost like programming," Druck notes. And assessing software can be worse. "Many products don't work," he complains. "Some products that are advertised aren't available yet, or when you call a company you find its phone has been disconnected." The task of evaluating software and hardware gets more complex every year, Druck continues, as a variety of products pours into the marketplace, many more of them now compatible with the leading vendors' products.

The growing complexity of the industry may also be making the micro manager's job more technical. Druck has degrees in electrical engineering and computer science, but many of his counterparts have little or no formal training. "A lot of so-called technical questions are simply questions of compatibility," maintains Hutton's Greenhouse, who admits that his technical training consisted of little more than "cocktail party talk."

Druck, by contrast, was involved with many aspects of corporate automation at Morgan Stanley, and has found this background useful. "Some technical experience is useful in giving the end user a good understanding of why we do things the way we do," he explains. "Training is sometimes necessary in order to understand the implications in certain advertisements."

The job may also call for some financial training or MIS background, suggests Time Inc.'s Copulsky. "A lot of people don't develop the proper audits and controls," he points out.

If the micro manager has to be a jack-of-all-trades, it appears that "politician" is one of his titles. For Druck and his colleagues



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CIRCLE 40 ON READER CARD

"I'm committed to getting the best solution with whatever tool is necessary to get it."

have found themselves caught up in an old debate: to what extent should computing belong "to the people"? Or, as MIS might rephrase it: to what extent should computing devices breed, uncontrolled, costing the company money and valuable time in the march toward total office (and factory) automation? Many MIS directors contend that valuable databases are misused and expensive purchases rendered useless when neophytes try to design and implement their own microcomputer systems.

"It reminds me of the analog-digital debate we used to hear when I worked at Bell Labs," muses Phil Druck. "Although digital had clearly proved its superiority—at least to

me—there were always lots of studies that justified the use of analog . . . just because more people were familiar with analog." Druck believes that as microcomputers become more entrenched in MIS departments, arguments against them will gradually disappear. But in the meantime, the debate can be almost shrill.

The central point many micro managers stress is that computing has become a common tool, and that MIS departments should be helping to spread the religion, not ban it. "Lots of companies want to handle micros like traditional data processing—hands off," says James Haner of the Los Angeles MMA. "That definitely won't work.

It's got to be open, hands on. People are going to do it anyway, with or without MIS or dp approval.

"Any MIS director who can't learn from the last two revolutions in computing is dead," Haner asserts flatly. "Senior management reads the *Wall Street Journal*, the *Los Angeles Times*. They know what's going on. If you're a guy holding it all back, they know it."

Traditionally, says consultant Irene Nesbit, MIS's reaction has been that they can do it better on a mainframe. "Well, how many users have mainframes?" she laughs. "It's MIS's problem to make it all work together." When MIS argues for a companywide systems approach, users lose their patience. "We'd wait until the year 2000," they retort. "If it were up to MIS, we still wouldn't have word processing. We'd be waiting for MIS to develop a strategic plan."

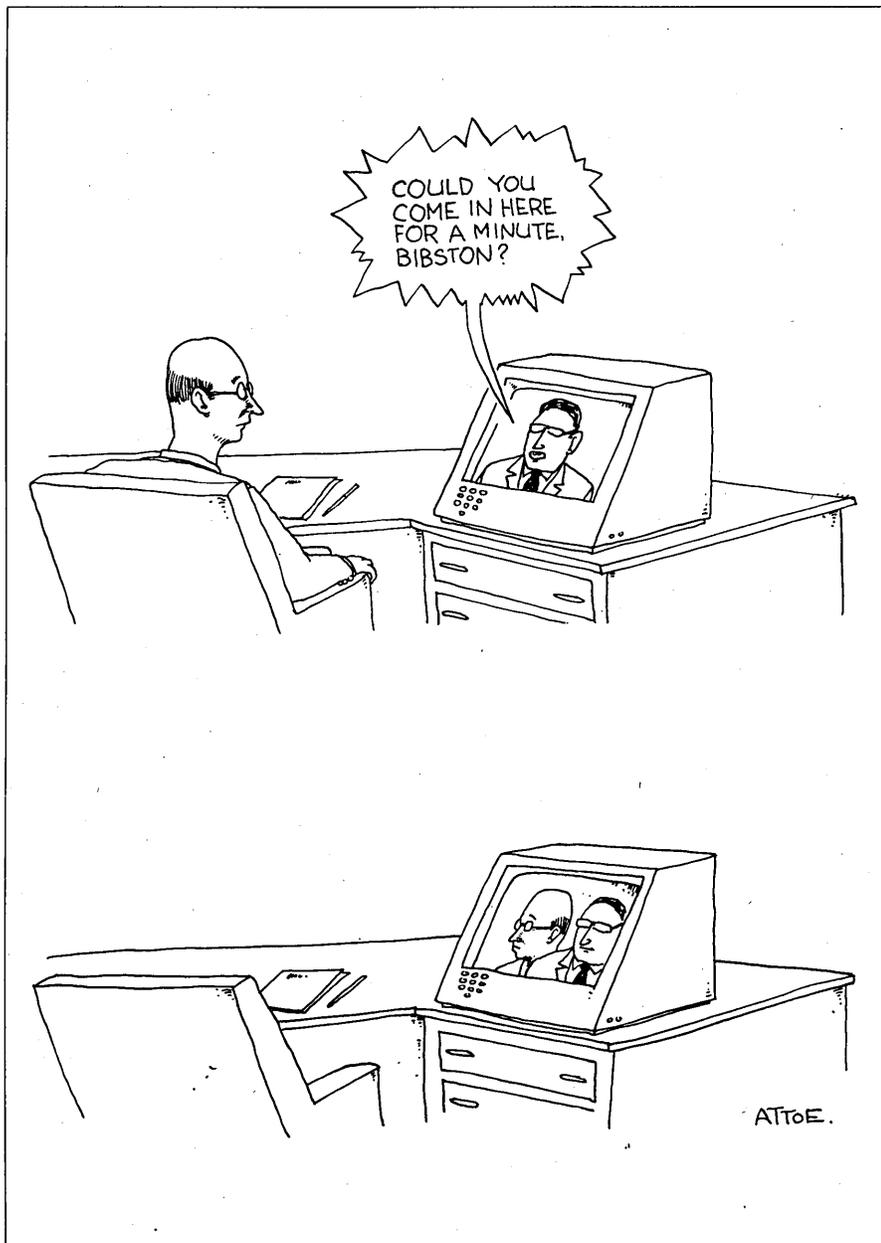
MICRO IS JUST ONE TOOL

"It depends on which neighborhood you're from," says Lee Greenhouse of Hutton. "If you're part of the systems department, as I am, you see micros as just one of the tools at hand. If you're a creature of the new micro age, your job and your integrity are based on your ability to do an end-run around the systems department. I'm committed to getting the best solution with whatever tool is necessary to get it."

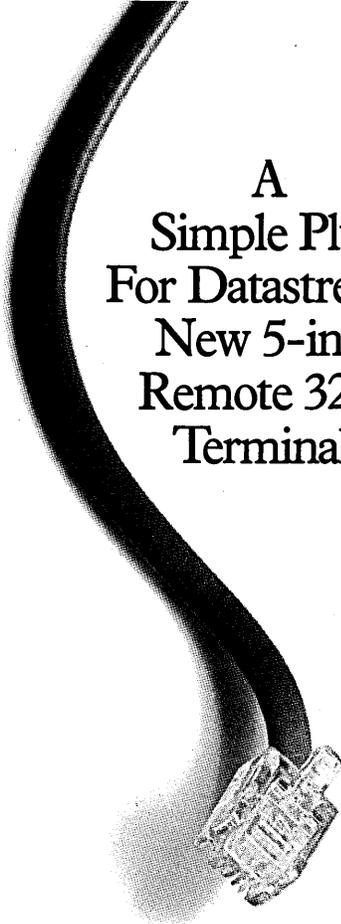
Although Phil Druck sympathizes with the "creature of the micro age," he believes that microcomputer managers tend not to have enough background in MIS. At a recent seminar on personal computers, he noticed that most attendees seemed to have more administrative experience than technical. To close that gap, it is important that the micro manager work closely with MIS, Druck believes.

But that kind of cooperation, while technically logical, can sometimes be politically difficult. The micro manager may find himself trapped between MIS, with its traditional concern for control, and users who want to move quickly. Alan Gross, founder of the Microcomputer Manager's Association in New York, tells of discussions at MMA meetings in which "people with the least connection to MIS seem to have had the most success. They have a greater degree of freedom to react to situations." Gross, a former micro manager at International Paper, is currently a member of the Technology Planning Group at Smith Barney, the New York brokerage firm. He reports that his micro managerial responsibilities mesh well with Smith Barney's MIS function.

Many micro managers are easily persuaded to leave the corporation and become



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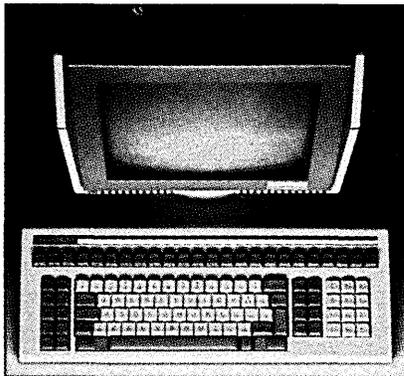
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CIRCLE 41 ON READER CARD

The emphasis of both the MIS department and the micro manager should be on delivering services.

independent vendors and consultants, as Haner and Druck have done. Job-hopping is common, says Phil Druck. "Technical people are not well managed in a dp environment," is part of his explanation.

A micro manager's function, he adds, is not well understood. "Traditional dp people will tend to fall back on old solutions—timesharing, for example, instead of local networks."

In addition, says consultant Nesbit, the pay scale is not high for micro managers, with compensation close to the level of programmers. As the job load gets heavier, however, and micros become more acceptable in large corporations, recognition may follow. Before any growing can be done, Nesbit emphasizes, MIS departments must learn to cooperate better.

"Some MIS people wonder, 'Is this the kind of thing MIS should be doing?'" Nesbit says. "The role of the microcomputer manager might not fit into the traditional MIS department, but the emphasis in both cases should be on delivering services. Control is important; they should set up training centers and support centers. Start a newsletter. Ex-

plain why we chose this particular package. Hold seminars."

Office politics is only one challenge micro managers face as employees trample each other and the MIS department in their rush to join the computer revolution. While most managers have heretofore spent much of their time worrying about getting people started, they can discern heavier issues just over the horizon.

One of those issues is security. As soon as a user is familiar with his personal computer, say managers at large financial companies, he wants to dip into the company's database. "Mainframe-micro products should have security precautions built in," says Nesbit. But ultimately solutions will have to be generated by political consensus as well as technology.

Another, more urgent issue is support. After he recommends a system to a broker, Weingarten of Shearson-Amex finds his job has just begun. The department has prepared a training film to help users get started; after they've begun, they start asking questions. "Which software package is best for this job?" "How do I use Lotus 1-2-3?"

"Why won't my printer work?"

On a typical day, Weingarten's department might field 125 such questions. His staff has its hands full with answering the questions of 350 users, Weingarten says; he would need dozens of staffers to support the entire 4,500 brokers.

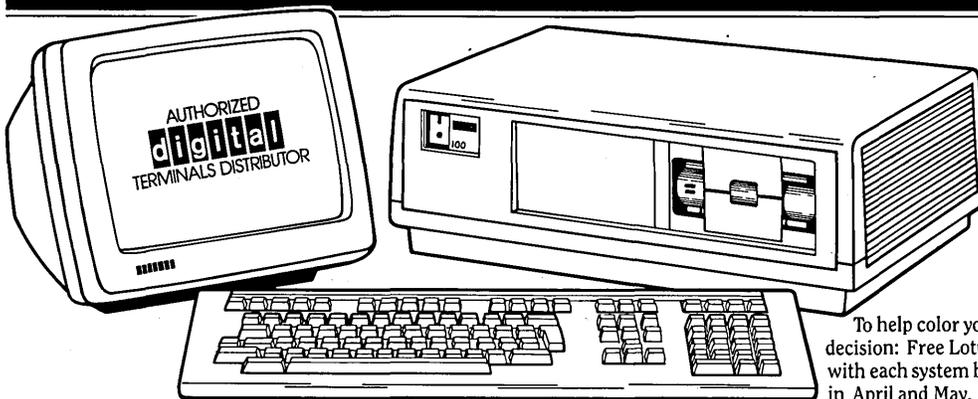
"It is difficult to support the diversity of users," nods Irene Nesbit. In most big companies, the micro manager knows the job has just begun. "If MIS offered support, it would have control," Nesbit predicts. "It might as well, because the activity on the pc side is not going to go away."

On that point, the debate ends. Both MIS directors and the micro marshalls agree: personal computers have arrived in the corporate world, and they are here to stay. Can these two combine to bring order to the current wild-West situation? For corporate management, the only acceptable answer is yes. But they'd do well to remember that the West wasn't won overnight. *

Theresa Engstrom recently became a staff reporter in the *Wall Street Journal's* Boston bureau.

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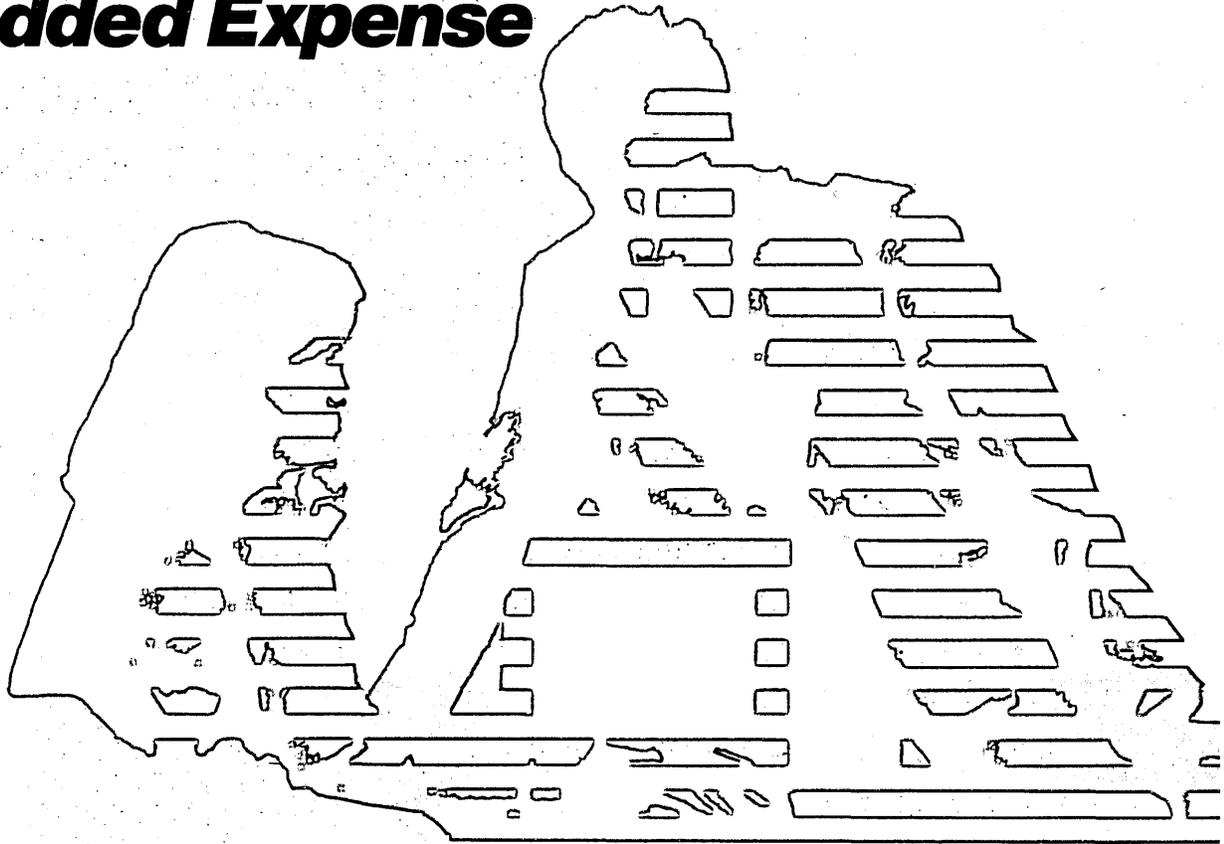
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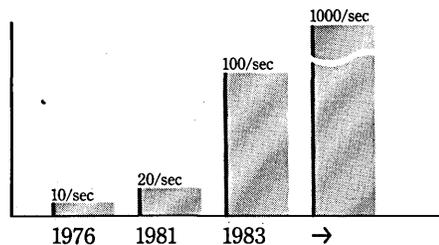
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It's built around multiple parallel 32-bit processors. Each addressing 16 MB of physical memory and over a gigabyte of virtual memory.

To help memory keep pace with that kind of processing, TXP pulls 64 bits on each memory access.

The TXP system also features parallel data paths. Manipulating 32 bits of information in a single cycle, two 16-bit operations in the same cycle.



Our success can be summed up in a second. Transactions per second. Numbers unsurpassed in the industry. On-line systems that fit your needs today. And tomorrow. With more processing power on the way.

And TXP incorporates extensive pipelining, to process multiple instructions simultaneously. Each processor overlaps instructions in three levels: Fetching one, while preprocessing a second, while executing a third.

While helping TXP deliver full 32-bit power, for less.

Cache memory pays off in faster response times.

Cache memory is a high-speed data storage area between the processor and main memory. It lets the processor store more frequently used information closer.

So it can get to it faster.

And our tests have shown that the TXP cache memory has a 98% "hit rate." Which means the requested data is virtually always nearby for fast access.

The result? Larger volumes of work can be processed in shorter amounts of time. Helping TXP to be even more productive.

Making cache memory pay big dividends.

A system you'll expand, not disband.

Most computer systems have very limited expandability. So if a company outgrows its computer's capacity, it usually means starting again from scratch.

Selecting and buying a larger and more expensive system.

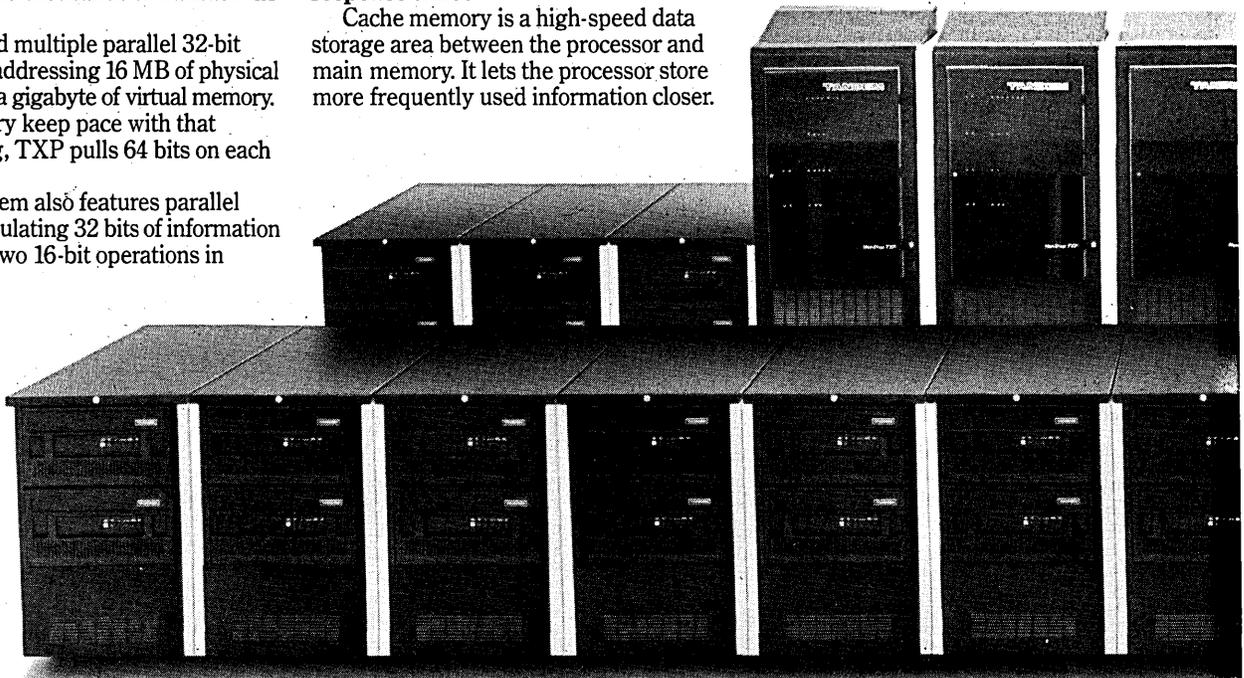
Then reprogramming.

Then re-training.

Plus all the chaotic disruption and massive loss of revenue that's unavoidable during the switch-over.

Not so with the TXP system.

It can expand from two to 16 processors.



NP

computer in business today.

Increasing its power by a factor of eight.

That's more power than any of the largest mainframes.

And the additional processors can be installed while TXP is running at full speed. No downtime. No reprogramming.

Still not enough power? Up to 14 TXP systems can be joined together by high-speed fiber optics. Linking the systems together as one computer with 224 processors.

But that still isn't the full potential of the TXP.

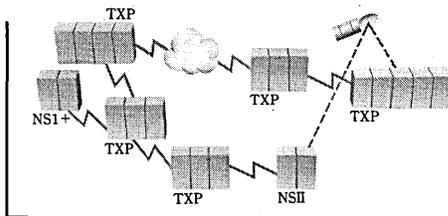
TXP systems at up to 255 sites can be joined in a worldwide network. Generating the power of over 4,000 processors.

And that gives TXP the most powerful on-line computer capacity in business.

Expandability our competition wishes they could disband.

NonStop™ system compatibility from the people who started it all.

TXP can process more information and support more programs, users and devices than



The most powerful computer network in business today. Users access a single unified global data base from any of thousands of terminals anywhere in the system.

any other computer designed for on-line transaction processing.

Devices you most likely already have. Even devices made by IBM.

But what if your company isn't quite ready for the TXP system's awesome power?

We suggest the Tandem NonStop II™ system. The second most powerful on-line computer in business today. The cost effective solution for medium to large corporations.

What if your company is somewhere between a NonStop II and a TXP?

No problem. They can be combined. They can share the same data and programs. In fact, NonStop II and TXP

processors can coexist in the same cabinets.

And what if your company needs even a smaller computer?

We make a smaller computer. The Tandem NonStop 1+ system. Perfect for those low-volume sites where less processing power is needed.

Tandem literally wrote the book on NonStop™ transaction processing. That's because we introduced the first NonStop system.

Over eight years ago.

And for over eight straight years, despite attempts by others, we've continued to lead the industry.

Learn all about TXP, ASAP.

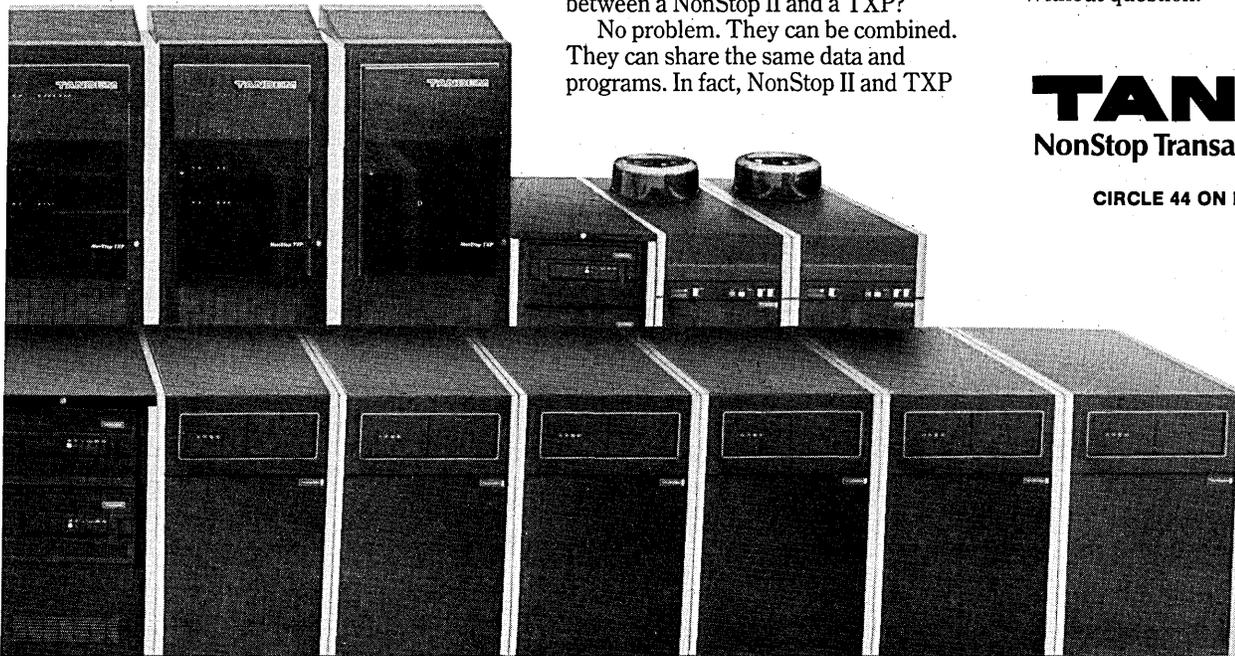
For complete literature, contact your local Tandem Sales Office.

Or write Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014.

Or call us, toll-free. (800) 482-6336.

TXP is the most powerful on-line computer in business today.

Without question.



TANDEM

NonStop Transaction Processing

CIRCLE 44 ON READER CARD

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WITH STATISTICAL MULTIPLEXING IS HERE!**

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With intelligent autodialing, the CDS 224® Superduplex makes any terminal look smart.

communications to a new level of performance, while cutting costs like never before.

The CDS 224 Superduplex modem's three port statistical multiplexer eliminates transmission errors and keeps costs low by allowing multiple asynchronous terminals to share a single dial telephone line. Data compression and adaptive priority setting techniques maximize throughput while ensuring that interactive traffic takes precedence over batch. Sophisticated ARQ error correcting power makes Superduplex the only dial line modem that will guarantee your data *error free* at speeds of 2400bps full duplex.

The CDS 224 Superduplex modem combines next generation technology with user-friendly engineering. Keyboard commands allow you to configure individual ports for character format, flow control and DTE speeds of 50 to 9600bps. Or you can use the

modem's autobaud feature which automatically adapts the speed of the multiplexer to match your DTE.

The CDS 224 Superduplex autodialer places and redials any access or telephone number using interactive keyboard instructions or software commands. Compatible with any personal computer, minicomputer, mainframe system and all long distance telephone services, the CDS 224 Superduplex modem lets your terminals transmit data unattended so you can take advantage of lower rates during off-peak telephone hours.

Like all CDS 224 modems, the CDS 224 Superduplex operates at 2400bps with Bell 212A compatible fallback. It fully complies with CCITT recommendations and supports HDLC, SDLC, X.25 and all other communications protocols.

So why pay for costly leased line data communications when the CDS 224 Superduplex modem gives you three port multiplexing, autodialing convenience *and* error free 2400bps full duplex transmission on one low-cost telephone line.

To order your Superduplex modem call or write Concord Data Systems, 303 Bear Hill Road, Waltham, MA 02154, (617) 890-1394, Telex: 95-1793 or contact us for the name of your nearest CDS distributor today.

The CDS 224® Superduplex modem cuts costs with three port multiplexing over ordinary telephone lines.



**CONCORD
DATA SYSTEMS**

LINKING COMMUNICATIONS TECHNOLOGIES

IBM's PC has engendered a new breed of user group; they don't have the impact of SHARE or GUIDE yet, but that may change.

UNITED WE STAND

by Edith Myers

Back in 1955, Frank Wagner and Jack Strong, then with North American Aviation, and Paul Armer, employed by the Rand Corp., decided to band together and push for standards for the IBM 704.

This marked the beginning of the first IBM user group, SHARE, which held its initial meeting in August 1955 with 17 members present. Today, SHARE has 1,700 member companies, institutions, or government agencies. "We call them enterprises," said Bill Butterfield, of General Motors Research Laboratory, president of SHARE.

Its members are the more complex IBM sites, says Butterfield. To enter SHARE, you must have at least one IBM computer: 4341 and up, 360 Model 44 and up, 370 Model 135 and up, or 3031 and higher.

A year after SHARE began, GUIDE was formed for users of the 4300 and above. It was founded in 1956 with 44 members and at the latest count, its member organizations number 2,500.

COMMON, for users of IBM models 34, 36, 38, and the Series 1, came on the scene in 1960 with 76 members. Today, its 2,600-plus members are also various entities, corporations, institutions, and agencies.

We know these groups were formed in hopes of influencing Big Blue, but did IBM listen? It did in the beginning. In the late '50s, SHARE was instrumental in getting IBM to adopt an outside FORTRAN assembly program as its standard (November, p. 271). And, in 1966, when IBM experienced delivery delays of 360 software and hardware, IBM board chairman Thomas J. Watson attended a SHARE meeting to explain why.

In the early '70s, SHARE and GUIDE were criticized for their decreasing influence on IBM's marketing strategies but were still

applauded for helping users cope with systems and applications complexities. "Maybe their [SHARE's and GUIDE's] influence is not as great as it used to be, but they still are needed simply to keep people abreast of change," said a onetime SHARE president, James D. Babcock, in 1974.

For many years, only these three IBM user groups existed. Their growth was steady and their membership loyal, in spite of rumors that surfaced from time to time about infighting and internal politicking.

Today though, nobody will hazard a guess as to how many IBM user groups exist. The real boom came in 1981 with announcement of the IBM PC. While no one has made an actual count, it is generally agreed there are now more than 100 user groups.

There is no formal association linking these diverse groups of individuals who have congregated to get the most out of their IBM PCs and, relatedly, out of IBM. They do, on an unstructured basis, exchange newsletters and software.

Newsletters range from a one-page rehash of last month's meeting to an ambitious 38-page job called *Micro News Letter* (Vol. 1, No. 1, Oct. 1983) put out by a group of ABC tv employees.

Does IBM listen to the groups or even notice them? The answer seems to be not much, yet, but there are great expectations. "They're beginning to listen," said Bennett Landsman, president of the Philadelphia Area IBM PC User Group. "They make mediocre products so you have to know they got where they are through support and service."

Landsman stated that "IBM calls me up once every two or three months to ask if they can do anything. They've established a hot line and a billboard." He said only group presidents can call on the hot line, which "is not for technical information, only for club

information." Another source of IBM information for Landsman's group members is technical hot line numbers established by IBM for its dealers. "We get the numbers and call using dealer names but they're constantly changing the numbers. It's an ongoing game."

Landsman, director of office systems for the Department of Human Services, State of New Jersey, says he gets a lot out of his user group activities that often helps in his job.

The Philadelphia group began in November 1981 with 20 members, and it now has 200. "We want to stay small," said Landsman. "We do a minimum of advertising." His group's membership is 60% business users, 20% people who use it for business at home, and 20% hobbyists.

GROUPS MEET PCJR

In the latter weeks of last year, IBM took its newly announced PCjr around to user groups. Landsman's was one that received the presentation in November. "They gave us the pitch and answered as many questions as they could and still keep their jobs."

Edie Windsor, a member of NYPC (the New York IBM PC Users' Group) doesn't feel PC user groups have much clout with IBM yet. "Other vendors are banging on our doors to get to make presentations, but not IBM. They do a lot of surveys of user groups but nothing happens. It's like SHARE was a million years ago."

She believes part of the problem is that IBM "still doesn't know where it [the PC] fits." She believes more cooperation will be forthcoming when IBM realizes the number of large corporations represented in PC user groups.

The New York group, founded with

"I think IBM was truly caught unaware by this wave of user needs," says the president of the San Fernando IBM PC Users Club.

30 members, has more than 1,200 today and is still growing steadily. What does it want from IBM? Among other things, software demonstrations and better documentation.

Gary B. Rohrabough, president of BorderLine IBM PC Users Group, Bellingham, Wash., said his group hasn't had any contact with IBM, "and I wish we would. We've tried with the local group but they don't know what the PC is yet. We may try Seattle," Rohrabough's group was instrumental in getting the Bellingham IBM service and support group up to speed on PC service.

Rohrabough was the "founding person" of the Bellingham group that started in February 1983 with about 13 people. "I put up notices in computer stores and called a few people I knew." A recent count shows the group has 84 members. A consulting programmer by profession, Rohrabough is now a computer store operator. His store, Soft-Source, opened its doors to sell software. "I did it because I couldn't get the software I wanted and needed." He's since added hardware to his line of goods, and sells the IBM PC and all peripherals. As of late November, his group had still not been offered a PCjr presentation.

The Manasota IBM PC Users' Group, Manasota, Fla., was to receive the pitch, per IBM's offer, on Dec. 14. In late November, Richard Reynolds, president of the group, wasn't too sure about what kind of turnout to expect. "I did a lot of research on PCjr to present to the group and when I asked at a meeting who was interested, nobody responded." He was hoping to attract non-members to the presentation by "hype in the local papers."

Reynolds's group is a year and a half old and has 90 members, but most of them are unsophisticated users, he says. "Some come just to get up to speed on what they need to know and then drop out."

Among the uncountable hordes of IBM PC user groups are a number started by the huge company itself. These are groups for IBM employees, usually under the auspices of an IBM Club set up to coordinate after-hours activities.

One of these, the IBM Club of Austin, Texas, took off a month after the PC announcement and now has 500 members. David Andrews, a club member, said it receives funding from IBM as do similar clubs wherever IBM has a "major location."

David Nussbaum, in his second year as president of the San Fernando IBM PC Users Club, North Hollywood, Calif., said he has tried very hard to have IBM make presentations to his club, usually without success. He finally received his first presentation, on PCjr, during the first week of December.

He is concerned about what he perceives as IBM's lack of support for PC users but feels "eventually they'll come around. It's like an aircraft carrier in an ocean. It needs 3½ miles to make a U-turn. I think they [IBM] were truly caught unaware by this wave of user needs."

He said members of his group have been invited to a number of "consumer testing get-togethers with the invariable reaction: 'Gee, IBM PC users are serious, IBM PC users are adult.'"

DEMANDS FOR MORE PC DATA

User groups aren't the only ones pressuring IBM for more data on the PC. Demands are also being made by SHARE, GUIDE, and COMMON, whose members have to deal with PCs in the overall dp scheme of their organizations.

"We have a very healthy PC activity," said Butterfield of SHARE. "We have an integrated PC project and we're not interested in the home hobbyist. Most of our members have acquired personal computers. They are interested in the whole area of PC use, in how it is related to the rest of dp. They want to know where the best place is to do the job. We probably have 10 ongoing programs that have something to do with PCs or workstations and this will probably double again in a year."

David Lister of COMMON said his group's conference in Phoenix last October attracted more than 1,400 attendees. "Of these, more than 500 declared an interest in the PC. There was a total of 207 sessions presented of which 23 of the most heavily attended were devoted to the PC."

"A clear trend noted," said Lister, "was the use of the PC to emulate other processors."

Lister has also noticed a major change in IBM's attitude toward COMMON. It has developed into one of openness and cooperation. "I feel this is a result of a shift in emphasis on IBM's part plus the growth of the organization."

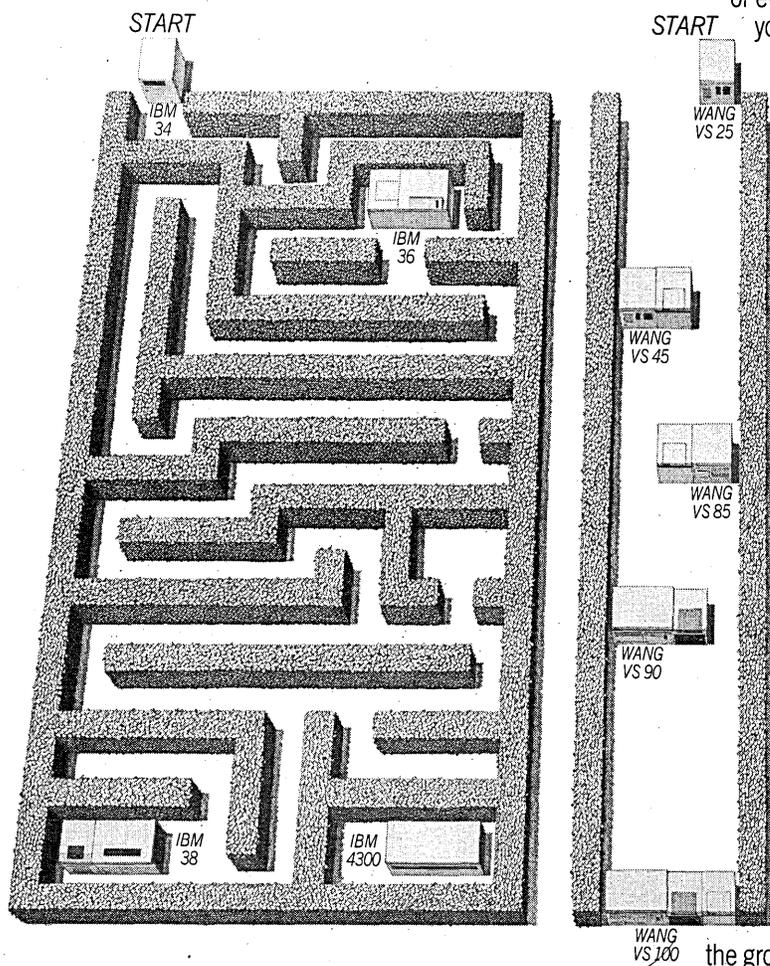
The future of smaller IBM user groups is uncertain. Some see the coming of a loose amalgamation. Windsor of the New York group feels some may "latch on to GUIDE or COMMON." For this to happen, at least in GUIDE's case, a change in membership rules would be required. COMMON, like SHARE, already allows PC users to join its ranks. *

CARTOON BY NICK HOBART



Compared to IBM, Wang has the growth path of least resistance.

If you're currently considering an IBM 34 or even a 36, consider this: where do you go from there?



To an IBM 38? Sure, if you want to spend up to 18 months converting to a different operating system, different source codes, and different software.

To an IBM 4300? The same problem again. Only magnified. Because if the IBM 34 and 36 have little in common with the IBM 38, the IBM 38 has nothing in common with the IBM 4300 (logo excepted).

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One operating system that supports the same software, utilities, and documentation. A line that's compatible from top to bottom and bottom to top. A line that's compatible with other Wang equipment as well as most mainframes, including IBM. And a line that can tie you into total office automation faster and easier than any other systems available anywhere.

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CIRCLE 46 ON READER CARD

Why are so many small computers collecting dust? Mostly because their users aren't getting proper training.

THE LONELY MICRO

by T. R. Young

The fiesta atmosphere surrounding the micro-computer market would lead one to believe the buying experience is all fun and games. But for many new owners, the experience is a personal catastrophe. They spend thousands of dollars on equipment they can't even use. These people fail because they view the micro as just another household gadget, like an electric can opener you simply plug in. To use their new, powerful tools, they need top-notch training—and fast.

Some experienced marketers and trainers report that many computers are sitting in attics rather than on desktops because the owners never learned to use them. Jo Ann Fry, microcomputing trainer and 14-year veteran of corporate systems development and training, estimates that about 25% of micro buyers have been thus frustrated. Riki Rudolph, executive vice president of Computer-Craft Learning Centers, says, "Of the early computers I sold, maybe 20% are sitting in closets, like my own parents' micro!" The *Houston Chronicle* quotes a figure of 30% to 35% microcomputer abandonments based on the experience of Allen Pritchard, vice president of General Business Services, a nationwide small business consulting firm based in Rockville, Md.

These figures refer, of course, to individuals and small business owners who usually have no prior computing experience. With such high estimates of total abandonments, it is likely that gross underutilization of the remaining micros is occurring.

What causes the disappointment? Perceptive marketing people are aware that selling a computer is selling a dream, to some extent. The buyer thinks, "If I buy this marvelous new technology, I will achieve a mastery over my environment that I never had before." Moreover, the usual selling techniques minimize the intellectual effort required to learn the new technology. These two conditions are enough to send many buyers home with boxes of gear and unwarranted expectations of wonderful new experiences. The new owner anticipates the computer will

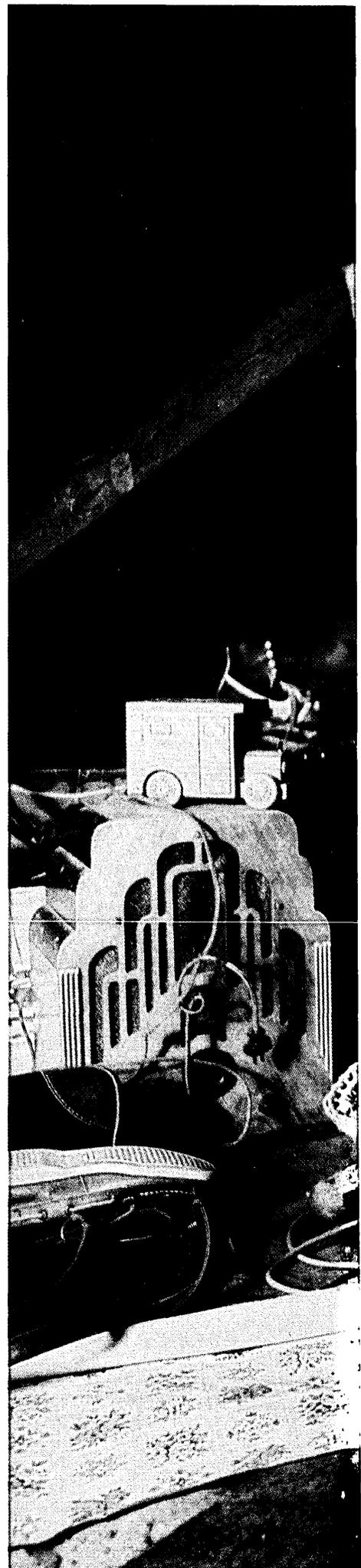
work as simply as a new toaster.

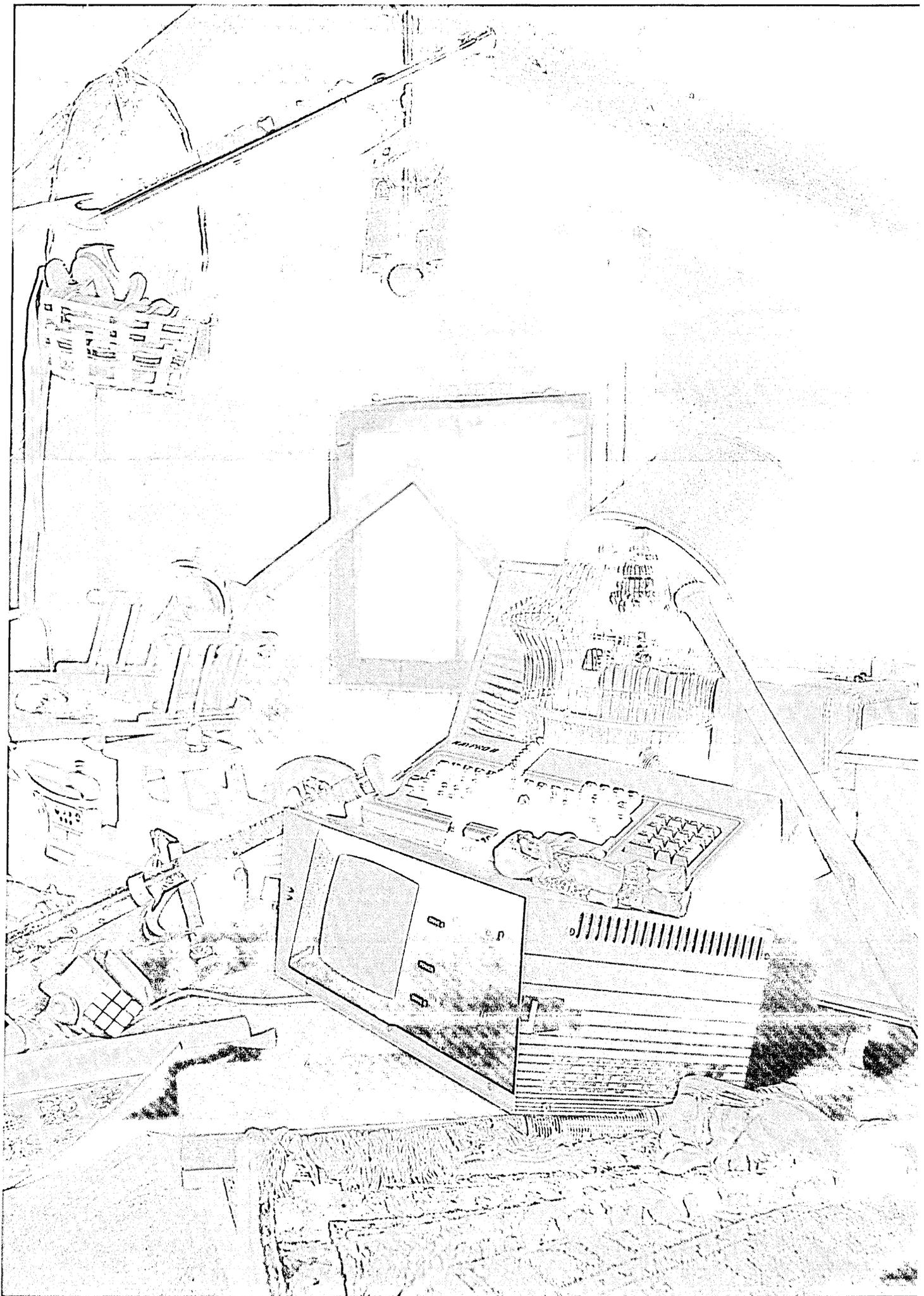
A second complication is seen in the marketplace. A year ago, buyers were computer jocks or business people. The former could hack their way through the most arcane documentation and master the system. The second group usually had a single application in mind—word processing, spreadsheet work, or possibly file management. Good packages were available, and, with dedication, the new buyer could conquer the limited application and be satisfied with it.

Many buyers, however, are still being keenly disappointed. Terry Worshek is an example. Worshek is a marine transportation services broker. He purchased a micro for his business and then bought recommended software, initially intending to handle only his accounting work. But the name-brand software didn't work for him. Worshek went back to the outfit that sold him his gear, and here's what happened: "The retailer called this guy in the support center, who supposedly designed the accounting package, and he admits, 'Oh, yes, there are some bugs in the program, but we are coming out with user update sheets. Did you get the last user updates?' " Later, Worshek found out that the store had update sheets it had never used—the program disks were full of known bugs that hadn't been corrected.

After trying to get the program to work for two months, Worshek returned it with a warning: "You guys have a choice—either give me my money back for the program, or give me my money back for the whole machine, because I'm ready to sue!" Worshek got his money back for the accounting package. He was also given a different, well-tested accounting program, presumably bug-free. To this date he has not used the new package. "I don't have two more months to put accounting information into a machine that doesn't want to take it," he says.

Worshek is currently taking micro-computer courses; he intends to continue until he has solved his problems. In the meantime, he's learned word processing and Visi-Calc in class and is happily using his computer for these applications—apparently





WHAT DO YOU GET WHEN YOU FALL IN LOVE?

I was seduced by the sight of Charlie Chaplin dancing through the business journals, lured to my downfall by Ms. Pac-Man with a bow in her hair. Alas! Do not condemn me hastily, dear reader. You who are so wise in your knowledge of the higher mysteries of RAM and ROM, have pity on an Innocent Young Businesswoman led astray by Glittering Technicolor Computer Ads.

Look at me, just 12 short months ago: a rising young executive, eager to succeed. Oh, how I chafed at the hundreds of columns of numbers, how I wearied of hours spent searching the files for past records. I dreamed of having access to the Database. But I was too junior, my tasks too insignificant, to join the select few who had been granted a Password and Terminal.

Nightly I studied the business journals, analyzing every word. What I learned was this: help was at hand! A Microcomputer would solve all my woes. I could escape the slavery of Endless Paperwork, be free of the tyranny of the Dp Department.

Immediately, I resolved to become the Hero of my Company. I would show them the way to automated heaven. No longer would we live oppressed by a Mainframe! I was going to succeed in business. I would buy my micro today. I would not be the last Executive on my block to have my very own computer.

