

COMPUTER DECISIONS[®]

MARCH 26, 1985

THE MANAGEMENT MAGAZINE OF COMPUTING

A HAYDEN PUBLICATION

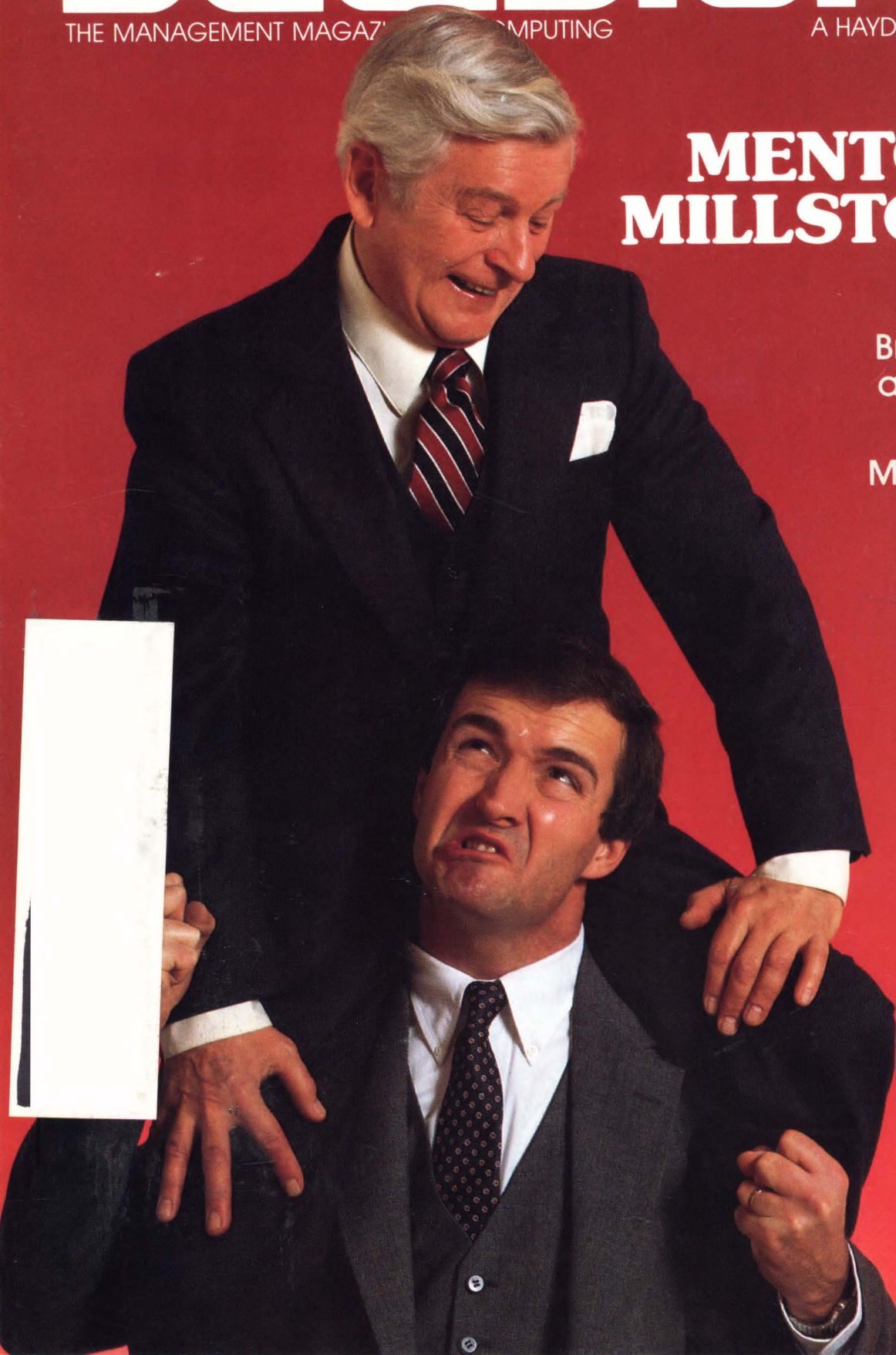
IS A MENTOR A MILLSTONE?

Breaking the
applications
logjam

Micro-output
devices

LAN-PBX
connection

Small
printers



The first smart terminal under \$400.

THE NEW QVT 101™

Block mode editing, multiple emulations, 16 host or user-programmable functions, a 14-inch screen, and more. All the editing power of the \$695 terminals, all for only \$395! Nothing is missing except the high price — you still get the industry's only one-year warranty. And its best reliability record.

No one else comes even close. Not Wyse. Not Esprit. Not TeleVideo. Only Qume can offer this unheard-of value, with smarter design, smarter sourcing, and greater resources behind us. For the best buy in VDT history, call (800) 223-2479. Qume Corporation, 2350 Qume Drive, San Jose, CA 95131. We'll be there.

Qume®
A Subsidiary of ITT

MAN'S PRODUCTIVITY HAS ALWAYS BEEN LIMITED BY THE LANGUAGE HE USES.



"Do you spell that with a bird or a tree?"

And no one knows it better than a programmer.

With this in mind, we at ADR® realize the best way to make programmers more productive is to provide them with more efficient programming languages.

ADR/IDEAL®, our 4th generation application development system, automates programming, so it makes the computer help programmers be more productive.

ADR/IDEAL applies a 4th generation language to all phases of an application's life cycle, which makes the entire programming process more productive.

And ADR/IDEAL's easy to understand language lets non-programmers develop their own applications. And that gives programmers more time to be more productive.

ADR/IDEAL is complete enough to be the only true replacement for COBOL. But since most of your applications are COBOL-based, you just can't abandon COBOL. So we won't. In fact, ADR is the only software company that offers an enhanced COBOL language as well as a 4th generation language.

ADR/DL®, our high-level extension of COBOL, significantly reduces the amount of coding and maintenance necessary, which makes programmers more productive.

ADR/DL brings the active dictionary support and the powerful data manipulation language of a relational software system to the COBOL environment. Which also helps programmers be more productive.

Both ADR/DL and ADR/IDEAL use intelligent editors to generate bug-free code. So, with an ADR programming language, programmers work faster and better.

Man's productivity may indeed be limited by the language he uses. But by significantly reducing the time it takes to create and maintain an application, ADR programming languages are helping productivity reach new heights.

For more about ADR programming languages, mail us the coupon. Or call 1-800-ADR-WARE and discover that, at ADR, increasing productivity is more than just talk. It's language.

ADR® WE KEEP WRITING THE HISTORY OF SOFTWARE

Applied Data Research® Orchard Road & Rt. 206, CN-8,
Princeton, NJ 08540 1-800-ADR-WARE. In N.J. 1-201-874-9000.

- ☐ Please send me more information about ADR/IDEAL®
- ☐ Please send me more information about ADR/DL®
- ☐ Please send me information about ADR Seminars.

Name _____ Position _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone Number _____

Computer Equipment _____

CD 3/26/85

© 1985 ADR



"THE KEY ELEMENT IN OUR WORLD IS COMMUNICATION. AND DIGITAL'S VAX IS TYING THE AVON WORLD TOGETHER."



Frank Giannantonio
Director of Information Services
Avon

There are few companies that understand the critical importance of communication better than Avon. So when it came time to choose an office automation system, the company evaluated all three leaders in the field.

The ground rules were these:

The system would have to use personal computers as universal workstations, for profes-

sionals, managers, secretaries and administrative staff alike.

It would have to network the variety of computers made by other companies which Avon was already using.

It would have to be elegant both in physical design and in ease of use.

The one system that perfectly matched Avon's needs was Digital's VAX™ computer – the best-selling 32-bit computer in the world – with ALL-IN-1™ office management software.

"IT DOES EVERYTHING WE WANT IT TO: PERSONAL COMPUTING, OFFICE AUTOMATION, EVERYTHING."

Frank Giannantonio explains. "The key was this: were

we able to do more with this system than any other one? Would it let us communicate with our other systems better than any other one? And the answer both times was 'Yes.'"

The 200-plus employees linked to the system at the Rye, N.Y., data processing headquarters have access to every function necessary to do their jobs effectively via a single workstation at each desk.

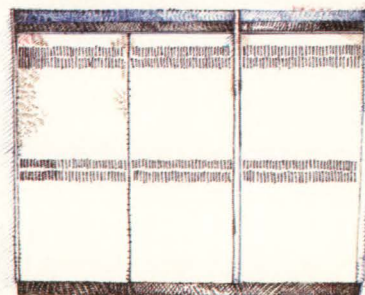
A plain English, menu-driven format appears on screen, so people can incorporate time-saving applications into their daily work routine. These include, among others, word processing, electronic mail, desk management tools and graphics.

Giannantonio elaborates. "You can come in in the morning,

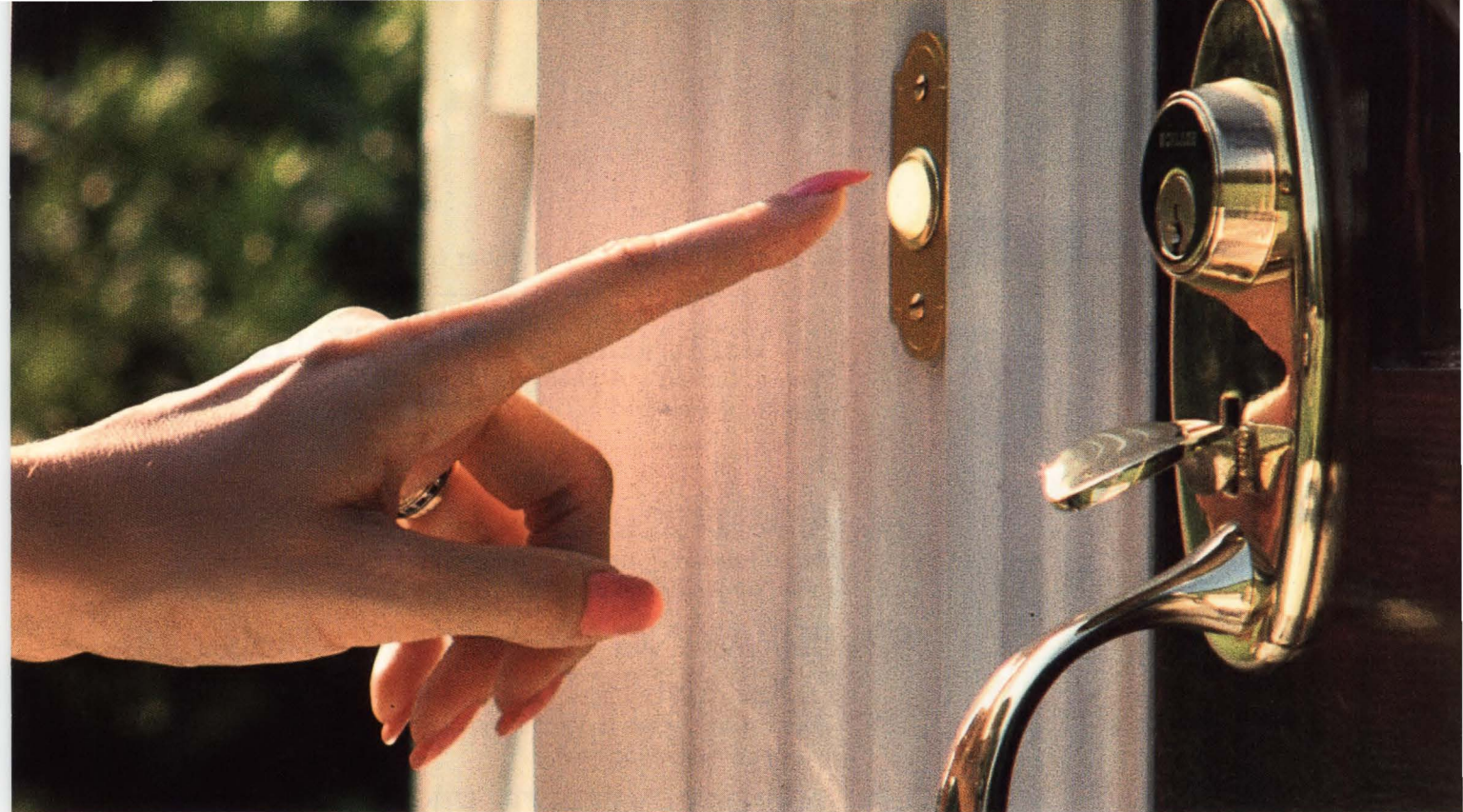
turn on your personal computer, and go right into the ALL-IN-1 system. From any of the various kinds of personal computers we use.

"The communications capabilities are very significant."

In addition to enormously enhanced individual communications capabilities, VAX computer



power makes a vast difference in the way people communicate with each other. For example, scheduling meetings.



"You don't have to call up somebody and say, 'I'd like to reserve the conference room.' It gets done automatically. The secretary just keys it in, and checks the time against everyone's schedules."

"PRODUCTIVITY GAIN IS JUST ABOUT 53%."

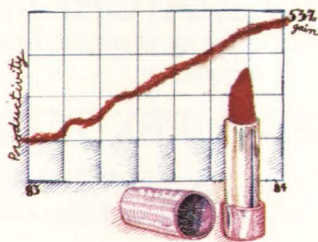
Menus and operating commands for these and other applications have been engineered in a consistent format, often requiring just two keystrokes to complete a function. Tasks can be performed without interruption. In preparing reports, for example, users can reference a chart on screen and then return directly to the report.

Not surprisingly, with fewer interruptions and immediate access to important information, the VAX system streamlines office efficiency.

To put it simply, Frank Giannantonio says, "People are becoming more productive."

Avon conducted a test to see just how much more.

Among professional and managerial personnel, productivity increased approximately 23 percent. Among secretarial



and administrative staff, the increase was even more dramatic, at 53 percent.

Those kinds of savings alone might have justified the cost of putting a VAX system to work for Avon. But there was more involved in the company's decision.

As Frank Giannantonio says, "We did not even consider the indirect savings from the productivity gain as cost justifications. They were added benefits."

"We used only the direct savings. And the direct savings amounted to a return on investment in one year."

"That's just about \$1 million."

"I CAN QUICKLY GET INFORMATION TO PEOPLE - AND JUST AS QUICKLY GET IT BACK."

There are other savings that are harder to quantify. "Like the fact," Giannantonio says, "that now I get information sooner.

Which means I can make decisions sooner. Information flows very quickly - very quickly."

Some Avon managers are connected to the VAX system from their homes. So if they've been away on a business trip or a vacation they can key into the system and know what's been happening even before they come back to the office. No more wasted time trying to catch up.

Time itself is being redefined. Through DECnet™ networking software, Avon plans in the very near future to link its Rye headquarters and domestic branches with its overseas offices. One of Avon's London managers was quick to see how a VAX computer could make the difference in time zones between his office and New York work to Avon's advantage.

"His first comment when he saw the system," says Giannantonio, "was 'I now have the opportunity to prepare a lot of information for New York during the first five hours I'm in, so that when you come in, you'll instantly know exactly what's happening in the European area.'"

"Of course the same is true," Giannantonio adds, "in every

one of our other locations.

"This is a great vehicle. It's going to bring our international companies closer to the home office. It's going to tie the Avon world closer together."

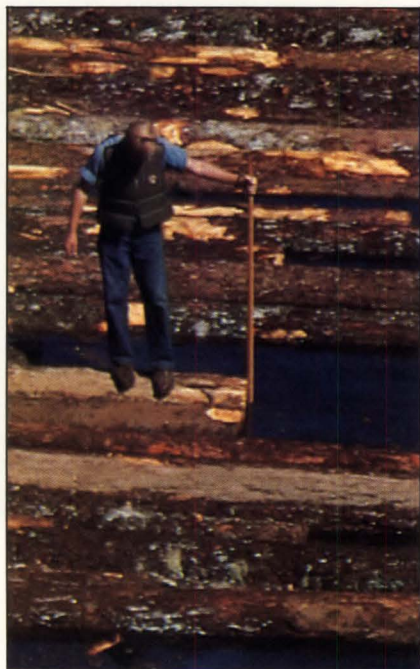
BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

VAX computers and ALL-IN-1 software, like all Digital hardware and software products, are engineered to conform to an overall product plan. This means our systems are engineered to work together easily and expand inexpensively. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

To learn more about Digital's VAX system, call toll free: 1-800-DIGITAL, ext. 200, or write Digital Equipment Corporation, 200 Baker Avenue, West Concord, MA 01742.

THE BEST ENGINEERED COMPUTERS IN THE WORLD.

digital™



67 OUTSTANDING DATA CENTER/

Theresa Conlon *A photographic tour of Fischer Camuto of Stamford, CT.*

COVER STORY

74 A MENTOR CAN BE A MILLSTONE/

Martin Lasden *Instead of making your climb to the top easier, a mentor can place a heavy burden on your shoulders.*

82 BREAKING THE APPLICATIONS LOGJAM, PART I/

Lamont Wood and Don Leavitt *Your organization's programming backlogs could be both greater and smaller than you realize.*

90 MICRO OUTPUT: FIND THE PERFECT MATCH/

Mark Brownstein *The alluring qualities of the latest output devices make matching machine to task a challenge.*

98 IS THERE A PBX TO THE PROMISED LAN?/

Gary Stix *PBX/LAN integration may be the bridge to high-speed voice and data communications—if it ever arrives.*

113 SMALL BUT POWERFUL PRINTERS/

David Whieldon *Greater speed, color, flexibility, and value distinguish this year's small-to-midsize printers.*

- 10 LETTERS 82
- 12 INSIGHT
- 16 NEWS & COMMENT
- 36 PERSONAL COMPUTING
Quest for DBMS
- 42 STRICTLY SOFTWARE
Strategic planning
- 52 DATA COMMUNICATIONS
IBM and telecomm
- 58 FOLLOWING THE LEADERS
ADP's forte
- 62 TRAINING
Chargeback
- 145 APPLICATION
ESPN grows with Arc
- 146 PRODUCTS
- 156 ADVERTISER INDEX
- 157 YOUR CAREER
Soothing anger



COMPUTER DECISIONS (USPS 771-040 ISSN 0010-4558) is published biweekly for \$40 per year by Hayden Publishing Co., Inc., 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address changes to COMPUTER DECISIONS, P.O. Box 1417, Riverton, NJ 08077.

COVER PHOTO: Ted Hardin

Fifteen Years Ago Software International Created The Mainframe Applications Software Industry. Today We're About To Change Its Course.

Fifteen years ago packaged software was an idea. Today it's an industry. Unfortunately, it's an industry that's never proposed a set of standards for itself... never spoken clearly to its customers about standards for product architecture or service or support... never put into words the standards that characterize a true level of professionalism in a software vendor.

That is until now.

Enter Software International.

Fifteen years ago we brought our first financial software package to the marketplace. Since then we have installed more than 5000 packages. And now, as a member of the General Electric family of companies we feel we are in a position to speak out and help chart our industry's course for the next fifteen years.

We've put our thinking into a 35-page white paper "Setting Standards in Mainframe Applications Software." We'll send you a copy at no cost.

The paper presents 16 topic areas that we believe to be critical to the long term success of applications software installations... important ideas for those who purchase or recommend applications packages.

It talks about the coming generation of architecture for software products and what that means to you... it suggests the kind of installation, support and service a user should expect from his software vendor.

Whether you're developing your own software, or evaluating a package, you'll want a copy of this timely report. It'll give you new insight into the direction the mainframe software industry is heading.

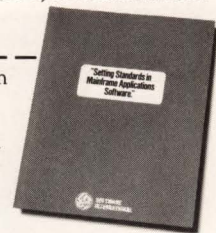
And a fresh look into the thinking that goes on here at Software International.

For a copy call 1-800-343-4133, in Massachusetts 1-800-322-0491.

Software International Corporation
One Tech Drive
Andover, MA 01810

Dear Sirs: Please send me a copy of
"Setting Standards in Mainframe
Applications Software."

Name/Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____



CD-1



**SOFTWARE
INTERNATIONAL**

SPACE MANAGEMENT, NATURE'S WAY.

**Our Space Management System
Does Something Nature Doesn't Do.
It Increases DASD Performance
While Reducing Cost In OS/VS
Environments.**

Our Automated Space Management software—ASM2—is recognized by over 700 users worldwide as the leading high performance DASD management system.

ASM2 substantially improves system performance by archiving, restoring, backing up and migrating data. It provides comprehensive DASD analysis tools, plus a command facility that lets users enforce individual DASD management standards, customize formats, and determine their own reports. All with just one simple command.

ASM2 further increases efficiency with its data restoration facility, IXR (Intelligent Transparent Restore). We call it intelligent because you'll never again have to pre-check data set availability, or issue manual restore requests. What's more, IXR's unique look-ahead approach allows far more data to be archived and retrieved.

Best of all, ASM2 is so efficient at optimizing critical DASD space that it can easily pay for itself within a year.

For an on-site, on-line ASM2 demonstration with some of your own data, write or call John Williams direct. He'll be glad to show you how ASM2 can help you avoid those sticky space management problems.

The Cambridge Systems Group



24275 Elise, Los Altos Hills, CA 94022, U.S.A.,
(415) 941-4558 • Telex 357437

London Paris Munich

CIRCLE 5

COMPUTER Decisions

Headquarters Office

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

Publisher/Vice President

Don Huber

Editor

Mel Mandell

Managing Editor

John Rymer

Senior Editor

David Whieldon

Software Editor

David Kull

Assignments Editor

Joseph Hillhouse

Art Director

Bonnie Meyer

Microsystems Editor

Susan Foster Bryant

Western Editor

Martin Lasden

(408) 736-6667

New England Editor

Mary Miles

(617) 746-4441

Office-automation Editor

Jennifer E. Beaver

(213) 548-7877

Southwestern Editor

Jordan Gold

(817) 292-8334

Washington Editor

J. B. Miles

(202) 488-8297

Data-Comm Editor

John Seaman

News Editor

Joseph Braue

Associate Editors

David Roman, Gary Stix

Industry Editor

Lee Keough

Regional News Editors

Michael Dobberstein

(408) 736-6667

Anita Micossi

(617) 890-8050

Production Editors

Bonnie DeBonis, Barbara Francett,

Robert Moran

Associate Art Director

Denise Barbieri

Photo Editor

Laurence L. Levin

New Products Editor

Theresa Conlon

Staff Writer

Patricia McShane

Copy Editors

Donna Jackel, Robbin Juris,

Dennis Mendyk

Researcher

Mary Jander

Editorial Support Staff

Virginia M. Johnson, Supervisor

Kathleen Ryan

Joanne Wendelken

Staff Artists

Laura Conca, Vincent J. Gallo



A NUMERICAL CONCEPT NO OTHER MONITOR CAN COMPREHEND.

As sophisticated as they are, you'd think monitor companies could solve a simple problem: keeping customers happy.

Fortunately, Amdek can. With the longest warranty in the industry. Namely, two years on all parts and labor. And three years on the CRT.

Even simpler, our warranty applies to every monitor we make, from our new Color Series to our amazingly popular Video Series.

And Amdek's own trained technicians make repairs quick and professional.

So when you're shopping for a monitor, look at the quality Amdek guarantees you, years after you leave the store.

According to our figures, it really adds up.

AMDEK[®] MONITORS

Amdek Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007, 312/595-6890, Telex 280803.



CONTROL

UNIX[™] SYSTEM V. FROM AT&T. ON TOP

Is your company's computing system an unmanageable muddle of isolated workstations and departmental computers?

You need a flexible means to integrate your system and get it under control. UNIX System V from AT&T.

It's another reason why good business decisions are based on UNIX System V.

UNIX System V can help you regain control of your company's system. Its flexibility lets you organize and expand your computing system for maximum efficiency.

And it protects your investment in hardware and software.

More freedom. More control.

UNIX System V is virtually hardware independent. It gives you the freedom to combine equipment from a variety of vendors. Even if the machines are of different generations.

You won't waste money rewriting software every time a new computer is added on. UNIX System V is easily adapted to a wide range of computers. From micros to mainframes. Including AT&T's range of 3B Computers.

Don't worry about your stand-alone personal computers running on

MS-DOS.* AT&T's PC Interface allows you to integrate your current machines into your system without costly disruptive change.

And, our COMMKIT[™] Software links UNIX System V to the major networking protocols for data communications between computers based on UNIX System V and those that are not.

UNIX System V can support a number of users doing varied tasks at the same time. All sharing a central processing unit and peripherals. All benefiting from a larger base of information. All working as a manageable whole. All contributing to bottom-line cost savings because equipment and computing

ROLL SYSTEM V

OF THE BOTTOM LINE.

costs come down while your output and productivity go up.

A standard that's here to stay.

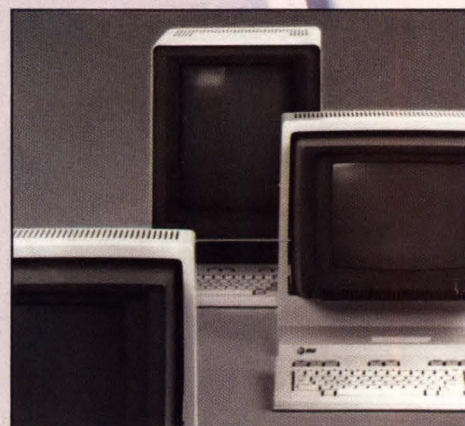
UNIX System V is backed by the full resources of AT&T. We're committed to seeing that it does the best possible job for your company—now and in the future.

All future software releases will be upwardly compatible. And designed to solve your business needs.

Our Independent Software Vendor Support Program will meet the demands of business with a complete line of high-quality applications software. Rest assured that your choice of a computing system based on UNIX System V is a smart, safe one.

To learn how UNIX System V can help you regain control of your computing system, send for our free brochure, "UNIX Software."

UNIX System V. From AT&T.
From now on, consider it standard.



Please send me "UNIX Software."

Mail to: AT&T, P.O. Box 967,
Madison Square Station, N.Y., N.Y. 10159

Name _____

Title _____

Department _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

UNIX™ System Licensee ☐ Yes ☐ No ☐ Don't know

CB-0326-EF

Data switching: Equinox makes it simple.

Introducing the Equinox Data PBX; a port selector that makes switching terminals between computers as simple as dialing a phone number.

Installation is simple; do-it-yourself using regular telephone PBX-type cabling and connectors.

And it's simple to integrate into your system, thanks to our super friendly, self-explanatory configuration menus.

The system grows to meet your needs, from 24 to 1320 lines. And the state-of-the-art design combines performance and reliability in a compact package that won't break your budget.

Check out the most full-featured Data PBX on the market today; call 1-800-DATA-PBX, for an on-site demonstration.



EQUINOX
Systems

12041 S.W. 144th St.
Miami, FL 33186
(305) 255-3500

CIRCLE 57

LETTERS

NO FREE LUNCH

The October issue of *Computer Decisions* incorrectly reported that a booklet entitled "Managing Microcomputers" was available at no cost from Price Waterhouse, the Big Eight accounting firm in New York. The booklet included information about the survey conducted for the National Association of Accountants in New York. The booklet is not free. It costs \$10.

MICROS NOT THE ANSWER

As your December project-management article "Avoiding pitfalls and costly detours" states, the primary rationale for procuring project-management tools is the need to precisely identify, correlate, and report project-management information. Unfortunately, for small and medium-sized projects, experience shows that the expense of obtaining and operating a computer-based project-management system routinely exceeds the cost of manual progress tracking. Only for large and very large projects does the cost-benefit payoff for automated project management become acceptable.

The difficulty with microcomputer-based project-management software is that the limitations of the host hardware preclude full storage and timely processing of the vast quantities of data needed by large and very large undertakings. As a consequence, effective project tracking needs to be carried out by a supermicro, at minimum. Information on project-management software available for supermicros, superminis, and mainframes would be far more beneficial than the information on micro-based software you presented.

David A. Feinberg
Seattle, WA

KUDOS FOR BOSS MANAGEMENT

Recently, I was in a customer's lobby and I came across an article in your publication entitled "How to manage your boss" [September]. For me, the article was like a prayer being answered—it was enlightening and informative, and helped me put things in a little better perspective.

Dean Orr
Fullerton, CA

Address letters to the editor to *Computer Decisions*, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604.

Make Stat Magic

Now for the IBM PC/AT*
with hard disk

Statistics, reports and plots happen magically with SPSS/PC™—the Statistical Package for IBM PC/XTs.*

SPSS/PC is the most comprehensive statistical package for performing simple or complex tasks, regardless of data size. It maintains feature and language compatibility with mainframe SPSS[®], while optimizing for the PC environment.

Statistics range from simple descriptive to complex multivariate, including Multiple Regression, ANOVA, Factor and Cluster analysis. Loglinear and nonparametric procedures are also included.

Simple facilities allow transfer of files between

SPSS/PC and programs like Lotus 1-2-3, dBase II and SAS. A complete Report Writer, Plotting facilities and a Communications program for mainframes round out a fully integrated product.

For more information, contact our Marketing Department without further ado. And see what a little stat magic can do for you.

SPSS Inc., 444 N. Michigan Avenue, Chicago, IL 60611, 312/329-3500.

In Europe: SPSS Benelux B.V., P.O. Box 115, 4200 AC Gorinchem, The Netherlands, Phone: +31183036711 TWX: 21019.

VISA, MasterCard and American Express accepted.



SPSS inc. PRODUCTIVITY RAISED TO THE HIGHEST POWER™

*SPSS/PC runs on the IBM PC/XT or AT with 320K memory and a hard disk. An 8087 co-processor is recommended. Contact SPSS Inc. for other compatible computers.

IBM PC/XT and AT are trademarks of International Business Machines Corporation. dBase II is a trademark of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corporation. SAS is a registered trademark of SAS Institute, Inc. SPSS and SPSS/PC are trademarks of SPSS Inc. for its proprietary computer software.

© Copyright 1985, SPSS Inc.

CUT THE FRINGE, SAVE THE SURREY

In time, Ronald Reagan may come to be known, or remembered, as the fringe-cutter. The present administration includes in its tax-reform plans restrictions on the provision of luxury cars for corporate executives. Such restrictions are also a good vehicle for exposing a common failing in corporate life: executives becoming too enamored of their images and of the images of their corporations. Just so, executives can be distracted from their primary objective: the survival of the corporations they lead, which requires a constant gaze at the bottom line.

I have encountered many examples of this inclination, which is rapidly becoming a trend. Many years ago, when I was investigating new ventures for investors, I helped reorganize a rather prosaic metal-cutting shop into a provider of technology.

Naturally, I visited the day the company moved into its new quarters. On the door leading to the offices occupied by the three officers was a large bronze plaque bearing their names and titles. When I noticed that the lone secretary was still equipped with an ancient manual typewriter, my heart sank. I

asked how much they had spent on the plaque. "Only \$600," one responded. That was the current price of an efficient electric typewriter. This trio of would-be industrialists valued image over effectiveness.

The data-processing industry has more than its share of image-lovers. To be sure, image is a necessity in contemporary corporate life, but did Trilogy, Gene Amdahl's ill-fated attempt to create "wafer-scale" integrated circuits,

need to equip its executive offices with oriental rugs and expensive mahogany desks, and the like? The resources squandered on such creature comforts could have been better spent elsewhere, although it would have been far from enough to have rescued Trilogy from its fate.

Did all those start-up operations in Silicon Valley and along Route 128 need to provide their executives with Mercedes, BMW, and Ferrari cars? Again, the re-

sources wasted would not have made the difference in the sad fates of so many of those ventures. But the distraction with image helped seal those fates.

I was amused by Jimmy Carter's aborted campaign against the "three-martini lunch." How many of us can cope with only one martini during a working lunch? But he had the right idea. And so does Reagan when he takes away the incentive to provide luxury cars for corporate executives.

Faced with a budget deficit of about \$200 billion, and that chilling imbalance in trade, the economy is far from healthy. One way to keep the current boom alive is to concentrate on basics instead of on image. □



Illustration by Dan Culhane

The full-time computer for part-time users

COMPAQ PLUS
SER# 107-46-9-104A

Marketing	FEB 7 1985
PAYROLL	FEB 8 1985
Finance	FEB 11 1985
Sales	FEB 14 1985
Boardroom	FEB 15 1985
	FEB 20 1985

COMPAQ PLUS
SER# 107-46-9-104A

RETURN TO
DATA PROCESSING

COMPAQ
PLUS[™]

Not everyone who needs a personal computer in your company needs one full time. That's why full-function COMPAQ[®] portable computers give you more for your money than most desktop computers. They're built tough enough to share.

In a single day, your research department can use a COMPAQ portable to access information, accounting can borrow it to track receivables, and marketing can take it to make sales forecasts. Everyone can use it as an "extra" computer to take home or on the road.

COMPAQ's unique cross-braced aluminum frame, shock-mounted disk drives and outer case molded from the kind of plastic used to make bulletproof windows help it withstand the rigors of being passed around.

Plus COMPAQ portable computers are software and hardware compatible with the IBM[®] PC and XT, offer high-resolution text and graphics on one screen, and can expand to 10 megabytes of storage.

No wonder they outsell the IBM Portable Computer in retail stores by 6 to 1.

Every small company should have one. Large companies should have one for every department.

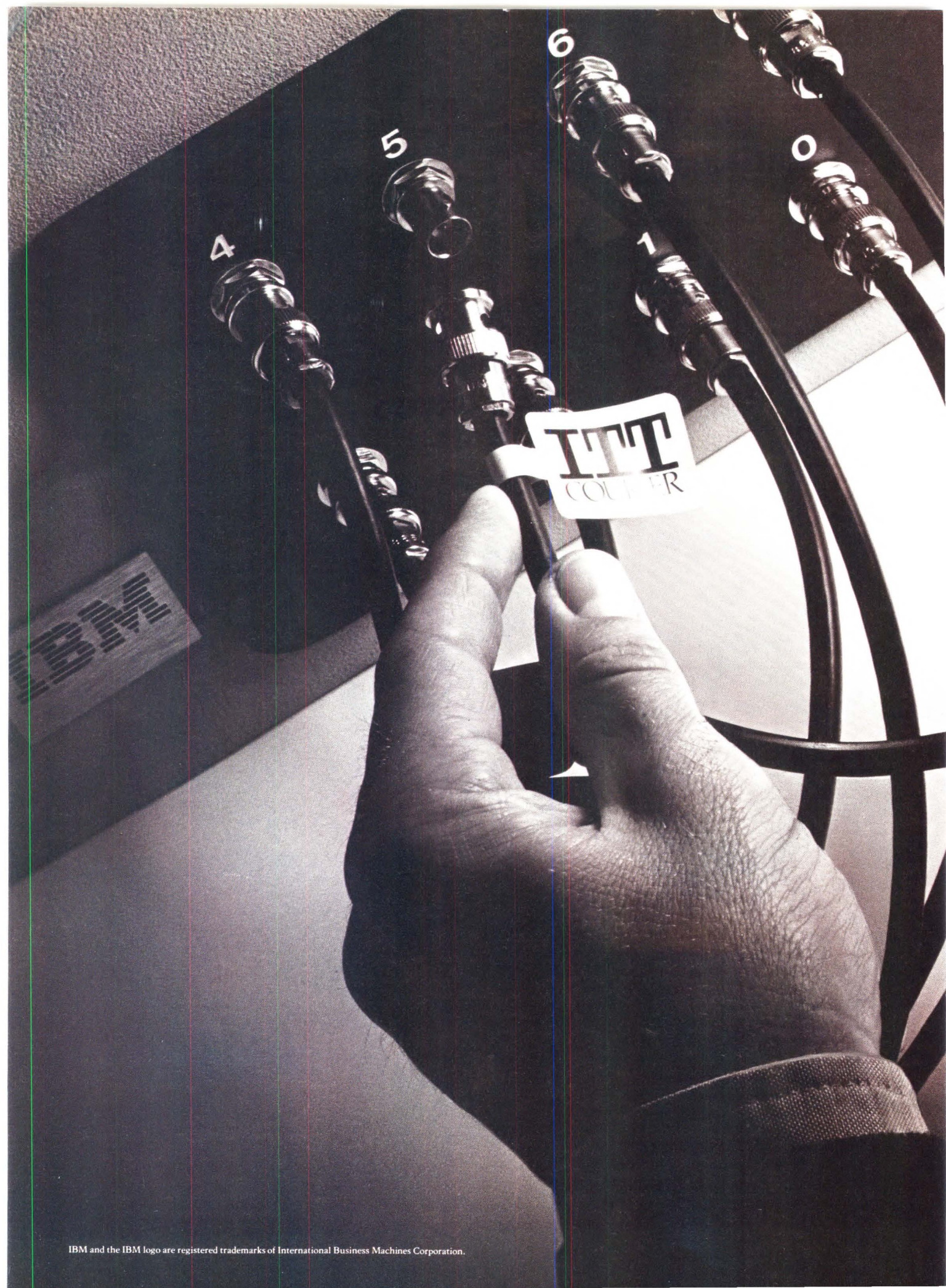
So check it out. For a free brochure or for the location of your nearest Authorized COMPAQ Computer Dealer, call 1-800-231-0900 and ask for Operator 2.

COMPAQ[®]

It simply works better.

COMPAQ[®] is a registered trademark and COMPAQ PLUS[™] is a trademark of COMPAQ Computer Corporation. IBM[®] is a registered trademark of International Business Machines Corporation.

©1985 COMPAQ Computer Corporation



A SMALL CONCESSION TO THE COMPETITION.

Much as we hate to admit it, our big blue competition has more 3270 controllers out there than we do.

Trouble is, that makes it tough to reap the benefits of our popular, 12-inch compact display.

So we're introducing a new 1778 compact that plugs right into your 3274 or 3276 controller.

Like our original 1700, the 1778 fits in places an ordinary display won't. And it comes with ergonomic features the competition forgot. A tilt/swivel screen in your choice of amber or green. Blinking fields. Variable field underline. And an optional lightpen.

All in all, this means our small concession to the competition just might be a giant leap for productivity.

And, come to think of it, isn't that what this business is all about?

For more information, contact your nearest ITT Representative. Or call the ITT Courier Sales Support Dept., toll-free at 1-800-528-1400.

ITT
COURIER



*The new plug-compatible ITT 1778 is
24% smaller than their 3178.*

Edited by Joseph Braue, News Editor

MICRO HOT LINES: HELP OR HESITATION?



Alpha Software technicians took top honors in a recent "drill."

Without prompt, professional telephone support, micro software is less useful to users—right?

Computer Decisions recently conducted a sneak drill, calling the technical-support crews from 12 software houses on the Softsel (Inglewood, CA) Hot List for the week of Feb. 4. Each software vendor was rated on length of time it took to get through to a support technician, and the promptness and the accuracy of the reply.

Brad Fenn, manager of support services for Alpha Software, Burlington, MA, provided a question that is very likely to be asked by users, and that, he believes, every techie should be able to answer: "How do I put my files into a subdirectory on my IBM PC XT hard disk?"

The "out-to-lunch" award goes to

Micropro International Corp., San Rafael, CA, (Wordstar). After three days and 19 busy signals, I gave up. A Micropro spokeswoman says the vendor is beefing up staffing on the hot line. She suggests that two factors have contributed to the delay: Micropro's recent introduction of Wordstar 2000, and the fact that it has perhaps the largest user

base (about two million) of all software companies.

BPI Systems (General Accounting) is runner up. Nine calls were attempted to its Austin, TX, hot line without success.

Multimate International Corp., East Hartford, CT, (Multimate) needs the eight new technicians it plans to add to the current crew of 20. "We're a day and a half behind," said a spokeswoman. I left a message early in the morning. I phoned again in the late afternoon of the same day. This time I insisted on holding for a technician.

Three minutes later, a technician picked up my call. We wasted a few more minutes while he tried to convince me to either call back the next day or look for a solution in my manual. When I pleaded urgency, he answered the question correctly and easily. Total

INSIDE NEWS

- Navy's DIF standard piques user interest 18
- Users ponder entry into IBM's Sierra Club 20
- IBM PCs best resale buy, claims guide 28

SIMWARE-A Software Approach to an Ever Expanding Galaxy of Networks.

SIM3278, PROTOCOL CONVERSION...

SIM3278, software which allows you to connect inexpensive microcomputers and ASCII terminals to your IBM mainframe, giving you complete 3270 emulation. Supporting more than fifty different terminal types, SIM3278 requires no additional hardware or software modifications. SIM3278 enables users to purchase less expensive display terminals and to use async communications to reduce their data communications costs.

SIM3278/PC FOR MICRO TO MAINFRAME COMMUNICATIONS...

SIM3278/PC together with SIM3278, gives your IBM PC's and compatibles complete 3270 emulation and file transfer capabilities. With the purchase of a corporate license you can duplicate the software, without paying any additional per copy price every time another PC is added to your network. Easy expansion without heavy incremental costs makes SIM3278 and SIM/PC the right combination.

SIM/PASSTHRU, SIMWARE'S SNA GATEWAY FOR VM SYSTEMS...

SIM/PASSTHRU smoothly integrates SNA terminals into your VM environment with simple logon procedures that allow users to access both VTAM and VM applications. With no complex system modifications, no additional software and no high overhead, SIM/PASSTHRU preserves the simplicity of your VM system while providing you with a cost effective gateway that will save you upwards of 60% on networking costs.



FOR A FREE EVALUATION ON EXPANDING YOUR NETWORKING CAPABILITIES, REACH FOR SIMWARE, THE PRACTICAL APPROACH TO DATA COMMUNICATIONS.

SIMWARE
a practical approach to communications

14 Concourse Gate, Suite 100
Nepean, Ontario
Canada K2E 7S6

(613) 727-1779
Telex: 053-4130

SIM3278 is a registered trademark of Simware Inc. SIM3278/PC is a trademark (pending) of Simware Inc. SIM/PASSTHRU is a trademark (pending) of Simware Inc.

CIRCLE 10

NEWS & COMMENT

elapsed time equaled five hours, 28 minutes, or five minutes, depending on when you turn on the meter.

Satellite Software, Oren, UT, (Word Perfect) took 24 hours, seven minutes to return my call, only to balk at a "DOS" question, which was answered grudgingly.

Peachtree Software, Atlanta, GA, (Peachtext) wins honorable mention for the "hoof-in-mouth" award. Peachtree's support staff took three hours, 32 minutes to return my call for help. "I'm not familiar enough with DOS to be able to set it up into a subdirectory," the technician replied. "You should be able to find something in your DOS book."

When I pressed him to consult one of his colleagues, he returned to the phone a few minutes later with the sad news that "We've all worked with the IBM XT, but we've never set up subdirectories before." There are reportedly 28 technicians on the Peachtree crew.

At Howardsoft, La Jolla, CA, (Tax Preparer 1985) a technician took two minutes to impart the following helpful hints: "There are 11 steps and I can't go over each step over the phone. Use your manual."

I held for six minutes while the representative from Software Publishing, Mountain View, CA, (PFS: file) struggled with his documentation. "Gee, I'm not really sure how to do this exactly," the technician lamented.

At Hayden Software, Lowell, MA, (Hayden Speller) a techie wiggled off the hook, saying, "We advise people to stay away from subdirectories. They can really confuse something unless they're set up perfectly." It took him eight surly minutes to come up with this non-answer.

The technical rep at Ashton-Tate, Culver City, CA, (Framework) was the friendliest and the clearest with instructions. He came in at under three minutes, even though, as he said, Ashton-Tate's 32 techies receive 1,300 calls per day.

"Our longest wait today," he confided, "was 15 minutes. If we had an 800

number, the wait would be more than an hour, because people would never get off the phone."

Because users stockpile their problems over the weekend, he advised to avoid calling on Mondays. There was no consensus from the various support teams as to the best time of day to call, although very early and very late (vendors' local time) were most often recommended.

In addition to Ashton-Tate, the list of no-hassle good guys includes:

Lotus Development Corp., Cambridge, MA, (1-2-3). With 20 technicians on duty, Lotus had an elapsed time of three minutes.

Microsoft, Bellevue, WA, (Microsoft Word), was clocked at three minutes. It employs 25 support staffers.

Harvard Software Inc., Littleton, MA, (Harvard Project Manager) an-

swered in four minutes.

For perspective, I called a couple of software vendors not currently on the Softsel Hot List. Best Programs, Alexandria, VA, (Tax Cut 1985) turned the question around in four minutes. Another sleeper, Leading Edge, Canton, MA, (Leading Edge Word Processor) tied the record at two minutes flat.

I financed these "eye-openers" with my own dimes, because only Multimate and Satellite Software offer 800 numbers for technical support. Both, however, publish a local number "just in case," which *was* the case in this experiment.

The winner was Alpha Software (Electric Desk). Called without warning, the Alpha reps had no prior knowledge of the specific question being asked. The rep answered in one minute, 55 seconds.

—Anita Micossi

IN WORD PROCESSING, WHAT'S THE DIF?

If your organization is considering local-area networking to link word-processing equipment from more than one vendor, you know the frustration of

trying to exchange completely formatted text between say, word processors made by Wang Labs. and Digital Equipment Corp. (DEC). Now the U.S. Navy has come to the rescue—maybe.

The Navy has produced a set of software specifications that have generated considerable vendor and user interest, and may soon become part of a broader standard for the transmission of data on local-area networks. The specifications, dubbed Document Interchange Format (DIF), allow users to swap formatted word-processing documents on a multi-vendor network.

DIF overcomes the fact that different word-processing systems use their own control characters to indicate how a document should be formatted. A machine from Wang Labs., Lowell, MA, for instance, may not be able to "read" the formatting instructions transmitted to it by a DECmate from the Maynard, MA-based vendor. DIF acts as an "interpreter" of these format codes, allow-



The National Bureau of Standards has taken up DIF for consideration as an official standard, says ANSI representative Fran Nielson.

Test Your Microcomputer IQ*

1. Name a totally integrated software package that was rated #1 by *Software Digest*. _____
2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it? _____
3. Who will educate IC personnel or end-users at their site or yours? _____
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation? _____
5. What provides a micro software facility that allows you to customize a system to your specific requirements? _____
6. Who are the premier micro consultants to the *Fortune* 1350 companies? _____
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals? _____
8. What is the easiest way for an IC manager to satisfy the many end-user needs in the organization? _____
9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come? _____
10. Name the companies that can provide all of the above? _____

*(Turn Page Upside Down for Answers)

1. DunsPlus Software 2. From DunsPlus 3. The DunsPlus Education Staff
4. DunsPlus's Communications Utilities 5. The DunsPlus Tool Kit 6. DunsPlus's Professional Consulting Staff 7. The DunsPlus Support Center 8. Call DunsPlus at 800-DNB-PLUS 9. Dun & Bradstreet, the parent company of DunsPlus 10. DunsPlus

If you answered all of the above correctly, you've already solved most of the problems facing you. If not, give us a call at 800-DNB-PLUS, or write us at 187 Danbury Road, Wilton, Connecticut 06897.

DunsPlus:
An Innovation In
End-User Computing
From Dun & Bradstreet

DunsPlus

DB a company of
The Dun & Bradstreet Corporation

IBM is a registered trademark of International Business Machines Corporation. DunsPlus is a trademark of DunsPlus, a company of The Dun & Bradstreet Corporation. NOMAD2 is a trademark of D&B Computing Services.

NEWS & COMMENT

ing the translation of one vendor's set of formatting instructions to another vendor's, clearing the way for transmissions between incompatible machines. (DIF should not be confused with Data Interchange Format, which allows some integrated personal-computer programs to exchange data among separate applications.)

Because the Navy is a large buyer of office systems, it was able to convince several major vendors, including Wang Labs., Xerox Corp. (Stamford, CT), Datapoint Corp. (San Antonio, TX), DEC, and Data General Corp. (Westboro, MA) to endorse DIF and write DIF-based software for word-processing systems sold to the Navy.

Even IBM, which has its own document-exchange scheme, has joined the DIF parade by indicating its intention to support DIF requirements on products it offers to the Navy. With the Navy behind it, DIF has an excellent chance of becoming a Department of Defense standard, but how enthusiastic are users about DIF?

Bell Atlantic, the Philadelphia-based regional Bell operating company, has approved DIF as a standard, reports Gary Ehlers, staff analyst for long-range office-automation planning. When Bell Atlantic solicits bids from a vendor of office-automation equipment, it can stipulate that the vendor provide a DIF interface for the equipment.

DIF was a natural, says Ehlers. Bell Atlantic wanted an office-automation standard closely compatible with the International Standards Organization's Open Systems Interconnection (OSI) communications model, but Ehlers emphasizes that DIF's attraction lay, in part, in the fact that several vendors supported it.

For some users, however, DIF is still too new to be judged. Many users haven't installed LANs, and they're still considering the other options for exchanging information between incompatible office machines. One solution, of course, is standardizing on one vendor's equipment. "I'm impressed with

DIF," says Helen Walker, senior analyst for the Information Resources Commission for the state of Florida, "but our networking requirements are still in the planning stage, and we just don't know yet if we'll need DIF."

Dick Bania, manager of Ford Motor Co.'s office-productivity center, says Ford hasn't analyzed DIF in great detail, but is encouraged by it.

What are the chances that DIF will become a standard? Dave McElvein, Navy marketing manager for Wang Labs., believes DIF is a "very good start" toward a standard. But he notes that DIF only addresses one of several problems in the transfer of data on local-area networks. Speed of operation and reliability are also user concerns about LANs.

In the meantime, the American National Standards Institute (ANSI) has taken up DIF for consideration as an official standard in Office Document Architecture/Office Document Interchange Format (ODA/ODIF), a broader office-communication scheme. According to Fran Nielsen, ANSI representative to the National Bureau of Standards, Washington, D.C., DIF only addresses a part of the applications layer of the OSI model for network communications.

ANSI and the International Standards Organization have been developing ODA/ODIF for about two years. It allows for the interpretation of more formatting controls than DIF and includes the communications protocols needed to transmit text. ANSI plans to include data, graphics, and video transmissions on local-area networks in the standard, says Nielson.

The path to standardhood for DIF, whether it be de facto or ANSI-endorsed, is strewn with hazards, not the least of which may be IBM. Big Blue offers its own document-interchange scheme, Document Interchange Architecture/Document Content Architecture (DIA/DCA), which is as attractive to users as DIF is.