Never once did I hesitate. Rashly I ignored the dozens of articles about analyzing needs, planning purchases—let some other poor fool miss his chance by thinking too long. I had seen the future: Onward and Upward with Microcomputers became my rallying cry.

One bright autumn day I hurried to my local computer store and bought a book. What harm in reading a bit before I purchased my machine? Obviously, information was necessary; the stores were overflowing with microcomputer texts. It would have taken 22 1/2 years to read them all. Just one book, to show me where to begin. And one magazine, for the latest products.

Four books, 27 magazines, nine computer stores, and three months later I was still looking for *the* book that would explain everything before I purchased my computer. I finally realized that each book raised more questions than it answered. And for every question there were five answers, all equally confusing, all pointing in opposing directions, and all equally wrong. (How could I ever have thought everything in computers was binary?) I would have been better off seeking advice from a for-

tune-teller.

Not having a local fortune-teller, I put on a suit and went to a computer store, determined to talk about computers with a salesman. As I had come to expect, the store was packed with people eager to buy. Perhaps my attire was at fault, for I stood in that computer store for six hours, without attracting the attention of a salesperson.

Several dozen computer stores (and a new suit) later, a salesman came over to me and said haughtily, "Do you have a question?"

A question! All I had were questions! It did not take me long to discover that no matter what questions I asked, I could not understand the answers. Whatever language salespeople appeared to be talking, no matter how familiar individual words may have seemed, I know now that, as the First Law of Computers states, Computer People Do Not Talk English.

Books were out; salesmen were out. Perhaps the best way to learn about computers would be to try one. I spent five months searching for computers to try. When I found one, I was usually left to my own ingenuity to figure out how this particular machine worked. Most often, it didn't. Working computers were always tied up by kids playing Frogger.

On a fine summer day, luck smiled on me. The computer store was new, the machines all worked, and wonder of wonders, the salesman seemed eager to help. I explained my plight. He smiled, then reassured me, "We have a computer to fill every need.

"You do not seem to be a candidate for the Video Game Special (I see no teenagers loaded with game disks near) with 32K RAM, graphics monitor, joy stick, light pen, and tape drive. You must be buying your husband a present. I recommend the Hacker's Joy, two hard disks providing 10 meg storage each, monochrome and graphics monitors, and integral modem.

"For yourself, Madam! Forgive me. We get so few women buying computers for themselves, even fewer seeking business machines. I know just the computer," he said, showing me a glossy ad.

"The Executive. 512K memory, two double-sided floppy disk drives, communications port. Built-in local area network." It was love at first sight. Yes! I whispered breathlessly, Oh, yes!

"If you would just step this way, we can write it up. . . . Graphics monitor or monochrome? Monitor card, printer con-

troller, printer? Dot-matrix or letter quality? Tractor feed (a mere \$200 extra)? Do you prefer an integral modem board or a modem on your desk?

"You are a financial planner? Since you work with numbers, I suggest the optional math coprocessor chip and extra memory—512K will not get you far. So, memory card with clock, RS232C serial I/O port, parallel port, and RAM disk. And a hard disk. Do you prefer fixed or removable? Number processing takes up so much space. . . .

"You must have a plotter to draw your charts. You will need a controller board for your mouse. Yes, I insist you get a mouse. Also an optical character reader. A light pen is always a good investment. With all this, you definitely need an expansion cabinet. . . .

"The total is \$14,867.23. Quite a bargain. You will be the star of your firm with this computer."

The cad. He never warned me that most of the products existed only in seductive Brochures. At that time, I didn't know the Second Computer Law: The Equipment You Want Most, Despite Having Been Announced and Heavily Advertised by the Manufacturer, Is Still Months Away From Usability. Who had heard, in those innocent times, of computer addicts so in love with dangerous living that they not only bought early models, but were even reckless enough to try to use them?

No. I was overwhelmed: at last, my own computer! I promised to return in two weeks with a check for \$17,500 (that included supplies—disks, paper, dustcover, spare ribbon for the printer, disk cleaning kit) and went home. Two weeks, and the machine of my dreams would be mine!

When I returned, my salesman was not available. His associate, a woman, finally agreed to look up my sales slip and take my check. After she finished ringing up the order, she smiled and said, "What language will you be using, my dear?"

"Horrors!" I thought.

"COBOL?" she asked. "FORTRAN, BASIC, Pascal, Ada, APL? Of course you will be programming—that's what computers are for. You do know you can't use your computer without a program. Fine. But what kind of program? Operating system, utility, applications? Let us not get diverted, but have you considered your asynchronous communications requirements?"

"WordStar," I responded, pretending confidence. "1-2-3, dBase II."

recovering his equipment investment, and then some.

Today's buyers experience another kind of problem. Many prospective owners are attracted to computers because their friends and business associates buy them and their children come home from school bubbling about them. They feel left out of an

important cultural change. These buyers, when they finally yield and walk into the computer store, have no definable purpose for buying the machine. In this situation, the most conscientious salesperson finds it impossible to recommend the right selection of hardware and software. Once the device is bought, the new owner is often puzzled as to

what to do with it. These machines are good candidates for stowage in attic or closet.

Additionally, the buyer is often fearful of damaging the computer. A common assumption by the novice is that the machine is intelligent, cannot make a mistake, and therefore all mistakes are the user's.

The untutored buyer may go home so

"Oh, no," she said. "Do not be misled by all the ads. There are other programs. . . Easyword, The FinalWord, Versa Text, Forthwrite, Perfect Writer, Super Writer, Volkswriter, Volkswriter Deluxe, Wordflex, Quick Brown Fox. . ." For two hours she recited the names of word processing programs. To that she added text editors, text formatters, spelling and grammar checkers, dictionaries, mail list merge routines, a thesaurus, and more.

"Financial records? Choose between VisiCalc, EasyCalc, NovaCalc, SuperCalc, PerfectCalc, and all the other VisiClones. Records to organize? Consider Data Ace, PDBase, Qbase, IDM-X, MDBS, RL-1. Or consider Dataflex, T.I.M., VisiFile, SEED, Personal Pearl. . ." (By the way, have you heard about the latest package from VisiCorp? It's not a program, it's a computer.)

I was thoroughly confused. "Could you give me a list," I asked, "preferably with reviews."

"Reviews? You want reviews?" An icy note of scorn crept into her voice. "Are you totally ignorant of the Third Computer Law? Software reviews are not common things, to be found just anywhere like book reviews. In fact, as the Law states, Most Software Will Not Be Reviewed. Or, if it has, the review covers the next to last release. There are so many new products appearing every day, it is impossible to be current." Head reeling, I slipped out the door while she went back to chanting names of programs.

Walking home, I passed a sign that said, "Madam Nova knows the future. Let her solve your problems." At least she admits her answers are derived by magic, I thought as I slipped in the door.

Madam Nova sat in a dim room, behind a strange green glowing screen. As I walked in, she said: "The Fifth Law of Computers is IF, by some remote chance, you discover that the product you need does exist, AND IF it does work, THEN it is not designed for the computer you own. ELSE it is not understandable anyway." (The only Fourth Computer Law is Reverse Polish Notation. You are free to do what Fourth programmers do: invent your own laws as you go.)

Was there no help for the novice? Pockets stuffed with money, I hired a Famous Consultant.

"Help me," I said.

"I'll help you," he replied, gently emptying my pockets. "What do you wish

to know?"

"The facts. I just want the facts."

"Floppy disk drives are out. Perpendicular magnetic recording is in. Data tables must be searched. Binary hash duplication is the key. N-channel metal-oxide semiconductors make the best VLSI chips. pSTVAL, pSYNC, and pDBIN. Synchronization demands redundancy. If the default doesn't fit, debug it. RadioTeletype normally requires two shifts, except at associated EPROM bytes."

"But what does it all mean?"

"You asked for facts, my dear, not meaning. For meaning, I offer you the Sixth Law: Factual Information in Easily Understood Form Is Impossible to Find."

As we parted he said, "There is something else you should know—the Seventh Law: Everybody Is Confused, Especially the Expert You Hired to Avoid the Confusion." I asked him what he meant by that but he said he wasn't sure.

Winter arrived, and with it my computer. A clerk called to tell me a machine was waiting. Not everything was in, but I could pick up the system unit, keyboard, and monitor. I would have to wait a short while longer for the printer. The mouse was available, but not the mouse controller card. Be there at 10:35 a.m. Wednesday. No, I could not set a different time. They were so busy. If I did not come then, my machine would go to someone else. No telling when my turn would come around again.

I was at the store by 10 a.m. At 9:30 p.m., just as the store was closing, a stockboy heaped nine boxes at my feet. "They're all yours, lady. Hope your husband likes his present. He shouldn't have any trouble assembling the components. If he does, don't call me."

Awkwardly, I loaded the boxes into my car and then carried them into my apartment. Within minutes, my 10-year-old neighbor appeared. For half an hour he sat silently as I opened the cartons, placed the pieces on my desk, and began reading the inventory list.

"Monitor, keyboard—that must be the system unit. Or is it the expansion cabinet? The keyboard cable plugs in here. . . or is it here? Then what goes in this socket?"

I flipped pages and compared diagrams, not sure which cord was which. (Or which board was which, either.) I knew if I could just read the Guide to Operations I would be able to figure it all out. Finally, the boy jumped from his chair, grabbed the

docs, and in three minutes had all the pieces assembled. He was busy installing the memory board when his father came to take him home.

"You're not going to learn anything reading the documentation," he said. "The Eighth Computer Law says it all: Manuals Are First Cousins to IRS Publications—Totally Obscure. The manufacturers assume you already know all the details and are not reading for information but for love of jargon. Glad I could help. . ." And he dragged his protesting son out the door.

A week later the kid returned, younger sister in tow. "Can we use your computer?"

I was ashamed to admit I was just going to take it back to the computer store. "There's something broken, or missing. It won't work; every time I try to use it, all I get are error messages."

"Let me see. Where's your program?" I slipped a disk in the drive, turned on the machine. Green letters screamed at me.

"Dummy," the girl said. "Nothing's wrong with this computer. Hasn't anybody told you the Ninth Computer Law? Once You Have Your Program, You Are Not Ready to Get to Work."

"First you have to format a disk, then make a backup copy of the program you bought. (Oops! \$800 and you can't make a copy? Can you afford to use it? Maybe you'd better just lock it up with your business papers.) Did you remember to DOS the disk? What about installing BASIC? You can't just put the disk in the drive and get it to work. Even my teacher knows that."

Well, the kids got the computer running. I had just about learned to use the spreadsheet by the time my printer was delivered to the store some five weeks later.

My original salesman was waiting to greet me. "You bought the Executive Special, didn't you? How do you like it? Difficult to use? Well, yes, those older machines are quite complex. Perhaps it would have been wiser to wait; just yesterday we received this new machine. It's a piece of cake. Everything you could possibly need in one preassembled package."

And so I confronted the Tenth, and Final, Law: The Best Computer for You to Buy Will Be Announced Two Months After You Have Made Your Purchase. Relax, do not let the announcement panic you. Pat your computer gently, speak to it in kind words, and remember the Seventh Law.

—Stevanne Ruth Lehman

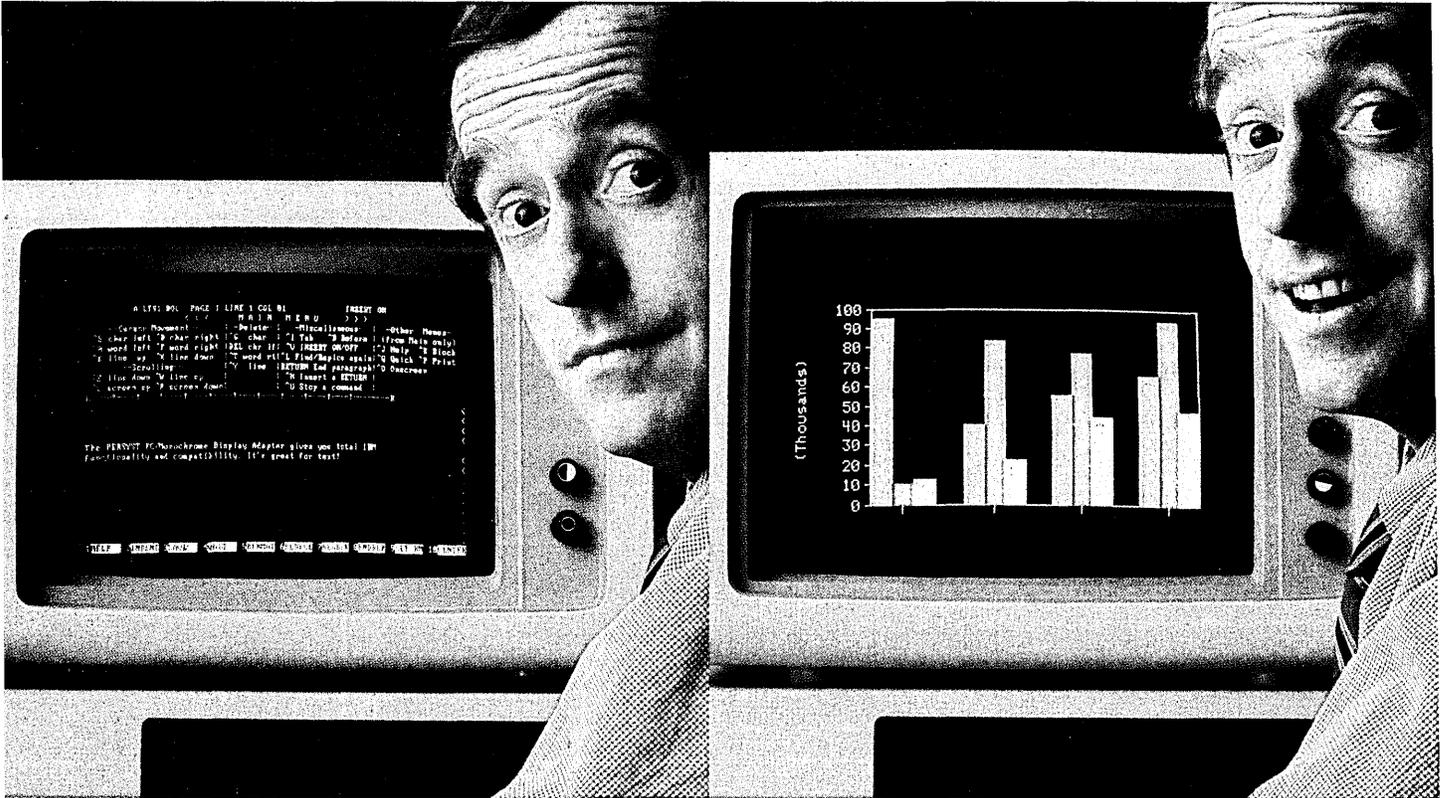
ignorant of his machine that, in following printed instructions to "remove the diskette from its jacket," he may rip the case off the diskette, exposing the magnetic disk. He may rip out board slots and motherboards with heavy pliers in his energetic attempt to "pull out the interface card." He may insert diskettes into drives backwards. No wonder the

dream doesn't come true!

But there are alternatives to abandoning your micro. Riki Rudolph sold 100 computers in her first year with ComputerCraft, the Houston-based retailer and parent company of the Learning Centers, of which Rudolph is now executive vp. In the process of selling, she realized that microcomputer doc-

umentation was difficult to use. Much of the material was out of learning sequence and was often unusable by the computer buyer. She began writing little booklets, or guides, to the proper sequence in which the manuals should be read, with helpful hardware and software operating instructions. This work made for satisfied customers, but it cut into

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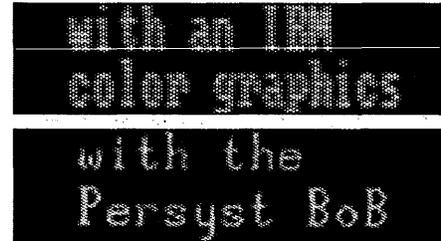
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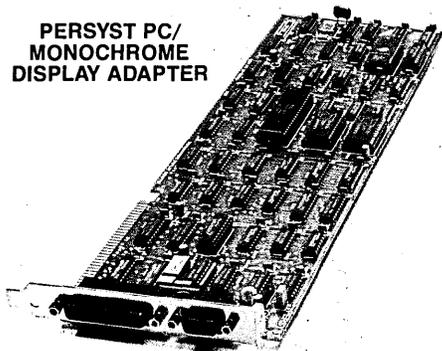
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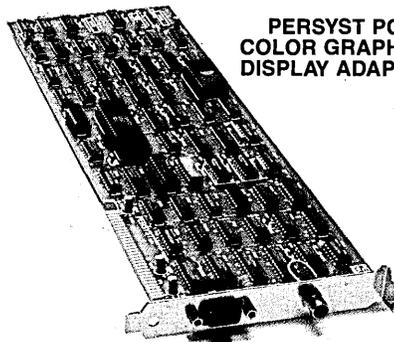
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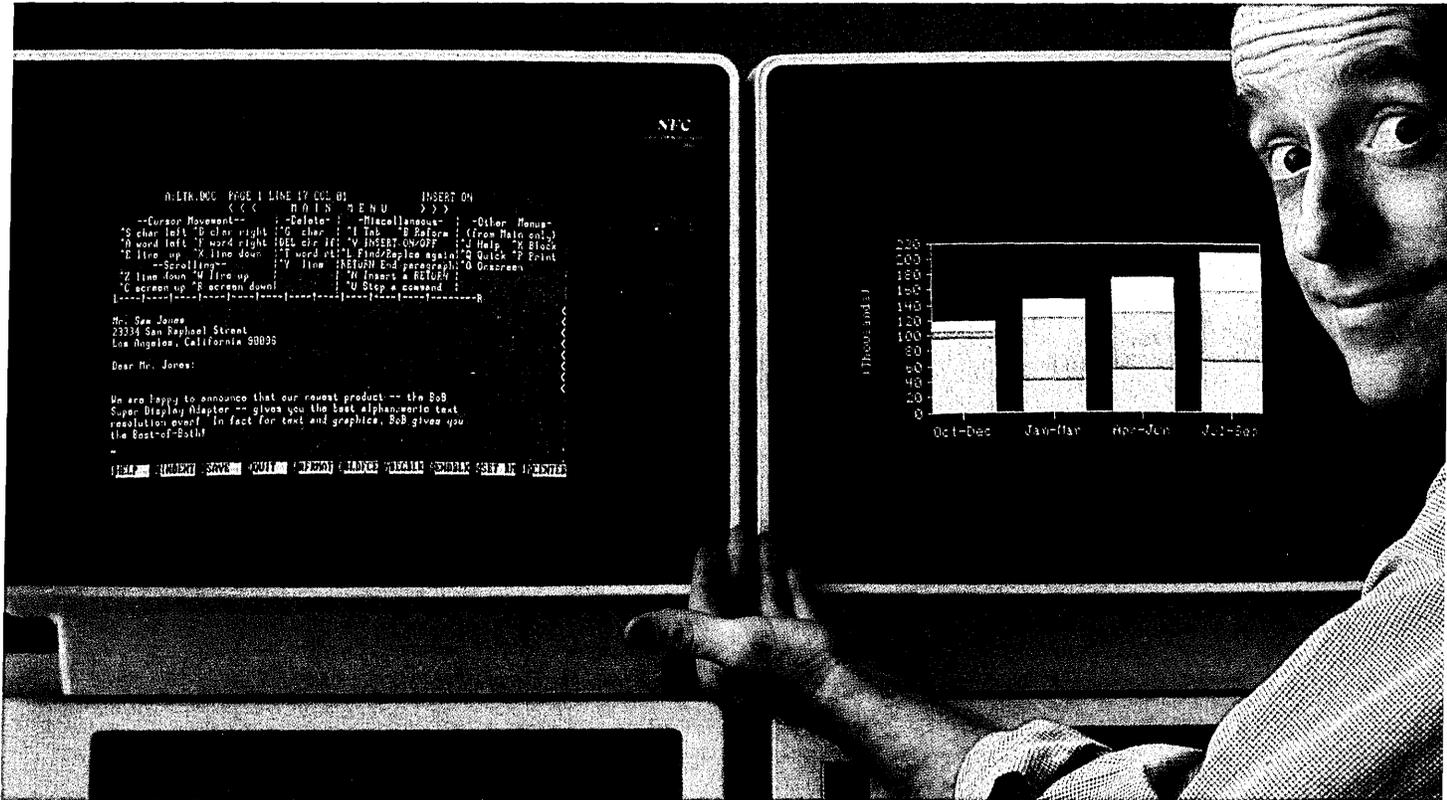
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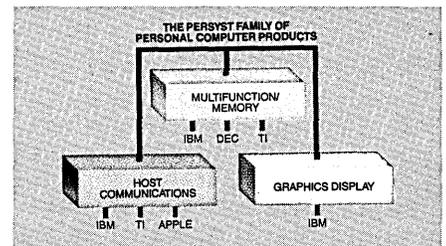
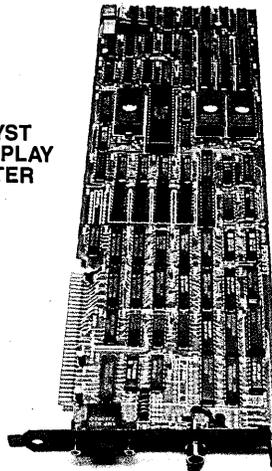
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CIRCLE 47 ON READER CARD

"Users don't know whether to trust the salesman or not."

her commission selling time.

To solve that problem, she organized introductory classes, priced at \$25 for two or three hours of basic instruction. Rudolph says this "Getting Started" class is designed to get first-time users over the psychological hurdle of being intimidated by computers. "We want them to walk out of the class feeling this is just a machine like a car, or anything else. So you put a program in the micro and tell the students to stand up and lean on their keyboards, pressing all the keys at once. To most people, particularly adults, that is terrifying. They feel they are going to break the machine. We do that a couple of times and the students are amazed—it didn't break! Then we show them how you fix it if you accidentally press multiple keys during program execution."

At the time Rudolph was teaching these introductory classes, Scott France, then a recent Rice University MBA, began offering courses in financial analysis on the personal computer. His subjects included cash flow management and other financial instruction for small businesses. Rudolph and France both saw their course enrollment grow and sensed a large training market appearing in the microcomputer's wake. France proposed the formation of a teaching company to Billy Ladin, chairman of ComputerCraft. Ladin accepted the proposal and in October 1982, France formed a subsidiary now called ComputerCraft Learning Centers.

Today, ComputerCraft Learning Centers operates 22 teaching locations in Houston, Dallas, Fort Worth, Austin, San Antonio, and soon, Memphis. The firm currently enrolls between 1,200 and 1,500 students per month who are taught by a contract teaching staff of about 60 instructors.

In the beginning, teachers were recruited from various Houston micro user groups. Later, teachers were experienced professionals who used specific software in their own work. Roughly half are full-time professionals and the balance are consultants.

Relations with the parent ComputerCraft organization include an agreement to furnish introductory classes to all computer buyers; instruction is included in the micro purchase price. The introduction is available to the public at \$55 for three hours of instruction. Classrooms are equipped with twelve microcomputers and a printer. Students are guaranteed full-time access to their own computer, but if for any reason attendees believe they have not mastered the class material, they may repeat the course without charge. Application package courses are also available, including Lotus 1-2-3, MultiPlan, WordStar PC, WordPlus PC, VisiCalc, Apple Writer, dBase II, PFS File, PFS Report, DOS 2.0, and others that support the product line

offered by ComputerCraft.

France is responsible for developing the company's business and identifying new markets. He uses several sources to guide him. Student course evaluations furnish information on "other courses desired," and the registration staff, working on the phone eight hours a day, picks up data on courses sought by prospective students.

HOW TO TALK TO A SALESMAN

The Learning Centers' students are typically small business owners or individuals. Rudolph describes their objectives: "They want to educate themselves so when they walk into a computer store they won't be sold a bill of goods. They don't know whether to trust the salesman or not. We used to call that class, 'How to Talk to a Computer Salesman.' The typical computer buyer realizes he has to be educated—he doesn't know anything about computers and wants to learn."

There are other classes designed to meet specific needs; the "Hands-On Workshop for Women" was developed because Rudolph observed that women were often intimidated in coed classrooms. Similarly, youngsters tend to intimidate more mature students with their aggressive self-confidence in handling the keyboard and skill in working with new programs. Consequently, Rudolph and France have made 14 the minimum age for enrollment in their introductory classes. To keep the kids happy, they also introduced KidBASIC and TeenBASIC courses for the appropriate age groups. LOGO is offered to children under 12 as an introduction to graphics languages.

The Learning Centers have agreements with major software developers that allow them to critique new software products for marketability. It receives advance product specifications so courses are ready to be taught when the new product reaches the market.

Future company development will be in the direction of the corporate training market. France already presents customized seminars at firms such as General Mills, Conoco, and Texaco. The market is large and economically attractive.

Other plans include the introduction of interactive video disk systems. This instructional medium uses a digitally addressable video disk, controlled by a micro, to present either still or motion frame images to the viewer. Instructions for the course material are delivered through the computer crt or the video screen. Tutorial reinforcement and remedial instruction are provided, although fast learners can proceed unimpeded. France has accepted six such systems from Interactive Research Corp. of Santa Clara, Calif.,

for evaluation. These are being installed in ComputerCraft Learning Center classrooms for use by both individual and corporate students. The equipment offers current technology at a low-cost delivery price for all kinds of instructional material.

When company training staffs were cut because of the recent recession, training requirements were often met by public education. Organizations with employees trained by the Houston Community College include Southwestern Bell, Digital Equipment, Texas Instruments, American Bell, Control Data, Transco Energy, Bechtel Petroleum, Power Division of Bechtel, the Pharmacy Association, the Association of English Teachers, and the Houston Fire Department.

HCC has 50,000 students at 26 locations. Roger Boston, the college's director of data processing, currently offers microcomputer introduction, database, spreadsheet, word processing, and telecommunication classes. A staff of 75 instructors will teach 244 class sections (25 to 35 students per section) this semester. The format is classroom lecture and laboratory, with media support. This type of enrollment is for academic credit, but a large, noncredit instructional load is also handled.

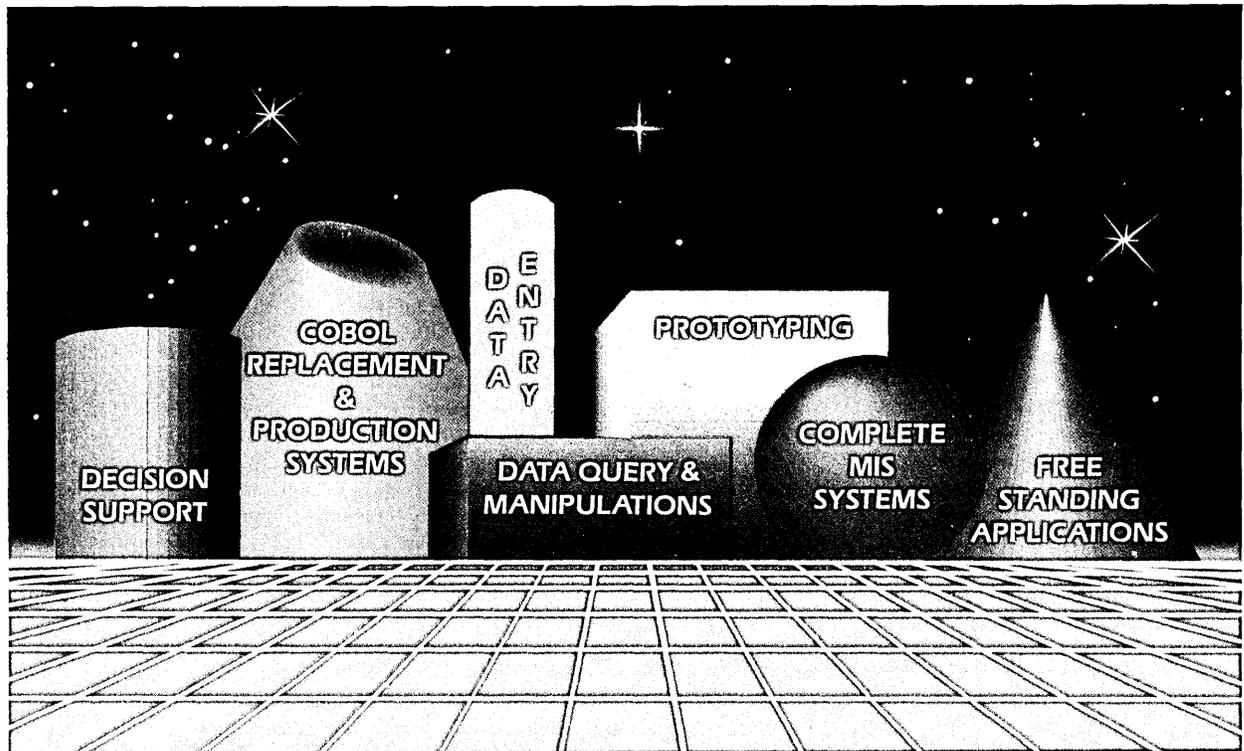
Seminars provided for such organizations are fitted to the groups' special interests. For example, training of department heads from the health community includes tutorial software using graphics to display fluid flow in the body, identification of specimens under the microscope, and laboratory data reporting. Microcomputers can be used for this type of teaching because there is plenty of high-quality tutorial software available. Boston says, "We are a two-year college but we have a big professional program that speaks to a night population who already have their credentials. They want career-related professional growth, or some technical skill. This has blossomed into a very nice and formal program for customized computer training."

THREE-PRONGED SUPPORT

"We have a three-pronged effort under way; there are general [computer] literacy issues for people who want their first brush with micros and need a place to start, intensive presentations in microcomputer software [database, spreadsheet, word processor], and a third area of telecommunications." Micros are distributed to the teaching locations—nearly a hundred of them are available.

Enrollment in the microcomputing classes is growing rapidly. The student body is comprised of freshman and sophomore day students; freshman and sophomore night students who work during the day; night stu-

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Anyone with a micro and a modem can access nearly 200 on-line databases with more than 80 million records.

dents who already have credentials and want only one skill; groups of professional students who take custom-designed seminars; and students seeking career migration.

Looking to the future, Boston is developing the micro's networking abilities, working with the IBM PC 3270 and 3270 XT. Private companies show strong interest in this capability and are asking for telecommunications training to support pc use in networks, especially those linked to mainframes.

The University of Houston also offers microcomputer courses to the public through its Continuing Education Center at the University Park Campus.

The program is still relatively new, having begun just last summer. It currently enrolls 750 to 1,000 students in courses such as microcomputer literacy, word processing, spreadsheets, and file management. Again, custom training for private organizations is also offered. Lee Tranfier, director of continuing education, reports that the university as a whole is experiencing pressure for microcomputer literacy with a surprising amount of interest coming from such unexpected areas as the fine arts and humanities departments. Theater groups are interested in using micros to plan actors' movements on stage in play production and for lighting control. In the humanities, Tranfier says, "Given the heavy emphasis on research at the university, a lot of papers are being prepared for publication, so word processing is important. There is a lot of statistical analysis that goes on in academic areas—all departments use that in one way or another.

"I have discovered we use them extensively here in our own operations [continuing education]," he continues. "Once you get used to those darn things you learn more and more applications every day and you cannot live without them. We have just begun to scratch the surface in their use. I was in the post office today and noticed them using a computer. They had tied it into their postage meters, counting the number of pieces and charging the appropriate budgets. People in our printing operation now take floppy disks from IBM PCs or Displaywriters and set type directly from the disk."

Architectural faculty are tying micros to drafting equipment and the Law School faculty use the word processing facilities. Language departments report extraordinary gains in productivity in language translation using word processing, especially when combined with dictionary support.

The continuing education department's student body is 90% adult. Tranfier says "the vast majority of them have bachelor's degrees and many of them have master's and doctorates. Most are at the professional or executive level." Why do they enroll? For

a variety of reasons, explains Tranfier. "Some have decided they want to use it [the pc] in their business or they just want to learn something; others have to do it because their boss says, 'We are getting a new computer system.'"

Tranfier's only reported difficulty is equipment obsolescence, which complicates equipment planning. To control this problem, he prefers to lease instead of buy.

MICROS FOR SOLO WORKERS

The classic trio of spreadsheet, word processing, and file management forms the backbone of useful software, according to current micro buyers. Another facility, telecommunications, is emerging as an important fourth. For networking within an office, for linking to mainframes for file or program access, and for public database access, the microcomputer is ideally suited to support the individual worker.

As a large database utility, Dialog Information Services, Palo Alto, Calif., will serve as a good example. The firm is a subsidiary of the Lockheed Corp. and has been operating publicly since 1972. In the 1960s, Lockheed Missile and Space developed in-house database systems for managing technical information. About the same time, NASA recognized a similar need for improved data management and gave Lockheed a contract to provide it with on-line database facilities for technical report management. Later, Lockheed extended these services to the U.S. Department of Health and eventually went public, initially offering two general interest databases. Today, Dialog offers nearly 200 on-line databases containing more than 80 million records.

Perhaps as astonishing as these large numbers is the fact that individuals with a microcomputer and a modem can access this resource at small cost. An expenditure of \$35 for a system manual will get you an account number, a password, and access to the system. The connect-time charge for the Knowledge Index service runs \$24 per hour, which includes communications costs. For the personal computer user, this simplified service is offered at reduced rates during evenings and weekends.

Dialog also offers training seminars. Joyce Camp, the company's southwestern region manager, says that until the last few years, Dialog's students were mostly librarians. "The next most numerous groups," she says, "were chemists and engineers. Then, a couple of years ago, we saw an enormous growth in nonlibrarian types. At least 50% of current seminar students are in this new group. They are market researchers, chemists, engineers, doctors, and attorneys. Al-

most always, they have the pc; they may or may not have the modem, but it is usually on order."

Training seminars are offered at Dialog offices in New York, Chicago, Houston, Philadelphia, Atlanta, Palo Alto, San Francisco, and Washington, D.C. Other cities across the country are served in regional training sessions conducted by the Dialog staff. More than 200 U.S. classes were scheduled for the first five months of 1984. Dialog is busy overseas as well. Training is available in London, Rome, Cologne, Amsterdam, Bern, Berlin, Copenhagen, Helsinki, Dublin, and Brussels—all conducted in the host country's language (68 classes, first quarter 1984). Service also extends to Australia and New Zealand.

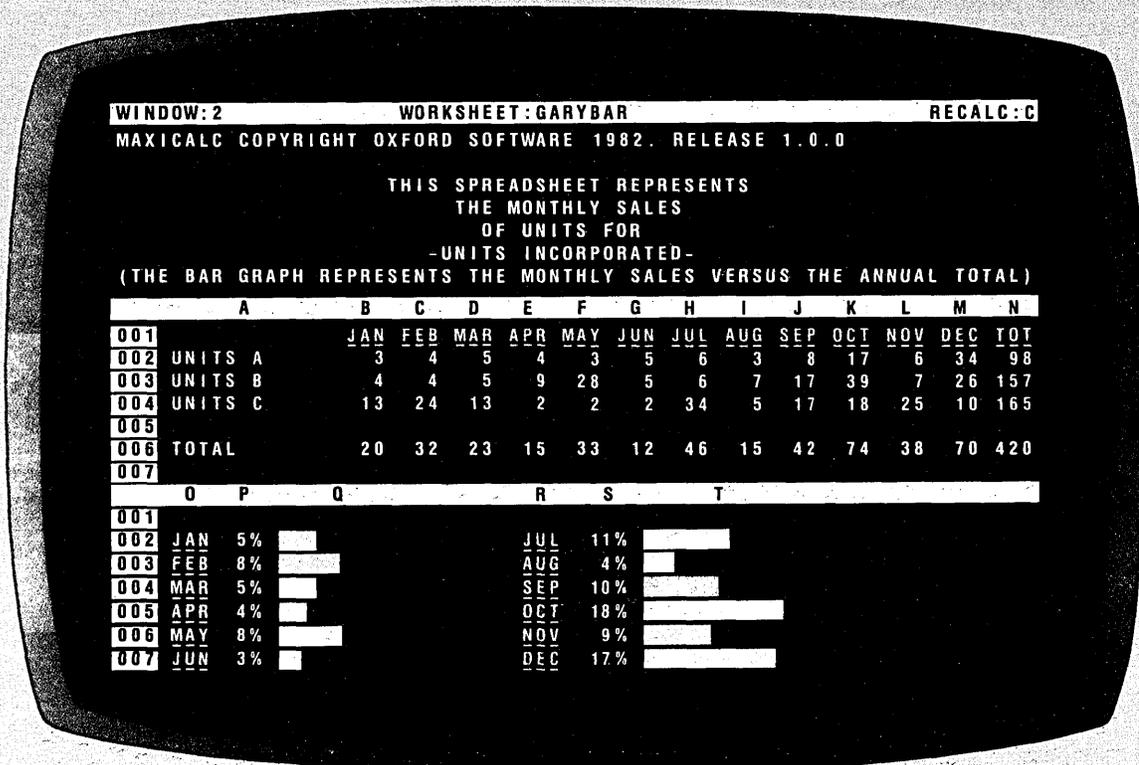
Each Dialog office is equipped with terminals, communications devices, classrooms, and instructors. Courses taught include introductory systems seminars and advanced topics, literature searching techniques for medicine, social science, humanities, science and technology, chemistry, bioscience, government documents, legal, patent, and business. The resources accessed are just about universal in scope. Systems seminars are priced at \$135 for 12 hours of instruction, usually in one-and-a-half day sequences with hands-on access to the databases of interest. Dialog also has a special program for younger folks, at the high school level.

COMPANIES TRAIN USERS

Now that we've seen how commercial trainers teach the new breed of micro user, let's take a look at the way big corporations handle it. A large engineering construction firm with worldwide operations maintains a staff of over 300 programming and systems professionals to support its projects around the world. The company's dp training manager reports that they had only recently put a pc policy together. "Our people were buying them in the divisions and just using them as executive workstations on their own. Now we have them under distributed data processing and we're going to be using them as RJE [remote job entry] installations to do batch downloading to payroll and other systems. Now that we're going to be doing that and actually running some small construction jobs on pcs, we are going to be getting a formal pc training curriculum, probably in the second quarter of 1984. Until now there has been no formal pc training."

Some job sites buy small computers to handle timekeeping, while many high-ranking office people purchase them for spreadsheet analysis and access to economic databases such as those offered by Dow-

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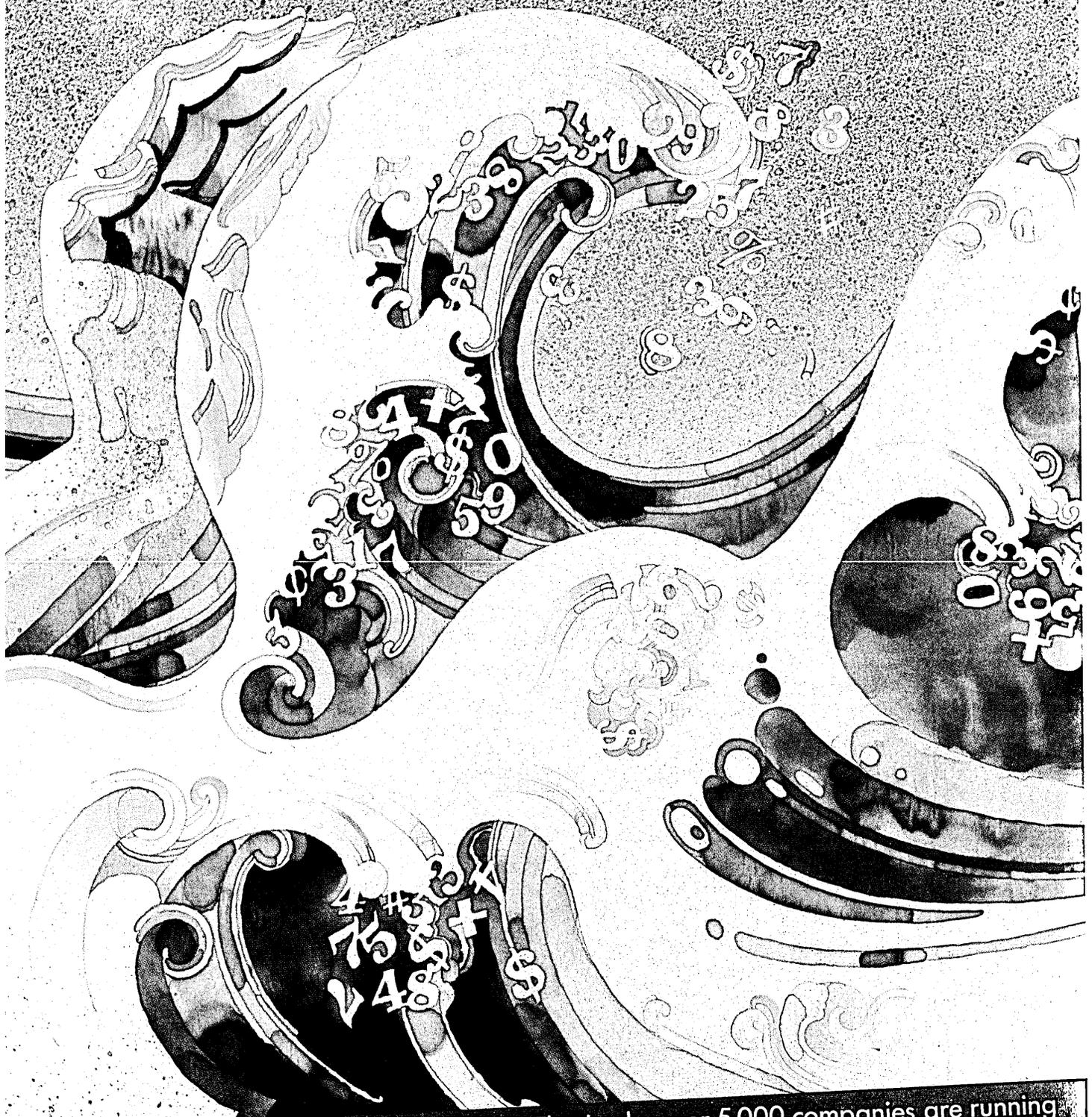
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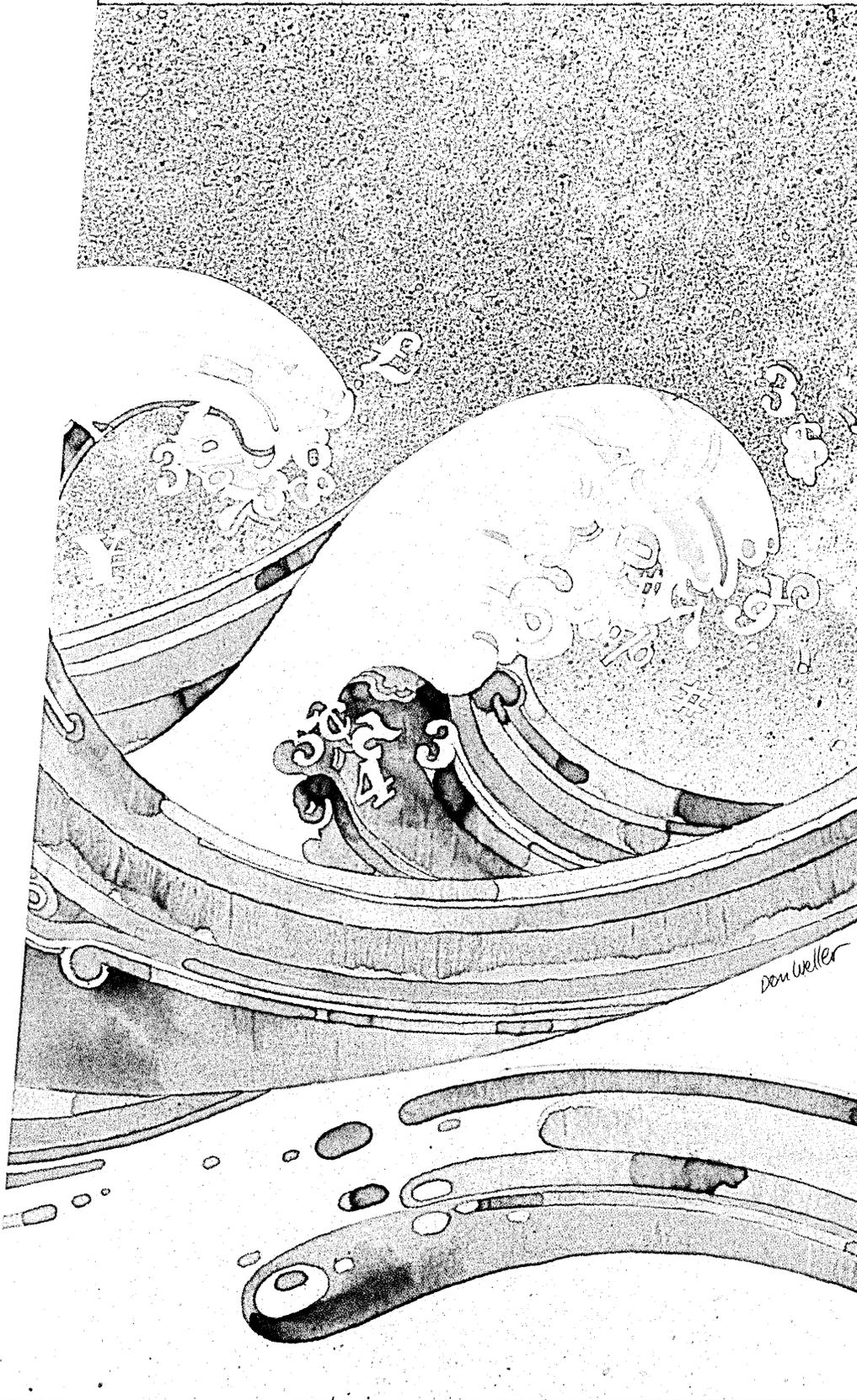
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Run With Us

HP's user-training software asks, "Okay, what is it you want to know?"

Jones and Dun and Bradstreet. In both instances, users simply read the manuals to use the hardware and applications packages. Given decent documentation, users make out very well with their new machines in these relatively uncomplicated operations.

The only failure associated with this casual introduction of pcs into the engineering construction firm was the central dp organization's indifference to the introduction of this technology. Under the new policy this will change, and central dp training will be more active. It is now planning development of a variety of courses, from microcomputer literacy to training in spreadsheet calculation, word processing, and file management. They expect to take a leadership role in instructional services.

Media for the new instruction will be primarily lectures, with video support from media suppliers, such as Deltak. Deltak also offers computer assisted instruction on diskettes, like "Teach Yourself the Pc." These are considered of high quality and are expected to work well.

Training will start in the second quarter of 1984 and will include CPM, MS/DOS, and TRS/DOS operating systems, and COBOL, FORTRAN, and BASIC languages. The three application systems previously mentioned will also be included in the curriculum since they are the principal applications of interest.

Another large company, this one in the oil business, has had microcomputer support for several years in the form of a demonstration laboratory equipped with a variety of

micros. These computers are supported by two or three technical professionals and the micros are available to any interested staff members. Employees are given individual assistance in using the computers, and a library of principal software is maintained to support trial development of applications.

To meet the increasing demand for micro training, classes were recently formed. The subjects taught include VisiCalc, Wordstar, and file management. This small facility is responsible for the initial orientation of dozens of company departments. As a consequence, hundreds of personal computers are now operating throughout the company.