DIA/DCA is no panacea, says Charles McCoy, vice president of marketing at Datapoint. It was designed only for the interchange of text on IBM systems. But DIA/DCA is potentially richer than DIF, claims McCoy, because it can handle more formatting instructions than DIF can.

In addition, McCoy says, DIA/DCA has the communications protocols necessary to transmit text on a network, whereas vendors who provide DIF have to make it compatible with whatever protocols the network uses. □

MAKING THE PILGRIMAGE TO SIERRA

If the IBM Sierra won't come to the users, will the users wait for the Sierra? Says Bob Griffow, director of management services for the Los Angeles Water and Power Department, "I keep looking for something behind the veil, but they haven't shown us anything yet."

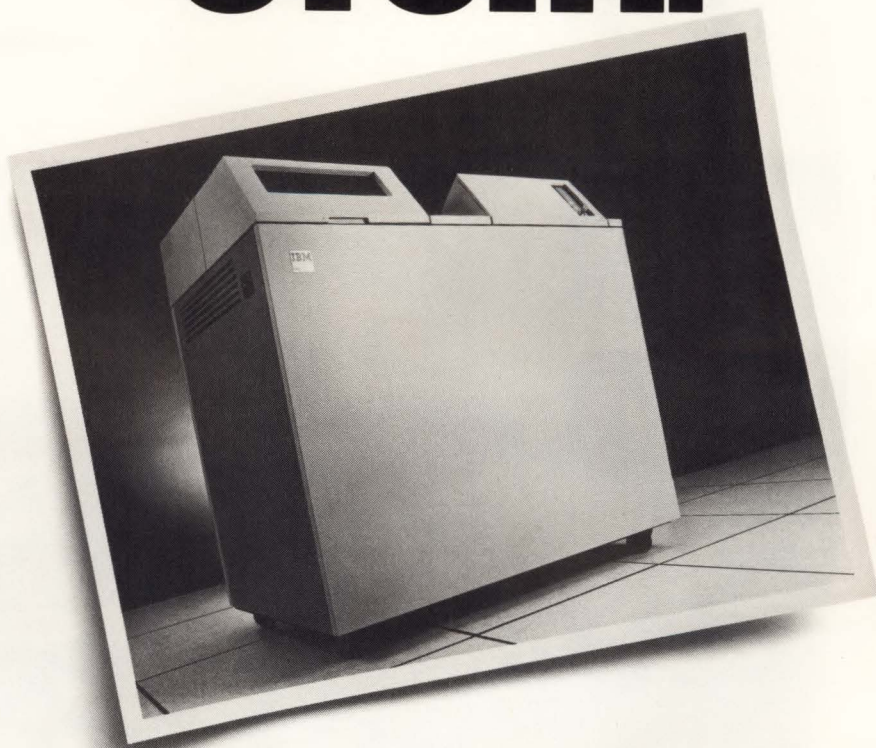
Keeping in sight the 1987 arrival date of the 50 million instruction per second (MIPS) 3090/400 Sierra, many MIS/dp managers are finding themselves tempted to purchase IBM's low-end Sierra, the 3090/200, which will be available this November. Priced at

about \$40,000 per MIPS, the 3020/200 will be cheaper than the 3084QX, the top-of-the-line of IBM's previous 308X generation of mainframes.

For users like Jerry Schade, computer-center director for the Colorado Department of Administration in Denver, who have reached the full capacity of their IBM mainframes, even the November shipping date of the Sierra 3020/200 seems far off. Having exhausted the capacity of his organization's 3033 mainframe, Schade will have to purchase the IBM 3081 main-

(Continued on page 24)

WANG IS ABOUT TO SHOOT HOLES IN IBM'S SYSTEM 36 STORY.



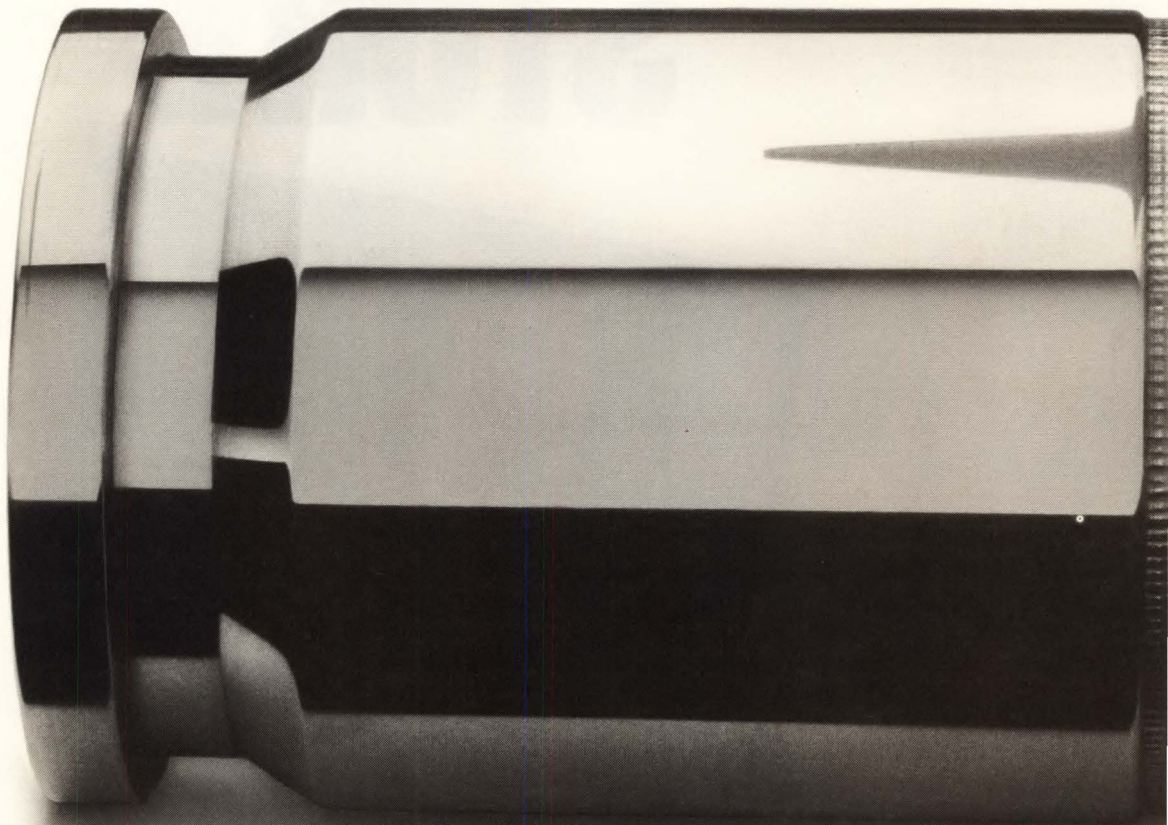
JUST GIVE US ONE BLOW IBM OFF YOUR

If you're shopping for a solution to your departmental data processing needs, IBM's System 36



is probably on your short list of finalists. But it shouldn't stay there.

	WANG VS	IBM SYSTEM 36
Designed to integrate and distribute data processing and office automation	Yes	No
Sophisticated programmer productivity tools	Yes	No
Easily upgradeable	Yes	No
Local area networking	Yes	No
Intelligent workstations that offload the CPU	Yes	No
Easy user interface throughout system	Yes	No
Totally integrated office automation applications	Yes	No
Integrated graphics and text	Yes	No
Connects to PC network	Yes	No



E SHOT AND WE'LL OUR SHORT LIST.

Because when you look at the facts, System 36 just doesn't stack up to the Wang VS.

For example, as the chart clearly shows, the Wang VS was designed to integrate data processing and office automation.

System 36 wasn't.

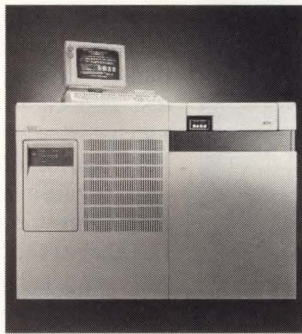
The Wang VS is easily upgradeable.

System 36 isn't.

The Wang VS gives you local area networking, intelligent workstations, a consistent user interface, integrated text and graphics, and programmer

productivity tools that can dramatically reduce your company's applications backlog.

System 36 doesn't.

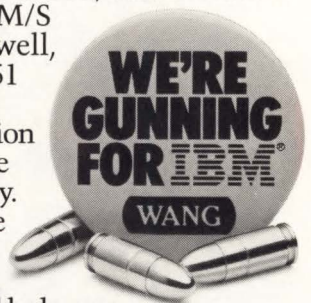


And every Wang VS computer is part of the Wang VS family, a fully compatible family of minicomputers that integrate data processing, word processing and graphics—all available for delivery now.

So look at their System 36. Carefully. Then call Wang at 1-800-225-9264 and challenge us to a benchmark

test. Or write to Wang Business Executive Center, One Industrial Avenue, M/S 5413, Lowell, MA 01851 for more information about the VS family.

Give us 20 minutes, and we'll help you cut that list down to just one name.



WANG

NEWS & COMMENT



IBM expects to release the Sierra 3090/200 (above) this November.

(Continued from page 20)

frame to meet his organization's present needs. Schade regrets that he can't delay purchasing new equipment until the Sierra arrives because "it suggests

more growth potential than any other line." In 1986, Schade will probably have to purchase another IBM mainframe, the 3084. He foresees his department exhausting the capacity of

the 308X series within four years.

Faced with similar capacity problems, other users are deferring some of their purchasing plans. Jim Baker, MIS director for Brooks Fashion Stores Inc., New York, may upgrade his organization's IBM 3083 mainframe sometime this year. Baker has been considering the IBM 3081, but may wait until the new 3090/200 is introduced to make his final decision. Carl Peter, director of data processing for Time Inc., Chicago, also expects to need more capacity in two years. He says he will probably hold out for the top-of-the-line 3090/400 because of its increased power. And Giffrow is weighing the 308X series against the Sierra line. "More MIPS will mean a higher overall price," he says. "A 3084QX at 13 MIPS costs about \$4 million and will get us about three years of use. A Sierra will cost 50 percent more and give us twice the MIPS and longevity." Despite the wait, "I lean toward the Sierra." □

COMNET HIGHLIGHTS MICROWAVE BYPASS SYSTEMS

Microwave bypass systems and a new way to move information from IBM mainframes to public packet-switched networks were highlights of the recent Communication Networks (Comnet) show in Washington, D.C.

Among the microwave offerings, General Electric Microwave Products Dept. (Owensboro, KY) exhibited the PVL 2000, a new variation of its Gem-link short-haul T-1 link. Designed for video teleconferencing, the PVL 2000 operates at 23 billion cycles per second and provides full-motion color video. A two-way PVL 2000 system costs \$19,250.

Enhancements to another short-haul microwave bypass system, the DMC 23, were announced by Digital Microwave Corp. The Santa Clara, CA-based startup unveiled a fully-regenerative repeater designed for the DMC 23 that operates on power from

solar cells. Priced at about \$20,000, the repeater increases the DMC's range to about 20 miles and makes possible low-cost installations in isolated locations where access to power lines is limited. The vendor also introduced a fiberoptic interface that allows easy switching from fiber to microwave.

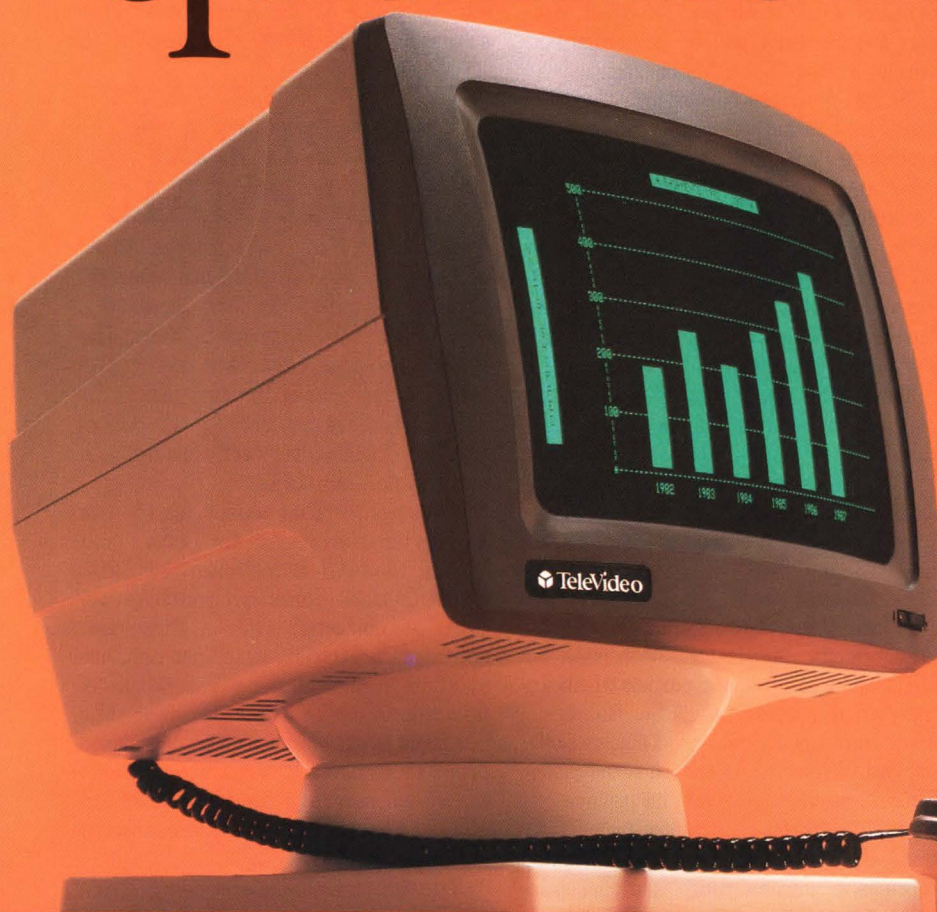
Amdahl Communications Systems Div. (Marina del Rey, CA) introduced several new offerings in X.25 packet switching, including an advanced network concentrator, model 4470, that can also be called a packet assembler/disassembler. It converts IBM's synchronous data-link control (SDLC) protocol, which is used for transmitting data between hosts and terminals, into the X.25 packet-switched format, which is used by most public value-added networks. Available in an eight-port version only, the 4470 is priced at \$12,500.

The telecommunications giants, IBM and AT&T, made their presence known with their respective local-area network (LAN) offerings. IBM displayed its office-cabling system, a star-wiring net that uses twisted-pair as well as fiber-optic connections. This scheme is intended as a precursor to the long-delayed IBM token-ring LAN.

Premises Distribution System (PDS), a wiring scheme developed by AT&T Information Systems (Morristown, NJ), made its debut at Comnet. Intended to support various voice and data transmissions in the office, PDS can be used with AT&T's LAN and Systems 75 and 85 private branch exchanges (PBXs). Products from a number of other vendors also may be connected to PDS. The cost of a PDS installation depends on the extent to which existing wiring can be incorporated into the system.

(Continued on page 26)

The price is just one of its qualities.



The 921 is built to the highest quality standards in the industry — our own.

The efficient, contemporary case houses modular subassemblies. All components are pretested and pre-stressed. Boards are mounted vertically to run cooler and last longer. And there's even room for plug in upgrade options. Like our low cost, Tektronix® compatible graphics board.

Superior performance is another outstanding quality of the 921. You'll find it in a keyboard arranged for individual workstyles, with non-volatile function keys.

You'll find it in your choice of green or amber screens offering exceptional readability. And in the 921's code compatibility with our popular 925 family of products.

The TeleVideo® 921. Now you know that low price is just one of its qualities.

To know more, call toll free (800) 538-8725. In California, call (800) 345-8008.

The TeleVideo 921



Terminals
TeleVideo Systems, Inc.

Tektronix is a registered trademark of Tektronix, Inc.

(Continued from page 24)

Also present at Comnet this year was Case-Rixon Communications Inc., an organization formed when Computer and Systems Engineering (Case) of Great Britain acquired the Rixon Co. (Silver Spring, MD) last year. Featured at the show was the vendor's new Beeline electronic-mail system.

Activity of interest to heavy users of modems included Penril Datacomm's (Gaithersburg, MD) announcement of the Datalinx series of leased-line/dialup high-performance modems. Priced at \$895, the DLX 224 2,400-bps two-wire, full-duplex, intelligent modem offers additional Bell 212A and 103 operating modes at 1,200 and 300 bps respectively. The 4,800-bps DLX 227 and the 9,600-bps DLX 229 cost \$1,395 and \$1,795 respectively. Either of these units supports a full-duplex, dialup transmission at full speed if two phone links are used.

Not to be outdone in modem offerings, Paradyne (Largo, FL) also introduced a 2,400-bps, full-duplex, auto-dial modem, the PDX 2400, designed for use on public packet-switched networks. Priced at \$805, the unit is Bell 212A, 113, and 103 compatible. For higher speeds on switched networks, Paradyne also introduced the HDX 12000, an advanced signal-processing modem for 12,000-bps synchronous data transmission over public packet-switched networks. Featuring automatic fallback to 9,600 bps when line conditions dictate, the HDX 12000 is well suited for dial-in timesharing services that use telephones or integral autodialers. The HDX 12000 costs \$3,600.

Finally, conference participants found the Discon 725, Interand Corp.'s (Chicago) desk-top version of its Discon videographic teleconferencing system, particularly innovative. With an easy-to-use electronic stylus rather than a keyboard, users can instantly send color photos, text, blueprints, or images of objects via telephone lines, and can also annotate an image while discussing a problem.

—John Seaman

EBB AND FLOW DEC OVER THE RAINBOW?

Digital Equipment Corp. (Maynard, MA) is absolutely not abandoning either the micro market or its MS-DOS-based personal computer, the Rainbow, according to Joe Nahil, Manager of DEC's corporate public relations.

Although the recent reports have referred to the recent halt of Rainbow production at DEC's Westfield, MA, factory, Nahil explains that production was stopped to retrofit the plant for the production of a new, unannounced product. DEC watchers, however, predict the product will be an enhanced version of the 32-bit Micro-Vax.

Nahil assures customers there is "sufficient quantity" of the Rainbow in inventory "to satisfy customers in the near and long term"—an assessment he quickly revises to "near and mid-term." At press time, he would not divulge the number of personal computers in inventory, nor would he name the facilities where the Rainbow is still, reportedly, "in limited production."

Nahil says, however, that DEC has plans to announce Rainbow enhancements.

Joe Codispoti, also of DEC corporate public relations, claims that Rainbow, which was introduced in 1982, has an installed base of at least 200,000 machines.

Sonny Monosson, publisher of the DEC-specific newsletter, "Monosson on DEC" (Boston), is not surprised about this latest ruckus over the Rainbow. The announcement of DEC's withdrawal of the product from retail distribution late last year was, he believes, a de facto admission of defeat by DEC in this market. An ally of Digital, Monosson admits that "low-cost personal computing is not DEC's business."

Franklin Computer Corp. (Pennsauken, NJ), says it's out of Chapter 11 bankruptcy. Since last June, the manufacturer of Apple-compatible personal computers has been operating under Chapter 11 protection from creditors.

Mike Strange, president of Franklin, says the vendor's reorganization plan calls for repayment of debts to creditors from liquidation of old assets.

Systems Strategies Inc. (New York), developers of IBM terminal-emulation software, has been acquired by AGS Computers Inc. (Mountainside, NJ). The acquisition will allow Systems Strategies to offer a broader range of hardware and software products, according to the vendor's president, Stanley Adelman. AGS, a computer consulting firm, has 2,300 employees. □

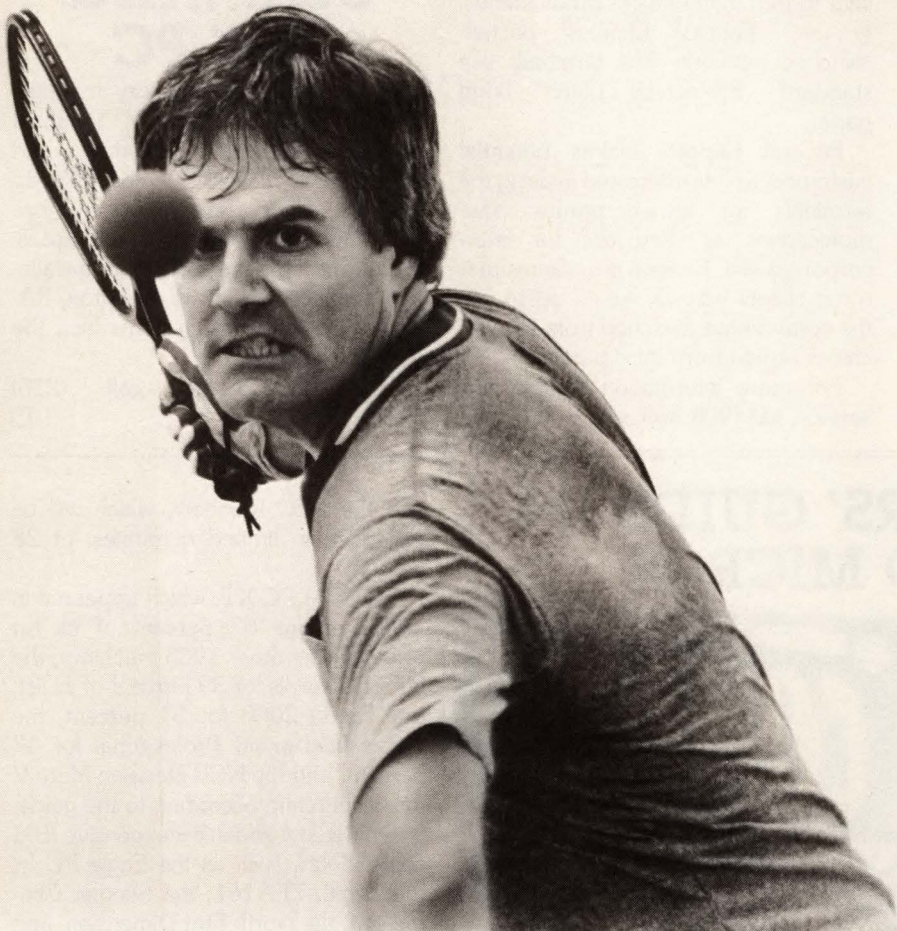
MORE ZAP IN ZAPMAIL

In an effort to boost interest in its Zapmail service, Federal Express Corp., Memphis, TN, has unveiled a new Zapmailer Terminal System. The system provides corporate clients with free on-site Federal Express fax terminals; customers pay only for the cost of sending documents electronically over the Zapmail network.

A customer that leases up to nine Zapmailer terminals for one year agrees to send a minimum of \$200 worth of documents per machine per year. A customer with a three-year contract for 10 to 50 machines only has to send a minimum of \$75 worth of documents per machine per year. The per-page rate starts at 95 cents and drops to 70 cents for organizations with three-year contracts for 10 or more terminals. The current average cost for a fax machine is \$3,000.

The fax terminals are being made for Federal Express by NEC Corp. in Japan. NEC supplied the 1,400 heavy-duty fax machines that Federal Express uses internally for Zapmail. Federal Express claims copies from its terminals are far easier to read than copies from typical fax machines. Federal also says the terminals transmit

To some, it's just a racquetball they're belting.
To others, it's Driscoll in the MIS group.



You know Driscoll. Every big organization has one.

He's sitting on the second-largest computer system in the Free World; he's the only person in the place who can make it work; he's got an applications backlog stretching to 1988, and it's gaining on him.

By any chance, is your name Driscoll?

**THAT'S ANOTHER REASON
WE CREATED COMMAND CENTER.™**

To leverage the investment you've already made in hardware and software.

To telescope the database and give the non-technical end-user direct access to precisely the information that he or she defines as critical to success: selected summaries; financial reports; sales tracking; variances from budgets, benchmarks or expectations; etc.

Without any wasted etc.

**COMMAND CENTER:
THE FIRST TRULY PRACTICAL
MANAGEMENT INFORMATION CENTER.**

It's a single, on-line, user-defined, distributed software system that resides on both the company mainframe and the manager's IBM® PC. It monitors 360° of internal and external data; then extracts, filters and compresses it to dramatically reduce workload.

It's the first executive-oriented system that's actually operational—without needing a Britannica's worth of documentation, or even a keyboard, to operate it.

It should interest anyone in management who feels that, while everyone else in the organization has a computer-aided career, he himself is somehow being cheated.

It should interest anyone in MIS who feels, as we do, that the future belongs to the heat-seekers.

We're in Boston, at (617) 350-7035.



Tracking and control for top management.
40 Broad Street, Boston, MA 02109.

documents at speeds of from 20 seconds to one minute per page, depending on the method of transmission available. Typical fax machines transmit documents at a rate of about one minute per page.

If an addressee does not have a matching terminal, Federal will deliver the fax document by courier for \$10. In addition, the terminals can be used as convenience copiers, at a rate of 25 cents per copy. All such charges count toward the minimum for the terminal in use.

Up to 999 names and addresses can be stored in each terminal, which

means that the same message can be sent to that many offices simultaneously over Federal Express' packet-switched network. The terminals use standard 8½-inch-by-11-inch bond paper.

Federal Express claims potential customers are as interested in using the terminals for intra-corporate communications as they are for inter-corporate use. Federal also claims that some clients who've signed up to use the system have switched from fax machines rented from third parties.

For more information on the new service, call (901) 369-3600. □

STALKING THE PC

PC Tracker, an inventory management system for IBM Personal Computers with two disk drives and 256 Kbytes of RAM, helps MIS/dp managers keep track of 50 or more PCs, software, peripherals, and accessories from purchase through installation. Designed by Ft. Washington, PA-based RG Software Systems Inc., the package costs \$495.

For information, call (215) 576-0970. □

A SELLERS' GUIDE TO USED MICROS



The resale value of IBM PCs and PC XT's is about 25 percent higher than that of IBM-compatible and look-alike micros, according to *The Brown Book*, a guide to the list, sale, and resale prices of 600 microcomputers, printers, and monitors from 200 vendors.

The IBM PC AT has the highest resale value of the PCs at 89 percent of its original price. Reselling at 70 percent of the list price, the Macintosh 512K from Apple Computer Inc. (Cupertino, CA) has the highest resale

value of the non-IBM-compatible micros. Also commanding high resale prices are The Portable from Hewlett-Packard, the Compaq portable, and Data General's DG/one portable. Of the 10 top-rated micros for resale value, seven are portables.

The IBM PC, which was introduced in 1982, sells at about 69 percent of its list price, according to *The Brown Book*. Among other microcomputers that came out that year, the Wang Professional is available at 49 percent of list, the Fujitsu Micro 16 at 48 percent,

and the DEC Rainbow, which will be produced in limited quantities, at 28 percent.

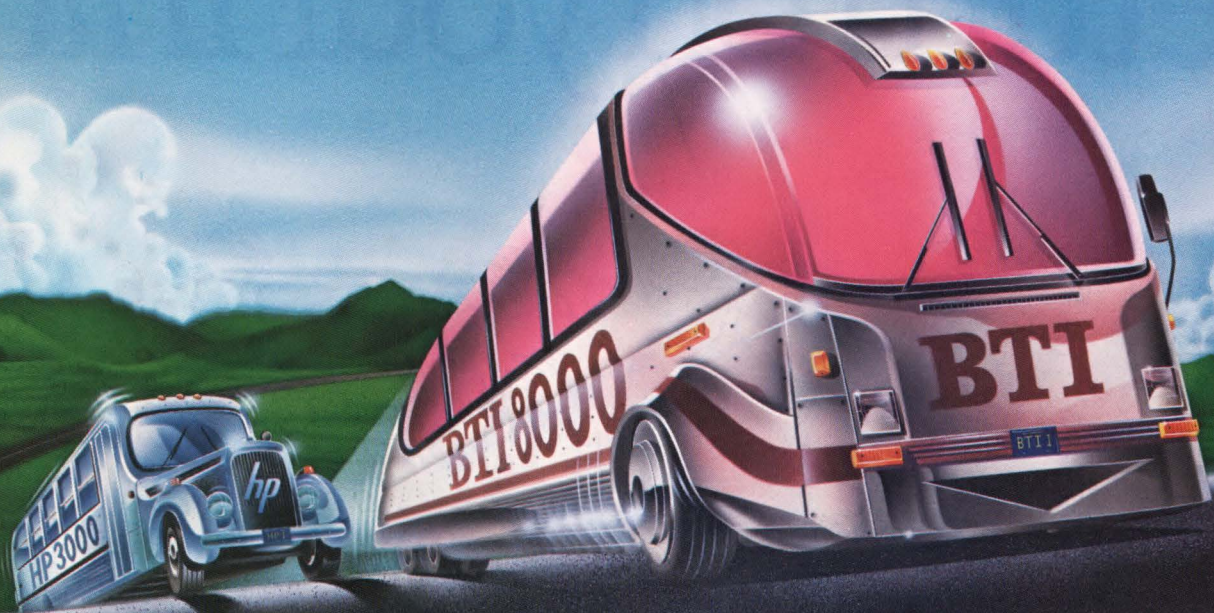
The IBM PC XT, which appeared in 1983, retains 63 percent of its list price. Of the other 1983 machines, the HP 150 resells for 39 percent of its list, the Tandy 2000 for 51 percent, the Texas Instrument Professional for 47 percent, and the NCR Decision Mate V for 48 percent, according to the guide.

On the low end are inexpensive IBM compatibles, such as the Eagle PC+, the Zenith ZFA161, the Seequa Chameleon, the North Star Dimension, and the NEC PC-8800, which sell for between 28 percent and 40 percent of their list prices.

According to Fred Brown, publisher of *The Brown Book*, the guide's resale-price information should be used "as reference points from which users can start to determine how much their used micros are worth." Because interest in used micros is relatively new, says Brown, many resale prices quoted in the guide are low. As more dealers start to sell used micros and it becomes easier to purchase them, their values will rise, he says.

The Brown Book is published by The Brown Book Inc. of Santa Barbara, CA. An 18-month subscription, which includes six quarterly editions, costs \$350. For information, call (805) 687-1140. (News continued on page 32)

The BTI 8000 outperforms the HP 3000 3 to 1



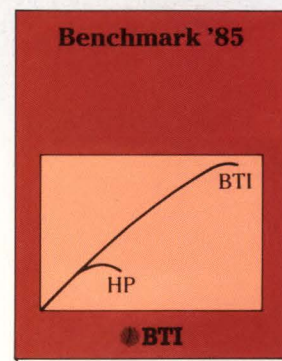
That's right! Benchmark tests prove that the latest version of the BTI 8000 can support more than three times as many online interactive COBOL users as HP's top-of-the-line Model 3000/68.

We programmed a "driver" computer system to simulate from 10 to 250 individual users performing representative data processing tasks. This provided us with a controlled and repeatable test of each benchmarked system, operating in a real world multi-user environment. Overall, we timed more than one million responses.

Under the conditions specified for the benchmark tests and simulating 200 busy interactive users (6 data base accesses per minute per user) the BTI 8000's average response time was *one second*.

Test results were examined by the international consulting and accounting firm of KMG Main Hurdman. Their detailed report is yours for the asking.

The BTI 8000 system is a modular supermini multi-processor system that can be sized to fit your needs. The system can use up to eight 32-bit CPUs and 24 megabytes of main memory, but you can start with a single CPU system and build up to larger configurations when your needs grow.



As for reliability and service, they're an established BTI tradition. Over 3,000 BTI systems are currently supported by BTI in the U.S., Canada, and Europe.

Contact us today for more information and for your copy of "Benchmark '85" including the KMG Main Hurdman report.

BTI 8000 32-bit Multiprocessor System

BTI Computer Systems, 870 West Maude Ave., Sunnyvale, California 94086 (408) 733-1122
In Europe: BTI Computer Systems, (UK) LTD., Birmingham B13 8NG, England (021) 449-8000

• & BTI are registered trademarks of BTI Computer Systems.

• is a registered trademark of Hewlett-Packard Co.

Honeywell's secret return on your *infor*



Honeywell, I said, tell me the secret to getting bigger returns on my information investment.



It's no secret, they said.



Please, I said, I just want to know what the insiders know. I'll never tell another soul. Promise.

Let's begin with a definition.

Return on Information Investment (ROII) means the degree to which an organization benefits from its investments in information resources. This includes computer equipment, software, and manpower.

How can ROII be improved? In large part this is a function of how information is used by your organization and how that information is created.

But for general purposes, ROII can be improved by increasing the accessibility of your information while decreasing the cost of producing and maintaining that information.

By increasing accessibility, we mean letting more people use more information more easily. By decreasing costs, we mean letting program

to improving the mation investment.



There is no secret, they said. All you have to do is increase the accessibility of your online information while decreasing the cost of producing and maintaining that information.



It's all very easy when you use our Solution Center and Development Center tools.



Actually, I knew it all along.

W.D. Mitchell

developers, system administrators, and operations people make more efficient use of the system.

At Honeywell we've developed strategies just to help you achieve these objectives:

The Solution Center enables you to offer your end users special GCOS 8 software packages to aid in decision-making, planning, forecasting, and creating reports. All capable of concurrent operation with your production applications with little or no dependence on your DP department. The result is improved self-sufficiency, productivity, and performance.

The Development Center is a collection of GCOS 8 based software tools designed to permit your program developers to design and test applications more quickly, assist system administrators in providing better performance and control, and to assist operations in managing

daily computer room activities.

And, Honeywell's design strategy for cohesive micro-through-mainframe software, networking, and computing equipment affords the long-range investment protection growing organizations need in order to keep ROII healthy in the years ahead.

By focusing on both increasing accessibility and decreasing costs, you can optimize your ROII.

That's the secret.

You might have known it all along. But, in case you didn't, call us for more information, 1-800-328-5111, extension 2757. Or write: Honeywell Inquiry Center, MS 440, 200 Smith Street, Waltham, MA 02154.



Together, we can find the answers.

Honeywell

NEWS BRIEFS

(News continued from page 28)

INHOSPITABLE HOST

Micro-to-mainframe communications are too difficult for untrained users to handle, say about half of the 1,500 MIS/dp executives surveyed by International Resource Development Inc. According to "The Directory of Plans, Executives, Policies for PCs, Office Automation, Datacom, & Electronic Mail," a report published by the Norwalk, CT-based market-research firm, executives also found that many micro-to-mainframe software links either did not work as expected or were not perfected. For information about the report, which costs \$595, call (203) 866-7800.

EDP SEMINARS

Digital Consulting Associates Inc. (Andover, MA) will be conducting a series of electronic data-processing seminars in 21 cities for Software Institute of America Inc. Among the 100 seminars slated for this spring are: DBMS and fourth-generation languages for PCs; Introduction to the Unix System; Data Communications: Network Design, Integration, and Applications; dBase II and III: Getting Started; Advanced dBase II and III: Programming Techniques; Lotus 1-2-3 and Symphony: The New Functions. For information, call (617) 470-3880.

IBM, STRATUS STRIKE DEAL

IBM, which has limited experience in manufacturing fault-tolerant computers, has signed an agreement with Stratus Computer Inc., Marlboro, MA, to remarket Stratus' line of fault-tolerant business computers. The deal puts Stratus, the second-leading maker of fault-tolerant computers, in a position to challenge Tandem Computers Inc. of Cupertino, CA, for the number-

one spot, according to Consulting Group, a Scots Valley, CA-based consultancy.

Although IBM's previous experience with fault-tolerant computers is limited primarily to specialized areas like the U.S. space-shuttle project, its IBM's Series 1 minicomputer has some fault-tolerant features.

VIVE LE TYPEWRITER

The electronic typewriter is alive and well and living in the offices of many corporations, says International Data Corp. In a report entitled "Electronic Typewriter Market 1984," the Framingham, MA-based market-research firm predicts that electronic-typewriter sales will reach \$6.6 billion by 1988, up from about \$2 billion in 1984, despite the current trend in favor of word processors. The 28 vendors surveyed believe the low price of electronic typewriters, their ability to interact with other office equipment, and the fact that dedicated word processors are not always necessary for daily tasks accounts for corporate users' renewed interest in these products. For information, call (617) 872-8200 ext. 375.

NO-FAULT DISK SERVER

Digital Microsystems Inc., Oakland, CA, has introduced the Mimic Master, an auxiliary disk server that backs up—in real time—data written to a disk server on the Hi Net local-area network (LAN).

Most tape-backup devices for LAN disk servers copy the disk at the end of the day, but the Mimic Master is actually a second disk server. Software installed on both the Mimic Master and the regular disk server allows inputting of information to both devices. If the regular disk server fails, the Mimic Master takes over. Users of transaction-oriented LANs that place a premium on instant recovery from disk failures

will find the product most useful.

The Mimic Master runs only on the vendor's Hi Net LANs, of which 3,500 are presently installed, the vendor claims. The company adds that up to 63 personal computers, running any combination of CP/M-80, CP/M-86, MS-DOS, or PC-DOS can be supported by the Hi Net LANs. The Mimic Master can have from 23 Mbytes to 84 Mbytes of storage, depending on the network. Prices start at \$7,950—about the same price as a Hi Net disk server, and more than three times the price of a regular tape backup. For more information call (415) 532-3686.

DISASTER PLANS MISS MARK

Many organizations have disaster-recovery plans, but they're generally inadequate and of poor quality. At least that's the opinion of about half of 344 executives responding to a recent survey conducted by Total Assets Protection Inc. (TAPP), an Arlington, TX, disaster-recovery and security consultancy.

According to the survey, many recovery plans are weak because they are outdated, and the developers of the plans no longer work for the corporation the plan is designed to protect. In addition, the plans suffer from a lack of adequate testing and detail.

TAPP says seventy-eight percent of the 344 executives responding to the survey have established some disaster-recovery procedures. Some of the corporations responding to the survey store backup files at an offsite location. However, asserts Mary Copeland, marketing-services specialist at TAPP, many corporations fail to secure their most important files off-site. Corporations should identify the essential parts of their businesses (the departments where downtime costs the most) and the most important files in those areas, says Copeland. For more information on the TAPP survey call (817) 640-8800. □

INTRODUCING DECISION DATA'S DUAL-PURPOSE COMPUTING WORK STATION



THE NEWEST CRT TERMINAL FOR THE IBM/34/36/38 IS A PERSONAL COMPUTER, TOO.

One machine. Two separate functions. A multi-feature work station for easy access to your System/34/36 or /38. And your own personal computer which runs programs from the IBM Personal Computer software library.

The Decision Data Computing Work Station combines the power of on-line computing with the freedom of independent processing. For less cost. And in less space.

Our Computing Work Station boosts your productivity two ways: First, it adds many new working conveniences to your standard CRT operations. Second, it makes it easy to use thousands of versatile personal computer programs.

You get the power you expect from an advanced system: a basic 256K-bytes memory, two disk drives, two serial ports and one parallel port — plus four expansion slots.

A special "hot key" lets you switch back and forth between terminal emulation and personal computing.

Operating as a terminal, the CWS permits computer output to be printed on your personal printer or stored on diskettes. Six memory keys

let you enter or retrieve up to 78 characters each — with a single key stroke, cutting down on repetitive typing.

Decision Data also provides you with nationwide service and support. Software operation and assistance during installation are provided through a toll-free 800 line that connects you to our software support center. A variety of maintenance options are also provided.

With the Computing Work Station, Decision Data can help you get more from your System/3X and more from personal computing than ever before.



**Decision
Data
Computer
Corporation**

Box 53032, 400 Horsham Road, Horsham, PA 19044

- ☐ Send me more about the CWS, Decision Data's dual-purpose work station.
- ☐ I want to know more now. I'll phone (800) 523-6529. In PA call (215) 757-3322.

Your Name _____

Company _____

Telephone _____

Address _____

City _____

State _____

Zip _____

CIRCLE 18

DECIDEDLY BETTER

Where program their

If you want to take a look at programming from a different point of view, take a look at a Smart Desk equipped with an IBM 3270 Personal Computer.

The screen of the 3270 PC can be divided into several windows—including multiple PC sessions and up to four host sessions from the same or different computers.



In the blue window you can keep a menu of your function keys. It's easy to log on and connect to a host system for browsing a program listing in the yellow window.

To edit a second program, a single function key can download the source code to a PC session in the red window.



And, when you're finished editing, another function key can send the revised program back to the host.

These multiple windows are available in eight colors. They are ideal for reviewing more than one program at once. Or for the concurrent viewing and testing of source code.



The end result is faster and more accurate programming with less demand on the host.

Any window can be viewed full screen for detailed analysis. Or it can be sized and moved to any area of the screen, so you can create the screen format that works best for you. You also get two handy notepad windows.

And, of course, the 3270 PC is backed by IBM's commitment to service and support.

One more point to keep in mind: The 3270 PC is available in quantity

discounts. Your IBM marketing representative has all the details.

And if you want to receive literature on how the 3270 PC can expand your programming capabilities, call 1 800 IBM-2468, Ext. 81 or send in this coupon.

D--PC

WHAT DO YOU WANT

PF1	Logon to
PF2	Connect t
PF3	Connect t
PF4	Connect t
PF5	Send data
PF6	Receive d
PF7	Other fun
PF8	Logoff of
PF9	Help

IBM
DRM, Dept. KP/81
400 Parson's Pond Drive
Franklin Lakes, NJ 07417

3-26

- ☐ Please send me more information on the IBM 3270 Personal Computer.
☐ Please have an IBM marketing representative contact me.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

IBM

The Smart Desk from IBM

mers can expand fields of vision.

TO DO?

sts
PC2
M8
SO
Host
from Host
ons
sts

```
E--TSO
EDIT --- K903220.XSPF1.OUT
COMMAND ===)
000025          // PARM=C
000026          // 'PGM=S
000027          6      //STEPLIB
000028          7      //
000029          8      //DFHLIB
000030          9      //CHKDD
000031          10     //CHKDD2
000032          11     //PARMS
000033          // SPACE
000034          // DCB=C
000035          12     //UMFILEA
000036          // SPACE
000037          // DCB=C
000038          13     //SYSOUT
000039          14     //SYSPRINT
000040          15     //SYSDBOUT
000041          16     //OUTPUT
000042          17     //INPUT
000043          18     //STEP2
```

E7

E7

```
C--PC2
TDISK EXEC A1 V 130 TRUNC=130
|...+...1...+...2...+...3...+...
00018 CP DEFINE AKIND AVADDR ACYL
00019 AIF ARETCODE EQ 91 AGOTO -FAILED
00020 -CONT
00021 ATYPE OBTAINED ACYL CYL.S OF AKIND DA
00022 ASTACK HT
00023 ASTACK LIFO TDISK
00024 ASTACK LIFO YES
00025 FORMAT AVADDR AMODE
00026 ARC = ARETCODE
00027 ASTACK RT
00028 AMODE = ACONCAT AMODE 1
00029 * WRITE A DUMMY FILE TO BE TESTED BY
00030 AIF ARC EQ 0 EXSERV WRITE TDISK ACCESS
00031 *
00032 AIF ARC EQ 0 ATYPE ADASD (AVADDR AMOD
00033 AEXIT ARC
00034 -FAILED
00035 ATYPE ... UNABLE TO GET ACYL CYL TDIS
00036 AEXIT 91
===)
```

C7

by Susan Foster Bryant, Microsystems Editor



Illustration by Ted Glazer

ONE USER'S QUEST FOR A DBMS

With features ranging from spreadsheet integration, automated mainframe communications, and applications development to data dictionaries and report generators, the database management system (DBMS) has become the software industry's new *cause celebre*. More than 200 packages crowd the field—a selection meant to simplify, but, in its variety, bound to complicate choices for users.

Sifting through the chaff to get to the wheat is not easy, but the managers at Service Merchandise Co., Nashville, TN, recently undertook such a task in order to set a DBMS standard for the discount retailer's personal-computer users. Richard Taylor, senior staff analyst, sought a package that performed the customary data association and retrieval chores, but also allowed users to prototype new systems and modify existing ones.

Although the most important criterion the DBMS package had to meet

was cost-effective applications development for personal-computer users, Service Merchandise established several other criteria to narrow the field. First, the package had to be flexible enough to handle both large and small databases, data entry, forms output, relational analysis, and decision support. In addition, it had to easily transfer files to and from dissimilar personal computers, minicomputers, and mainframes as well as inject database information into graphic displays or written texts. Because several departments use numeric databases, the ability to transfer data to and from spreadsheet formats was also consid-

ered important. Dropped from consideration were simple file-server DBMS packages, such as PFS: File; systems that could not support at least 30,000 records per file or 30 fields per record, such as 1-2-3 and Symphony from Lotus Development Corp., Cambridge, MA, and dBase II from Ashton-Tate, Culver City, CA; and systems that could not easily support database field addition and deletion.

Taylor also compared how well packages worked with Service Merchandise's hardware. Could the system operate efficiently with 256,000 bytes of memory or less? What was its response time on the IBM PC XT? Did the package make efficient use of the PC XT's hard disk? Could the system interchange ASCII and DIF files and support the corporation's printers and plotter?

In addition, Service Merchandise sought a DBMS that personal-computer users could learn to use in three

(Continued on page 40)

Taylor looked for
packages that
offered online help
information.



Lear Siegler Proven Quality and Reliability. Now More Versatile Than Ever.

Now your best buy in general purpose video display terminals is even better.

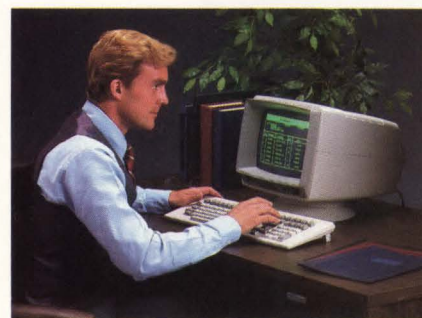
Lear Siegler's popular ADM 11 conversational and ADM 12 block mode terminals are available with more design flexibility and system compatibility.

In addition to standard compatibility with Lear Siegler terminals, you can now get compatibility with ADDS Viewpoint and Regent 25, Hazeltine

1400, 1420 and 1500, DEC VT52, and TeleVideo 912/920, 925 and 950.

You can enjoy Lear Siegler's superior performance and reliability, ergonomic design and High Touch™ style in more applications than ever before.

Call your local distributor or contact us directly for complete information on the ADM 11 and ADM 12 video display terminals.



LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION

901 E. Ball Road, Anaheim, CA 92805
(714) 778-3500

CIRCLE 20

Ready!
Fire!
Aim!

**In sales, if you're not aiming
at the right leads, you're just
shooting in the dark.**

Leads. Vital to every business. Because without them, you don't have sales. And without sales, you don't have a business.

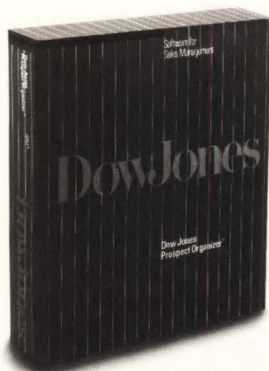
Of course, you say. You don't have to take out an ad to tell me that. Fair enough. But let us ask you this: How do you manage your leads? On index cards? On the backs of envelopes and cocktail napkins? In your head?

The point is this. Without a systematic way of keeping your sales targets in view, you might as well just close your eyes and pull the trigger.

A lost lead is a lost sale.

We're talking percentages. The more random your sales and marketing efforts, the lower your percentage of hits. You probably spend a lot of time placing phone calls that never get returned and sending out mailings that never get replies. The old shotgun approach.

Dow Jones Prospect Organizer™ helps you be a sharpshooter. The more information you have and the better it's organized, the higher your hit percentage will be. And that means a better percentage for you.



**Dow Jones Software.
For informed decisions.**

**Dow Jones Prospect Organizer:
On target, on time.**

Dow Jones Prospect Organizer helps you make the most of your sales opportunities. It is designed specifically for sales and marketing professionals. The Prospect Organizer helps you:

- create and customize prospect files
- qualify those leads through telemarketing
- manage correspondence, including personalized form letters
- analyze the effectiveness of various lead sources and promotions

Customized for your needs.

The Dow Jones Prospect Organizer can be tailored by you to meet the unique needs of your business, no matter what industry you're selling in. The Prospect Organizer comes with a toll-free Customer Service Hotline, an extensive electronic tutorial and uncomplicated documentation.

**The Prospect Organizer.
Ready. Aim...**

For a free brochure on the Dow Jones Prospect Organizer, call:

1-800-345-8500 ext. 241

(Alaska, Hawaii and foreign, call 1-215-789-7008 ext. 241)

Fill out this coupon and mail to:

A. Callahan, Dow Jones & Company,
P.O. Box 300, Princeton, NJ 08540.

☐ Yes, please send me more information on the Dow Jones Prospect Organizer.

☐ Yes, please send me a demonstration disk for the Dow Jones Prospect Organizer. Enclosed is my check or money order for \$10, payable to Dow Jones & Co., Inc.

Name _____

Company _____

Address _____

City _____ State _____

Zip _____ Phone _____

Dow Jones
Software™

ALC

(Continued from page 36)

days. Toward that goal, Taylor looked for packages that offered online help information and clear documentation, including indices giving users quick access to specific information. Packages, such as Knowledgeman from Micro Data Base Systems Inc., Lafayette, IN, dBase III, and Metafile from Sensor-based Systems Inc., Chatfield, MN, that did not meet the corporation's ease-of-use standard did not make the final cut of packages.

Because users from many departments work with sensitive data, Service Merchandise sought a DBMS package that called for passwords at data-entry and file levels. Also desirable was a package's ability to back up and save files while the system was in use.

The final criterion was each vendor's commitment to and track record for product enhancement and research and development as well as its potential for financial solvency over the next four years. Taylor wanted to avoid being stuck with an obsolete or unsupported package.

These criteria led the managers at Service Merchandise to select four packages from a group of 200 for final consideration. They were: Aura from Softrend, Salem, NH (\$495), Open Access from Software Products International, San Diego (\$595), Smart from Innovative Software, Overland Park, KS (\$495), and Data Ease from Software Solutions Inc., Milford, CT (\$600). According to Richard Taylor, the manager who rated the packages, each product was analyzed independently of—rather than against—the other products. Scores ranged from 20

to 100 points, with a score of 100 points signifying that the product met all of his criteria for a particular rubric. Smart came in first, with a total of 590 points; Data Ease followed, with 490 points; third was Open Access, with 460 points; and Aura was fourth, with 450 points.

For flexibility, Taylor ranked Smart and Data Ease first and second respectively. Aura, which does not give users access to more than one file at a time for query, retrieval, reporting, and data entry, placed last in this category. Smart holds 100,000 records per file vs. 65,000 for Data Ease and 35,000 for Open Access. Three of the packages support 255 fields per record, except Open Access, which holds 55 fields per record.

According to Taylor, Aura's tutorial, menu prompts, documentation, and screen formats earn the package first place for ease of use. Although Open Access' documentation rated high, the package's screen formats were difficult to read, says Taylor. Both Data Ease and Smart showed weaknesses in the ease-of-use category, Taylor found. Data Ease's menu prompts were slow and its documentation was unclear; Smart, which now comes with training videotapes that were unavailable at the time of the test, had a poor tutorial, according to Taylor.

In the category of functional integration, Open Access took first place. With the exception of Data Ease, which lacked spreadsheet integration, all of the packages had integrated modules for word processing, graphics, and spreadsheets. Aura's spreadsheet is the smallest of the three, at 255 rows

Database management systems have become the software industry's new cause celebre.

× 63 columns. Smart and Open Access offer time-management modules, and Aura and Open Access offer communication modules. Aura excepted, all the packages allow file interchanges between ASCII and DIF formats.

Both Data Ease and Smart require users to enter passwords at various levels and provide activity logs or audit trails. Aura requires passwords only at the menu level; Open Access requires no passwords.

For vendor survivability, Innovative Software, the manufacturer of Smart, received a perfect score. It has been in business longer—five years—than the other three vendors. Also, because Smart is written in C language, which is considered by some to be the language of the future, and has a modular design, Taylor judged the package both as having the brightest future and as being the most efficient of the four packages.

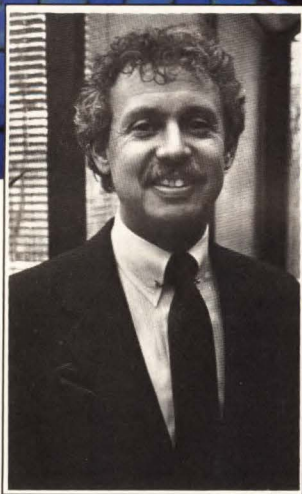
Smart, the winner for Service Merchandise's database management needs, will be supported by the corporation's information center, which is developing a training program to teach users the basics of systems development using database management principles and the specific features of the Smart system. A training videotape is available for users, as well as videotapes from Deltak, a training-products vendor based in Naperville, IL, which cover the fundamentals of database management. For follow-up support, says Taylor, a member of the information-center staff will be on hand to answer questions and assist users in developing applications with the Smart system. □

TAYLOR'S "FOURCAST"

	Aura	Data Ease	Open Access	Smart
Data interchangeability	60	100	80	80
Data security and integration	50	90	20	90
Ease of use	100	50	70	60
Efficiency of operation	80	50	80	90
Flexibility	30	90	50	100
Functional integration	70	40	100	70
Survivability/futures	60	70	60	100
Total score	450	490	460	590

These scores reflect the opinions of Richard Taylor, senior staff analyst at Service Merchandise Co., based on pre-set criteria.

Man Bytes Dog



Steven Swartz, CEO,
Drumbeater Corporation:
Advertising, Marketing,
Public Relations, Corporate Design.
(617) 246-0782

Now *that's* news.

Drumbeater Corporation has been helping companies across the country make news and create sales for more than a decade.

We do it with high-impact, convincing advertising, marketing and public relations programs that put hardware, software, and other highly technical products in the public eye. And keep them there.

We back it all up with knowledgeable, effective media plans, targeted to decision-makers, so that good news develops into outstanding response.

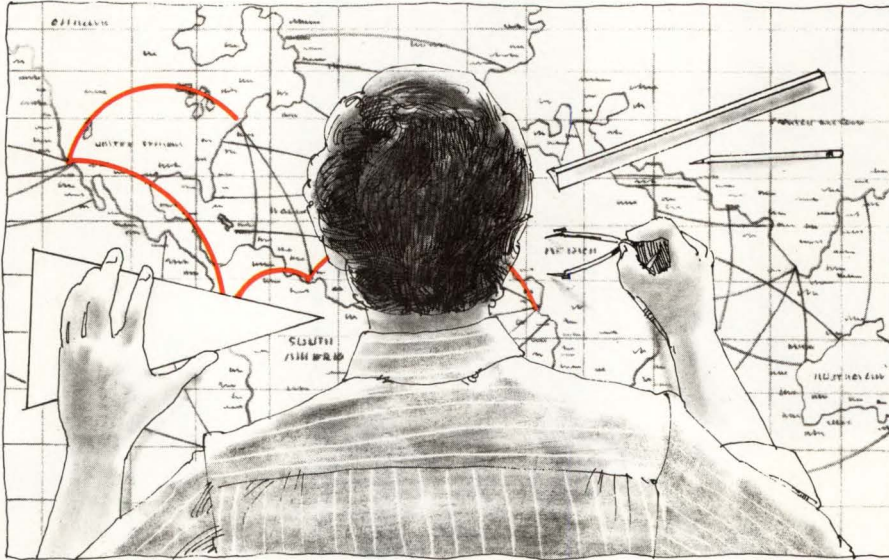
That's why Computer Decisions is included in our media planning process. With 100% management circulation, it's the publication read by the people our clients need to talk to. People respond to what they see in Computer Decisions.

That means results . . . good news in any business.

**COMPUTER
DECISIONS**
THE MANAGEMENT MAGAZINE OF COMPUTING

STRICTLY SOFTWARE

by Peter L. O'Dell, Guest Columnist



OF MIS, SOFTWARE, AND PLANS

The best-laid plans of MIS/dp managers are often mislaid in the service of maintaining old software while meeting today's user demands with new packages and in-house solutions. Although this reality does not bode well for MIS/dp departments finding their way out from under increasing applications backlogs, it does underscore the importance of strategic planning in setting and meeting objectives and in keeping these goals in line with those of the rest of the organization.

One of the main reasons MIS/dp departments exist is to provide data and technical support for the rest of the organization—a fact of life MIS/dp managers can't afford to lose sight of. Day-to-day decisions about applications and how to provide for them made outside the context of the organization as a whole may result in a technically sophisticated, smooth-running MIS/dp operation, but one that isn't doing its job.

This problem surfaces when MIS/dp directors view strategic planning as an annual event, a process akin to preparing a corporate budget. Once a year, usually after a long, problem-filled day, the director pulls out the plan, dusts it off, and hurriedly rewrites it, deleting outdated items and briefly noting major developments from the previous year. The plan is retyped, distributed to top management for light reading, and then stored for another year, which is an understandable strategy given the pressures of keeping current with existing technology and meeting users' demands, let alone projecting the organization's needs into the future.

However, with the assistance of their administrative staffs, it shouldn't take MIS/dp managers more than 50 hours to develop plans that look five years ahead. If plans are viewed as working documents, referred to and revised regularly as departmental and corporate objectives change, they needn't be rewritten unless a major event, such as

a merger, requires managers from all parts of the organization to drastically restructure corporate policy. In addition, keeping a close watch on existing applications will enable MIS/dp managers to anticipate new system or software requirements before they become crises or missed opportunities.

The advantages of working with a malleable document are many, but they all hinge on one important detail: the plan's clarity of purpose. A strategic plan should first focus on information, applications, and systems needs—and software is probably the most dynamic, difficult-to-track part of that plan—and then on the means of fulfillment. Some questions MIS/dp managers can ask to keep both the goal and the means of providing information in perspective are:

- How great an impact does information services have on your organization's profits and/or sales?
- Which systems do users and top

(Continued on page 46)

WHEN THE BOSS'S KID STARTS REWRITING THE FINANCIALS, WHAT'S YOUR DEFENSE?

VMCENTER:

THE ONE INDISPENSABLE SURVIVAL TOOL FOR VM DATA CENTER MANAGERS.

Breaking into your online system isn't supposed to be child's play. But all too often, it is.

Unless, of course, you have VMCENTER.

VMCENTER is the one comprehensive system that addresses all your key concerns as manager of a VM data center. And none of those concerns is more important than the security of your system and data.

That's why VMCENTER provides multiple authorization levels—for maximum control over system usage.

It's also why we've designed VMCENTER to make it easy for you to customize your protection to meet specific needs. You can change passwords in a flash, encrypt data through simple commands, and use on-line reports to keep top management informed of potential security problems *before* they happen—not after.

But if you think VMCENTER is great for security, you should see what it does for disk and tape management, resource scheduling, workload balancing, and system accounting. In one stroke, VMCENTER eliminates all your biggest headaches. And does it in an integrated manner that's more effective than any possible collection of quick fixes.

VMCENTER. It's not much fun for the boss's kid. But it can be a lifesaver for his dad—and for you.

For more information on VMCENTER, call or write VM Software, Inc., 2070 Chain Bridge Road, Suite 355, Vienna, Virginia 22180, telephone (703) 821-6886.





ere are the facts. Not vendor
hype. Not empty promises.
Simply the facts. And that
should be refreshing.

**Users name SOFTWARE
company with top DBMS**

AG as and 4GL team!

The word is out--and we're not surprised!

When Data Decisions decided to rate systems software packages, they went right to the people who really count. The users. Their 1984 Systems Software Users' Survey reveals ADABAS—for the third year in a row—to be the highest ranked data base management system for the IBM mainframe. And NATURAL was a top contender for best fourth-generation language.

Taken together, ADABAS and NATURAL make an absolutely unbeatable team! When we talk about product integration . . . it's not just

talk. Every product in our system is fully integrated.

At Software AG, we don't believe in surprises. We believe in providing our users with the most powerful software tools available anywhere. And that's the proper plan for the world leader in advanced systems software.

So if you want the facts about systems software, just ask our users. For starters, send us the coupon below and we'll rush you a reprint of the survey results. Or call us at 1-800-336-3761. (In Virginia and Canada, call 1-703-860-5050.)



Where the future
comes as no surprise.

Send me the facts.

Name _____

Title _____

Company _____

Address _____

State _____

Zip _____

City _____

Complete and mail to: Software AG, 11800
Sunrise Valley Drive, Reston, VA 22091.
(Or call 1-800-336-3761. In Virginia and
Canada, call 1-703-860-5050.) CD 0326

© 1985 Software AG of North America, Inc.
ADABAS and NATURAL are trademarks of
Software AG of North America, Inc.

(Continued from page 42)

management consider to be successes? Which are not? Why?

- How well does your staff measure up to top management's standards?
- What percentage of your department's budget is spent on staff, hardware, software, communications, maintenance, and research and development?
- What is your organization's hardware and software architecture?

Not only can a strategic plan centered around a clearly defined goal provide solutions to an organization's software problems, but it also allows MIS/dp managers to establish procedures for allocating resources to users according to their needs rather than on a first-come-first-served basis or in response to political pressures. If they have top management's approval, MIS/dp managers can use strategic plans to deflect criticism when they deny or postpone users' requests. If, for example, a personnel director should ask the MIS/dp department to write a program that generates birthday cards for employees, a plan sanctioned by an organization's top brass could help an MIS/dp manager explain why other applications take precedence over such a request.

Although a strategic plan provides a framework for decision-making, it should not be so rigid as to preclude exceptions. However, too many derailments from a strategy usually signal that an MIS/dp manager is making some short-sighted choices. If a project manager requests a new development tool, for example, its immediate benefits may be obvious, but the tool may not fit into an overall development strategy. Instead, MIS/dp managers

"If a strategic plan answers some questions, but raises a thousand more, that means it's right on target."

must be willing to forgo the short-term productivity gains afforded by specific projects for the long-term benefits provided by an integrated approach.

Meeting users' needs brings MIS/dp managers into the mainstream of business, and strategic plans are important in this arena as well. To prepare information plans, MIS/dp directors must understand the organizations they serve, and that means they must have business as well as technical savvy. One of the best and fastest ways for MIS/dp managers to become business-smart is to include key managers and executives from various departments in the planning process. Not only will this type of planning strategy give MIS/dp managers a first-hand education, but it will also open lines of communication and solidify relationships between MIS/dp and user departments. As an added plus, by becoming more of a generalist, the MIS/dp manager can make him- or herself more marketable for the next step up the managerial ladder.

Discussions with general management provide the MIS/dp manager with a clear sense of the present needs and the history of the organization—the background he or she requires to draft a strategic plan. Although such a document need not be long or elabo-

rate, it must answer specific questions about how the organization functions as well as how the MIS/dp department serves the organization. In addition to meeting with key executives, MIS/dp managers can find answers in their employers' annual reports and business plans, in business and industry journals, and in their competitors' annual reports. The following questions, which are based on a strategic plan for a large manufacturer, apply to any type of organization and should be addressed in MIS/dp managers' strategic plans:

- How many people does your organization employ? How many locations has it? What are your organization's liquid assets?
- Is your organization centralized, decentralized, or a mixture of both?
- How many products does your organization produce? What proportion of sales and profits does each represent?
- What are your organization's gross and net profits? Sales? Market share?
- Is your organization an innovator or does it produce products engineered 30 years ago?
- What are your organization's critical success factors?
- Who are your customers?
- What are your organization's key objectives over the next five years?
- What is the state of the economy? What is the prime interest rate? The rate of inflation?
- What pending or new legislation affects your organization?
- How does your organization react to changes in the economy? Are there key economic indicators that affect your organization?
- Who are your organization's competitors? How well are they doing overall? In sales? Profits? Market share?
- What are their plans for the future?
- How do they use information systems?

Information culled from business periodicals and annual reports or provided by top executives will give MIS/dp managers a running start in preparing strategic plans, but these are not their only resources. The expertise and support of the MIS/dp staff itself can go a long way toward indurating a strategic plan within an organization. Subordinates who read industry publica-

A PLANNING MANIFESTO

Strategic information plans vary, of course, according to the type of organization and the needs of users they serve. But several universals can be identified that cut across organizational and user differences:

- The planning process must be on going and evolutionary.

- The end product, information, determines the means of producing it.
- MIS/dp objectives are inextricably linked to organizational objectives.
- Strategies must reflect real, not ideal, objectives.
- Concise but detailed document will win the support of high-level management.



Oh, the joys of being a DP professional.

Every job has its share of problems. But DP professionals seem to be blessed with more than their fair share.

We can help you do away with some of the grief and hassle. Things such as JCL errors, production foul-ups, and network breakdowns.

Our JCLCHECK™ program spells "relief" from JCL problems. It catches all JCL errors, gives you complete, on-line error validation and concise diagnostics. Plus full documentation on a job stream, or entire production system, suitable for insertion in the run book.

Our ProDict™ program is the instant remedy for production headaches. It's an automatic, on-line dictionary of all your production jobs, data sets and programs, that can save

you the hours, days, even weeks now spent manually searching listings. It makes possible better scheduling, reliable contingency planning, and faster disaster recovery.

Our NetCheck™ program takes the pain out of taking control of your CICS network. It allows you to organize your network in manageable groups with easy-to-remember names. It enables you to bring up the network in just minutes. And troubleshoot problems in seconds. So things get done faster and easier, with you in control of your network, instead of vice versa.

For all the details on JCLCHECK, ProDict, and NetCheck send the coupon, or call us at (408) 554-8121. We'll deliver fast, long-lasting relief.

Send me more about:

- ☐ the JCLCHECK program
- ☐ the ProDict program
- ☐ the NetCheck program
- ☐ Have your representative call me.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

OPERATING SYSTEM _____ NUMBER OF CICS TERMINALS _____



Triangle Software Company

4340 Stevens Creek Blvd., Suite 275
San Jose, CA 95129

CRITICAL-DATA CHART

	Customers	Production	Distribution
Complexity	High; many customers; custom billing	Low	Moderate
Present status	Excellent	Satisfactory	Unsatisfactory—many errors
Anticipated change	None	New lines will require revisions	New markets will require attention—high priority item

A chart like the above provides a format for describing the key corporate data sets identified in a strategic information plan.

tions and attend trade shows and seminars can fill in some of the gaps in MIS/dp managers' research. But any strategic plan that attempts to be inclusive requires the input of two key players, the database administrator and the technical manager. If inventory records are only 80 percent accurate, for example, the database administrator's understanding of the organization's information system will help the MIS/dp manager decide whether the problem reflects poor software, bad management practices or lack of concern, or other problems. The technical manager who follows the latest developments in technology can be an invaluable asset when an MIS/dp manager has to find a workable systems architecture to meet users' needs.

With a realistically rendered picture of an organization's present tempered by an equally faithful representation of its recent past, an MIS/dp manager can begin to plan for the future. Major changes in the past can offer clues as to the direction in which the organization is or should be going. If an organization has a strategic business plan that details objectives for the next five years, this artifact will help an MIS/dp manager plan for the information needed to meet those objectives. Even a vague business plan that contains imprecise language, such as "maximize profit" and "minimize turnover," can be of some use. Because most department managers have strong opinions about the future of the organization, they can provide the specifics that will sharpen a hazy plan. If an organization does not have a strategic plan, but operates on a

day-to-day basis, an MIS/dp manager should try to sketch one on the basis of discussions with top management and department managers and selective reading.

Once MIS/dp managers are satisfied they have garnered enough information, they can begin writing. But even though they may have taken great pains to make their research complete, MIS/dp managers must bear in mind that concision most of all will sell their reports to the corporate brass, who already have too much to read. A document held to 10 pages that does not justify or explain every entry will suffice in most cases. The elements to include are:

- Mission statement, which defines the responsibilities of your department and explains why it exists.
- Business-plan summary, which focuses on the business activities that relate to your mission and covers the effects those wide-ranging plans will have on your department and your organization's information system. For example, if a proposal for expansion into new geographical areas means additional communications facilities will be needed, this is the time to discuss such a change.
- Current situation, which briefly describes systems that are working well

and those that could be improved. Emphasize the systems that justify the existence of your department. Describe current development projects and point out possibilities for the near future.

● Key-data summary, which diagrams key-data divisions within the organization and ranks them in terms of complexity. The accompanying chart suggests a format for this information.

● Planning assumptions, which establish how your strategic plan relates to the most likely course of events laid out in the business plan. Develop both optimistic and pessimistic scenarios to prepare your department for the best or worst of all possible worlds. For an established, well-run company, a pessimistic forecast may translate into a 2 percent increase in net profits and an optimistic projection may mean an 8 percent increase. In a volatile business, the downside may be a 50 percent decline in business; the up side may mean 200 percent growth. The greater the difference is between extremes, the more important is the planning process. However, you must also be aware that a causal relationship may not exist between how well an organization does overall and how well the MIS/dp department fares.

● Departmental objectives, which outline in business rather than technical terms what you expect your department to accomplish over the next five years. Be realistic, but aggressive, and keep your audience in mind. To you, a statement such as "provide current shop status on orders in progress" may mean "install automated data-collection module of program X," but you might lose your audience if you choose the latter version. After you have written these objectives, compare them to your assumptions. Do they match?

● Functional-support schedule, which describes current systems, lists major additions that will be implemented dur-

"If a strategic plan answers some questions, but raises a thousand more, that means it's right on target."

TO CUT PAYROLL/PERSONNEL PROBLEMS — CUT HERE

Reading the information packet that comes when you send in this coupon is like getting free advice from a consultant. It's loaded with ideas on how you can use your current computer to gain instant access to the information that helps you solve human resource problems.

How it Works

The ISI Human Resource System puts you in complete control because it addresses everything from equitable compensation to flexible benefits and payroll processing. ISI's software solution is modular so you can use the components individually or integrate them into a powerful human resource system.

Easy to Learn, Easy to Use

ISI designed the System to deliver information easily and quickly so you can make better decisions and manage with greater expertise. The system is menu-driven to prompt you every step of the way. Documentation and training get you going quickly. The software provides on-line inquiry, editing and real-time updating.

mentation and training get you going quickly. The software provides on-line inquiry, editing and real-time updating.

Proven Performance

ISI's reputation as a leader in the industry has been earned over thirteen productive years working exclusively with human resource systems. That means our Systems are dynamically designed and constantly updated. ISI

YES! Send me a free information packet on the ISI Human Resource System.

NAME _____

ORGANIZATION _____ TITLE _____

ADDRESS _____

CITY, STATE OR PROVINCE _____ ZIP _____

TELEPHONE (____) _____

HARDWARE _____ # OF EMPLOYEES _____

Announcing the ISI Seminar Series for Payroll/Personnel decision makers in twenty-six cities. Call for details.

Can't wait for the postman? Call toll free. In the U.S. call (800) 824-8199, in California, (800) 824-8198, locally and in Canada (415) 939-3900. We'll ship your material the same day.

Systems have been acquired by hundreds of organizations including Ford Motor Company, Harvard University, RCA Corporation, First National Bank of Chicago, The City of Cincinnati and many, many more.

Send Today

We'll rush you our free fact-filled packet that points the way to better management with

the ISI Human Resource System.

HARDWARE — IBM System/38, 370, 43xx, 30xx, and PCM'S.

DATA BASE ENVIRONMENTS currently supported — VSAM, IMS, IDMS, ADABAS, DATACOM, and TOTAL.

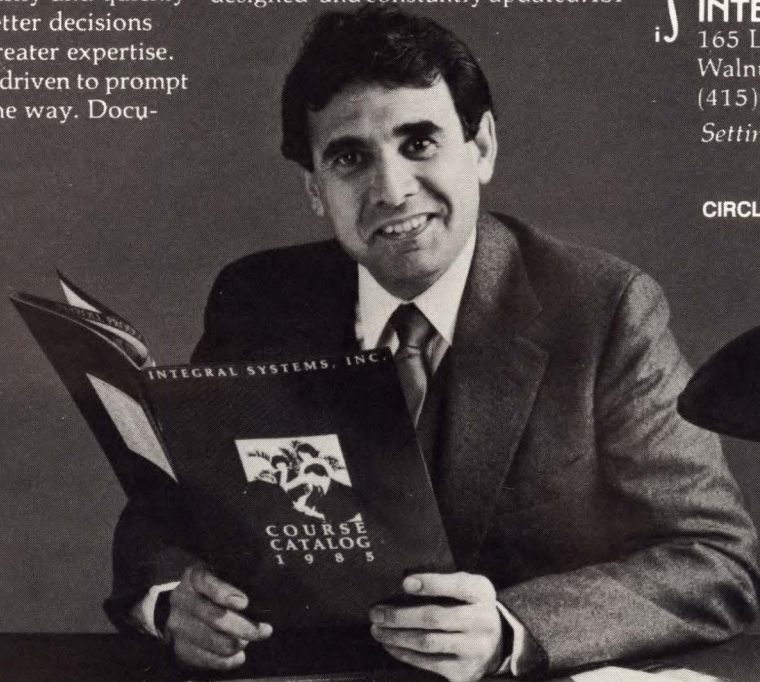
ON-LINE ENVIRONMENTS currently supported — CICS, IMS/DC, ADS/OnLine, NATURAL, IDEAL and TIS.

INTEGRAL SYSTEMS INC.

165 Lennon Lane
Walnut Creek, CA 94598
(415) 939-3900

Setting the Standards for Excellence

CIRCLE 26



ing the planning period, and projects how and when they will benefit the organization.

- Departmental-operations descriptions, which consider in detail all the functions within your control and your plans for them. You'll probably want to touch on hardware architecture, software, systems-development approaches, data management and integrity, storage capacity, communications, integration, personnel, training, facilities, end-user computing, new technology, security, and disaster recovery.

- Summary, which condenses and highlights the essence of your plan.

If a strategic information plan answers some questions, but raises a thousand more, don't worry: That

"It shouldn't take MIS/dp managers more than 50 hours to develop plans that look five years ahead."

means it's right on target. An aim of the planning process is to stimulate thought about the future and all the variables that will shape it. For this reason, the plan should be distributed, pondered, shown to top management for feedback, rewritten, and used as the basis

for more detailed planning and budget preparation. The guidelines of a realistic plan will pertain to all subsequent plans, projects, and budgets. But most of all, the plan shouldn't be hidden in the back drawer of a desk or filed into oblivion. Key points should have everyday applications. The document itself should be stored on a word-processing disk so it can be easily referred to and updated. If MIS/dp managers take some time every week to look at their objectives, they will begin to see progress, which, however slow, takes the sting out of daily frustrations. □

Guest columnist Peter L. O'Dell is director of technical services for Criton Technologies, Bellevue, WA.

IN BRIEF: CASE GOES MICRO

Nastec Corp., Southfield, MI, has introduced Case 2000 Environment, a version of its Case 2000 computer-aided software-engineering package that runs on IBM PC XT, PC AT, and 3270 PC computers. Systems designers can use the package to create data-flow diagrams and write associated documentation. Case 2000 Environment features a design dictionary, which allows design elements such as data descriptions and workflow and process definitions to be reused; an analyzer, which assesses the completeness and accuracy of data-flow diagrams; a full-screen programming editor; and facilities for checking the consistency of Cobol programs. Earlier versions of the package were available only for Nastec-supplied workstations. Priced at \$6,900, the package requires a graphics board at an additional cost of \$695. A Microsoft mouse is optional. For information, call (313) 353-3300.

NEW ADR/DL FOR COBOL

Applied Data Research Inc., noted in recent years for its database management-systems development tools, has released a package that extends fourth-generation facilities to Cobol

applications. The Princeton, NJ-based manufacturer's ADR/DL provides an interactive development system for applications running under its own database, Datacom/DB, and IBM's database, IMS. The new version allows users to develop and maintain Cobol programs that access conventional files as well as maintain Cobol programs not originally developed with ADR/DL. The Cobol version of ADR/DL costs \$25,900 for machines running ADR's Roscoe development system under OS and \$21,000 for those running ADR's Vollie under DOS. Contact ADR at (201) 874-9000.

SAS BUYS SYSTEM 2000

Having purchased Intel's System 2000 database management system (DBMS), SAS Institute Inc., Cary, NC, will support the licensees of the package and develop interfaces between the DBMS and SAS' statistical analyses and graphics packages. According to an SAS spokesperson, other DBMS vendors have interfaced the SAS packages with their products. The System 2000 acquisition allows SAS to offer its own integrated SAS-DBMS package.

EXPRESS ROLLS ON

Management Decision Systems Inc., the Waltham, MA-based manufacturer of Express decision-support system, recently released two packages that will speed the work of financial analysts and corporate accountants. Express Easyscan, which costs \$50,000 and runs on Prime and IBM computers, allows analysts to rapidly access and analyze corporate financial data in Standard & Poor's Compustat II databases. Users can scan the database, which includes stock prices, sales and profit figures, research and development expenditures, and other financial information for more than 6,000 publicly-held corporations, according to a range of criteria.

Like Easyscan, Financial Consolidation and Reporting System (FCRS), runs on IBM and Prime mainframes. Priced at \$120,000, FCRS helps users manage the process of consolidating subsidiaries' financial reports, including validations, reconciliations, currency translations, and roll-ups. The system captures data and provides analysis facilities as well as maintains a comprehensive audit trail. For information about either package, call (617) 890-1100. □

Announcing Support for
IBM 5080
Graphics Workstation
Call for details.

Choose Precision Visuals graphics software and you're in the best company.



"DI-3000 has saved our company a lot of time and money."

David Millard
Advanced Software Analyst
Marathon Oil Company

"Superior documentation makes our customers successful."

Rick Maule
Director of Product Marketing
Harris Corporation, Computer Systems

"Support from both corporate and the local office is outstanding."

Leland Freeman
Manager of Decision Support Software
Management Decision Systems, Inc.

Over 1,000 customers depend on the safety and reliability of our software.

Demanding end users and systems integrators world-wide—including many Fortune 500 companies—choose Precision Visuals graphics software as their corporate standard. They choose safety in machine independence, from mainframes to the leading supermicros. They choose reliability in products that offer device-intelligent support for every major graphics hardware vendor. And they choose peace of mind by investing in graphics software that commands 92% repeat business from our customers.

A complete graphics toolbox means one-source problem-solving.

Graphics champions in diverse industries, including aerospace, petroleum, electronics, and scientific research, choose Precision Visuals' integrated family of standards-based packages. Our device-independent subroutine libraries, DI-3000® and GK-2000,™ are used in applications ranging from interactive 3D modeling to VLSI design. Our Contouring System is used widely in cartographic and geophysical applications. GRAFMAKER™ is our powerful chartbuilding system, and PicSure™ is our new, easy-to-use data presentation graphics package.

Responsive support and industry-acclaimed documentation make our users more productive.

A HelpLine offers quick answers to keep them on schedule. National training programs help get their applications operating on time and within budget. User's groups exchange creative and timesaving ideas. And example-intensive documentation adds value to their investment.

Choose Precision Visuals graphics software and you're in the *right* company. Call Rob Look today at 303/530-9000.



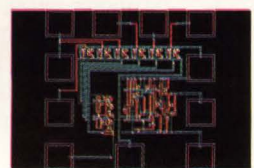
Precision Visuals®

Precision Visuals, Inc.
6260 Lookout Road
Boulder, Colorado 80301 USA
303/530-9000
TELEX (RCA) 296428

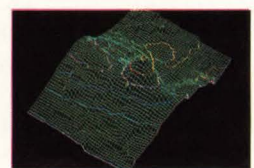
CIRCLE 27



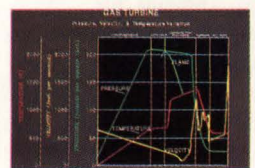
Interactive 3D Modeling
using DI-3000®



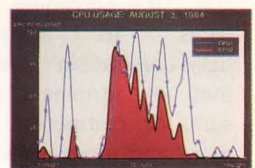
2D Circuit Design
using GK-2000™



3D Surface Display
using the Contouring System



Powerful Chartbuilding
using GRAFMAKER™



Technical Data Presentation
using PicSure™

German Office: Hahnstrasse 70, D-6000 Frankfurt 71, Tel. 069-6666597
UK Office: Tel. 0734 (Reading) 21528

by John Seaman, Data Communications Editor

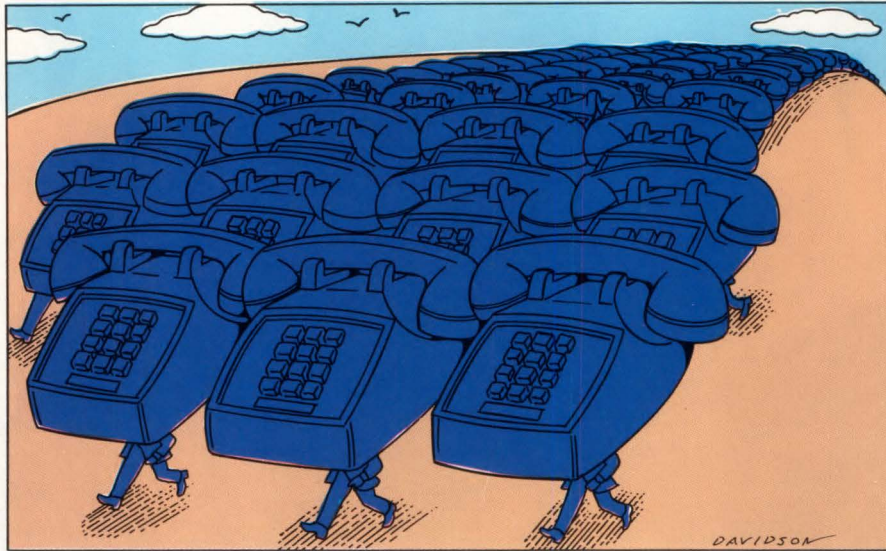


Illustration by Everett Davidson

BIG BLUE STALKS COMMUNICATIONS

Users who are accustomed to tapping various sources to meet their telecommunications needs will have to adjust to a new corporate reality. IBM's January 1 reorganization signals that the giant is stalking telecommunications in a big way. IBM intends to provide "cradle-to-grave" solutions and encourage its army of users to buy IBM integrated systems. For many of these users, prior commitments to IBM will leave little room for choice.

"IBM is locking up the communications world using the same strategies that were so successful with mainframes," says Joseph Healey, manager of the voice and local-area communications group at Network Strategies Inc., a consultancy in Burke, VA. "It's becoming very difficult for users to employ so-called 'IBM-compatible' machines—whether they are terminals, front-end processors, or computers. IBM is making more and more of its systems interde-

pendent. You can't buy one piece without the other."

Central to IBM's reorganization is the IBM-AT&T confrontation. There's a big difference between AT&T's efforts to compete with IBM in the computer business by offering minis and micros and IBM's acquisition of Rolm Corp., the Santa Clara, CA-based vendor, as a way of competing on AT&T's traditional turf, says Healey. "IBM is not challenging AT&T in transmission facilities, but in every aspect of equipment," says Healey. "IBM is throwing down the gauntlet."

Charles R. Robbins, who heads Strategic Market Trends, a consultancy in Sharon, MA, believes IBM and AT&T are both scrambling to be full-service vendors. "It's fairly evident," he says, "that users are beginning to want totally integrated telecommunications solutions. This includes local, gateway, and long-distance needs."

Analysts at the Gartner Group, a consultancy in Stamford, CT, say that

IBM, once a computer maker *seeking* to enter the telecommunications market, is now a fully integrated information-systems competitor, providing a full range of computer and telecommunications products and services. IBM is focusing on integrating its workstations with the Rolm CBX II, as well as on coordinating private branch exchange (PBX) and local-area network (LAN) developments.

Rolm, a wholly owned subsidiary under the overall IBM umbrella, was IBM's first major acquisition in two decades, and Big Blue has tied it to its other telecommunications and workstation projects. The new Telecommunication Products Organization has been made part of a newly restructured Information Systems and Communications Group. It joins the Raleigh, NC-based Communications Products Division, which is responsible for IBM's putative token-passing local-area network and the 3270 family of dumb

(Continued from page 52)

Guess Who is Getting the Best Deal in 2400 bps Modems? You!

With Gandalf's New Auto-dial/Auto-answer Modem for \$995.

Gandalf now offers you the best value in full duplex 2400bps modems. Why let your modem slow you down? 2400bps is now affordable! With the SAM 24 modem, you can send and receive data over standard telephone lines. What's more, it is line compatible with CCITT V.22 bis and Bell 212A modems. And it can talk to Bell 103 modems. The SAM 24 automatically adjusts its speed to 2400bps or 1200bps (300bps optional).

The Gandalf SAM 24 is more than just another 2400bps modem. It's technically advanced with its own custom LSI, microprocessor design and in-

cludes an automatic adaptive equalizer and extensive diagnostics to ensure superior performance. And set-up is easy. The SAM 24's user friendly dialog puts you on line effortlessly. Its integral auto-dialer permits direct pulse or Touch Tone dialing using an attached computer or terminal keyboard. And SAM 24 is available in standalone and rack-mount models.

When it comes to value at 2400bps, the name is Gandalf. Call us today for details on our complete line of modems, multiplexers and data networking products.

gandalf®

(312) 541-6060
TWX 910-651-4951

A subsidiary of Gandalf Technologies Inc.

Boston	617-329-7630	St. Louis	314-878-8099
Hartford	203-269-2693	Chicago	312-459-6628
Washington, DC	301-622-5400	Los Angeles	818-571-6644
Atlanta	404-446-0033	San Francisco	415-571-6100
Houston	713-869-7229	Bellevue	206-881-1994
Dallas	214-980-2690		



Takes their without



The Displayphone-Plus Terminal

terminal's place the space.

It's important that the Displayphone-Plus* terminal can fit with an existing information management system, offering download emulation of virtually any cursor addressing conversational CRT and plug-and-play compatibility with the VT-100.

But what makes the Displayphone-Plus amazing is that it does it all while still fitting comfortably on a desk.

Inside the Displayphone-Plus terminal is a 212A compatible auto answer modem with selectable 300/1200 BPS transmission rates and full automatic log-on. So it can meet the needs of managers and other occasional data users, while emulating such terminals as the Digital Equipment Corporation

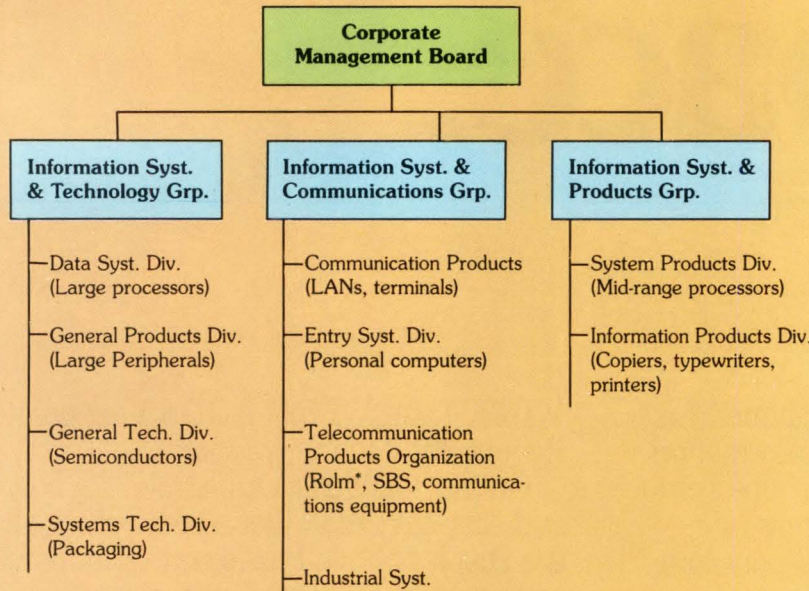
VT-100™ and VT-52™, ADDS Viewpoint®, Regent 25®, and many more.

On the outside is a full-stroke keyboard and easy-to-read amber screen which allows the Displayphone-Plus terminal to match the performance of large, conventional terminals. Its sophisticated telephone capabilities allow it to surpass them with a 90-number directory, automatic dialing, and handsfree speaking. And it's as easy as a telephone to use.

To find out more about the Displayphone-Plus terminal, call 1-800-328-8800, or write to Northern Telecom Inc., Advanced Communications Terminals Division, P.O. Box 202048, Dallas, TX 75220-9990.



THE NEW IBM



Although Rolm is under the rubric of Information Systems and Communications Group, it is a wholly owned subsidiary of IBM and reports directly to Paul Rizzo, IBM vice chairman.

(Continued on page 56)

terminals; and the Boca Raton, FL-based Entry Systems Division, which is responsible for IBM's intelligent workstations.

To complete the reorganization, IBM has organized the Information Systems and Products Group, comprising the Information Products Division, which is responsible for typewriters, copiers, and other stand-alone office products; and the Systems Products Division, which is responsible for mid-range processors (System/36, System/38, 8100, and 4361). Both were formerly part of the Information Systems and Communications Group.

As a result of the January reorganization, IBM now has three development and manufacturing groups, organized by product; and a single U.S. sales and service group, organized by user.

Will the new IBM/Rolm alignment help promote new IBM products—particularly a local-area network? "Selling with Rolm," Healey replies, "will certainly ease the IBM office-cabling systems [designed to accommodate the not-yet-announced IBM LAN] into place. Users will be able to buy a Rolm

switch for corporate voice-transmission needs today and, later on, obtain the means to handle data at very little additional cost."

Managers can expect to be able to deploy all IBM personal computers, except for the PC jr., with the Rolm CBX II as soon as Rolm supplies CBX II interface cards. Users will see PCs that employ more microprocessor intelligence and, consequently, that are better able to work with the CBX II, says Healey. "The PC interaction with the CBX II will not be constantly interactive, as, for example, with a dumb terminal. Occasionally, you're going to require large file transfers. This will be possible for enhanced PCs."

Right now, IBM is developing what Healey describes as a port-contention type of scheme. With it, IBM 3278 terminals will have access to 3274 cluster controllers through the CBX II, a cheaper alternative than providing separate links from each terminal to the controller. "Users will avoid the expense associated with providing a 3274 port for every 3278 terminal," he says. "These same users will also simplify their wiring."

Organizations that already have

Rolm PBXs would prefer not to have to acquire general-purpose LANs that "wire the whole world," says Healey. IBM has responded, says Healey, with a promise to eventually provide a PC local network, a star-shaped ring LAN to handle many office transmissions, a broadband system for factory automation, and the CBX II. "With the CBX II, even now, voice is omnipresent—you've got phone extensions everywhere—so users will be encouraged to hook a wide range of IBM products to the system. And many CBX IIs are online already."

IBM's Systems Network Architecture (SNA) protocol will be the glue that holds all this together, says Healey (for example, when the CBX II can become another node on an SNA network). "Users will have little option to do anything else but buy a whole integrated system," says Healey. "Users won't be buying the separate pieces anymore."

Healey foresees gradual price increases in the wake of the IBM reorganization. "In a year or two IBM and Rolm customers can expect to pay about the same. Users will be buying from IBM because of the perceived advantages in service and support. In several years, users can expect to pay more, especially for Rolm integrated-systems products, products that include the yet-to-be announced IBM LAN, and products that incorporate SNA. As the functionality of the products increase, prices will increase." However, Healey emphasizes that in about 10 years, IBM/Rolm will capture the market for telecommunications equipment, and prices will come down. "As other vendors catch up and are able to provide equivalent functionality," Healey says, "IBM will cut its prices, kill off the competition, and then dominate."

Some IBM and Rolm users are happy about the merger and acquisition. Nonetheless, some managers are quick to point to the merger's anticompetitive implications. Whether the inherent benefits outweigh this drawback, you can be certain that more changes will follow as a consequence of the IBM/Rolm merger and the January 1 reorganization. □



A. Jones. Patrick Henry Delivering His Speech at the House of Burgesses. Courtesy The Bettmann Archive.

There's no argument that in today's business arena, 2400bps full duplex dial modems provide the lowest cost and fastest route to data communications. But of all the modem manufacturers that are promising you great dial line savings, there's only one company delivering the modem products you really need—Concord Data.

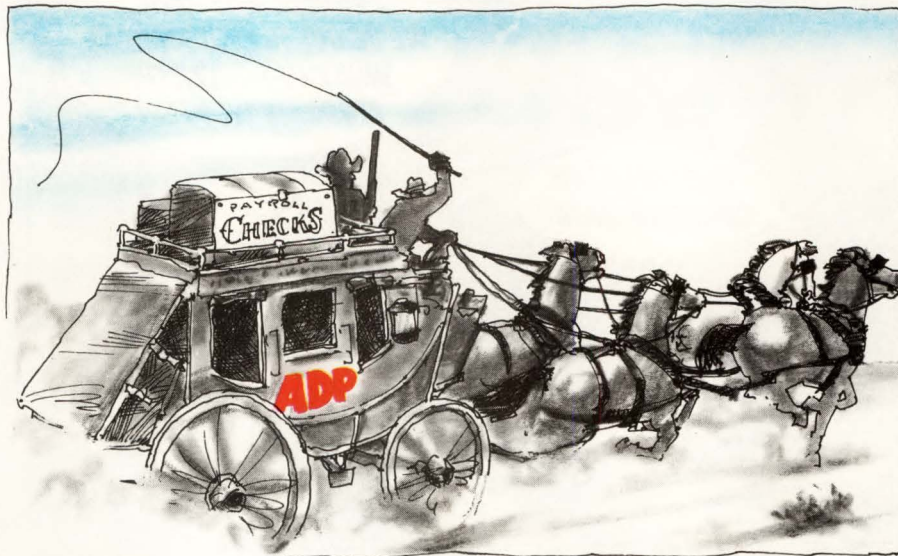
We offer the largest family of 2400bps modem products on the market, with features that you can mix and match to get just the data performance your business application requires. Choose from autodialing, error correction, statistical multiplexing, complete diagnostics and more. We even have the world's first central site, rack-mounted modem card that operates at 2400, 1200, and 300bps. We've installed over 50,000 modems worldwide, and we're shipping *thousands* more each month. And naturally, we're offering revolutionary prices on our complete line. If you've heard enough talk about 2400bps dial line modems, and are ready for action, call us at (617) 890-1394 or write 303 Bear Hill Road, Waltham, MA 02154, telex 951793.

Concord Data Systems

Leading the Communications Revolution

FOLLOWING THE LEADERS

by Mel Mandell



SPECIALIZED SERVICES ARE ADP'S FORTE

ADP—Automatic Data Processing—must be doing something right; its revenues have increased tenfold in the past 10 years. This caps an unusual record in the data-processing industry: 35 straight years of consistent growth in profits as well as revenues. Only a minority of the industry's leaders have been in business as long. In addition, ADP has maintained its No. 17 position on *Computer Decisions'* "Top 100 in data processing" list for the past three years.

Can ADP maintain the steady growth—an impressive streak, by any standard—that has thrust it over the \$1 billion mark in revenues this year? Josh Weston, president and CEO, is confident that ADP won't falter—that it will attain its next goal of \$2 billion in revenues by 1990. Why? Because ADP concentrates on handling tough chores for its many clients—services that it performs so reliably and cost-effectively that some 80 percent of its

growth is internal and not based on its many acquisitions.

The best and most familiar example is payroll services, which ADP now lumps in with "Employee Services." Some 10 million Americans and Canadians receive paychecks via ADP (or a simple notification that a paycheck has been deposited in a bank account). All of ADP's many payroll customers among the Fortune 500 have substantial computer installations, yet they prefer, and have for years, to let an outsider prepare their payrolls and handle the increasingly complex paperwork associated with them. (Incidentally, ADP's business with large organizations is growing faster than its business with its traditional base, the small business.)

Payroll is where ADP began, founded by three over-achieving sons of immigrants (as is Weston) who have now essentially retired from active roles in the business. One is Frank Lautenberg, the junior U.S. senator from New Jer-

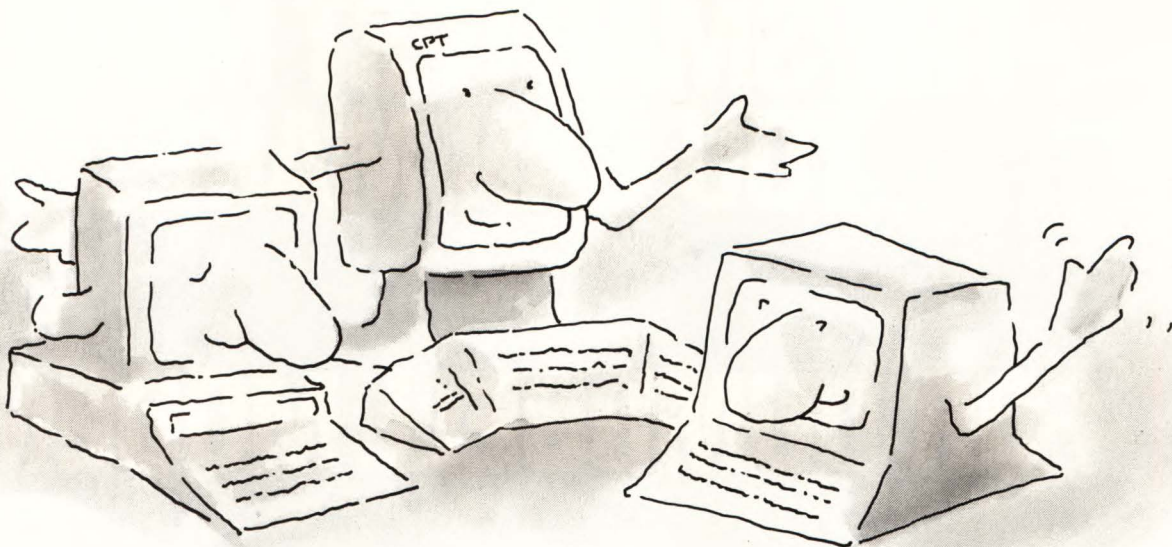
sey. Today, ADP offers many services, some tied into turnkey installation of minicomputers, workstations, or personal computers on the customers' premises—an approach that will be emphasized in the coming years.

One of the most interesting of ADP's new offerings is the Collision Estimating Service. Based on a carefully constructed and frequently updated database of nationwide costs for repairing damaged motor vehicles, it allows insurance adjusters to quickly check items to be replaced or repaired. The data are transmitted to ADP, and ADP quickly responds with a cost estimate delivered via desk-top or portable terminal. The insured can actually be handed a check to cover the damage on the spot, in minutes.

ADP also supplies workstations based on IBM Personal Computers or machines from Convergent Technologies, Santa Clara, CA, tied to one or more of its database services. Rather

(Continued on page 143)

CPT introduces real office ~~automation~~. *productivity*



Real office automation is friendly. Productive. It's a good neighbor; working with your existing systems, not against them. It's as compatible with human beings as it is with personal computers and mainframes.

It's by your side when you can't remember what you sent, how you filed it or who you sent it to. Real office automation retrieves every reference in the entire office... in seconds... guided only by a word or a phrase.

Electronic mail, calendaring, scheduling and other tasks are almost effortless because its technology is startlingly advanced. But we don't dwell on that. Technology is not as important as how easily and effectively you can use it. *productivity*

Real office automation is available now from CPT... for large or small offices. Call 1-800-447-4700 for a free booklet and a friendly introduction.

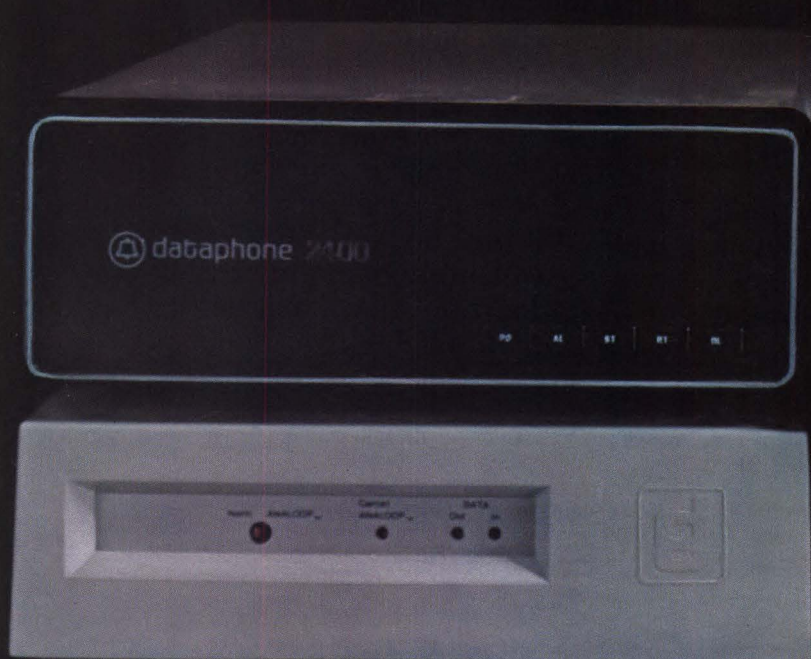


1-800-447-4700



THE SMARTEST MOVE YOU CAN MAKE...