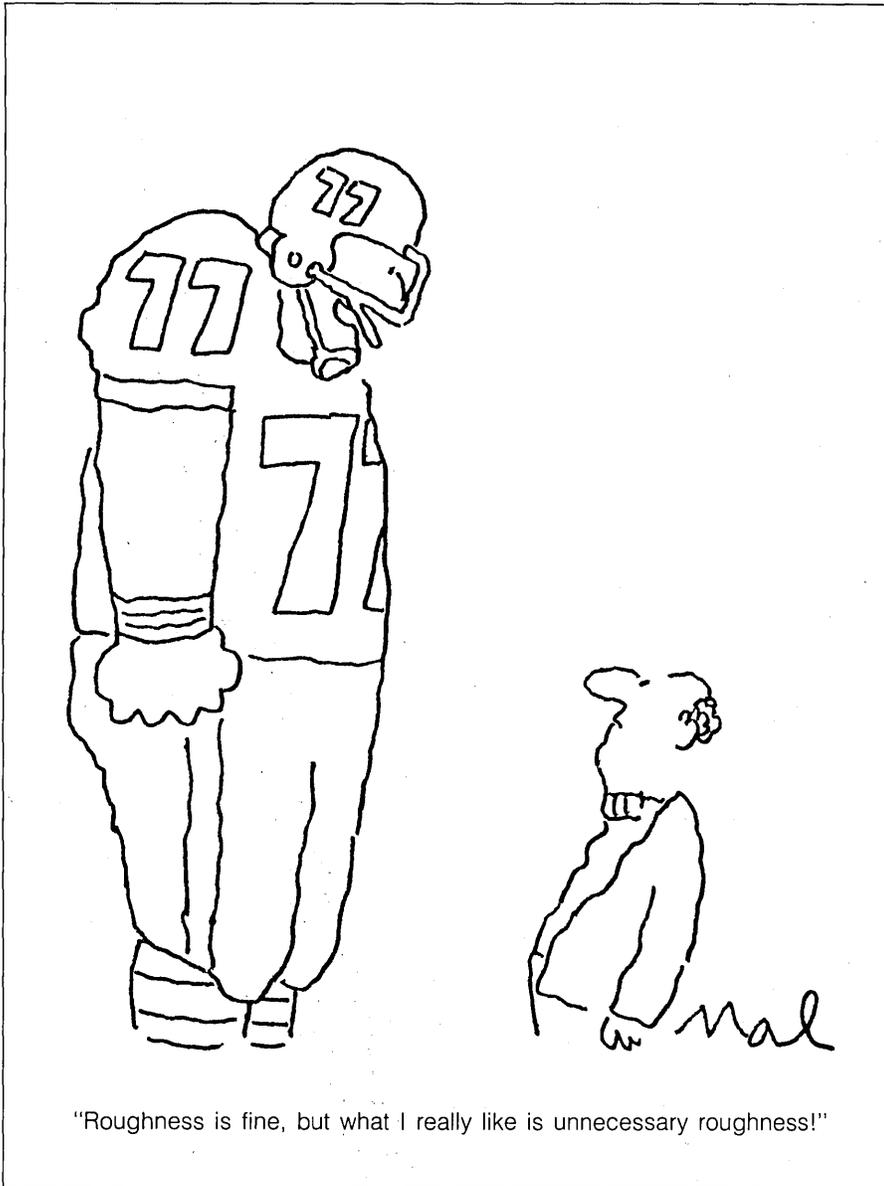
During this early developmental period, the formal data processing training group had not been involved in personal computer training. The need for expanded training, however, has reached the point where computer literacy courses are now being planned to insure that company employees are generally familiar with the micro's capabilities.

The training group is operating with a reduced staff after recession-induced budget cuts, and must search for cost-effective teaching methods such as media-based courseware that allows leveraged use of training staff. Courses are also available that teach computer keyboard use and other micro staples. In addition, new authoring languages are appearing that operate at a high level and permit course development by in-house training professionals. The training group anticipates that its role will be comprised largely of teaching authoring languages to trainers in other company departments, so the trainers can return to their areas and modify purchased courses or create new ones in their specialized subjects.

VIDEO DISK SYSTEMS

Strong interest is developing in the use of interactive video disk systems, as previously described. The oil company's management believes the training role is changing as technology moves to substantially higher productivity levels. The data processing training manager projects that "future training will be done on the pc. I feel that the access people have in the field locations will allow them to develop their own courses for their operations. People are going to come into the local offices and take the courses on the pc. Head office training thinks the same way. The interactive training we have on the mainframe is still available to anyone with CMS [timesharing] access—you just don't have graphics and video disk capability. Pc technology, in the training area, has outpaced that of the mainframe."

One manufacturer, Hewlett-Packard, has distinguished itself by providing very high quality product documentation. The



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company's manuals are good enough to permit effective self-instruction on its personal computer products and software. Coupled with an 800 number help desk that works, these manuals enable the standalone user to operate effectively. Jan Stambaugh, director of the Hewlett-Packard Training Center at Santa Clara, Calif., provided some insight into new directions HP training is taking that may make the traditional training manual obsolete.

The training methods under development are embodied in computer-based tutorials that are integrated with the software product itself. Stambaugh comments, "I really think this is the wave of the future. What I also find is that people have a penchant for not opening documentation, if they can avoid it. Whereas, if they are using a [software] product and they want to change the margins but don't know how, they hit a button that responds, 'Okay, what is it you want to know?' then they ask how to set margins. A little window opens up on their screen and tells them how, they close the window, and go on with their work. So you can get away from written documentation. As teaching products become more intuitive, the need for manuals will diminish. With the tutorial built into the software, you simply open the tutorial window, get your instructions, close the window, and proceed. You don't need to read a whole manual."

The concept is being developed for HP 150 proprietary software packages, with completion projected for this spring.

To create the convenience of the integrated tutorial facility, HP had to find an authoring system that would permit implementation of the windowing feature. Stambaugh's group evaluated 38 authoring systems in an effort to find one with the capability they needed for exercising this function. Having found a good one, they now plan to package the authoring capability itself and provide it to institutional customers, universities, and other organizations with training needs. Such organizations will be able to create integrated computer-based training for their own applications.

Beyond the integrated tutorial products described above, HP is also developing interactive video disk systems to provide dual-media teaching facilities. Stambaugh says, "Our whole effort is to make products more intuitive, to make them simpler so they are not so intimidating to people."

Full utilization of the microcomputer requires a trained user. Computer professionals, skilled with other classes of equipment, can usually learn to use micros effectively from the documentation alone. It is imperative, however, that ordinary buyers supplement their microcomputer purchases with good training if they wish to ride the information revolution rather than be trampled by it. *

T. R. Young, a free-lance writer based in Houston, writes on business and technical subjects.

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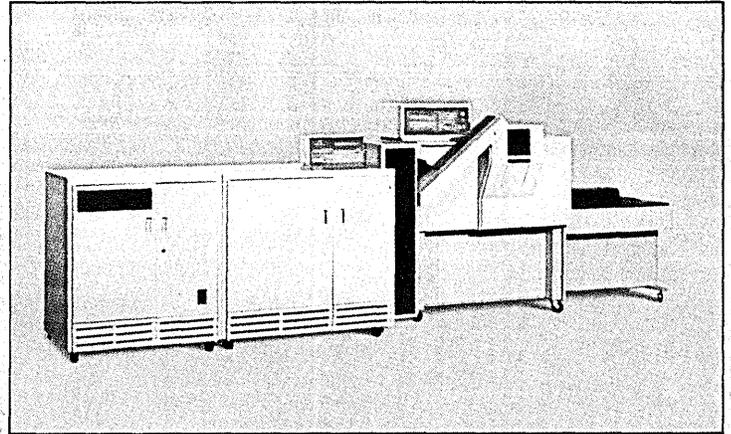
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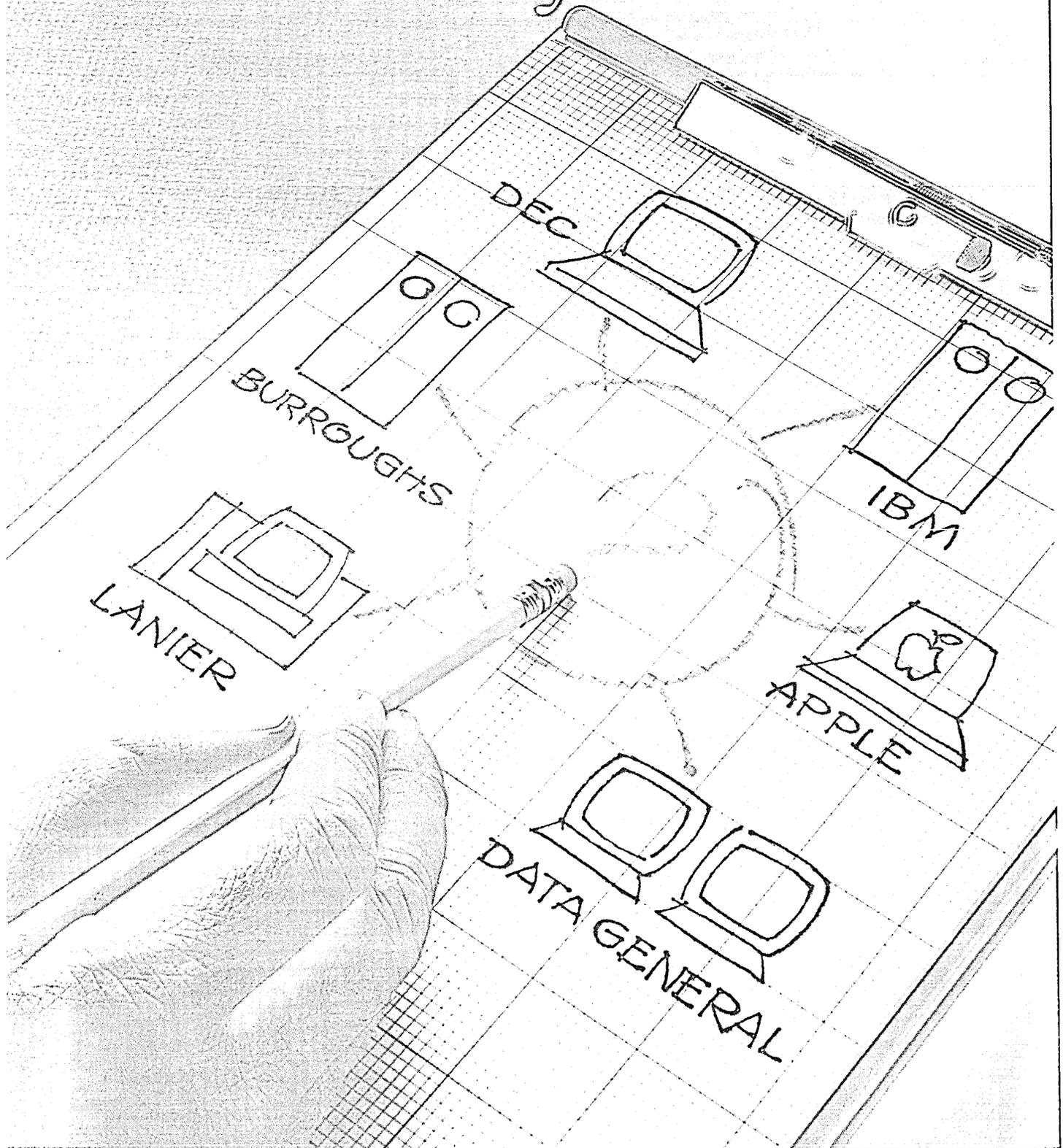
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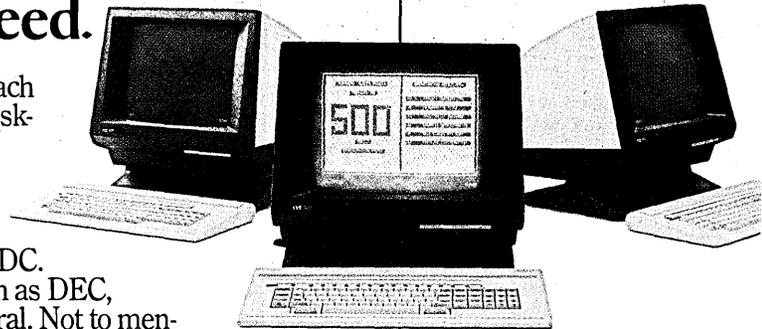
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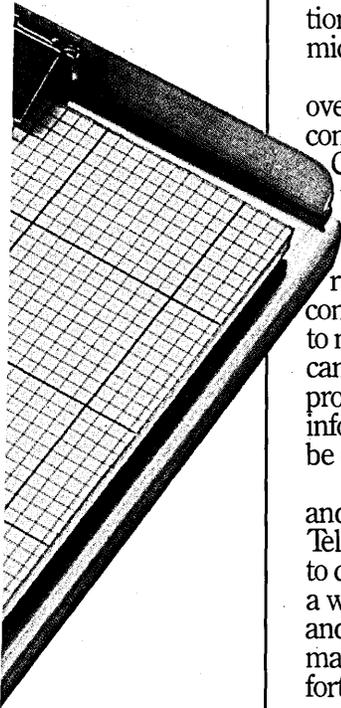
At the same time it's running CP/M, the family can also be running its own unusually powerful operating system which is compatible across the whole 500 line. It permits a unique approach to multitasking — with a few simple keystrokes, up to 16 tasks can be performed simultaneously on the same terminal. Data processing, personal computing, spread sheets, word processing, information management, electronic mail, whatever task needs to be done can be done at the same time. An incredible timesaver.

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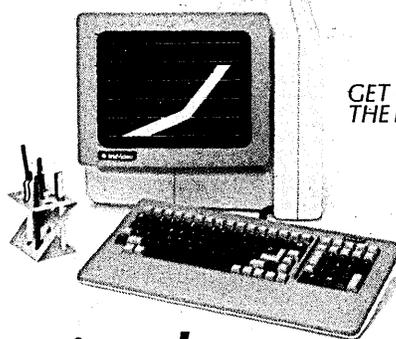
The 970's 16 non-volatile function keys (shiftable to 32) literally automate ANSI code command entry. Other features include VT-100 compatibility, block mode operation, 32 non-embedded visual attributes and a reconfigurable keyboard. An RS232 printer port with built-in buffer is standard.

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—James Martin

**AN
OCCASIONAL
CONSULTANT →
MANY
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As paradigms proliferate and methodologies multiply, more and more top managers are finding they need outside help just to keep up. Ask yourself, how many fads have passed you by in the last few years? Have you implemented an office of the future? Have you used information as a strategic resource? Will these activities still be current by the time you get around to them? The good news is that help is available, and up-to-date information professionals are paying plenty for it. Skilled consultants stand ready to subordinate every facet of your daily operations to whatever theory happens to be in vogue. A good ratio is one consultant per employee.

**BIOCOMPUTERS →
FIFTH
GENERATION
TOFU**

With a single flick of its microscopic cilium, a one-celled animal will propel a stream of microbes toward the next living logic gate. Another of humanity's dreams, long deemed impossible, will be realized: flesh and blood that actually thinks. A researcher at Hormel Information Systems claims that "with the meat computer, we will soon reach the intellectual limits of living matter." But the Japanese low-fat processor, based on Fifth Generation Tofu and financed by MITI, threatens to make mincemeat of American efforts. And claims made for Denver-based Ovo-Lacto-Tec's voice-activated western omelet have so far proved to be more shell game than breakthrough.

**HARD
WORK →
STRATEGIC
PLANNING**

Today's information professional works not in a vacuum but in an increasingly complex socioeconomic environment. As at the dawn of any new era that's the most significant in history, new tools abound: the strategic conditional matrix, the copyrighted 7-S



framework, the three-day meeting, and the slide projector, to name but a few. These tools are enabling astute men and women to delegate quotidian concerns like applications development and budgets and concentrate on megamatters: long-term opportunity windows, time-frame/bottom-line impact correlations, and lunch.

**DUMB
SHOES →
SMART
FOOTWEAR**

The intelligent shoe will soon be widely available, in all widths, say observers of

microelectronic trends. The breakthrough shoe, a sling-back spectator in white kid and brown calf with 256 kilobits of memory, was the sole sellout at a recent electronics show in Lowell, Mass. Al Gepetto, ceo of IQ Shoe, says he sees the chip-equipped footgear "as the natural path for distributed data processing." Gepetto adds, "We've already got networking software built into the shoes, a self-booting operating system called SOX." Savvy MIS directors will quickly tie in their own oxfords, bluchers, pumps, and flats; to miss this megatrend is to risk being caught flat-footed as the information revolution races by.

ILLUSTRATIONS BY MIKE GARLAND

**DIRTY,
SWEATY
ECONOMY →
MICROPROCESSOR,
FAST-FOOD
ECONOMY**

As any fool can see, the shift from an industrial to a service economy is well under way. Content analysis of pan-media advertising campaigns indicates the obvious: in the information age, there will be button pushers and burger flippers but no middle ground. Securing a stake in the future means making certain megapurchases right now; you can buy your kid a home computer, or he can work in Burger King for the rest of his life.

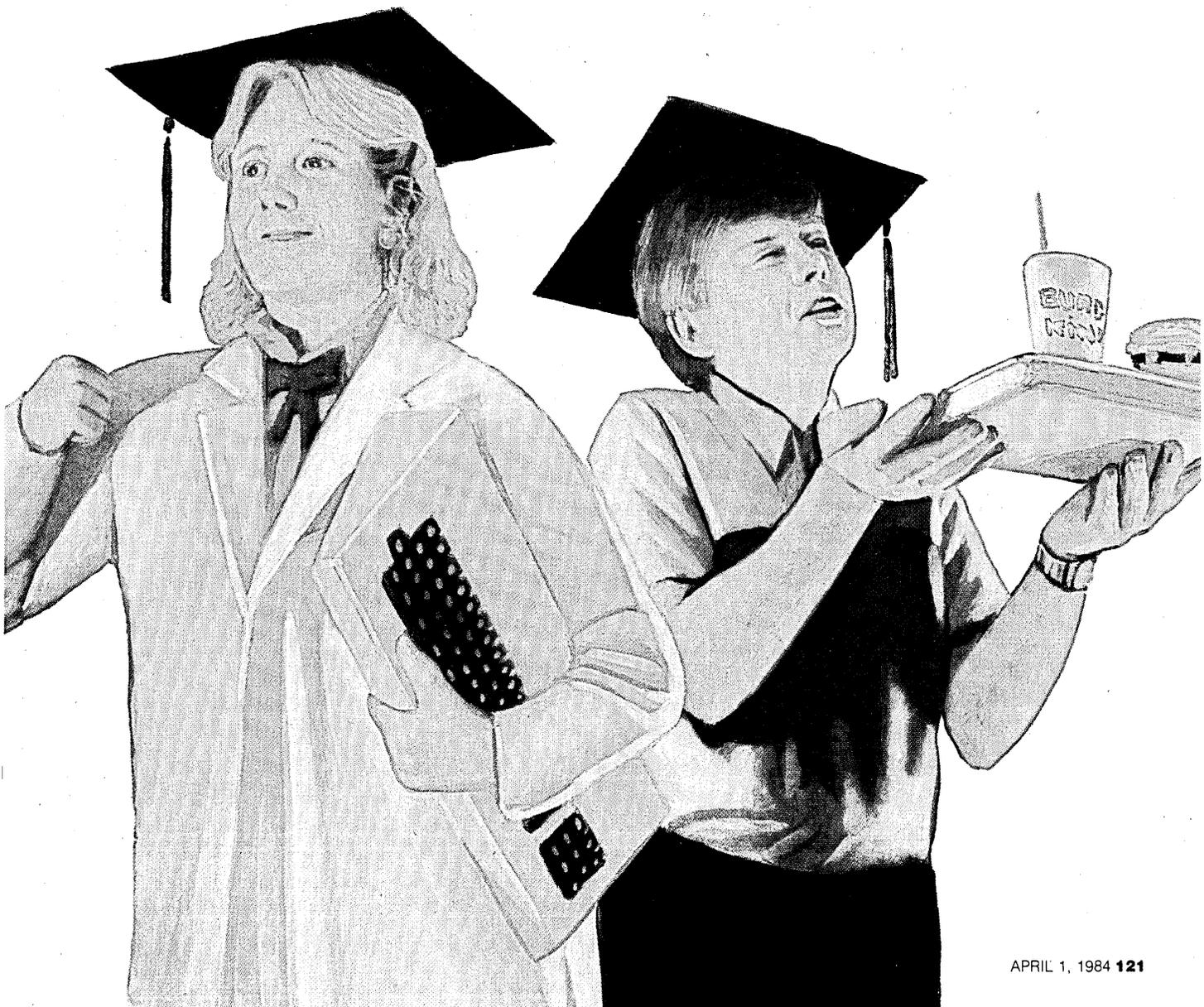
**ELECTRONIC
FUNDS →
THE
TRANSCENDANCE
OF DEBT**

Money is no object, and hasn't been for years. Now electronic funds transfer technology is poised to complete the transformation of money from stuff to information. Cash will no longer be required, or even permitted; a few irradiated pixels will spell out your solvency on the face of a crt. The Federal Reserve will use EFT to nationalize the "float"—that interval during which banks have collected interest on your money while you waited for checks to clear. All so-called money will move by EFT, and all EFT transactions will pass

through a huge Federal Reserve data switch in Atlanta. Every nickel of the trillion-dollar U.S. economy will spend at least seven nanoseconds per year within the switch, and the aggregate of these visits will be an interest-earning pool of ideational cash large enough to retire the national debt within four years.

**EXPERT
SYSTEMS →
AUTOMATED
FEE
SPLITTING**

Human experts have been taking you for years; now it's the computers' turn. Automated accountants, digital dentists, and loadable lawyers will charge





more than their living counterparts ever did—and, because they'll be specialized systems with sophisticated communications capabilities, when you consult one, you'll have consulted 20. An automated accountant won't be able to complete your tax claims alone; it will automatically consult with real estate systems, business experts, and building inspectors (in case you insulated your house for the ninth consecutive year). Besides expertise, you'll be paying for power, maintenance, supplies, and communications, but at least the charges will be tax-deductible.

INFORMATION CENTER → STRATEGIC INFORMATION COMMAND

While the president worries about missile bases, the dp manager must worry about the corporate database. Information has emerged as a strategic weapon in today's increasingly complex socioeconomic environment, and only those firms willing to fortify their information centers will survive the inevitable world data crisis. Dedicated information professionals will safeguard

corporate information at all costs, protecting it from rival firms and bone-headed, would-be users. Only the biggest companies can pay for SAC-strength mountain storage, but even the smallest will station armed guards at each terminal. Remember: loose bytes lose fights.

TOP DOWN → BOTTOMS UP

Yesterday's structured programming methodologies are giving way to more liberal approaches. The terms bar code and flowchart take on new meanings as the dp shop undergoes a paradigm shift toward the corner tavern. The Do-While statement so common in earlier software is being replaced by the more powerful, more evocative Do-Be-Do-Be-Do structure. Computer performance that was measured in terms of uptime is now calculated in units of Miller time. Programmers who don't know when to stop must frequently be told: "You're done!"

ORDINARY SPEECH → MEGASLOGANS

The One-Minute Manager reminds us that we are the person managing our behavior. In an organizational environment, discrete idea parcels are crucial to this managerial challenge. Even at this early stage in the information revolution we're memorizing some of the fifty-odd thoughts that promise to replace all others: "Insightful nicheman-ship impacts opportunity windows. Maintain a lean, loose/tight, hands-on entrepreneurial bias and stick to your knitting. Don't compromise, reconceptualize!" When these insights are bound into books we buy them by the bushel, because a slogan properly wielded beats five hours of original thought, every time.

A FEW TRADE PUBLICATIONS → MILLIONS OF MAGAZINES

Ignorance is anathema in the fast-paced information business, and the press is doing its darndest to see that professionals don't get caught with

their pants down. That means you can look forward to exciting new periodicals like *Abends*, *Infoglut*, and *Computer Quandaries*, as well as a daily DATAMATION and morning and evening editions of *Computerworld*. Far-sighted dp managers are already hiring staff ophthalmologists because they've realized that the number of computer publications you must read is double the square of identifiable market segments.

**PROFIT
 MOTIVE →
 MOTIVATING
 PEOPLE**

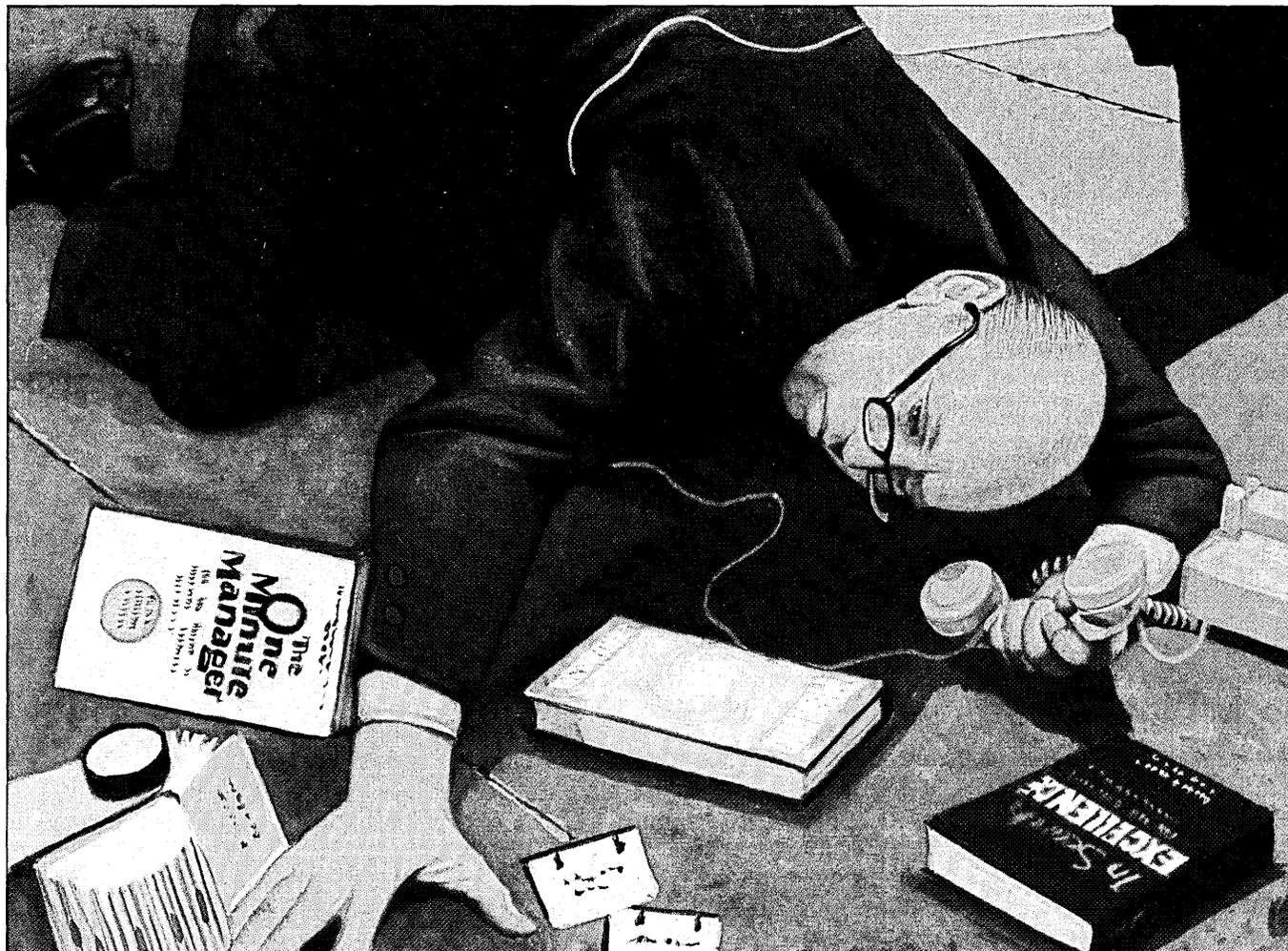
"When we brought the new technology in here," explains Xerxes Williams of Acme Life & Casualty, "we thought it was purely for bottom-line impact. Well, we've had some of that. But now that we're all on-line, we've discovered what the machines are really good for:

making folks jump." Williams is typical of a new, enlightened breed of manager; he realizes that people are his most important resource and should be pushed hard. Like most of his new-age colleagues, he believes in human potential and the return of joy to the workplace. "You don't know what fun it is," he gushes, "until you've barged onto somebody's screen with a message like '6079 Smith W.: Time is 10:13:22. You have visited coffee shop once, men's room three times, and are 731 keystrokes under quota. Per your low-salt diet directive (Corp. Health 1431), please dispose of those potato chips.'"

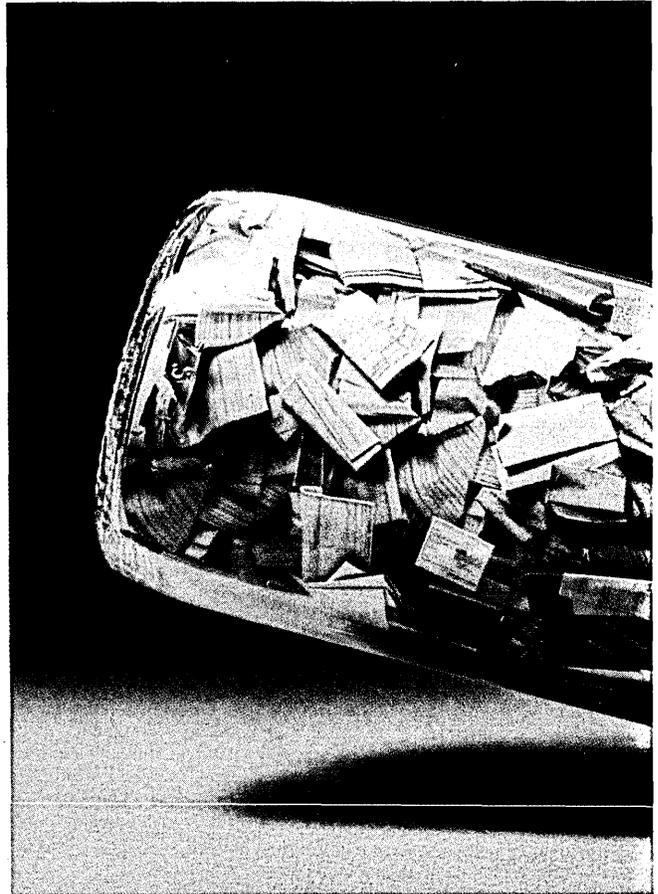
**MANAGING
 CHANGE →
 CHANGING
 MANAGEMENT**

In the old days, computer people laid low and made corporate managers

look good—to each other and to stockholders. When new technology came along technical types made it work, despite the cavilling of the smug self-promoters it would ultimately benefit. Now these same ignoramuses, mesmerized by 90-second *Action News* computer features and hypnotized by *Harvard Business Review* articles with 17-word titles, are mumbling management mantras like "Information systems are competitive weapons." MIS directors are chuckling because weapons are dangerous if you don't know how to use them. Most corporate managers believe that if they see it on a crt it must be true, and infopros with long memories and curmudgeonly outlooks can be expected to take advantage of that fact. In their capable hands, decision support will become a powerful new tool for causing big shots to embarrass themselves and, where appropriate, lose their jobs. *



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Bit-Mapped Graphics.....	STANDARD	\$240	STANDARD	\$845
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COMPLETE SOLUTION PRICE	\$2,695	\$3,528-\$4,628	\$3,465-\$4,165	\$4,840-\$5,540
Dual Drive Capacity.....	800 KB	640 KB	280 KB	800 KB
Graphics Resolution.....	640 x 300	640 x 200	280 x 192	800 x 240
Keys on Keyboard.....	93	83	63	105
Standard Memory.....	128K	64K	64K	64K
Optional Winchester.....	YES	YES	YES	YES
Tilt and Swivel Display.....	YES	NO	NO	NO

1—Includes CPU, Standard Memory, Keyboard, Display, Two Disc Drives, and Operating System.
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Your talk on relational databases is bound to be a crowd-pleaser if you follow these simple guidelines.

TECHNICALLY SPEAKING

by Karen E. Horowitz

In large corporations, where anonymity is often the norm, visibility is vital to gathering support for technical ideas. Managers are often required to cost-justify their projects to high-level management or explain the design of their systems to peers. An effective presentation can turn around a no-go project decision, or quickly gain the speaker the technical respect of his or her colleagues. Yet few technical professionals are comfortable enough to get up in front of an audience and sell their ideas.

Dr. Carletta Aston, assistant professor of speech, language, and hearing science at Rutgers University, and instructor of "Briefing and Presentation Techniques" in AT&T Bell Laboratories' Business Skills Development Program, says, "Since we live in a society based largely on perception, it is important to have people perceive you the way you want them to. Often someone who is talented in technical areas is bypassed for promotion by someone who projects what management perceives is the right image. Giving a presentation to an audience is an effective way of communicating your ideas while projecting yourself the way you want others to perceive you."

Michael Braude, vice president of technical services at Morgan Stanley, agrees. "You must have the ability to convince people you're as good as you are, or your career growth will be stunted. Many people judge you on the basis of interpersonal interactions—you must be able to convince them of your worth."

The director of Employee Information Systems at Philip Morris, Hedy Fore-

man, adds, "It's important for technical people to be exposed to other groups and to higher levels of management. I want the people who do the work to give their own presentations. Everyone in my department has been through a course on presentation skills. It takes a lot of preparation to present the right image—and there may be no opportunity to change that first impression."

The first step in giving a presentation is to establish its purpose. Is it supposed to persuade, inform, or teach? What points should you make in your talk? If you were asked to give the presentation, find out what the audience wants to learn from it. If you independently decided to give it, establish your purpose, and let your audience know in advance what you will be covering.

For example, you designed a word processing system that recommended purchasing a large number of microcomputers to ease the load on mainframes. You designed a communications network between the micros and mainframes that enabled users to do their computing locally and to use their micros as terminals.

The board of directors has asked you to give a presentation on your system. You are enthusiastic about the design because it is technically innovative, and you welcome the opportunity to demonstrate your expertise in computer communications. But that is not the purpose of this presentation. The board of directors wants to know one thing only: is this implementation cost-effective? It is not interested in the design details.

It wants to know how the system will affect productivity, next year's budget—the bottom line. The board of directors needs assurance that you have addressed the financial

concerns of the corporation as well as the technical ones. Focusing your presentation on the issues that are important to the directors will prove you have looked at the big picture. They will get the information they need and you'll project the desired and appropriate image.

PRESENT A TECHNICAL SEMINAR

Let's look at a different scenario. You were asked to explain your network design to your department's technical staff. This time, your talk can be instructional. Concentrate on the reasons for your particular design, and how you chose to implement it. Advertise your talk as a technical seminar, and present your points that way. In both the above cases, the audience will get what it came to hear, and you will achieve your objectives as well.

Now that you've established the purpose of your talk, choose the level at which you will present it. Do some research. Know your audience. Find out how many people will attend, what level of management will be there, and whether or not they are familiar with your subject. Then target your talk to the level of your audience. Rutgers professor Aston says, "The biggest problem most people in technical professions have when giving presentations is that they get lost in details. The nature of technical work is a narrow focus. But in presenting to others, you often need the overall view." Don't get bogged down in details. Be prepared to back up to a higher level, if necessary. Philip Morris's Hedy Foreman agrees. "Technical people are used to dealing at the bit level. They have to learn to eliminate the jargon and speak in a language their audience can relate to."

If you talk above your listeners' level of understanding, they will stop listening.

A good case in point is the seminar (discussed earlier) you are holding for your department. The people attending are technically astute. They've heard of your work, although they are not necessarily familiar with the technology. Most of the people attending will be technical staff, but some first- and second-level managers will also be there.

Your talk should be developed at a level that is comfortable for your listeners. Even though they are technically competent, they may not all be acquainted with communications technology. Do not assume that they are familiar with the acronyms or terms used in the computer communications field. Start off with a brief, high-level overview of the subject. Define the terms you will be using in your talk. If you do not know whether to explain a concept or to assume prior knowledge, choose to explain. In either case, keep the overview brief; those who are already familiar with the terms will feel more comfortable, and those who don't will appreciate your explanations and the effort that you are taking to address their needs. The purpose of the presentation is to communicate; no matter how technical you can be, if you talk over their level of understanding, they will stop listening.

OUTLINES ARE USEFUL

If possible, organize your presentation at least a few days in advance. This will give you the chance to keep a cool head and to think clearly about how you want to structure your talk. An outline is extremely useful, because it allows you to focus on the subject and to organize your presentation into subtopics that keep related ideas together. It can also serve as your notes while you speak, reminding you of what you want to say next.

Make the outline fairly detailed. You may not use all the information in your presentation, but it will be there if you need it. Braude, of Morgan Stanley, says, "Your outline should be a multilevel structure. You can start out with a basic, high-level talk, but you have to be prepared to go into another level of detail when challenged—and only when challenged. If you introduce a lot of technical detail otherwise, you'll lose your audience."

If your audience asks for more detail, you will have the information at your fingertips, already prepared in an organized format. If attendees are getting glassy-eyed, and you know you ought to speak at a higher level, back up and use the outline's broader headings as your main points. In either case, the format of the talk is laid out for you. This technique will allow you to concentrate on the delivery of your presentation while you give it, rather than on how you should have

organized it before you got up to speak.

Here's another example: you've conducted an evaluation of various databases' designs and implementations, chosen the relational model, and picked a particular database on which your department will build its applications. You've been asked to give a presentation to your department members, describing the reasons and evaluation criteria behind your decision.

You choose to speak at a fairly high level, touching briefly on the different database models, your reasons for choosing the relational model, and your criteria for picking a particular implementation: performance, user interface, features, etc. In your outline, you may treat each of these subjects equally, breaking down the high-level points into the same amount of detail. In your talk, you can start out using those high-level points, but it is likely that your audience will be interested in a particular area and will want more detail; be prepared to give it to them.

Suppose the database package you chose far outperforms the others in response time. Your audience wants to know what that package does differently to allow such fast response times. If you've got the information in an outline, you can respond in an organized, logical manner. If you are unprepared, your response will be much less graceful.

Do not, however, feel glued to your outline. It is only a tool to help you when necessary. Don't sacrifice your natural mode of speaking by reading from it, and don't avoid addressing a subject your audience wants to hear about simply because it is not in the outline. If you feel comfortable with the way your presentation is going, follow your instincts.

There are basically two ways to relay information: present the idea and then support it; or build up to the main point. According to Professor Aston, the former method is far more successful than the latter in technical environments. "People need to know whether they want to listen to you—especially high-level management. They're busy and don't want to waste time waiting until you build up to a point they're not interested in." State your premise, describe your idea, present your results, and then present your supporting data.

RETAIN CONTROL OF FORMAT

Foreman concurs and notes that "it's important to let your audience know what you're going to say and the order in which you plan to say it, right from the start. Unless you do that, the first question you get is likely to pertain to the last topic on your list. By letting the audience know in advance, you retain control of the format while assuring them that their ques-

tions will be answered."

Using the database evaluation example above, you should begin your talk with a brief introduction, stating that you have conducted an evaluation of various database models and packages, have chosen model X and package Y, and will describe your evaluation criteria and result. You will then satisfy the people who came only to hear which package you chose (they can now leave), and you've assured everyone else that you will cover the issues they're interested in hearing about.

Visual aids can be useful presentation tools. Outlining your main points on transparencies helps you keep track of the direction of your talk and allows the audience to follow along. But how many of us have sat through presentations where the speaker read the information from the visuals or spent the entire time talking to the blackboard?

DON'T HIDE BEHIND VISUALS

Visual aids can quickly become crutches—reading straight off the transparency is much easier than dynamically composing articulate speech. But then you miss the opportunity to project a desirable image and to give voice to your personality. You might as well distribute copies of your visuals and sit down.

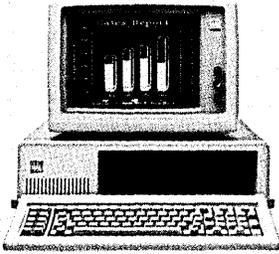
If you outline your points on transparencies, paraphrase, elaborate, and explain them, but do not read from them. Don't write down whole sentences; use phrases, instead. Since you speak in sentences, not phrases, you will be less likely to fall into the trap of reading directly from the visuals.

Put no more than 25 words on each transparency. Illustrating your ideas in a diagram can be much easier than expressing them verbally. In addition, the audience will grasp your ideas more quickly and will probably remember the concepts afterward. Braude offers the example of a talk he gave on Josephson junctions for an advanced technology seminar. These devices must operate at close to absolute zero for fast switching times, so they present a formidable problem for real-world applications. His visual was a picture of a computer in an ice cube, held by tongs—simple, graphic, and effective.

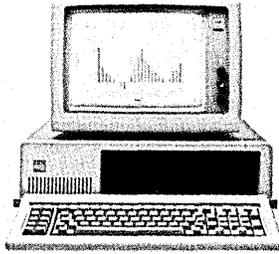
If you use a diagram, keep it uncluttered. Eliminate unnecessary detail, and write in large, clear lettering. Do not use too many transparencies or diagrams. It becomes tiring for both you and your audience. A good rule is one visual for every three to four minutes.

If you write on the blackboard during your presentation, do not speak at the same time. Finish writing, then turn around to face your listeners before addressing them. If you write and speak simultaneously, only a lucky

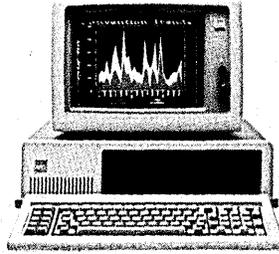
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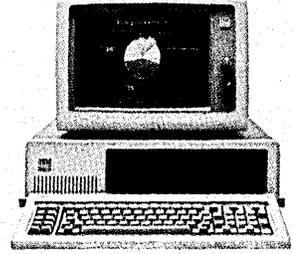
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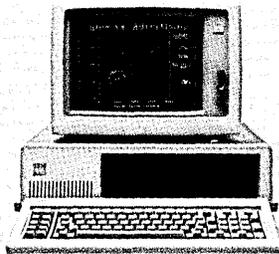
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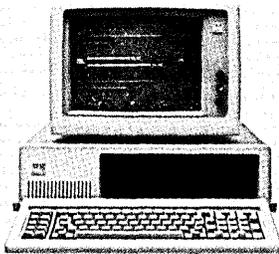
3. Access entire mainframe files, so you can work with large amounts of information at one time.



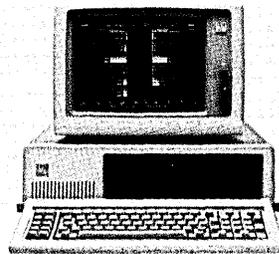
4. Choose the exact mainframe information you need, as much as you need, in the form you need.



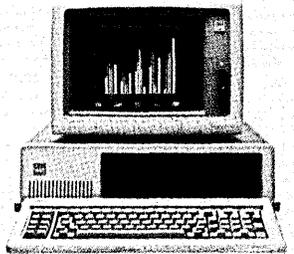
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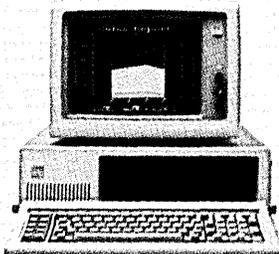
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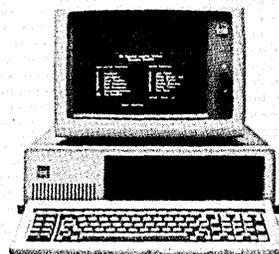
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If you sense hostility during your presentation, try to address it directly.

few in the first rows will hear you and everyone else will be frustrated. Don't be afraid to turn your back to the audience. The movement of writing on the blackboard will help you release tension, if you are feeling it, and allow your audience to relax its attention briefly.

Visual aids can help relieve nervous tension in an acceptable manner. Speakers often pace back and forth, tap pencils on the podium, or swing their arms. These are all methods for releasing tension, but they are distracting and disconcerting to the audience. Walking over to the blackboard or pointing at a diagram are ways speakers can move around without making the audience uncomfortable.

When developing your point in a presentation, you can draw on several support techniques:

Analogy. It is often easier to grasp a new subject in terms of something we already understand. Using an analogy can help you explain your point effectively and vividly. For instance, in describing the flow of processes through a timesharing system, one can use the analogy of a flow of automobile traffic through a road network. Servicing a high-

level interrupt then becomes analogous to pulling over to the side of the road when an ambulance comes through.

Definitions. As already stated, define your terms and acronyms. In the database presentation mentioned earlier, you would define the words relation, table, record, tuple, field, and attribute. Even someone familiar with relational database terminology will benefit by these definitions, since the meaning of the words often depends on the speaker's point of view.

Specific Examples. If the theory you are describing is complex and abstract, make it real. Show what a database relation is by drawing a table with column names and filling in the rows with sample employee data. It is easy to misunderstand an abstract idea, but by giving specifics you assure closer communication and eliminate ambiguity.

WHEN TO ANSWER QUESTIONS

Questions during a presentation can be a nuisance, distracting you from the structure of your talk. If you do not want to be interrupted, say so at the beginning and suggest a question and answer period after the talk, making sure you

save time for it.

On the other hand, questions are useful tools; they can give you the opportunity to develop a point further and involve the audience in your presentation. Also, when you answer questions, you'll become more relaxed and natural.

Professor Aston says, "Taking questions as you talk and taking them afterward is like the difference between having a fish on the end of your line and just having your line in the water, waiting for a fish to bite. Good questions mean that the fish are biting and that is where the fun begins. Good questions are both flattering and satisfying to the speaker because they are evidence that he or she is holding the attention of his or her audience."

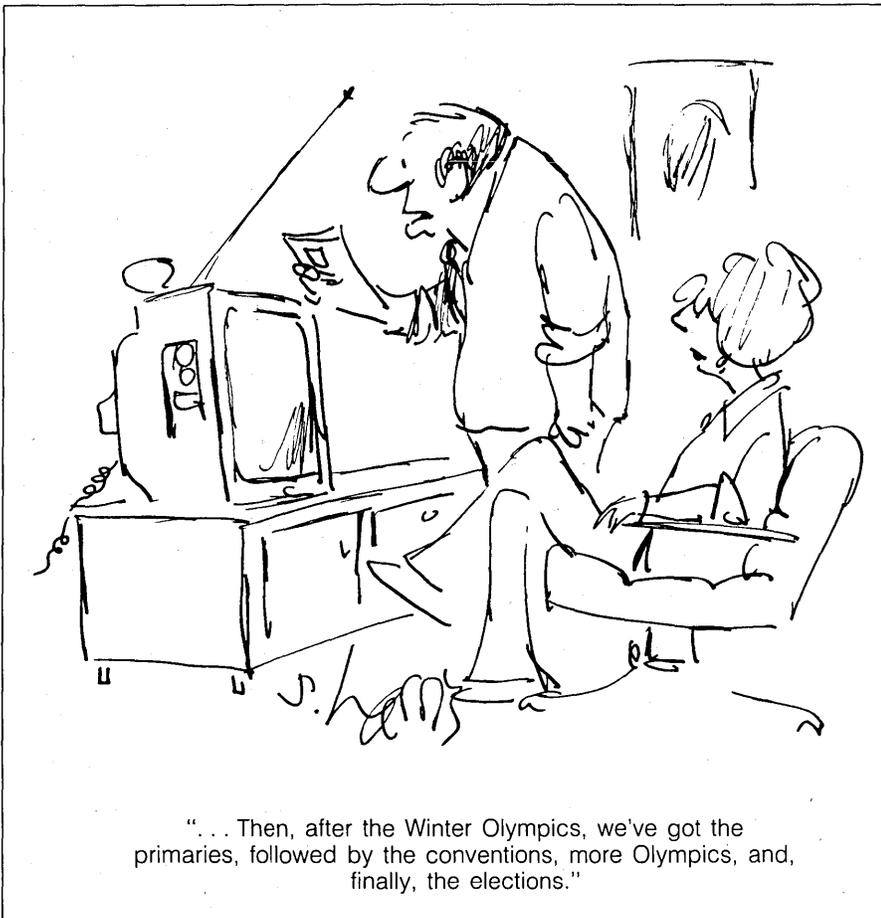
If you take questions, make sure they are heard. Repeat them, if need be, and then answer. If you do not know an answer, say so. If you feel it is important, say you will find out the answer and get back to the questioner later.

How do you deal with hostile questions? Aston advises that your audience analysis should include how your listeners are likely to feel about what you say. If you know in advance that your audience will probably be hostile, try to come early, talk to people, make allies. If they just finished conversing informally with you, they will have difficulty remaining hostile. If you sense hostility during your presentation, try to address it directly. Ask for feedback, such as, "How does that sound to you?" Look at them directly. Don't fold your arms or exhibit other forms of hostile body language. "Certain kinds of people get attacked," remarks Aston. "You know the expression 'dogs smell fear'? Well, an audience can sense fear as well. Show people you respect them and are not frightened of them. They will then treat you with respect."