FOR DUMBBELL MODEMS.



You don't have to replace your modems to take control of your network.

This is no time for a network full of non-diagnostic modems. Now that divestiture has put end-to-end responsibility in your hands, you need better control of your network. But you don't need the expense of replacing existing modems.

That's why Racal-Milgo offers a more affordable way to gain the diagnostic control you can't afford to be without...our TCM-7 test control module and CMS® network management systems.

Integrate your existing modems into an advanced network management system.

TCM-7 upgrades any non-diagnostic modem to a fully diagnostic unit, (even if you're still using Bell or equivalent leased line modems). So you can take advantage of CMS capabilities – without changing installed modems.

CMS systems let you manage even the largest

network from end-to-end. Remote unattended modem tests, fault isolation, dial back-up, and network restoral can all be accomplished from your central site. And since TCM-7 places your modems under CMS control, central site operators can find out about hardware and line problems before irate users do.

Whether you use non-diagnostic modems from one or many vendors, you can upgrade primary or spare units operating at 1.2 to 16 Kbps... in point-to-point or multidrop configurations. You get round-the-clock network surveillance without interrupting main channel data. Because alarms and performance information generated by TCM-7 are carried continuously on a secondary channel.

TCM-7 and CMS are two more ways Racal-Milgo demonstrates its reputation for reliability. With our broad range of products and systems, backed by extensive service capability, there's not a problem in data communications we can't solve.

Racal-Milgo®

MS 1302
P.O. Box 407044
Ft. Lauderdale, FL 33340

RACAL

Special Offer

CD 3/26/85

We're so certain we can solve your network problems that we've developed a "Problem Analysis Form." Just fill it out, return it, and we'll solve your problem fast. To receive your copy, call us right now at **1-800-327-4440**, Ext. **1021**. In Florida, call **(305) 476-4812**, Ext. **1021**. Or fill out and mail this coupon today.

NAME/TITLE _____

COMPANY _____

ADDRESS _____

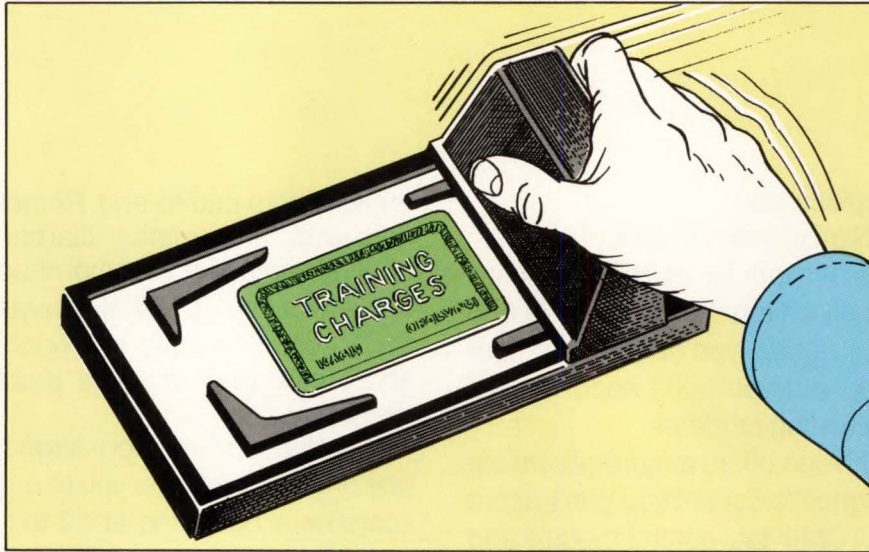
CITY/STATE/ZIP _____

PHONE () _____ EXT. _____

© 1985 Racal-Milgo

TRAINING

by David Roman, Associate Editor



CHARGES OF THE TRAINING BRIGADE

Corporate training organizations that operate solely as service centers count insouciant managers and students as their worst enemies. A nonchalant attitude undermines the trainer's best efforts to make educational offerings effective and worthwhile. Organizations can disarm this indifference by setting up chargeback systems that make middle managers pay the training center for their employees' training.

"When managers are directly charged for training, they start thinking about whether a service is worth its cost," says Marcia Hearst, manager of the information center at Metropolitan Life Insurance Co. in New York. "When training is free, managers are cavalier about it."

Many training centers are frustrated by students who sign up for a course but fail to appear. These students squander precious training dollars that have been spent on personnel and equipment to accommodate them.

Want to discourage corporate class cutting? Charge a student or manager for a class that is canceled without a fair warning. "When managers and students are held accountable," Hearst says, "they're more responsible."

But chargeback systems aren't set up just so a training department can collect money. With or without chargeback, training services are paid for. Metropolitan Life, which is now setting up a chargeback system for corporate-sponsored training, formerly prorated its training costs, charging each user department its portion at the end of the year. A chargeback system is much more precise. Under the chargeback system, Metropolitan will not bill departments for training but individual "cost centers," the smallest organizational unit within the giant carrier. The manager of each cost center is accountable for its training costs.

"Chargebacks are not ends in themselves," says Chester Delaney, vice president and manager of systems

training for Chase Manhattan Bank in New York, which for seven years has charged users for in-house training programs. "Chargeback systems are a consequence of a much more important decision to push decision-making out to the departmental managers—where it belongs."

In Metropolitan's management approach, each manager is responsible for the success of his or her cost center, according to Romia Bull, the manager of the education center, the insurance carrier's largest training body. Charging for services won't begin until the middle of this year, but much of the groundwork for the chargeback system is already in place. The company's careful progress toward the system's full implementation indicates the complexity of a chargeback system.

The insurance carrier has already billed departments for data-processing services, and when Marcia Hearst's information center began to offer online computing services to end users (via

THE WORD IS OUT.



©1985 AT&T Information Systems.
IBM is a registered trademark of the International Business Machines Corp.

The word is AT&T Information Systems. We have a full line of multi-functional data terminals and printers. Business tools designed for peak performance over the long term.

Our asynchronous and synchronous workstations and printers are compatible with the AT&T 3B Computers—the computers with the future built in. And they're compatible with other leading computers.

These terminals are designed with people in mind, too. Features like non-glare, smudge-resistant tilt screens and intelligent integrated modems help reduce errors. AT&T terminals meet the needs

of all end users. And keep them working productively.

Our synchronous terminals are compact, modular and IBM* 3270 compatible. The E4540, for example, comes with a choice of displays, keyboards, controllers, printers and cabling methods.

We have asynchronous terminals that offer sophisticated graphics and windowing capabilities. And compatible printers that are among the most functional available.

AT&T led the communications revolution over 100 years ago. Today, designers at AT&T Information Systems Laboratories are developing new data products to meet

your company's needs now and in the future.

To learn why the last word in data terminals is AT&T, call 1-800-247-1212.

WHEN YOU'VE GOT TO BE RIGHT.



Information Systems

IBM's VM operating system), they were charged, as well. Because the information center trained end users, it was logical to start charging for training once the chargeback for the new system was in place, Hearst says.

The VM chargeback established a valuable foundation for starting a training-chargeback program. "A lot of the initial work had been done for us to fit chargeback into our accounting system," Hearst says. The cooperation of the corporate accounting department is necessary because, as Hearst points out, "Money doesn't change hands with a chargeback system." Thanks to corporate accounting, if either the information or education center offers training to a department, the charge shows up as a debit to the cost-center manager's budget and as a credit to the information or education center.

For six months before users were charged for the information center's VM service, end users received *pro forma* bills for the service according to usage. This allowed users to estimate how much money they should set aside for VM resources. Similar "bills" are being sent to cost centers for six months before the training chargeback begins, so they too can gauge how much to budget.

The departments offering the training have the job of fixing a price for each service—a job in itself, especially if multiple media are used for training. DeLana Williams, president of Techniskills Inc., a data-processing-education consultancy in Birmingham, AL, suggests adding the costs of a course's development and presentation—including the instructor's time, and any training materials used—then dividing the total by the number of students who take the course. Sounds simple enough, if the training is offered as a lecture. Other forms of training, however, re-

quire different calculations.

Off-the-shelf videotapes, for example, don't carry a development cost. The purchase price can be defrayed by charging trainees for each use, much the way a video-rental store charges for renting a movie. At Chase Manhattan Bank, tapes are just one part of a "study program" built around a variety of training media, including computer-based training (CBT). The study program's cost and curriculum are derived from discussions between the student, the manager, and the trainer. This committee approach ensures a sharp definition of training objectives and of the strategies that will be used to achieve them. The program doesn't begin until a manager has signed off on the cost.

Charges for CBT courses can be based on computer-access time or on a per-course rate. Mainframe CBT systems will frequently track a student's time on the computer, which helps the CBT administrator set up a chargeback. "That's one of the selling points," says DeLana Williams.

Not all organizations agree on a standard for pricing. Some find it easier to set a standard price for all instruction under the same format, regardless of the subject matter; others prefer rates that differentiate between a live class, a videotape, or a CBT course, and that set a value on the subject matter being taught. At Metropolitan Life, all instructor-led classes carry the same price, Romia Bull says, because determining a price for each one could take months. "There are so many variables to consider," she says. These instructor-led classes will also be the only form of training that cost centers are charged for, at least initially. "We'll be going through our own learning process when we start this," Bull says. "It's easier to place a price on instructor-led classes, because so many other

people have done it."

Whatever charges a training department places on its services, it must decide whether it wants the total charges to be greater than, less than, or equal to its total costs. A chargeback system gives the training department a chance to become a profit center. The opportunity to gather extra income is available if employees are charged more than the cost of developing and delivering a course, or if classes are open to students outside the organization. Chase Manhattan Bank lets outsiders into its classes on an individual basis. Romia Bull says Metropolitan Life will let outsiders attend its classes as well, as long as they don't interfere with in-house training. Neither organization advertises its classes or admits outside students to gain revenue. The courses are offered more as a professional courtesy to contacts made through professional associations.

Chargeback prices may have to be low to avoid discouraging employees from signing up for training. Since managers always have the option of sending their employees outside for training, in-house educators are motivated to keep their offerings pertinent, as well as low-priced. "It keeps us on our toes," says Marcia Hearst. "The charges for training were almost invisible when they were prorated. Cost centers look around a little more now that they're directly charged. They see the cost and make their decision based on that. It makes us accountable, so we have to deliver a good value." If a manager decides to seek training outside the organization, the in-house training experts should be consulted.

Hearst is "a little worried" that the charge for personal-computer training will scare potential users away from micros. Some trainers, Romia Bull says, may "have to do a public relations job on some educational courses that are necessary for people to do their jobs." Other trainers believe that the supply-and-demand training promoted by a chargeback eliminates the need for any publicity efforts or worries. "Managers see in advance what they're going to pay for a service," says Paul Komiak, director of support for administrative

(Continued on page 144)

"Chargebacks are a consequence of a decision to push decision-making out to the department managers where it belongs."

Delaney, Chase Manhattan Bank

No. It's not a computer.



But Emerson's New UPS for minicomputers is right at home in the computer room.

Until now, if you wanted a true, uninterruptible power system for your minicomputer, you'd have to hide it in the basement or equipment room.

They were big. They were noisy. And they were expensive.

Emerson has put an end to all that. Our new AP100 series UPS in power ratings of 3, 5, and 10 KVA are small, quiet (less than 60db) and very affordable.

They have internal sealed batteries that continue to give perfect power even when the lights go out.

And because it is a true UPS, it gives you complete isolation from the hazards of raw utility power.

Every AP100 UPS has a built-in microprocessor that monitors your computer's total power requirements, displays real time status, and performs hundreds of system checks every second.

With its single rotary control switch, anyone can learn to operate it in 5 minutes.

And that's not all we could tell you about the new, revolutionary Emerson AP100.

So call us.

Find out more about the first true UPS that's designed for the computer room.

1-800-556-0100



Emerson Electric Co.
Industrial Controls Division
3300 S. Standard St. (P.O. Box 1679)
Santa Ana, California 92702 USA
(714) 545-5581

© 1984 Emerson Electric Co.



Photo: Ron Kimball

SUPREME

The bald eagle: swift, powerful, majestic. It has no equal in the skies — just as Graham computer tape products are unequalled in reliable, error-free performance pass-after-pass.

With each reel of computer tape full-width/length certified, Graham assures each user unsurpassed, error-free operation.

Graham Magnetix's long-term commitment is to supply premium-



Graham Magnetix

Graham Magnetix Incorporated
Subsidiary of Carlisle Corporation
6625 Industrial Park Boulevard
North Richland Hills, Texas 76118

CARLISLE

1-800-433-8006, TWX 910-893-5010, TELEX 6829068 GRAFW

quality computer tape products to data processing managers worldwide. You know your data is a valuable corporate asset, well worth protecting with the highest-quality, problem-free computer tape in the world. So if you're tired of "bargain" tapes with untimely, costly problems, call Graham.

Graham Magnetix: making sure that high-quality permanent magnetic media never becomes an endangered species.

OUTSTANDING DATA CENTER

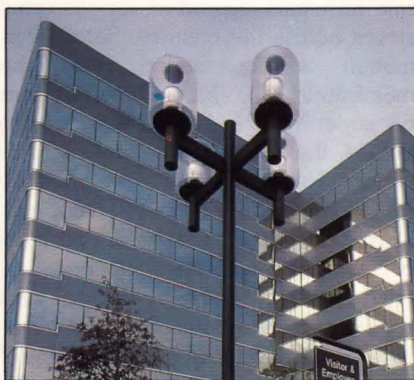
by Theresa Conlon, New Products Editor

FISCHER CAMUTO STAMFORD, CT



Photos by Andy Levin/Black Star

For Fischer Camuto, there's no business like the shoe business. The privately held concern manufactures 15 million pairs of women's shoes in Brazil each year. These shoes show up in product lines including 9 West, J.J. Calico, Westies, Enzo Angiolini, and Gloria Vanderbilt footwear. Fischer Camuto will be adding to its large wholesale operation a chain of more than 200 retail stores over the next two years. According to Ken Scharf, vice president and director of MIS, "Every function—from order processing, inventory control, and distribution to accounting, polling retail stores, and production tracking—is computerized. That's one of the ways we meet our marketing and sales needs."



△ Redwood, plants, and glass mirrors adorn Fischer Camuto's reception area. Located in Stamford, CT, Fischer Camuto occupies two stories (1,500 square feet) of the recently constructed Savin Building.

One of the main jobs of the data center's staff of 230, says Scharf, is to track shoes as they are shipped from the Brazilian manufacturing plants to warehouses in this country and finally to more than 5,000 retail customers. In addition, each day the data center collects sales information based on shoe color, style, size, material, even heel height from large department stores, such as Bloomingdale's and Macy's in New York, and Marshall Field's in Chicago, as well as from its budding network of 9 West retail stores, to quickly identify sales and fashion trends. "We can tell if a particular shoe style, color, or size is popular, and in which part of the country," says Scharf.

(Continued on page 68)

OUTSTANDING

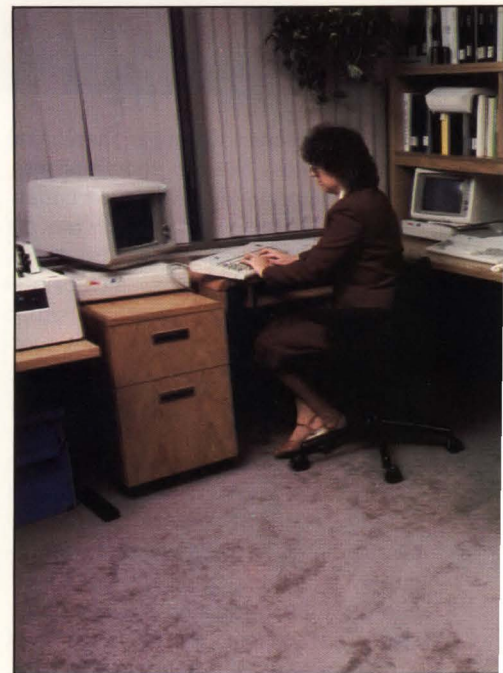


△ Fischer Camuto's soundproof, glass-enclosed computer room houses IBM 4341 and 4381 mainframes and an MDS Qantel System 64 super-minicomputer. An intercom system supplied by Toshiba America Inc. lets employees who do not have access to the computer room talk to programmers, operators, and technical-support staff.

(Continued from page 67)

The process begins on IBM 4341 and 4381 mainframes, which are used to collect data from IBM 3684 point-of-sale terminals located in various retail stores across the country. Sales information is downloaded from the mainframes to an MDS Qantel System 64 super-minicomputer. According to Scharf, the super-mini's software, Advanced Retail System, developed by MDS Qantel (Harward, CA), helps analysts study and forecast sales patterns because it is specifically designed for retail chains. "It would have taken at least a year to develop our own software to handle the retail side of our business," explains Scharf. "By purchasing the MDS Qantel system, we could act immediately." Results of analyses are

(Continued on page 72)



DATA CENTER



▽ Ken Scharf, vice president and director of MIS, at work at an IBM 3178 terminal. When Scharf is not using the computer keyboard, he can slide it underneath his desk, which was supplied by DAR/RAN.



◁ Fischer Camuto's five product lines, grouped by color and style, on display in one of several showrooms located throughout the data center. The showrooms also serve as meeting places where executives can view products and discuss buying trends and marketing strategies.

◁ Ron Latka and Brenda Petti, programmer analysts, analyze a database design. Furniture was supplied by Shaw Walker.

OUTSTANDING



△ Each year, the data center's traffic department tracks over 15 million pairs of shoes from Brazil and sends them to warehouses in this country.

SUPPLY SOURCES

Access control

Cardkey Syst.
(818) 882-8111
Circle 428

Air conditioners

Liskey-Aire
(301) 859-3910
Circle 426

Halon-gas system

Walter Kidde
(919) 556-6811
Circle 432

Mainframes, peripherals

IBM
(Contact local
sales office)

Office equipment

Lanier Business
Products
(404) 326-8000
Circle 431

Office furniture

DAR/RAN
(919) 431-7153
Circle 429

Satellite link

MCI
(305) 661-8399
Circle 434

Super-mini- computer

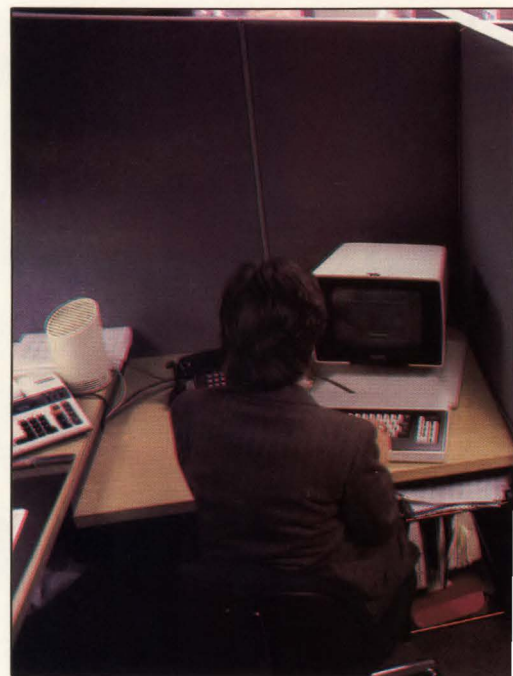
MDS Qantel
(415) 887-7777
Circle 427

UPS

Exide Electronics
(919) 872-3020
Circle 433

Workstation furniture

Shaw-Walker
(616) 722-7211
Circle 430



DATA CENTER

▽ Sales information collected by IBM 3684 point-of-sale terminals located in the retail stores is recorded by the center's IBM mainframes nightly and then downloaded to the Qantel System 64 super-minicomputer.



◁ Information on sales trends is transmitted to Fischer Camuto's contractors in Brazil via Telex.



◁ Accounting clerks use Qantel VT3 terminals to gather information on retail sales from various department stores and Fischer Camuto's own 9 West stores. Also pictured are Shaw Walker ergonomically designed workstations.

OUTSTANDING DATA CENTER



◁ Lynn Kelley, president of retail, and Noel Hord, vice president of operations, discuss sales and fashion trends.

▽ IBM 3684 terminals are customized by the data-center staff for each of the 9 West retail stores. Store employees are trained on the cash registers, which are programmed to be user-friendly.



(Continued from page 68)

then transmitted via Telex or an MCI dedicated satellite link to the manufacturer's contractors in Brazil.

An uninterruptible power supply and backup battery system supplied by Exide Electronics will keep the computer systems running for 12 to 15 minutes in the event of a power outage. A Halon-gas system, located in the computer room and tape-storage area, protects against fire.

The data center, which was designed recently by Van Summern & Weigold of Stamford, is protected by an access-control system designed by Cardkey Systems. Only programmers, operators, and technical-support employees have access to the computer room,



△The 9 West logo, a symbol of Fischer Camuto's fast-growing retail chain. Also pictured are logos for three other Fischer Camuto product lines.

which, in addition to the IBM mainframes and Qantel super-mini, houses two IBM 3684 point-of-sale terminals used to train 9 West employees. The terminals, programmed to be easy to use, are customized for each 9 West store.

The office area of Fischer Camuto's data center reflects the outlook of a very fashion-conscious organization. To create an aesthetically appealing effect as well as to define the boundaries of the various data-center departments, the designers painted the walls of each department different colors. Complementing the color scheme are showrooms located throughout the center that display Fischer Camuto's product lines. □



MY MANAGERS WANT
VERSATILE SOFTWARE
BUT THEY DEMAND
IMMEDIATE RESULTS.
HOW DO I CHOOSE?

HERE'S HOW: FRAMEWORK SOFTWARE

Framework™ saves time because it lets managers work efficiently using a single program. They can change from writing to data management or even graph creation without switching disks or having to flip-flop between different command languages.

Framework is easy to learn. Nine simple pull-down menus list all major commands. Framework puts the user in a familiar environment: there's a desktop, file cabinets and an "in-basket" which keeps track of the files on the desk.

Users can "see" a file moving from the desktop to the file cabinet (disk) when they store it, and the file directories "zoom" out of the disk drive symbol when they're called up.

Framework works like you do. If there are three files open, they're organized on

the desktop with the current open file on top. It's design like this which makes Framework intuitively easy, even for beginners.

Framework is versatile enough for serious spreadsheet or data management work, and its graphics capabilities can bring a little bit of "Star Trek" to even the most routine business report.

The final advantage is that Framework can create documents that include text, data and graphs all on one sheet of paper. Framework is a program that will make a big difference. Ask your managers after the first week.

For a dealer near you
call (800) 437-4329,
ext. 2237. In Colorado
(303) 799-4900,
ext. 2237.



Framework and Ashton-Tate
are trademarks of
Ashton-Tate.

©Ashton-Tate 1985.
All rights reserved.

Software from
ASHTON-TATE™
We'll put you in control.

A MENTOR CAN BE A MILLSTONE

Corporate newcomers seeking success through the support of a seasoned executive, beware. Instead of making your climb to the top easier, a mentor can place a heavy burden on your shoulders.

by Martin Lasden, Western Editor

To the up-and-coming executive, he's a wise and powerful father figure who's willing to take you under his wing; someone who'll advise, protect, and promote you as you make your way toward the top. That, in essence, is the role of the corporate mentor, and over the last decade scores of ambitious young executives, spurred on by all the articles and books that have been published on the benefits of mentorship, have pursued this treasured asset with a passion.

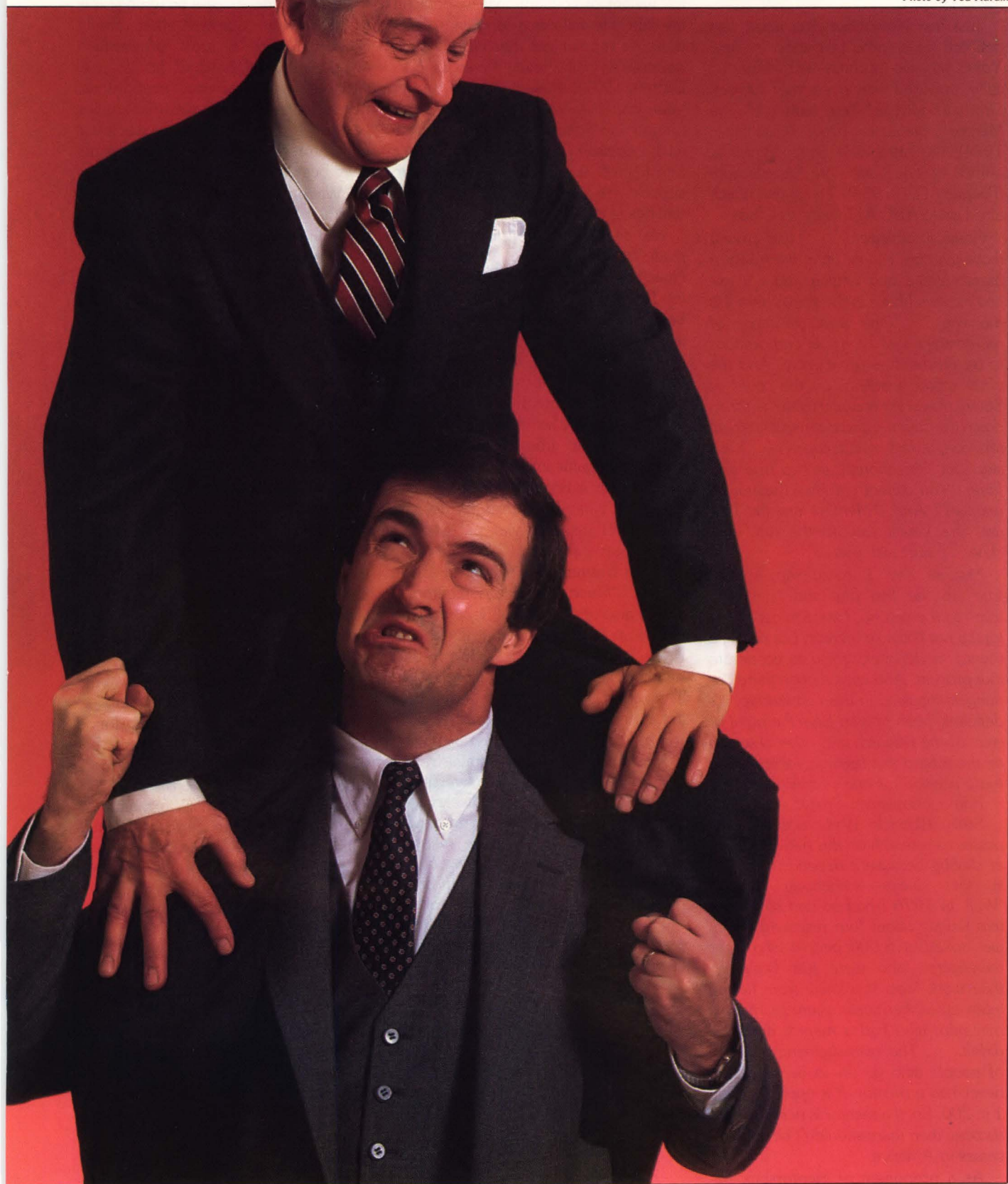
But just as maturing children must, at some point, come to terms with the inevitable realization that their parents are not all-knowing, would-be proteges must come to terms with their mentors. Life with a mentor, as it turns out, is not always what it's cracked up to be, and

to dive headlong into such a relationship without stopping to consider the potential losses can lead to some terrible disappointments.

There are questions to be asked. How do you avoid the resentments and fears your special relationship might engender among peers and other associates? How do you avoid inheriting your mentor's enemies as well as his or her friends? What happens if your mentor leaves? And what happens if, for any reason, the relationship turns sour?

So far, these questions have been largely ignored by those more interested in acquiring a mentor than working with one. But there are signs that the pendulum is swinging back the other way. For now, a most visible debate is

Photo by Ted Hardin



taking shape over the pros and cons of mentorship.

Just last November, the issue was debated on a radio talk show in New York, by two authors with diametrically opposed views on the subject. One was Michael Zey, author of *The Mentor Connection* (Dow Jones-Irwin, 1984); the other was Srully Blotnick, author of *The Corporate Steeplechase* (Facts on File, 1984). The show, which aired on WABC-AM, went like this:

Radio interviewer: . . . and among those who are caught up in the midst of mentormania and writing about it are two experts I have in the studio here this morning . . . One is so in favor of mentorships that he wants corporations to assign mentors upon entry. And the other made headlines on the cover of *Savvy* magazine recently when he threw down the gauntlet and claimed that mentors can, in fact, ruin a career. . . . Let's start out first, though, with a true and false: "You cannot get ahead without a mentor?" And, "Mentors are the best and the fastest way to the top." Michael, I'll start with you . . .

Michael Zey: I would say "maybe true" to the first one and "definitely true" to the second. One can get to the top by not having a mentor. But having a mentor is definitely going to accelerate that process. And even though there are dangers involved in this relationship, it's definitely been proven from the point of view of my research and other research on the subject that having a mentor is actually positive for one's career.

Radio interviewer: Srully?

Srully Blotnick: Well, most of what passes as research on this subject is rather shabby because it depends on retrospective views—somebody saying, "Well, in 1976 I had so and so." What was unique about [our research] is that we looked at 5,000 people who were teenagers—who were just beginning their work lives. We knew from having interviewed them once every six months minimum who had a mentor and who didn't. . . . The overwhelming majority of people who go on to be successful never had a mentor. It is approximately 1 in 200. So, if a mentor is necessary for success, then there shouldn't be any successes in America.

As a proponent of mentorship, Mi-

chael Zey came to this debate with the full weight of conventional wisdom on his side. He follows a long line of authors on the subject that include such notables as Gail Sheehy [*Passages* (E.P. Dutton, 1977)], Rosabeth Moss Kanter [*Men and Women in the Corporation* (Simon and Schuster, 1979)], and Daniel J. Levinson [*The Seasons of a Man's Life* (Alfred A. Knopf, 1978)]. And to support his argument, Zey cites the findings of several studies.

He cites, for example, the 1977 study by Heidrick and Struggles Inc., New York-based headhunters. Surveying 1,250 executives whose names had been mentioned at one time or another in the Who's Who section of *The Wall Street Journal*, the agency not only found that two-thirds of its sample claimed to have mentors, but that as a group, those who made the claim showed higher gross salaries, higher percentage gains in salary, and higher total compensation than those who said they didn't have mentors. (A description of this research was published in the January-February 1979 issue of the *Harvard Business Review*, in an article entitled "Much ado about mentors.")

Zey also cites *The Cox Report on the American Corporation* (Delacorte Press, 1982), in which 1,086 top and middle executives were interviewed. The report strongly suggests that having a mentor can have at least as positive an effect on one's career as having a Masters of Business Administration degree from a prestigious university.

Zey also cites his own research, in which some 100 top and middle managers who claimed to have mentors were interviewed. In all but six of the cases, he found, the relationship had a positive effect on the protege's career.

How can so many studies that so

"My relationship with my mentor was helpful, but there's no doubt I've had to pay a price."

Zelog, project administrator

strongly point to a connection between mentorship and success be wrong? It is to this very question that Srully Blotnick offers a most provocative answer. On the basis of his 25-year study of unprecedented proportions, he maintains that all those other studies have been so positively skewed in favor of mentorship because the respondents have been lying.

"When executives become very successful," Blotnick declares, "they become uncomfortable saying they did it on their own. It makes them feel egotistical. Immediately, they go casting around for two or three people to thank. But when we went back to the record, we found that many successful executives didn't have mentors at all. All they had were bosses. So, mentorship, as we found out, is a wildly oversold idea—one that's been shoved down people's throats by workers who are exaggerating and lying about the influence of their former superiors. . . ."

Thus, Blotnick concludes, most successful Americans are rather independent and self-made. They get to where they are going through their own drive and ambition, not because someone up above has taken a particular liking to them.

But Blotnick's iconoclasm does not stop there. For when he talks about those who have bought the "myth"—who have actually gone out and found themselves a mentor—he claims that these sought-after relationships, more often than not, end up in disaster. "It's like a marriage," Blotnick explains. "A protege wants someone to hold hands with. But in an effort to calm certain anxieties, a whole set of new ones are created." Among them:

- Unwelcome surveillance by and interference from a mentor.
- Especially harsh treatment when a mistake is made. This, Blotnick explains, is to compensate for the impression that you are being singled out for favoritism, which, as your mentor is likely to realize, can demoralize the other workers in the organization.
- Tremendous resentment from your mentor when you threaten to equal or surpass his or her status. Here is where all those feelings of guilt and/or betrayal come to the fore. And it is in this re-

gard that Blotnick brandishes a most startling figure. Of the 3,000 mentor-protégé relationships he claims he has studied, in some 40 percent of the cases, the mentor ended up firing the protégé—just as maturing offspring are pushed out of the nest by their parents.

Are, then, the costs of having a mentor worth the gains? Zey answers with a definite yes; Blotnick answers with a definite no. Who is right? Well, if you carefully analyze their arguments, there are reasons to believe that both men, for the purposes of debate, are overstating their cases.

For example, Blotnick was negative about the idea of mentoring in his article for *Savvy* last October. But in parts of his book, *The Corporate Steeplechase*, he is not nearly so critical. In fact, in one section, subheaded "A risk worth taking," he actually sounds downright bullish on the idea. "One of the most pleasant surprises experienced by executives who had chosen the right protégé occurred during moments when the subordinate rose to the occasion," he writes. "The opportunities, provided by the senior officers, resulted in the subordinates' doing more than they ever thought they could. One thing our study taught us is that there is a huge quantity of dormant ability in the business arena, and it will remain dormant unless it is fostered to a much greater extent than is currently the norm."

Moreover, with respect to the numbers that Blotnick uses to prove his point, there seems to be some ambiguity. Of the 3,000 alleged protégés he claims to have found, he seems to accuse a good number of them of lying. But he includes those apparent liars in his estimate of how many mentor-protégé relationships fail.

Finally, Blotnick defines a mentor as someone who fills the role of an immediate boss. That may or may not be true; a mentor can also come from two or three levels above the protégé. And by focusing on the former rather than the latter, Blotnick may well have picked on those cases where the potential for conflict is most acute.

At the same time, Zey may be accused of hyperbole when he says, as he

"When I needed him most, he wasn't there. He was too concerned with his own career."

Little, programming manager

is quoted on the jacket of his book, that mentorship "can be the single most important factor in achieving corporate success." For, as his own book acknowledges, there are risks in latching onto a mentor. Although Zey maintains that many of these pitfalls are avoidable, he also acknowledges that a prospective protégé has far less control over the outcome than does a prospective mentor.

Ultimately then, perhaps there is no definitive answer to the question: Is a mentor worth the risks? Indeed, it may just be that the tradeoffs of such a relationship can only be evaluated on an individual basis with respect to specific values, goals, and circumstances.

Many mentioned MIS/dp executives, as it turns out, attribute substantial payoffs to the experience. At the same time, many of them acknowledge significant costs. What were the payoffs? What were the costs? And was it worth it to them?

The answers to those questions are often obscured by expectations and semantics. When executives talk about mentoring, it often turns out they aren't talking about the same subject. In modest terms, a mentor is someone who advises or teaches, and nothing more. At that level, the complexities of the relationship are kept to a minimum, and the potential pitfalls are vastly reduced. Which is not to say, however, that at some later point expectations inherent in the relationship won't crop up.

One who appreciates the significance of such expectations and the need to manage them effectively is Linda Crosby, managing director of organizational development at Federal Express Inc. in Memphis, TN. Over the last five years, she has managed an experimental internal program that for-

mally matches mentors to subordinates. Under her tutelage, the program has gone through several iterations, and, as a telling indicator of how sensitive she has become to the potential hazards, she expresses considerable consternation at the mere mention of the word *protégé*. "We don't like that word," she explains, "because it suggests an heir apparent. And that gets us into all sorts of problems with respect to perceived favoritism." Thus, the approved term at Federal Express these days is not *protégé*, but *mentee*.

To further reduce the chances of conflict, Federal Express requires mentors and mentees to come from different divisions in the company. "It's important that everybody understands that there are no promotional opportunities associated with this program," Crosby says. "What is gained with these once-a-month meetings, however, is access to individuals who can advise you on how to sharpen your political skills, and who are able to critique you without having to decide whether or not to give you a raise."

Julie Thompson, who oversees a similar program at Bell Laboratories in Long Branch, NJ, agrees. "We have to be careful in defining what we mean by a mentor. We're really conducting a career-advisement program. . . . And the reason it got more formal is because we found supervisors needed help in assimilating new people into the corporate environment." Thus, says Thompson, a formal mentoring program became just one more tool to help new employees adapt to their jobs.

It is with respect to the issue of expectations that formal mentoring programs are of particular interest; for such a program to work smoothly, expectations must be kept to a minimum. Raise the expectations of a protégé—or mentee—just a bit, and you're likely to generate a nasty feeling of entrapment in mentors.

However, mentoring in its most comprehensive sense—the sort in which the mentor takes on the full weight of somebody's support—is a relationship that can never be formally arranged. It has to be spontaneous. Either the chemistry is there or it's not. Most pro-

MENTOR MILLSTONES



spective proteges desire this more comprehensive alliance, with its potential for greater benefits. But that means a more intense relationship, as well, with greater potential for disaster.

What happened to Gary Zelog, a project administrator for a major eastern city, illustrates that point particularly well. Despite a disastrous outcome, Zelog does not for a moment try to minimize what a tremendous asset his mentor, Ralph, was early in his career. "He took me under his wing and taught me everything he knew," he says. "There was no way I could have learned so much, so fast, without him."

Sure, Zelog continues, Ralph had made a few enemies over the years within the organization. Intellectually, he was far superior to his peers and wasn't at all shy about letting them know it. But still, as long as Ralph was the boss, Zelog's stature within the organization was assured.

The situation started to get dicey when Ralph announced one day that he would be retiring in two years. "At first," Zelog recalls, "Ralph sat me down and advised me to start looking for a position somewhere else in the organization. But then he had a change of heart. He realized that if I moved on, his job would be a lot more difficult." Zelog's stature deteriorated from there. On one hand, Ralph had become a lame duck and could no longer offer effective protection from his enemies. On the other hand, as time went on, Ralph himself started getting more hos-

tile toward his once-trusted protege, saying things like: "Look what I've done for you," and "What's the matter, aren't you man enough to take it?"

It's been 10 years since Ralph retired. Zelog is still working for the same organization (though in a different department). However, because he was perceived as Ralph's boy, he never was seriously considered for the position Ralph left vacant. And, in fact, since Ralph left, Zelog hasn't received a single promotion. "I've been stigmatized," the 47-year-old manager now reflects. "I haven't been able to break through. Which is not to say that I'm over the hill yet. But the setback I've received has continued to work against me. Overall, the relationship I had with my mentor was helpful," he adds. "But there's no doubt about it. I've had to pay a price."

In his book, *The Mentor Connection*, Michael Zey points out that in a mentor-protege relationship, the benefits enjoyed by the mentor can be just as striking as those enjoyed by the protege. Indeed, it is this mutuality that makes the relationship work in the first place. "The protege helps the mentor do his job, serves the mentor as a source of organizational information and intelligence, and often becomes the mentor's trusted advisor," Zey writes.

However, this mutuality is often lost because the mentor-protege alliance is, by design, a relationship between unequals, and hence fraught with ambiguity. Where is the line between loyalty

and foolishness? Between self-interest and betrayal? The fact that mentors and proteges often consider one another friends as well as business associates only adds to the ambiguity and ensures that participants will not always act in their own best interests.

Windham Plessy, data-processing manager for a southeastern manufacturer, agrees, recalling his own experience with a mentor. "Looking back, I probably should have terminated my relationship with John six or seven years ago." Why? Because as long as Plessy was John's protege, there was no way to improve his relationship with Bill, his supervisor.

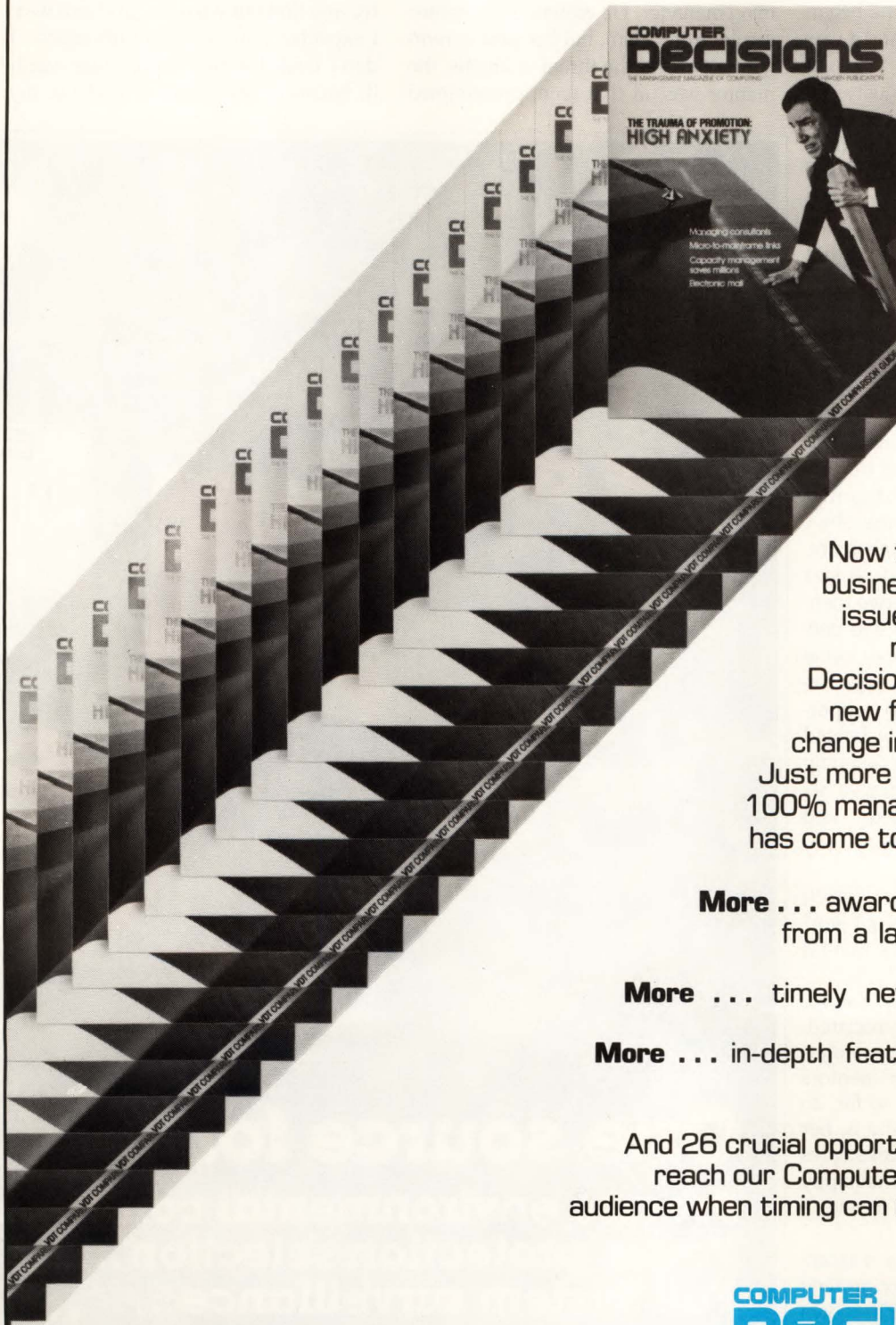
Plessy was involved in a cumbersome triangle. On one side, there was John, a senior executive who offered Plessy advice and tutelage and saw to it that the young manager received particularly desirable assignments. On the other side, there was Bill, who, as Plessy's immediate supervisor, felt threatened by Plessy's relationship with John. "I always got the impression that I had to be 25 percent better than everybody else for Bill to give me the same rating," Plessy says.

According to Plessy, his 12-year relationship with John grew especially difficult during its last four years. By then, with retirement in sight, John began to neglect his duties, which in turn, increased the pressure on Plessy.

Was it worth it? Plessy ponders the question a moment. "Probably yes," he decides. "But it's conceivably a tight race. I got a tremendous amount of satisfaction from working with John, but if I had openly terminated my relationship with him a lot sooner, it would have solved a great number of the problems between me and my supervisor."

Another data-processing manager whose story underscores the point that "breaking up can be hard to do" we'll call Sanford Wiley. He works for an eastern steel manufacturer. "The first four or five years, I was in awe of my mentor," Wiley remembers. "I was in awe of the knowledge and insights he had to offer me, and I am convinced that had he not been my mentor, I would not be where I am today." However, as Wiley notes, there definitely

Computer Decisions Delivers 26 Issues in 1985



Now there are only 10 business days between issues. Because from now on Computer Decisions is bi-weekly. A new frequency with no change in editorial thrust. Just more of everything our 100% management audience has come to expect from us.

More . . . award-winning editorial from a larger staff of top writing talent.

More . . . timely news and product information.

More . . . in-depth features and incisive columns.

And 26 crucial opportunities for you to reach our Computer Decision Maker audience when timing can make or break an ad campaign.

**COMPUTER
DECISIONS**

175,000 Computer Decision Makers
Every 10 Business Days in 1985

MENTOR MILESTONES

came a point of diminishing returns—a point where he had pretty much learned everything that his mentor had to teach him. It was then that he began to develop ideas on his own. And it was then that he realized he had to make the break. “Of course I felt guilty. Of course I felt as if I were betraying him,” Wiley says. “But by taking into account my responsibility to both myself and my family, those feelings didn’t last very long.”

Just as parents often find it difficult to perceive their children as adults, so too is it often difficult for corporate mentors to get used to the idea that their once awestruck proteges have matured. For indeed, such shifts in the balance of power can be traumatic, causing some of these relationships to die, others to be redefined, and still others to be torn by resentments.

At the pharmaceutical house she’s been working at for the last nine years, information-systems specialist Agnes Linton says she used to have two mentors. Now, she says, she has two enemies; one with whom she’s now equal in status and one whom she has since surpassed. “They used to be so supportive,” Linton laments. “But now, behind the scenes, I feel that they’re constantly undermining my authority. They’ve become competitive and jealous and have tried to detract from my accomplishments.”

“I think it came as a complete shock to them both that I got as far as I did,” she adds. “I think they thought that I’d be reporting to them forever.”

Within the context of Linton’s story, there is a sad irony to be appreciated: Though Linton readily acknowledges that without the help of her mentors she would never have come so far, so fast; now that she is where she is, her relationship with these two colleagues has grown sour. Such is the unhappy ending that can result from a protege’s ascendance.

But it’s not only the protege’s ascendance that might ruin a mentor-protége relationship; the mentor’s own descendance can be just as traumatic. And that brings us to Stanley Little. “When I needed him most,” Little complains, “he wasn’t there. He was too concerned with his own career.” Little

is referring to the time when he was laid off from a major facilities-management service where he served as a programming manager. He assumed his mentor would protect him, but because of reorganization and the threat of layoffs, the mentor was, at that time, preoccupied

with his own problems.

“Yes, I do feel he betrayed me,” Little declares. “He just didn’t bother to try and find out what the problem was. I expected that of him. In retrospect, I don’t think the relationship was worth it, because, essentially, it cost me my

The advertisement features a dark blue background with a grid pattern. In the center, there is a large, light blue computer cabinet with the word "COMPUTER" written vertically on its side. To the right of the cabinet is a smaller, white computer terminal with a monitor and keyboard. In the foreground, a person is seated at a desk, working on a computer. The overall scene is illuminated by a soft, blue light, creating a futuristic and professional atmosphere. The text "SUPPORT SYSTEMS" is written in large, bold, white letters at the top of the advertisement. Below this, the text "One source for:" is followed by three bullet points: "Precise environmental control...", "Power protection selection...", and "Full System surveillance...". At the bottom, the Liebert logo is displayed, consisting of a stylized flame icon and the word "Liebert".

SUPPORT SYSTEMS

COMPUTER

One source for:

- Precise environmental control...**
- Power protection selection...**
- Full System surveillance...**

Liebert

MENTOR MILLSTONES

job. I believed in him, you see, and I was lulled into a false sense of security."

"Once," recalls researcher Sully Blotnick, "a computer-company executive confided that when his protege quit, he felt 'as if his son had died.'"

That these extremely intense feel-

ings can enter into the mentor-protege relationship suggests all the more the need for caution. And nowhere is the need for caution stronger than when the mentor happens to be a man and the protege a woman.

As Gail Sheehy told us in her widely

read article on the subject, "The Mentor Connection: The Secret Link in the Successful Woman's Life," which appeared in the April 5, 1976 issue of *New York* magazine, having a mentor can indeed make all the difference to a woman trying to make it among men who are supported by their own "old-boy" networks. But as the now-famous William Agee-Mary Cunningham alliance has so dramatically demonstrated, the risks of such a relationship are particularly acute.

At San Diego State University, Natasha Josefowitz, an adjunct professor in the College of Human Services and author of the book *You're the Boss* (Warner Books, 1985), acknowledges these risks, but, nevertheless, suggests that overall they are worth taking. "What I keep hearing over and over again from women," she says, "is how much their sponsors have paved the way for their success."

Others, however, aren't so sure. Meg Wheatley, who teaches management at Cambridge College, a newly founded "alternative educational institution" in Cambridge, MA, is among them. "Once," Wheatley recalls, "a woman said to me: 'When I was growing up in the 1950s, the whole emphasis was on how to dress to get a man; then in 70s and 80s, it was all on how to dress to get a mentor. Things really haven't changed that much!'"