Braude's advice for handling a confrontation is to "try to take it off-line. Say something like 'Let's get together and talk about it afterwards.' The audience can usually sense who handled the situation better."

If you follow the above guidelines, you're well on the way to creating a good presentation. But the most important element in a truly excellent presentation is the most difficult one to teach: allowing your personality to come through. Have fun with your subject. Use your imagination. Giving a presentation can be a rewarding experience for you and your listeners if you relax and truly enjoy communicating with your audience.

Karen E. Horowitz is responsible for technical support, eastern region, for Unify Corp., Morristown, N.J., maker of relational database management systems.



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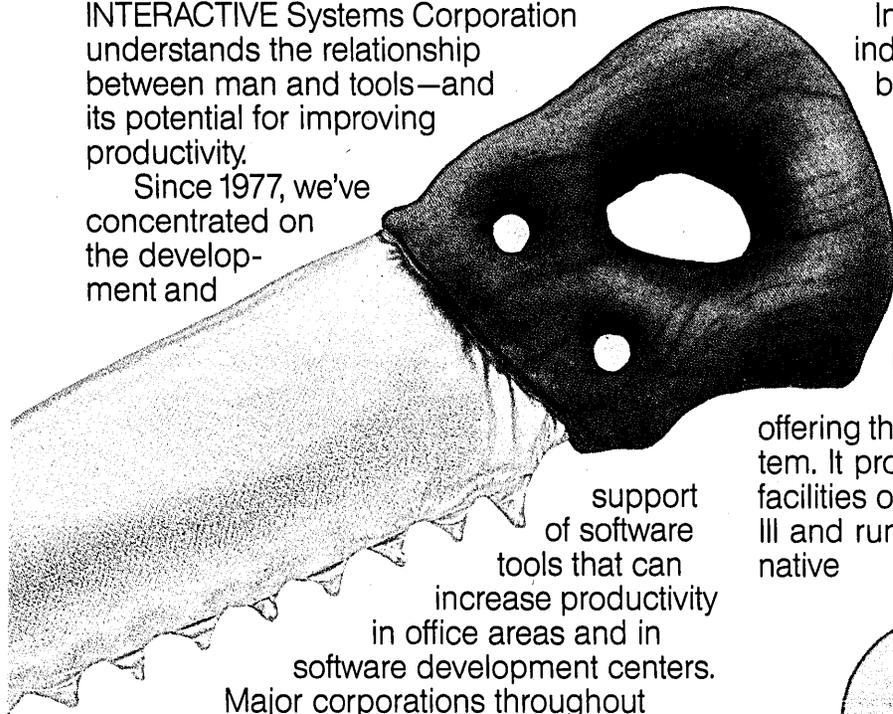
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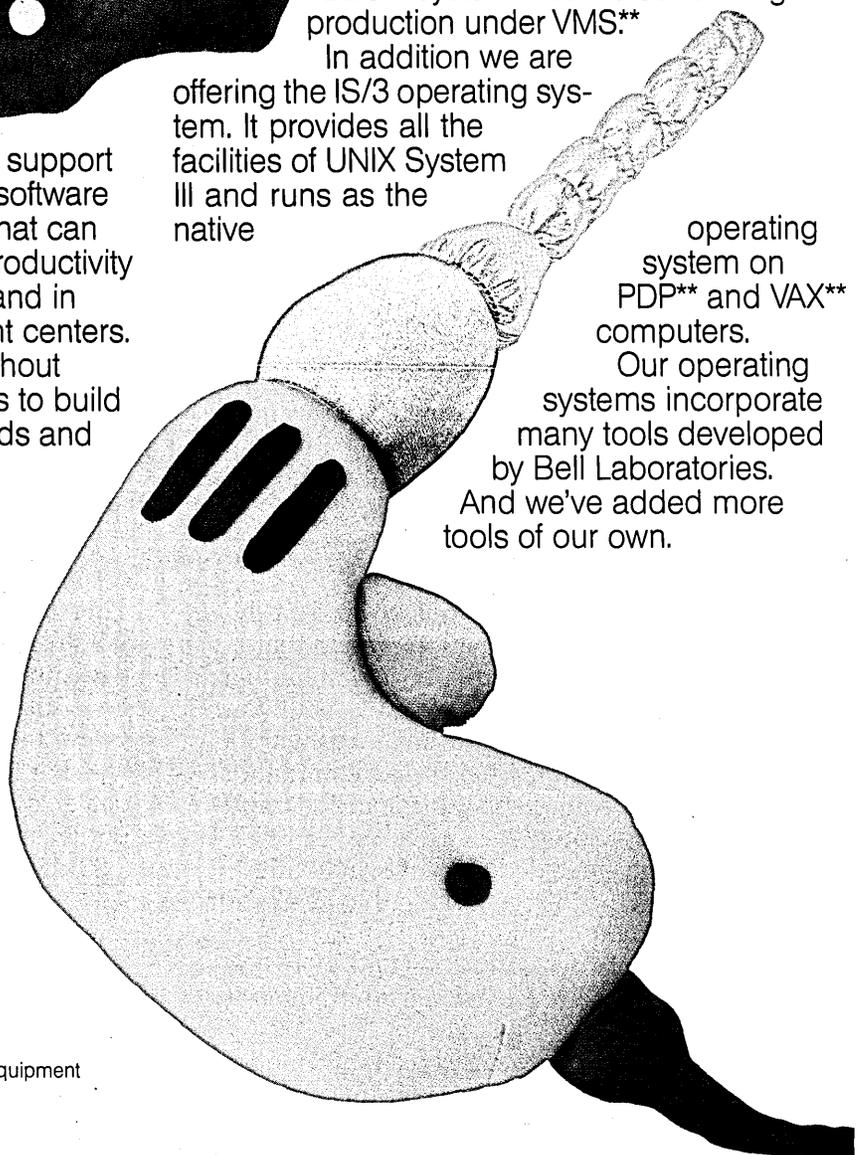


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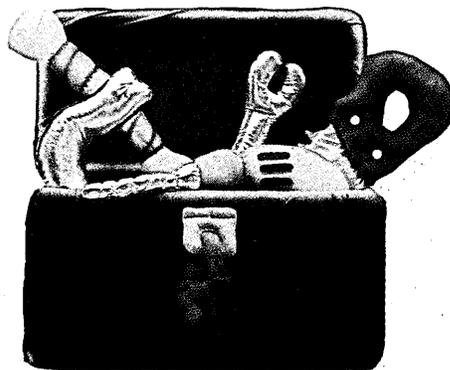
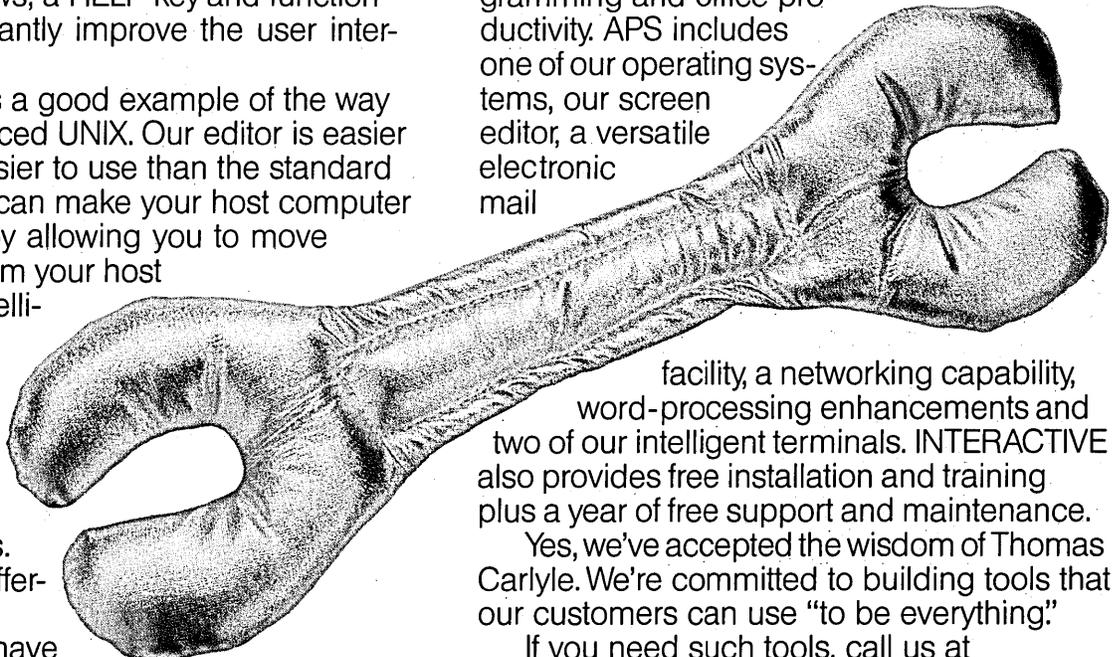
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As word processors get smarter, bad ideas become harder to spot.

MENDACIOUS MACHINES

by Tom Parret

In *Gulliver's Travels*, Swift's narrator describes a giant language engine. With it an eighteenth-century researcher intends to produce "a complete body of all arts and sciences": "by [this] contrivance, the most ignorant person, at a reasonable charge, and with a little bodily labour, may write books in philosophy, poetry, politics, law, mathematics and theology, without the least assistance from genius or study."

The world is about to face that language engine's modern equivalent: the "intelligent" word processor. These slavishly patient, electronic editors help rectify grammar, spelling, and syntax; their offspring will block that cliché, machine a phrase, cut for length, even dandy up a paragraph with quotes from thesaurian sources.

As reported in this magazine (November, p. 58), the die is cast. Word processing will soon get new databases. Four companies have already secured rights to some of the most useful reference works for writers. Wang Electronic Publishing Company (née Dictronics) has the *Random House Dictionary of the English Language*, *The Oxford Dictionary of Quotations*, *Roget's Thesaurus*, Rand-McNally's *Atlas*, Strunk and White's *Elements of Style*, three authoritative technical dictionaries, and more. Houghton Mifflin has, among others, the *American Heritage Dictionary* and *Roget's II Thesaurus*. Proximity Technology has various Merriam-Webster products. And Xerox Information Resources Group owns a vast number of data sources including R.R. Bowker's *Books in Print*, the periodicals and dissertations of University Microfilm International, and Autex Systems' network of commodity buyers and sellers.

What Wang ultimately seeks is to make its databases, integration technology, and interfaces the office automation standard. So, naturally, lie the hopes of IBM and AT&T. The latter's Bell Laboratories owns the early lead with *Writer's Workbench*, a Unix-based electronic editor on sale since last fall

(\$4,000 for the first cpu, \$1,600 for copies; 50% discount for educational uses). More than two dozen programs "check spelling and punctuation, analyze the writer's style, and provide information about principles of good writing," claims Bell. One program, thin-skinned as a NOW recruiter, bristles at sexist words and phrases. Another judges the writer's style "based on advice from reference books and on the results of research on the psychological bases of comprehension." (Whose research? What psychology?)

Wang and IBM are not napping. Wang has a new menu-driven "letter generator" that provides letter drafters with a wide variety of templates ("Dear Mom," "Dear Mr. President"). Soon to come is Wang's sentence analyzer; researchers at IBM's Yorktown labs call their sentence analyzer "Epistle."

SCENE: Your office. TIME: June 1985.

Anton Flig, your impertinent aide, a home-study University of Coleco wonder, circulates a report you've never seen. It is so well written it sizzles; top executives, slack-jawed with astonishment, buzz personnel for his file.

You thought this guy was barely competent to read gauges, and you were right: clever software transformed him on paper into George "Adam Smith" Goodman. You were going to fire him. It's too late now.

The difficulty is, this new technology threatens to transform more than Flig's prose. It could upset a lot of people, generate bogus careers where none were before. It could rock the foundations of our culture. At the very least it could boost absenteeism, give a hearty endorsement to prime time tv, and spawn whole new take-out dessert industries. Imagine Sylvester Stallone writing a major novel all by himself, his Hell's Kitchen banalities gaining (once he learns hunt-and-peck is easier without gloves) the clarity of *The Naked and the Dead*.

There are worse possibilities, and they're only slightly farther fetched:

- Your 24-year-old cleaning person, a soap junkie and would-be extra, reveals a screenplay she's just sold, composed under the in-

fluence of the National Endowment. It reads like Noel Coward masticated by Lydia Lunch. It is these two, in fact, melted into Lunchward via the program "Stagecraft 12.3."

- *Alive*, a high-gloss monthly produced in a Brooklyn basement, forces high-toned cant between ads for French perfumes, Iranian caviar, and Ferraris. Its avid audience enjoys a median annual household infusion of \$142,000. Until a product called Power Prose came along, *Alive's* teenage editors couldn't bolt two sentences together.

- A new, widely syndicated column—"From the Suite"—by George Steinbrenner. Critics call it the most sensitive baseball commentary since Red Smith departed for heavenly stadia. How does George do it? Simple: just fume, excoriate, and snarl into a dictaphone, order a secretary to type these rantings onto a disk, then process (separate and blend), and voilà: King George reads like Pascal.

- Juvenal Betancur, brother of the president of Colombia and reputed drug-world mastermind (you thought Billy Carter was odious), starts selling articles to *Vanity Fair* about the poignancy of daily life on a mountainside coca farm. His secret helper? A Silicon Valley firm called Mots Justes Iric. You'd swear the wily Colombian was the next E.B. White, and you're not far off: he sifts his final drafts through a custom MJI database, "One Man's Feat."

- James Watt, mounting a surprise campaign for the presidency, opens with learned treatises in *Foreign Affairs*, *The New Republic*, and *Fortune*. The elite thus wowed, endorsements pour in: Tammy Wynette, Archie McGill, Tommy John. With such heavyweights behind him, Watt steals the convention and then wins it all—no landslide, mind you, but an invigorating margin. Unprecedented federal action commences. Cape Cod is sold for foundry sand, the Everglades are filled with floating condos, Lake Michigan is drained to wet the whistle of the Southwest. Most everybody gets rich; the counterintuitive lose their jobs. Watt's projects tattoo the face of America. How does he

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PITHY QUOTE

SUPPORTING STATISTICS

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ANALOGY

PUN

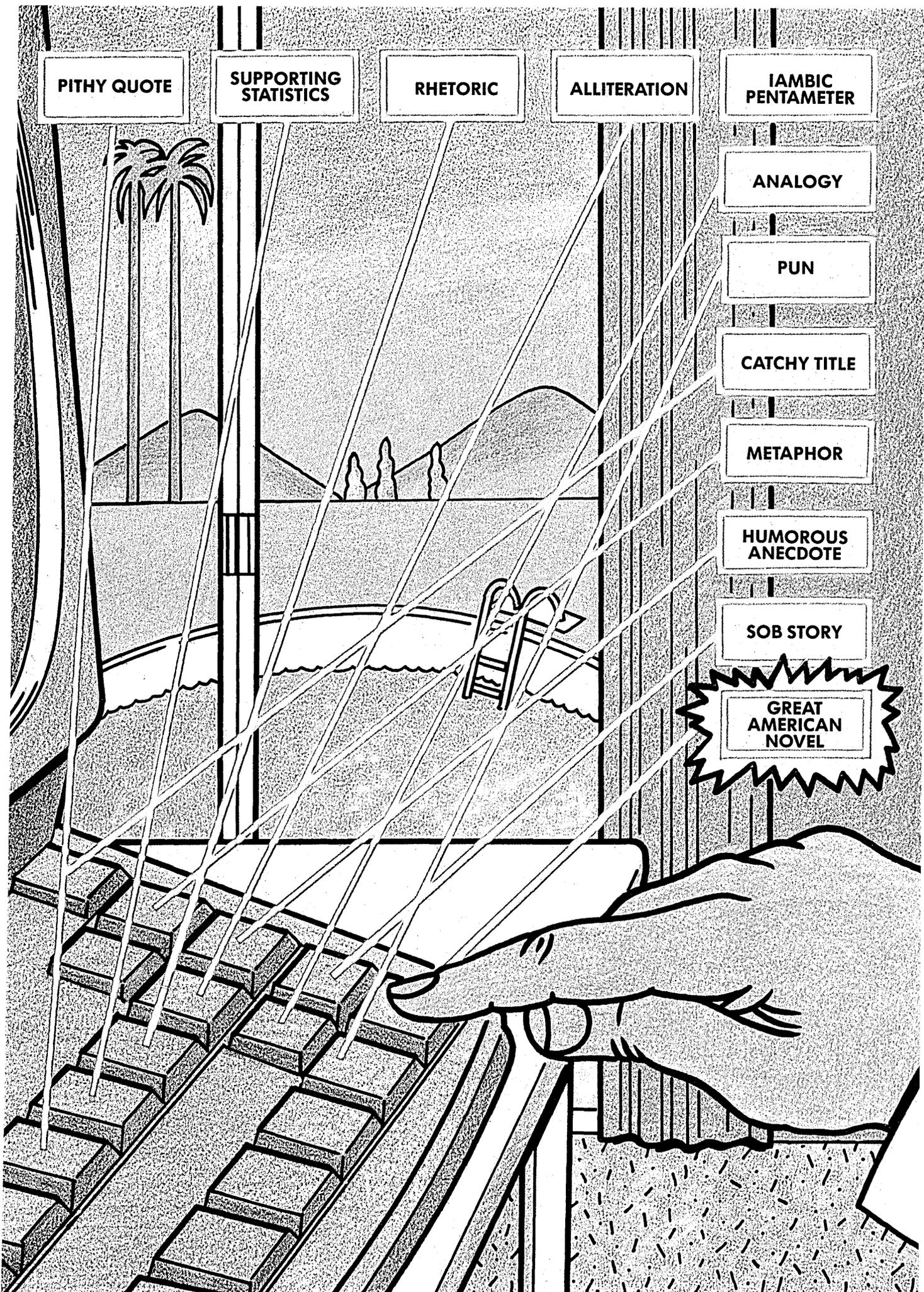
CATCHY TITLE

METAPHOR

HUMOROUS ANECDOTE

SOB STORY

GREAT AMERICAN NOVEL



Language's devolution, brake lines severed, begins to accelerate.

get away with it? Sheer processed eloquence, aviator sunglasses, a gullible populace.

INPUT NO LONGER THE KEY

The devisers of these new programs surely have something else in mind. Their aim is, presumably, to help those for whom well-crafted prose seems unattainable. Needless to say, a vast potential market. Presented with intelligent word processors, for instance, the General Accounting Office just might give recognizable English a try. Pentagon aides would learn that "neutralize" means—revelation!—"kill" or "annihilate," though perhaps then they'd be "transferred to Beirut." Made mandatory for the civil service, word processing might someday save Washington from itself.

But such applications are at best remedial. They'll raise to standard the writing of people whose standard of living demands it. The next step, however, is drastic—a broad jump, as it were: word processing so sophisticated that learning to write well *may not be necessary*. Kid can't write? No problem—have the litte ignoramus talk into this microphone here. . . .

Already AT&T's Writer's Workbench has tidied undergraduate prose at Colorado State University. Professors receiving the laundered, scrubbed, and combed compositions were reportedly enthusiastic (excepting that number who grade solely on punctuation). And 68% of students in initial tests said they'd like to use Writer's Workbench again. Of course they would—a better grade is the likely reward. But will these students think that the computer has, at last, distilled all there is to know about writing into a rapid, methodical operation? That clear, concise prose is no more difficult than, say, Oodles of Noodles?

Could be. And then language's devolution, brake lines severed, begins to accelerate. Appalling options assemble. Consider that intelligent word processing will disguise not only bad men but also bad ideas. Envision a lineup of middle-aged commuters. Pick the chronic scofflaw. Pick the game poacher. The philanthropist. Pick dear old dad, hard-working father. To a certain extent you trust your judgment, right? But when commuting falls from favor, and all words travel via word processor, it's going to be difficult at first glance to tell a redneck survivalist nut from a statesman. On close examination, maybe—but who's got time for that? Americans like to appraise life at face value, and the face of prose, ladies and gentlemen, may soon lack any useful clue to value at all.

The film star biography, to select possibly too obvious an example, stands mighty—preening fool before dim, indolent

customers—in its potential to launch us into lasting insensibility. The mounting tide of cash-rich fan magazines and smug interview shows, the lemminglike migrations of young aspirants toward an imagined film capital, are proof enough that the audience for tv and movie "literature" has barely been mined. What has restrained the supply of Hollywood reminiscence so far is not modesty, as some suspect, but complete lack of linguistic skills. Soon, that crucial deficiency will be corrected. Young film stars will serve up fascinating off-the-cuff versions of their adolescences, thus unclogging the way for similar effusions from anchorpersons, game-show hosts, associate producers, even grips. Publishing houses will leg-wrestle for the rights to studio recollections, imprints will sign up entire staffs of local tv stations. The inundation of logorrhea from these sources alone will wash legitimate writing, like so much flotsam, pell-mell into obscurity.

Naturally, such write-o-matic prose will hold no surprises, just as milk from many cows, once processed, emerges as individually wrapped slices of American cheese. All best-sellers, Wilfred Sheed said, seem to be written by the same person. Moreover, that is why they are best-sellers. Once you're accustomed to a writer's style, why change? Especially when no mental effort is involved, just coordinated eye movement: it's not *Under the Volcano*, after all—it's exactly the way most folks talk! Give the average reader average writing, that's the spirit.

WORD ARBITERS AT WORK

So who is dreaming up this foil-wrapped, all-purpose, tamper-proof language? Hazard a guess: somewhere in New England or California, in one of hundreds of thousands of squat, faceless buildings, a congenial group of consultants sits down to another day of preprocessing English. They range in height from 5'7" to 6'1"; all wear pin-striped or grim-gray suits; the wing tips are regulation; ties are of the type known as club but for one daring departure—navy blue with wild-fowl motif. The task force is locked in the thesaurus mode. The word for now—"mediocre"; the task—provide alternate words so as to avoid repetition. They work quickly.

Middling: "Stuffy sounding."

Indifferent: "Wide of the mark, fella."

Modest: "Now we're talking."

Moderate: "Fine—great stuff."

Betwixt and between: "Grandma banter."

Respectable: "Damn straight."

Passable: "Can't dicker with that."

Tolerable: "Seems a bit disparaging."

Dull: "Not in my database."

Lackluster: "No sirree."

Tedious, insipid, vapid: "Kind of pretentious."

Wishy-washy, namby-pamby: "We don't talk that way around our house."

Ordinary: "Oh, what the heck."

Coarse: "Negatory."

Cheesy, tacky: "Nothing doing."

Tinny, shabby, seedy, cheap, Mickey Mouse: "I say thumbs down to the lot."

Paltry: "'Poultry,' is it? Kind of weird, but all right."

"That's it now?" asks the chairman. "What've we got?"

Secretary reads: "Mediocre—moderate, moderate, respectable, passable, ordinary, paltry."

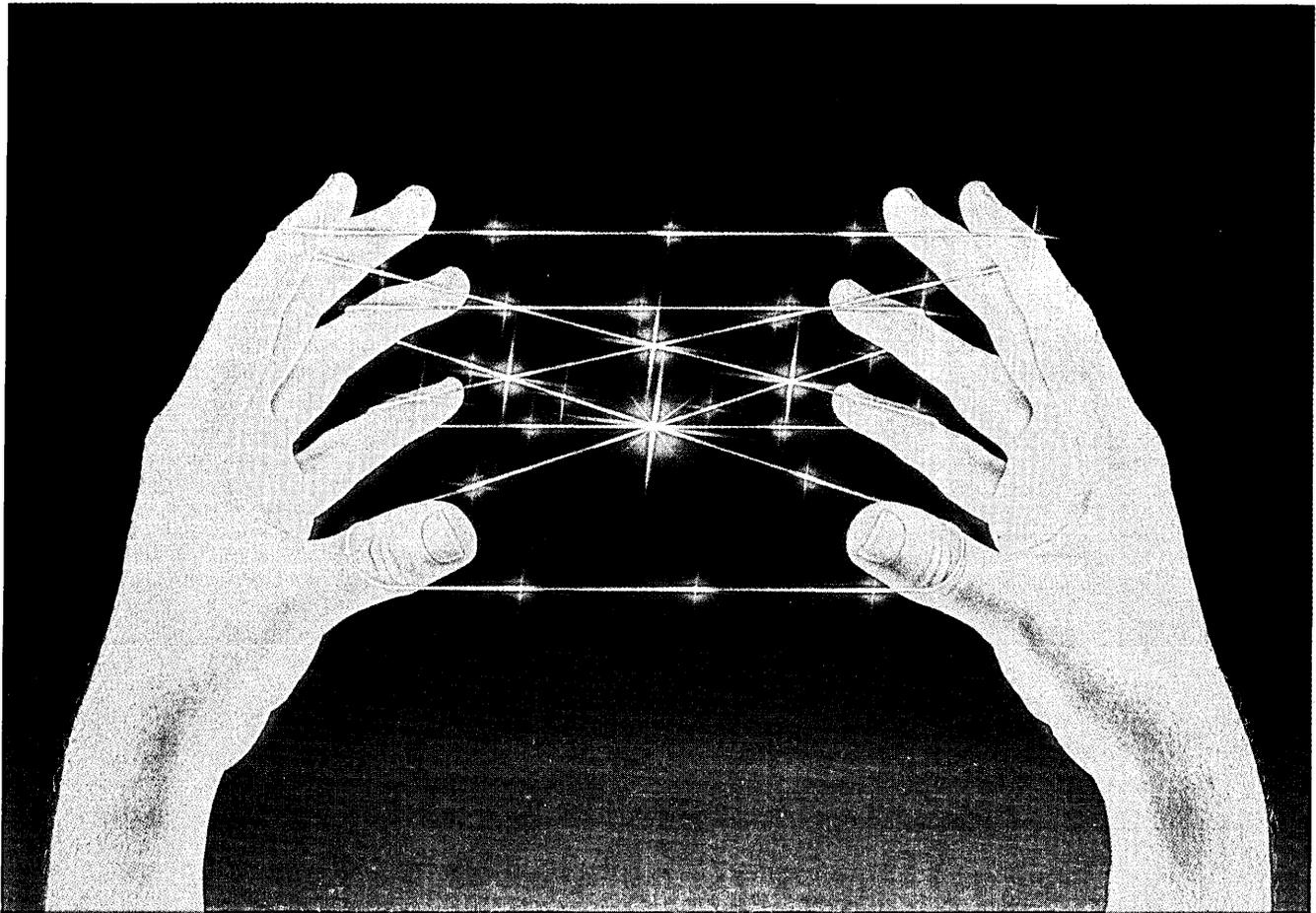
"What's that per-word synonym quotient again? Six-point-three meaning units? Excellent. Print! Moving right along then to, let's see, 'clean.' This one's going to be a real challenge, guys and gals."

Similarly, other appointed arbiters of the electronic word, in cozy confabs across the country, labor at the grubby, thankless task of making good writing accessible to everyone. They bait and snare brute adverbs and frugivorous verbs; they corral flouncy nouns and mewling modifiers. Their task is enormous, and aside from money their only reward is the knowledge that middle managers, lab technicians, fashion consultants, and countless others will soon have at their fingertips an eloquence undreamed of.

On one hand, then, will be homogenized language, headed toward us like an immense, unstable ridge of slag. On the other, a shovel-wielding rabble of irregulars—committed to battle but as able as King Canute was to arrest the tide. We may not sense disaster's soft approach. In fact, we will celebrate its first notable triumphs: comprehensible insurance forms, brisk Congressional newsletters, fewer zippy, sophomore news-magazine similes. But the new literacy, once it has emerged, will manufacture its own momentum. The first electronic editors may be offered to good intent, but what happens when competition sets in? When the pressure builds for a new model, a significant competitive edge?

For a time, smaller, entrepreneurial companies will devise and sell versions of IBM and AT&T superlanguages, with names like Max Beerbohm II, the Tom Wolfe New Journalist, Lew Archer Dialog. But the Bigs will consume these market mavericks like frogs gulping flies. Meanwhile, to keep each other off balance, they'll offer simpler, easier-to-use programs, each more user-chummy than the last.

Unintentionally perhaps, such highly refined language begins to take on character-



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“... One can hear the unsleeping hum of the word processor.”

istics predicted by a writer some 44 years ago: “The purpose of Newspeak . . . was to make all other modes of thought impossible. . . . This was done partly by the invention of new words, but chiefly by eliminating undesirable words and by stripping such words as remained of unorthodox meanings, and so far as possible of all secondary mean-

ings whatever.” Our leaders, far from deploring this trend, are liable to encourage it once its advantages become obvious. To wit, as Aldous Huxley observed, “language is, among other things, a device which men use for suppressing and distorting the truth.” War is peace, love is surveillance, hunger is joy, the computer is your only friend.

**WP COULD
REDUCE
IGNORANCE**

Huxley also wrote that “most ignorances are vincibile, and in the greater number of cases stupidity is what the Buddha pronounced it to be, a sin.” Intelligent word processors can be tools to reduce ignorance, to teach linguistic skills to those who possess few. As such they will be inestimably valuable. But at best they will be mere implements; they can never be mistaken for implementers. A hoe does not a gardener make.

Word processing is already altering the way people write. Scribes by the thousand claim everything for it from greater output to, as one professed, “deeper penetration of one’s own work.” Others have reservations. James Wolcott wrote recently in a review: “. . . beneath the book’s meandering sentences, one can hear the unsleeping hum of the word processor.” Certainly the word processor brings speed and order to the messy task of editing. It also eliminates retyping an edited draft.

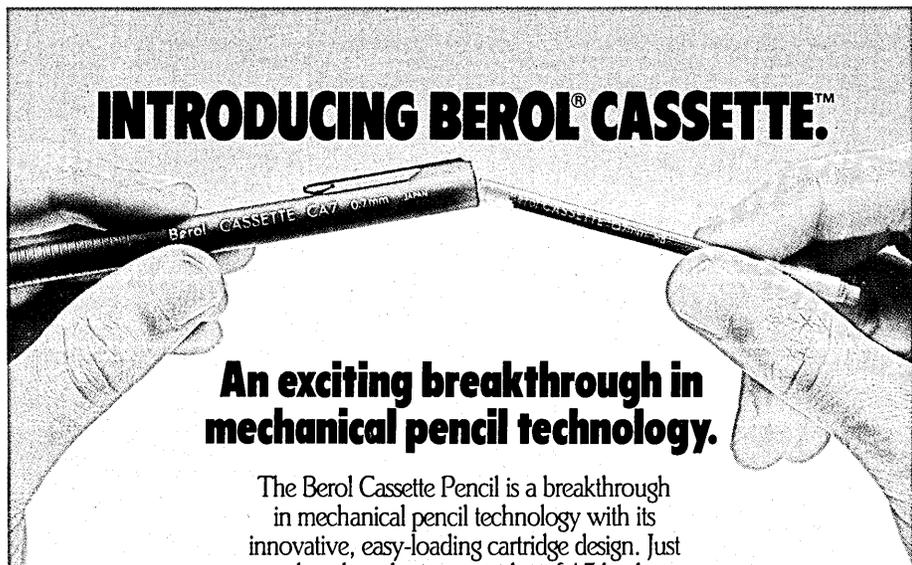
But for some, retyping results in a measure of rethinking—a final opportunity for critical appraisal, new verbal inspiration, one last comparison between the rhythms of the prose and the writer’s internal cadences. If the prose is already fixed in appearance on the screen—a luminous, perfectly ordered reality—the incentive for more, and perhaps crucial, refinement is diminished.

These objections may be quibbles. For professional writers, word processing won’t change much. Like switching from standard to automatic transmission, or from a wood frame tennis racquet to one with a larger, metallic head (bigger sweet spot!). The question is, what will intelligent word processors do for those who don’t write well? One fears that with their promise to reveal writing’s secrets, the new machines will also seem to promise an end to mental toil.

Language is alive, its vigor the brightest signal of our humanity. If the word processors to come enhance language’s vitality, they are welcome. If they make spiritlessness respectable, if they transform the blood on the tyrant’s hands to milk, we had best prepare ourselves for a situation Wallace Stevens described in “The Motive for Metaphor”:

“The obscure moon lighting an obscure world
Of things that would never be quite expressed
Where you yourself were never quite yourself
And did not want nor have to be . . .”

Tom Parret, a free-lance writer based in New York City, wrote this article on an electronic typewriter.



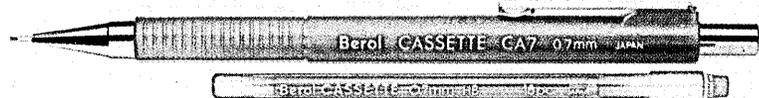
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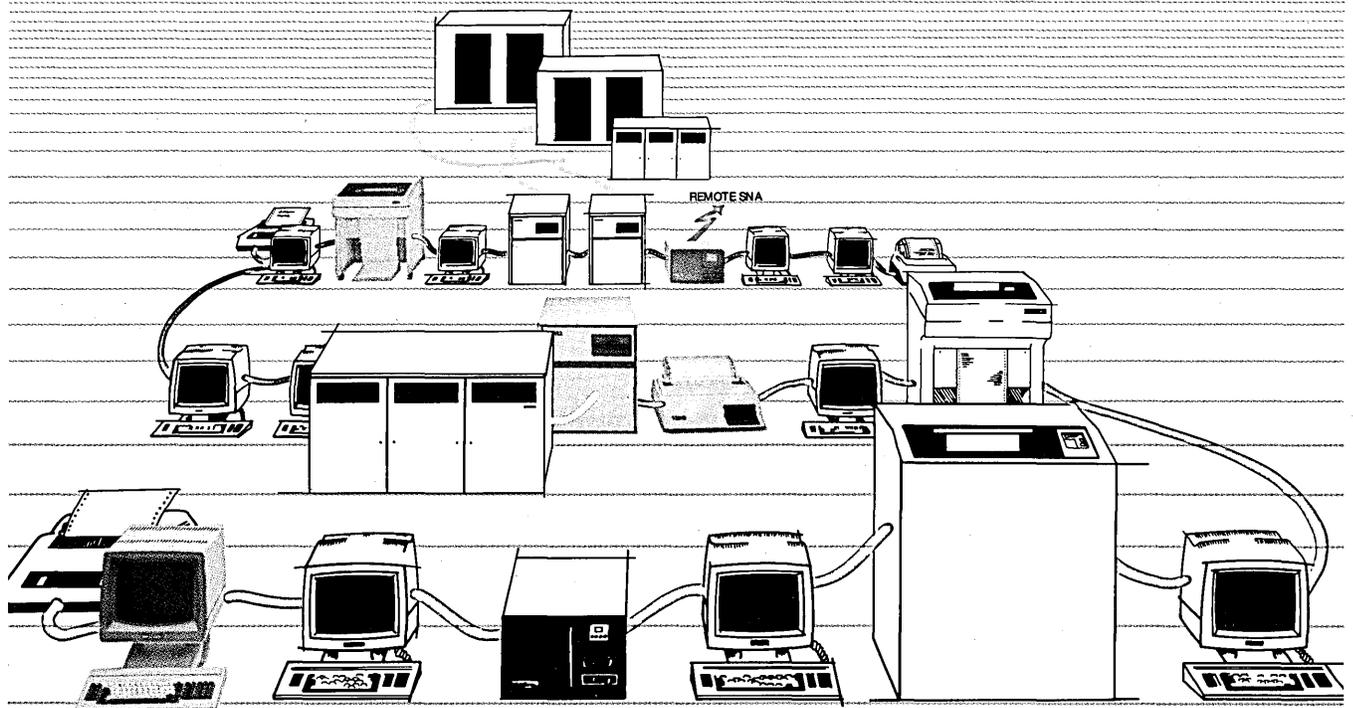
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CIRCLE 61 ON READER CARD



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CIRCLE 62 ON READER CARD

DATA PROCESSING

TOUCH ME

TOUCH ME IS A TOUCH SCREEN PROGRAM THAT INTERACTS WITH THE USER TO DEMONSTRATE THE FOLLOWING:

- DATA PROCESSING
- BAR GRAPHS
- ELECTRONIC MAIL
- TOUCH SCREEN
- WORD PROCESSING
- LANGUAGES
- PERSONAL COMPUTER
- SPREAD SHEETS
- AREA CHARTS
- THE SOURCE

BAR GRAPHS

Bar chart with 5 bars of varying heights. The x-axis is labeled 'CATEGORIES' and the y-axis is labeled 'VALUES'.

ELECTRONIC MAIL

RECEIVED FROM: [Name]

TO: [Name]

FROM: [Name]

SUBJECT: [Subject]

DATE: [Date]

TIME: [Time]

TEXT: [Message Content]

TOUCH SCREEN

PROGRAM MENU LISTING:

1. TOUCH ME
2. BAR GRAPHS
3. ELECTRONIC MAIL
4. TOUCH SCREEN
5. WORD PROCESSING
6. LANGUAGES
7. PERSONAL COMPUTER
8. SPREAD SHEETS
9. AREA CHARTS
10. THE SOURCE

WORD PROCESSING

THIS IS A WORD PROCESSOR THAT INTERACTS WITH THE USER TO DEMONSTRATE THE FOLLOWING:

- TEXT EDITING
- TEXT FORMATTING
- TEXT DELETION
- TEXT INSERTION
- TEXT ALIGNMENT
- TEXT JUSTIFICATION
- TEXT WRAPPING
- TEXT SEARCHING
- TEXT SPELLING
- TEXT PRINTING

MENUS

Line graph with a rising trend. The x-axis is labeled 'TIME' and the y-axis is labeled 'VALUES'.

LANGUAGES

PROGRAM MENU LISTING:

1. BASIC
2. FORTRAN
3. COBOL
4. PASCAL
5. C
6. ADA
7. PROLOG
8. LISP
9. SMALLTALK
10. SIMULA
11. ALGOL
12. PL/I
13. REXX
14. PERL
15. PYTHON

PERSONAL COMPUTER

Area chart with 5 areas of varying heights. The x-axis is labeled 'CATEGORIES' and the y-axis is labeled 'VALUES'.

POINT PLOTS

THE SOURCE POINT PLOTS:

1. SOURCE POINT PLOTS
2. SOURCE POINT PLOTS
3. SOURCE POINT PLOTS
4. SOURCE POINT PLOTS
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10. SOURCE POINT PLOTS



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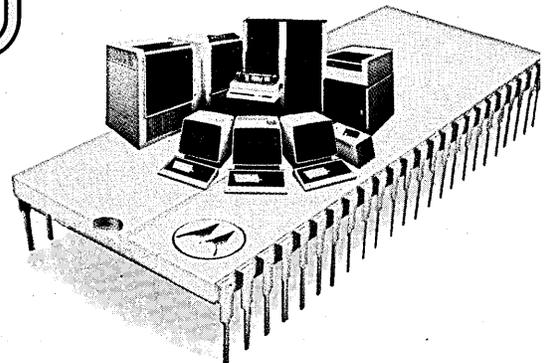
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CIRCLE 64 ON READER CARD

Multinationals have a tough time implementing the systems changes that support new products. American Express has found a way to smooth the transition.

TOTAL PROJECT PLANNING

by Kenneth D. Meyers

Managing the worldwide incorporation of new services and products is a particularly difficult task, especially for large, diversified organizations. The activities surrounding such changes include notification and training for all divisions within the corporation, notification to all outside establishments that will be asked to accept the service or product, and extensive updating of computer systems to support the service or product. American Express has done some innovative work in this last area.

Until January 1982, the United States Card Operations at American Express used the classical approach to changes in computer systems—ideas for new services or products were communicated from the marketing department to the programming staff. Systems and programming specifications were created and programs were written and tested, all within the programming department. When it was ready, the programming staff showed its output to the line operating departments that would support the new development. Written approvals were sought and obtained, and the change was implemented.

In the new scenario, the approach is considerably different. The marketing department now communicates its ideas to both the programming and operating departments, where extensive evaluations take place. Highly structured and detailed plans are formulated and approved before the project is given the go-ahead. Personnel assigned exclusively to the project then monitor ongoing performance against the plans, highlighting potential danger spots as well as recording completed items. Periodic meetings are held for review and problem solving, and no one is left lacking information or involvement.

The American Express Travel Related

Services Company Inc., a wholly owned subsidiary with data processing installations worldwide, is responsible for development and maintenance of the computer systems that support such changes. In the United States, three main operating centers, located in Phoenix, Salt Lake City, and Fort Lauderdale, Fla., house the hardware and software that process American Express Travelers Cheques, card charges, and customer remittances. Systems and programming support for the software is divided: the center in Salt Lake City controls Travelers Cheques, while the centers in Fort Lauderdale and Phoenix divide software responsibilities for card systems.

Both the Fort Lauderdale and Phoenix centers house similar databases for different card products. For example, systems supporting the American Express Corporate Card are executed in Phoenix, while those supporting the Gold Card and the Financial Services Account (offered through Shearson/American Express and other brokerage firms) are executed in Fort Lauderdale. The Green Card database and associated systems are shared by both operating centers.

The card systems are driven by an IBM 3084 plus an IBM 3081 at the Fort Lauderdale site; the Phoenix site uses three IBM 3081s. All mainframes are under MVS/JES2. Both installations are controlled by a communications management configuration (CMC), which is driven by different types of IBM 370 cpus and 3705 transmission control units (TCUs). The information management system (IMS) currently supports nearly five thousand 7250-type computer terminals in the U.S. and Canada. On-line database information is available to all users, regardless of location, through the data network.

American Express is currently one of the greatest processors of IMS transactions per second in the world. Peaks of 32 transactions

per second are not uncommon, and spikes of up to 45 per second have been noted.

The Credit Authorizations System (CAS), controlled and routed through CMC, allows instant authorizations for card charges to users around the world.

With split databases and split software responsibilities for its card products, American Express management realized that one unified and controlled approach should be created to plan for the introduction of new services and products, particularly those affecting multiple card products. New acquisitions by the parent corporation, competition from similar businesses, plus emerging new markets and opportunities impelled the card products group to change, thus making control imperative.

One of the first steps American Express took to control major new product development was the creation of a user coordination department. User coordination departments were started in Fort Lauderdale and Phoenix, as well as in the New York and Toronto, Canada, operating centers.

TESTING FOR NEW SYSTEMS

The initial charter for each user coordination department was to perform the user acceptance testing for computer systems associated with new products and services, as well as the American Express Travel Related Services Modernization Program (an upgrading of existing software into an on-line, real-time environment). User acceptance testing at American Express is the final stage before implementation. It is conducted after the business systems development (BSD) department has concluded both program and systems testing. Acceptance testing is conceived and controlled by the end users who will be affected by the change, or by the user coordination department acting

Staff members for the user coordination departments were drawn mainly from the company's operational areas.

for the end users. Data processing operations also uses acceptance testing to get hands-on experience prior to production. BSD personnel are constantly available, acting in a consulting capacity and making software changes when necessary.

Staff members for the user coordination departments were drawn mainly from the company's operational areas and were permanently relieved of their existing line duties. They were immediately immersed in two different, but necessary, tasks associated with their new charter. First, they had to absorb the business requirements associated with each new product or service, including those from each of the main departments within an American Express operating center: customer service, credit operations, finance, and data processing operations. Second, they had to understand the dp systems requirements, including program-to-program and system-to-system flow, on-line screen design, and file design and organization.

A host of new terms and concepts greeted the user coordinators. Their knowledge of American Express's operations was broadened considerably; their introduction to systems and dp could have been likened to an immediate immersion into the deep end of a pool. They all swam back to the surface, pleased by the expansion of their own fields of knowledge as well as the perceptions gained by viewing new software, hardware, and business systems.

The job of creating detailed test conditions also fell to the user coordination department. Working closely with BSD and the financial systems department, it identified, created, or extracted thousands of test elements from multiple files and databases. For example, over 5,000 elements were identified (and tested) for introduction of the Financial Services Account product. This included testing data interfaces between American Express, participating brokers, and the Provident National Bank in Philadelphia. The software written to support the new test material became reusable, as did the databases, which were recycled for subsequent tests on different products and for training material for line operations personnel.

While striving toward the paperless society, the user coordination department began to falter under the paper matrices that identified test elements, changes planned for those elements, actions and interactions between systems, predictions of the changes' effect, and interfaces with the banks, brokers, and third parties. Detailed test plans and elaborate program-to-program flowcharts were also drawn, monitored, and coded during the course of testing, so that all participants knew exactly how far the testing had progressed at any point.

The user coordination staff created demonstrations and held meetings to introduce and explain new developments to the rest of line operations, setting up a special office area in the operating center for these functions. In this "model office" visiting dignitaries received previews of upcoming new products and services, and line directors, managers, and supervisors learned about the details surrounding those new offerings. User acceptance tests were also conducted in the model office, which kept the midnight oil burning on many occasions. At American Express, where operating centers function 24 hours a day, seven days a week, the model office was just another room that remained active through the night.

HELPING BRIDGE THE GAP

Because the user coordinators' prior experience was mainly in line operations, their explanations of new systems development were more easily understood and accepted by the other members of line operations. This helped bridge the gaps that often exist between operations and dp systems when new developments must be explained and absorbed into current operations. The end users of a new service or product felt more relaxed with "one of their own" explaining how the new development would function. Because user coordination, a full-time job, was handled exclusively by the user coordination staff, the rest of line operations were left free to conduct the day-to-day business, getting involved only in major steps or reviews and previews of upcoming products and services. Line management was always consulted for major decisions. The user coordinators, however, handled the daily interaction between systems and operations, and resolved the many small problems, interpretations, and situations that invariably arise when dealing with new computer systems.

It soon became apparent that a user coordinator at American Express Travel Related Services was half systems analyst and half business analyst, or the ideal interface between BSD and line operations. As a result, additional duties were added to user coordination's charter, including involvement in the creation of business requirements for new services and products, review of procedures and workflows prepared by the operations planning department, and review of training material prepared by the operations training department.

The user coordination department became involved in all aspects of major projects, such as front-end analysis and requirements definition, project progress, acceptance testing, implementation, and post-implementation analysis. The department,

however, was still not responsible for overall project control. Only its position within a project was expanded and defined more clearly.

User coordinators also became ideal troubleshooters by investigating and evaluating problems as they occurred throughout the operating center. Many a situation was resolved or clearly defined by drawing on the department's experience and expertise. In fact, the manager of the user coordination department in the Canadian Operating Center was presented with a fireman's hat (complete with working light and siren), because her department was so adept at speedily answering calls, questions, problems, and "putting out fires"!

As projects were implemented, and new ones approved, management soon began to see that more steps were needed to create and maintain total project control. Some products, such as the Financial Services Account, involved the creation of whole new departments as well as major software development, further requiring additional office space, new equipment, telephone and cable installation and more. Other services, such as the new method of deferring payments on major purchases charged on the American Express Card (i.e., Sign & Travel), demanded negotiations with national banking institutions and contracts with vendors of forms, in addition to software development. Organizing and controlling these activities, as well as disseminating information and charting progress against predetermined plans, necessitated more control. Toward that end, the user coordination department's activities and charter expanded again.

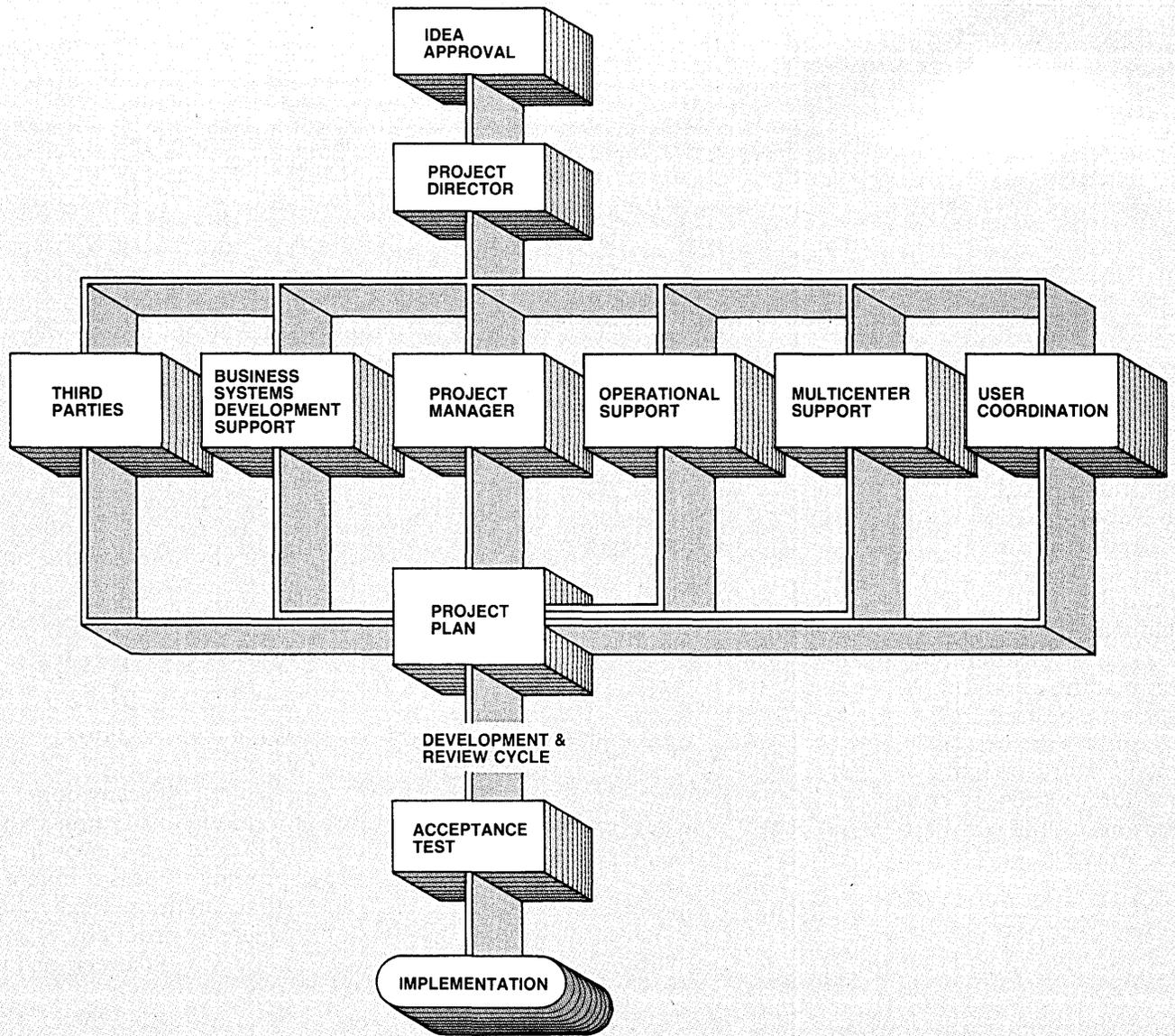
Management decided that large projects required both a project director and a project manager. These positions would be the focal points for planning, scheduling, and control. The project director would assume total project responsibility, make major decisions, set priorities, and provide the motivation for successful project completion. The project manager would take on day-to-day project responsibilities, monitor and report on progress, and keep the project moving.

The project director, chosen by corporate management, was usually one of the senior executives from the operating center where most of the computer software was being developed. Any other staff member in the same operating center, oftentimes a manager from one of the operating or support departments (such as user coordination or operations planning), would assume the project manager's position.

Both positions lasted for the duration of the project. Appointees assumed the responsibilities for their new titles in addition to other responsibilities they already held.

FIG. 1

PROJECT PLANNING FLOWCHART



AUTOMATED TECHNIQUE APPLIED

Management also decided that an automated technique of project control must be applied to project development. After investigating several alternatives, the PERT (Program Evaluation and Review Technique) form of project management was found to be most useful for the basic managerial functions of planning, scheduling, and control. A PERT expert, complete with access to an automated, timeshared PERT program, soon joined the user coordination staff. American Express had previously used the PERT technique of network planning and scheduling to merge its New York City Operating Center and its Miami Service Center into a new facility in Fort Lauderdale.

The staff established project milestones, and discussed, charted, compared, and timed interdepartmental activities. Peri-

odic meetings were set up, and detailed minutes were taken and distributed. The computer timesharing system was used to automate project deliverables, track responsibilities, and measure progress against plans. The PERT charts were reviewed at every project meeting. Representatives from every department involved in a new product or service could then visualize their goals and understand how they fit into the project.

User coordination then became another operating department within the boundaries of a project. The department reported on the progress of its deliverables, which was measured through the PERT network.

Under the expanded responsibilities of the user coordination staff, projects proceeded along the following sequence (see Fig. 1 for an abbreviated breakdown of these steps) toward completion and success.

1. Ideas were presented to, and approved by, senior management.

2. Project director and project manager were appointed.

3. A review and approval of requirements by senior management, BSD, and operating center management was completed.

4. BSD presented an estimate of time and resources for approval.

5. Appointment of departmental staff to assist in project development was completed.

6. Review and assimilation meetings were held between user coordination and operating departments; BSD, marketing, and other involved parties were included when necessary.

7. Milestones were established by each department affected. An initial PERT chart was created.

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CIRCLE 66 ON READER CARD

The user coordination department's role in total project planning is still evolving.

8. A periodic review schedule was established and maintained. PERT was reviewed and updated as required.

9. All other departmental requirements were developed.

10. BSD Program Testing and Systems Testing were completed.

11. User Acceptance Testing was conducted by user coordination.

12. A final review was held.

13. Training was completed.

14. Implementation.

ROLE IS STILL EVOLVING

The user coordination department's role in total project planning is still evolving. The Fort Lauderdale operating center has formalized its method of project planning into an easily readable how-to manual. Other divisions under the American Express corporate umbrella are also interested in these concepts.

The projects that the department works on are not limited to those that need computer systems development. For example, the recent relocation of an entire department from the Fort Lauderdale operating cen-

ter to the Salt Lake City operating center was accomplished with the aid of a detailed PERT chart. The department is currently working on plans to help open a new materials warehouse near the Fort Lauderdale operating center.

Further innovation occurred when the user coordination department participated in the BSD systems test activities. The presence of user representatives during BSD-controlled activities resulted in a more complete systems test that had positive downstream effects upon the user acceptance test phase of the project. Plans are currently under way to include this type of user coordination assistance in the systems testing of every major project.

In just four years, the user coordination department has assumed a significant role in total project planning. Users are no longer assigned from operations for the length of a project, only to disappear after its completion. Project tasks and important deliverables are not left to chance, imagination, or luck nor do any last minute emergencies arise from previously unattended problems.

Total project planning has allowed American Express Travel Related Services to

implement major products and services on time. Resources and schedules are now planned; discrepancies and problems are noted in time for evaluation and resolution. The user coordination department plays a significant role in defining, planning, and delivering new products and services. By participating in all phases of project development, controlling acceptance testing, and planning for the total project environment, the department thrives on the cutting edge of innovation, both from the computer systems and operational points of view. *

Ken Meyers has worked at American Express for more than eight years. Currently project director in the Performance Engineering Directorate, he is interested in forming a nonprofit federation of people who work in an environment similar to the one described in his article. If you would like to share information with Mr. Meyers, please contact him at American Express Travel Related Services Inc., 777 American Expressway, Wing 2A, Plantation, FL 33337.

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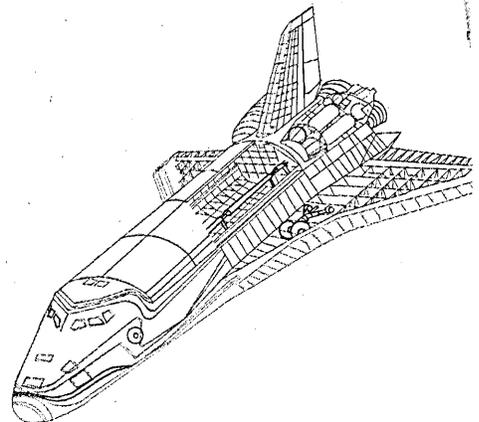
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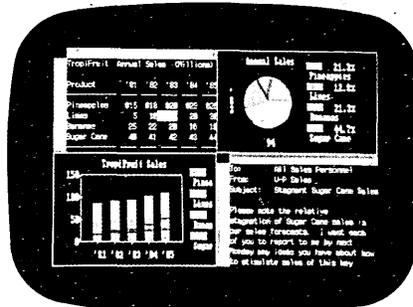
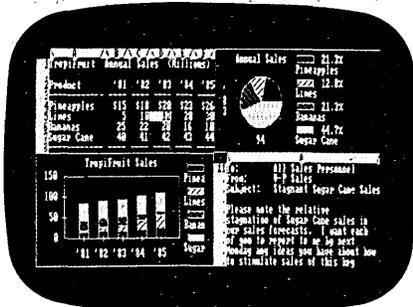
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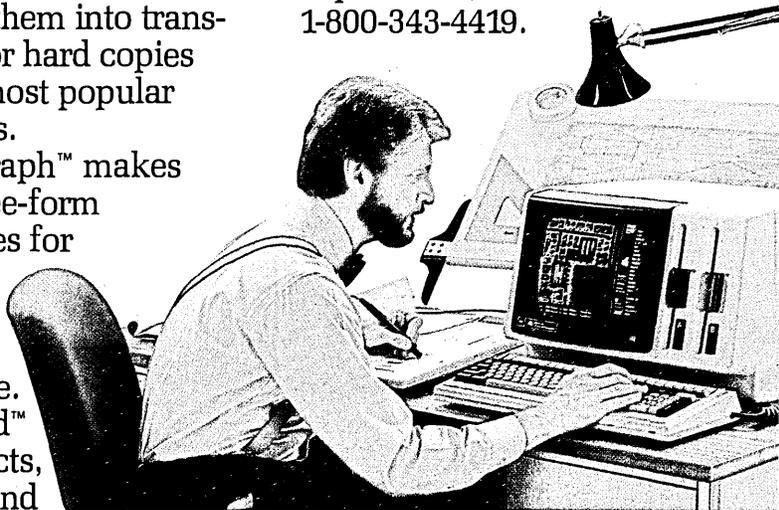
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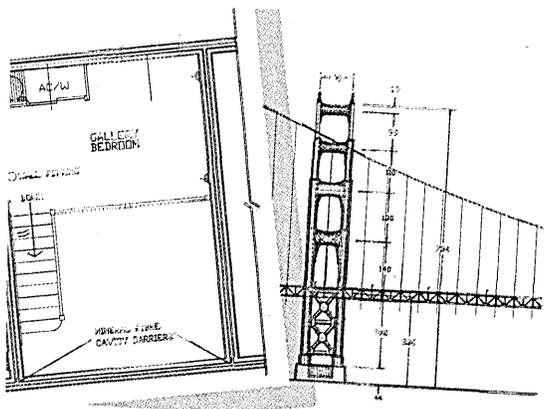
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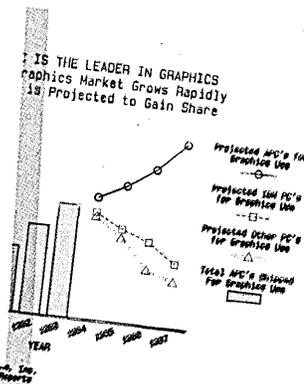
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Foreign research labs continue to make valuable contributions to IBM's product line.

A GLOBAL REACH IN THE R&D REALM

by Fred Lamond

IBM's manufacturing muscle, which stretches around the world, has long been recognized as one of Big Blue's biggest strengths. What is less well known and less appreciated is the company's equally extensive R&D realm that reaches far beyond the borders of the U.S. It's there in those European and Japanese laboratories that IBM researchers have made and are continuing to make major contributions to the company's ever-expanding product line.

In the past, European and Japanese R&D labs have added small mainframes, business computers, and associated operating systems to IBM's worldwide product portfolio. Today those same research centers are helping spearhead the company's development efforts in communications, office automation, bureau software, and fourth generation applications development generators.

IBM's global R&D effort began in 1957, when the U.S.-based Data Processing Division subcontracted with its laboratory in Böblingen, West Germany. Under the contract, the lab was supposed to come up with a 1,400 character, off-line, card-to-tape and tape-to-printer programmable converter for large 7000 series mainframes—the 1401. On their own initiative, the Germans developed a 4,000-character version for independent card file processing, and then an 8,000-character magnetic tape version. The resulting 1400 series, which became the first IBM computer series to be shipped in large volume, gave the company dominance in the world market for small mainframes.

Since then the Böblingen laboratory has been responsible for each succeeding generation of small IBM mainframes: System/360 models 30, 20, and 25; System/370 models 115 and 125; and most recently the 4331 processor and its 4321 and 4361 derivatives.

The British Winchester laboratory contributed the 7040 and 7044; and the 360/40, 370/135, and 370/145 processors.

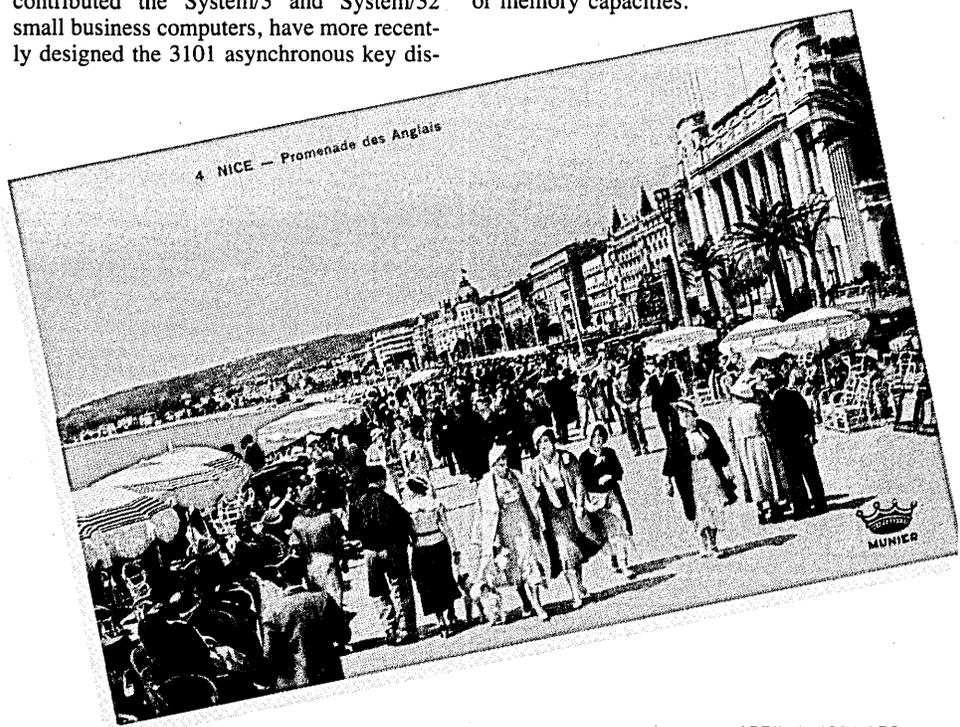
All System/360 processors were originally supposed to run under the U.S.-designed OS/360 operating system. But after IBM determined that OS could not multiprogram on less than 128KB of main memory, it also released the rival German-designed BOS, TOS, and DOS operating systems that could multiprogram I/O spooling on 32KB systems. German and Dutch laboratories went on to develop DOS into DOS/VS and then DOS/VSE and SSX/VSE. These same labs are not rumored to be working on a VSE/XA version.

IBM's Japanese laboratories, which contributed the System/3 and System/32 small business computers, have more recently designed the 3101 asynchronous key dis-

play terminal and 8815 Scanmaster document reader. Difficulties in keyboarding the Japanese kanji character set have made Japan heavily dependent on facsimile message transmission, and therefore, leaders in fax and document scanning technology.

TAPPING CULTURAL SKILLS

By spreading product development tasks across three continents, IBM was able to tap each culture's particular skills. European and Japanese designers, living in crowded countries with limited natural resources, seem more adept than Americans at squeezing the maximum performance out of restricted processor speeds or memory capacities.



The token passing control method for IBM's baseband LAN was patented by a Swedish engineer.

It still seems paradoxical that IBM chose French, Swiss, German, and British laboratories for its current communications processor, local area network (LAN), and value-added network developments, since U.S. telecommunications are commonly regarded as the cheapest and best in the world. But it's precisely because European communications are less advanced, more expensive, and more beset by PTT monopoly regulations than their U.S. equivalents that they were chosen as a testbed. In other words, Europe represented a more demanding environment in which to develop IBM line attachments and software. Also, anything that works in Europe should be adaptable to U.S. conditions with little difficulty, whereas the reverse is not always true.

IBM's main European communications laboratory is at La Gaude near Nice on the French Mediterranean coast. This is also paradoxical since the French telephone network was the worst in Europe until 1975. It may indeed have been sheer frustration over the inadequate PBX offered by French industry in the late 1960s that led La Gaude to develop its own communications system built around two IBM 1800 processors. This PBX was announced as the IBM 2750 on the French and Italian markets in 1969. A redesigned version that followed in 1973, the 3750, received PTT approval on the British, German, and Dutch markets. The 3750, which was the first computer-controlled electronic PBX on those markets, was also the first system to offer such advanced features as abbreviated dialing and long distance call accounting.

The smaller and more compact 1750 PBX followed in 1980.

Though still on the market in Europe, the IBM 1750 and 3750 PBXs are now technically obsolete, since they use space division switching techniques for analog lines. With fewer than 300 installations in Europe in the decade that they have been sold, the 1750s and 3750s were considered commercial failures by IBM top brass. Rather than produce a successor time division digital switch designed at La Gaude, IBM has decided to sell the Rolm CBX in North America. It is also rumored to be looking for a similar linkup in Europe.

The 1750 and 3750 design features remain interesting nevertheless, because of the light they shed on IBM's office communications strategy. Indeed, IBM's early (1969-1973) entry into the European PBX market is indicative of just how important the PBX was to the company. For even then, IBM realized that the PBX could be the linchpin in the future automated office. Should distributed minicomputers and personal computers erode the mainframe's dominant position in the 1990s, the PBX would remain the sole integrator of all office processing, IBM reasoned.

The IBM 3750 was also the first office PBX to offer special line interfaces for computers and data terminals. It allowed pushbutton telephone handsets to be used for interrogating computer databases. A voice synthesizer incorporated into the switch answered inquiries when the interrogating tele-

phone handset had no screen.

This points toward a long-term IBM project to integrate the functions of 3725 front-end communications processors (FEP) for 4300 and 308X cpus and the digital TDM successor of the 3750 and 1750 PBXs. A team of researchers at La Gaude is believed to be working on this project, which carries the code name "Mistral." The selection of La Gaude for the 3725 project was designed to facilitate this long-term integration—integration that will now be complicated by IBM's decision to get PBXs from Rolm and possibly European firms.

Whatever happens to the Mistral project in the new IBM-Rolm partnership, there is little doubt that the 3725 has been designed to allow users to add extra functions in the future. The 3725 also bears a strong physical resemblance to the German-designed 4331 processor, and is believed to run on the same machine instruction set.

If true, this would open the door to substantially more downloading of communications functions into the 3725 at a later date. With expanded memory, the 3725 could take over the greater part (including all those parts dealing with SNA levels 3, 4, and 5) of ACF/VTAM and MSNF from the host cpus to which it is connected. The integrated ACF/VTAM-E program running on 4331 cpus equipped with an integrated communications adapter instead of an FEP could be the forerunner of such an expanded 3725 network control program.

Whether or not IBM eventually produces a single integrated FEB/PBX box, the company has already accumulated valuable experience in computer-controlled PBX message switching and electronic mail. All its main European data centers, development laboratories, factories, and national and regional sales offices have used IBM 3750 and 1750 PBXs since the mid-1970s to switch voice and data traffic both internally and on long distance leased lines.

MOVING MAIL ON THE LINE

During nighttime hours, IBM uses its leased lines for unattended interoffice electronic mail. Under the setup, all outgoing intracompany mail is placed on magnetic cards in the Office System/6 or on the secondary storage of its 5520 Administrative System or 6580 Displaywriter. The central computer, which is used as a common electronic mail processing center (originally a 370/158), dials each workstation during the night via the 3750/1750 PBX network and instructs it to transmit to it all its outgoing messages. The computer then sorts all the messages by destination workstation, and redials each workstation, with instructions to send all incoming messages.

Postkarte.

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Par avion

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gnomes in the
token ring
Project
Regards to all.

—the Zurich Staff

Each workstation keeps these messages on its own secondary storage until office personnel instruct it to print or display them in the morning. The Interoffice Document Distribution (IDD) software developed by IBM for this purpose is also offered for sale to IBM 3750 and 1750 users.

When customers want a dedicated computer to control PBX autodialing and electronic mail transmission, IBM's answer is the Series/1 minis and specially developed software. At Telecom 83 in Geneva, IBM demonstrated how a Series/1 could autodial both European 1750 PBXs and Rolm CBXs in North American IBM offices to establish transient North Atlantic communications links between PC workstations.

Other IBM exhibits at Geneva featured PBXs as the main interface between internal and external communications systems. For example, they will link local area networks that interconnect PCs, Displaywriters, and other workstations within a single office. They will also provide access to the long distance leased lines and public switched telecommunications and data networks.

It is not surprising that IBM picked Europe for another important task—the development of its future LAN architecture—though this time the assignment went to its Zurich, Switzerland, not its La Gaude, laboratory. In addition to the 4Mbps token passing ring architecture exhibited at Geneva (see box), the Zurich laboratory has also experimented with a wireless star network: an 8100-controlled loop in which the twisted pair cables and connectors were replaced by infrared beam transceivers on each terminal that focused on a general transceiver on the ceiling.

The token passing control method that IBM has chosen for its baseband (LAN), in preference to the carrier sensed multiple access with collision detection contention method, or CSMA/CD, promoted by Xerox, is itself a European development patented by a Swedish engineer. It has been used by Cambridge University in its pioneering local area network, and is therefore often called the Cambridge Ring method in the U.K. In explaining its support of the method to the U.S. IEEE 488 committee on LAN standardization, IBM cited the greater ease with which it facilitated the interconnection of different LANs.

In addition to the twisted pair LAN developed at Zurich, IBM has also offered a high-level type LAN for the last two years. It consists of a ring of up to 16 Series/1 processors interconnected by coaxial cables of up to 1,500 meters (about 5,000 ft.) between adjacent processors. The LAN thus provides a much greater circumference—24 km (about 15 miles)—than the Zurich-developed net.

One could conclude from all this that

IBM may indeed be planning a two-level LAN architecture. The higher-level Series/1 ring would interconnect all the buildings of a university campus or private industrial complex or all the floors of a high-rise office block. A Series/1 processor in the basement of each building or on each floor would act as a gateway to a more local lower-level LAN that would serve only that building or that floor. This truly local net would be based on the Zurich design.

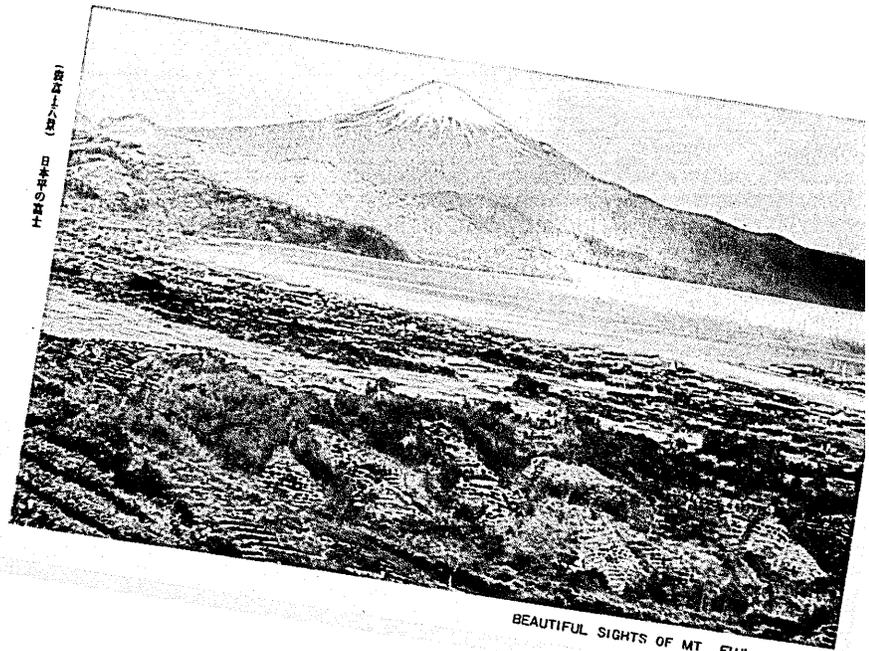
IGNORING A PACKET PROTOCOL

IBM has often expressed mixed feelings about some European PTT initiatives, most notably the X.25 packet switching protocol. In fact, the company tried to ignore the protocol for as long as possible before finally accepting it as an alternative to SDLC as Level 2 in SNA networks. Its reaction to the British Post Office's Prestel videotex effort (originally called viewdata) was nevertheless enthusiastic even from the start.

As a market for private business videotex systems began to emerge in the U.K., IBM inked a deal with software house Langton Information Systems to develop Series/1 as a viewdata gateway processor. The revamped Series/1 translated database inquiry messages from the British viewdata format to standard 370-compatible mainframe CICS formats and vice versa.

In that way, Prestel-compatible domestic television sets and specialized business viewdata terminals can be connected via dial-up 1,200 bps phone lines and Series/1 gateways to IBM mainframe information systems. Managers can thus inexpensively access their company's database from their homes.

Early in 1982, the British IBM Data Center Services installed this type of gateway at their Warwick computer center to allow their customers to access various timesharing



services from cheaper viewdata terminals in their homes or offices. When British Telecom's public Prestel service started offering a gateway facility to other computer systems in April 1982, IBM Data Center Services became the first outsider to connect its gear—the Warwick computer center—to the viewdata facility.

The center can now be accessed via both the Prestel network and ordinary dial-up telephone lines.

Meanwhile IBM Germany surprised all its competitors by winning the public West German Bildschirmtext computer contract. Everyone had thought the bidding would boil down to a two horse race between the German national computer manufacturer Siemens and Prestel vendor GEC Computers.

The Bildschirmtext contract calls for the most ambitious videotex network control software yet developed. It also specifies interfaces for home shopping and home banking services in addition to the usual public information databases.

SOFTWARE SNAGS IBM NET

IBM is about a year late in delivering this software, which means that its 4341 host computers can't take over the West German Bildschirmtext network until June. The company is therefore incurring substantial penalties, and is believed to have suffered a hefty loss on the contract. But IBM's willingness to expose itself to such financial risks underscores just how important videotex services are to the company.

IBM certainly views videotex as a generator of future business. Other ongoing European operations are also of interest to the

IBM may indeed be planning a two-level local area network architecture.

mammoth company. One of those key operations is its software/services business.

When IBM sold its Service Bureau Corp. subsidiary to Control Data in January 1973 as part of the settlement of CDC's anti-trust suit, the company's European service bureau operations were left out of the deal. Since the late 1960s, the company has offered on-line remote computing services via 327X, 3741, and 3770 terminals on customer premises in Europe, where it's also pioneered many user-friendly suboperating systems and applications packages. Some of these have subsequently been bought by IBM's sales divisions as program products for customer sites.

Virtual Storage Personal Computing (VSPC), for example, was originally developed by the British IBM Data Center Services. A suboperating system running under MVS or OS/VS1, VSPC helps the main operating system and the end user avoid mutual interference and corruption. It supports special VSPC/FORTRAN and VSPC/PL/1 compilers in addition to VS/APL and VS/BASIC as well as the APL Development Interface (ADI). After supporting it on customer mainframes since 1977, the IBM sales divisions have now decided to stabilize it and concentrate future end-user interface development on the rival VM/CMS operating system.

The more recent Application System (AS), also developed by the British IBM Data Center Services, is a personal computing and problem solving service for end users who have no dp expertise. It offers a single interface to facilities for information management and retrieval, business graphics and planning, management science, data analysis and reporting, and text processing. Responding to user demands, IBM's sales divisions have been offering AS to in-house customers since the end of 1983.

Terminal Business System/VS (TBS/VS) is an interface between IMS/DB-DC databases and TP monitors and user applications written in GIS, COBOL, PL/1, assembler, or BASIC. Designed for users who have no knowledge of database structure or real-time program writing. TBS/VS is a kind of tutorial system that enables in-house programmers to move on the CICS/VS applications.

Another clue to IBM's direction came recently when the company filed with the British Department of Industry for a license to become a value-added service provider. The petition, however, did not disclose any of the services that IBM proposes to offer. When one juxtaposes its in-house electronic mail developments and its interest in videotex gateways with its traditional data center activities, the range of facilities it could offer on such a network is not too hard to imagine.

From conventional 3278 key display



terminals, business viewdata sets, videotex-compatible domestic tv sets, or personal computers, users could access personal computing facilities at IBM data centers, electronic mailboxes, and gateways to bank and department store computers for home banking and shopping.

These are precisely the sort of facili-

ties that British Telecom has been planning to offer on its none-too-successful Prestel network. BT and IBM, however, are rumored to be negotiating a joint venture pact to set up a value-added network. Such schemes, coupled with fruitful research in other foreign R&D realms, should fuel the launching of major IBM products around the world. *

COMMUNICATIONS CONTRIBUTION

In recent years IBM's European research labs have given added impetus to the mighty company's communications drive. One of the more important communications contributions has been in the field of local area networks.

IBM has given its Zurich, Switzerland, R&D laboratory the challenging job of brainstorming its future LAN architecture. The company provided some clues on that future architecture last October when it displayed its Zurich-developed LAN at the Telecom 83 show in Geneva.

The LAN that IBM exhibited at Geneva was a 4Mbps "ring-based star," token passing baseband LAN that uses four-wire twisted pair telephone cables. At the heart of the net is a ring that runs along the walls or ceiling of a building floor. The maximum distance over which IBM can sustain the 4Mbps throughput is "at least equal to that of a local twin-axial terminal connection"—i.e., 1,500 meters or 5,000 feet.

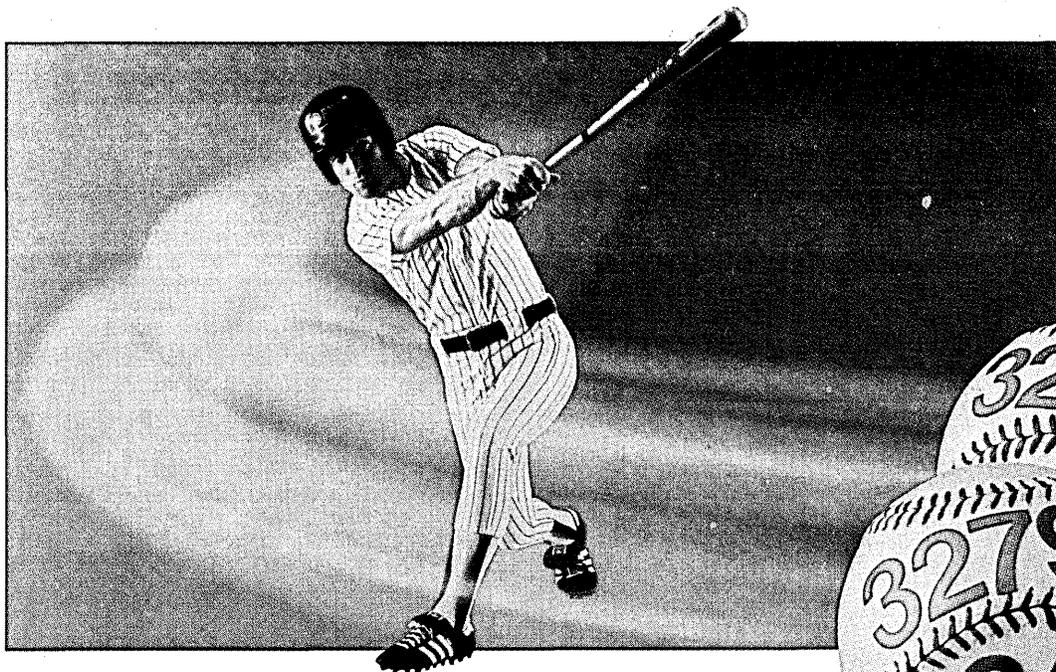
This ring is linked by individual, full-duplex cables to computers of any size, from 308X mainframes to PCs. The cable-to-computer interface is a single printed cir-

cuit adapter that holds the LAN token passing control protocol. IBMers in Geneva hinted that this adapter card would also be sold to non-IBM users.

When any connected computer is switched on, a flip-flop at the junction between connection cable and ring ensures that all network messages pass through the computer, which then regenerates them. If the computer is switched off, ring messages bypass its cable connection.

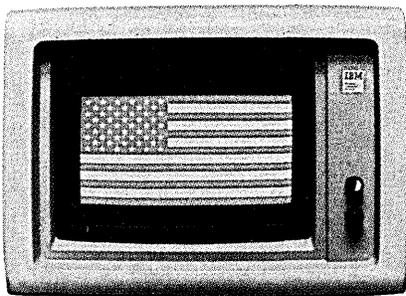
Any connected computer can initiate network traffic by generating a token or empty packet, which travels around the ring until a computer replaces it with an active message. This message, which also moves around the ring, is then copied by the destination computer, which sets a "packet received" bit. This processor then returns the bit to its point of origin, where the originating computer deletes it and replaces it with another empty token. Since no heavy control station is required, an IBM LAN could economically interconnect PCs or other manufacturers' personal computers or file servers.

—F.L.



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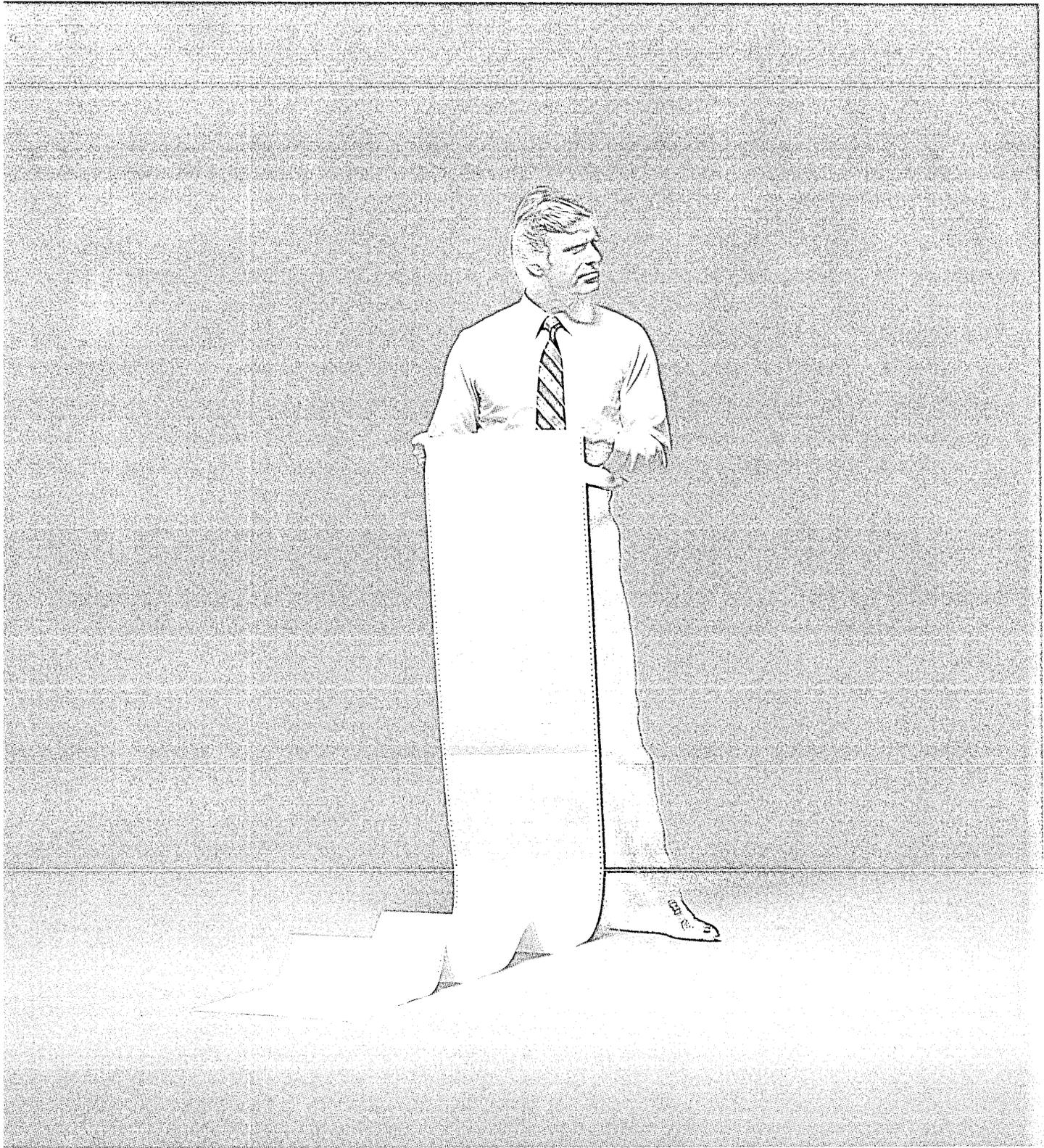


Figure \$50 a line for programming.

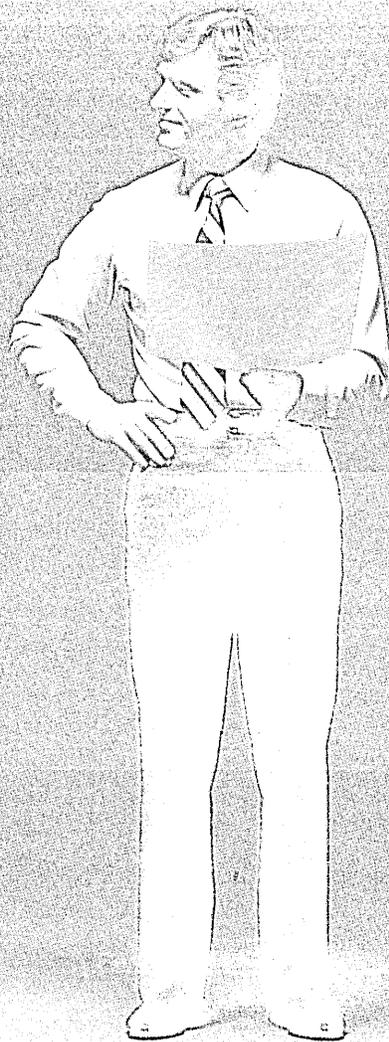
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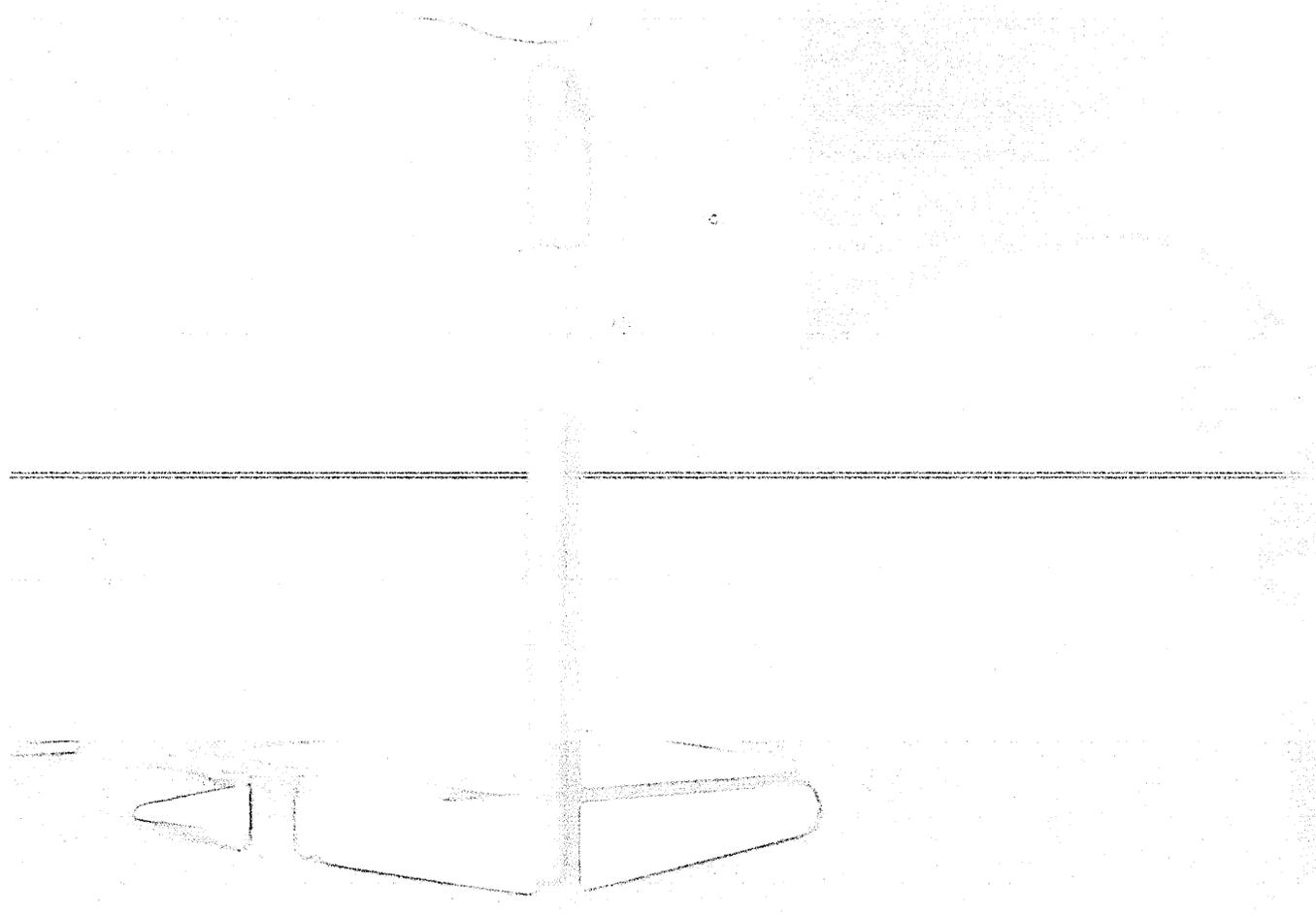
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mation to Tom Rappath, Hewlett-Packard, Dept. 04185, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, write Henk van Lammeren, Hewlett-Packard, Nederland B.V., Dept. 04185, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

CIRCLE 71 ON READER CARD



**HEWLETT
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Educating a dp staff is a never-ending task. If it's done right, the whole company will benefit.

Training +
Technology =
Profits

by Janet Dight

Training is one of the most critical issues in today's dp department. Properly handled, training can improve productivity, reduce turnover, and increase morale. Poorly handled, it is a waste of time and money and a demoralizing influence on the rest of the department.

Unfortunately, many dp training departments fall into the second category. They're underbudgeted, understaffed, underqualified, and lack serious commitment from an upper management that doesn't realize the benefits offered by a strong training program.

Training is a problem-solving activity. Used correctly, it can solve a number of the personnel and workload problems that most dp departments face. Given the generalized ivory tower computer education many colleges dish out, there is a critical need for both real-world and company-specific training of newly hired college graduates. For experienced data processors, training

A training director can't be fully involved in dp planning if he reports somewhere else.

WHERE DP TRAINERS MEET AND GREET

Dp training groups are springing up all over the country. Almost every major metropolitan area now has a dp trainer organization or society. These groups promote idea and information exchange and act as a basis, in many cases, for consortium training. Most groups are well organized, with monthly meetings, speakers, and newsletters.

We've listed a sampling of these groups below. To find out if there is a dp trainer organization in your area, contact your local ASM (Association for Systems Management) or DPMA chapter, or call training vendors in your area. Most training suppliers can direct you to someone in the organization.

National

American Society for Training and Development (ASTD). Although general in nature, ASTD has a computer data processing subgroup that might be of interest to dp trainers. Membership fee is \$80 a year; local chapter fees are extra. Write or call ASTD, 600 Maryland Ave. SW, Washington, DC 20024, (202) 484-2390.

Regional

California

Coordinators of Data Processing Education (CODE). Membership fee is \$78 a year. Write to CODE, 109 Minna St., Suite 605, San Francisco, CA 94105-3796.

Trainers Association of Southern California (TASC). Membership fee is \$60 a year. Recently established an Orange County chapter. Write or call Ellen Gifford, 2010 Crestwood, San Pedro, CA 90732, (213) 970-4346.

Connecticut

Hartford Area Trainers (HAT). Annual membership fee is \$10 per company. Write or call Richard C. Forcier, Connecticut National Bank, 150 Windsor St., Hart-

ford, CT 06120, (203) 728-2470.

District of Columbia

Baltimore-Washington Information System Educators (B-WISE). No membership fee. Write or call Judy Cohen, American Management Systems, 1777 North Kent St., Arlington, VA 22209, (703) 841-6498.

Illinois

Chicago Data Processing Education Council (CDPEC). Strict membership requirements and limits. No membership fee. Write or call Casey, People's Energy Corporation, 122 South Michigan Ave., Room 614, Chicago, IL 60603, (312) 431-3850.

Chicago Organization of Data Processing Educators (CODE). Membership fee is \$80 a year. Write or call George Bogler, Rockwell International, 3100 South Central Ave., Chicago, IL 60650, (312) 656-8600.

Indiana

Central Indiana Educators of Data Processing (CIEDP). Annual membership fees are \$20 per corporation and \$10 per individual; a subscription to the newsletter only is \$3. Write or call Nancy Cammack, Information Services Agency, 1942 City Council Building, Indianapolis, IN 46204, (317) 236-3128.

Iowa

Iowa Data Processing Educators Association (IDEA). Membership fee is \$20 a year. Write or call Jim Murphy, Bankers Life of Iowa, Planning Department 4-West, 711 High St., Des Moines, IA 50307, (515) 247-6875.

Kentucky

Blue Grass EDP Trainers Association (BETA). Annual membership fees are \$50 per organization, \$30 per vendor, and \$10 per individual. Write or call NESTA

Britt, First National Bank, P.O. Box 36000, Louisville, KY 40233, (502) 581-4350.

Massachusetts

Association for Data Processing Trainers (ADAPT). No membership fee. Write or call Chris Riopel, Conifer Computer Services, 370 Main St., Worcester, MA 01608, (617) 791-7811, ext. 592.

Minnesota

Minnesota Programming, Analysis, and Computer Training Council (PACT). Membership fee is \$20 a year. Write or call Chuck Hoffman, St. Paul Companies, ISD Training, P.O. Box 43271, St. Paul, MN 55164, (612) 738-4243.

New York

Tri-State Information Managers in Education (TIME). Membership fee is \$10 a year for individuals, \$50 a year for vendors. Write or call Judy Schack, Irving Trust, 61 Broadway, 11th Floor, New York, NY 10015, (212) 487-7396.

Pennsylvania

ASTD Special Interest Group for Electronic Data Processing (ASTD/SIGEDP). Affiliated with American Society for Training and Development. Membership fee is \$15 a year. Write or call Annie Schempp, ALCOA, 1223 Two Allegheny Center, Pittsburgh, PA 15212, (412) 553-3059.

Wisconsin

Madison Area Data Processing Educators Council (MADPEC). Membership fee is \$25 a year. Write or call Vernetta Moe, University of Wisconsin, ADP, 1210 West Dayton St., Madison, WI 53706, (608) 263-2447.

Metro Group. Membership fee is \$25 a year. Write or call Candace Grabski, Universal Foods, 433 East Michigan, Milwaukee, WI 53202, (414) 271-6755.

eliminates the skills obsolescence that creeps up on dpers in just a few years. Training can make major software or hardware conversions fast and efficient. When training is coordinated with career development, employees begin to see a real future with the company, and turnover is reduced. Finally, training in productivity techniques can reduce workloads, logjams, and stress.

The benefits are so great that the training function can pay for itself. Dennis Yancey, training officer with South Trust Corp., Birmingham, Ala., says, "If I, as a trainer, don't save my company two to three times my salary in a year, then I don't feel I've done my job."

But many companies discover that

their experiences with dp training don't match these glowing expectations. Their training departments are ineffective, their trainers aren't respected, and their training directors are ignored. In some cases, training has become a personnel junkyard that serves as a haven for burned-out programmers and former teachers who aren't cutting it as data processors. Training is only effective and cost beneficial when given the necessary resources and support.

Training is no longer just a reaction to a request. It isn't scheduling classes and checking to see if everyone attended. It is more than asking a programmer what he'd like to learn next year.