"We've got to get rid of this idea that there's a Mr. Right," Wheatley argues. "And we have to develop many allies rather than just rely on one mentor."

That's good advice in theory, Josefowitz counters, but having many allies is not the same as having one executive who takes a special interest in you and throws the full weight of his or her support behind you.

Like most gambles, there seems to be a direct correlation here between risks taken and potential payoffs gained. However, for all those who would wish to gamble heavily on this particular game, the bulk of the evidence that's been accumulated suggests two important points: First, mentor-protege relationships tend to be rather fragile. And second, they tend to be rather temporary, as well. So, let the gambler beware. ☐

BY LIEBERT

The computer life support systems that keep computer availability at its optimum level are all available from the industry leader!

The two best Power Protection systems:

- The Programmed Power Center™ for uninterruptible power ... and
- The Power Management Center™ with patented Datawave® technology for unmatched cost efficiency.
- Environmental Control Systems. Liebert sets the standard for precise control of computer room temperature, humidity and air cleanliness!
- Support System Surveillance with Liebert Sitemaster™, a versatile, microprocessor-based monitoring and control system that provides constant surveillance of all key support functions.



Liebert

World leader in computer support systems

Liebert Corporation, 1050 Dearborn Drive,
P.O. Box 29186, Columbus, Ohio 43229
Phone 614-888-0246 Telex 246655 LIEBERT WOGN

Please send your free booklet on "Data Center Design"

Name

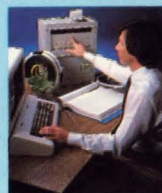
Title

Company

Address

City State Zip

☐ Have salesman call. Phone: CD2125



BREAKING THE APPLICATIONS LOGJAM

Part I: Your organization's programming backlogs could be both greater and smaller than you realize.

by Lamont Wood and Don Leavitt

It's an all-too-familiar scenario: A planning professional asks the data-processing or MIS department to whip up a program to analyze an important series of business transactions. And the department responds, "Fine, you'll have it—in about two years." That includes six months to develop the application, preceded by 18 months spent wading through the programming backlog to get started on it.

Your organization's backlog of programming is probably both greater and smaller than you realize. It is smaller because an application that's been hibernating in the backlog for a few years is likely a dead issue; the manager who requested it may have already implemented it on his or her own—a practice that is becoming more and more common with the increasing power of micros. Or, if the need hasn't faded

away due to changed business conditions, there's also the possibility that the executive who pushed for it in the first place has left the organization.

Unfortunately, your backlog is also greater than you perceive. As Donald Dell of the Diebold Group consultancy in New York stresses, existing applications are also part of the backlog, so many of them are obsolete and in need of replacement. In addition, there's the "invisible backlog," which is made up of applications that department managers don't dare request because they know their projects will be placed at the end of a long queue. Often these applications could greatly enhance a corporation's competitiveness.

"Even if you overcame the backlog, you'd have to deal with the invisible backlog—managers would unveil needs they otherwise never would have



Photo courtesy of International Paper Co.



mentioned," explains William R. Synnott, senior vice president of First National Bank of Boston and co-author of the book *Information Resource Management* (John Wiley and Sons, 1981).

"There's a measurable backlog, plus an unmeasurable backlog caused by the frustration with which the data-processing services are viewed by the rest of the corporation," asserts consultant Thomas A. Hannagan of Hannagan and Associates in Chicago. "Many desirable applications are not part of the backlog but part of the intimidation—the users are afraid to bring up the idea."

The worst aspect of the backlog is that "it can dictate how long the organization takes to react to market changes," Hannagan points out. "If the corporation must be able to react to changes within six months and the backlog is longer than that, you're in trouble—unless some powerful executive uses clout to push an urgent request to the lead of the queue."

Fortunately, this burdensome backlog is being attacked on many fronts—all to be covered in *Computer Decisions'* five-part series on reducing the applications logjam, which this article inaugurates.

The most obvious solution is packaged software, which is currently supplied by a multi-billion-dollar industry. A 1984 survey by the Diebold Group found that expenditures for packaged software by 160 large corporations had risen 28.4 percent in two years, and now amounts to 5 percent of the average MIS budget, compared to 3 percent two years ago.

Of course, the disadvantage of packaged software is its mass appeal; often a package can't be found to meet your organization's exact needs. And adapting the program to fit your requirements could add to the backlog. (The advantages and drawbacks of this process will be explored in Part V of this series, on adapting standard packages, in the May 21 issue.)

For many organizations the only way to put a significant dent in the programming backlog is to increase programmer productivity through special tools and techniques. Such solutions have a

history that stretches into the dim past, when software development first became a major investment. Efforts to measure programmer productivity by counting lines of code were tried and discarded, and in due time the computer community came to embrace the concept of structured programming—the idea that programmers would be limited to using certain well-understood logical structures. These limitations, and the fact that flowcharting had long been used to specify software projects, suggested a graphical approach to system design.

The results were sets of formal graphic symbols used in Hipo (hierarchical input/output), Warrier/Orr, and other diagramming schemes. Indeed, there are said to be more than 150 graphical notation systems available for software designers, offering the designer a way to cut through the ambiguities of human language. Such diagramming techniques also led to an understanding and use of the "top-down" approach to systems design, in which the main program logic is settled before lesser details are tackled.

New computerized tools have emerged to support these schematic structured software-design techniques. Following the lead of computer-aided design and computer-aided manufacturing, these devices are termed CASE (computer-assisted software engineering). CASE systems would also be expected to support documentation and

project-management efforts. (David Kull, *Computer Decisions'* software editor, will explore these and other design systems in Part II of this series, on system-design tools, in the next issue.)

But while such tools help impose discipline on the design process, the design effort is only part of the overall software-development cycle, which also includes coding and testing. "Structured design is more concerned with the correctness of code than with the speed of development," cautions Philip Teplitzky, a consultant with Price Waterhouse, the Big Eight accounting firm headquartered in New York. "Of course," he adds, getting a program right the first time has a good effect on efficiency."

In any event, the use of diagrams and other structured-design methods are no more than tactics to increase staff efficiency. The current trend in software design seems to emphasize *what* is designed rather than *how* it is designed.

"The fundamental question is 'what should MIS professionals be programming,'" declares Hannagan. "It's a variation of the old 80-20 rule—80 percent of the benefits come from 20 percent of the code. But which 20 percent? If we look for that 20 percent, sometimes we can tremendously cut the workload of the applications developers without cutting the software's benefits. The other phases of development can then also be mitigated—fewer needs to be designed, coded, tested, etc.," he explains.

As for separating the 20 percent from the 80 percent, "you have to decide what payoff you want out of the project," Hannagan says. "And get off the ego trip that you need all possible bells and whistles. Get the developers off the ego trip that if it's not a big project it's not worth doing because it won't advance their careers. They ought to be advancing themselves by meeting the goals of the organization," he says.

Another way to raise programmer productivity is to provide newer, more sophisticated tools for software development. A lot of people seem to have asked themselves the same question posed by Teplitzky: "Many of the



Photo by Tom Sobolik

Consultant Philip Teplitzky believes automating rote dp chores will speed programming.

BACKLOGGED WITH END-USER REQUESTS?

**YOU CAN HIRE
THIS COBOL
PROGRAMMER...**

**OR YOU CAN HIRE
THIS ONE.**



 **FOCUS**

Cutting through the applications backlog using COBOL or PL1 is pretty tough business. In order to catch up and "get current" with your end users' requests, you need a team of 8-armed programmers...or more realistically, you need FOCUS.

4th Generation Technology

FOCUS is the 4th generation language/DBMS that handles the programming details for you—details that COBOL and other languages require you to specify at great length. It combines a non-procedural, natural language with advanced database and 3270 screen management technology. So, you can accomplish data analysis, storage and maintenance functions with a handful of simple English statements **instead of hundreds of lines of equivalent COBOL or PL1 code!**

Reads All Data Center Files

FOCUS can access any existing file or database in your information center, including: VSAM, QSAM, IMS, IDMS,

TOTAL, ADABAS, MODEL 204, SYSTEM 2000 and DL/I. It increases programmer productivity by hundreds of per cent, even on the most complex and demanding applications. And with its new TableTalk™ windows, it provides non-technical end users with the ability to develop their own reports and graphs after just a few moments familiarization.

Prototype On Your PCs!

PC/FOCUS is a functionally equivalent FOCUS system for your PCs. With it, you can prototype applications without consuming mainframe resources. Procedures and files can then be uploaded for production execution.

Put Application Backlogs Behind You With FOCUS

It's the system that spans all of your application development needs, yet stays easy to use as those applications grow more complex. Find out how to put it to work for you, now. For details, write to Don Wszolek, Information Builders, Dept. F1, Inc., 1250 Broadway, New York, NY 10001.

**INFORMATION
BUILDERS, INC.**

New York: (212) 736-4433 • Washington, D.C.: (703) 276-9006 • St. Louis: (314) 434-7500 • Chicago: (312) 789-0515
Dallas: (214) 659-9890 • Palo Alto: (415) 324-9014 • Los Angeles: (213) 615-0735 • Houston: (713) 952-0260

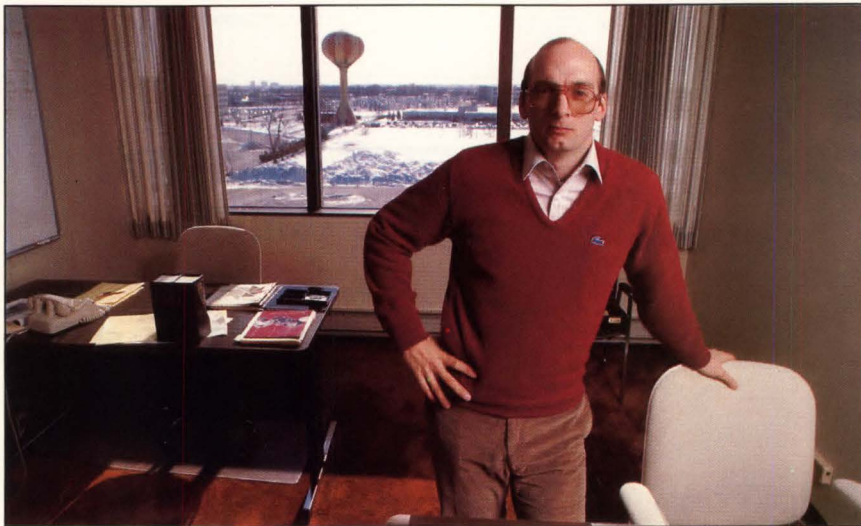


Photo by Richard Dirk

The worst aspect of an applications backlog is that it can prevent an organization from reacting quickly to market changes, says consultant Thomas A. Hannagan.

chores we perform in data processing are rote—why can't I develop an automatic way to deal with them?"

A lot of vendors are trying to answer that question, notes Damian Rinaldi, director of the software and services information program at International Data Corp., Framingham, MA. "One of the fastest-growing aids is application-development tools—software aimed at improving the productivity of the data-processing department, Rinaldi says.

Software-development systems include fourth-generation languages like Focus and Ramis, other database management tools for querying and debugging, applications generators, screen painters, and interactive program editors. They also include high-performance terminals like the IBM 3270 PC, which enable programmers to conduct up to four live mainframe sessions at once.

System-development tools offer an important advantage when applications must be developed quickly, but they're not a panacea for the backlog blues. Says Hannagan of fourth-generation languages: "They can be helpful, but the question is where do you use them, and how? Programmers should only use them when there will be a definite payoff, and when the risks have been minimized.

"The danger of fourth-generation languages is that they can chew up a lot of computing resources. Even though computing resources may still be

cheaper than labor, a lot of dp departments don't have the budget elbow room they used to. Also, some languages are better at certain tasks than others, and there's also training required," Hannagan points out.

The right software generator can also go a long way toward overcoming the backlog. Says Alfonso Cardenas of the computer-science department at the University of California in Los Angeles: "The benefit of using software generators varies from some improvement to major improvement. Using the right generator with semi-canned applications can save years and millions of dollars."

There are features every software generator has—or ought to have, says Cardenas. "A major module in an automatic application generator is a screenpainter—something to let you paint screens in a high-level way, and format the report the way the user wants," he explains.

"The generator has to define the database very simply, perhaps by drawing a schematic on the screen, and then defining the required inputs," Cardenas continues. "Once it's accomplished all the global definitions, it should handle all the rest of the details automatically, up to producing the final code."

Such software tools have also stimulated a trend toward prototyping—an effort to arrive at a fast-and-dirty version of a system within days or weeks, using whatever tools are available. The

prototype is then put in the users' hands, and the professional staff refines and redesigns it according to user feedback. (Prototyping is covered in Part II of this series.)

The problem with prototyping, according to Hannagan, is that "a project may take two years to complete. And by then the market often has changed, the users' minds have changed, and another year is spent revising the system. It's a wonder any prototypes ever get installed," he comments.

After software coding—be it manual or automatic—comes testing, which is the newest automated interest among software developers, notes Boris Beizer, consultant in Pennsauken, NJ, and author of *Software Systems Testing and Quality Assurance* and *Software Testing Techniques* (Van Nostrand Reinhold, 1982).

"You will consider testing if you're really interested in cutting the backlog," Beizer says. "Quality assurance makes up 50 percent of the development effort and 75 percent to 80 percent of the effort in software maintenance. For the last three decades, all concentration has been in automating the generation of code. The only way to test the code was on the hardware.

"But a new family of software-testing tools is emerging, as professionals begin to realize how labor-intensive testing really is. With the right testing tools, you can probably cut the labor involved in new software development by 20 percent, and the labor of maintenance and updates by half," Beizer says. (See Part IV, on testing and debugging, in the May 7 issue.)

Beizer identifies the main automated test tools as the "test driver," the "test generator," and the "coverage certifier." A test driver automates the capture of test data and keeps records of the results, he explains. "Coupled with a large database in which to store the results, it's a marvelous tool."

A test generator can generate certain tests based on its own analysis of the target software. "It's also a marvelous tool, but a very dangerous one because it lets you just go through the motions of testing," Beizer explains. "If you are going to generate tests based on bug-ridden software, all a test gener-

bāk·lôg

n. An ancient affliction of MIS departments, resulting from overwhelming demand for mainframe applications systems and programs. Unknown since the development of The Intelligent Assistant, circa 1985.

Inside every MIS department is the same problem. There aren't enough hours to create and maintain all the programs the organization needs to operate at its peak. Result: frustrated executives, weary programmers, low morale. All the problems of backlog.

But now, backlog can be a thing of the past, dissolving under the fifth generation powers of The Intelligent Assistant. This new leader in software technologies can generate entire applications systems and programs faster than you ever dreamed possible.

Working from a general set of input and output instructions, The Intelligent Assistant stretches the mainframe's potential by delivering an entire production system with the flexibility of a prototype, fully documented, and in stop-watch time. What's more, it greatly reduces the time and effort needed to maintain existing systems. The Intelligent Assistant will regenerate the entire system automatically following the simple entry of a changed input or output specification.

Suddenly, no more backlog. The Intelligent Assistant brings automation to the process of developing and maintaining business systems. For the end-user, that means accurate on-time data. For the programmer analyst, that means the opportunity to advance to more creative assignments.

Why not remove backlog from your shop, and put it in the pages of history where it belongs?

*leading
software
technologies
corporation*

Contact us at:
26250 Euclid Avenue, Suite 307
Cleveland, Ohio 44132
(216) 261-0187

CODE CRUNCH

ator can tell you is that the program is running like bug-ridden software. It can't deduce anything new. The tests it generates should be at most half the tests you use."

A coverage certifier, meanwhile, does a complete set of tests and some defining of software function. "You can test for instructions executed, passes completed, decisions made—anything you want covered," Beizer says.

These approaches to cutting backlog apply to the cumbersome production applications that can only be tackled by data-processing professionals and make heavy demands on computer resources. There is much talk these days of moving such development off the mainframe to reduce the burden on the mainframe cpu and let more processing and programming be done at the same time. For example, the IBM PC 370 can be used to develop CICS applications or transaction systems, and then those systems can be moved to run on the mainframe.

An issue related to systems development on a micro involves the concept of sub-section response time. IBM has been pushing the notion that reducing response time below 1 second can produce significant productivity gains for programmers. IBM also advocates the use of minis dedicated to systems development to improve response time. IBM contends that achieving sub-second response time improves quality as well as speed.

Another aspect that contributes to the applications backlog is the sometimes ad hoc requests from end users for minor changes and adaptations to programs. Although these requests are usually simple, they are politically demanding, because many end users hold powerful positions in the organization. To keep these nontechnical users happy, many organizations are implementing information centers to teach them how to make minor adaptations to programs, themselves.

This is far from a new idea. "In the 1920s, Bell Labs did a study and found that, given the then current growth rates in phone usage, the whole population of the country would have to become telephone operators by about 1952," recalls Teplitzky of Price

Waterhouse. "To avoid this impossible situation, Ma Bell automated the phone network to let users dial the phone themselves, and turned the entire population into telephone operators."

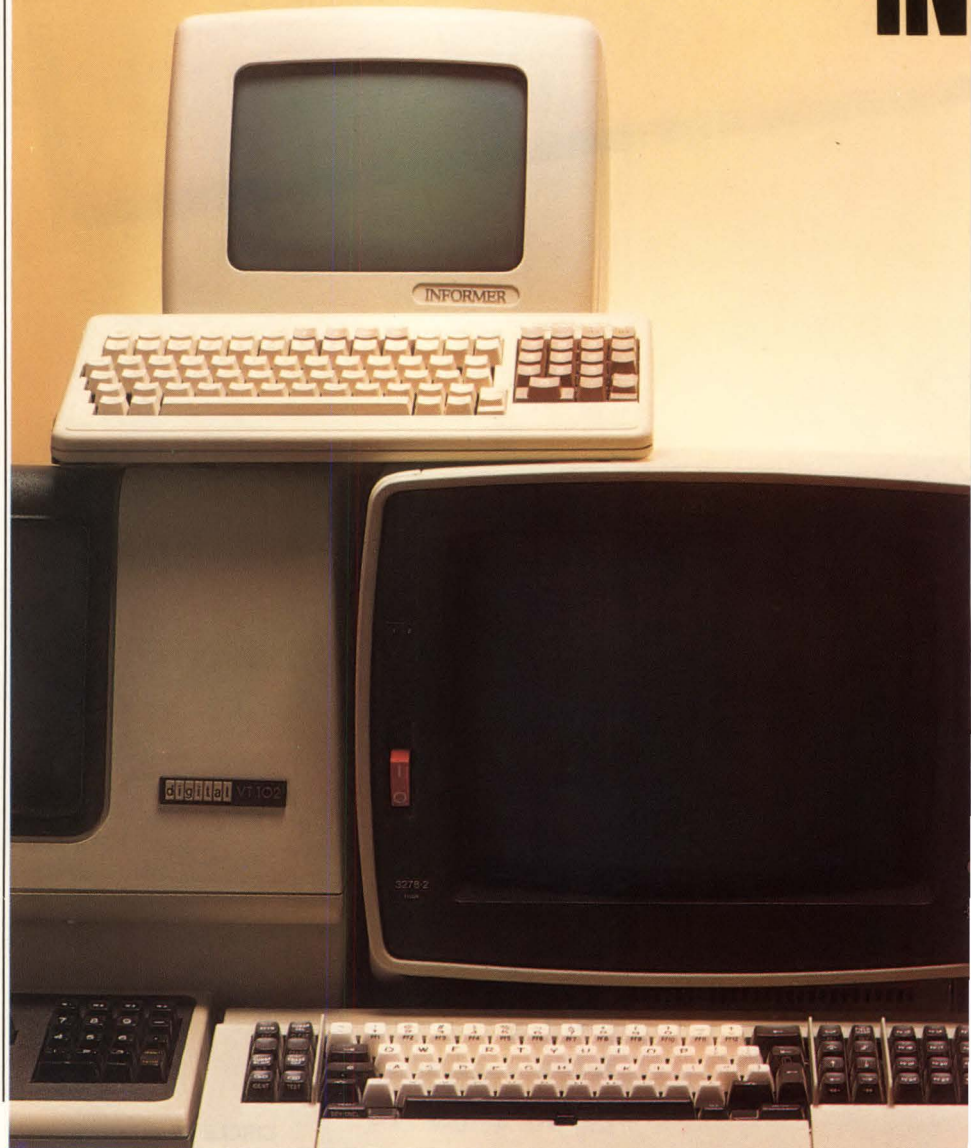
"And given current projections, every employee will have to become a programmer by some foreseeable date.

But with simple query and report-generation techniques, you are, in fact, already making every employee a programmer," Teplitzky says.

What this means for the MIS or data-processing manager is explained by Dell of the Diebold Group. "MIS directors need to come up with a strategy

Copyright 1985 © Informer, Inc.

SPEAKS IN



for managing the end users' choices, and realize they're in a diversified-services business."

As a result of this move toward giving programming responsibility to end users, professionals are creating an array of service alternatives apart from standard programming, such as putting

front-ends on existing applications to facilitate queries and generate reports, Dell says.

The immensity of this trend is demonstrated by the dramatic upsurge in the use of information centers. (An information center is a branch of the MIS department that helps users perform

their own data-processing tasks.)

In the Diebold report, 80 percent of the large corporations reported having an information center in 1984; 67 percent had one in 1983. And those who had an information center reported doing 9.4 percent of their ad hoc applications development through the center, up from 7.2 percent in 1983.

But transferring such a minor part of the workload to the end user is far from a solution to the backlog. For one thing, the 9.4 percent cited by Diebold is not that big a deal. As Hannagan points out, "Compared to the users' former non-involvement, any transfer of programming responsibility seems impressive. But when you consider the limited resources available to the end user, it's still a minor percentage." And, in the final analysis, someone has to write all those application packages, and it can't be the users.

Of course, there's always the chance that dramatic developments in hardware performance could reduce the backlog burden. "It takes a lot of time to design the database for a large transactional system for a bank," notes Teplitzky. "What would happen if you had a machine that could handle databases automatically? The machine may not be all that efficient by the software standards of the 1970s, but if the hardware is cheap enough, who cares? Remember, a million bytes of memory in 1976 cost \$1 million, but now it costs less than \$10,000.

"Such machines do exist—like the one being developed in the Non-Von project at Columbia University," Teplitzky explains. "It uses non-Von Neumann architecture, with multiple cpus or content-addressable memory central processing units—could fetch a specific data item by name, instead of having to address a memory cell. It works the way your brain works. The effort involved in data structuring will simply be taken away."

For now, however, to adopt an old saying: "A programmer's work is never done." Evidence suggests that it will hold true for a while longer—at least until the new methods and techniques for dramatically increasing programmer productivity are put to work on the backlog. □

TWO LANGUAGES HALF THE SPACE AT LESS COST.

AND TALKS OVER THE PHONE, TOO.

Now you can reach both your IBM and DEC mainframe from one little terminal.

With our 178/100 Dual Host Option.*

If we're talking your language, choose the only terminal that speaks theirs.

Ours.

Two keystrokes, and you can switch from your IBM to your Digital, and back and forth. Instead of shuttling between two desks or two beefy terminals.

You might select the compact, 9" terminal shown to the left, or an executive oak cabinet version with tuckaway keyboard. Or the standard 12" model.

Or, so you can take it anywhere, a 14 lb. portable that

reaches your mainframe over the phone. All are available with our 178/100 Dual Host Option.

Each comes with IBM or DEC style keyboard, so your fingers can run as fast as they're accustomed.

Tilttable, non-glare screens accommodate the way you see things.

A printer port supports most serial printers.

And modular design lets you upgrade the integral modems, protocols, emulations and keyboards as your needs change.

Cut your terminals in half and you cut the number of service contracts you need. Which cuts the cost of buying and owning a terminal.

And reveals all sorts of desk space to get re-acquainted with.

INFORMER
Performance in small sizes

Corporate offices: 22936 Mill Creek Road, Laguna Hills, California 92653 (714) 855-3112. Telex: 466386
Regional Sales offices: New Jersey: (201) 299-0770/North Carolina: (704) 523-3610/Michigan: (313) 569-2208/Illinois: (312) 642-4240
Texas: (214) 392-9944/California: (818) 888-5995

IBM is a trademark of International Business Machines. Digital and DEC are trademarks of Digital Equipment Corporation.

*IBM 3278 and DEC VT100



MICRO OUTPUT: FIND THE MATCH

Although many of the latest output devices have alluring qualities, your challenge is to match machine to task.

by Mark Brownstein

Upgrading to new output devices is often a major step. Since most new equipment is bought to meet a particular need, it's important to determine what the nature of that need is before deciding how to deal with it.

Personal-computer output devices come in many stripes, from printers and monitors to communications devices and voice boxes. They also include

auxiliary devices, such as spoolers, that can reduce operating costs or help equipment work better. Which devices you choose for your organization should depend on a thorough assessment of existing equipment, of the functions proposed new equipment performs, and of how well it meets present and anticipated needs.

Obviously, some organizations need to consider the purchase of printers,

and a good understanding of the available technology will help you understand your needs and anticipate future moves. Printers come in two basic types—those that produce formed characters and those that print characters and graphics using a matrix of dots or lines. In printers, there is also a distinction between letter quality and non-letter quality, although the distinction is becoming hazy as dot-matrix printers

BOOSTING MICROS

Photo by Jeff Glancz



produce higher and higher quality.

Until a few years ago, it was easy to tell a letter-quality printer from other types of printers. Letter-quality printers came in three varieties—those that used a spherical printing element, like the “golf ball” of the IBM Selectric, those using a daisy wheel, and those using a print “thimble.” All three worked in approximately the same manner. To print a character, an impression of the character was transferred through a ribbon to paper. Most other printers used a fairly crude matrix of dots to produce a much less legible character, and in most cases they were far less expensive than the letter-quality printers.

Today, dot-matrix printers are still less expensive, but they’re approaching true letter quality. Most of the near-letter-quality printers have a minimum of 10 print needles and intricate print sequences to reduce space between impressions, giving a more formed look. For example, the Toshiba 1340 from Toshiba America Inc., Tustin, CA, produces a legible, if somewhat

heavy, Courier character set. For all but the most demanding applications, such as formal correspondence, one of the new generation of dot-matrix printers will probably be sufficient.

The ultimate dot-matrix printer uses a xerographic print process. The most popular of these is the laser printer, although ion-deposition and magnetic-field printers use much the same method of printing. Several printers currently print about 300 dots per inch, producing letters that are difficult to distinguish from formed characters.

A big drawback of dot-matrix machines is that they can’t normally print more than one type style on a single page. Some software programs will produce varying type faces. Printworks from Softstyle, Honolulu, provides control over pitch, typeface, type size, format, character sets, and special fea-

tures. Hy Siegel, a consultant at Winston & Winston, a consultancy in Fort Worth, TX, says, “You can use a chintzy printer, and Printworks will give you additional type fonts.”

According to Siegel, Printworks’ features lend themselves more closely to interoffice correspondence than to intra-office correspondence. However, Printworks offers a special font editor for designing a company’s own type styles and a feature that allows rotation of a wide screen so that a spreadsheet can be printed vertically instead of horizontally.

For text requiring letter quality, formed-character printers are still considered the best option. Compared to dot-matrix printers, however, they are still relatively slow. Until recently, print speeds have been limited to around 60 characters per second (compared to 200 or more for dot-matrix printers), or 12 pages per minute for laser printers. New formed-character printers offer speeds of around 90 characters per second—better, but still slow. (Continued on page 92)

For a detailed comparison of the prices and features of many popular microcomputer printers, see Computer Decisions’ “1985 Guide to small and mid-sized printers” in this issue.

(Continued from page 91)

Ink-jet printers have also begun to rival formed-character quality at much higher print speeds. A line printer from Genicom, Waynesboro, VA, prints a very fine matrix using ink-jet technology. Similarly, Siemens Communications Systems, Boca Raton, FL, has introduced an ink-jet printer with very fine resolution.

Printing graphics has become the job of all but the formed-character printers, although many dot-matrix printers still lack the software required to support graphics. Some formed-character printers can print graphics if the printer hits the period for each dot in a graph, but this wears excessively on the printer.

A better option for graphics is the plotter. In contrast to printers, which print patterns of characters or dots, plotters draw on a surface using a pen or other implement. Plotters come with as few as one or several colored pens. In contrast to dot-matrix printers, plotters can actually draw smooth lines and curves and describe circles with smooth edges and, usually, perfect shape. A figure drawn with a dot-matrix printer will have edges that appear as many closely connected dots, not with the smoothness of a plotted figure.

Typically, businesses use plotters for the preparation of charts and graphs, for growth projections and analyses, and for presentation graphics, such as

product logos and sales materials. Enter Computer's Sweet-P plotters are used throughout the University of California for graphic representations of research projects. The combination of a plotter with a presentation-software package may replace the need for outside graphic artists.

The Sweet-P plotters support any computer with a driver for HP 7470, 7475, or Sweet-P graphics output. Some of the micro-based programs generating compatible output include AutoCAD from Autodesk Inc. (Mill Valley, CA), Chartmaster from Decision Resources (Westport, CT), Graphriter from Graphics Communications Inc. (Waltham, MA), and Lotus

UPDATING THE OLD

If your organization has old printers that are unused because the computer that drives them is old or obsolete, it's possible to give them new life by installing an updated interface. In many cases, the manufacturer of that original equipment will help refer you to a supplier of an updated interface.

Printers, for example, that used to come with dedicated word-processing equipment (typically, Diablo HyType 1 and HyType 2 machines) have proprietary interfaces that make them incompatible with most of today's personal computers. According to David Kuzara, president of Kuzara International (San Diego), there are over 40,000 of these printers in American offices.

Kuzara claims these older printers are often superior to the printers being sold today: "The old Diablo printers were built like trucks. They seem to last forever. They're better because they're heavier." A heavier printer vibrates less than a lightweight model and therefore produces sharper characters.

Kuzara sells the Printerface, an interface that adapts the HyType printer, NEC 5500, and Diablo 630 printer to accept the more standard Centronics, RS-232C, IEEE-488, or Current Loop (used on some mainframes) printer protocols. En-

hanced features include bi-directional printing, micro-justification, automatic centering, and selectable pitch (10, 12, or 15 characters per inch, or proportional printing). Printerface also offers an optional switch that will allow the old printers to function with either dedicated word processors or with computers. Such a printer can then be shared by users on different machines.

Even a relatively modern printer may seem obsolete because it can't keep pace with the rapid speeds of the latest computers. In fact, many computers sit idle, wasting time and money, waiting for a printer to print. Instead of a faster printer, your organization may need a print buffer—a memory unit that can store output until the printer is ready to print, freeing computers to do other tasks.

Most buffers, however, aren't up to speed, so to speak, because they allocate projects on a first-in, first-out basis—a system that makes no provision for rush or priority work. The Shuffle Buffer, from Interactive Structures Inc. (Bala Cynwyd, PA), lets users assign a file for each job and then print documents in any order. In other words, the Shuffle Buffer provides random access to stored files.

In theory, once the buffer is loaded, "boilerplate" passages and repetitive documents can be prepared by select-

ing an order of printing for the parts of the document. Because the Shuffle Buffer is powered independently from the micro and printer, the computer can be turned off or used for other jobs while the printer continues to print, according to Interactive.

If your organization is planning to add more computers and you don't expect any of them to need a printer for more than an hour or so each day, it doesn't make sense to buy a new printer for each computer. Extended Systems (Boise, ID) offers one solution with their Sharepool and Shareplot units, which allow a printer to be shared by up to three computers. As print jobs are output from computers, they are stored in Sharespool/Shareplot's buffer and kept until ready to print. As their names suggest, Sharespool is for printers, and Shareplot supports plotters.

Normally, an RS-232C-compatible printer will only work with RS-232C output from a computer, but the Sharespool interface modifies the data signal, matching a printer's input with an incompatible computer's output. One unit converts a computer's RS-232C printer to drive a Centronics compatible printer; another unit does the reverse conversion. The units available vary in the input and output protocols they accept.

BOOSTING MICROS

1-2-3 and Symphony from Lotus Development Corp. (Cambridge, MA).

Photographing a computer-generated screen is another way of presenting computer-generated graphics. Many devices are available. Most involve a hood that attaches to the front of the monitor, with a clamp for attaching a camera. A slide picture taken of the monitor can then be projected to a screen or used as an original for printing or color litho reproduction. Suppliers include Polaroid and Kodak.

Computer graphics can also be generated by sending the actual signal from the computer to a projection television set. This method is very useful

for presentations before large groups. Such presentations generally have more impact than a folder full of printed charts and graphs. Furthermore, answers to "what-if" questions can be presented interactively before a group. Even a small group meeting would benefit from such an approach. One supplier, Inflight Services Inc., distributes the Barcodata 32 video projector. However, these devices cost more than the micros they're attached to.

Color-dot graphics are beginning to come into their own. When printed in color, charts and graphs are more easily understood and have more impact than a similar black-on-white chart.

Many methods of color printing use multicolored ribbon. As the ribbon—usually cyan, magenta, yellow, and black—is moved in place between the print head and the paper, each cell is printed one color at a time. When one color has been printed, the ribbon advances to the next, which is then printed. After all colors in a cell have been printed, the print head moves to the next cell, and the process is repeated.

Apple Computer has a color printer that uses this basic technology, but its impact method is different. In Apple's thermal-transfer technique, the colored ribbon carries a series of pigmented,

MICRO OUTPUT OF EVERY STRIPE

Plotters

Vendor	Product	Requirements	Price	Circle
Amdek (312) 595-6890	Amplot II	Accepts input from Centronics parallel or RS-232C serial port	\$799	401
Apple Computer (408) 996-1010	Apple Model 410 Color Plotter	Apple II, IIe, III	\$779	402
Celtic Tech. (818) 884-6767	VFR 200	IBM PC, PC XT; Apple II, II Plus, IIe; TI PC; DEC Rainbow; other micros	\$2,795	403
Comrex Int'l. (213) 530-2528	Comscriber I	Many personal computers	\$695	404
Enter Computer (619) 450-0601	Sweet-P Personal Plotter (Six Shooter) Model 100 Pen Plotter	IBM PC and Apple micros with Centronics-compatible interface Same systems	\$395 \$1,095	405
Hewlett-Packard (415) 857-1501	HP 7475 six-pen plotter	IBM PC	\$1,895	406
Houston Instruments/ Bausch & Lomb (512) 835-0900	PC Plotter Model 595 four-pen plotter PC Plotter Model 695 four-pen plotter	Any micro with RS-232C port Same systems	\$595 \$695	407
Mannesmann Tally (206) 251-5524	Pixy 3 Micro-plotter (three-pen)	Most micros	\$595	408
Nicolet Computer Graphics (415) 372-7568	Zeta 8 eight-pen plotter Sprint six-pen plotter	IBM PC IBM PC	\$5,950 \$1,395	409
Quadram (404) 923-6666	Quadjet	IBM PC, PC XT	\$895	410
Roland DG (213) 685-5141	DXY-880	IBM PC	\$1,295	535
Strobe (415) 887-0756	M100 M260	IBM PC; TI PC; Apple IIe, II Plus, III; other micros IBM PC	\$395 \$595	411
Tandy/Radio Shack (817) 390-3921	FP-215 Flatbed Plotter/Printer	TRS-80 series	\$995	412
Western Graphtec (714) 770-6010	FP-5301 10-pen plotter WX-4731 four-pen drum plotter/writer DA-8400 six-pen plotter	Most micros Most micros Most micros	\$3,290 \$2,490 \$1,850	413

BOOSTING MICROS

paraffin-based dyes, which a thermal print head melts (instead of striking), vaporizing the dye and depositing a colored dot on the printing surface. With the thermal method, however, either a color prints or it doesn't—there are no half-tones. In addition, a printer ribbon can be used only once.

Ricoh Corp., West Caldwell, NJ, has developed a variation of thermal transfer, which it licenses to original equipment manufacturers. The Ricoh technology allows mixing of colors and variation of a color's intensity. The result may be as defined as a good color photograph or, conversely, as "muddy" as the pages of a comic book. Unlike the Apple thermal-transfer ribbon, the Ricoh ribbons can be used up to 15 times.

Another device that usually comes to mind when discussing output devices is the video monitor. The choice between monochrome and color is not one to be taken casually. With IBM Personal Computers and compatibles, a different card is required to process the video signal that is sent to either monitor. Additionally, some software is designed to work with only a color monitor, or with only a monochrome monitor. You must be careful to match your monitor to the display requirements of the software you plan to be using. Otherwise, you may end up using two monitors and two video-adaptor cards, and not all computers will allow both to be installed in the computer simultaneously.

A monitor's resolution refers to the

number of pixels (picture elements) that can be displayed on the screen. As a rule, the higher the resolution of a monitor, the sharper the picture it is capable of producing (although 640 dots would look sharper on a 13-inch monitor than on a 19-inch monitor, since the dots will be closer together). Bandwidth also relates to image sharpness. A monitor with a higher bandwidth (above 18 MHz) is required for most 80-column displays.

It is also important to differentiate between the types of input required. A majority of personal-computer monitors accept RGB (red-green-blue) inputs. Theoretically, these monitors can produce thousands of hues, but most monitor spec sheets don't mention this fact, and few color cards can generate

MICRO OUTPUT OF EVERY STRIPE

Voice synthesis

Vendor	Product	Requirements	Price	Circle
DEC (617) 897-5111	DECTalk speech synthesizer	Any micro with RS-232C port	\$4,000	414
Street Electronics (805) 684-4593	Echo Speech Synthesizer	IBM PC	\$250	415
	Echo Speech Synthesizer —Echoplus	Apple IIe	\$150	
	Echo Speech Synthesizer —Cricket	Apple IIc	\$180	

Video output

Vendor	Product	Requirements	Price	Circle
Bell & Howell (312) 262-1600	Digital Imager IV digital film recorder	IBM PC and PC XT	\$7,500	416
Celtic Tech. (818) 884-6767	Computer Camera (computer-graphics camera)	IBM PC and PC XT; DEC Rainbow, Pro 350; TI PC; other micros	\$2,795	417
Eastman Kodak (716) 724-4985	Kodak Instagraphics Slide Products (slide imager with cone adaptor)	Most micros	\$389	418
General Parametrics (415) 527-5600	Videoshow with Picturlt software (display system)	IBM PC	\$4,094	419
	Photomaker 150 (generates slides and prints)	Videoshow system	\$2,999	
Image Resource (805) 496-3317	Samurai (digital film recorder)	IBM PC, PC XT, PC AT, or 3270 PC with graphics-processor card	\$10,000 to \$12,000	420
Inflight Svcs. (212) 751-1800	Barcodata 32 (large-screen projector)	IBM PC, PC XT, and PC AT	\$16,465	421
Lang Syst. (415) 328-5555	The Video Slide 35 (digital film recorder)	IBM PC, PC XT, PC AT; Apple micros; DEC micros; other micros	\$2,999	422
NPC (617) 969-3487	Screenshooter (digital film recorder)	Most micros	\$169	423
Photographic Sciences (716) 265-1600	Datacam (digital film recorder)	IBM PC, PC XT, PC AT; TI PC; other micros	\$875 to \$925	424
Polaroid (617) 577-3131	Palette (digital film recorder)	IBM PC, PC XT, PC AT; Apple IIe or II Plus; DEC Rainbow and Pro 350; AT&T PC	\$1,799	425

Now your computer or word processor can read

The OMNI-READER

The OMNI-READER is a revolutionary new Text Reader or Optical Character Reader (OCR).

It costs a fraction of the price of your computer system. It reads the printed word and translates it into an electronic signal capable of being recognized and down loaded into most computers and word processors. The need for slow and tedious retyping of already printed data is eliminated.

The quick brown fox can jump from the OMNI-READER into your micro computer system and onto the screen with as little effort as it takes to read "The quick brown fox."

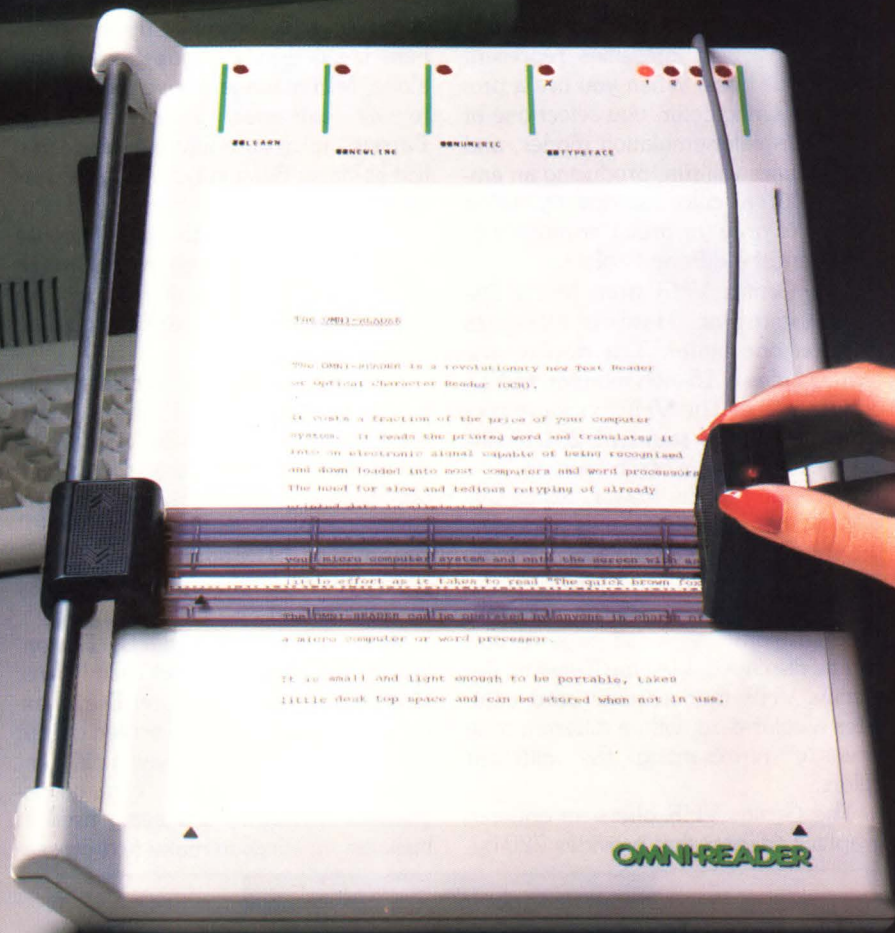
With the Oberon OMNI-READER™ — the first optical character reader designed and priced for small computers.

You can transfer material directly from the typed page to the screen of your computer — without ever touching the keyboard.

And because the OMNI-READER uses a standard RS232 serial port hookup, it interfaces easily with *your* computer.

The technology is revolutionary. But what is most revolutionary is the price — under \$500.

Find out more about the Oberon OMNI-READER. Dial 800-2-OBBERON. In Texas, (214) 446-9567.



OBBERON
INTERNATIONAL

more than about 16 colors at a time. A composite monitor can display only 256 colors. Most computers generate only RGB outputs—a composite monitor would not be able to display this type of computer's output. Although you can use a composite monitor to play back video output from a video tuner, a videocassette recorder, or a low-end computer, composite monitors are usually not capable of displaying readable 80-column text.

As mentioned, some computer software will work only on monochrome systems, while other software requires a color card for operation. This problem can be avoided using the Ericsson Monochrome adapter for the Ericsson PC (Ericsson, Greenwich, CT). In addition to working like a monochrome card, the adapter also emulates an IBM color card and, in effect, fools the software into thinking that a color card is in the computer. Instead of generating color on the monochrome screen, half-tones of varying intensities represent the various hues. When you use a program requiring color, you select one of the card's color-emulation modes, and the software will run, producing an emulation of a color screen by using shades of gray (or green or amber) to represent the different colors.

The Genius VHR from Micro Display Systems Inc., Hastings, MN, goes Ericsson one better. This display system includes a 15-inch monitor and an adapter card. The VHR package produces either the standard 25-line display or a full-page 66-line screen.

According to Bill Fraser, Micro Display Systems' national sales manager, the standard unit can run any personal-computer program. The power-on default produces a 25-line display. Through software, a full page of text can be displayed. Like the Ericsson, the Genius VHR monochrome card emulates a color card, with a different tone intensity representing the different colors.

The Genius VHR offers an optional graphics adapter that provides 720-by-

990 pixel bit-mapped graphics. With the graphics board installed, the screen can be split to display text on the top 25 lines of the screen, with graphics on the bottom. In addition, text and graphics can be simultaneously displayed on the screen and individually manipulated. In other words, graphics can be overlaid on text.

Color monitors present a broad palette to computer users. However, they cost more. Before ordering a color monitor, determine your software needs. If a station will be used only for word processing, a monochrome monitor is the best choice. Not only is a monochrome screen cheaper, but also only the best color monitors can produce truly readable characters.

However, there are times when color is essential. When a computer is used for computer-aided design, color is usually required to differentiate between the many, otherwise identical, lines that typically make up a component being drawn. Aside from design alone, MIS managers have found color to be extremely important. Fred Barrett, microcomputer-systems analyst at Union Bank in Los Angeles, uses his micro to develop presentations to investors, as well as to make in-house reports. He found that monochrome charts just weren't sufficient for the presentations Union Bank wanted to make.

Instead, Barrett went to color graphics on his IBM PC XT, using Chartmaster and Lotus 1-2-3. "Sometimes we present a series of charts from various angles of the investor's portfolio. Color graphics is an advantage," Barrett says. "The alternative is tabular presentations, and they're not as easy to understand."

Arts Computer Products, Boston, has an interesting product called Lens. Company spokesman Peter Duran explains that Lens can take screen output and magnify it to any of seven different levels. Text characters can be increased in height. "It's being used in business meetings to make text presen-

tations," Duran says. Lens can be used to show what a user is doing on a large screen—a valuable tool for presentations and reports directed to large groups.

A final category of output devices are those using speech. During the last year, a wide number of speech output devices has been announced. Arts Computer Products, for example, has a package called PC-Voice. PC-Voice reads characters on a display. It is capable of reading one letter at a time or complete words. A visually impaired data-entry operator may benefit from the audible feedback. When a mistake is made an operator hears it as it's done. Alternately, a text screen can be played back and checked again.

Computer-generated speech can be incorporated into functions such as office communications, with something like a computerized switchboard, or can guide data entry (the entry person would complete forms based on questions from the computer). (Input aspects of voice were discussed in the March 12 issue of *Computer Decisions*.)

In addition, computer-generated speech can be used to identify upper- and lower case as changes are input, or to identify line and column numbers on a spreadsheet. Similarly, a verbal "help menu" may be incorporated into new software, so instead of referring back to a manual for answers to a question, the computer will "talk you through" it.

A company's output equipment should be tied into its needs. For major in-house publishing requirements, a laser printer may be essential. For an installation requiring less-frequent publishing, a slower dot-matrix or letter-quality printer may be adequate. Alternately, it may be best to leave paste-up and formatting to an outside service that specializes in that type of work. The point is that an MIS manager must evaluate current and near-future needs and be careful to select the option and equipment configuration (and such alternatives to equipment as outside services) that best fit the organization. □

Mark Brownstein is a free-lance writer based in Sepulveda, CA.

"Today, dot-matrix printers are approaching true letter quality."

WORDS ARE ONLY WORDS ARE ONLY WORDS



Words Alone Don't Describe The Lasergrafix™ 1200 Printer.

The QMS Lasergrafix 1200 is a breakthrough in electronic page printing. But words alone just don't describe it. Because QMS designed the Lasergrafix 1200 to do so much more than words. With a built in intelligent controller that takes simple print commands through your normal data stream. Built-in applications firmware eliminates the need for additional software — and frees your computer's resources for other work.

The difference is graphic — for all your business, scientific and individual printing needs. Create forms that have multiple type-faces and letters up to ten inches high — all on the same line. CAD/CAM. Bit mapped and vector graphics. Pie charts. Bar charts. Even barcodes. At a crisp resolution of 90,000 dots per square inch. With a printing speed of 12 pages per minute.

And, of course, letter quality word processing.

The Lasergrafix 1200 interfaces with just about any computer system. With versatility that lets you take business graphics to the limits of your imagination. Ask for a demonstration. You'll discover that the whisper-quiet performance of the Lasergrafix 1200 speaks softer than words.

And says a whole lot more.

QMS®

QUALITY MICRO SYSTEMS, INC.

P.O. Box 81250 Mobile, AL 36689

Telephone (205)633-4300 Telex RCA 26 60 13

WHERE IMAGINATION LEADS

- ☐ Send me the Lasergrafix 1200 Information Packet, samples of mixed fonts, graphics and everything else it does.
☐ Please contact me to arrange a demonstration.

Name: _____ Title: _____

Company: _____

Address: _____

Type of system you are now using: _____

Number of print workstations you are considering: _____

Prime applications for printer: _____

QUALITY MICRO SYSTEMS, INC.
P.O. Box 81250 • Mobile, AL 36689

CD

IS THERE A PBX TO THE PROMISED LAN?

*PBX/LAN integration is the bridge to
high-speed voice and data communications.
Well, maybe.*

by Gary Stix, Associate Editor

If only data would move as fast on private branch exchanges (PBXs) as sales reps talk. Unfortunately, PBX manufacturers have mostly promises and postponements to show for claims that their products have achieved the high-speed data transfers characteristic of local-area networks (LANs).