In progressive companies, training is

an integral part of the planning and development process for the entire dp department. New employees need orientation and on-the-job training; younger staff members need career path development and information; established personnel need to keep up with the latest developments in dp; staff members at all levels need training on new equipment and software. To be aware of and respond to these needs, the training director must be involved from the very beginning in planning the department's activities. For example, if management decides to buy a major new piece of software, the training requirements can be substantial and costly, and they must be considered in making any purchasing decisions.

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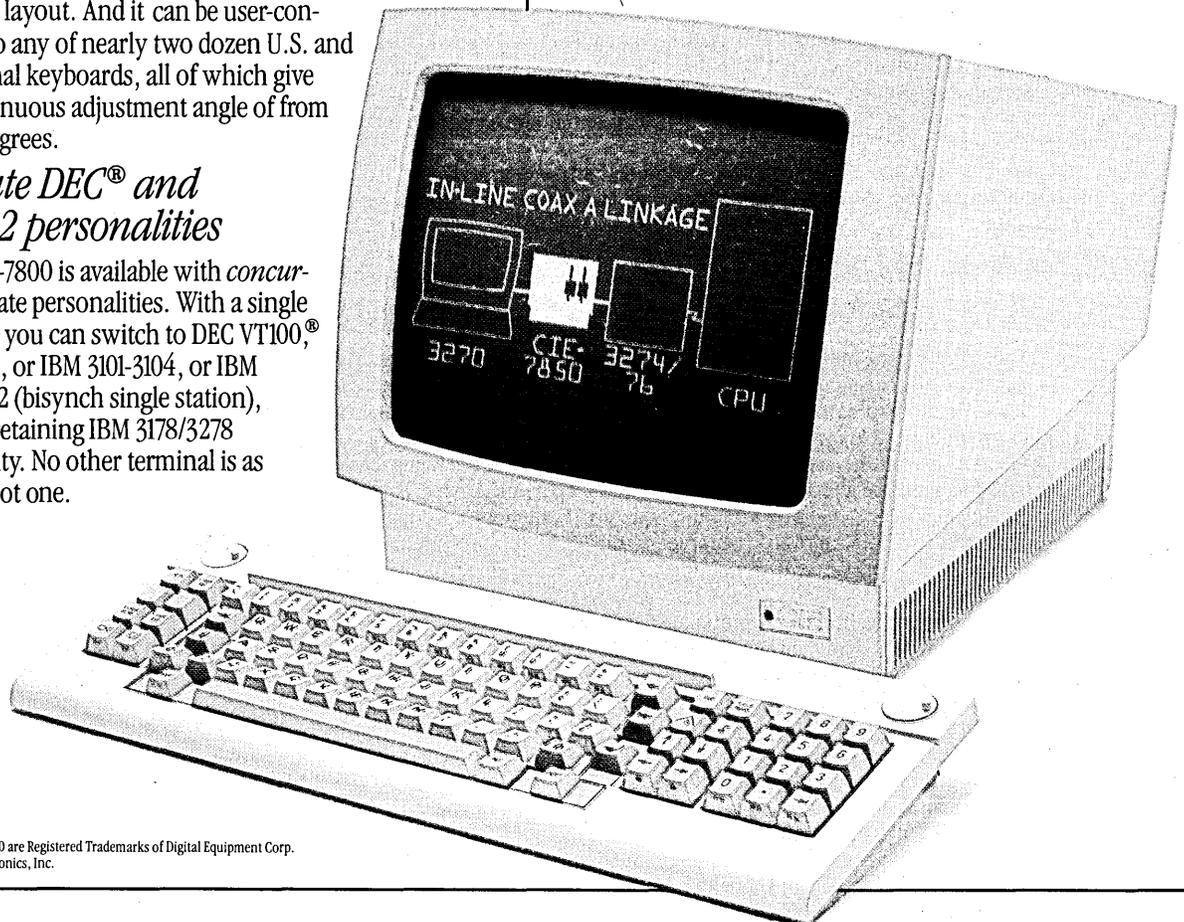
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CIRCLE 72 ON READER CARD

Whenever a training director reports high, there is a highly effective educational program.

more and more software now," says Bill Sebrell, assistant secretary of education for the Hartford Group, "because of the productivity demand and this huge backlog we all face." With over 1,000 programmers, training is a major consideration for any conversion at the Hartford Group. "Now I'm built into the actual acquisition of that software. If you don't forecast it, and you don't plan for it, and it isn't in the business plan, you're not going to bring it in, because I can't teach it. I don't have unlimited resources."

Managing training is resource management, and the training director must have a departmental perspective to accomplish this. First, he must perform a needs analysis of the entire department—a complete look at the current skill levels of the department, what projects are coming up in the next year, and what skills will be needed for those projects. Next he should look at the groups and individuals who will handle those projects and determine which employees need training and how that training fits into individual career paths.

The training director should assist in developing those career paths. "At the Hartford," Sebrell says, "we have identified the skills an individual needs for his current job and the skills he needs for his next job. Our philosophy is that you cannot make an intelligent career decision about what path you want to take without some way of 'tasting' it, and the only way you can taste that, so to speak, is through the educational process."

Once the training needs have been established, the training director must develop a budget and determine the best way to fill those needs—in respect to media, vendors, and education.

REPORTING HIGH AND INSIDE

The training director should report to the highest possible management level. If he is to be effectively involved in the planning and budgeting process for the whole department, he cannot report to the systems manager or the programming development manager.

Gopal Kapur, president of Kapur & Associates, Danville, Calif., works with training directors and says they are "seldom at the right level. They are more often data processing education coordinators than managers. They don't have any budgeting responsibility or even strong budget recommendation responsibility, so nobody really listens to them. Many of them are not successful because their companies don't put the right emphasis on these people."

Reporting high demonstrates management's commitment to training and forces the selection of a more qualified person. Lorna Storck, director of customer service for

READ ALL ABOUT IT

The training field isn't exactly deluged by publications. Only one, in fact, is dedicated exclusively to training for dp professionals:

Data Training. This monthly newspaper covers training and development topics for experienced data processors. *Data Training* also presents three conventions annually for dp trainers. Subscriptions are \$24 a year. A free sample copy is available by writing or calling Judy Simson, *Data Training*, 38 Chauncy St., Boston, MA 02111, (617) 542-0146.

Several magazines cover general training, and all do at least one article a month on computer literacy training. Although they don't currently carry articles for established data processors, these publications provide good information on general training principles and practices:

Training. Subscription rate is \$28 a year. For free sample issue, write or call Chernah Coblentz, *Training Magazine*, 731 Hennepin Ave., Minneapolis, MN 55403, (612) 333-0471.

Deltak, Naperville, Ill., believes training directors "ought to be highly respected by top management, so they really can play the consultant role. If you give it to ex-kindergarten teachers because they were in education, I think that doesn't fly."

The training director should be of the caliber of a project manager. He should be able to work with senior level dp management as well as the department rank and file. He needs to be experienced in planning, budgeting, and management.

The 1982 dp training survey conducted by Brandon Systems Institute, Bethesda, Md., showed that in 336 organizations queried, the average dp training budget was \$304,200. Although company budgets vary widely, this sizable amount of money and the man-hours spent in training should be handled by a capable, experienced manager who has access to top dp management. And as dp training spreads throughout an organization because of the need for user training, the training director must be able to do work with non-dp managers at various levels in the company.

Kapur observes of training directors, "Wherever they report high, I have found a highly effective educational program. Wherever they report low, these people just become brochure passers and announcers of schedules."

Where they report can be as important as how high they report. Although some dp training directors say they successfully report to corporate training, being outside the dp department can create problems. A training

Training & Development Journal.

This is the official publication of the American Society for Training and Development. Subscription rate is \$40 a year or free with ASTD membership. Complimentary issues are limited. Write or call Katrina Styles, ASTD, 600 Maryland Ave. SW, Washington, DC 20024, (202) 484-2390.

Training News. Subscription rate is \$18 a year. For free sample, write or call Judy Simson, *Training News*, 38 Chauncy St., Boston, MA 02111, (617) 542-0146.

In addition to these monthly publications, more information is available from the Brandon Systems Institute, which conducts an annual dp training survey. The survey covers all areas of dp training, such as responsibilities, salaries, budgets, staffing, etc. The report is available for \$30, plus postage and handling and is free to survey participants. For more information, write or call Shirley Mintz, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, MD 20814, (301) 986-8611.

director can't be fully involved in dp planning if he reports somewhere else. As an outsider he is excluded from budget discussions and planning sessions: he gets called in after the fact.

Training directors are often perceived to be consultants to the dp department, but they must be internal, not external, consultants. Removed to the corporate training department, they suffer the same distance problems as any outside vendor or supplier and have trouble breaking into the close-knit dp group.

Several years ago one of the Big Three car manufacturers attempted to consolidate all its training activities into one corporate training department. The dp training director gradually lost touch with the dp department, was no longer considered a member of the dp group, and became progressively more ineffectual. In less than a year, he was back, along with the training function, in the dp department.

Monetary concerns enter into this question as well. Dp trainers tend to be paid more than general trainers, which can put a strain on relations inside the corporate training department. Funding can also become a problem when the dp training budget is part of the corporation's total training budget, because the dp portion is usually small and doesn't get the attention it deserves. In hard times, other departments may even dip into the dp budget. As part of the dp department, dp training budgets (and personnel) are better protected from raids or cutbacks by the parent company.

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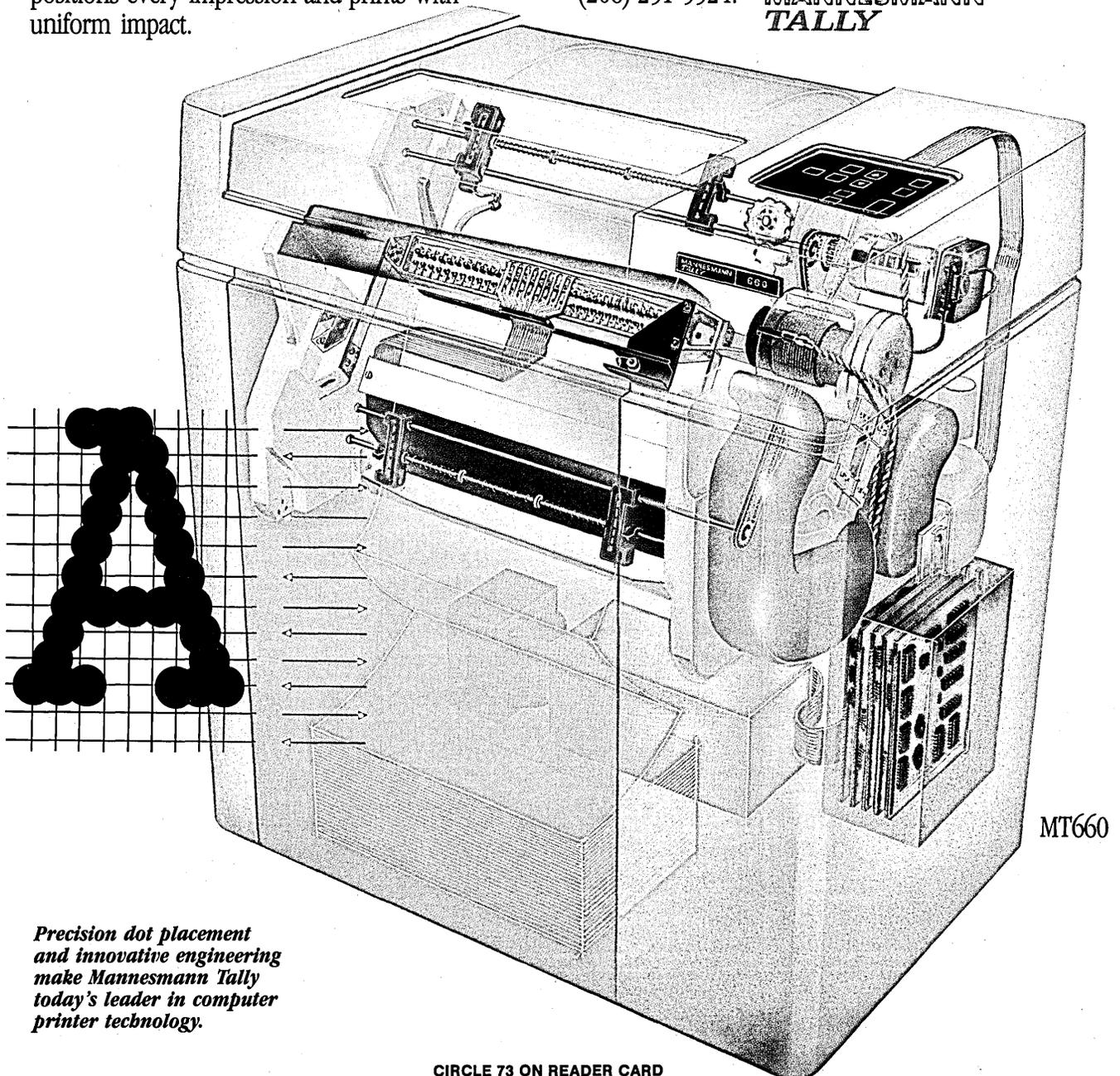
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CIRCLE 73 ON READER CARD

The more knowledgeable the training manager is about dp trends, the more productive his training program will be.

The corporate training department, however, does offer a wealth of experience that the dp training director should make use of, such as expertise in planning and managing educational resources. The training director with a limited background can benefit significantly from working with other company trainers.

ESSENTIAL TO CAREER PATH

Gary Slaughter, president of the Gary Slaughter Corp., also of Bethesda, Md., believes that any data processor on the fast track should seek a dp training directorship. "Ideally, this isn't a career position; it's a position through which people tend to rotate. It should be on the career path to higher level management within the department. It ought to be the normal career path to go through positions that focus on developing people. The person ought to be relatively technical coming in, and be prepared to go back to a relatively technical position afterwards." Slaughter believes specialized personnel within the dp group can meet the educational requirements and talents needed in the training department.

Because schoolteachers are entering the dp work force in droves, people with education backgrounds are easy to find, and many of them have been selected for the training department solely on the basis of that background. An understanding of educational design, curriculum development, and the

learning process is very valuable, but it doesn't necessarily make good managers. Educators with only two or three years' experience in data processing may find it difficult to gain the respect of more experienced dp staff members. They may never have managed a large budget or a program that has impact on the entire department, if not the company. Also, they often find the transition from academia to career training difficult.

Denise Goulette, division manager of staff services for First Data Processing Management Co., Oklahoma City, Okla., points out, "Some educators are used to taking a textbook and teaching from it. That is not data processing training."

Gary Slaughter agrees. "There is a tendency to give that job to someone who has an educational background, which is kind of silly, because education is considerably different from training. The purpose of training is to help people do their jobs, and it's more important that you know what the job is than that you know how to educate someone. So a data processing background makes a lot more sense than an education background."

Regardless of background, it is essential that whoever heads up the training function be a believer in training. Even if top management supports training, others in the department will not, and a strong conviction in the value of training is necessary to overcome that opposition.

One of the major problems for the

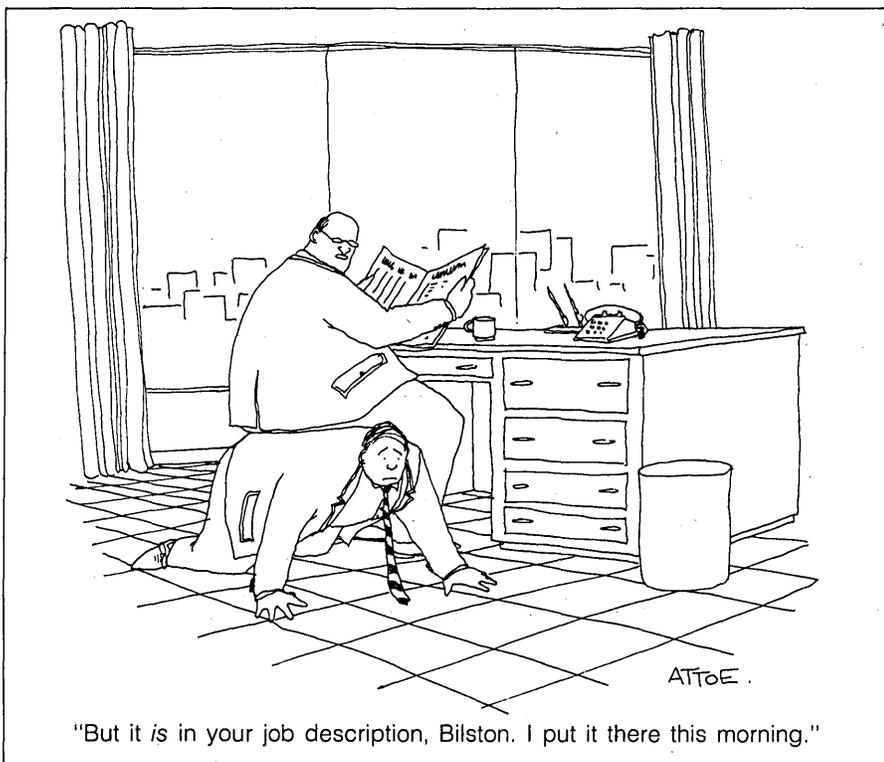
training director is training himself. Because he is not working in applications and not attending training programs, the training director may lose contact with new developments in the field. After three or four years, his skills may be totally obsolete, and his ability to judge the value of the course materials is seriously diminished.

Few companies allow their training departments enough time to keep abreast of the data processing field. They load training managers and trainers with work they load programmers or analysts, and forget that for training to be effective, it must reflect the latest developments. Training directors should have enough time in their schedules to audit the courses bought from outside vendors; they should attend courses specifically for trainers; they should be actively involved in dp associations and dp trainer groups; and they should attend conferences and conventions. The more knowledgeable the training manager is about dp trends, the more productive his training program will be.

No matter how small your dp staff, you must manage your training function. The Brandon survey shows that it takes about 100 data processors to support a full-time dp training manager. But small companies that are just beginning to establish a training program can probably use a full-time or almost full-time person with only 40 or 50 programmers and analysts. Creating an organized training program from scratch is no small task, and there may be resistance from other line managers in the department. Needs analysis may be new to them, skill level evaluation and career pathing are probably foreign concepts, and many of them just don't believe that training buys you anything. Besides program development, there is a great deal of public relations work for the new training director to do.

In staffing your dp training department, even if that department consists of only one manager, be sure to provide adequate clerical support. A dp training director should not be an administrator; he should manage. He can't do that, however, if he is bogged down in course reservations, invoice approvals, and attendance taking. Appointing a training director won't get you the desired results unless you also appoint a secretary, assistant, registrar, or whatever support staff is required to free the director to do his real job—planning, needs analysis, vendor and course evaluation, and budget management.

Janet Dight is the owner of Venture Marketing, Colorado Springs, Colo., a marketing and advertising consulting firm that specializes in new products and new businesses.



CARTOON BY STEVE ATTOE

A "BORING" CAREER

"I don't believe in job burnout. Burnout occurs when you don't control your own destiny. When a person is able to make her own decision to tackle something, you don't burn out."

That's the philosophy of Margaret Loftus, a soft-spoken, girlish-faced woman whose career has been one of tackling some of the world's toughest programming problems. That career started in 1965, when she graduated with a math degree from Oklahoma State University, Stillwater. "I've had a boring career," she deadpans. "I've only worked for two companies in my life"—first Control Data, then Cray Research in 1976—"and I've always done the same thing." Her thing has been the gut-level programming—operating systems and compilers—that gave life to machines like the CDC 6600, the 7600, and the Cray-1 supercomputer. Today, as vice president of software development at Cray Research Inc., Loftus manages about 200 "very, very bright people" and all software development, including the as yet unveiled but imminent Cray-2. Margaret Loftus has a career that could be described in many ways, but not as "boring."

Her first contact with computers was at college, where she took "all three computer courses" offered at the time. Her goal was to be a statistician, a career track requiring a master's degree at the starting gate. "Unfortunately, because of poverty," she confides, that didn't work out.

What did work out was a job offer from Control Data. Shortly after joining CDC, Loftus found herself in Palo Alto, Calif., working on the operating system for the 6600—"the world's first supercomputer,"



Margaret Loftus: "Next week would come and we'd say, 'Gee, I think it's going to take two months.'"

to her mind. The 6600 project was the "status" assignment at CDC, she recalls. "We were learning how to harness its power. We made a lot of mistakes. No one had done this kind of work before.

"The operating system in a 6600 resided in all these peripheral processing units. So you had to coordinate all these little computers to make the big computer work effectively. It was to some extent parallelism, but not in the same sense we talk about parallel processing today.

"Now the problem is how to take an existing FORTRAN application and spread it across many processors. Today's compilers are not really capable of dividing up a single program into parts that can be run at the same time on different processors. Doing an operation was a lot easier because we had control over all aspects of the operating system and could make all the programs in the operating system follow all our rules," she says.

Along with the glory of riding the leading edge came the nerve-racking experience of predicting and missing deadlines. "One week someone would come by and ask when the project would be done. We'd say, 'Next week.' Next week would come and we'd say, 'Gee, I think it's going to take two months.' Those were the years of learning how to make software development predictable," she remembers.

More challenging than meeting deadlines was surviving intense peer pressure, recalls Loftus. The 6600 team was an elite group of overachievers. Most were single, in their twenties and thirties, and many, like coworker Charlie Bass (of Ungerman-Bass Inc.), went on to start their own companies, or, like Loftus, went on to top-level executive positions in other companies.

Not only did Loftus survive, she flourished. By 1976 she had risen to the sage rank of consultant within CDC and was looking for a new challenge. Like several CDC colleagues, she found that challenge at Cray Research.

"Cray was just getting into software in 1976." It was the 6600 game all over again, only this time better. The team was older, more experienced, and more confident. It was the company that was the beginner.

"When I came to work at Cray there wasn't much management structure to speak of, which actually created some problem when it came to recruiting. No one had a title." Loftus was company employee number 61, but within software development she was one of only four. By the end of 1977 there were eight.

"I had some pretty grandiose ideas about what I wanted to do," recalls Loftus. But all got shelved the second day on the job when Seymour Cray himself dropped by and dropped the NCAR (National Center for Atmospheric Research) contract in her lap. For small, money-starved Cray Research, that first contract was a lifeline to the future. "Nobody mentioned anything about an NCAR contract when I was inter-

PEOPLE

viewing." The pressure was back on.

"One of the early founders had a habit of coming by my office every day to see if the software was done yet, and always reminded me that the company was running out of money and couldn't stay in business much longer." With what Loftus calls "inspired performance," the group managed to meet NCAR's "stringent software requirements and some very stringent deadlines." NCAR liked what it got and the rest is history. "Such pressure back then, but we had a sense of ownership, we had a feeling of success."

It's still high risk and high pressure at Cray, so why no burnout? Loftus claims the secret is self-commitment and that direct personal link with the company's success. Loftus continues to protect and promote that original culture on which Cray was built. Exposing the direct line between the company's success and an individual's performance is central to Loftus's management style.

"It is not uncommon for the acceptance of a computer to be dependent on the completion of certain software projects," she notes. Nor is it out of the norm for one person to be responsible for a "very signifi-

cant segment" of a piece of software.

As for self-commitment, the trick is to get people to "sign up" for their projects, let them choose their work. "We try to spread the pressure around," she jokes. Freedom of choice and a strong sense of ownership in the company's success, that's what breeds the "inspired performance" Loftus still sees in Cray people today, performance like 350,000 lines of code produced in one year by a small team, anywhere from one to four people—Loftus would not say how many.

That same team is currently aiming for 250,000 lines in nine months. "I hate counting lines of code, but they kept flaunting those numbers in my face," she says, as a sly smile of pride crosses her face.

Little wonder that the software division hires few greenhorns. "Ours is a very senior staff," she says, usually people with five to 10 years of experience, many of whom still come from CDC or Univac. But not many per year are needed, only enough to fill expanding needs. "We have little turnover," she claims. "Most who leave do so because they can't cut it professionally. They leave because of the peer pressure. Peer pressure is very high here."

Nor does Loftus worry a lot about what "the other guys" are doing. "I don't know if I can tell where the Japanese are in terms of developing a supercomputer," she says, and she doesn't seem to care. What drives Cray, she adds, is the people. "They are not content with last year's results. They want something better."

The current competition between Seymour Cray with his Cray-2 and Steven Chen with the XMP is one example of inward competition that Loftus reveals. "Each one is trying to outdo the other," she assures. Imagine if every company's pace were set by a Seymour Cray.

She sees her main responsibility as manager as making sure "all employees have meaningful jobs" and "keeping everyone oriented toward Cray's long-range goals.

"I spend a lot of my time communicating our five-year plan to everyone. I speak to every department and make sure everyone in that department speaks up and tells me how they see what they are doing fitting in."

With everyone striving to outdo last year's performance and meet tomorrow's deadlines, it's not surprising Loftus perceives a low level of in-house politics at Cray. "But there's not a lot of socializing either and that bothers me. When people are talking in the halls I don't hear many comments about last night's football. Usually they are talking about their projects. I wish there was more socializing."

Another interesting bit of "Cray culture" is the lack of formal procedure and policy books. Cray employs 1,500 people worldwide, and nowhere is there a policy book, asserts Loftus. "I have only one corporate policy and that is a policy of no harassment. My belief is policy books inspire harassment."

In a more serious tone, she adds, "I have learned along the way that bright people have to be treated like bright people, and the main thing is be honest with them. If they don't deserve a raise because of this or that problem, then tell them so. Don't fall back on some policy that covers up the real reasons."

Unlike many corporate executives, Loftus never had a goal to be vice president. "I just like working for Cray. I liked my job seven years ago and I like it today. Although it is somewhat different, I have always managed software development. It's just today there are a lot more people, and instead of solving software design problems it seems all I do all day is talk."

Would she ever leave Cray? "There is a lot of pressure for a little company," she admits. "But once you work in supercomputers, where do you go? As far as I am concerned, for me this is the best software job in the world."

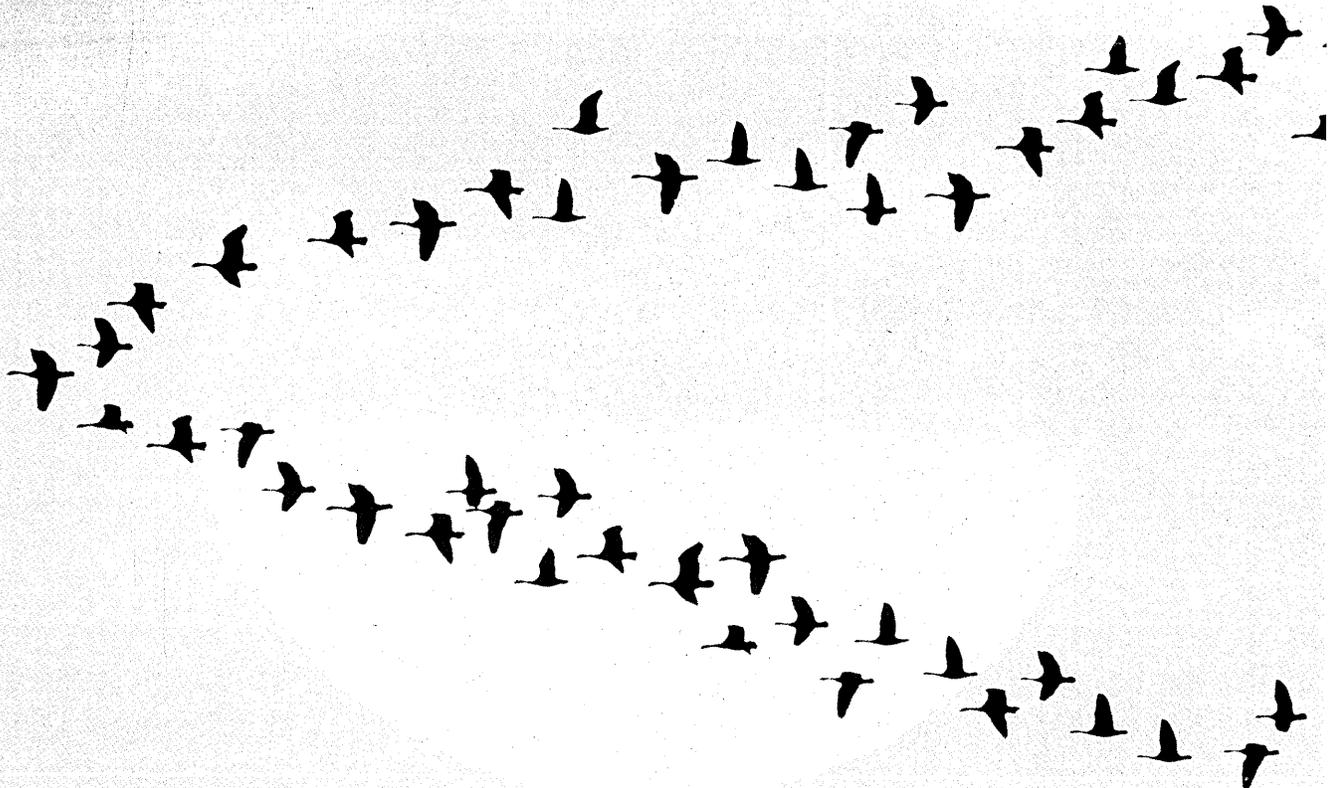
—Jan Johnson



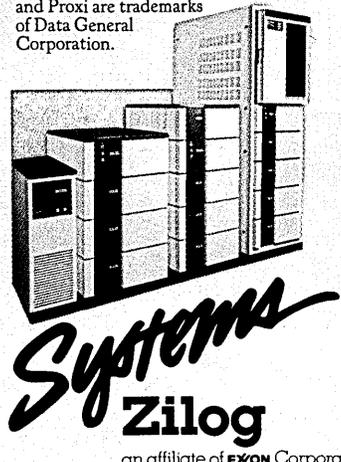
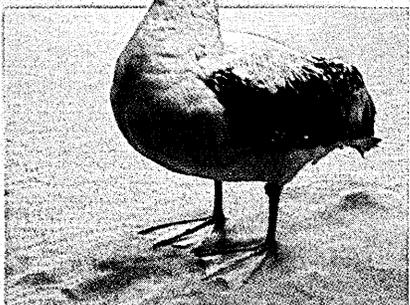
"You harrumphed, Sir?"

CARTOON BY BRENDA BURBANK

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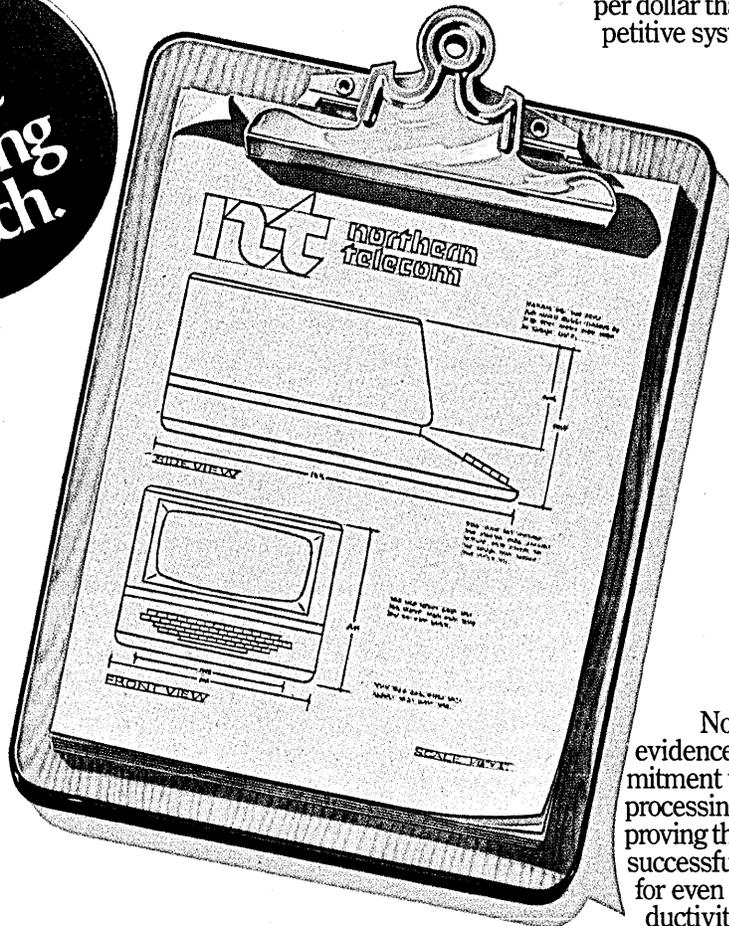
CIRCLE 74 ON READER CARD

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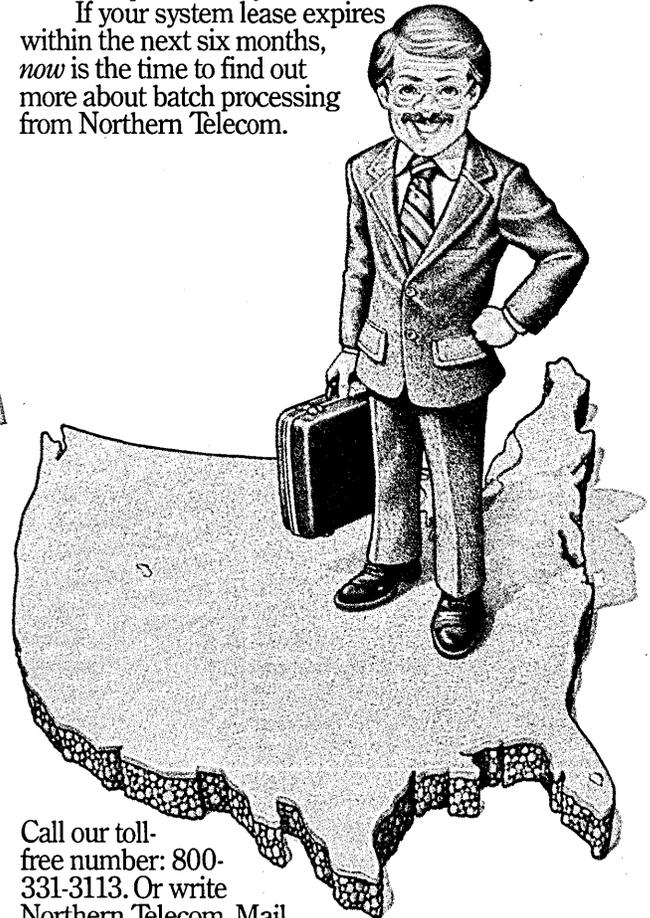


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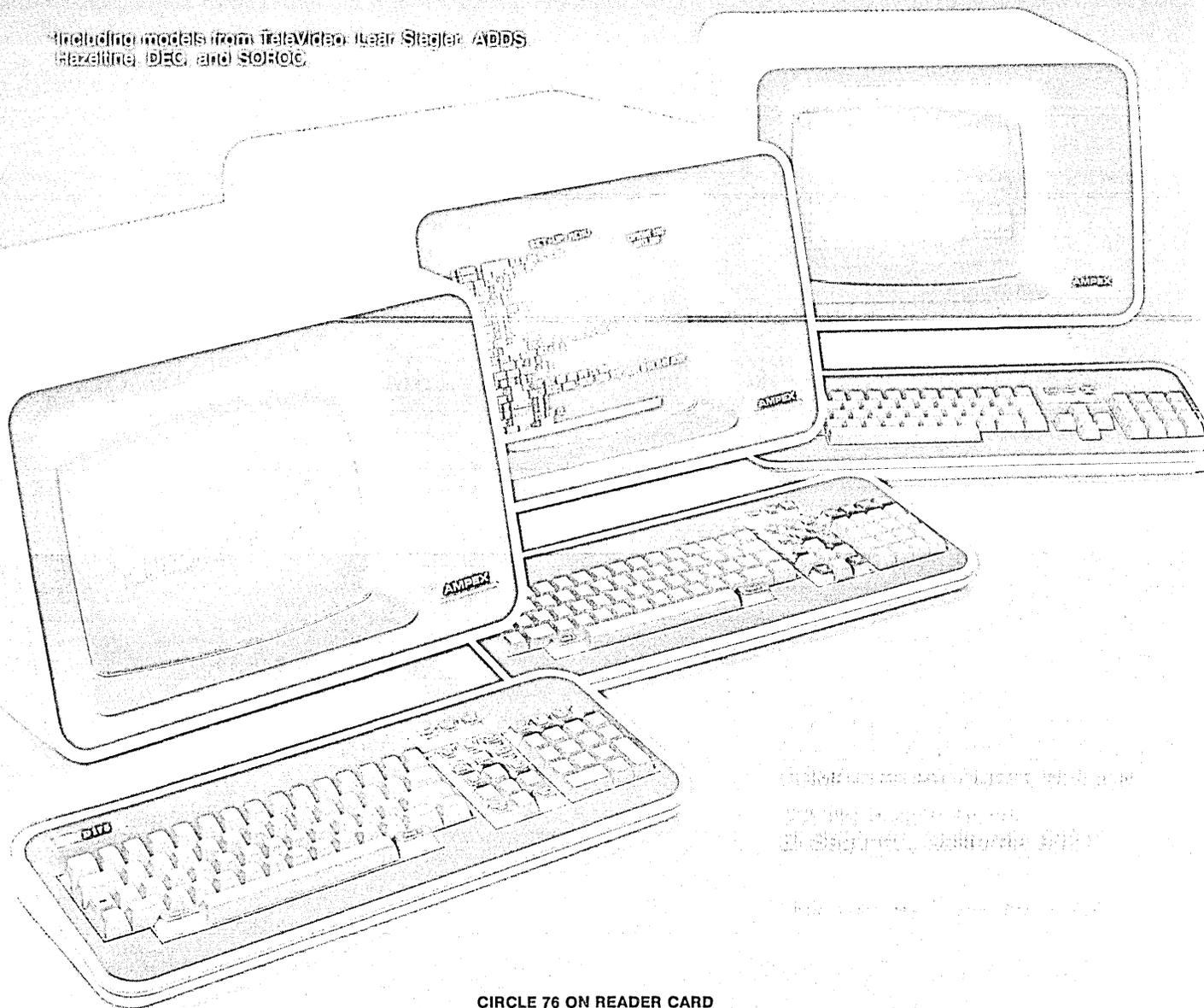
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CIRCLE 76 ON READER CARD

HARDWARE

OFF-LINE

There are many ways to measure the initial success of a new product in this industry. One favorite way, which applies primarily to cpus but also to significant peripherals and software, is to watch how many vendors leap onto the new product's bandwagon. Even before competitors emerge with knock-offs, many third-party firms evaluate the new product and decide whether to modify their own products to work with it. Take Apple's new Macintosh microcomputer, for example. Within a week of the Jan. 24 introduction of Macintosh, about half a dozen peripherals were announced -- and over 30 software vendors said they would make their products compatible with the micro. On the hardware side, some notable entries include the DataTalker II, a front-end processor that plugs into Macintosh's serial port and allows the system to emulate IBM 3270 interactive terminals and 2780, 3780, 3741, 2968, and 2270 remote batch terminals. The unit comes from Winterhalter Inc., Ann Arbor, Mich., and costs \$1,000. Then there is the Magic Phone, a telephone from Artsci Inc. that attaches to the side of Macintosh and provides a communications link to the outside world for any user with a modem. The North Hollywood, Calif., vendor wants \$200 per unit. There is also Mac Disk, which comes not with French fries and a Coke but with 5 to 32 megabytes of hard-disk storage. Davong Systems Inc., the Sunnyvale, Calif., maker of Mack Disk, will also be selling a 28MB streaming tape backup system for Macintosh. Finally, Tecmar Inc., in Cleveland, brought out seven peripherals for use with Macintosh, including modems, power supplies, Winchester disk drives, expansion chassis, and modems. Judging by the number of vendors interested in making money off the Macintosh, it

would seem that Apple has a hit on its hands -- for now, at least. The problem with this measurement of success is that it does not gauge the product's staying power.

While all these vendors clamor for the glamor of Macintosh's spotlight, there lurk many areas of the industry that never seem to get much more than a passing glimpse, where users face serious issues and vendors tread only at the risk of perpetual obscurity. One such area is data communications protocol testing, an essential process if users ever hope to talk to each other or to a host computer. A recent advance in the field comes from Atlantic Research Corp., the Springfield, Va., vendor of datacom protocol analyzers. Inherent in its new Comstate I and II line of products is what it calls the Comstate Programming Technique, which uses state diagrams directly in analyzing protocols. The technique breaks each state within a protocol into individual "triggers," which comprise a single input (condition) and output (action or transition to another state). Screens list all triggers listed for a given state, full explanation of each trigger, possible outputs for each input, and free-form footnotes for each trigger. The idea is to provide testers with a simple way of comparing what is actually happening in the hardware with what the state diagram for the protocol says should be happening. The technique is currently available only on the Comstate I and II devices. The Comstate I comes with a library of 100 tests, X.21 and X.25 compatibility, asynchronous terminal emulation, and 64KB of RAM for \$6,000. The Comstate II has all that and additional programming facilities, 512KB of RAM, and a 600KB tape drive for \$20,000.

COMPUTER OUTPUT MICROFILM

These computer output microfilm (COM) systems are controlled by a personal computer. Designated the NCR 5310 and NCR 5320, the systems offer automatic microfiche production from magnetic tapes formatted by a host computer. The 5310 utilizes photographic chemistry, and the 5320 uses heat as the developing agent.

The systems employ a self-loading, tabletop tape drive for data input. The tape drive eliminates the need for operators to manually load the data input tape. Job-specific information can be filed on flexible disks and called into memory for a particular job. Specific job information can include page size, lens size, and operator prompts for form slide mounting. The microfiche printer communicates with the NCR pc via RS232 cable.

A job log is standard with each system, providing the user with a fiche production management tool. Diagnostics have been built into the system for use by the customer services engineer and are expected to increase overall system reliability and reduce maintenance time. Typical configurations for the NCR 5310 and 5320 will sell for approximately \$67,000. NCR MICROGRAPHIC SYSTEMS DIVISION, Mountain View, Calif.

FOR DATA CIRCLE 301 ON READER CARD

INTERACTIVE TERMINAL

This terminal is designed for operators, interactive/timesharing end users, and applications developers. The AVT+ series is compatible with ANSI standard X3.64 and DEC VT100 software.

The unit provides 80/132 column capability, up to eight pages of display memory, 46 programmable function keys, and three additional communications ports for connection to other peripherals and computers. Nonvolatile memory enables users to configure a terminal permanently for their needs or applications. It also has windowing that allows users to create individual displays within display memory.

The display terminal's keyboard

HARDWARE

measures 16¼ inches by 7¾ inches. The keyboard is detached and has 101 keys. It also has a programmable volume control for bell and clacker, four programmable LEDs, and VT100-style numeric pad.

The vendor says this terminal can perform multiple computer applications and block mode forms applications. The AVT+ costs \$1,295 in single quantity. HUMAN DESIGNED SYSTEMS, Philadelphia, Pa.
FOR DATA CIRCLE 302 ON READER CARD

COMMUNICATIONS CONTROLLER

The KCT-32 intelligent front-end communications processor is designed for networking and custom communications applications on VAX computers. Usable in most computer-to-computer and computer-to-terminal environments, the unit has supporting software enabling it to run under the VMS operating system. The communications processor incorporates the vendor's T11 chip and is targeted at custom moderate- to high-performance communication market areas, such as banking, insurance, telecommunications, and large corporations.

The unit has 56KB of user-programmable memory for execution of custom functions, and implements PDP-11 instructions. Special software can be developed on a VAX system utilizing VAX/VMS software support tools.

The unit employs a single hex-width board and can be initialized by line, for bit/



byte synchronous or asynchronous data transmission and reception. The unit supports two lines at 64K baud per line, or a single line at 130K baud, full-duplex. The communications processor can be used with VAX-11/780, 750, and 730 systems. Up to four controllers can be used per system.

The unit accommodates RS232C, RS422, RS423, and RS449 standards, which are on-board selectable. The secondary microprocessor, which is used as a line accelerator, provides basic HDLC and BSC framing capabilities. An optional circuit board is available to accommodate the V.35 standard. The KCT32 is priced from \$6,900 to \$7,400. DIGITAL EQUIPMENT CORP., Maynard, Mass.

FOR DATA CIRCLE 303 ON READER CARD

INK-JET PRINTER

The HP 2225 ink-jet printer works with a variety of personal computers, using the HP-IB, HP-IL, and parallel interfaces. It operates below 50db and prints at 150 characters per second. The ink reservoir and printhead are combined into a single disposable unit, which can be replaced for \$8. According to the vendor, the average life of the ink cartridge is 500 pages. Any paper may be used with the printer, although the manufacturer recommends paper specifically treated for ink-jet printing.

The printer produces bold and underlined characters without slowing the printing speed. It supports a dozen languages, using ISO standard character sets and a roman font. Both tractor and friction feed are available for paper loading. The drop-on-demand printhead uses 11 by 12 dot matrix characters, and can produce graphics with either 96 by 96 or 192 by 96 dots per square inch resolution.

The unit measures 11½ by 8 by 3½ inches and weighs 5½ to 6 pounds. It can run on batteries, producing 200 pages between charges. The HP 2225 costs \$600. HEWLETT-PACKARD CO., Palo Alto, Calif.

FOR DATA CIRCLE 304 ON READER CARD

PORTABLE MICRO

The Execuport XL portable computer is based on the 8-bit Z80 microprocessor and can be configured with the 16-bit 80186 cpu as well. The Z80 supports CP/M, and the 80186 supports the MS/DOS and CP/M-86 operating systems. Options include a 300/1,200 baud 212A-type intelligent modem, telephone handset, 200 cps printer, and a hard disk drive.

The XL has 80KB of RAM and a 9 by 5-inch green phosphor screen, which can display up to 132 columns by 24 lines. Dual double-sided, double-density 5¼-inch floppy disk drives come with 800KB of formatted storage each. The XL+ model adds the 16-bit processor and an associated 128KB of memory to the basic machine. This option can be added in the field, the vendor says.

Four Perfect Software packages (Calc, Speller, Writer, and Filer) are included in the purchase price of the portable. Optional operating systems include the OASIS, MP/M, CP/NET, and CP/NOS packages. The XL costs \$2,700, and the XL+ lists at \$3,500. COMPUTER TRANSCIEVER SYSTEMS INC. (CTSI), Paramus, N.J.

FOR DATA CIRCLE 305 ON READER CARD

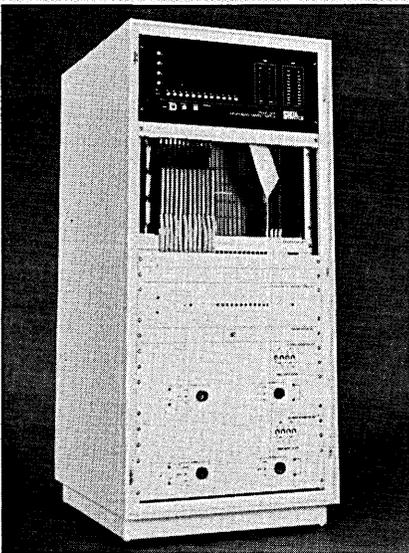
COMPUTER SECURITY

The LazerLock computer security system contains a hand-held decoder coupled with security software. Computer systems that incorporate LazerLock can require the user to respond to a security check at any point. The check is accomplished by holding the user's decoder to the crt screen, so that an automated security process can be executed

HARDWARE SPOTLIGHT

PERIPHERAL SWITCH

This vendor enters the low end of the data processing switching market with a peripheral switch designed for the one- or two-IBM or compatible cpu market. The model 600 switches peripheral control units between channels of one or multiple cpus, providing



recovery from hardware failures. For example, if an active cpu or control unit fails, the failed device can be instantly taken off-line and a spare device brought on-line.

In addition, peripherals can be shared among cpu channels or among multiple cpus. Users can correct or avoid data-flow bottlenecks by switching control units to other, less busy channels, thus optimizing cpu performance through load balancing.