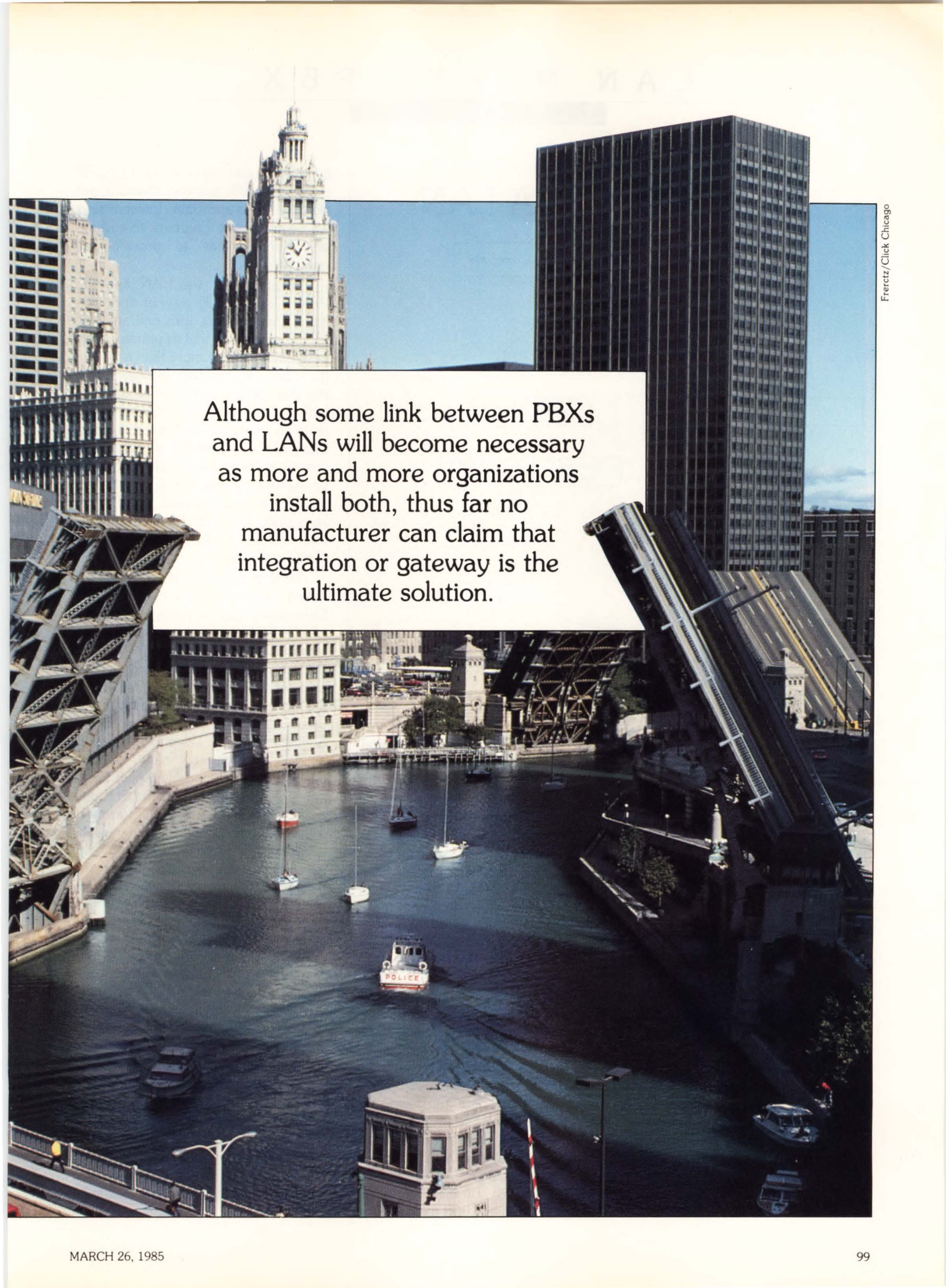
Sometimes referred to as the fourth generation, these advanced PBXs are touted as hybrids, mixing the megabit-per-second speeds of LANs while furnishing the switching and processing intelligence of PBXs. Citing features such as shared use of modems—or modem pooling—and the channeling of outside calls to the lowest-cost communications channel—least-cost rout-

ing—manufacturers of this generation of PBXs say their devices deliver more than the three previous generations. Those generations evolved from devices based on electromechanical voice switches through third-generation voice/-data switches—computers that route voice and low-speed data to their destinations as digital pulses.

Other manufacturers, however, are not so sure that LAN/PBX integration is the way to go, and they are hedging their bets. "This is space-age technology," says a project engineer for one of these vendors. "We'd like to be space age, too. But the difficulties involved in developing this kind of product could mean we'd be in the laboratory for years."

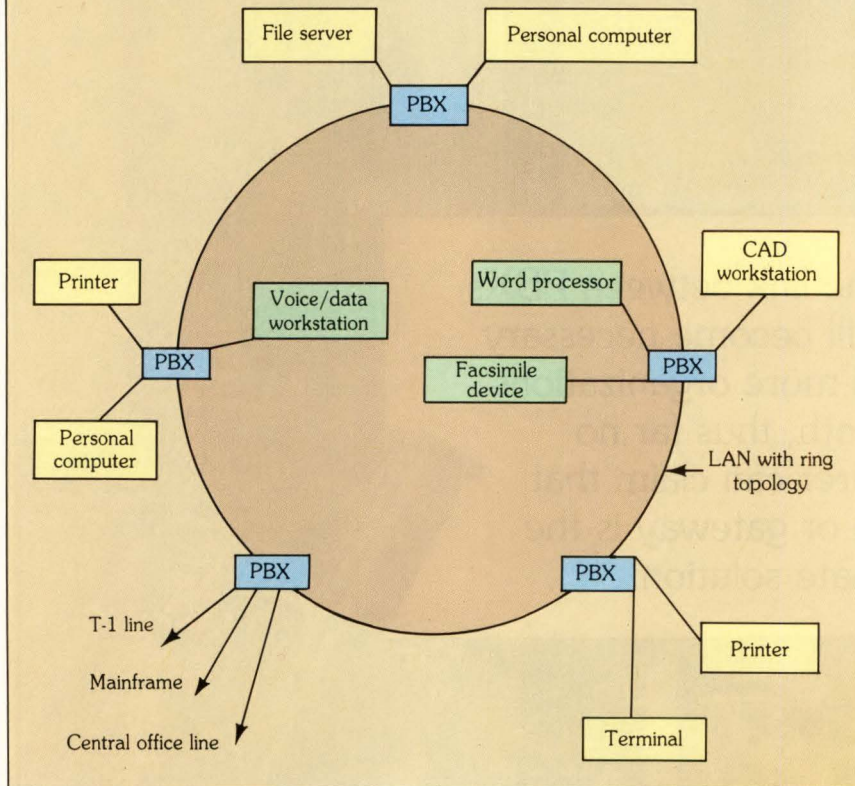
(Continued on page 100)



An aerial photograph of the Chicago River. The Bixby Creek Bridge is raised, allowing boats to pass. In the background, the Willis Tower is visible. A police boat is in the river.

Although some link between PBXs
and LANs will become necessary
as more and more organizations
install both, thus far no
manufacturer can claim that
integration or gateway is the
ultimate solution.

PBXs LINKED VIA LAN



(Continued from page 98)

Research and design concerns are not the only factors keeping some PBX manufacturers out of the race. Some believe that the differences in the way LANs and PBXs handle voice and data make it advantageous for each to remain separate. Rather than integrate the two, these vendors envision a gateway device that would connect the two systems.

Although some link between PBXs and LANs will become necessary as more and more organizations install both, thus far no manufacturer can claim that integration or gateway is the *sine qua non*. Taking their cues from the manufacturers, perhaps, telecommunications managers are approaching integrated LAN/PBX products with caution. According to some analysts, they have reason to do so. Ian Angus, head of Angus Telemanagement Group (Toronto and Boston), a telecommunications consultancy, says, "If you haven't seen a device working twice on a customer's premises, assume it doesn't

exist." In short: *caveat emptor*.

In fact, some integrated LAN/PBX products appear more slowly than promised. In the product literature for its new PBX, the NEAX 2400-IMS, NEC Telephones, the Melville, NY, based subsidiary of the Japanese conglomerate, describes a nonexistent LAN module. Another manufacturer, Intecom (Allen, TX), delayed shipment of Lanmark, a high-speed LAN, for almost a year. Lanmark uses in-place copper wiring as well as coaxial or fiberoptic cabling to channel data at speeds of up to one megabit per second via Xerox' Ethernet protocols. A circuit board in Intecom's electronic telephone converts voice signals into digital pulses while data are formatted for high-speed packet switching. Packet switching places data into fixed-length packets for transmission over the network. Both signals are routed to their destinations via a PBX or other electronic switching device. Intecom's PBX, the Integrated Business Exchange (IBX) S/80, costs \$900 to \$1,500 per

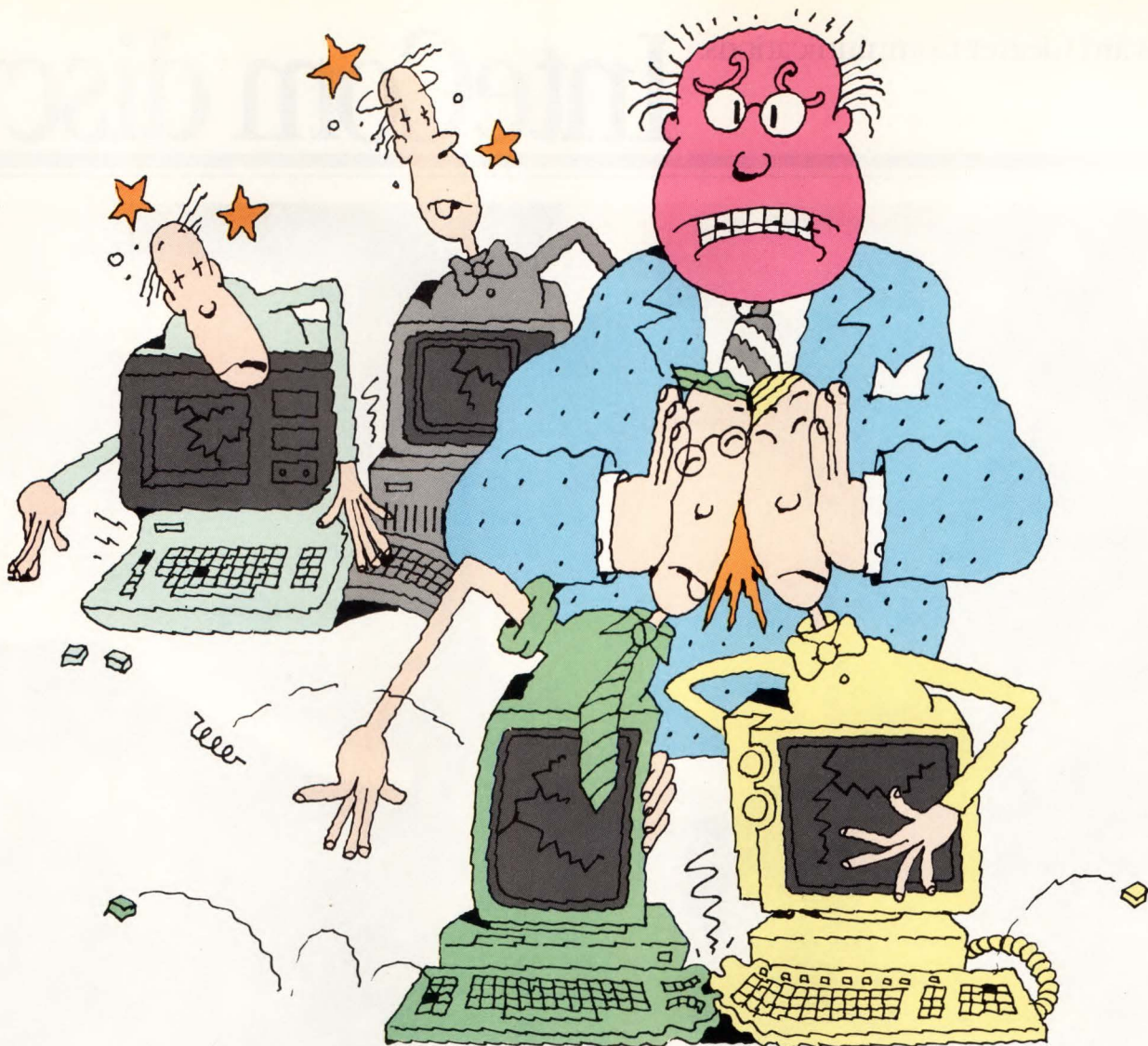
connection and supports up to 8,192 ports. The IBX has two channels per port for voice and data. Intecom says it's begun to ship Lanmark to customers, but declines to provide references.

Intimating that the LAN and the PBX will peacefully co-exist and, perhaps, communicate with one another, IBM has indicated that its primary LAN device may still be more than a year in the offing. Several factors suggest that Big Blue sees a symbiotic relationship between the two communication systems: its purchase of Rolm, the Santa Clara, CA, PBX vendor; its inclusion of coaxial cabling for LANs and telephone-type copper wiring for PBXs in its office-wide wiring plan, the IBM cabling system; and its mention of the interconnection of LANs and PBXs in publicity materials.

The IBM cabling system received a mixed review from an early user, Carnegie-Mellon University, Pittsburgh, which installed a prototype of the system in its computer center. Although the cabling system is still being considered for other campus sites because of the limited number of alternatives, the university found it expensive and bulky. Southwestern Bell Telephone, a regional Bell operating company, decided against using IBM's cabling plan for its new 44-story headquarters in St. Louis despite the fact that Southwestern Bell Telecommunications, its unregulated subsidiary for selling business equipment, was once a distributor of the product. Instead, Southwestern Bell found a less costly combination—twisted-pair wiring for transferring voice and fiberoptic cabling for sending data. "It was a more economical solution than the IBM cabling system," says Scott D. Pool, president of Southwestern Bell Information Systems Integrators, the consulting division of Southwestern Bell Telecommunications.

Other manufacturers that have introduced products combining LAN and PBX technology have done so in limited fashion. Compugraphic, the Wilmington, MA-based manufacturer of computerized typesetting and graphics equipment, conducted a pilot test last summer of Private Network Exchange

(Continued on page 104)



Are you battling incompatible office automation systems?

Call 1-800-227-1817 ext. 812E
for your free booklet.

Now, in just minutes, you can get two incompatible office automation systems to work together. To swap documents in letter perfect order.

All without battling a single modem, service bureau, telephone company or instruction manual.

**Announcing the KEYWORD 7000,
an exciting new breakthrough in office
automation compatibility.**

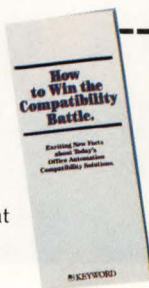
It's here! A compact new hardware/software device that can convert diskettes quickly. Easily. *With no cleanup.*

That means you can swap diskettes between all the major office automation systems without losing headers. Footers. Tabs. Underlines. Or any other formatting codes.

What's more, the KEYWORD 7000 costs just pennies a page. Compared to service bureaus at \$3. And rekeying at \$4.50.

But that's not all. With Keyword, you'll discover a whole new cost-saving world of office efficiency... *using the office automation systems you have right now!*

To find out more, call 1-800-227-1817 ext. 812E and get your complimentary copy of *How to Win the Compatibility Battle. Exciting New Facts about Today's Office Automation Compatibility Solutions.* Or fill in — or attach your business card to — the tear-out coupon. And mail.



KEYWORD
Keyword Office Technologies, Inc.
25354 Cypress Avenue
Hayward, California 94544

812E2

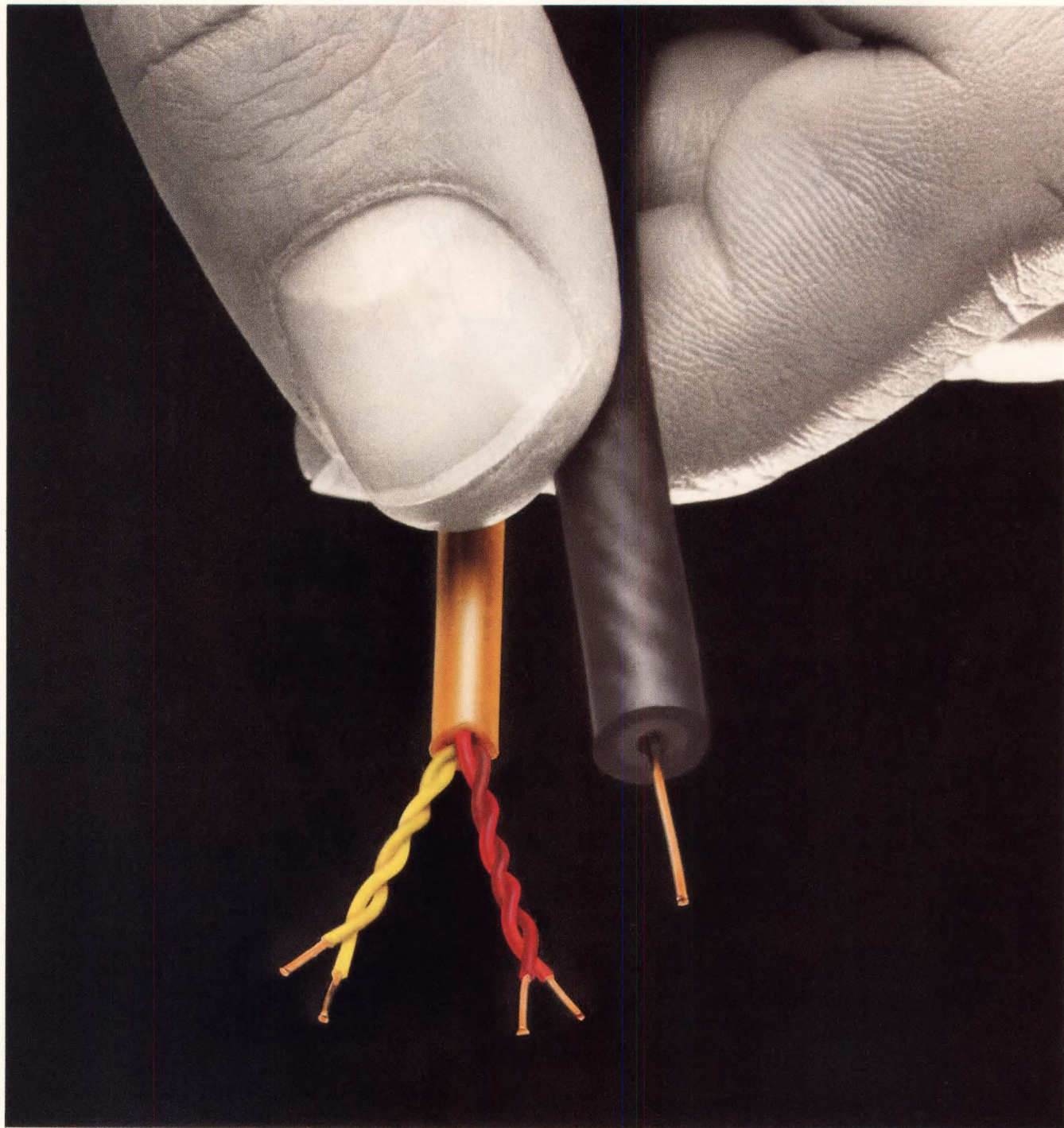
Yes! I want to find out how the KEYWORD 7000 can solve my office automation compatibility problems.

- ☐ Call me ASAP at
() _____ Ext. _____
- ☐ Send me your FREE booklet.

Name _____
Title _____
Company _____
Address _____ M/S _____
City _____ State _____ Zip _____
Phone () _____ Ext. _____

Toward Clearer Communications:

InteCom discuss



ses LAN alternatives.

The manufacturer of the first integrated voice/data switching system considers the factors in local networking.

The need for a Local Area Network is no longer an issue for most organizations. The question is whether a LAN should be separate or an integral part of the voice communications system.

The purposes of a LAN are to share resources such as expensive peripheral devices, allow devices to communicate with each other, and permit users to share data bases. Communications managers must sort through several options to find the most cost efficient way to combine these benefits.

Choices to consider.

There are several ways to create a communication network that includes a LAN. The first solution is to build three separate networks—one for voice, another for data, and still another for higher speed office automation devices.

A second choice: retain the existing voice system and add a new system that combines data and LAN capabilities. Both alternatives, however, involve multiple systems to administer, multiple cable plants and complicated system reconfiguring during moves and changes.

Faced with the costly realities of separate voice, data and local area networks, astute managers are choosing a third option—a voice/data system with integral LAN—one network for all communications.

Five years ago InteCom introduced the IBX™ Integrated Business Exchange, the first integrated voice/data system using a twisted pair network. And LANmark™ local area networking has been an integral part of the IBX from the start, operating on the same twisted pair network!

The benefits of an integrated LAN.

The primary benefit of an integrated LAN is major cost savings. The payback is quickly realized through the management efficiency of a single system. Such a system also provides

for modular growth as needed.

With LANmark, an organization can begin with voice and add or expand its data capability because the required network, standard telephone wiring, is already in place. No separate wiring or bulky and expensive coaxial cables are needed. Nor does LANmark require separate modules or separate ports. Moves, adds and changes are simplified through reconfiguration at the host. The administration of one system also cuts down overhead and streamlines management reports.

Universal Connectivity

To cope with changing technology, companies now realize the importance of selecting a flexible communication system. Because, as yet, there is no recognized standard among the many approaches to office automation. The only safe choice is a system designed like the IBX/LANmark for compatibility with the equipment of many vendors. For only such a system can protect your investment in equipment by providing the capabilities for dissimilar devices to communicate.

Some organizations already have one or more dissimilar LANs in place, and that's a major investment that can't be disregarded. But if existing LANs are too limited, the situation demands a change. Several LANs can actually be improved and combined into one master network through an integrated voice/data/LAN system.

One of LANmark's primary advantages is the ability to connect multiple Ethernet LANs. And in IBM 3270 configurations, LANmark increases efficiency, growing the network by eliminating the high costs of coaxial cabling. Relying on laser-driven fiber optics and two-pair telephone wire, LANmark uses the network that's already installed for voice communications.

Speed

Data speed is often irrelevant...

except when it's too slow. For many situations, 64 Kbps circuit switching fills the requirement, but as data use continues to grow, high speed packet switching will become increasingly important.

With the growing numbers of workstations and terminals in simultaneous use, and the high speeds required for computer-to-computer information exchange, the value of LANmark capabilities becomes more apparent. LANmark can accommodate device speeds up to 10 Mbps!

Whether this high speed capacity is used now or retained for the future, it's excellent protection against obsolescence and helps a company prepare the infrastructure for an automated office.

Size

Every LAN has limitations on the distance it can cover, the number of users who may access it, and the number of devices you may connect. It's important not to become trapped by a network that's too restrictive for future growth.

InteCom's LANmark offers unusually generous capabilities. It can connect up to 8,000 devices located as much as ten miles apart.

LANmark for the future.

Since the introduction of the IBX in 1979, InteCom has been setting the pace for the office communications industry. The system has been proving its merits in nationwide installations for more than three years. It's backed by comprehensive support and refined through an ongoing program of research and development. Software oriented, flexible for new technology and protected against obsolescence, the IBX and LANmark offer you connectivity for the automated office of tomorrow.

We hope you'll find this information useful in your LAN decision-making. InteCom has met the networking requirements of companies in a wide range of industries. And today, our representatives are ready to help you evaluate your specialized needs.



Integrating voice and data communications.

601 InteCom Drive • Allen, Texas 75002 • 214-727-9141 • 1-800-INTE-800

IBX and LANmark are trademarks of InteCom Inc.

(Continued from page 100)

(PNX) from Ztel, a PBX manufacturer with offices and development facilities directly across the street from Compugraphic.

While it introduced its first customers to the PNX, Ztel experienced internal problems. Last December, already behind schedule in bringing out the PNX, Ztel decreased its 395-member workforce by about 20 percent just a week before the president and chief financial officer departed. The layoffs will be partially offset by new hirings in the manufacturer's technical-development and customer-service divisions, asserts Kevin Moersch, Ztel's vice president for sales.

Because Ztel had not released its LAN module, Compugraphic's test of the PNX only involved circuit-switched voice and data characteristic of a conventional voice/data PBX. Circuit-switching establishes a direct connection between callers. Eventually, the PNX will incorporate nodes connected by a token-ring LAN. The PNX's distributed architecture offers protection against system breakdowns. Each node is, in effect, a separate PBX that switches both voice and data signals; if one node fails, the others continue to operate. From the PNX, packets of voice and data information move between nodes carried on a token—an electronic signal that moves around the LAN's ring of cable. The system accommodates 2,048 ports per node.

The PNX, which ran in addition to Compugraphic's present Rockwell 580-L PBX, was removed in late Sep-

tember. According to David Curreri, Compugraphic's telecommunications operations supervisor, "The PNX without the LAN was no better than our current system. We really wanted to see the LAN in operation."

Another Ztel customer, the State of Utah, gave a qualified endorsement to the PNX, which it began using last November for voice communications in a new building leased by the state government. Craig Jorgensen, Utah's telecommunications manager, cites the system's promising diagnostic capabilities, which are intended to perform periodic maintenance checks on 250 telephone lines, as one of the PNX's benefits. But, he adds, "The diagnostics aren't working to what I consider their full capacity yet." According to Jorgensen, a Ztel technician was on site up to 12 hours a day the first month the PNX was installed, and a technician from Firstel, a subsidiary of US West, a regional Bell operating company that markets the PNX, also made daily visits. The PNX was out of operation three times—about 60 minutes—during the first month, which, says Jorgensen, "would have been an unreasonably long time if it weren't a new product."

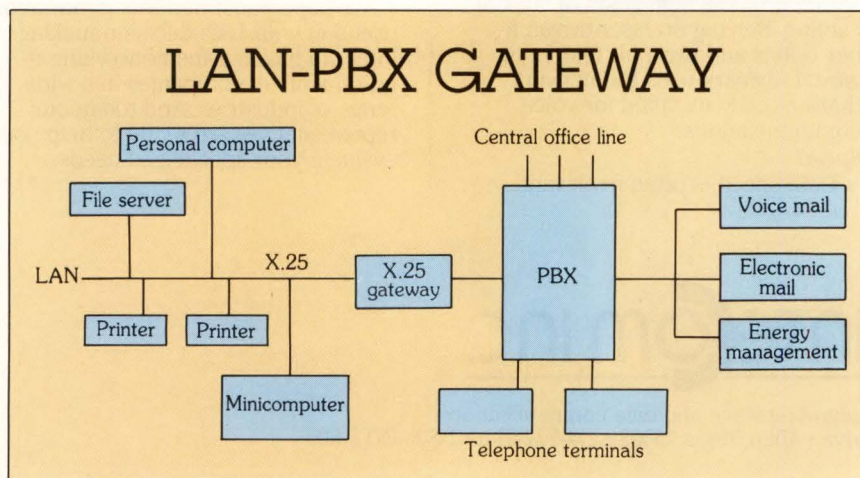
Why would the State of Utah take a chance with a system in the rough? According to Angus, intrepid beta-testers can sometimes negotiate discounts on future equipment purchases. "A telecommunications manager has to decide whether it's worth it for his or her organization to be experimented on," says Angus. "If the answer is yes, the organi-

A gateway device that would connect LANs to PBXs is an alternative to integration.

zation should get a terrific price break for it." As one of Ztel's first customers, the State of Utah negotiated what it considered to be a favorable pricing agreement—\$860 per line. Ztel's prices range from \$800 to \$1,000 per connection. And Compugraphic's Curreri says one reason his organization undertook a pilot test was to obtain a favorable price if it decides to purchase Ztel's PNX.

Like Ztel, Irvine, CA-based CXC was late in meeting its original shipment date for the Rose, an advanced PBX that uses local-area networking to connect different nodes. CXC says it has begun to deliver the device, but refuses to provide prices or customer references, saying only that a distributor—Western Union's Government Systems Division—is currently using the Rose. According to Robert Hawk, CXC's vice president of marketing, the product hasn't been broken in. "Until 20 to 50 systems are working in the field," he says, "the system can't be shaken down completely."

Among the manufacturers that plan to add LAN capabilities to their existing PBX products is Northern Telecom. The Richardson, TX-based manufacturer was scheduled to announce last month an extension to its SL line of PBXs that would enable packet-switched data and circuit-switched voice to be sent over twisted-pair wiring at speeds up to 2.5 Mbps over distances up to 4,000 feet. Shipment of the device is slated for the third quarter of this year. During the latter half of 1985, GTE Communications Systems Corp. (Phoenix, AZ), will supply an X.25 interface for its Omni line of PBXs, enabling it to connect with LANs. By June, AT&T Information Systems (Morristown, NJ) intends to link its System 85 PBX with its proprie-



NEAX[®] 2400 IMS: Communications on all levels.

All businesses today share a need for modern efficient information management. Yet each company's specific needs are unique. That's why NEC, the computer and communications company, developed the NEAX 2400 Information Management System.

The NEAX 2400 combines sophistication with flexibility. Its modular design makes it the advanced information management system you can tailor to your own requirements.

Take size: Order a system with as few as 84 ports, or as many as 23,184. You can start small and build later on—just by adding self-contained modules.

Take features: Choose any or all of the latest technological capabilities—

voice, data, facsimile, voice messaging, packet switching, local area network. Take some features at once, hold off on the others, and add them on easily whenever you wish.

With the NEAX 2400 IMS you get a system that fits your needs, both now

and in the future. You never pay for more system than you want, yet you never settle for less than you need. That's why it's the smart, cost-effective answer to the communication needs of businesses of every type and size.

NEC, a telecommunications innovator since 1899, is a worldwide leader in integrating computers and communications. For more information about the advanced NEAX 2400 IMS, call us toll-free at **1-800-626-4952**; in New York State **516-293-3015**. Or write: NEC Telephones, Inc., 8 Old Sod Farm Road, Melville, NY 11747.

NEC

NEC Telephones, Inc.

Simultaneous voice and data on some terminals, voice only on others; facsimile and text mail; 820 ports.

Local area network connects headquarters with three branches; voice, data, voice messaging, text mail, packet switching, more; 7,460 ports.

Voice system only; 240 ports.



LAN MEETS PBX

tary LAN, Information Systems Network, via fiber-optic cable. And Ericsson Communications (Garden Grove, CA) plans to supply LAN interfaces for its MD-110 PBX by 1986. The interfaces—hardware or software connections—would enable the MD-110 to communicate with Ethernet and token-ring networks. Ericsson is also investigating the possibility of using its personal computer as a gateway between its PBX and an LAN manufactured by Mountain View, CA-based 3Com Corp.

Although telecommunications managers can expect to see a slew of new PBX and LAN products, it is still not clear how these devices will figure in their plans. Like the space shuttle, PBX/LAN integration will have wide-ranging benefits for American business sometime in the future, but for now, LANs and digital PBXs, though much publicized, are still in their youth. According to George Colony, president of Forrester Research, a Cambridge, MA market-research firm, approximately 10,000 LANs have been installed in corporations throughout the country. More than half of those are Datapoint Arcnet LANs—originally installed to tie Datapoint computers in a proprietary network—which until last year failed to meet today's requirement that an LAN connect incompatible computers.

Also of recent vintage are integrated voice/data PBXs, which switch voice and data signals over telephone wiring as digital pulses and feature many of the advantages of LANs. Besides switching phone calls, integrated systems can transmit circuit-switched data messages over a telephone network at speeds of up to 64 Kbps—enough bandwidth for most data-communications needs. At Prudential-Bache, a New York-based securities brokerage, the SL-1 integrated PBX from Northern Telecom, is used for both voice and data transmissions. Says William T. Rush Jr., a senior vice president, "I'm not clear as to what role the LAN will eventually play and where the voice/data PBX will fit in our system. Based on our current data needs and what PBX manufacturers are able to do, my feeling is that the

LAN will be a relatively minor player."

As Rush suggests, the lack of burning interest in LANs can be attributed to current demands. Although the need for computer-to-computer communications continues to grow, it still takes a back seat to users' desire for more sophisticated voice-transmission technology, which still accounts for about 90 percent of most corporations' total communications load. "In the next five years, if the demand for data approaches 30 percent of the communications picture, that will be a high figure," says Gerald Mayfield, a Stamford, CT-based vice president of the DMW Group, an Ann Arbor, MI, consultancy. In addition, large corporations, the primary targets for advanced office systems, are in no hurry to commit large amounts of capital to a technology that hasn't been widely tested. According to James Marston, Dallas-based American Airlines vice president for data-processing and communications services, his employer, an industry leader in using computers and network systems, does not feel compelled to take a leadership role in office automation. "In some spheres, we want to be a pioneer," he says, "but this aspect of technology isn't one of them. We can afford to move relatively slowly."

Even some PBX manufacturers perceive only a moderate demand to hook their products to existing LANs. "There isn't a huge need for this type of connection," says Janice Carnes, Rolm's director of corporate marketing. "The majority of data-transmission needs can be met using a voice/data PBX. But there will be small clusters of users who can use LANs for high-speed applications, such as computer-aided design and manufacturing. Our customers can do that now with the X.25 interface on our PBXs, the standard interface for packet-switched networks." (LANs provide the high speeds essential to transfer large files of graphic in-

formation to the powerful workstations used by design engineers. It might take one second for a drawing transferred at megabit-per-second speeds to fill a screen, whereas it might consume 15 minutes or more on a slower-speed network.)

Before LANs and PBXs become fully integrated, however, further developmental work appears to be necessary. LAN and PBX designers are working toward a system that will forego the need for any type of switched connection. Such a system will resemble an LAN to which every office-communications device, be it a micro-computer, a mainframe, or a telephone, will be directly connected. The product, however, is still in the laboratory—or in an engineer's imagination. "The switches that can concurrently carry high-speed voice and data haven't arrived yet," says Harvey Freeman, vice president of Architecture Technology, a Minneapolis consultancy. For the high-speed performance that will mark the true integrated system, optical memories that use lightwave technologies and more powerful processors must become available—events that may not occur before the year 2000, says W. Spencer Rice, a senior partner at S&R Consultants, Madison, NJ.

An obstacle to developmental work has been the traditional separation of voice and data communications. As in the case of IBM buying Rolm, some computer manufacturers are buying the communications knowledge they lack. Wang Laboratories (Lowell, MA) has taken an equity stake in Intecom, and NCR Corp. (Dayton, OH) has bought a piece of Ztel. Ralph K. Ungermann, president of Ungermann-Bass (Santa Clara, CA), a major LAN supplier, says both Ztel and CXC have offered to combine product lines with his company. Ungermann believes LAN manufacturers' knowledge of how to connect dissimilar computers

**Communications managers are
approaching integrated LAN/PBX
products with caution.**

GIVE US 3 MONTHS, AND WE'LL CHANGE YOUR COMPANY'S WAY OF DOING BUSINESS FOREVER.



Presenting a superior communications and information delivery system, CompuServe Interchange.

Finally, there's a way for all those computers out there to really increase your company's productivity.

The breakthrough is Interchange, a superior electronic communications and information delivery system from CompuServe—the premier supplier of business information, electronic mail and network services to major financial institutions, government agencies and FORTUNE 500 companies.

Interchange lets you build and maintain your company's information sources and then disseminate this information to any audience: office staff, sales representatives, customers, distributors, suppliers, purchasing agents—in any combination that is right for your business.

Many corporations and associations in a wide range of industries are already

profiting from Interchange and our electronic mail system, InfoPlex®.

Borg-Warner Chemicals has increased sales significantly with an Interchange system that (1) supplies technical information, (2) updates changing trade news, and (3) allows customers to run interactive, industry-oriented programs.

Heinz U.S.A. uses CompuServe's electronic mail to communicate sales and promotional information to the company's sales personnel. The speed and accuracy of InfoPlex have resulted in improved customer service and effectiveness.

CompuServe Interchange also allows access to a variety of useful information including stock quotes, the AP newswires, USA TODAY Update, and market research databases.

You can organize and disseminate information, provide electronic mail and much more. And we can help you put it together quickly and efficiently.

And in just 3 months, that can change your company's way of doing business forever.

For more information, call us or send this coupon today.



CompuServe Interchange

- ☐ Please send me additional information.
☐ Please have a CompuServe representative call me.

Name _____

Title _____

Company _____

City _____

State _____ Zip _____

Business Phone _____

CompuServe

CompuServe Interchange
P.O. 20212
5000 Arlington Centre Blvd.
Columbus, Ohio 43220

800-848-8199

In Ohio call 614-457-0802

503

An H&R Block Company

LAN MEETS PBX

will place them in a better position to provide backbone office networks than PBX manufacturers. Ungermann believes PBXs will play a limited role in office automation. For example, an LAN-to-PBX link can serve as a gateway to the public phone network, channeling data on an LAN to a bank of modems connected to the PBX.

Using an interface to connect PBXs and LANs is an approach some telecommunications managers find more appealing. Michael Bitterman, director of telecommunications for Pepsico, White Plains, NY, says he prefers interfaces to LAN/PBX integration, at least for now. Expressing skepticism about PBX manufacturers' qualifications, Bitterman says, "I wouldn't want to use a PBX supplier that doesn't have a lot of expertise in data communications."

Some PBX suppliers also believe that arms-length coexistence with LANs, not integration, is the best path. Employing LANs' packet-switching technology can lower the quality of voice transmissions, they contend. For example, United Technologies Communications, St. Louis, plans to provide interfaces that allow its UTX series of PBXs to connect to LANs manufactured by other vendors.

Whether LAN/PBX integration or gateway devices proves the better choice, as corporations' demand for automated equipment—from personal computers to special design workstations for computer-aided design—grows, so will the requirement for high-speed, high-capacity communications. Then the benefits of an LAN or an LAN-like PBX will become apparent. Instead of keeping track of hundreds or even thousands of floppy diskettes, telecommunications managers might use such networks to deliver to a workstation selected analytical or clerical software tools—word processing or spreadsheeting—as well as to keep data contained therein.

Already, a few corporations are seeing demands for massive data transfers that justify the purchase of an advanced system. Monsanto Corp.'s research center near St. Louis, for example, house more data devices than employees. Having installed Intecom's IBX in November, the giant chemical



producer is now awaiting delivery of Lanmark, Intecom's LAN module for the IBX, which is scheduled to be installed by April 1. With several thousand miles of wiring already in place, Monsanto can move computers or terminals to any site that contains a standard telephone wall jack. "We often move people around, so we have to move equipment, too," says Marvin Noelken, Monsanto's manager of office services.

Perhaps the most advanced work in integrating LANs with PBXs has been undertaken by General Motors, Detroit, as part of its effort to promote a standard LAN interface that would allow incompatible equipment from various factory-automation manufacturers to be connected. According to Karl Schohl, project engineer for GM's advanced-product and manufacturing-engineering staff, PBXs will be gateways between different factory LANs or between an LAN and a larger corporate-wide network. The interface is scheduled to be installed this fall at one of GM's "factories of the future," a steering-drive plant in Saginaw, MI.

Several PBX vendors, including Northern Telecom, Ztel, AT&T Information Systems, and Rolm, have indicated they will offer the GM-specified interface, known as Internet or Connectionless Network Service (CLNS), on their systems. Says GM's

Schohl, "Our purchasing decisions will be weighted toward suppliers that can provide this capability." CLNS originates from the standards-development work of the International Organization for Standardization and its U.S. representative, the American National Standards Institute. Intended as a software specification for connecting the major types of LANs, CLNS can also be used to build an interface for PBXs, says Schohl.

Not all corporations will or should follow GM's lead, but for those with the flexibility and the extra cash, it may be wise to experiment with an advanced PBX. "These systems can help telecommunications staffers develop interdisciplinary expertise," says Ian Angus. "It is becoming essential for staff to understand both voice and data communications. But the setting in which these systems are used should be carefully controlled. For example, I'd tend not to put all vital customer-credit information on the system."

Once testing is completed and discounts negotiated, however, it may be difficult to devise a prudent purchasing strategy. Because these advanced systems incorporate hundreds or even thousands of lines, it's often impossible to make a tentative purchase. An alternative is to forego an LAN by installing specialized workstations and controller units that allow high-speed data transfers over copper phone wiring only where needed. David Systems, Sunnyvale, CA, offers such a device, the Information Manager, which transmits packet-switched data at speeds of up to 2 Mbps.

A customer's decision to buy an advanced communications system may stem from a manufacturer's claim that an advanced design assures a longer product cycle than that of a competitor's. This edge can only be maintained, though, if trailblazing manufacturers aren't overtaken by larger competitors who wait until the market's ripe before making their entry. Says Amy E. Smith, senior analyst with the Yankee Group, a Boston market-research firm, "These suppliers say their switches won't be gone in five years. The question is will they still be in business?" □

If corporate changes are tying your data communications network in knots, our Family of LAN can help to eliminate the tangle.

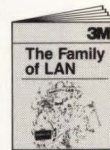
Growth, organizational changes, and physical expansion of a company's campus can wreak havoc with many wire- and cable-based data communications schemes. That's why it'll pay you to investigate the Family of LAN from Interactive Systems/3M.

The Family of LAN includes several high-capacity, high-speed net-

works that make adding or relocating devices both simple and economical. These broadband systems can handle hundreds or even thousands of devices over distances of up to 15 miles.

LAN/I links as many as 10,000 devices with a terminal-to-host "information highway" that gets data through reliably no matter

how heavy the traffic. LAN/II meets IEEE 802.4 LAN standards for communications between computers and peripherals of different vendors. LAN/PC links your IBM PCs and compatibles. IS/3M can also give you cost-effective point-to-point communications between computers and thousands of devices on a single broadband cable.



Find out more about the Family of LAN from the pioneering company that offers the widest variety of broadband solutions to data communications problems.

Call 800-328-5727 ext. 176A toll-free. (In Minnesota, 800-742-5685 ext. 176A.) Or write to Interactive Systems/3M, Response Center, Dept. 176A, 701 Decatur Ave., No., #205, Minneapolis, MN 55427.



3M hears you . . .

3M

What do your re

Introducing Ensemble.™ Now

He has a good head on his shoulders.

A good listener.

He's a very pleasant person.

Good grasp of the basic issues.

He has his feet firmly planted on the ground.

He's got a mind like a steel trap.

Tremendous analytical abilities.

He's dynamic.

A first rate problem-solver.

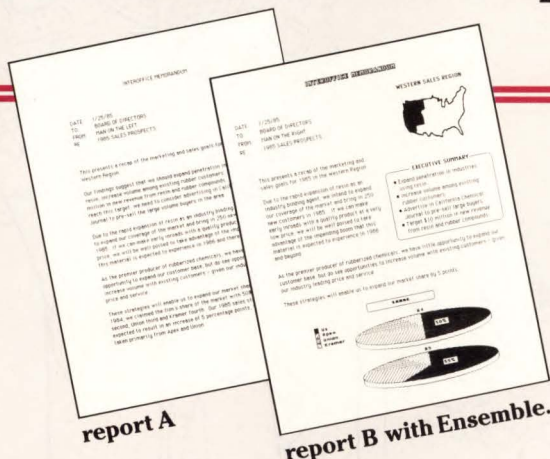
This guy is going places. Fast!

Executive with report A

Executive with report B
done with Ensemble.

ports reveal about you?

You Can Dress Your Reports For Success.



Which report would you rather submit? Report B, submitted by the executive on the right was prepared with Ensemble. It integrates text, numbers and graphics. It's more interesting. It's more persuasive. And it's more impressive.

Every tool you need to generate impressive business reports is on a single Ensemble software disk.

Ensemble is the first fully integrated business software package for the Macintosh.TM

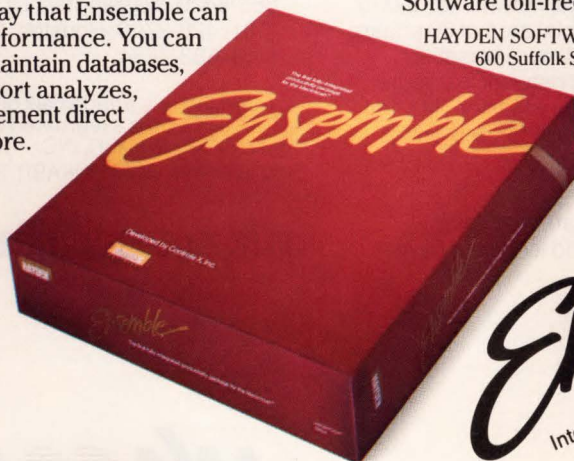
Ensemble combines Word Processing, Database Management, Report & Form Design, Calculations and Graphics in one very powerful and productive program.

It's all here—everything you need to merge text, numbers and graphics in your reports.

For example, with Ensemble you could draft an analysis of market trends; support your findings by inserting a spreadsheet, illustrate a critical comparison with a bar graph; highlight your conclusions by creating a border of stars around them and dramatize your recommendation with artwork you design especially for the report with MacPaint.TM

Ensemble's Report Creation capability is unique. But, it's not the only way that Ensemble can help improve your performance. You can also use Ensemble to maintain databases, conduct decision support analyzes, design brochures, implement direct mail programs and more.

RUNS IN
128K or 512K

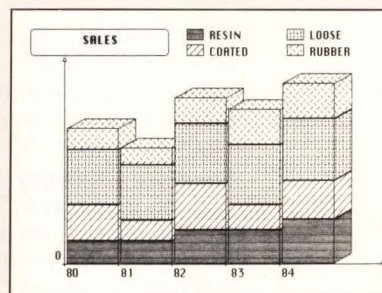


Best of all, Ensemble is as easy to use as your favorite personal computer. Ensemble was developed with you and your Macintosh in mind. It takes full advantage of the Macintosh User Interface, features a remarkably fluid operating style, and is compatible with MacWriteTM and MacPaint.

You can design your own "customized" spreadsheet formats with Ensemble. And a variety of calculation options are available including: all arithmetic, logical and comparative functions.

PROFIT ANALYSIS					
					% of Net
Cost of Goods					0.25
Expenses					0.45
	Q1	Q2	Q3	Q4	Total
Net Sales	5000	3000	3000	7000	18000
Cost of Goods	1250	750	750	1750	4500
Expenses	2250	1350	1350	3150	8100
Profit	1500	900	900	2100	5400

Now you can easily create handsome two and three-dimensional business graphics with a sweep and a click of your mouse. Ensemble provides bar graphs, line graphs, pie charts, a time line graph and a scatter chart.



Thousands of business reports are prepared every day. Most are submitted for approval. Some are read. A few are discussed. Only a handful are remembered. You can make a lasting impression with Ensemble. See your local software dealer today. Or call Hayden Software toll-free at 800-343-1218.

HAYDEN SOFTWARE COMPANY, INC.
600 Suffolk Street, Lowell MA 01854 (617) 937-0200

HAYDEN
SOFTWARE

Ensemble
Integrated software that makes you look good.

WANT TO GROW YOUR NETWORK?

TRUNKMASTER™ TMX 144 LETS YOU BRANCH OUT— UP TO 36 SQUARE MILES.



The TrunkMaster TMX 144 Multiplexer from M/A-COM LINKABIT is just what a growing network needs—*more* user capacity at *more* speed over *more* distance than with other multiplexers currently available.

For more efficiency

With the TrunkMaster TMX 144 Multiplexer, you can concentrate up to 144 asynchronous, full-duplex lines, each operating at a speed of 9.6 Kbps, onto one T1 line. If top speed isn't a priority, your TrunkMaster TMX 144 Multiplexer can handle even more users—all at a reduced transmission cost, regardless of the T1 transmission medium.

For more versatility

The TrunkMaster TMX 144 Multiplexer will triple the reach of your local network to 18,000 feet. That adds up to a total area of 36 square miles—and a good deal more versatility, especially for a growing network like yours.

You can even use a TrunkMaster TMX 144 Multiplexer as an IDX3000® tandem link to further increase your capacity.

For the office of now

Your growing network can't wait for a product of the future. And it doesn't have to.

The TrunkMaster TMX 144 Multiplexer is here now—the latest addition to the IDX3000 family of products. The IDX3000 Local Communication Network is already known as the "No-Risk Network"—proven, in use, and backed by M/A-COM, one of the nation's largest communication companies. Find out how the TrunkMaster TMX 144 Multiplexer can enhance its capabilities even further.

Call or write the representative nearest you for more information. M/A-COM LINKABIT, INC., 3033 Science Park Road, San Diego, CA 92121. Outside California, call toll free (800) 626-6640.

Representatives: San Diego, Mat Akk, (619) 457-2340; Boston, Mike Murray, (617) 863-8420; Washington, DC, Harry George, (301) 428-2720; Houston, Charlie Burke, (713) 683-7834.

TrunkMaster is a trademark of M/A-COM LINKABIT, INC. IDX3000 is a registered trademark of M/A-COM LINKABIT, INC.

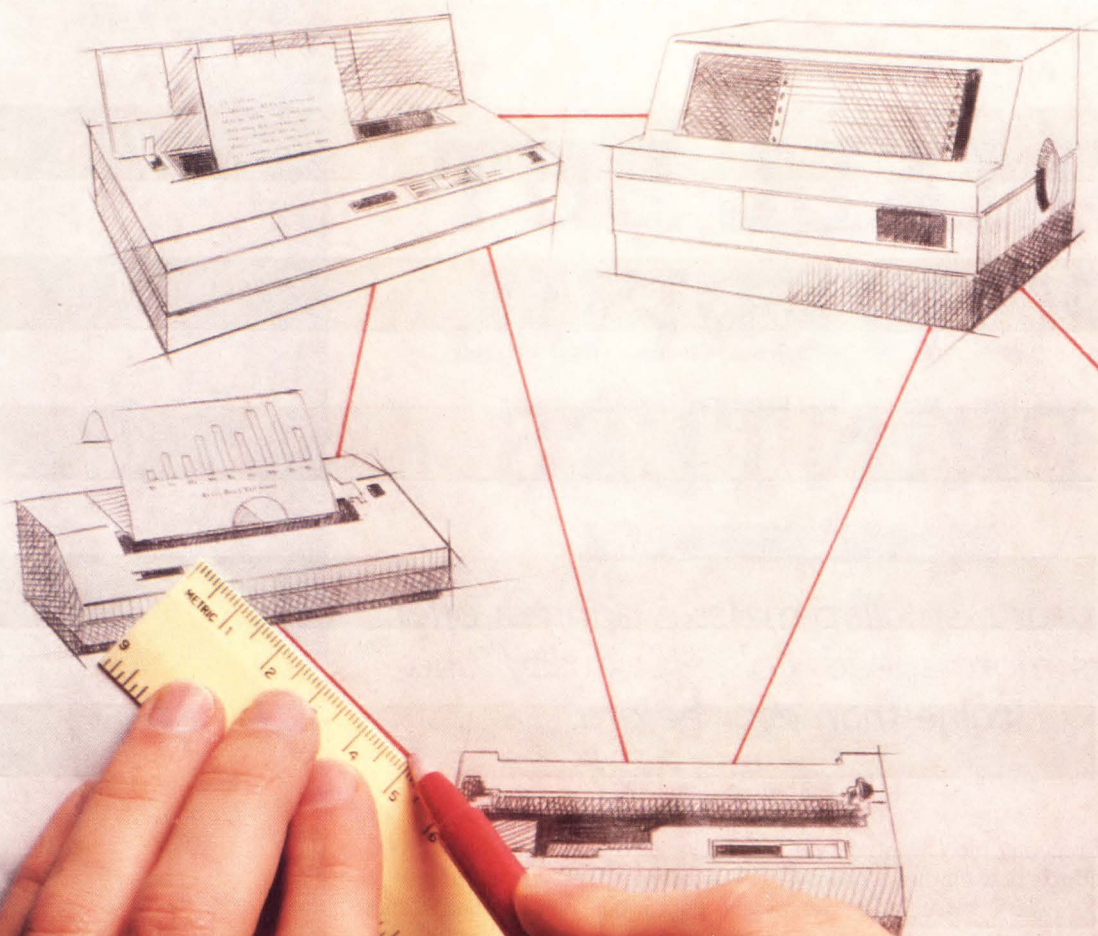
© 1984 M/A-COM LINKABIT, INC.