The model 600 handles data throughput speeds of up to 8MBps. Synchronous switching allows switching onto and off of an active channel without interrupting cpu operations. The unit also incorporates semiconductor switching technology. All equipment interconnections are displayed on the control panel. A data path may be selected or altered by pushing the proper channel button and port button on the control panel. Key lock security is provided to prevent unauthorized configuration changes. The unit also has a diagnostic display and built-in signal generator. The \$25,700 unit can be field-upgraded to intelligent model 1200. DATA SWITCH CORP., Norwalk, Conn.

FOR DATA CIRCLE 300 ON READER CARD

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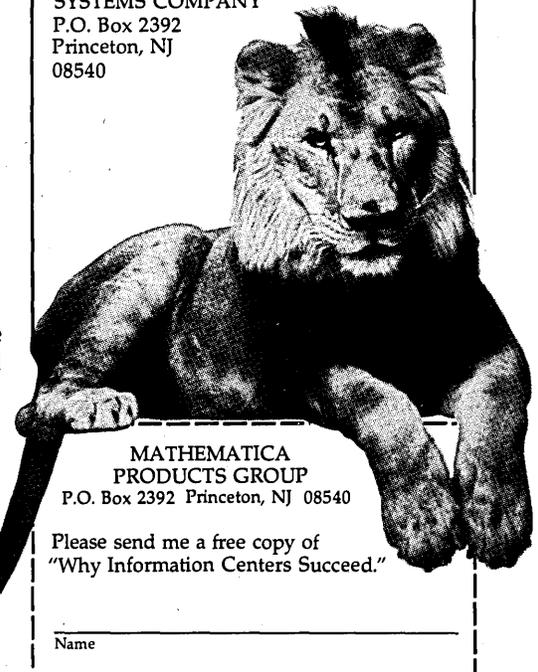
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CIRCLE 77 ON READER CARD

HARDWARE

between the software and decoder.

The result of this process is a four-digit code that changes every time it is displayed on the decoder. This code must then be typed into the computer to complete the security check. There are no password or hardware encryption schemes with this system. Authorized users need only carry their personalized decoders to gain access to the system.

The manufacturer says LazerLock will be compatible with most computer equipment and software, for micros, minis, or mainframes. LazerLock will cost between \$100 and \$200. Special implementations of the system will be available for unique security requirements of large government and commercial organizations. UNITED SOFTWARE SECURITY INC., McLean, Va.

FOR DATA CIRCLE 306 ON READER CARD

MAINFRAME COMPUTER

The A 9 is the first of a new line of mainframe computer systems. It is being offered in three models, B, D, and F. Users of the A 9 will be able to field-upgrade the model B to the midrange model D and in turn upgrade that unit to model F.

The system's memory can be expanded to 24MB and can support up to 6MBps of data transfer in burst mode and 4.5MBps in sustained mode.

The vendor says this computer's architecture is different from what is offered in its other large systems. The architecture in the A 9 allows multiple functions to occur simultaneously within the main processor. This is accomplished by incorporating three logical processors within the main processor.

The A 9 is the first entry in the company's A series of mainframes, and is compatible with the vendor's B 5000, B 6000, and B 7000 series mainframes.

Prices for the A 9 start at \$350,000. Shipments of the A 9-F are scheduled to begin this summer, and all three models will be available within the next 12 months. BURROUGHS CORP., Detroit, Mich.

FOR DATA CIRCLE 307 ON READER CARD

MULTIMODE COLOR PRINTER

The DP-9725B Color/Scribe printer produces multiple colors for both text and graphics. Software supplied with each printer on a 5¼-inch disk makes this unit IBM-compatible. Color printing is made possible by multiple pass capability and a four-color ribbon. A single color can be selected for each pass of the printer, and multiple color combinations are obtained by overlaying single-color selections. The printer can also change colors at any point on a printed line.

Graphics resolutions of either 144 dots per inch or 72 dots per inch are obtainable in both horizontal and vertical dimen-

sions. Single-color printing speed for correspondence quality is 60 cps at 10 cpi, 72 cps at 12 cpi, and 67 cps for proportional spacing. In the enhanced quality mode, speed is 120, 144, 180, 197, and 134 cps for 10, 12, 15, 16.4 cpi and proportional spacing. Speed is 240 cps for draft quality. The single-color correspondence quality modes employ double-pass printing, while other single-color modes are single pass.

The printer has reverse line feed, seven ISO character sets, and right and full justification. RAM is expandable to 12.5KB in 4KB increments. The DP-9725B costs \$1,625. ANADEX INC., Camarillo, Calif.

FOR DATA CIRCLE 308 ON READER CARD

COMPUTER GRAPHICS SYSTEM

The model 200 computer graphics system is designed for business presentations. The system is an on-site workstation with a software package that creates and produces graphics for business and industry.

The system generates 35mm slides, color overhead transparencies, 8 by 12-inch



color prints, black and white or color hardcopy, and video visuals.

The system is based on IBM PC XT microcomputer hardware and can function as an independent graphics system or as the nucleus of a graphics network for IBM personal computers and Apple II microcomputers.

The Guideline software package developed by the vendor allows users to select a variety of background colors, text colors, font types, and slide formats. The Poly-Curve software is developed to produce logos, symbols, and 3D maps and illustrations. Other software includes a multitasking package that allows users to continue designing visuals while other graphics are being exposed or printed.

The system comes with an Epson dot matrix printer, Hayes Smartmodem, color monitor, black and white monitor, and electronic drawing table. A Matrix QCR film recorder is optional. The model 200 costs \$35,500. AUTOGRAPHIX INC., Chicago, Ill.

FOR DATA CIRCLE 309 ON READER CARD

MULTIHEAD DISK DRIVE

This 5¼-inch Winchester disk drive has 12 read/write heads on each side of the disk. In

a 10MB configuration (5 fixed, 5 removable), the Turbo-Disc maintains 425KB of data under 48 heads at all times. Average access time for data under the heads is 8 msec and 16 msec for the remaining data.

The head slider assembly is mounted on a parallelogram, which moves the read/write heads across a rotating media surface. When not in use, the heads are protected from crashing onto the planted media by a head lifting system that physically locks the heads above the surface of the disk.

The subsystem includes a host interface board compatible with IBM, Apple, DEC, S100, and Multibus systems. It has its own power supply, a disk controller, two types of connecting cables, and utility software. When interfaced with microcomputers, the standard SASI interface is provided. For IBM PCs, two additional slots are available when ordered with the bus-level interface.

The unit's architecture (two logical drives) provides data redundancy and off-line data security. The Turbo-Disc ST506/412 interface is available in three models, two of which are for the oem market. The units range from \$1,800 to \$2,325 with oem discounts. NEW WORLD COMPUTER CO., Pleasanton, Calif.

FOR DATA CIRCLE 310 ON READER CARD

BANKING MACHINE

This automated teller machine can dispense coins, cash paychecks, and accept check deposits without slips or envelopes. The 4370 Personal Banking Machine is designed for use in banks, stores, and work locations. The unit can dispense pennies, nickels, dimes, quarters, and five denominations of bills. It also performs account transfers, payments, deposits, and withdrawals.

The unit can also cash payroll, Social Security, and other third-party checks for uneven amounts by reading the magnetic characters on the check. The manufacturer says the product simplifies proofing because the deposit slip and envelope are eliminated, which reduces paper handling.

All personal identification numbers transmitted from the 4370 to the host computer are encrypted. In addition, messages with sensitive data are tagged with a special code. Any tampering with the system will change the code, and the computer will not complete the transaction.

The basic model has a single console with card reader, display keyboard, statement printer, and currency dispenser.

The check deposit, envelope deposit, and coin dispenser are optional features. The unit can be expanded. The single-console IBM 4370 costs \$20,300, and the two-console model lists for \$32,700. IBM CORP., Rye Brook, N.Y.

FOR DATA CIRCLE 312 ON READER CARD

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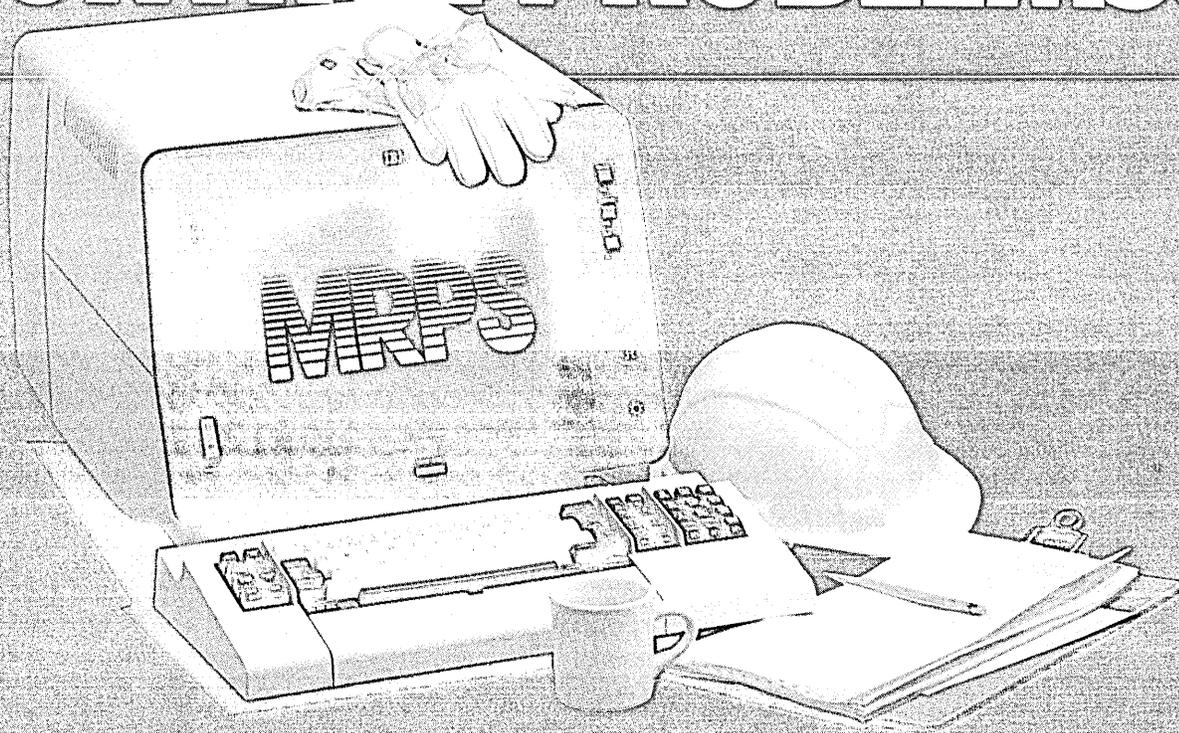
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MRPS

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1. High Performance
MRPS is a well-designed, well-written system with proven on-line performance. MRPS fits easily into virtually any DP strategy and it provides state-of-the-art manufacturing control without disrupting established manufacturing procedures.

2. DBMS Integration
Unlike other manufacturing software systems which are based on the enhancement of older technology, MRPS is based on completely new technology designed to meet today's modern manufacturing needs. Powerful on-line DBMS integration insures data integrity and increases information availability. Simply stated, MRPS keeps the information accurate. And accurate information leads to better business decisions which ultimately lead to greater manufacturing efficiency.

3. Unparalleled Portability
MRPS offers an unparalleled degree of hardware portability for IBM mainframe and DEC™ VAX™ users. For situations where the high performance of the VAX is needed, modules can be tailored for the VAX. For tasks best handled by the IBM mainframe, IBM modules can be used. This compatibility provides the freedom to establish one consistent approach to manufacturing control throughout the organization.

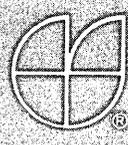
4. Modular Growth Path
MRPS is a modular system that provides comprehensive manufacturing control. Virtually every manufacturing need is addressed

in one of four planning modules which include: Manufacturing Materials Planning, Master Production Scheduling, Production Planning & Control, and Vendor Analysis & Purchasing. Due to the extreme flexibility of its modular design, MRPS can be tailored to meet specific needs. You can begin with the module, or modules, that address immediate needs. Then, as you grow, MRPS can grow with you.

5. Proven In Use
In more than 100 installations around the world, MRPS is providing dramatic improvements in both the productivity of the individual user and the company as a whole. The on-line high performance of MRPS has made believers out of many manufacturing managers who have been disappointed with the performance of other manufacturing systems.

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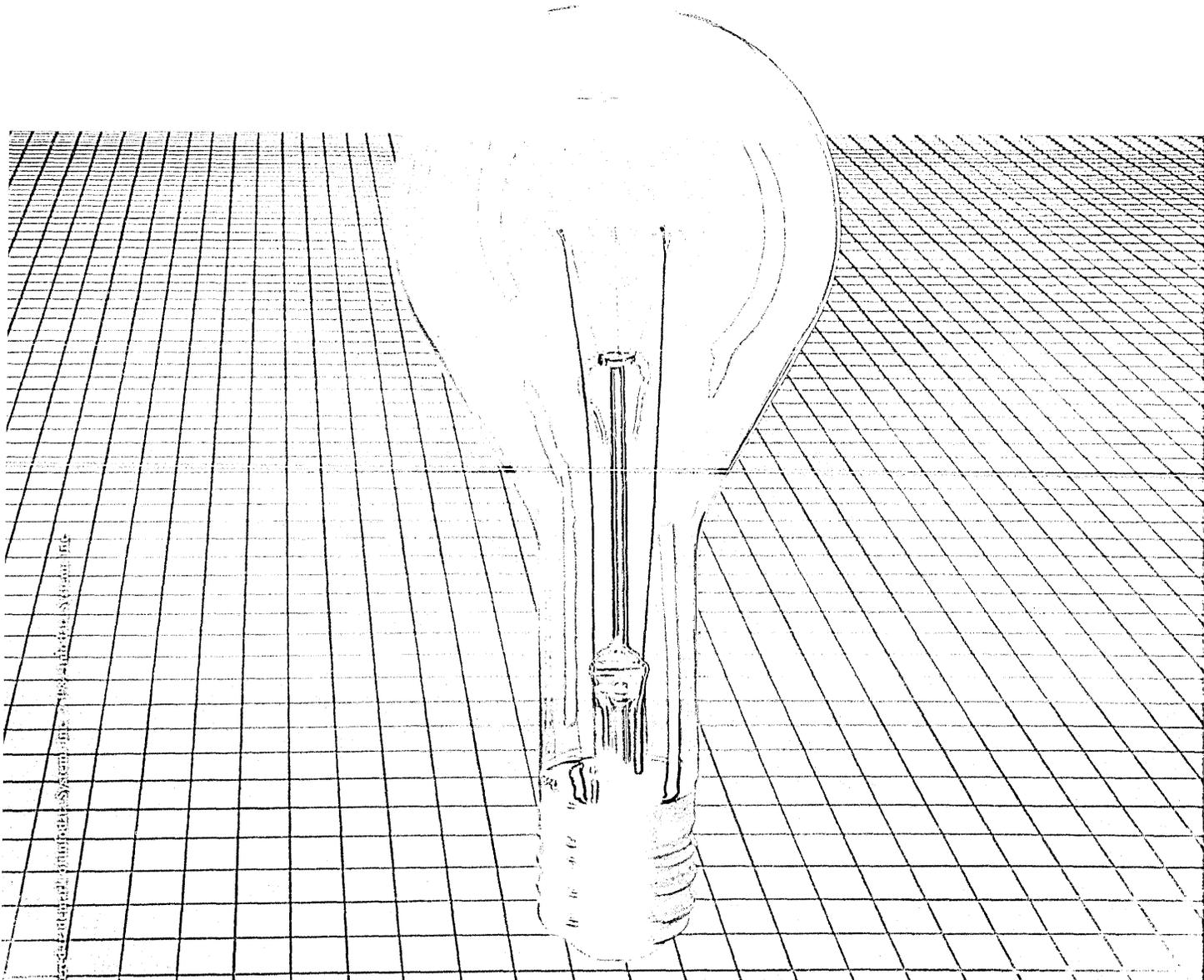
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CIRCLE 10 ON READER CARD

SOFTWARE AND SERVICES

UPDATES

In the microcomputer software business, what you call a product is easily as important as what goes into it. The most popular products -- dBASE II, 1-2-3, VisiCalc -- all had unique names when they were introduced; competitors calling themselves ZorroCalc or 4-5-6 or CalcuCalc, for example, would have a hard time being noticed after the originals had laid their claims. And while these knock-off companies may say that all the good names are taken, along comes Lotus Development Corp., the Cambridge firm that made 1-2-3 a household word. Lotus followed that hit recently with the brilliantly named Symphony, a significant expansion of the previous product. As a symphony in music combines the various talents of many musical instruments and musicians into a single, integrated whole, so the new Lotus product merges five business applications and some other features into a single, compact product.

The product is not necessarily as good as its name, however. Its biggest advantage, that all facilities are resident in memory at the same time, is also its biggest disadvantage. Sure, it's nice to switch from graphics to word processing instantly instead of waiting for a disk access, but one wonders whether that convenience is worth the price of the 1-2-3 upgrade and a memory expansion board. Symphony requires 320KB of RAM and a single disk drive at a time when most users have 256KB or less RAM and a pair of drives already installed. Symphony's construction, then, does not mesh with the hardware facilities that most current users have. And if Lotus wants to sell to new users, the \$695 price tag and massive hardware requirement will seem imposing compared to VisiCalc or even

1-2-3. Nor is Symphony as easy to use as some other integrated software products, such as Jack2 from Business Solutions in Kings Park, N.Y. Nonetheless, Symphony is a powerful, integrated package, and with the creativity and business acumen of Lotus as support, it may still prove to be the hit Lotus expects.

This just in from our tongue-in-cheek department, London bureau: Arthur D. Little consultant Adrian Norman has proved that international data havens with "a full array of Big Brother technology" are possible and, yes, feasible. Such a haven, which might be called Operation Goldfish (Global On-Line Data Files and Information System Haven), could be established within the borders of a neutral, cooperative nation and consist of a database of unrestricted information about organizations, nations, and individuals. Data could be assembled, organized, stored, and disseminated for anyone willing to pay a fee. The data haven would of course be exempt from all laws.

The data haven could be protected from any national government's examination by means of go-between companies, called Guppies (Goldfish User Program Purveyors by International Electronic Systems). Oh, and as for those nasty concerns about thievery and piracy: "Goldfish is so private and secure that even it does not know what is going on," Norman says. As for ethics, he adds, "commercial pressures will ensure enough staff to operate the system. No country bans the making of inquiries about its citizens in foreign databanks." Norman sees the Goldfish plan as an ideal way for underdeveloped nations to leapfrog into the world of high technology and earn significant revenues, simply by playing Big Brother.

APPLICATIONS DEVELOPER

The Aura application development system for microcomputers allows users to build custom applications in which database management, spreadsheets, word processing, and graphics are all tied together. The menu-driven product uses no new command languages, and provides help screens in windows on the screen.

The database is capable of executing reports, sorts, editing, filing, and data storage. The spreadsheet performs the most common spreadsheet functions with a maximum size of 255 rows by 63 columns. The word processor documents may include information taken from the database, spreadsheets, or graphics. (The graphics may not be able to be presented on the same crt display, depending on the hardware used. The system will print hardcopy with text and graphics integrated, however.)

The applications development tool allows users to tailor and update program menus or user-specific sequences of operations. An applications builder can link several operations together if the end user plans on using them together, so that the user need not learn how to work with the operating system. Users can build menu screens and then determine what the computer should do for each menu choice, including hidden items. All options can be password protected.

Aura is available for the IBM PC and PC XT models, as well as for other MS/DOS-based micros. Minimum system requirements include 256KB of RAM, a hard disk drive, and a double-sided, double-density floppy disk drive. Aura costs \$500. SOFTREND INC., Salem, N.H.

FOR DATA CIRCLE 326 ON READER CARD

INVENTORY

The Stores Inventory and Purchasing Management system is designed for use with the IBM System/34, 36, and 38 minicomputers. It comprises three modules, which together are designed to aid users in determining what to buy, when to buy it, what price to pay, which vendor to seek, what parts are

SOFTWARE & SERVICES

required, and where those parts are stored.

The purchasing module generates purchase orders, sends expediting letters when specified past due dates are reached, and allows on-line inquiry into the status of outstanding purchase orders and vendor performance. The inventory management module provides for the maintenance of on-hand balances in both dollars and quantity for all products by warehouse location. A suggested reorder report is generated, using one of three order quantity and order point formulas, to minimize inventory levels and stock outs. The module can record product issuances against either a general ledger account number, a work order number, or an equipment number.

The accounts payable module provides audit controls. Invoices are compared with the purchase orders and the receivers to permit internal controls. The system produces and reconciles checks as well. Together, all three modules cost \$27,000 for the S/34, \$31,000 for the S/36, and \$35,000 for the S/38. They can also be purchased separately. SHAWWARE INC., Burlington, Ont.

FOR DATA CIRCLE 327 ON READER CARD

LAN DATABASE

This relational database management system has been designed specifically for local area networks of personal computers. Called LAN: Datastore, the system supports the EtherSeries, MultiLink, Omnet, PCnet, and ShareNet networks. The vendor says this system offers end users security and data locking features at the field and record levels. It also limits a user's ability to read, update, delete, and add records.

Through the use of encrypted passwords, and a second level of internal tamperproof security, this system prevents unauthorized users from accessing confidential information. On-screen help messages and menus are included to help novice users. Experienced users can access information directly because commands are both function key and mnemonic driven.

The product can create files as large as 16MB and does not limit users to a fixed number of records. Each record can be as large as 16KB, and contain more than 500 fields. Keys are stored in a B+ tree structure. LAN:Datastore is available in single user and network versions for IBM PCs, PC compatibles, and Texas Instruments' pc. It costs \$945. SOFTWARE CONNECTIONS, Santa Clara, Calif.

FOR DATA CIRCLE 328 ON READER CARD

FINANCIAL SOFTWARE

This software system is designed for financial performance measurement and budgeting applications with micro-to-mainframe links to spreadsheet packages. Called Compass, the software is meant for controllers, financial analysts, and business managers who prepare budgets and for ongoing financial management using large amounts of data.

Typical Compass installations involve data for several hundred business units and a comparable number of line items. The package provides users access across corporate data. The package can handle "what if" questions regarding alternate financial scenarios for a corporation.

With links to microcomputers and spreadsheet packages, Compass uses a vari-

ety of applications software, including database management, ad hoc and fixed reporting, graphics, and screening and sorting capabilities. It operates in conjunction with XSIM, the applications software system sold by Interactive Data Corp., using the VM/CMS operating system.

The software is licensed for \$80,000 and can be custom installed to the user's needs. INTERACTIVE DATA CORP./CHASE DECISION SYSTEMS, Cambridge, Mass.

FOR DATA CIRCLE 329 ON READER CARD

APPAREL SOFTWARE

This software package is designed for garment manufacturers and can run on the IBM S/34 and S/36. The Apparel System includes allocation, customer service, inventory control, production planning, order entry, warehousing, sales analysis, and an optional accounts receivable module.

The vendor says the system tracks current and scheduled bookings and purchases and production. Key reports are a single page long, summarizing the condition of all the areas of the business. Detailed reports can be generated depending on the user's needs.

The system shows what is in stock; what has been shipped; what will be available by color, size, and style; when shipments are scheduled; and which orders are held and why. The system generates picking tickets, order acknowledgments, invoices, and packing lists. For companies that factor, it will prepare factor slips and invoice registers automatically. The Apparel System costs \$30,000, and monthly maintenance is available. GP WEST SOFTWARE, Los Angeles, Calif.

FOR DATA CIRCLE 330 ON READER CARD

SOFTWARE SPOTLIGHT

SATELLITE LINK

Under a joint marketing and support agreement, Hewlett-Packard and this vendor provide a satellite communications system that allows high-speed, long distance information exchange between computers. The system is designed to operate with the HP 3000, and includes a satellite link and earth station that is installed on the customer's property. A number of computers at two or more distant sites can exchange files and other data at a variety of transmission rates.

The vendor says the system offers savings over other forms of communications, costing about \$1,800 per month. The system is designed for geographically dispersed organizations that need to transfer files and information quickly for the purposes of decentralized inventory control, financial management, and CAD/CAM.

The Vitalink equipment can be attached to the computer because the system uses the HP 3000 Distributed System Network. The earth station connects directly to the computer's input/output circuitry and

runs with HP software. Users operate the computer as if they were employing a standard phone link. No user networking commands or protocols are needed for using the system.

The system performs full two-way data communications at transmission rates of 4.8Kbps to 56Kbps. Each station can have a dual electronics arrangement that sends and receives two parallel signals to ensure continued transmission even if one channel fails.

The system can be expanded. Additional sites can be added to the network. The earth station supports a variety of additional communications functions such as video conferencing and multiplexing to accommodate more than one computer per site. Equipment and installation cost \$120,000. Vitalink monthly charge is \$1,800 for two-way transmission at 56Kbps. HP DSN/satellite communications installation is \$20,000. VITALINK COMMUNICATIONS CORP., Mountain View, Calif.

FOR DATA CIRCLE 325 ON READER CARD

MICRO-TO-MAINFRAME LINK

This software package provides a micro-to-mainframe data link. It allows microcomputer application programs to access and update records contained in an IBM mainframe database as if the database were resident on the microcomputer. The program performs all translation necessary to access the particular mainframe database in use.

Interchange/1 supports access to ADABAS, IDMS, Total, TIS, and VSAM mainframe database files. Access is supported from the IBM, Apple, and Wang microcomputers. The vendor says the software treats the microcomputer as another computer and not as a 3270 terminal. Full file transfer, both download and upload, is supported. The package also provides access to mainframe data at a record level.

The vendor says any computer may request resources from any other computer in a distributed network without regard to the method of data storage or the type of computer making or servicing the request. The nature of commands and functions in-

SCAN/370—The system that automatically simulates the execution of every cleanly compiled COBOL program. SCAN/370 gives you critical analysis information that reveals how each program will execute at run time—information not obtainable via cross referencers, flowcharters, or other analysis tools.

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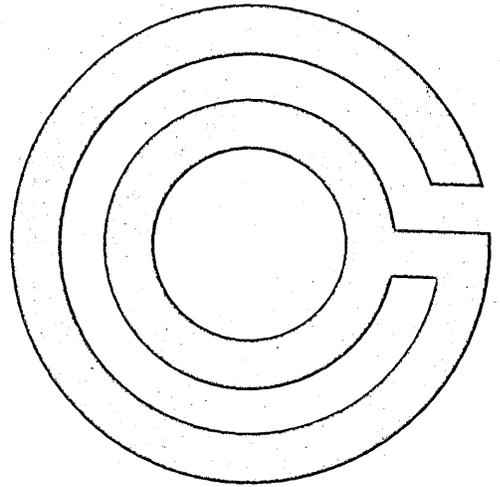
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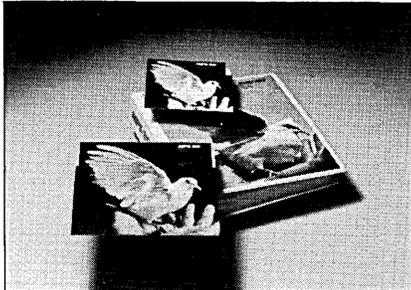
ulates users from changes in the DBMS. Interchange/1 costs \$45,000 for an unlimited usage license. FIRST CONCEPT TECHNOLOGIES INC., Rochester, N.Y.

FOR DATA CIRCLE 331 ON READER CARD

PROGRAMMING LANGUAGE

This vendor's programming language, called MAGIC (Machine Generated Integrated Code), can increase productivity up to 10 times greater than BASIC, COBOL, PASCAL, and C, the vendor says.

MAGIC/MPS is a medium-level portable language that maintains traditional language philosophies to create application



programs without the need of a run-time package. The instruction set, through the MAGIC compiler, permits the creation and maintenance of machine-executable programs. It has file I/O capabilities with random, sequential, and ISAM file types.

MAGIC has internal data areas that are completely variable, with buffers allocated for both hardware and software efficiency; BCD arithmetic with up to 36 digits; simplified screen formatting and data editing; handwritten assembly language that can be mixed anywhere in the source code; total string manipulation capability; control over peripherals; and conditional compilation of source code. The MPS/80 is for all CP/M systems and is priced at \$795. The MPS/86 is for CPM-86 and MS/DOS systems and lists for \$995. DATA MANAGEMENT ASSOCIATES INC., Wilmington, Del.

FOR DATA CIRCLE 332 ON READER CARD

LETTER WRITER

This program is a database for over 100 letters on many subjects. The difference with this correspondence package, according to the vendor, is that it is not a collection of prewritten letters stored on a floppy disk. The Letter Writer is an actual database of letters and addresses, cross-indexed by key words.

The program involves a find-and-assemble process, and takes advantage of text processing and text database management offered by the vendor. Users can search through all letters on a given topic or on a combination of topics; transfer the chosen letter to a text processing editor; edit the letter; search through the user's database, using name, zip code, and other keywords; transfer the address into the letter; and print

a formatted copy. Users may add their own letters and addresses to the database. The program lets users cross-reference letters under one to 10 different keywords. Users can also select letters by any desired combination of topics.

Complete sample letters on many topics are included and may be edited. Model letters for which the user may insert appropriate text are also added. The Letter Writer is on a double-sided 5¼-inch floppy disk, and costs \$60. The Idea Processor lists for \$300. IDEA WARE INC., New York, N.Y.

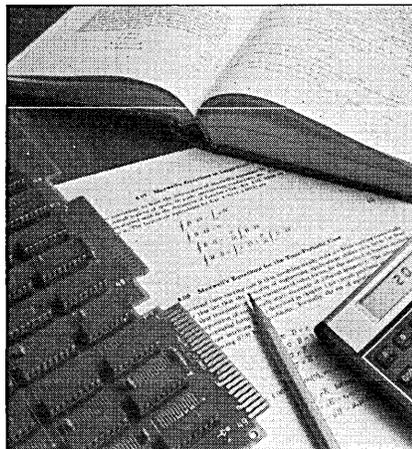
FOR DATA CIRCLE 333 ON READER CARD

DOCUMENT FORMATTING SYSTEM

This document formatter software package enables users in the scientific and technical areas to create and print complex expressions and equations using an engineering workstation and a compact laser printer, without requiring a special typesetter.

HP Tex accepts text files from HP 9000 series 200 computers in standalone mode or on the Shared Resource Manager, a device that provides access from desktop computers to shared peripherals. Use of this formatting system enables users to produce technical papers, reports, or memos typically requiring a typesetter.

Embedded commands can be used to specify formatting features like underlining, subscripts and superscripts, page size, footnote placement, and exponents, among



other notations. Page size can be specified, and pages can be printed in a multi-column format.

HP has adapted the capabilities of the HP series 200 and SRM workstations to run this formatting system. The HP2688A workstation laser printer is a 12-page-per-minute device designed to handle all of the special formatting commands of the software. HP Text text formatting system costs \$4,000 with delivery in 12 to 14 weeks. ARO. HEWLETT-PACKARD CO., Palo Alto, Calif.

FOR DATA CIRCLE 334 ON READER CARD

SOFTWARE DEVELOPMENT TOOL

The FORMIX Screen Forms Master Information Executive is a CICS-like screen management system composed of a run-time executive to manage all the data traffic between the end user and the applications program, with a set of flexible interactive screen development tools.

For the end user, FORMIX provides standardized full screen at a time processing. It can also be used with screen capture utilities to off-load CICS data sessions to an IBM PC. For the applications developer, the system can create user data entry/display screens and eliminate most of the programming required to handle, edit, and validate input data, and to maintain system messaging. It also has screen layout capability, on-line help screens, messages, and screen prompts.

For programming, FORMIX provides language interfaces so that application programs written in BASIC, Pascal, C, and COBOL load a defined screen form and call the FORMIX Run-Time Executive; the executive handles the screen I/O messaging, and data editing and validation that the application program would normally do. No application code is required by users. FORMIX costs \$495. MASTER COMPUTER SYSTEMS INC., Eden Prairie, Minn.

FOR DATA CIRCLE 335 ON READER CARD

THOUGHT PROCESSING

This "thought processing" software package is designed for the IBM PC and PC XT. It is called THOR—for thought organizer—and integrates the free formatting facility of a word processor and the filing and retrieval capabilities of a database manager into a single program.

THOR allows users to record, categorize, and retrieve thoughts without any knowledge of computer syntax. The user can relate thoughts to one another, change their relationship, review a thought in summary or in detail. A "thought" is the basic form of recording information with THOR. Thought categories and thought retrieval criteria are not fixed and can be added to, changed, or deleted at any time.

The word processing portion of the software package permits basic writing and editing functions, in addition to screen and print formatting comparable to independent word processors, according to the vendor. Additional features allow the user to define alternate characters, such as foreign language and graphics characters. It also gives character attributes.

THOR is function key driven, and a mini menu is available at the bottom of the screen. Minimum system requirements are machines with 128KB memory. THOR costs \$295. FASTWARE INC., East Orange, N.J.

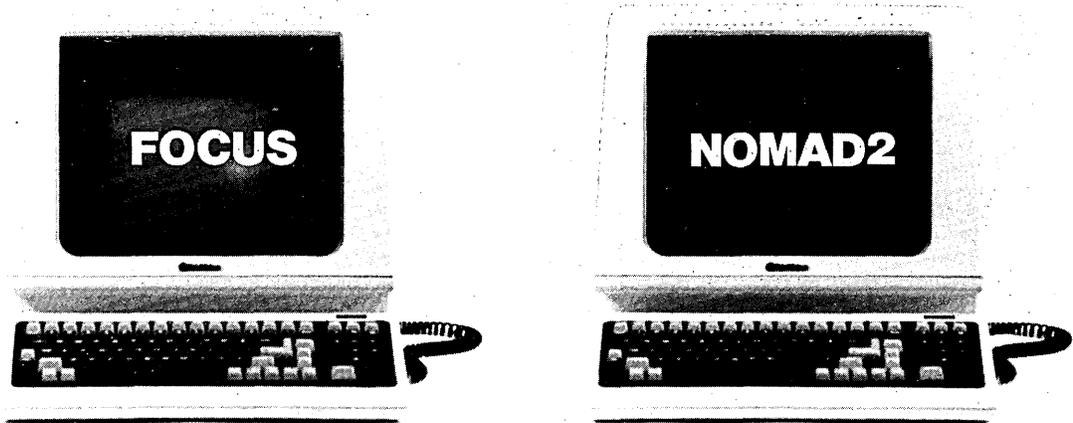
FOR DATA CIRCLE 337 ON READER CARD

—Michael Tyler and Robert J. Crutchfield

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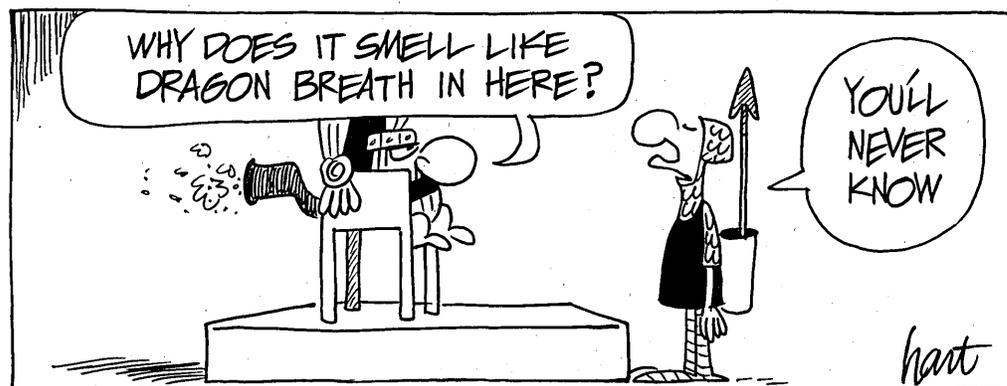
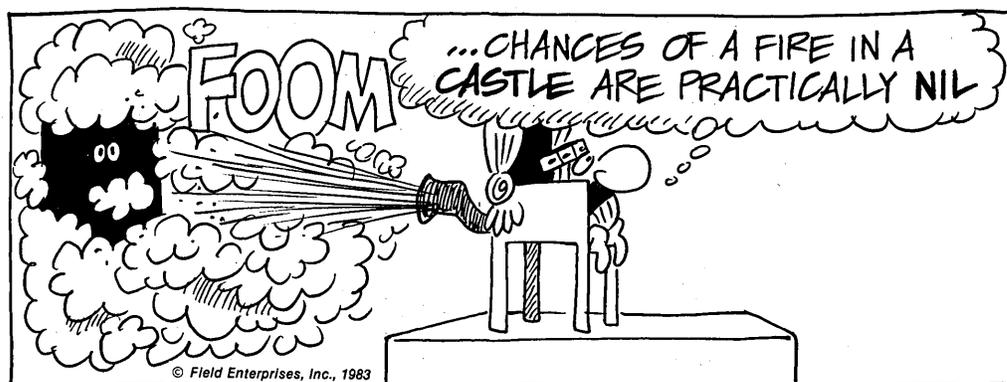
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BOOKS

MACRO: A CLEAR VISION OF HOW SCIENCE AND TECHNOLOGY WILL SHAPE OUR FUTURE

**by Frank Davidson
with John Stuart Cox**

"Make no little plans," Daniel Burnham, author of the Chicago plan, is supposed to have said. "They have no magic to stir men's blood." Big plans are what *Macro* is all about. It is a book about successful macroengineering, past and present, and it is also a polemic for advancing future macro schemes.

What is macroengineering? Regular, old engineering writ large, with bulldozers. Big projects, big 16-wheel machines, big expense. It is Haussman blasting thoroughfares through Paris, or Lesseps digging in the sand of Suez. It brings a Promethean grandeur to man, and makes him mighty—there is spiritual solace to be had in operating an earthmover.

This book is a pleasant work, inspiring if not stirring. While it's true the book is diffuse and awkwardly structured, one should refrain from finding fault with *Macro*. This isn't the *Principia*, after all; this is a jovial book, a capricious pile of schemes.

Frank Davidson is chairman of the System Dynamics Steering Committee at MIT's Alfred Sloan School of Management. He and coauthor John Stuart Cox are unabashed admirers of engineering: the Third Augustan Romans in North Africa, with their 100-mile aqueduct carrying water from the Jebel to Leptis Manga, or the Dutch land reclamation polders in the Zuyder Zee. Canals, virtual icons to the aspiring macroengineer, figure prominently in *Macro*. We read of Pierre-Paul Riquet's Canal des Deux Mers between the Mediterranean and Atlantic, and of the millennial Grand Canal in China.

New York Governor DeWitt Clinton's "Ditch," also known as the Erie Canal, is championed in *Macro*. Although the

idea of a water route from the Hudson to Lake Erie had been around for years, the canal was considered impossible to construct. "Little short of madness," according to Jefferson. But Clinton built it. Work began on the 364-mile canal in 1817, and it was opened for traffic by 1825. The canal enabled emigrants and traders to avoid the Appalachians. Its importance has been virtually inestimable.

While not approaching the grandeur of the Erie or Panama canals, the contemporary efforts discussed in *Macro*, such as Jubail, the Arabian fishing village made over into an industrial city by the Bechtel Corp., or the Le Grande Rivière hydroelectric project in Quebec, are still representative of humanity's magnificent ability to overcome its environment. These, like Clinton's Ditch and others, are presented as examples of visions that were transformed into reality.

Davidson and Cox list future possibilities, including some wild-eyed ones. James Oberg's crazy scheme to "terraform" Mars, so that it might be rendered habitable, isn't likely to happen in this century. Nor should you hold your breath for Gerard O'Neill's quixotic space stations, which will supposedly relieve growth restraints, thereby creating a new world. Nobody ever goes broke with the really ridiculous ideas, which never get off paper. Witness the Richard J. Daley jetport planned for Lake Michigan, or former Ohio Governor James Rhodes's trans-Erie bridge to Canada.

These ideas exhort us to think big and not to be discouraged by the seeming implausibility of such musings. The sober voices of bankers and other pedestrian thinkers can be disavowed, no matter how overblown or unlikely the engineering notion. The authors casually describe a tunnel or tube beneath the North Atlantic from Port Burwell, Labrador to Scotland and Norway, for transportation of goods. They cite submarine aqueducts to carry Rhone River water under the Mediterranean and over the Atlas Mountains to irrigate the

edge of the Sahara. Nigel Chattey's Ican-Erie project, which would enlarge the Erie Canal and use the resulting fill to build an island off New Jersey, is cited, as is the planned reclamation of 1,500 acres in Osaka harbor. Davidson and Cox even write about T.W. Kieran's Great Recycling and Northern Development Canal concept, which would enclose James Bay by dikes, store diverted water in the Great Lakes, and distribute it to the dry South and West. Whether the people of Michigan would like the idea of sending their water to California or Mexico remains to be seen. Little wonder that most people view this macroengineering as pie in the sky.

The authors give Robert Salter's "Planetran" concept considerable attention. This magnetically levitated train would travel at supersonic speed through an evacuated tunnel 15,000 feet underground. But tunneling technology isn't advanced enough to accomplish cheap, automated drilling. (The authors suggest a diversified tunneling lab.) And cost, in this case, is still outlandish, although *Macro* urges governmental guarantees to assuage pusillanimous investors.

Macro offers a wealth of information on transportation, specifically railroads. Of the GNP, 25% is absorbed in transportation costs. Trans-shipping eats up a lot of that. Why insist on air transport when land or water transport might be more efficient? Coast-to-coast trucking can be faster than rail or air. While American technology developed the high-speed train, other nations are using it. Davidson and Cox lament how the Northeast Corridor program has stalled, while high-speed land transport has continued in France by SNCF, the country's national rail system, and in Japan in Yoshiro Kyotani. "I confess to mild astonishment when I perceived the U.S. Department of transportation was not, in sober-minded fact, doing anything fundamental to improve prospects for ground transport," Davidson writes. "Reducing regulatory intervention and letting private industry 'take up the slack' is only a half-answer."

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The authors admit some of macro is farfetched. Sure, they seek new communities on seamount-supported artificial islands, asteroid mining, new shipways and deepwater ports, and automated industry, too. Davidson is even a big advocate for the channel tunnel between France and England, once fondly endorsed by Winston Churchill. Davidson and friends resurrected it while lunching at Luchow's (a lot of lunches seem to crop up in *Macro*). The English initially worried about uninvited French troops arriving at Victoria Station, until they were assured the tunnel could be flooded in event of attack. Davidson is dismayed this tunnel "remains largely on paper," while the Japanese have constructed their 33.46 mile Seikan tunnel beneath the Tsugaru Strait.

While incredible, and occasionally preposterous, macro projects often improve the quality of life. Some are less visionary but are commonsensical. Having spent time in the Civilian Conservation Corps, Davidson supports redeveloping a permanent CCC. The idea of a transcontinental bike path, while ingenuous, is appealing. Davidson correctly insists that not all progress will come from emergent technologies. Progress can also come from traditional and often neglected methods, like William Vandersteel's Tubexpress system, which would ship goods from warehouse to consumer via pipeline.

Davidson and Cox also have suggestions for public policy: revamp education so that technology will be granted greater importance, preserve natural resources (air, water, forests, and topsoil), redesign urban neighborhoods, and pool talents and resources from both industry and government.

The notion of intersectorality (public and private sectors) is a good one, even if encumbered by some naive propositions (that the private sector will overlook profit and return on investment, for example). "A dogged insistence on sectoral integrity is leading toward defeat," warn Davidson and Cox. Having selected strategic industries, the White House should sponsor intersectoral meetings, resulting in a cooperative commitment by government, industry, and labor: "Either we leave the modernization or 'optimization' of our basic plant and equipment to the mysterious workings of a 'market economy' that we know is subject to cyclical fluctuations, or we ask government to join with private enterprise."

Davidson's call for a national policy is a relatively Jacobin utterance these days. He thinks steel should be preserved as the strategic industry, which, in Ohio and Pennsylvania's Mahoning Valley at least, it is. He wants to protect shipbuilding interests, too.

Davidson doesn't believe the current back slapping about entering a new ep-

och, the arrival of the heralded service economy, siliconed, technology-intensive, and honeyed: "One solution is to turn our educated technologists into a race of consultants, so that actual 'industry'—that is, the realization of ideas developed in American laboratories—is carried out elsewhere. Perhaps this notion lies at the root of much of the present interest in a 'postindustrial' society. Such a society would run the risk of becoming, also, 'postagricultural,' 'postintellectual,' and even *post mortem*."

The authors go so far as to propose, backhandedly, a technocracy, where engineers would be in charge of industry and government. This is a whimsical suggestion, as engineers have not necessarily fared too well as plenipotentiaries. Mere mention of the Army Corps of Engineers causes cussing in parts of the country.

What would a world or nation ruled by engineers be like? Probably the same. In fairness, perhaps engineers should get a crack at running things. Lawyers, bankers, and public policy graduates haven't done all that well. With engineers in charge, there would still be about the same amount of raving idiocy. But the authors are sorry that engineers are treated in a second class manner. "While top American management ranks include fewer than one professionally trained engineer out of five, in Japan and France, engineering provides the typical route to advancement into management," Davidson writes. Engineering, as an applied science, still plays second fiddle to "pure" science, perhaps because, in the American mind, an engineer works in a locomotive and gets his hands dirty. Anyway, the MBAs make the critical decisions today and get the good lunches.

Engineers have succeeded in transforming our world over the past century and should get credit for their accomplishments, but they should also share in the opprobrium. Macro engineers, given the scale of their projects, have a chance to forge macro mistakes. Traffic engineers proudly introduced the cloverleaf at the New York World's Fair in 1939, while somehow overlooking the effects of their highways on cities. Engineers such as Robert Moses practiced a monumentalism, belittling the individual with projects of colossal scale.

While proudly mentioning the St. Lawrence Seaway or the Roberts Tunnel (which brings water to Denver across the Continental Divide), *Macro* avoids mention of the Tacoma Bay Bridge or the Kansas City Hyatt. Often, beneficial engineering projects result in unexpected failure: the introduction of the lamprey to the Great Lakes as a result of the St. Lawrence Seaway greatly affected fish populations, and the threat of the Bilharzia parasite increased when Lake Nasser was created.

Engineers sometimes get swept

away by the grandeur of their vision, or they can be influenced by excitable speculators and profiteers. Every so often they'll go overboard with systems approaches and neglect the obvious.

Macro is a clumsy, lumbering book relieved only by 130 pages of photos. Points are frequently repeated, such as how innovative the invention of elevators was or how smart George Schultz was with the Euro-Soviet natural gas pipeline. Davidson's editors gave him too much room to graze and ruminate. There's a lot to *Macro*; ideas, anecdotes, and encouragements. But there are also a lot of mistakes, so many that it may be assumed the editors did not bother to read all of *Macro*. Buzz Aldrin did not say "one small step for man, a giant step for humanity." It was Neil Armstrong, and he said, "That's one small step for a man, one giant leap for mankind." The unnamed gentleman we meet at another meal, who "made money" for a living (the manufacture of U.S. bills on his London-based firm's machines) must have been pulling Davidson's leg. The U.S. Mint uses Italian, Swiss, and German machines, not British presses. Other errors, while less egregious (like misspelling Litton Industries or the Glass-Steagall Act), are simply annoying.

As a book, *Macro* has several weaknesses. But as a notebook of possible projects, it's fine. Emerson exhorted us to hitch wagons to a star, which is what *Macro* does. The authors have not been afraid to contemplate some hog-wild schemes; as they demonstrate, grandiose ideas can sometimes materialize into sound realities. Despite its errors, *Macro* is a book worth perusing. William Morrow and Co., New York, N.Y. (1983, 450 pp., \$17.95).

—Leopold Froehlich

BOOK BRIEFS

GET PROTECTION

Dennis S. Deutsch has written a book entitled *Protect Yourself: The Guide for Understanding and Negotiating Contracts for Business Computers and Software*. Deutsch claims you'll learn how to spot meaningless sales representations; analyze and recognize a fair (or unfair) contract for a computer or software purchase; negotiate favorable hardware purchase agreements; determine the proper action to take if the product fails to perform; and prepare for arbitration or litigation if earlier redress fails. The book helps you understand contract implications and attempts to keep readers away from "boilerplate contracts" that minimize the after-sale responsibility of vendors. It also explains how to invite bids for computer systems and includes sample RFP documentation. The 223-page book costs \$21.95. For more information, contact John Wiley & Sons Inc., One Wiley Dr., Somerset, NJ 08873, (201) 469-4400.

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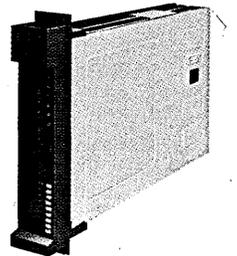
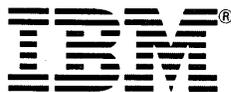
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MULTIBUS BUYERS GUIDE

The Iroquois Company has put out the Winter 1983/1984 edition of *The Multibus Buyers Guide*, which lists over 1,200 Multibus products, current prices, and specifications. The president of the company, Fred Mazanec, claims that "with more than 200 manufacturers producing Multibus-compatible products, it is extremely difficult to locate the full spectrum of Multibus product offerings. Our guide is designed to simplify that task." Included with the product details are addresses, phone numbers, telex, and TWX numbers for the manufacturers. The first copy of the guide costs \$35 while each additional copy is \$19.95. For more information, contact the Iroquois Co., 3239 Caminito Ameca, La Jolla, CA 92037, or call (619) 450-0191.

ONLINE DATABASE DIRECTORY

The first edition of *Online Database Search Services Directory* provides detailed descriptions of the on-line information retrieval services offered to outside users by public, academic, and special libraries, private information firms, and other organizations located in the U.S. and Canada. Published by Gale Research Co., the book furnishes up to 17 points of information about each organization, including full name, address, and telephone number; year service was established; key contact person; number of staff members conducting searches; on-line systems accessed; subject areas searched; most frequently searched databases; associated services; service availability; fee policy; names of search personnel; and more. The guide has six indices to help users locate the most appropriate search service for their needs. Volume one

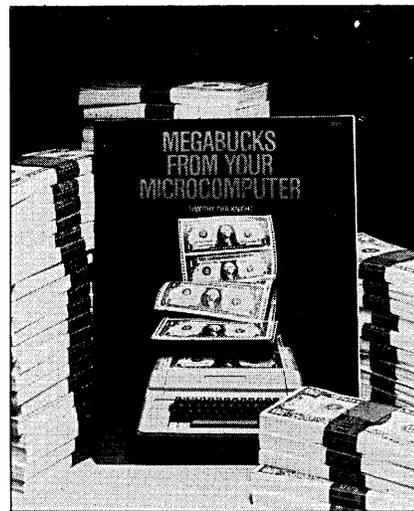
of the two-book series is available immediately; the second volume will be published this August. Subscription to both volumes costs \$75. For more information, contact Gale Research Co., Book Tower, Detroit, MI 48226, (313) 961-2242.

MICROMINI MANAGEMENT

Electronic Trend Publications has published a report to "introduce the management of companies participating in the small computer market, whether as manufacturers, users, or as third-party participants, to the challenges and opportunities presented by the emergence of a new class of product—the microminicomputer." The author, Andrew Allison, claims the microminicomputer market (microprocessor-based minicomputers) will grow at an 86% annual rate to reach \$12 billion by 1987. The result of this, he says, will be that the minicomputer segment will shrink from a 60% market share of the \$10.9 billion total market in 1983, to 18% of a projected \$25 billion market by 1987. The guide, *Managing the Microminicomputer Explosion*, examines the issues surrounding widespread micro use and its impact on manufacturers and component suppliers. The report also deals with the technology and design trends driving the current 8-, 16-, and 32-bit micromini boom, as well as the upcoming battle between IBM and AT&T. The report features a look at the industry's market history during 1978 to 1982, and a forecast of the micromini markets in the U.S., Europe, and Far East from 1983 to 1987. Leading micromini manufacturers and third-party participants are profiled in the book. The report costs \$985 and can be obtained by contacting Electronic Trend Publications, 10080 N. Wolfe Rd., Suite 372, Cupertino, CA 95014, (408) 996-7416.

MICRO MOONLIGHTING

Megabucks from Your Microcomputer is a new book published by Howard W. Sams & Co. Inc. that explains how to use micros to



earn additional income. Author Tim Knight details actual techniques and offers advice on buying the right computer to begin with as well as getting the best possible return on your investment. He discusses how to write and market software, magazine articles, product reviews, and other kinds of free-lancing. Knight also tells how to use the computer to "enhance creativity," make investments, and dodge the potentially money-draining pitfalls associated with free-lancing. The book costs \$3.95 and is available by contacting Howard W. Sams & Co. Inc., 4300 West 62nd St., Indianapolis, IN 46268, (317) 298-5400.

SEMINARS

SYSTEMS ANALYST DEVELOPMENT

Cara Corporation, Lombard, Ill., is offering a five-day seminar to teach programmers, systems analysts, analyst trainees, auditors, and user personnel the skills that will improve their abilities to develop management information systems. Classes will be held in Oak Brook, Ill., and the \$975 fee includes all reference materials, lunches, and refreshments. The course stresses learning by doing; students must solve assigned problems and then present their findings. The dates of the classes are April 16-20 and June 11-15. The company also conducts seminars on software package selection and project management. For more information, contact Ms. Shirley Cerone, Cara Corp., Professional Development Programs, 611 E. Butterfield Rd., Lombard, IL 60148, (312) 968-8100.

NEW AND IMPROVED MANAGERS

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SCIENCE/SCOPE

Some of the fastest digital integrated circuits yet built have been demonstrated by Hughes Aircraft Company scientists. The circuits, made of gallium arsenide, are bi-phase clock flip-flops configured to perform frequency division. They were operated at frequencies up to 5.77 GHz, the highest division speed yet reported for integrated circuits operating at room temperature. The circuits were fabricated by electron-beam lithography (using a Hughes system) to produce gate lengths of 0.5 micrometers in the MESFET switching transistors. These gallium arsenide devices could be used in very-high-frequency signal processing or as interfaces to more complex chips, including Very High Speed Integrated Circuits.

A novel engineering tool for producing the AMRAAM missile is expected to save the U.S. government and Hughes millions of dollars and months of work. A full-scale prototype of the Advanced Medium-Range Air-to-Air Missile has been completed using actual engineering drawings, materials, and processes. The purpose of this "precision physical model" is to refine AMRAAM's design and detect potential manufacturing problems, especially those stemming from late improvements. Among other things, the model has been used to determine routes and lengths for wire harnesses so that mating connectors will line up. It also was used in designing handling and test fixtures, and to show how its components react to vibration. AMRAAM is in full-scale development for the U.S. Air Force and Navy.

Six gallium arsenide field-effect transistors, designed for power amplifiers in radar and communications applications, have been introduced by Hughes. The single- and dual-cell power transistor chips are mounted on internally matched chip carriers. The devices consist of 10-GHz, 13-GHz, and 15-GHz power FETs capable of output power levels up to 1.5 watts. They are matched to operate in a 50-ohm-in/50-ohm-out system for a full 2-GHz bandwidth.

Military commanders can get a detailed picture of tactical situations and the current status of their resources with a new display terminal. The Hughes HMD-8000 has two display screens, with one producing seven-color graphics with about twice the resolution of commercial TV. An innovative touch panel controlled by computer software lets an operator retrieve and display data very quickly. Commands that combine several complicated processes can be made with the touch of a fingertip. The system is built in modular form and is so flexible that it can be reconfigured to meet changing needs immediately. In an air defense command and control system, for example, it normally would display tactical air battle data and tactical air force resource data. As a battle grew and more information was needed, additional screens could be used.

The Hughes Tucson facility, located in picturesque Southern Arizona, is a large, modern manufacturing complex with capabilities for producing advanced missile systems developed by Hughes. We have openings for experienced and graduating engineers to work on such advanced systems as the electro-optical Maverick, radar-guided Phoenix, TOW, and AMRAAM, the Advanced Medium-Range Air-to-Air Missile. Please send your resume to Professional Employment, Dept. S3, Hughes Aircraft Company, P.O. Box 11337, Tucson, AZ 85734. Equal opportunity employer.

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CORPORATE PCS

Systems Technology Forum is holding a series of three-day workshops to examine the technical, business, and organizational issues surrounding the integration of the pcs into traditional corporate dp and telecommunications environments. The seminar, Corporate Personal Computers, begins with background information on the evolution of microcomputer technology and business arrangements, and then discusses the role pcs will play in many companies. Communication subsystems are described, and the major components of currently applicable systems are analyzed. Three configurations are discussed: standalone pcs; pc integration with mainframes; and pcs and LANs. The workshop will show attendees how to create a corporate and organization-wide personal computer strategy and will close with a discussion of future trends and directions. The \$795 seminar will be held April 4-6 in Lexington, Mass.; May 21-23 in New York; and July 9-11 in Washington, D.C. For more information on how to register, contact Systems Technology Forum, 9000 Fern Park Dr., Burke, VA 22015, (800) 336-7409; in Virginia, call (703) 425-9441.

INTERNATIONAL COMMUNICATIONS

Business Communications Review claims that international communications is one of the least understood components of the communications market, even though it involves over \$2 billion in revenues each year. This company offers a course, entitled "International Communications: Products, Technology, and Regulation," to prepare managers and analysts to evaluate the cost-effectiveness of existing international communications services, and to develop implementation alternatives. They say their seminar will help acquaint attendees with the various product and service options now available for international voice, data, and message communications, and show the choices that will be available in the future. The course will analyze the regulatory environment in the U.S. and overseas; actual case histories will be used to illustrate the problems and solutions involved in international communications. The course runs for two days and costs \$595. It will be held at the United Nations Plaza in New York City on April 24-25. For more information, contact BCR Enterprises Inc., 950 York Rd., Hinsdale, IL 60521, (800) 227-1234; in Illinois, call (312) 986-1432.

SECURITY SERIES

The Computer Security Institute offers a new seminar that recognizes the potential problems posed by the growing use of word processors, electronic mail, and personal and portable computers. Entitled "Security in the Electronic Office: Micros, Word Processors, and Workstations," the two-day

seminar will be held in Chicago, April 12-13. The institute is presenting some other seminars during the spring sessions, including: An Introduction to Communications Security, New York, March 29-30, and Atlanta, June 21-22; Planning an EDP Disaster Recovery Program, Chicago, April 9-11, and Atlanta, June 18-20; EDP Physical Security, New York, May 3-4. The price of a two-day seminar for members and non-members is \$545 and \$575, respectively, and the cost of a three-day seminar is \$750 and \$795, respectively. For more information, contact Carol at (617) 845-5050 or write to the Computer Security Institute Educational Resource Center, 43 Boston Post Rd., Northborough, MA 01532.

RECORDS IMPROVEMENT

The American Management Association is providing a seminar entitled "Establishing and Improving Records Management Programs" to give you a new perspective on your records management system. The course has been put together to help attendees weed out all but the most essential records by eliminating inconsistent and overlapping systems. It will offer guidelines for developing an appropriate uniform classification system and ideas on how to implement it. The seminar will examine the legal ramifications of records management—government guidelines, what to keep and for how long—and compare security systems for vital documents. The association recommends team attendance for the course and, accordingly, offers group discount rates. Individuals can take the three-day course for \$675 (AMA members) and \$775 (nonmembers). The seminar will be held April 16-18 in New York at the AMA's headquarters, and May 14-16 in San Francisco at the Holiday Inn Golden Gateway. For more information, contact American Management Associations, P.O. Box 319, Saranac Lake, NY or call (518) 891-1500.

VENDOR LITERATURE

UNINTERRUPTIBLE POWER BROCHURE

Computer Power Products is offering a four-color brochure on its line of Rotary UPS systems, including new products with higher power ranges. The eight-page brochure explains standard and optional features, and has a table that shows performance specs as well as model numbers for systems from 12.5 kVA up to 500 kVA. Parallel operation for redundancy or increased power is also described. COMPUTER POWER PRODUCTS, Gardena, Calif.

CIRCLE 360 ON READER CARD

FURNITURE CATALOG

Steelcase has published a four-color, 28-page brochure that describes its complete

line of Ultronic 9000 computer-support furniture. The furniture is photographed in a variety of settings, from executive offices to word processing and clerical support workstations. It also includes diagrams that indicate a number of workstation configurations. STEELCASE, Grand Rapids, Mich.

FOR DATA CIRCLE 351 ON READER CARD

CONTROL SOLUTIONS

Micro-Link Corp. describes its family of industrial control products in a 16-page, four-color catalog. Included are features of over 35 STD Bus cards, details of the APPROACH Series of Microcomputers for machine control. MICROLINK, Carmel, Ind.

FOR DATA CIRCLE 353 ON READER CARD

IRM DATA

Holland Systems Corp. has put together a 12-page brochure on its approach to information resources management. The brochure identifies the symptoms of inadequate information resource management, and defines the benefits of undertaking a strategic information resource plan. HOLLAND SYSTEMS CORP., Ann Arbor, Mich.

FOR DATA CIRCLE 354 ON READER CARD

MANCHESTER CODING BUS DATA

A 12-page application note dealing with various techniques for transferring data on a serial data bus network is offered by ILC Data Device Corp. The note describes Manchester Coding and its use in MIL-STD-1553, NATO STANAG Standard, Ethernet, and local area networks. ILC DATA DEVICE CORP., Bohemia, N.Y.

FOR DATA CIRCLE 359 ON READER CARD

PC STANDALONE CAD SYSTEM

Cadnetix Corp. has published a brochure describing the features and benefits of their new Cadnetix CDX-5000 standalone pc board CAD system. The eight-page, four-color brochure discusses the system's 32-bit internal architecture, high-capacity memory, built-in database management package, and high-resolution graphics system. CADNETIX, Boulder, Colo.

FOR DATA CIRCLE 355 ON READER CARD

CABLE GUIDE

Support Systems International Corp. has released a data brochure that covers the specifications of over 50 types of bulk cable for computer and data and telecommunications installations. SUPPORT SYSTEMS INTERNATIONAL CORP., Richmond, Calif.

FOR DATA CIRCLE 356 ON READER CARD

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ON THE JOB

COMPUTER CAREERS, PEERS, AND FEARS

For more than 10 years, the Dewar's White Label advertisements have profiled the career achievements of talented men and women in business, science, the arts, the humanities, and other professions.

The company is now taking a more active role in charting the course of the job market by reporting on members of specific professions. Dewar's will issue a series of surveys presenting employees' opinions of their work, training, and career paths, in addition to their life-styles and aspirations. The company says the reports are intended "to help people, particularly young people, make career decisions."

The first one, *Profile of Computer*

Professionals, is based on telephone interviews with 301 active members of six different computer professions. These people are educators, systems analysts, programmers, consultants, entrepreneurs, and computer sales or marketing personnel. The study, conducted for Dewar's by Research & Forecasts Inc., New York, covers a variety of topics including career and job satisfaction, professional aspirations, motivations and rewards, views on where the field is heading, and advice to those considering pursuing a computer career.

Another section contains eight in-depth profiles of successful people with different jobs in the field. While the respondents are mostly white (94%), male (86%), and married (73%), there is a good mix of

professions and, indeed, an interesting variety of questions.

The first question respondents were asked deals with job satisfaction. On the whole, says the study, computer professionals were "overwhelmingly satisfied" with their jobs. Seventy percent of the group claimed they were very satisfied with their current positions, 24% were somewhat satisfied, 4% were not very satisfied, and only 2% were very dissatisfied. The survey then breaks down the issue by work category. Entrepreneurs were most satisfied, while systems analysts were the least.

Another question tackles the issue of work complaints. Paperwork and bureaucracy garnered 42% and the number one spot on the employee hit list. The next

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ON THE JOB

biggest complaint (12%) was pressure and long hours, followed by lack of financial rewards (9%).

One interesting query categorized the different types of personnel by the degree to which they were committed to their jobs, in terms of time and intensity. At one end of this spectrum are "computerholics"—those people (22%) who devote at least 50 hours a week to their jobs, often work weekends, and function in a work environment they themselves describe as "extremely hectic." At the opposite end are the

"nine-to-fivers" (21%), who devote 40 hours a week or less to their jobs, hardly ever work weekends, and describe their work environments as "generally steady or relaxed." Wedged between these groups is the category most respondents fall into: the "overtimers" (57%). Overtimers spend 41 to 49 hours a week, sometimes work weekends, and claim their environment is "moderately hectic."

When asked if they were considering moving into another area of data processing, 81% of the participants said no,

while the remaining 19% assented. As for leaving dp altogether, only 6% said they were considering the idea.

The respondents and their current work situations were split into four categories: 37% work mostly independently, 32% work closely with a small group, 28% primarily manage others, and 2% work under someone else's close supervision. One percent didn't fit into any of the categories.

One interesting segment of the survey raised the issue of how closely the work experience of today's computer professionals corresponds to the expectations they had when they were in college or grad school. Respondents' answers were divided into four roughly equal quarters. Half of the group believed their work experience corresponded "very closely" (23%) or "somewhat closely" (29%) to their earlier expectations, while the other half felt it didn't correspond very closely or didn't correspond at all (24% and 23%, respectively). The remaining 3% didn't know or didn't answer.

When posed with the question of how they got their first jobs, more of the computer professionals (25%) landed them through third-party contacts like relatives or teachers than through any other means. Seventeen percent of the group got their first positions through a campus recruitment process, 11% did so by answering ads, and 12% by pounding the pavement and making "cold calls." Twenty-two percent relied on "other means," 6% found part-time jobs or internships, another 6% went through agencies or headhunters, and the remaining 1% found jobs by attending meetings of professional associations.

On the subject of leisure activity, 55% said it was very important to them, while 37% said it was somewhat important, and 7% and 1% of the respondents respectively said it was somewhat unimportant and very unimportant. The study then focuses on what kinds of rewards computer professionals seek in their leisure activities and compares them with the general public's attitudes. In addition, the kinds of activities these people prefer are charted. When asked if their leisure activities involved computers, 65% said no, while the remainder said yes.

Also featured in the study are questions on job opportunities for women and minorities, on characterization of employees' peers (sorry, only 10% of the respondents saw their peers as "weird"), and on opinions of the areas of dp that offer the best opportunities because of increasing personnel needs in the foreseeable future.

If you're interested in getting a full copy of the report, send \$1 for postage and handling to the Dewar's Center for Career Development, 110 East 59th St., Suite 1100, New York, NY 10022.

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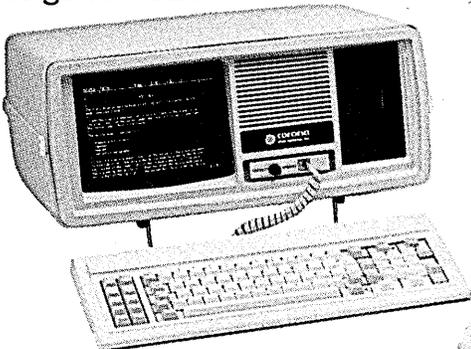
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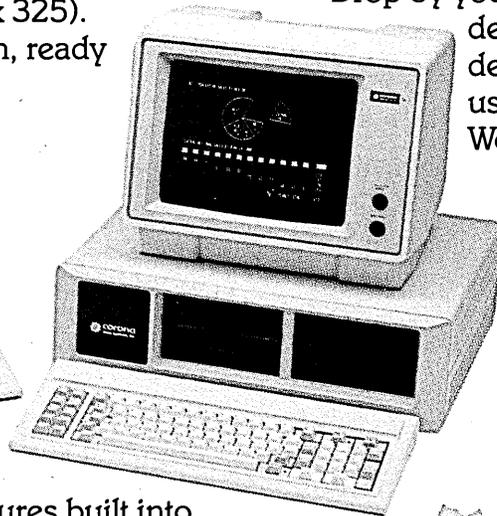
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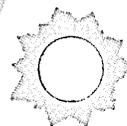
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ABENDS, DINOSAURS, AND MICROS

Last December, just before the tax year ran out, I purchased one of the new "productivity machines," a microcomputer. In spite of the lateness in the year, this was no impulse purchase. My wife and I had surveyed our needs carefully and spent the previous two years trying to find a set of packages, both hardware and software, that would satisfy our needs.

We primarily wanted something that would do word processing. My wife is a writer and needed something that would be easy to use for short stories, articles, and perhaps a novel. I wanted something that would allow me to write textbooks, for which I needed automatic sectioning (for new chapters, sections, subsections, etc.), sub- and superscripts for formulas and footnotes, margin justification, and a number of other somewhat sophisticated functions. Besides this, we wanted something that our children could use for BASIC programming, some computer games, and so on. It took us 18 months to find a suitable software package, and then the hardware decision was almost automatic.

In spite of this leap into new technology, I am not a "believer" in computers. They do not replace thinking, they certainly do not replace managing, and they are not easy to learn or use. I also question their purchase and use in the great majority of cases. I think the computer should be a last resort. It was for me. Let me explain.

I am a professor at a rather large university; we have something like 47,000 students enrolled at our local campuses. When I came here in 1976, there was a computer center with two large Amdahl computers, some smaller units, and a host of peripherals. Few of my faculty colleagues took advantage of the center. The facilities were mostly used by administration for record-keeping and similar tasks. Access to the computer was simple and easy, as was access to computer personnel the same.

Since then, demand for computer time and assistance from computer personnel has multiplied many times over. Consequently, the center has grown substantially, as have most computer centers in the last decade. With this demand behind it, our center has done its best to satisfy its users, provide adequate computer time, and still keep up with the latest developments. Computer personnel pride themselves on having the latest version of every package and system. But I don't.

Last term I attempted to run one of my examination programs—the kind that automatically prepares stencils for final ex-

ams. I hadn't used it since the previous term. When I tried to get on the computer from my terminal I kept getting the message "max users; session terminated." Never having received that interesting message before, and being forcibly ejected from the system anyway, I decided to go to the (possibly considerable) trouble of finding someone who might know what this message meant. I was lucky. On my first call to a computer consultant at the university, I reached one and he said that the message, as all students knew, meant there were already too many terminals connected to the computer for me to get service. The answer was to try again later, especially when the students weren't so apt to be on it, such as the dinner hour, or 1 a.m., or before 9 a.m.

Okay. I tried at dinner time and, sure enough, I was allowed to sign on—almost. When I entered my password, the computer informed me my account monies from last term were not valid and I would have to get a new account. This was a bit baffling since we operate on a "funny money" basis, anyway. It was like saying I needed new counterfeit money. This procedure regularly takes a week, but expedited through one's secretary, can be done in a day. So now I owe the secretary another favor. Finally, at dinner time the next day, I was allowed to sign on the computer. As I tried to call in my examination program, the computer told me my library was empty. As a matter of fact, I had no library at all. At this, I seemed to recall in the dim recesses of my memory a proposal policy to "roll out" any user's library that was not accessed for 90 days. As I counted back, and included Christmas vacation, it was indeed 92 days since I had last even been on the computer. Apparently, I was already using the computer less and less without realizing it. (I use it even less now.)

So, back to the computer consultants. This time I was not so lucky. One would return my call, I was told, if one ever became free. Promptly the next day my call was returned. I explained my dilemma: I was trying to write an exam off the computer so the secretaries wouldn't have to type it. But time to run it off as dittos was slipping away, never mind trying to get the secretaries to type one for me on such short notice. The consultant would check on my library, I was told, and roll it back in if it had been rolled out. "But you should use it more often if you want to access it regularly." Ah yes. Even if I didn't need it I should call it up, just to keep it there. Kind of like using your air conditioner in the winter to keep the seals from drying out and losing the Freon in the system, I imagine.

Two days later my library was available and there I was, on the computer, entering data into my exam program. Goody! I told it to "run" and then I waited. The results came back within minutes. Isn't the power of a computer wonderful? But the output wasn't quite what I had been expecting. No exam questions in nice rows down the page. Instead, I saw a bunch of computerese and number/letter combinations (e.g., 6A2). I needed a consultant.

When I went in to the university a couple of days later, I found the right line and waited for a consultant to help interpret my output. After some time, one saw me. He diagnosed my problem as

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using obsolete JCL. They had updated their version of Wylbur to version 6.2, as everyone had been informed in their newsletter, and version 6.0, which I had been using for some time, didn't work any longer. Of course, they had replaced version 6.0 with 6.1 some time ago and these versions were compatible, but all users were supposed to switch over to version 6.2 in the meantime.

It was really my own fault for not converting when I was supposed to, but the thought intrigued me that, since the program worked the last time I ran it and didn't now, there must have been one day when the program would run and then the next day when it wouldn't. For that matter, there was one minute, even one second, when my program would run and the next second it wouldn't. I found the thought fascinating.

Back at my terminal the next day, I corrected the JCL and reran the program. Again, I fetched the output and looked for my now desperately needed test. Instead I saw the words "User performed an abend at location 7X0." Now, I didn't know exactly what that meant, but I did know an "abend" was a very bad thing to do and that the computer wouldn't let my program run. Somewhat ashamed of myself, though not sure for what, I vowed to reinput the data without doing one of those nasty abends again.

But darned if I didn't get another abend. I decided to spend some time at this and very carefully review my inputs one final time to see if it wasn't just some careless error I was making. After all, the program worked the previous term so the error must be in my input data.

After dinner, I spent some time going over the data, and sure enough, there was an error in my input. I was ecstatic! I called up the computer again, input the data stream correctly this time, and told it to run. It responded, as it always does, with my position in the input queue. I was in position 71! I had never seen a position beyond 15 and, for that matter, didn't know the computer could count that high (or at least hold that many jobs at once). As I asked the computer to keep "locating" my job over the next 10 minutes, I found it didn't seem to move from position 71. Someone was hogging the whole computer and no one else could get on! To pass the time I decided to take a shower. When I came back I was flabbergasted to find I was now in position 75! How could that happen? Can some users get priority to move ahead of others? Apparently so. I decided to go out for a beer with the gang. I don't drink beer, but I had to do something to chew up the time and, simultaneously, calm my anxiety. The secretaries were going to be awfully mad at me for handing them stencils so late in finals week. I would be in debt for quite a few hours now.

After the beer, I stopped by my office to gather the results and leave them on my secretary's desk to run copies in the morning. Indeed, my job was finished, but it still hadn't run—more abends! I couldn't stand it. It was now 1 a.m., 31 hours before my 8 a.m. exam was scheduled to be handed out to 250 students. I gave up. I

sat down and started manually writing up the final exam. In an hour I had completed a test almost as long as the one I had contemplated giving off the computer. I left it on the secretary's desk with an apologetic note of explanation and went home to bed. Driving home, I couldn't help thinking about the 15 or more hours I'd spent over the previous two weeks trying to use a computer to do perhaps one and a half hours' worth of manual effort, not to mention all the frustration and anxiety.

The next day I decided to look very carefully at the computing center's newsletter to see if I could learn something of value. Perhaps it contained something that would help me avoid another nightmare in the future. Here is a sampling and some of my thoughts as I read.

FORTRAN H will be removed from the system on Jan. 1. Users must change their JCL to reference S475. VFORTLIB.

What in the world is S475? VFORTLIB?

IBM did crack down on some sloppy coding practices that were previously acceptable.

So now users won't be able to run at all unless their JCL is absolutely perfect.

Check the schedule for a short course on the differences between these two compilers.

I need to take a course because they updated a package?

As of Jan. 1, any datasets with invalid project numbers will be archived to tape.

There goes my library again.

Data sets without a valid high-level qualifier will be scratched, regardless of when they were last accessed. So if you create a data set with a name of BOY or GIRL, don't expect to have it stay around.

I wonder what a valid high-level qualifier is; maybe SMART BOY? Beginning Jan. 2, a new disk space management facility will be introduced.

Will this affect me? Am I on a disk?

Users should note that unless the DSBS option is added to the PARM field, the BLKSIZE option in the DCB field will be ignored.

Huh?

We have received new versions of the RTI procedures for Statistical Analysis System (SAS).

Won't be able to use SAS anymore.

The installation of the new version of the Job Entry System (JES) has been postponed again.

Relieve!

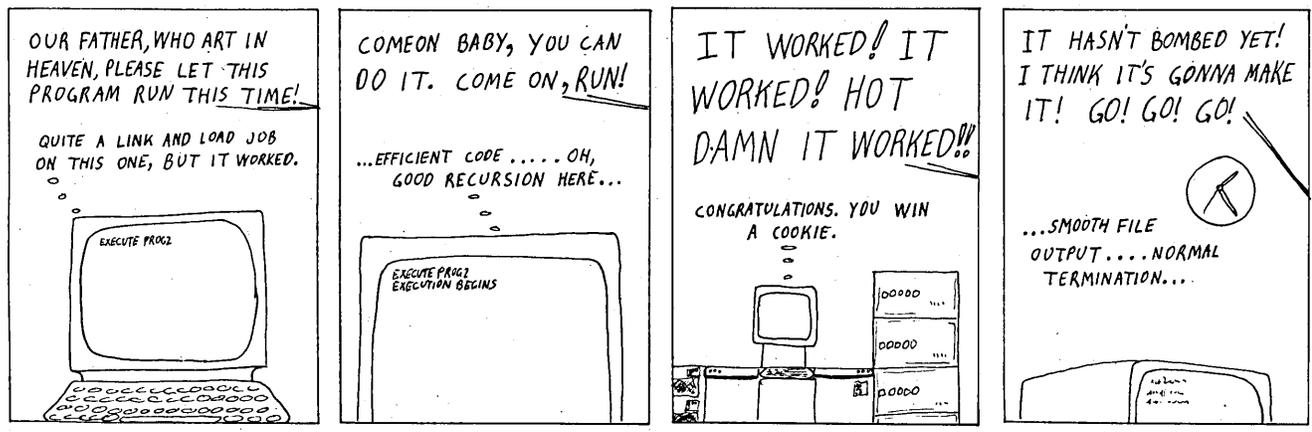
Job cards that do not have the project number coded on the same card as the job name will not be acceptable when the new JES is installed.

Expect trouble soon.

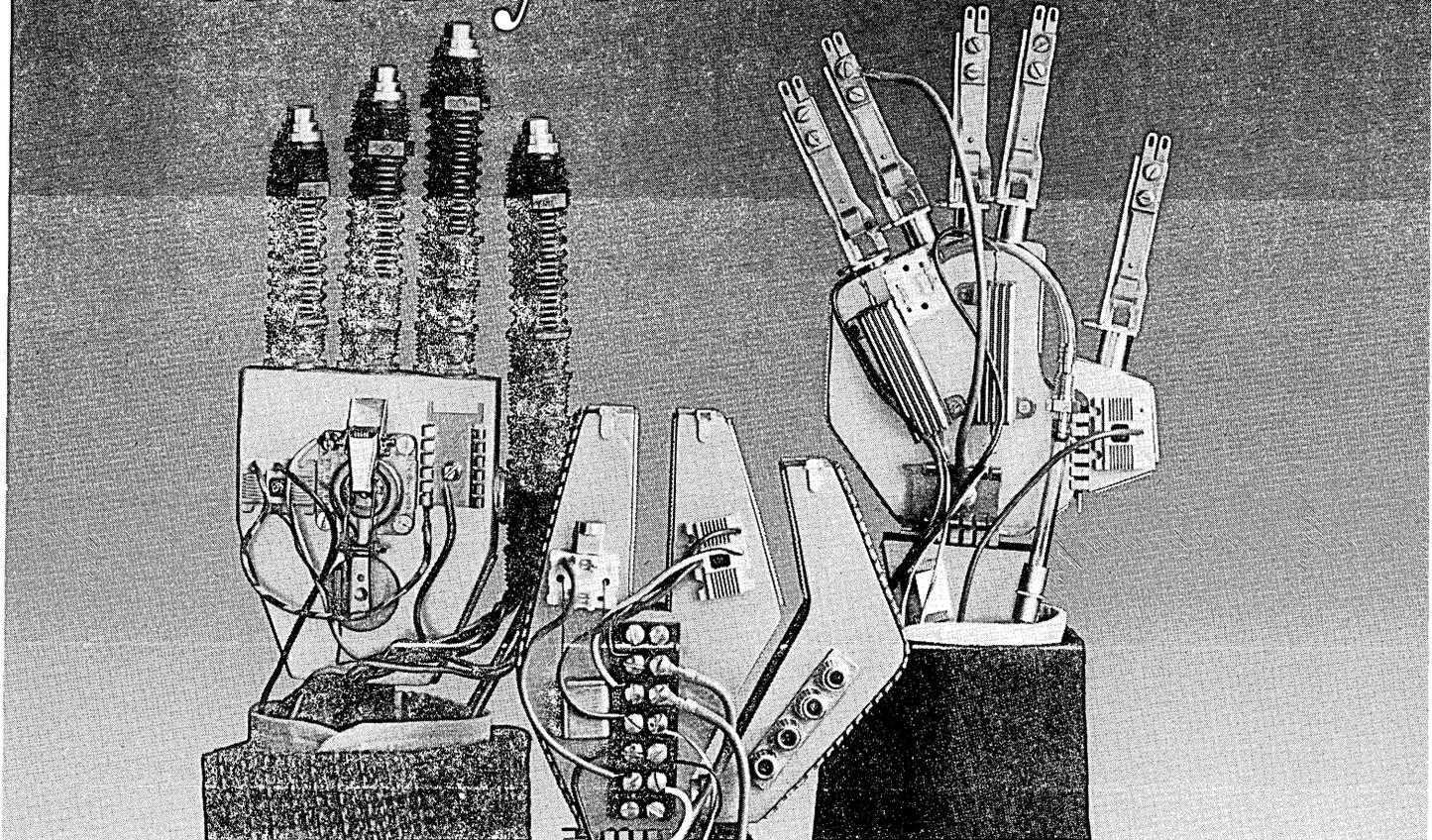
A new release of SHAZAM has been installed. The old version will be removed Jan. 3.

Captain Marvel, where are you?

DIGITS BY ROY MENGOT



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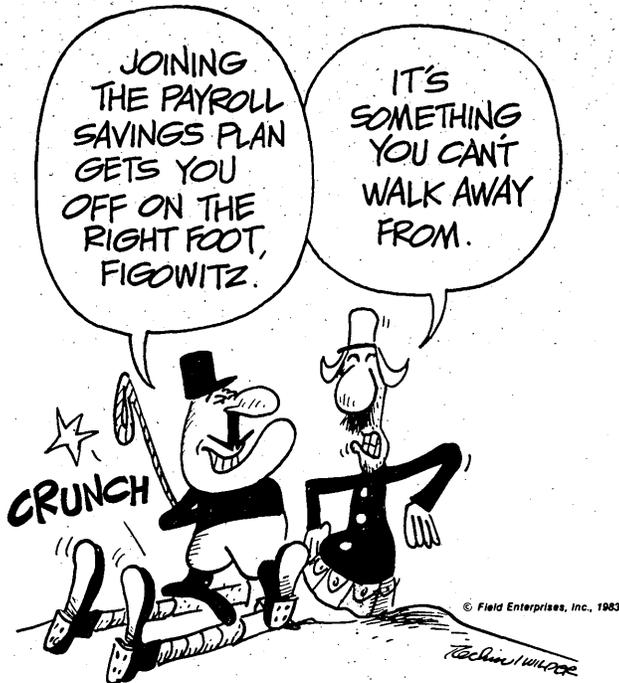
From this I concluded that all those people at the computer center aimed to keep the systems as unused as possible by changing them so often that no one could ever learn them. This reminded me of the early days of libraries and other service organizations whose staff hated to see patrons come to use their nice neat facilities because they messed them up so and were such a bother.

Another user disservice of many computer centers in the name of progress is the elimination of all those noisy, troublesome keypunch machines. Our center's goal is to have all clients transfer their programs onto tape. When I inquired how to do this, I was sent to the tape consultants, where I spoke to four people who disagreed about the two dozen statements and formats that were required. They did, however, agree that I had to supply my own tape, which, I was told, could be bought "anywhere," such as our bookstore. As it turns out, a reel of tape costs \$25. My programs would require about five feet or so, I imagined, but the bookstore seemed indignant when I asked them to cut off about seven feet of tape for me. Local computer supply outlets told me I could indeed get tape in smaller rolls, but only if I bought \$100 worth at a time.

One of my graduate students was doing a research project with the dp center of a local firm and wanted to have the data put on tape to transfer them to our facility and analyze them. I suggested he use cards instead, but he insisted that tape was "the way to go." A month later when I inquired how his project was coming, he stated that he couldn't seem to communicate correctly the tape format requirements to the firm's dp people, and that he was trying to get our dp people to talk directly with their people about the necessary format. At the end of the term I found out he had finally gotten a tape from the firm but was never successful in getting it read. He therefore had gathered his family together and they were transcribing the data by hand.

I wondered if I were the only faculty member to have such difficulty with the center. Other people didn't seem to complain. Since that time, I have found that everyone, even the computer people themselves, have the same problems I had. (I'm not sure if I'm relieved or troubled!) My experience taught me one thing, though. Computers, at least the mainframe dinosaurs, are not "user friendly." I have concluded that any computer system that requires experts to intervene will never be suitable for me. The answer is either to have someone always available who can talk to both you and the computer (which I cannot afford), or else to find a system you can have complete control over (and can afford). Now, with the advent of the micro, I have found an acceptable last resort.

The micro was not easy to learn to use. Even before starting to read the word processing manual I made myself read the computer guide to operations book. And then the operating system book. And then the BASIC manual. Then two books on my micro "made easy" (one was and one wasn't). Then even the printer manual, a



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large tome in itself. (And they all have different functions associated with the same keys.)

The computer system was expensive—almost \$8,000. But at least no one will be changing the JCL on me. What worked yesterday, or a minute ago, will work now. And when the system "max users" me, I can toss my kids off it and get on myself. I still occasionally get some "abends" types of messages when I try to do something different, but this is always the case when learning or trying something new. Besides, if I get anabend when I'm doing something old, I know it's my fault, so I look for and find my error.

I am convinced that the individually controlled micros will sweep through the organizations of America and the world; and the big dinosaurs that frustrate us at every turn, whether mainframe, mini, distributed, or timeshared, will disappear. The micros will become more standardized, have more internal and external storage, be cheaper and faster, and, most important, become easier for users to use. In the near future, the only people using large computers will be those simulating nuclear explosions or the dynamics of the universe. Businesses will go totally micro—we can't afford the luxury of having to wait to get on the system, of getting abends when we need results, of going through keepers of the brain to translate our problem into computerese, and of charging us funny money while wasting our real money.

—Jack Meredith
Cincinnati, Ohio

USER MANUALS AS ART

Everyone knows that software creation is an art, but few people recognize that creating user manuals is also an art. As with any art form, there are rules and guidelines that should be followed. Here are 10 preliminary suggestions:

1. Use at least 20 technical terms in the first three pages of the manual to discourage users immediately.
2. Make the manual as voluminous as possible—readers may delay using it indefinitely.
3. Assume your readers have already mastered BASIC or COBOL. At the very least, assume they are skilled word processors.
4. Sprinkle the manual liberally with inconsistencies. Was F-4 the clear button on page 4? Call it the escape button on page 6.
5. At least once on every page, tell the reader to consult another page.
6. If you must include explanations of error messages, be sure not to include them all. This will create a thread of suspense.
7. Two weeks after the publication date send out a packet of "new pages to insert." Mail such packets approximately once a month. By so doing, you ensure that all customers have their own individualized editions.
8. Publish your manual in an inconvenient format, one that will slip off a desk with ease, preferably opening its loose-leaf holder and scattering its pages on the floor.
9. Make no distinction between key names and literals in your instructions. Do not indicate where or when the user should press the space bar. Let him practice guessing.
10. Follow these rules and you too may produce a classic of the genre.

—Marcia Willieme
Westport, Connecticut

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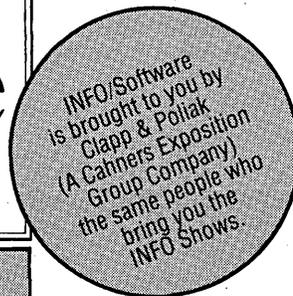
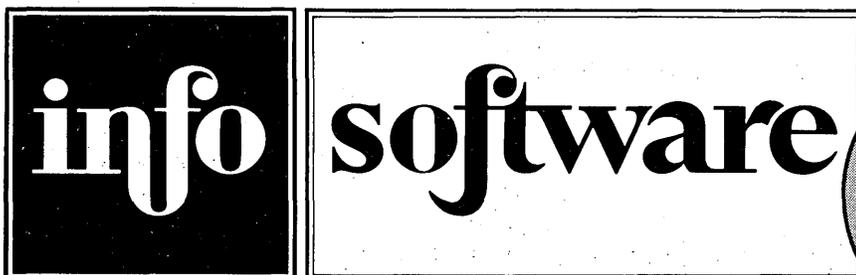
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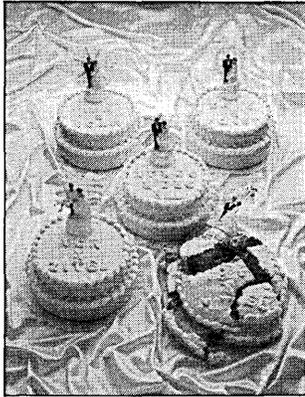
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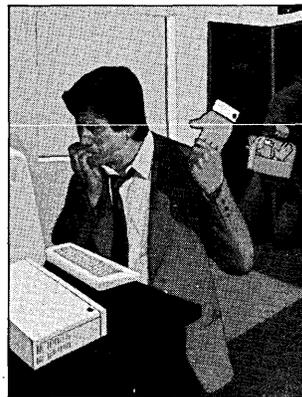
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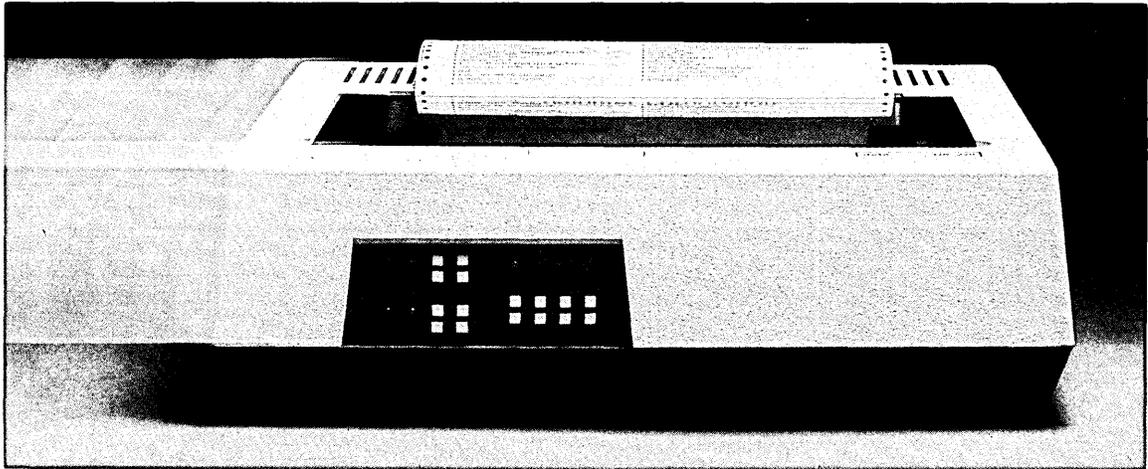
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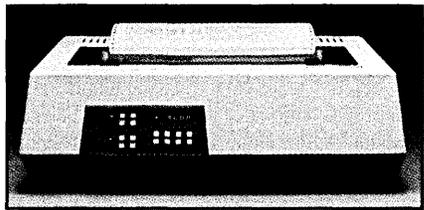
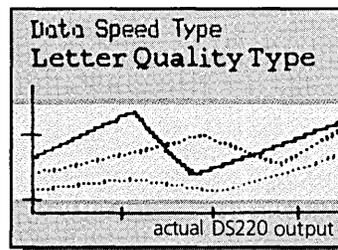
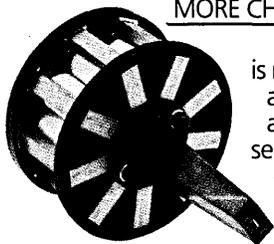
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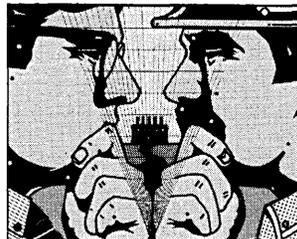
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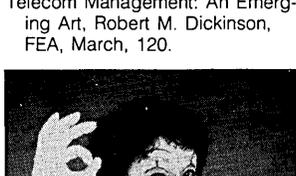
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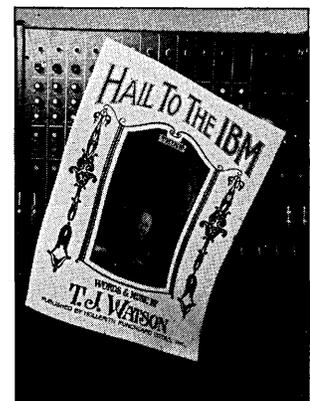
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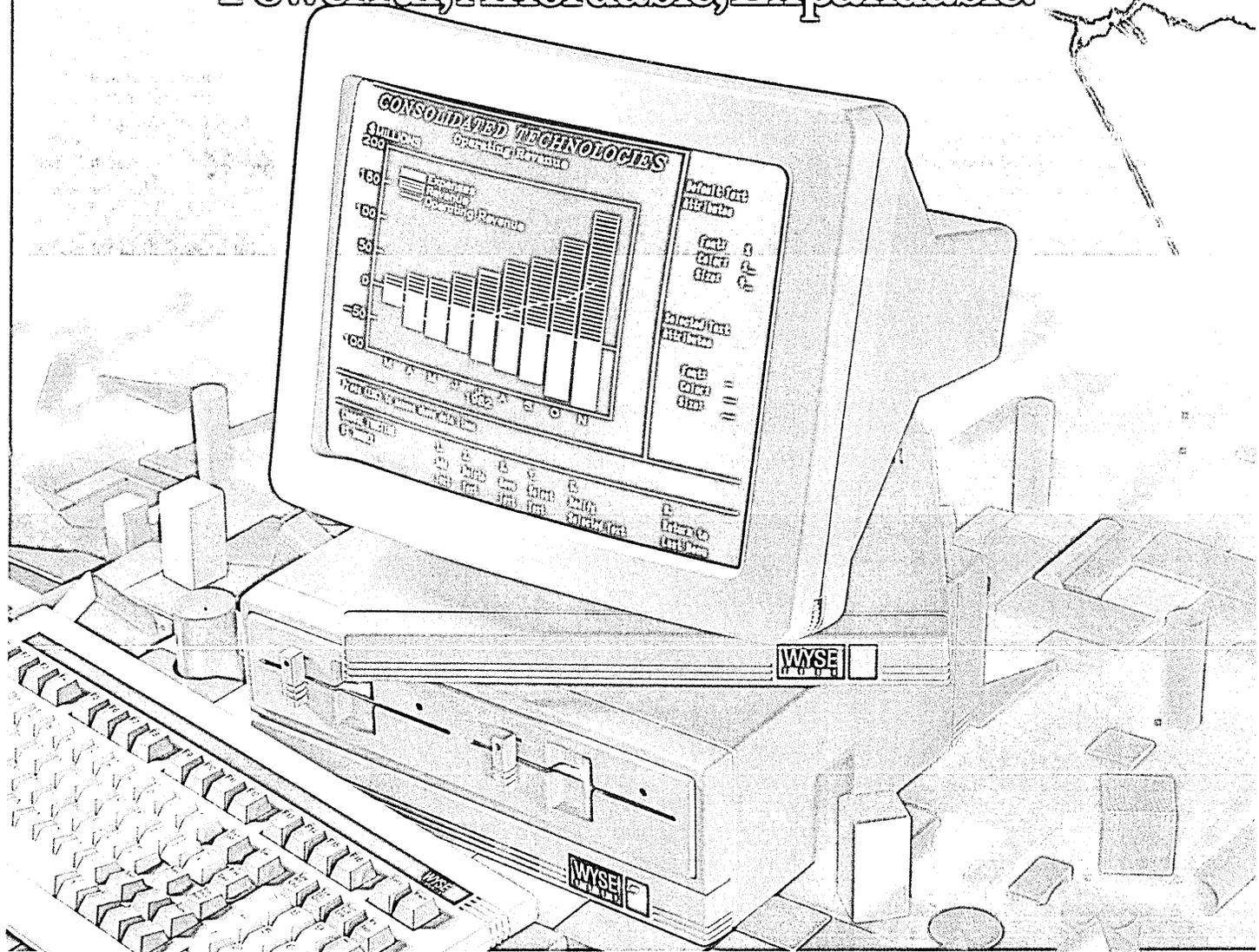
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