THE T1-EFFICIENT NETWORK



COMPUTER DECISIONS®

THE 1985 GUIDE TO
SMALL & MID-SIZE PRINTERS



SPECIAL
SECTION

SMALL BUT POWERFUL PRINTERS

This year's small-to-midsize printers offer users more speed, color, flexibility, and value than ever before.

by David Whieldon, Senior Editor

Until recently most printers, as products of a mature technology, were plain, "gray-flannel" machines every corporation had to buy once in a while. Now printers are more exciting—they're faster, offer more options, and frequently print in two or more colors. And, with increased competition, prices for smaller machines have dropped. Most printers are selling better than ever. Even those familiar workhorses, the impact line printers, are holding their own.

One of the most promising machines, in both performance and price, is the compact, desk-top laser (page) printer. Many of the laser printers now available evolved from a relatively low-cost machine developed by Canon Inc., the Japanese manufacturer of cameras and photocopiers. Some versions, like Hewlett-Packard's Laserjet, sell for as little as \$3,500, although some ven-

dors' models cost as much as \$10,000. These printers operate at a rate of eight pages per minute, and Canon claims that the most recent model eliminates downtime. In seconds, the user can replace a cartridge containing a photo-conductor drum, toner, and other components.

Ink-jet printers, after a troubled start several years ago, have caught users' interest again. Now they don't clog so easily, and they offer many features that appeal to users. They operate silently, produce dot-matrix print as fast or faster as daisywheels, sell for about the same price, and are available in color models for producing graphics.

To add to users' choices, many dot-matrix impact printers can now operate in three modes—and cost little more than one-speed machines. They can produce draft-quality documents for internal use, a better-quality print

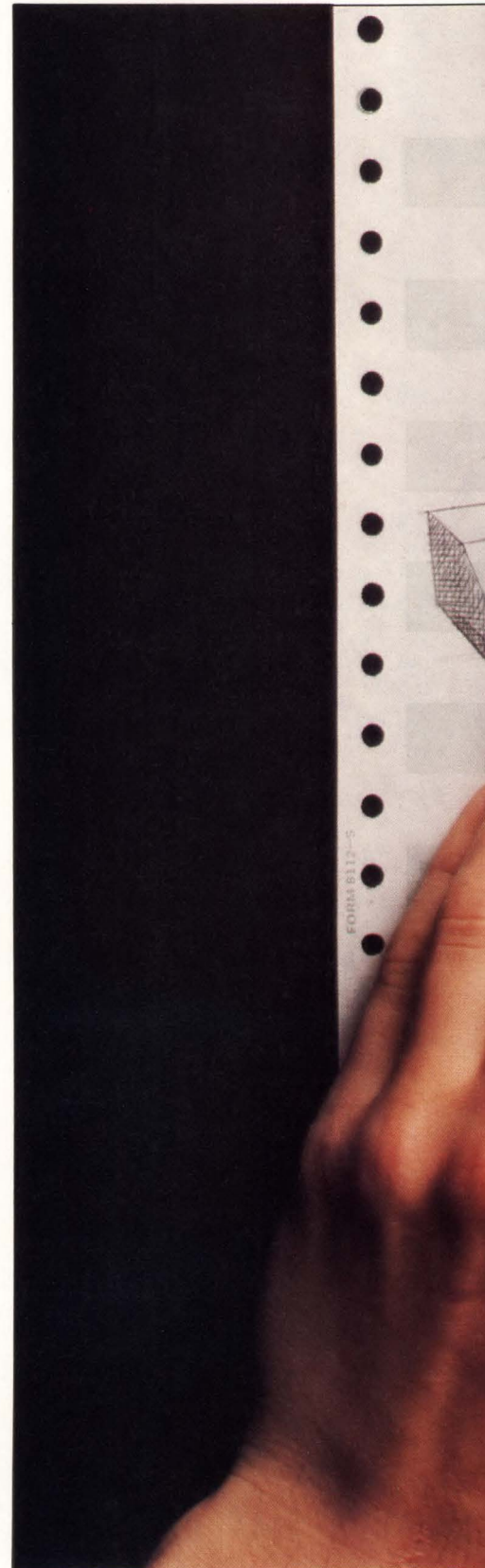
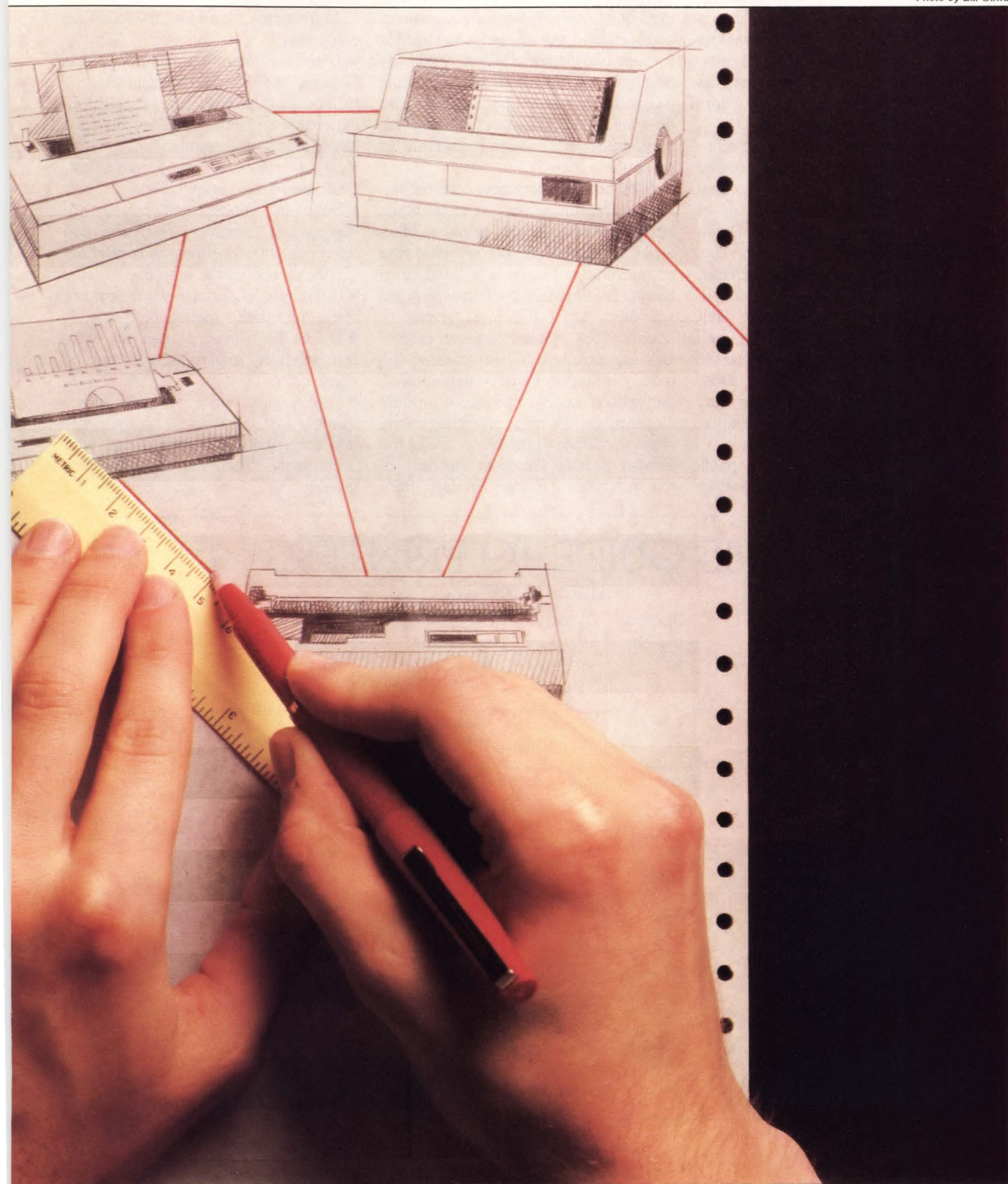


Photo by Bill Oliwa



PRINTER GUIDE

for improved legibility, and near-letter-quality (NLQ) print for text material. NLQ printing is often so good that a user must examine the characters closely to determine they weren't printed from fully formed type, such as daisywheel printers or typewriters produce.

Another boon to users is that more printer models are available loaded with extras at no additional cost. Jonathan W. Dower, managing editor of *The 1984 Printout Annual*, from Datek Information Services in Newtonville, MA, observes that, on small machines, "niceties such as friction and continuous feed, NLQ capabilities, larger print buffers, variable character fonts, and graphics capabilities are now standard features." Soon color capability, especially on serial dot-matrix printers, may become another standard feature, Dower says.

In addition to standard color capability, David R. Bothwell, vice president

and general manager at Dataproducts Corp.'s Milford, NH, operation, predicts even more options are imminent, and someday, the machines will be able to print two pages of a letter, address an envelope, and then fold and stuff pages into the envelope. Bothwell also believes printers may eventually become intelligent enough to operate as computers.

MIS/dp managers now confront the happy dilemma of many choices when buying small-to-midsize printers. Managers' first considerations are what kind of machine to buy and in what price range. That's where the following guide will help. Only the most significant specifications in each of seven categories are included. While scanning the data, mark entries that match your organizations' needs. To receive product literature on the most promising candidates, circle the numbers on one of the Reader Service Cards at the back of the magazine. (Note: Printers from

mainframe manufacturers aren't included in this list.)

In the guide, you'll find the following categories:

- *Thermal printers* are compact, inexpensive, and designed for light use.
- *Daisywheel printers* are relatively inexpensive and slow, but they produce highly legible documents.
- *Ink-jet printers* are moderately fast, quiet, and fairly inexpensive.
- *Dot-matrix impact (serial) printers* are inexpensive, relatively fast, and can often offer two- or three-mode printing. They can also create graphics.
- *Dot-matrix impact (line) printers* are faster than their serial counterparts.
- *Impact band (line) printers* are very fast, relatively expensive, and may be noisy.
- *Page printers* may be fairly to extremely fast, depending on their size and complexity, with prices that vary accordingly. They can also produce graphics. □

1985 GUIDE TO PRINTERS

Thermal printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Alphacom (408) 559-8000 Circle 435	Alphacom 81	80	80	RS 232, Cent, Apple Macintosh	No	Yes	\$130
Computer Devices (617) 663-4980 Circle 436	2100	160	80/132	serial, RS 232	No	Yes	\$1,195
	2300	160	80/132	serial, RS 232	No	Yes	\$1,695
Computer Transceiver (201) 261-6800 Circle 437	Execuport 4120	200	233	RS 232	No	Yes	\$3,000
	Execuport 1200 series	280	136	RS 232	No	Yes	\$995 to \$1,395
Okidata (609) 235-2600 Circle 438	Okimate 10	60	40/66 80/136	Commodore, Atari	Yes	Yes	\$240
	Okimate 20	40/80	8½ × 11 in.	PC	Yes	Yes	\$270
Star Micronics (714) 768-4340 Circle 439	STX-80	60	80	par, Cent	No	Yes	\$200
Texas Instruments (713) 895-3000 Circle 440	703	45	80/132	EIA, RS 232	No	No	\$595
	707	300	80/132	Bell 103	No	No	\$695
	703 RO	45	80/132	EIA, RS 232	No	No	\$495
	707 RO	300	80/132	Bell 103	No	No	\$595

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

PRINTER GUIDE

1985 GUIDE TO PRINTERS

Daisywheel printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Alphacom (408) 559-8000 Circle 441	Alphapro 101	20	96/165	RS 232, Cent, IBM, Macintosh, Apple IIc and Apple IIe	No	No	\$400
Amdek (312) 364-1180 Circle 444	5025 5040 5055	25 40 55	136/204 110/165 110/165	RS 232, serial, par RS 232, Cent, IBM RS 232, serial, par	No No No	No No No	\$900 \$1,695 \$1,995
AT&T Teletype (312) 982-3189 Circle 443	T300	300 lpm	132	RS 232, serial, par	No	No	N/A
BDS (415) 964-2115 Circle 442	LQ-55	55	132	Diablo	No	No	\$2,500
Daisy Syst. Holland (404) 451-0257 Circle 445	M20 M45/M45 Quiet Write	20 45	157/188 132/158	RS 232, serial, par, Cent, Qume, Diablo serial, par, IEEE 488, Qume, Sprint	No No	No No	\$1,000 \$1,695 to \$1,845
Computers Int'l. (213) 386-3111 Circle 446	Daisywriter 2000	40	13.2 in.	serial, par, RS 232, IEEE 488, Cent	No	Yes	\$1,195
Dataproducts (818) 887-8451 Circle 447	DP-20 DP-550/ DP-55SQ	20 55	15 in. 132/196	Cent, IBM, PC, Eagle, Columbia, Cent, IBM, PC, Eagle, Columbia, Qume, Diablo	No No	No Yes	\$800 \$2,195 and \$2,495
Datasouth Computer (704) 523-8500 Circle 448	DP36	36	136	Diablo 630	No	No	\$1,295
Diablo Syst. (415) 498-7000 Circle 449	Advantage D25 630 API, 630 API/ECS, 630 ECS	25 40	198 132/198	RS 232, IEEE 448, Cent, par, RS 232	No No	No No	\$745 \$2,095 to \$2,295
Digital Assoc. (203) 327-9210 Circle 450	DP 35 DP 55	35 55	96 96	RS 232, Cent, Datap RS 232, Cent, Datap	No No	No No	\$1,700 to \$3,800 \$2,300 to \$4,300
Digital Equip. (617) 493-5489 Circle 451	LQP02	32	132/158	serial, RS 232	Yes	Yes	\$2,800
Facit (603) 424-8000 Circle 452	Facit 4560 Facit 4565	22 40	130 136	serial, RS 232 serial, RS 232	No No	No Yes	\$895 \$1,595
Fujitsu (408) 946-8777 Circle 453	Daisymax 830 DM 320	80 48	136 136	Diablo 630, Sprint 5 Diablo 630	No No	No No	\$2,295 \$1,500
C. Itoh Electronics (213) 306-6700 Circle 454	Y-10 F-10/55 F-10/40 A-10/30	15 55 40 30	115 136 136 115	RS 232, Cent RS 232, Cent RS 232, Cent RS 232, Cent	No No No No	No No No No	\$550 \$1,995 \$1,795 \$795
Juki Industries (201) 368-3666 Circle 455	6300 6100	40 18	16 in. 13 in.	IBM, PC IBM, PC	No No	Yes Yes	\$995 \$600

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

PRINTER GUIDE

1985 GUIDE TO PRINTERS

Daisywheel printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
NEC Information Syst. (617) 264-8000 Circle 456	Elf 370	19	110	IBM	No	Yes	\$545
	Elf 360	19	110	serial, par, IBM, Cent	No	Yes	\$595
	2000	20	136	serial, par, IBM, Cent	No	Yes	\$995
	3500	35	136	serial, par, IBM, Cent	No	Yes	\$1,895
	8810	55	136	serial, par, IBM, Cent	No	Yes	\$2,495
Panasonic Computer Products Div. (201) 348-5330 Circle 457	KX-P3151	22	198	RS 232, IBM	No	Yes	\$700
Primages (516) 567-8200 Circle 458	Primage 1	45	135-202	serial, par, RS 232, Cent, Diablo	No	No	\$1,875
	Primage 90	90	135-202	serial, par, RS 232, Cent, Diablo	No	No	\$1,895
Printer Syst. (301) 258-1155 Circle 459	PSC 1155	55	132	RS 232, IBM 3287, Cent	No	No	\$2,020
Qume (408) 942-4000 Circle 460	Letterpro 20	22	13 in.	serial, par, IBM	No	No	\$600
	Sprint 11/40	40	15 in.	serial, par	No	No	\$1,775
	Sprint 11/55	55	15 in.	serial, par	No	No	\$1,990
	Sprint 11/90	80	15 in.	serial, par	No	No	\$2,695
	Sprint 11 Plus Wide Track	50	22 in.	serial, par	No	No	\$3,235
Ricoh (201) 882-2000 Circle 461	1500Q	40	16 in.	RS 232, Cent	No	No	\$1,695
	2200Q	20	16.5 in.	RS 232, Cent	No	No	\$800
	1600Q	50	16 in.	RS 232, Cent	No	No	\$1,995
Telex Computer (918) 627-1111 Circle 462	286F	80	132	IBM 3287	No	No	\$5,350

Ink-jet printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Advanced Color Tech. (617) 256-1222 Circle 463	Act II Chromajet	85	120	serial, par, RS 232, Cent	Yes	Yes	\$6,400
Anderson Jacobson (408) 263-8520 Circle 464	650	180/210	132	RS 232	No	No	\$1,495
Diablo Syst. (513) 898-3644 Circle 465	C150	20	8½ in.	par, Cent	Yes	Yes	\$1,250
Diconix (513) 898-3644 Circle 466	Dijit I	18 ppm	N/A	Cent, Diablo, video interface	Yes	Yes	\$5,000 to \$7,000
Exxon Office Syst. (203) 329-5000 Circle 467	965	60/90	132	serial, RS 232, IBM, PC, Zenith 100	No	Yes	\$2,995
Hewlett-Packard (206) 254-8110 Circle 468	Thinkjet	150	80/142	RS 232, Cent, IBM	No	Yes	\$495

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC



At a speed of 150 cps, the advantages of a GENICOM 2120 are immediately apparent.

When you can't afford to wait. When you have to have the information in your hands. In print...now. That's when you need your hands on a GENICOM 2120 teleprinter.

With a 2120, you get immediate, reliable hard copy data communications at a sustained 150 cps rate. Instantaneous printed communications, whether you're linking one person to another in the same building...or an office on the east coast to a warehouse on the west coast. Or even around the world. It won't take long for you to discover the advantages of the 2120 for electronic mail.

And combined with options like our 32K text editor, the 2120's speed can save you up to 70% in on-line time and communication charges for applications like time-sharing as well.

Of course, there are more advantages. Features like attractive, lightweight styling and easy to use color coded, annotated keyboard. Options like extended line buffers, internal modems. So contact us as fast as you can, and we'll send you information on how the GENICOM 2120 could have done it even faster.

GENICOM

GENICOM Corporation, Waynesboro, VA 22980.

For the solution to your printing needs call

TOLL FREE 1-800-437-7468

In Virginia, call 1-703-949-1170.

CIRCLE 50

PRINTER GUIDE

1985 GUIDE TO PRINTERS

Ink-jet printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Quadram (404) 923-6666 Circle 469	Quadjet	40	80	IBM	Yes	Yes	\$895
Tektronix (503) 682-3411 Circle 470	4691	N/A	8½ × 17 in.	par	Yes	Yes	\$1,300
	4692	N/A	8½ in.	par	Yes	Yes	\$6,000
	4695	20	8½ in.	par	Yes	Yes	\$1,600

Dot-matrix impact (serial) printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Alphacom (408) 559-8000 Circle 471	Alphacom Aero	130	132	RS 232, Cent	No	Yes	\$255
Anadex (805) 987-9660 Circle 472	WP-6000	285	132	serial, par	No	Yes	\$2,700
	DP-6500	540	132	serial, par	No	Yes	\$2,995
	DP-9000B	240	80	par	No	Yes	\$1,200
	DP-9001B	250	80	par	No	Yes	\$1,200
	DP-9500B	240	132	par	No	Yes	\$1,280
	DP-9501B	250	132	par	No	Yes	\$1,280
	DP-9620B	240	132	par	No	Yes	\$1,380
	DP-9625B	240	132	par	No	Yes	\$1,500
	DP-9632B	240	132	par	No	Yes	\$3,995
	DP-9725B	240	132	par	Yes	Yes	\$1,625
Anderson Jacobson (408) 263-8520 Circle 473	AJ-864	180	132/158	serial, RS 232	No	Yes	\$2,495
AT&T Teletype (312) 982-3189 Circle 474	M43	47	80/100/132	serial, RS 232	No	No	N/A
	5310	200	80/132	serial, RS 232	No	Yes	N/A
	5320	200	80/132	serial, RS 232	No	Yes	N/A
BDS (415) 964-2115 Circle 475	GP300L	80, 300	132	Diablo	No	Yes	\$3,000
	M-200	340		Custom interfaces	No	No	\$3,000 to \$5,000
Cal-Abco Peripherals (818) 704-9100 Circle 476	Legend 880	80	80/142	par, RS 232, Cent, Epson FX-80	No	Yes	\$280
	Legend 1080	100	80/142	par, RS 232, Cent, Epson FX-80	No	Yes	\$340
	Legend 1380	130	80/132	par, RS 232, Cent, IBM, Epson FX-80	No	Yes	\$380
	Legend 1385	130	15 in.	par, RS 232, Cent, IBM, Epson FX-80	No	Yes	\$450
	CP VII	180	15 in.	par, RS 232, Cent, IBM, Epson FX-80	No	Yes	\$1,195

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

(Continued on page 124)

*Internal modem
direct-connects to any
telephone network.*

*Standard 132 columns
(compressed print) add
wide format for spread-
sheets, financial data.*

*Full-size keyboard is
a practical tool.*

*Exclusive program
cartridges add
custom functions
now; added
expandability
later.*

*All you appreciate in
the 745 and more — in an
even smaller, lighter
package.*

*Rechargeable
battery puts you
in the know
wherever you go.*

*TI Silent 700™
operation won't add noise
to surroundings.*

Only Texas Instruments packs more portable terminal into less space.

Here's a brief case for the Texas Instruments Silent 700™ Model 707 Portable Data Terminal. It's the latest and lightest in a long line of standard-setting Silent 700™ terminals. And it's the most versatile full-function portable anyone can pack into a briefcase.

By carrying TI's Model 745 one step further, we made the best even better. The 707's standard internal

modem connects to any telephone network while the optional acoustic coupler and battery pack make it fully portable. The spreadsheet size 132-column printer is now standard. And TI's solid state plug-in cartridges can add functions for your current use and later expansion.

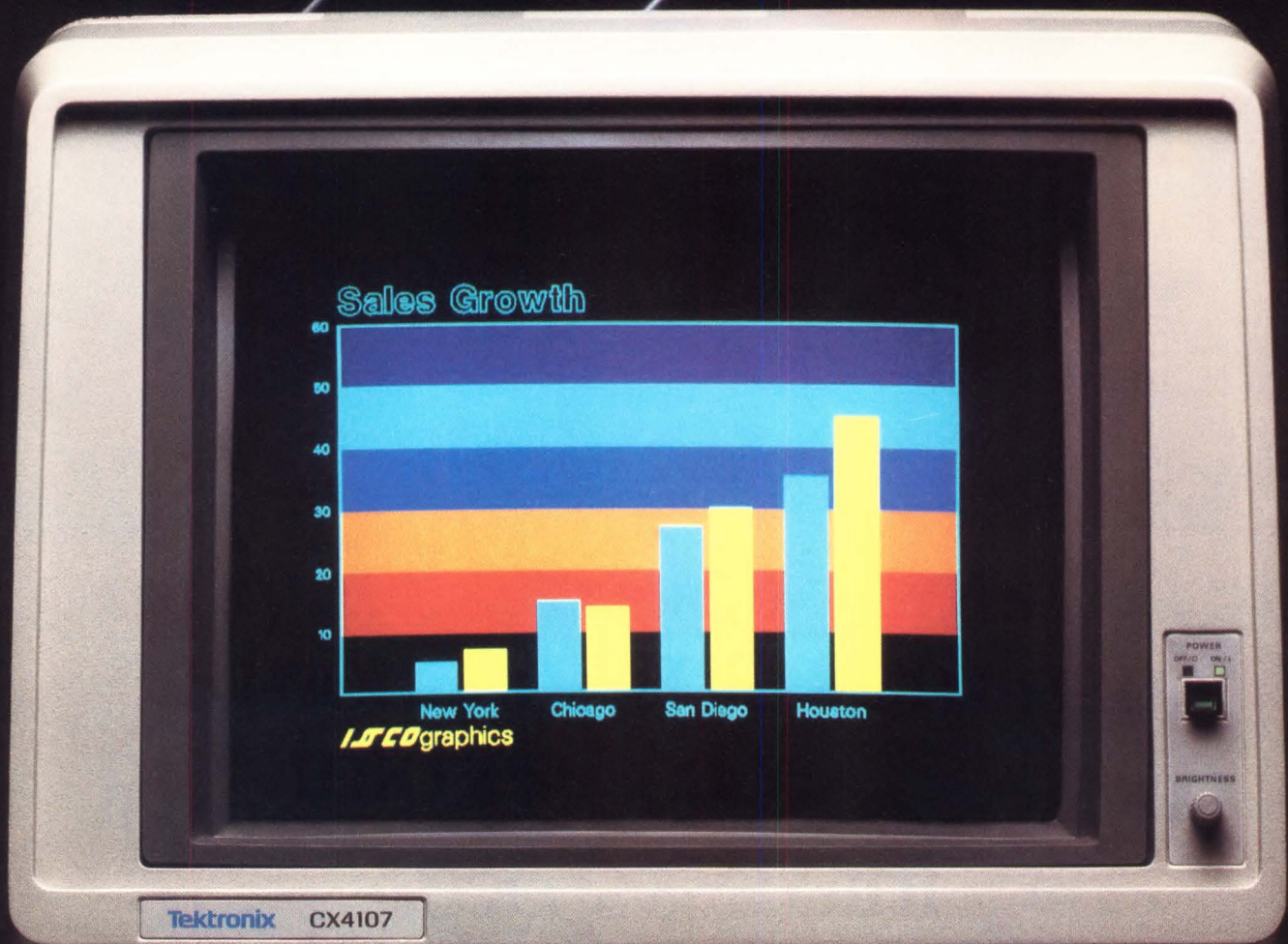
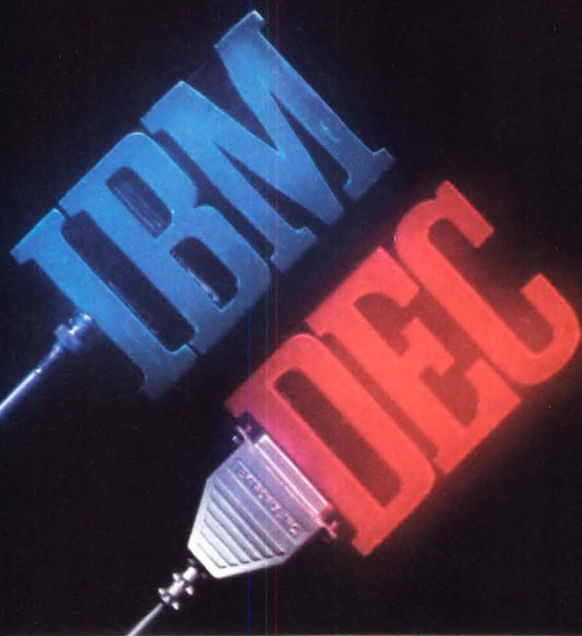
For the standard-setting terminal that packs more product into less space, get the TI Model 707. At only six pounds, it packs more full-size

functions than any other portable ...all at a surprisingly low price. For more information contact: Texas Instruments Incorporated, P.O. Box 809063, Dept. DTB-163E9 Dallas, Texas 75380-9063. Telephone 1-800-527-3500



TEXAS INSTRUMENTS

Creating useful products
and services for you. 2763-39MIS-R1



Copyright 1984 Tektronix, Inc. HDT-103

OEM prices and leasing programs (U.S. only) are available.

DEC and VT100 are trademarks of Digital Equipment Corporation.
IBM is a trademark of International Business Machine Corporation.

DISPLA and TELL-A-GRAF are the registered trademarks of ISSCO. Display graphics courtesy of ISSCO.
SAS GRAPH is a registered trademark of SAS Institute Inc., Cary, N.C.
DI-3000 is a registered trademark of Precision Visuals, Inc.

YOUR TWO FAVORITE COMPUTERS NOW HAVE ONE THING IN COMMON. YOUR FAVORITE GRAPHICS TERMINAL.

Introducing the new CX4100 Series of Tektronix high performance, yet affordable color graphics terminals.

Now you can have the Tektronix PLOT 10 graphics command set you've always wanted while you use the host of your choice, IBM or DEC. Just by typing a single

IBM-style keyboard. Plus Tek enhancements: individual key program-mability, user-selectable ten-key pad, and joydisk for quick cursor movement and graphics input.

Screen output will be just as familiar as keyboard layout. 32-line 3278/3279 alphanumeric emulation is built in. And so is full support for the 4957 Graphics Tablet, plus full hard copy and transparency output to a full range of Tektronix Color Graphics Copiers and the 4510 Color Graphics Rasterizer.

IBM flexibility is matched by DEC flexibility. In RS-232 mode, the terminals can run all VT100 applications through the extended ANSI X3.64 command set. In addition to the host interface port that transmits data at rates up to 38.4k baud, CX terminals are provided with two additional RS-232 ports and a Centronics-style parallel port for connecting a wide range of peripherals.

But best of all you'll have great graphics and full software compatibility. The CX Series will accept many existing programs written for 4010, 4100, and 4110 Series terminals. And they're fully compatible with PLOT 10 IGL, GKS, and TCS programs as well as with popular third-party software such as SAS/GRAPH®, ISSCO's DISSPLA®, and TELL-A-GRAF® and Precision Visuals' DI-3000®.



Tek's all new precision ink jet 4692 color copier produces very high quality full color transparencies or hard copy.

That's software investment protection—matched by technology protection. CX terminals feature a 60 Hz non-interlaced display with 4096 x 4096 addressability displayed in a 640 x 480 matrix.

16 colors, eight line styles, 11 marker types, rapid area fill, scalable/rotatable text, complete segment support, true zoom and pan, and separate dialog area. It's all there with the full PLOT 10 command set.

So don't wait. Set the best of three worlds on one desk: TEK, DEC, and IBM. Contact your local representative today for information on the CX4100 Series. Call 1-800-547-1512. In Oregon 1-800-452-1877.

Familiar 3270 IBM-style alphanumeric output is fully emulated on all CX4100 terminals. Enhanced IBM-style keyboard is part of the package.

"switch-host" command.

Tek's CX4106, CX4107 and CX4109 are all directly plug compatible with both host environments. One coax to a standard IBM 3270 controller is all you need or one RS-232 connection to your DEC system.

To make your use of existing or new graphics data fast and friendly, the CX Series comes with an

Tektronix®
COMMITTED TO EXCELLENCE

PRINTER GUIDE

(Continued from page 120)

1985 GUIDE TO PRINTERS

Dot-matrix impact (serial) printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Centronics Data Computer (603) 883-0111 Circle 477	GLP	12/50	80	par, RS 232, Cent, IBM, PC	No	Yes	\$300
	Horizon H80	27/160	80	IBM, PC	No	Yes	\$700
	Horizon H136	27/160	156	IBM, PC	No	Yes	\$900
	Printstation 240	80/160	136	serial, par	No	Yes	\$1,495
	Printstation 250	40/185	80	par, RS 232, Cent, IBM, PC, Qume, Diablo 630	Yes	Yes	\$1,295
	Printstation 351	50/200	132	serial, par, IBM, PC	No	Yes	\$2,195
	Printstation 352	200	132	serial, par, RS 232	No	Yes	\$2,295
	Printstation 353	50/200	132	serial, par, RS 232	No	Yes	\$2,495
	Printstation 354	50/220	132	serial, par, IBM, PC	No	Yes	\$2,195
	Printstation 358	100/400	132	serial, par	Yes	Yes	\$3,295
CIE Terminals (714) 660-1421 Circle 478	CI3500	350	132	serial, par, RS 232	No	Yes	\$1,995
Computer Transceiver (201) 261-6800 Circle 479	Execuport 430	80	50/140	RS 232	No	Yes	\$995
	Execuport 440	80	20/140	RS 232	No	Yes	\$1,195 to \$1,295
	Execuport 443	80	20/140	RS 232	No	Yes	\$1,795
Dataproducts (818) 887-8451 Circle 480	M-100	140	132	serial, par	No	Yes	\$3,015
	M-120	180	132	serial, par	No	No	\$2,715
	M-200	340	132	serial, par	No	No	\$3,015
	P80	110/200	80	RS 232	Yes	Yes	\$1,300
	P132	110/200	132	RS 232	Yes	Yes	\$1,500
	8010	30/90/180	80	Prism	No	Yes	\$650
	8011	30/90/180	80	IBM	No	Yes	\$650
	8021	30/90/180	132	IBM	No	Yes	\$850
	8050/8051	35/110/200	132	IBM 8051, Prism	Yes	Yes	\$1,895
	8070/8071	75/200/400	132	IBM	Yes	Yes	\$2,395
Datasouth Computer (704) 523-8500 Circle 481	Personal Printer I	27/160	80	Epson	No	Yes	\$545
	Personal Printer II	27/160	156	Epson	No	Yes	\$795
	DS 180 Plus	180	136	Most computers	No	Yes	\$1,395
	DS 220	220	136	Most computers	No	Yes	\$1,695
	CX 3180	180	136	IBM 3287	No	No	\$3,195
	TX 5180	180	136	IBM/34, /36, /38	No	No	\$2,995
Decision Data Computer (215) 674-3300 Circle 482	6541-02	150	132	IBM	No	No	\$4,145
	6541-05	150	132	IBM	No	No	\$5,315
	6541-07	150	132	IBM	No	No	\$3,995
Diablo Syst. (415) 498-7000 Circle 483	101	80	10 in.	par, Cent	No	Yes	\$500
	P32CQ ECS series	150	132	par	No	Yes	\$900
	P38/S38	400	132	par	No	No	\$2,195
Digital Assoc. (203) 327-9210 Circle 484	M 120	180	128	RS 232, Cent, Datap	No	No	\$2,700 to \$4,500
	M 140	140	128	RS 232, Cent, Datap	No	No	\$2,900 to \$4,900
	M 200	340	128	RS 232, Cent, Datap	No	No	\$2,900 to \$4,900

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

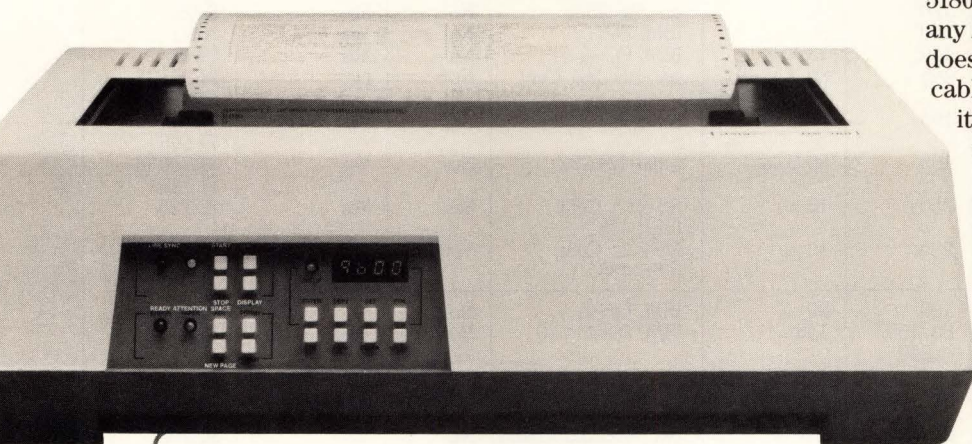
Your IBM 34/36/38 Will Think This Is A \$17,000 Printer.

For all your IBM 34, 36 or 38 knows, your new Datasouth TX-5180 is an IBM 5225 — an under-featured \$17,000 line printer the size of a washing machine. Your computer could also think your Datasouth is an IBM 5224 — a \$10,000 desktop version of the 5225. Or a 5256 — an older serial matrix printer that still costs \$4500.

That's why you and your accountant are glad to know the Datasouth TX-5180 is a workstation workhorse that costs just \$2995. You also know your TX-5180 doesn't come with a black box. Or dipswitches. Or any of the other old-fashioned inconveniences that clutter most of the printers in the 34/36/38 market. Instead it comes with a list of features that make you as happy as your accountant.

For example, you get both parallel and IBM twin-ax interfaces, so your 5180 will run with your IBM PC (or any ASCII computer) as easily as it does with your 34/36/38. You get cable-through and terminate capability. Bi-directional printing at 180 cps. Six different character pitch settings. The most complete, friendly and ergonomic front panel controls in its class. And legendary Datasouth reliability.

So treat your computer and your accountant to the best printer a little money can buy: your new Datasouth TX-5180. Call for one today. It's toll-free.



Your Accountant Will Think It's A Miracle.

AUDITOR'S REPORT

We have examined the Datasouth TX-5180 and found its features and characteristics exceed accepted expectations for IBM 34/36/38 printers. A partial list follows.

- ☐ Tabletop, impact matrix serial printer
- ☐ 180 cps bidirectional printing
- ☐ Tractor feed forms: 3"-15"
- ☐ Cartridge ribbon
- ☐ Cable-thru and terminate
- ☐ Push button programming
- ☐ Twin-ax and parallel (ASCII) interfaces

The TX-5180's ratio of value to price is exceptional. Purchase of the device is highly recommended.

datasouth

H I G H P E R F O R M A N C E P R I N T E R S

Datasouth Computer Corporation
Box 240947 • Charlotte, NC 28224
704/523-8500 • Telex 6843018 DASOU UW

CIRCLE 52

AVAILABLE NATIONWIDE
THROUGH OUR NETWORK OF
SALES AND SERVICE DISTRIBUTORS
CALL TOLL-FREE:
1-800-222-4528

PRINTER GUIDE

1985 GUIDE TO PRINTERS

Dot-matrix impact (serial) printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Digital Equipment (617) 493-5489 Circle 485	LA12 DECwriter Corresp.	150	132	serial, RS 232	Yes	Yes	\$1,495
	LA120 DECwriter III	180	217	serial, RS 232	Yes	No	\$2,420
	Letterprinter 210	30/80/ 240	132	IBM, PC	No	Yes	\$1,595
	LA 50	100	132	serial, RS 232	Yes	Yes	\$695
	LA 100	30/240	217	serial, RS 232	Yes	Yes	\$2,195
Epson (213) 539-9140 Circle 486	JX-80	160	80	par, IEEE 488	Yes	Yes	\$800
	FX 80 Plus	160	80	par, IEEE 488	No	Yes	\$570
	FX 100 Plus	160	136	par, IEEE 488	No	Yes	\$850
	LQ-1500	200	136	par, IEEE 488, Cent	No	Yes	\$1,595
Facit (603) 424-8000 Circle 487	Facit 4510	120	80	par, RS 232	No	Yes	\$495
	Facit 4511	160	80	IBM, PC	No	Yes	\$650
	Facit 4512	140	132	IBM, PC	No	Yes	\$995
	Facit 4528T	165	80/136	par, RS 232, Cent	No	No	\$1,345 to \$1,395
	Facit 4528V	165	80/136	serial, RS 232	No	Yes	\$1,545 to \$1,595
	Facit 4528D	165	80/136	serial, RS 232	No	Yes	\$1,700 to \$1,735
	Facit 4542	250	15 in.	RS 232, Cent, IEEE 488	Yes	Yes	\$2,725
	Facit 4544	225	15 in.	RS 232, Cent, IEEE 488	Yes	Yes	\$3,275
Fujitsu (408) 946-8777 Circle 488	Dotmax 9	180	80	IBM, Epson	No	Yes	\$500
	Dotmax 24	80/160/ 240	136	IBM, Diablo 630	No	Yes	\$1,995
Genicom (703) 949-1188 Circle 489	2030	60	132	RS 232	No	Yes	\$1,250
	2120	150	132	RS 232	No	Yes	\$2,195
	3014	32/80/ 160	132	par, RS 232, Epson, Grafrax, Okidata	No	Yes	\$1,200
	3024	40/100/ 200	132	par, RS 232, IBM, PC, Microline 84	No	Yes	\$1,500
	3180	180	136	serial, par	No	Yes	\$2,030
	3184	45/180	136	serial, RS 232	Yes	Yes	\$2,230
	3300	200/300	136	serial, par	No	Yes	\$2,250
	3304	100/200/ 300	136	par, RS 232	Yes	Yes	\$2,490
Hermes Products (201) 574-0300 Circle 490	3404	100/400	136	serial, par	Yes	Yes	\$2,650
	612	100/400	136	par, Cent, IBM	No	Yes	\$2,550
	615	100/400	136	par, Cent, IBM	Yes	Yes	\$2,695
Hewlett-Packard (206) 254-8110 Circle 491	PC-Printer I	100/400	136	Cent, IBM, PC	No	Yes	\$1,995
	2932A	200	136	RS 232, Cent, IBM	No	Yes	\$2,495
	2933A	200	136	RS 232, Cent, IBM	No	Yes	\$2,795
Infoscribe (714) 641-8595 Circle 492	2934A	200	136	RS 232, Cent, IBM	No	Yes	\$2,895
	700	150	136	serial, par, Cent	No	No	\$1,895 to \$2,020
	1000	200	136	Cent	No	Yes	\$1,645 to \$1,775
	1100	200	136/224	IBM, PC, Diablo	No	Yes	\$1,795 to \$1,895
	1200	200	136/224	IBM, PC, Diablo	Yes	Yes	\$1,995

Legend for tables

ANSI-American National Standards Institute
 CDC-Control Data Corp.
 Cent-Centronics
 cpl-characters per line

cps-characters per second
 Datap-Dataproducs
 EIA-Electronic Industries Association
 IBM-IBM mainframes and minis

lpm-lines per minute
 N/A-not available
 par-parallel
 PC-IBM PC



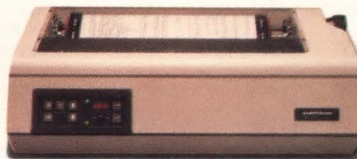
No Paper Wait.

Waiting gets you nowhere. Waiting wastes time. It wastes money.

► To save both, Tally presents the MT400 FlexiForm printers. And to help you boost efficiency, these high volume, high speed serial printers have productivity features you won't find anywhere else.

► For about half the cost of a line printer, a Tally FlexiForm will whip through paper work at up to 300 LPM.

► You'll produce draft copy at a consistent 400 CPS. Your correspondence will have a high resolution, professional look. From inventory reports and spreadsheets to business graphics and bar codes, nothing in their class is engineered to perform like FlexiForms.



MT440L

► For speed and ease of programming, direct menu access lets you arrange page and print formats with just a few front panel commands. And there's always the ideal paper handling choice for the work you do. Because FlexiForm printers can have tractors that push and pull, friction feed, a quick-tear bar, automatic feeders for single sheets and more.

► Waiting for important information is the last thing you want. So wait no more. Call Mannesmann Tally today for information on the world's best engineered serial printers: (206) 251-5524.

MANNESMANN
TALLY

PRINTER GUIDE

1985 GUIDE TO PRINTERS

Dot-matrix impact (serial) printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
C. Itoh Electronics (213) 306-6700 Circle 493	1570	130/200	136	par, RS 232, Cent	Yes	Yes	\$1,900
	7500	105	80	par, RS 232, Cent	No	Yes	\$450
	1550B	120	136	par, RS 232, Cent	No	Yes	\$950
	1550S	120/180	136	par, RS 232, Cent	No	Yes	\$1,125
	1550SC	120/180	136	par, RS 232, Cent	Yes	Yes	\$1,225
	8510B	120	80	par, RS 232, Cent	No	Yes	\$495
	8510S	120/180	80	par, RS 232, Cent	No	Yes	\$795
	8510SC	120/180	80	par, RS 232, Cent	Yes	Yes	\$895
	8600	60/90/180	80	par, RS 232, Cent	No	Yes	\$1,295
Mannesmann Tally (206) 251-5524 Circle 494	Spirit	80	80	par, Cent, Epson	No	Yes	\$270
	MT 160L	40/160	80	serial, par, Epson	No	Yes	\$800
	MT 180L	40/160	132	serial, par, Epson	No	Yes	\$1,100
	MT 1800	50/200	132	serial, par, ANSI	No	Yes	\$2,295
	MT 420L	50/200	132	serial, par, ANSI	No	Yes	\$1,995
	MT 440L	100/400	132	serial, par	Yes	Yes	\$2,395
Memorex (408) 987-2278 Circle 495	2068	80/350	N/A	IBM	No	No	\$6,495
Micro Peripherals (801) 263-3081 Circle 496	Printmate 150	150	136	MPI machines only	No	Yes	\$995
	Printmate 180FT	180	136	IBM	No	Yes	\$1,245
	Printmate 350	300	136	IBM	No	Yes	\$1,495
	X	180	80	IBM	No	Yes	\$695
	SX	300	80	IBM	No	Yes	\$795
NEC Information Syst. (617) 264-8000 Circle 497	P2	30/180	80	serial, par, IBM, Cent	No	Yes	\$700
	P3	30/180	136	serial, par, IBM, Cent	No	Yes	\$1,100
	CP2	30/180	80	IBM, PC, NEC	Yes	Yes	\$1,100
	CP3	30/180	136	IBM, PC, NEC	Yes	Yes	\$1,395
Okidata (609) 235-2600 Circle 498	ML 83A	120	136	RS 232, Cent, IBM	No	No	\$750
	ML 84	200	136	serial, par, RS 232, Cent, IBM	No	Yes	\$900 to \$1,020
	ML 92	160	80	serial, par, RS 232, Cent, IBM	No	Yes	\$500 to \$600
	ML 93	160	136	serial, par, RS 232, Cent, IBM	No	Yes	\$800 to \$900
	ML 182	120	80	serial, par, Cent	No	Yes	\$300 to \$395
Panasonic Computer Products (201) 348-5330 Circle 499	KX-P1090	96	158	RS 232, IBM	No	Yes	\$400
	KX-P1091	120	132	RS 232, IBM	No	Yes	\$500
	KX-P1092	180	132	RS 232, IBM	No	Yes	\$600
	KX-P1093	160	220	RS 232, IBM	No	Yes	\$900
Printek (616) 925-3200 Circle 500	910	45/200	136	serial, par, RS 232, Cent	No	Yes	\$1,595
	920	80/340	136	serial, par, RS 232, Cent	No	Yes	\$2,395
	930	80/200	132/220	serial, par, Cent, Diablo, ANSI	No	Yes	\$1,995
	935	40/200	132/220	Cent, Diablo, ANSI	No	Yes	\$1,695
Printer Syst. (301) 258-5060 Circle 501	PSC 3024	40/200	132	RS 232, Cent, IBM 3287	No	Yes	\$1,500
	PSC 3184	50/200	132	RS 232, Cent, IBM 3287	Yes	Yes	\$2,230
	PSC 3404	100/400	132	RS 232, Cent, IBM 3287	Yes	Yes	\$2,795

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

PRINTER GUIDE

1985 GUIDE TO PRINTERS

Dot-matrix impact (serial) printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Quantex (516) 582-6060 Circle 502	7020	180	136	par, RS 232, Cent	No	Yes	\$1,495
	7035	180	136	par, RS 232, Cent	No	Yes	\$1,695
	7065	300	136	par, RS 232, Cent	No	Yes	\$1,995
Sakata (312) 593-3211 Circle 503	SP1000	100	80	par, Cent	No	Yes	\$370
	SP1200	120	80	Cent	No	Yes	\$400
Telex Computer Products (918) 627-1111 Circle 504	281B	100	80	IBM 3287	No	No	\$900
	287D2	150	132	IBM 3287	No	No	\$5,000
	387	400	136, 233	IBM 3287	Yes	Yes	\$7,200
Texas Instruments (713) 895-3960 Circle 505	850XL	75/150	80	serial, par, PC, TI PC	No	Yes	\$600
	855	35	80	serial, par, PC, TI PC	No	Yes	\$935
	860XL	75/150	136	serial, par, PC, TI PC	No	Yes	\$900
	865	35	136	serial, par, PC, TI PC	No	Yes	\$1,300
Toshiba America (714) 730-5000 Circle 506	P1340	54/144	80	Qume 5	No	Yes	\$995
	P1351	100/192	136	Qume 5	No	Yes	\$1,895

Dot-matrix impact (line) printers

Vendor	Model	Speed (lpm)	Width (cpl)	Interface	Color	Graphics	Price
CIE Terminals (714) 660-1421 Circle 507	CI 300	300	136	serial, par	No	Yes	\$4,495
	CI 600	600	136	serial, par	No	Yes	\$5,995
Digital Assoc. (203) 327-9210 Circle 508	P 300	300	132	RS 232, Cent, Datap	No	Yes	\$5,900 to \$8,300
	P 600	600	132	RS 232, Cent, Datap	No	Yes	\$7,700 to \$10,000
Florida Data (305) 259-4700 Circle 509	OSP 130	100/150 600	132	par, RS 232, Cent, IBM	Yes	Yes	\$3,995
	OSP 3000	100/150 600	132	par, RS 232, Cent, IBM	Yes	Yes	\$3,795
Genicom (703) 949-1188 Circle 510	200	200	136	par, RS 232	No	No	\$2,470 to \$2,590
	4000	300/600	132	serial, par, RS 232, Cent	No	Yes	\$5,500 to \$7,200
Hewlett-Packard (206) 254-8110 Circle 511	2563A	300	132	RS 232, RS 422, Cent	No	Yes	\$5,780
Printronix (617) 321-2400 Circle 512	P series	300/600	132	Many computer systems	No	Yes	\$5,400 to \$8,550
	MVP 150	150	132	Minicomputers	No	Yes	\$3,745
	MVP 150B	150	132	Microcomputers	No	Yes	\$3,745
	MVP 150C	150	132	Microcomputers	No	Yes	\$3,545
	Graphprint 4160	130	132	Minicomputers	No	Yes	\$5,380

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproductions
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

(Continued on page 134)

Scouting For **Management Talent?**



Computer Decisions Launches A New Recruitment Advertising Section In July

If you've been looking for an exciting and responsive new market for recruiting MIS/dp managers, engineering managers, and computer-involved general and corporate managers, your search is over. Starting with the July issue, *Computer Decisions* gives you the opportunity to draw from a pool of 160,000 highly qualified executives you can't reach with any other publication. Managers who are prime prospects for the positions you have to offer.

The Ideal Audience For Your Recruitment Advertising

This prestigious group of upwardly mobile professionals is made up of managers in the nation's most active user organizations, including the Fortune 500. And they're prime prospects for recruitment. How do we know? Our latest Salary-Status Survey revealed these facts about the

computer-involved executives in our audience . . .

- *58% would move to another organization for greater challenge.

- *46% would change jobs for more autonomy, authority, or control.

- *42% of MIS/dp managers would like to move into general management.

The Best Editorial Environment For Reaching Information Resource Management

Our management editorial guarantees high readership for your ad among the prospects you want to reach. And to enhance your readership even more, we're positioning this special section with "Your Career"—consistently one of our top-read columns.

Now You Can Recruit From The Richest Source of Computer-Involved Management In The Industry!



**You
Can Reach
80,000 MIS/dp
& Engineering
Managers With Titles
Like These**

Vice President of MIS • MIS Director/
Manager • Chief of EDP/MIS • Direc-
tor/Manager Programming • Systems
& Procedure Manager • Communica-
tions Manager • EDP Operations
Manager • Vice President R&D • Vice
President Engineering • Plant Manager
• Production Manager • Chief Engineer
• Technical Director of R&D • Director
of Engineering

**Or 80,000 General & Corporate
Managers With Titles Like These**
Chairman • President • Owner
• Partner • Director • Vice President

- General Manager • Comptroller
- Treasurer • VP Finance • VP
Operations • VP Sales • Marketing
Director/Manager • Manager of
Personnel • Director of Purchasing
- Sales Manager

Choose Your Target Audience And Get Results

Whichever segment of our audience
you choose to recruit from, you'll
reach approximately 80,000 prime
prospects for your positions. That's
40% of the 201,000 dp adminis-
trative/management/supervisory
personnel estimated by IDC to be in
U.S. organizations. And, with pass-
along readership, your recruitment ad
can reach 420,000 additional dp per-
sonnel for other positions you may
want to fill.

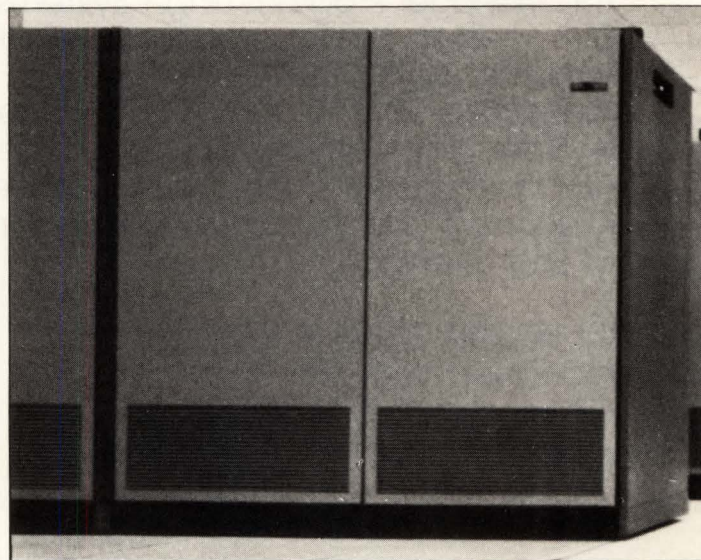
Call Today And Reserve Your Space
Frank Marino (201) 393-6027 or Helen Ryan (201)
393-6028 will give you the details.

Here's how you can:

Identify key prospects

Improve
direct mail response

Lower
your cost per sale



Take Advantage of Mailing Lists from Hayden

Hayden Direct Marketing Services offers you the most specialized, high quality, flexible lists you can buy in the computer industry—and they are proven responsive!

Now You Can Target Prospects By Manufacturer / Model# On Site

For a little more than 1¢ per name, you can have the option of selecting individual labels by manufacturer and model number. Zero in on only those you want to reach. For example . . . select labels for managers with IBM & Plug Compatibles such as . . .

IBM 3081/303X/4341/4331 •

Amdahl 580/470

Or . . . with medium/large mainframes like these . . .

DEC VAX/10/20 series • H-P 3000 • Data General C/350-M/600/MV 8000

And these minicomputers . . . Data General Eclipse/Nova • DEC PDP 8/11 • H-P 250/300/1000 • IBM series 1/3/7/32/34/38

Or micro/personal computers like . . .

Apple II/III • Commodore • Radio Shack
PLUS . . . dozens of others.

Give Your Direct Mail High Impact At Low Cost

Hayden gives you 100% management lists from Computer Decisions subscribers. That means you reach the industry's prime decision makers . . . and the base cost is an *amazingly low* \$60.00/M

Select These Options Tailored To Your Needs

Job title/function	\$5/M
Business/industry	\$5/M
5-digit zip, SCF, or state	\$5/M
Manufacturer/model number	\$20/M
4-up Cheshire labels	no extra charge
Pressure-sensitive labels	\$8/M
Total list	175,000 managers
Minimum order	\$275.00

**HAYDEN
DIRECT
MARKETING
SERVICES**

You can test these lists for as little as \$275.00. All you have to do is call Hayden Direct Marketing today at (201) 393-6384 or fill out coupon. We'll tell you how you can.

Zero in

on your best prospects.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

CD-3/26/85

Mail today to:
Hayden Direct Marketing Services
10 Mulholland Drive
Hasbrouck Heights, N.J. 07604

Photo courtesy of McDonnell Douglas Corp.

PRINTER GUIDE

(Continued from page 129)

1985 GUIDE TO PRINTERS

Impact band (line) printers

Vendor	Model	Speed (lpm)	Width (cpl)	Interface	Color	Graphics	Price
AT&T Teletype (312) 982-3189 Circle 513	M40	300	80/132	EIA, RS 232, serial	No	No	N/A
BDS (415) 964-2115 Circle 514	B-300	300	132 or 136	Custom interfaces	No	No	\$6,000 to \$8,000
	B-600	600	132 or 136	Custom interfaces	No	No	\$9,000 to \$11,000
	B-1000	1,000	132 or 136	Custom interfaces	No	No	\$12,000 to \$15,000
Centronics Data Computer (603) 883-0111 Circle 515	Linewriter 400	400	18 in.	serial, par, Cent	No	No	\$4,885
	Linewriter 800	800	18 in.	serial, par, Cent	No	No	\$6,595
Data Printer/ Printronix (617) 321-2400 Circle 516	DP600	600	132	RS 232, CDC, IBM, Cent, Datap	No	No	\$9,400
	DP750	750	132	RS 232, CDC, IBM, Cent, Datap	No	No	\$10,400
	DP1000	1000	132	RS 232, CDC, IBM, Cent, Datap	No	No	\$11,800
	DP1200	1200	132	RS 232, CDC, IBM, Cent, Datap	No	No	\$12,800
	1210	100	132	RS 232, CDC, IBM, Cent, Datap	No	No	\$16,675
	1260	600	132	RS 232, CDC, IBM, Cent, Datap	No	No	\$11,210
Digital Assoc. (203) 327-9210 Circle 517	B 300	300	132	RS 232, Cent, Datap	No	No	\$5,900 to \$8,400
	B 600	600	132	RS 232, Cent, Datap	No	No	\$7,700 to \$10,200
	B 1000	1025	132	RS 232, Cent, Datap	No	No	\$11,900 to \$14,700
	L 400	400	132	RS 232, Cent, Datap	No	No	\$5,500 to \$8,100
	L 800	800	132	RS 232, Cent, Datap	No	No	\$7,000 to \$9,500
	9386E	600	132	RS 232, Cent, Datap	No	No	\$8,300 to \$11,000
	Model II	1200	132	RS 232, Cent, Datap	No	No	\$15,000 to \$18,000
	1260	600	132	RS 232, Cent, Datap	No	No	\$12,600 to \$15,300
Digital Equip. (617) 493-5489 Circle 518	LP 25	300	132	par	No	No	\$6,500
	LP 26	600	132	par	No	No	\$10,000
Genicom (703) 949-1188 Circle 519	310	231	132	serial, par	No	No	\$4,200
	340	425	132	serial, par	No	No	\$4,835
Innovative Electronics (305) 624-1644 Circle 520	Innovator 154	300	80	serial, par, RS 232, Cent, Datap, IBM	No	No	\$4,995
	Innovator 202	300	132	serial, par, RS 232, Cent, Datap, IBM	No	No	\$5,495
	Innovator 250	300	80	serial, par, RS 232, Cent, Datap, IBM	No	No	\$5,195

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

PRINTER GUIDE

1985 GUIDE TO PRINTERS

Impact band (line) printers

Vendor	Model	Speed (cps)	Width (cpl)	Interface	Color	Graphics	Price
Mannesmann Tally (206) 251-5524 Circle 521	MT 660	600	132	par, RS 232, Cent, Datap	No	Yes	\$7,995
Printer Syst. (301) 258-5060 Circle 522	PSC LW 400	400	132	RS 232, Cent, IBM 3287	No	No	\$5,820
	PSC LW 800	800	132	RS 232, Cent, IBM 3287	No	No	\$8,110

Page printers

Vendor	Model	Speed (ppm)	Width (cpl)	Interface	Color	Graphics	Price
Corona Data Syst. (805) 495-5800 Circle 523	Laser Printer	8	150	IBM, PC, bus-compat.	Yes	Yes	\$3,395
Dataproducts (818) 887-8451 Circle 524	NP24	24	8½ in.	Serial video	No	Yes	\$12,900
Digital Equip. (617) 493-5489 Circle 525	LN03 LN01	8	120/150	Digital Equip. par	No	Yes	\$4,195
		12	132		No	No	\$19,995
Fujitsu (408) 946-8777 Circle 526	M3071	16 to 20	8½ in.	Serial video	No	Yes	\$7,760
Hewlett-Packard (206) 254-8110 Circle 527	Laserjet 2686A 2687A	8	132/176	RS 232, RS 422 RS 232, RS 422	No	Yes	\$3,495
		12	132		No	No	\$12,800
Imagen (408) 986-9400 Circle 528	Imagen 8-300 Imagen 12-300	8	11 in.	RS 232, Cent, Datap RS 232, Cent, Datap	No	Yes	\$9,950
		12	11 in.		No	Yes	\$19,950
KEL (617) 933-7852 Circle 529	5211	20	7.9 in.	serial, par, RS 232, Cent	No	Yes	\$17,500
Kentek Information (201) 825-8500 Circle 530	K-2	12	8½ in.	Major syst.	No	Yes	\$8,995
Printronix (714) 863-1900 Circle 531	Laserprint 20	20	N/A	Many syst.	No	No	\$15,900
QMS (205) 633-4300 Circle 532	Lasergrafix 800	8	8½ in.	Standard	No	Yes	\$9,995
Ricoh (201) 882-2000 Circle 533	LP4120	12	8 in.	RS 232, RS 422, Cent	No	Yes	\$9,995
Xerox Printing Syst. Div. (213) 536-7000 Circle 534	2700 II Distributed Electronic Printer	12	8½ in.	serial, par, RS 232, Cent, Datap, IBM	No	Yes	\$19,995

Legend for tables

ANSI-American National Standards Institute
CDC-Control Data Corp.
Cent-Centronics
cpl-characters per line

cps-characters per second
Datap-Dataproducts
EIA-Electronic Industries Association
IBM-IBM mainframes and minis

lpm-lines per minute
N/A-not available
par-parallel
PC-IBM PC

New—Just Released! The Most Valuable MIS/dp Salary Study You Can Buy

Compensation in the MIS/dp Field (2ND EDITION)

Sponsored by
Computer Decisions, this
tightly-packed, 396-page
report provides the most
intensive study of salaries,
salary ranges, and bonuses
ever attempted in the
MIS/dp field. For 44 job
functions, ranging from
Junior Key Entry Operator to
Top MIS/dp Officer, it reports
all compensation data:

- By 16 levels of supervisory responsibility
- By geographical location—total U.S., U.S. by seven regions (including & excluding major metropolitan areas), and 28 metropolitan areas & states
- By 25 types of employer
- By total MIS/dp budget
- By number of employees
- By annual sales of manufacturing/ extractive and non-manufacturing organizations and utilities
- By total assets of financial organizations

- By insurance policies in force
- By education, experience, & sex

An *invaluable* tool for determining the
"right" salaries in the MIS/dp field. \$250.00

Complete & mail today for your 15-day FREE
Trial Copy—No Obligation!



Abbott, Langer & Associates. *Computer Decisions*. 10 Mulholland Drive. Hasbrouck Heights, N.J. 07604

Yes! I certainly can use Compensation in the MIS/dp Field in my work. Please rush my copy to me immediately! (If I'm not satisfied, I'll return it within 15 days and not be charged for it.)

- ☐ Check No. _____ for \$250.00 is enclosed (IL residents add 6¼% sales tax.)
☐ Bill my employer, adding a small charge for shipping and handling.

Signature _____ Name _____

Title _____ Employer _____

Street Address of Employer* _____

City _____ State _____ Zip _____

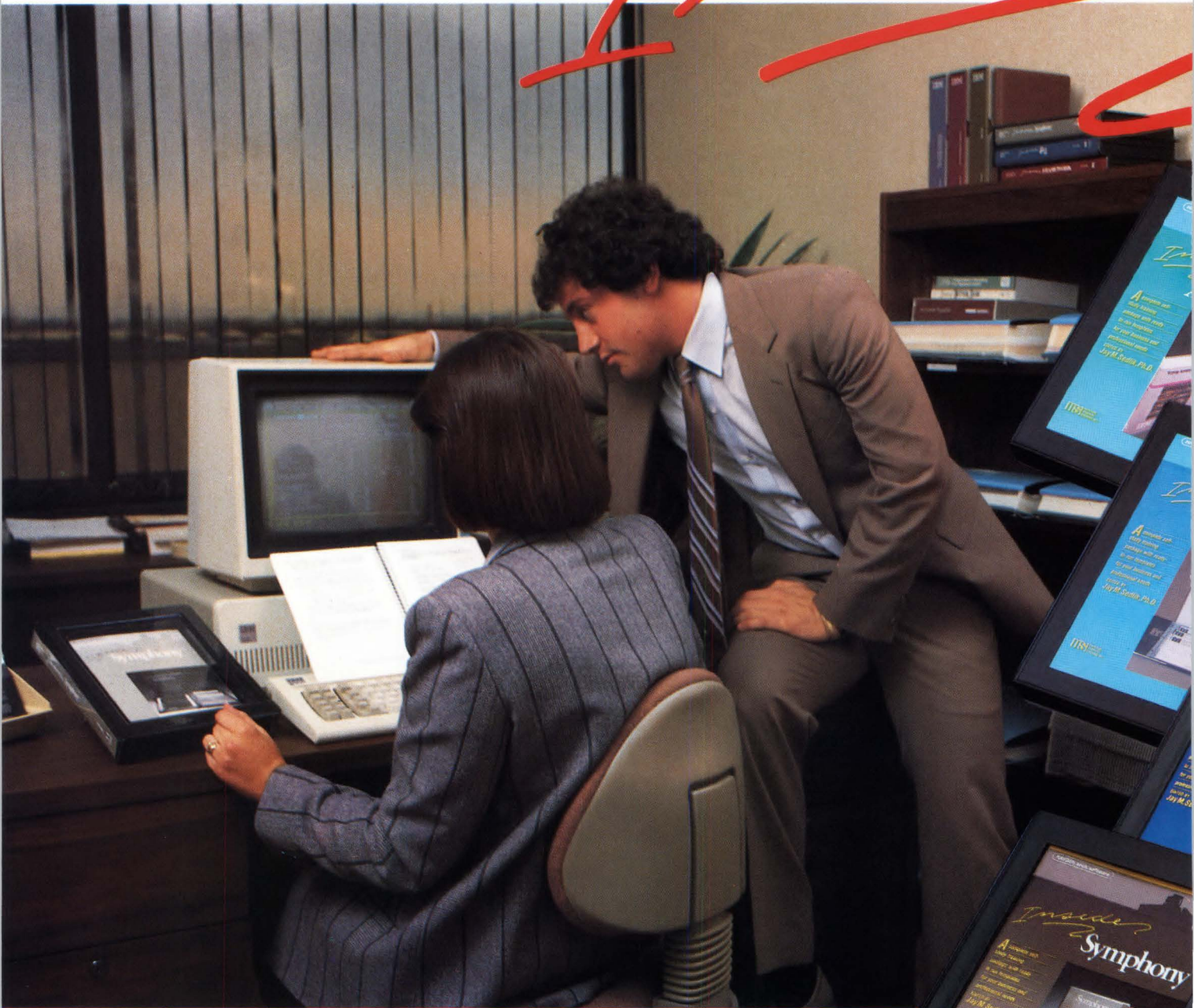
*U.P.S. will not deliver to a P.O. Box. Please give street address.



Get *Inside*

When you invest in expensive business software packages like dBase III, or IBM's Assistant Series, or Framework or dBase III, or IBM's Assistant Series

Get the *Inside*



Now it's easy! The INSIDE packages from Hayden are the first and only self-training packages that contain an IBM PC, XT, or PC compatible diskette with preformatted templates that enable the micro user to interact with their 1-2-3, or Symphony, or Framework, or dBase III, or the five applications in the Assistant Series and put it to work QUICKLY and INEXPENSIVELY.

ackages like Lotus' 1-2-3 or Symphony, or Ashton-Tate's
eries...you want to put it to work for you fast.

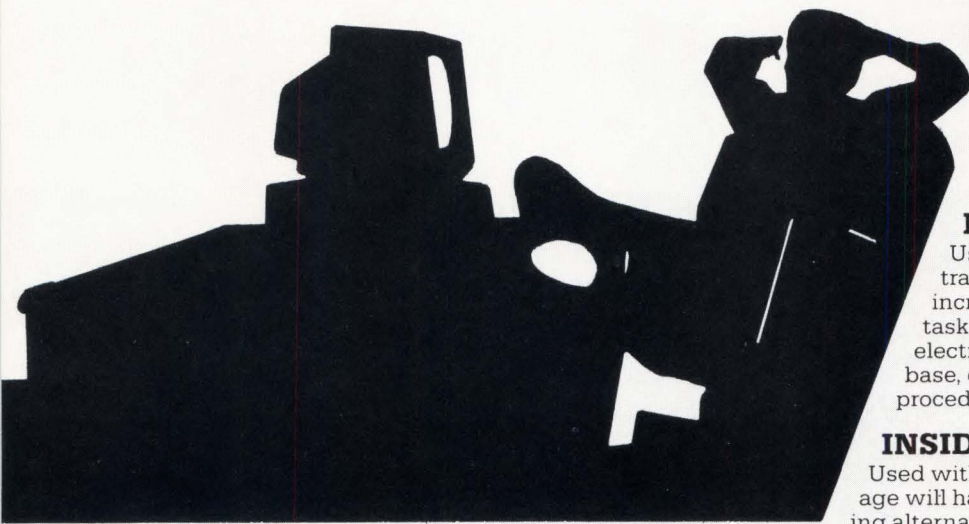
inside benefits!



HAYDEN book/software

Designed from the user's perspective, these INSIDE training packages are developed by instructional technologists at National Training Systems—a leading provider of computer training products and services since 1974. Combined with your own application software, the book/software packages include everything you need to make that software productive on the job sooner: a book, the diskette, and a user's quick reference guide.

Ahhhhh... the satisfaction of putting that software to work fast!



INSIDE FRAMEWORK™

Used with Framework software, this self-training package will enable you to perform increasingly complex and sophisticated tasks like idea/word processing, building electronic spreadsheets, setting up a database, creating graphics, using communication procedures, and integrating capabilities.

INSIDE 1-2-3™

Used with 1-2-3 software, this self-training package will have you creating, reviewing, and analyzing alternative electronic spreadsheets and setting up a database within hours.

INSIDE SYMPHONY™

Quickly and inexpensively, you'll use your Symphony software and this book/software package to set up a database, create electronic spreadsheets, do word processing, automate graphics, communicate electronically, integrate capabilities and use macros.

INSIDE THE IBM ASSISTANT SERIES™

Within hours you'll be using your IBM Assistant Series software to manage data, create reports, build electronic spreadsheets, develop graphics, and prepare word processing documents. It's a value-added package that provides users with training they need for the individual applications they have now as well as those they may add in the future—all at one low price.

INSIDE dBASE III™

Don't waste a minute of productivity... with this self-training book/software package and your dBase III software you'll learn to create and use different types of dBase III files and to design and begin to write dBase III programs fast.

Each book/software package only \$49.95



HAYDEN book/software

Dealer's inquiries welcome

At bookstores or computer dealers, or order by phone: **800-631-0856 or 201-393-6300**

HAYDEN BOOK COMPANY

10 Mulholland Drive, Hasbrouck Heights, New Jersey 07604

In Canada: Holt, Rinehart & Winston, 55 Horner Avenue, Toronto, Ontario M8Z 4X6

Framework and dBase III are trademarks of Ashton-Tate. 1-2-3 and Symphony are trademarks of Lotus Development Corporation. The IBM Assistant Series is a trademark of International Business Machines Corporation. IBM PC and XT are registered trademarks of International Business Machines Corporation.

(Continued from page 58)

than loosing out to the micro revolution, the fate of many other remote-computing services, ADP is capitalizing on it. Timesharing is a declining business for ADP, representing only 3 percent of its revenues.

Since 1967, ADP has consummated over 100 acquisitions, mostly of smaller operations. About 75 percent have worked out, an excellent batting average in general, but especially in the dp industry. Even those that did not work out or "that did not meet ADP's objectives," as Weston puts it, have usually been disposed of at little or no loss—and sometimes at a small profit. Thus, ADP has been able to maintain an unusually strong balance sheet—one that, coupled with a consistently high price-to-earnings ratio, would permit it to make far-more-extensive acquisitions than in the past. However, Weston indicated that no substantial acquisitions are in the works or planned at present.

In addition to its apparent immunity from hostile takeover, ADP enjoys another advantage: It does not at present compete in any way with IBM, although there is some chance of future competition in services. In fact, as a supplier of workstations based on IBM PCs, ADP is a heavy buyer of IBM products.

When asked what ADP's greatest strength is, Weston responded: "Its people." When asked where he would like to see ADP strengthened, he responded: "Lengthen the current client lifecycle, which averages seven to 10 years." What about depth of management? What would happen if Weston were struck by lightning? He pointed to ADP's organizational chart, which shows three main product groups, each headed by a "president." In addition, a senior vice president is in charge of the staff at ADP's new world headquarters in Roseland, NJ. Each of these executives has many years of service at ADP, and each still in his early 40s. All are qualified to take Weston's place, he claims.

What about the possibility of some giant acquiring ADP? Weston discounts an unfriendly takeover because ADP's strength is its staff, whose loyalty might dissipate under less-

enlightened and less-democratic management. Weston is called "Josh" by all employees down to the janitor, who, incidentally, popped in to his office to adjust an errant thermostat during the interview on which this column is based.

At a time when so many of data-

processing hardware, software, and services are faltering or just plain falling out of bed, it is a refreshing experience to explore an organization that is seem-immune to traumatic downturns. But that's what large organizations want from a supplier of vital services. No surprises. □

Turns Spaghetti Code COBOL Into Structured COBOL Automatically

SUPERSTRUCTURE takes your unstructured COBOL programs and automatically produces structured COBOL programs that are easy to understand and maintain.

SUPERSTRUCTURE provides a simple and cost effective alternative to manually rewriting those unstructured programs that are a maintenance nightmare. Of course you can't believe it. Let us prove SUPERSTRUCTURE works, using your programs at your location. SUPERSTRUCTURE—the breakthrough you've been waiting for.

Call today: Marketing Director—
SUPERSTRUCTURE.

Group Operations, Incorporated
1110 Vermont Avenue, N.W.
Washington, D.C. 20005
(202) 887-5420

Offices in: Atlanta, Boston, Chicago,
Dallas, Hartford, Los Angeles, New
York and Toronto



(Continued from page 64)

systems at Providence Life and Accident Insurance Co. in Chattanooga, TN. "When they don't have a corresponding price, they don't realize what training's worth. A chargeback lets them decide if the training's worth the benefit they're going to get from it."

A chargeback system may actually help an organization come to grips with the increasing number of personal computers. "I've seen organizations successfully handle the training for personal computers through a centralized system like an information center," DeLana Williams says. A chargeback system will necessarily centralize training that may have been offered informally. Because trainers and managers are more accountable for training delivered and received under a chargeback, it is unlikely that different training groups, even within the same organization, will duplicate each other's efforts. Metropolitan Life has an education center, an information center, an office-

automation group, and a human-resources group, all of which offer training. The cooperation between these organizations—setting prices, and deciding which group will handle what training—is "one of the benefits you obtain from a chargeback," Hearst says.

The absence of this benefit is one of the arguments Bernard McGinley is using to convince senior management at Pittsburgh National Bank to implement a chargeback system. For now, training is decentralized, says McGinley, the data-center-education coordinator. Any communication that exists between the training groups at the bank is initiated by the trainers themselves, each of whom reports to a different supervisor and has a different support staff. McGinley is afraid this fragmented training system will let some training slip through the cracks. Since each group has its own narrowly defined training function—McGinley's group trains dp operations per-

sonnel—he believes certain training will fall outside of each group's responsibilities.

One of the reasons management is stalling on the chargeback system, McGinley says, is that it wonders how it will tie in the training departments of the other banks it acquires. He has already worked out a method that calculates a cost for training, and he's producing billing reports so the users of training can see what their training expenses will be. Management is also moving the process along. "An educational steering committee has been created that pulls together all of the professionals involved with training throughout the corporation," McGinley reports.

Pittsburgh National's cautious, deliberate progress is a reminder that a chargeback system's successful implementation is analogous to its successful operation. It requires judiciously offered input before it will deliver any of its benefits in return. □

**MANUFACTURING = INCREASED
PRODUCTIVITY PROFITABILITY**

Gartner Group and Enhansys have convened a major Forum examining the tools and techniques needed to improve your company's productivity now!

INFORMATION MANAGEMENT AND INDUSTRIAL PRODUCTIVITY

May 13-14, 1985
Loews Anatole
Dallas, Texas

Key issues include:

- Factors influencing U.S. manufacturing productivity.
- Why foreign industrial nations are overtaking us.
- Becoming a leader in manufacturing productivity.

Call Lynn Bentley at (203) 964-0096 to register today!

Gartner Group, Inc./Enhansys, Inc.

INSTANT FINANCIAL PICTURE!

Corporate Financial Simulation
Model on your

IBM PC or XT with Lotus 1-2-3,
Multiplan, SuperCalc, VisiCalc or
PeachCalc. Also available on
most CP/M & all Apple systems.
A \$6,000 value for \$295.



Bottomline V

A Financial Decision Support
System — budgeting, planning, analysis,
and five-year forecasting.

For information or immediate
UPS COD delivery call (714) 476-2842
ILAR Systems, Inc. • 1300 Dove Street, Suite 200
Newport Beach, CA 92660

APPLICATION



Datapoint's Arc network allows ESPN to run efficiently, says Tony Tamburo.

ESPN GROWS WITH ARC

For ESPN, the cable television sports network, success depends on the schedule. ESPN learned that lesson early, says Tony Tamburo, manager of information services. When opening for business in September 1979, the network needed an automated way to log the programs and commercials that would air in any 24-hour period. A three-terminal Datapoint 6600 small minicomputer equipped with special software for broadcasters was brought in to solve the scheduling problem.

As ESPN grew, it expanded and enhanced its original Datapoint system to encompass other functions. In 1980, it added word-processing software and then a Datapoint Arc local-area network. The network allows ESPN's users to share disk files and peripherals. It gives users access to the same data, programming languages, and applications software, all within a secure framework.

ESPN—the Entertainment and

Sports Programming Network—is one of the largest cable-television networks, reaching 30.2 million households. The network televises a variety of sporting events, including professional and collegiate basketball and football, golf tournaments, and Davis Cup tennis matches. ESPN also covers news of the sports world, and, last year, added "Business Times," a weekday-morning business-news show.

Today, ESPN's Arc network connects 16 small Datapoint minis (three 6600s, nine 8600s and four 3800s) with a total of 160 million bytes of disk storage. Functions from accounting to word processing are running on the system. All software is written in Databus, Datapoint's business programming language for data manipulation and statistical operations.

Since the installation of the Arc network, ESPN's users have extended their use of automated tools," says Tamburo. "Our legal department, for example, maintains all of ESPN's con-

tracts in various electronic files. Word processing has virtually eliminated work duplication. It's been a big time-saver," he says.

ESPN's employees make heavy use of the word-processing software running on the system. Datapoint's software includes the Associative Index Method (AIM) of indexing files. AIM generates indices to files and documents without requiring users to classify, describe, or specify what they should contain. Indices dramatically reduce the time and effort required to retrieve information and word-processing files.

As ESPN continues to grow, the Arc network can be expanded and enhanced. Tamburo expects to install the next generation of Datapoint computers at some point in the future. "We've stayed with Datapoint to maximize our investment, and we're satisfied with response time and Datapoint's professionalism. They've been excellent."

Circle 537

DATA-ENTRY TERMINAL

CIE-7100 data-entry display terminal emulates the IBM 3101 as a multi-user add-on to the IBM PC AT. Priced at \$695, it costs almost half as much as the IBM 3101 terminal. The CIE-7100 can be used as a data-entry device with CIE System 680 computers.

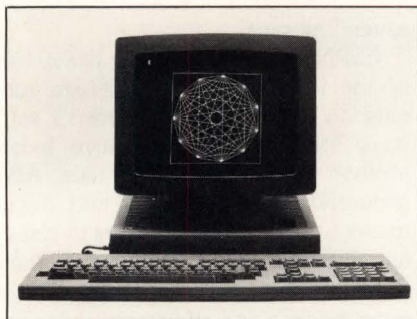
CIE Systems, 2515 McCabe Way, Irvine, CA 92713.
(714) 660-1800. *Circle 200*

SMART TERMINAL

Link 125 emulates six ASCII terminals, including Wyse 50; Televideo models 925 and 910; Lear Siegler models ADM 3A and 5; and the ADDS Viewpoint. Priced at \$599, it features 32 programmable function keys with non-volatile storage, 14-inch screen, and 132-column display.

Link Technologies, 2260 Paragon Dr., San Jose, CA 95131.
(408) 943-0142. *Circle 201*

GRAPHICS TERMINALS



The Freedom 240 Graphics/ANSI VDT is compatible with DEC VT200/VT100 and Tektronix 4010 and 4014 graphics terminals. The Freedom 210 Graphics/ANSI VDT is compatible with the Freedom 200 terminal and emulates the Televideo 950 and Tektronix 4010 and 4014 terminals. Both the Freedom 240 and Freedom 210 have 14-inch, 132-column alphanu-

meric displays. A 665 x 288 pixel resolution is also featured. Prices: \$1,395 for Freedom 240; \$1,295 for Freedom 210.

Liberty Electronics, 625 Third St., San Francisco, CA 94107.
(415) 543-7000. *Circle 202*

3270 DISPLAY TERMINALS

The Telex 080 15-inch display terminal is an IBM 3278 plug-compatible display terminal priced at \$2,195. The Telex 179 color-display terminal, priced at \$2,295, offers enhanced 3270 capabilities, a 14-inch monitor, standard seven-color support, and is plug-compatible with the IBM 3179 in emulation mode.

Telex Computer Products, 6422 East 41st St., Tulsa, OK 74135.
(918) 627-1111. *Circle 203*

DISK DRIVES

Double-sided, double-density, 360-Kbyte compatible disk drives for the IBM PC AT cost \$275. The drive comes with instructions, test procedures, and a custom disk-drive test program. It features quiet operation with the same type of closing mechanism as the high-capacity drive.

Personal Computer Products, 1400 Coleman Ave., Santa Clara, CA 95050.
(408) 988-0164. *Circle 204*

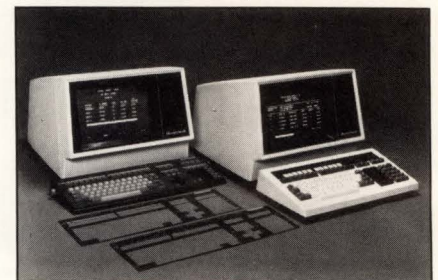
PLOTTER UPGRADES

The Versatec 7200 series of electrostatic plotters can now be upgraded from 200 to 400 point-per-inch resolution. Upgrades in plotter speed are available for Versatec 7400 models. The cost of upgrading a 7200 plotter is \$10,600.

Versatec, 2710 Walsh Ave., Santa Clara, CA 95051.
(408) 988-2800. *Circle 205*

EDITING TERMINALS

Honeywell's VIP7816, VIP7826, VIP7817, and VIP7827 editing terminals are compatible with the VIP7800 product family. They operate in text and form mode to emulate the VIP7705R terminal, and advanced VIP7800 terminals in either synchronous or asynchronous modes. Prices: \$2,800 for VIP7816/7826 terminals; \$3,350 for VIP7817/7827 terminals.



An RS-232C cable comes with the VIP7816 and VIP7817 terminals. The VIP7826 and VIP7827 terminals include an RS-422A cable for asynchronous direct communication to Honeywell computer systems.

Honeywell Inc., 200 Smith St., Waltham, MA 02154.
(617) 895-6616. *Circle 206*

MATRIX LINE PRINTERS

Two new matrix line printers offer matrix-printer versatility at band-printer speeds. Prices: \$18,766 for Model HP 2565A, and \$21,766 for Model HP 2566A. Model HP 2565A prints at 600 lines per minute (lpm), and Model HP 2566A prints at 900 lpm. Standard character set in both printers is 8-bit Roman8, which supports ASCII as well as 11 European languages. As many as 14 fonts may be installed at one time in each printer. Both printers can print barcodes and are designed for medium- to high-volume print loads. The printers can be used with HP 3000 and HP 1000 computers.

Hewlett-Packard (Contact your local sales office.) *Circle 207*

PROTOCOL CONVERTER

The Series II+ 3287/Coax Protocol Converter allows local attachment of non-IBM output devices to IBM 3270 cluster controllers. Price: \$1,995. It emulates the functions of an IBM 3287 Model 1 or Model 2 printer, allowing the ASCII printer to appear to the host as a 3287. Series II+ supports RS-232C, Dataproducts, and Centronics controllers, and accepts SNA LU1 (SCS), SNA LU3 (DSC), or BSC data streams, depending on the application program and local controller.

KMW Systems Corp., 8307 Highway 71 West, Austin, TX 78735.
(512) 288-1453. *Circle 208*

EMULATION DEVICE

Bi-Path acts like a reverse protocol converter to allow the IBM 3270 family display stations to emulate industry standard ASCII terminals and perform normal 3270 operations. Price: \$700. Bi-Path can be used with any host, including 43XX or 30XX and compatible control units. It operates with SNA, BSC, local channel, and other protocols that support 3278 and look-alike display stations. The device allows 3278 and look-alike terminals to emulate 3278 DEC VT100 or IBM 3101.

Renex Corp., 1513 Davis Ford Rd., Woodbridge, VA 22192.
(703) 451-2200. *Circle 209*

PRINTER BUFFER

Up to 15 computers can share one or more printers with the Systemizer printer buffer. The Systemizer, priced at \$299 and up, offers from 16 Kbytes to 64 Kbytes of memory for data buffering. Input and output connections can be configured for either serial or parallel operation. An optional third connection allows several Systemizers to link together via standard four-wire

telephone cables to form a printer network. Each user can access any printer that is connected to another Systemizer linked to such a network.

Applied Creative Technology Inc., 2156 W. Northwest Hwy., MS303, Dallas, TX 75220.
(214) 556-2916. *Circle 210*

Scanning wand: The Datawand II from MSI Data Corp. (Costa Mesa, CA) has four times the memory and more sophisticated software than the original Datawand. Price: \$400. The Datawand II barcode scanner has 16,000 digits of memory and dual synchronized microprocessors. *Circle 211*



The new mechanical pencil with a cartridge refill system.

The Berol CASSETTE Pencil is a breakthrough in mechanical pencil technology. Just take an easy-loading, long-lasting cartridge of 15 leads and slide it in like a ballpoint refill! It's clean and simple and you never have to fool with one-at-a-time leads.

The special "shock-absorber" cushioned point helps reduce lead breakage.

And the automatic push-button lead advance keeps you writing. Berol

CASSETTE . . . it's the most innovative mechanical pencil since mechanical pencils were invented.

Ask for it wherever fine writing instruments are sold.

"Shock-absorber" cushioned point reduces lead breakage.

Automatic push-button lead advance.



Available in .5mm and .7mm lead diameters.

Cassette cartridge holds 15 leads plus eraser.

Berol®

Berol USA
Division of Berol Corporation
Danbury, Connecticut 06810

© 1985, Berol USA.

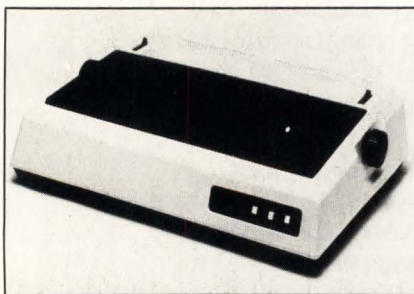
FILM RECORDER

Matrix PCR, a portable color-film recorder, reproduces computer-generated graphics as 35mm color slides. Price: \$11,795. There are over 4 million pixels per frame and each one can assume any one of over 16 million colors and shades. Matrix PCR interfaces with the IBM PC, PC XT, PC AT, XT 370, and 3270 PC, main-frame networks, and minicomputers. It is also compatible with most major graphics packages.

Matrix Instruments Inc., 1 Ramland Rd., Orangeburg, NY 10962.
(914) 365-0190. **Circle 212**

DAISYWHEEL PRINTER

The Starwriter A10-30 daisywheel printer is IBM PC-compatible and prints 29 characters per second. Price: \$800. It features a 138-character col-



umn width, 200 bytes of buffer memory for bidirectional printing, and RS-232C serial or Centronics-type parallel-communications interfaces.

C. Itoh Digital Products, 19750 South Vermont Ave., Torrance, CA 90502.
(213) 327-2110. **Circle 213**

DATA-ENTRY SYSTEM

The Laser 3 Formsreader data-entry system is a combination page and document reader that uses optical-character recognition technology. Price: \$72,500. The system consists of

the scanner, one alphanumeric font, floppy disk, console crt, and keyboard with numeric handprint, matrix printer, and tape-drive options. Up to 4400 single-line documents can be read per hour.

Compuscan, 81 Two Bridges Rd., Fairfield, NJ 07006.
(201) 575-0500. **Circle 214**

DOT-MATRIX PRINTER

The DP9632B Omni/Scribe printer is designed for use with IBM 3270 terminals. Dot-addressable graphics provide either 72 or 144 dots-per-inch resolution. Price: \$3,495. Options include OCR-A and APL fonts, and alternative character sets.

Anadex, 1001 Flynn Rd., Camarillo, CA 93010.
(805) 987-9660. **Circle 215**

3-D WORKSTATIONS

The Tektronix 4125 Color Graphics Workstation and the 4128 and 4129 3-D Graphics Workstations are 80286/80287-based units featuring 2-D, 3-D wireframe, and 3-D solid-shading capabilities respectively. Prices: \$19,950 for 4125 workstation; \$25,000 for 4128 workstation; and \$35,000 for 4129 workstation. Intended for CAD applications, they can be used for structural analysis, finite-element modeling, thermal and vibration analysis, interference modeling for piping layout, and creative design work.

Tektronix, P.O. Box 500, Beaverton, OR 97077.
(503) 644-0161. **Circle 216**

3270 emulation: Multimas, from Computer Toolware of Toledo, OH, enhances IBM 3270 emulation for HP 3000 minis. Multimas interfaces with the vendor's existing 3270 emulator, VTS/IMAS, and costs \$595 per cpu.

Circle 217

Computer Decisions' purpose is to help computer-involved managers and executives make strong contributions to the effectiveness, productivity, survivability, and profitability of the organizations they serve.

We provide practical information on the following subjects:

- How to make information-handling resources and staff more effective, productive, and responsive.
- How the latest in information-handling technology can improve operations.
- How managers and executives can develop and advance their own careers.
- How managers can promote effective end-user computing.

Computer Decisions' accuracy policy:

- To make diligent efforts to ensure the accuracy of all editorial material and to publish prompt corrections. Corrections appear in the "Letters" section.
- To refuse any advertisement deemed to be fraudulent.

Copyright © 1985 Hayden Publishing Co., Inc. James S. Mulholland Jr., President and Treasurer, and Philomena DiMeo, Secretary. Printed at Brown Printing Co. Inc. All rights reserved. *Computer Decisions* is issued free of charge to qualified executives with active professional and functional responsibility in organizations that use computers and computer-based services and among computer manufacturers. To request a subscription, please complete the Subscriber Qualification Form included in each issue. The publisher reserves the right to reject requests from unqualified individuals. Subscription rates: Qualified subscribers in the U.S. and Canada—free. Paid subscription rates in the U.S., Canada, Mexico, and Central America—\$50. Single copies—\$4.00. All other countries via surface mail—\$50. Single copies—\$5.00. Air-delivery rates: Europe—\$75; Japan, Asia, Africa, the Middle East, and Australia—\$85; New Zealand/New Caledonia—\$110. Limited number of subscriptions for persons outside the field.

Changing your address? Complete the Subscriber Qualification Form in the magazine, being sure to attach old mailing label in the space provided.

Back issues of *Computer Decisions* are available on microfilm, microfiche, and 16mm or 35mm roll film from Xerox University Microfilms, 300 N. Zeeb Rd., Ann Arbor, MI 48106, (313) 761-4700.

Where necessary, permission is granted by the copyright owner for libraries and others registered with the Copyright Clearance Center (CCC) to photocopy any article herein for the base fee of \$1.50 per copy of the article plus 50¢ per page per copy. Payments accompanied by the identifying serial fee code below should be sent directly to the CCC, 21 Congress St., Salem, MA 01970. Copying done for other than personal or internal-reference use without the express permission of Hayden Publishing Co. Inc./*Computer Decisions* is prohibited. Requests for special permission or bulk order should be addressed to the editor. Serial Fee code: 10-4558-84, \$1.50, plus .50.

Want to contact *Computer Decisions*? Address correspondence to: Editor, *Computer Decisions*, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604.

IBM MEMORY EXPANSION

STOR/8000 expands or replaces main memory for IBM 3081, 3083, and 3084 computers and migrates between these models. Prices are \$95,000 and \$180,000 for 8- and 16-Mbyte modules respectively. STOR/8000 plugs into a Cambex backplane with its own power supply and uses IBM circuitry and signals. Read and write speeds adhere to IBM standards and memory is compatible with and transparent to the 308X series. **Cambex Corp.**, 360 Second Ave., Waltham, MA 02154. (617) 890-6000. **Circle 218**

DAISYWHEEL PRINTER

Xerox/Diablo Advantage D25 letter-quality daisywheel printer for the IBM PC and other personal computers re-

quires a Centronics or RS-232-C interface. Priced at \$745, the D25 types 25 cps and is suited for word processing and text/graphics applications. **Xerox Corp.**, Xerox Sq. 006, Rochester, NY 14644. (716) 423-5078. **Circle 219**

COMPUTER/PROJECTOR

Limelight computer-projector displays computer-generated video information onto a screen for viewing by large groups of people. Priced at \$3,950, it weighs 25 pounds and connects to most personal computers via a standard video cable. Images can be displayed from an off-site PC that is part of a computer network or accessed over telephone lines via a modem link. **Vivid Systems**, 2440 Embarcadero Way, Palo Alto, CA 94303. (415) 424-1600. **Circle 220**

DRAFTING PLOTTER

DMP-51/52 MP, a high-speed, 14-pen plotter for drafting-intensive applications, features .001 resolution, plotting speed of 22 inches per second, and acceleration to 4 G. Priced at \$5,995, it has a built-in digital microprocessor, is compatible with over 200 software programs, and can be interfaced through an RS-232-C port. **Houston Instrument**, P.O. Box 15720, Austin, TX 78761. (512) 835-0900. **Circle 221**

Bluebook for used computers: *Used Computer Guide*, from Hansen Publishing (P.O. Box 1194, Mercer Island, WA 98040), helps determine the fair market value for over 260 models of used computers and contains a list of micro brokers, advice on where to advertise, and other information. **Circle 222**

CEMT COMMANDS

FROM BATCH JOB STREAMS

\$495 - FREE 30 DAY TRIAL

OPEN OR CLOSE FILES

START OR STOP DL-1

SEND MESSAGES TO CRTS

WORKS ACROSS MACHINES

MacKinney Systems

(417) 833-9553

CIRCLE 62

DEC VT220. FOR YOU TO BUY.



Buy the new Digital VT220 video terminal from USL Data Systems. It's a pleasure to use. And it's perfect for transaction processing, interactive editing, and a variety of sys-

tem monitoring tasks. Call us today for the office nearest you.

USL Data Systems

US

A US Leasing Company

2988 Campus Drive
San Mateo, CA 94403
800/227-6884
415/572-6600 (in California)

Nobody offers more.

CIRCLE 63



**Only INNOVATION
(not even IBM)
supports a STAND ALONE
BACKUP program
or provides a
STAND ALONE program
that supports XA mode**

**WHEN DISASTER STRIKES while
your processor is running in XA
mode or 370 mode ...
INNOVATION's SAR provides the
fastest RECOVERY.**

- SAR automatically determines running mode (XA or 370)
- XA mode support saves critical time in a disaster/recovery mode
- XA mode support makes operator procedure simpler and less error-prone
- XA mode support eliminates the need to maintain an alternate IOCDS to use in 370 mode for SAR

SAR supports dumping of disk volumes, data sets, or tracks when no operating system is available.

STAND ALONE BACKUPS Since you can use the DUMP feature of SAR to backup the volume before the restore, STAND ALONE BACKUPS eliminate the need to keep a spare volume to do restores in case the system pack goes down.

VM USERS SAR backup and restore functions are supported under VM.

**//////FDR — The Fastest DASD
Management System...**

**For Your Free
No Obligation 90 Day Trial**

CALL (201) 777-1940, or write:

**INNOVATION
DATA PROCESSING**

970 Clifton Avenue, Clifton, New Jersey 07013

RECOVERY

CIRCLE 76

M I C R O S P L U S

WP PACKAGE

Version 3.30, an enhancement of the Multimate Professional Word Processor, runs on the IBM Personal Computer. Price: \$495. The new version features proportional-space printing and a merge utility that can access standard ASCII files created by other programs. It lets users of DOS 2.0 and higher create and edit documents on more than one sub-directory of a disk.

Multimate International Corp., 52 Oakland Avenue North, East Hartford, CT 06108.

(203) 522-2116.

Circle 225

MANAGEMENT PACKAGE

PC Info is a microcomputer relational data-management package that allows microcomputers to tap directly into minicomputers. Price: \$1,200. It is compatible with the Info minicomputer data-management 4GL package. PC Info has an upload/download capability that lets users access existing Info applications, reports, and files on both mini and microcomputer systems. PC Info runs on the IBM PC XT and PC AT.

Henco Software Inc., 100 Fifth Ave., Waltham, MA 02154.

(617) 890-8670.

Circle 226

MBC 550 ADD-ONS

A video board for the Sanyo MBC 550 Series Computer allows users to run Lotus 1-2-3, PFS, and other IBM graphic applications. Price: \$200. Applications specifically designed for the Sanyo MBC 550 Series can be used with the Video Board. The CRT 50 is a 13-inch color monitor compatible with the Sanyo MBC 550 Series and the IBM PC. Price: \$450. It has an 80-character by 24-line display.

Sanyo Business Systems Corp., 51 Joseph St., Moonachie, NJ 07074-1098.

(201) 440-9300.

Circle 227

REPORT WRITER

Quickreport, a report writer for Ashton-Tate's dBase II and dBase III, runs on the IBM PC and compatibles. Price: \$295. It produces both simple and complex reports and can combine up to six dBase III databases into one report.

Fox & Geller Inc., 604 Market St., Elmwood Park, NJ 07407.

(201) 794-8883.

Circle 228

PRODUCTS/MICROS PLUS

BIG-SCREEN PORTABLES



Compass II Models 1131 and 1139 feature large electroluminescent screens that display up to 128 characters per line to accommodate larger

spreadsheets and databases. Prices: \$6,795 for Model 1131; \$7,995 for Model 1139. Both models offer up to 512 Kbytes RAM, up to 512 Kbytes of user-installable ROM, and 384 Kbytes of nonvolatile bubble memory.

Grid Systems Corp., 2535 Garcia Ave., Mountain View, CA 94043.
(415) 961-4800. **Circle 229**

LASER PRINTER

The Concept Laser 8 printer, compatible with the IBM PC, PC AT, and the IBM Virtual Device Interface (VDI), prints letter-quality text and graphics at a 300 dot-per-inch resolution and has an optimum speed of 8 pages per minute. Price: \$8,000. The

printer can operate in five modes to interface with graphics, alphanumeric, and image applications.

Concept Technologies Inc., 6950 P.O. Box 5277, Portland, OR 97208.
(503) 684-3314. **Circle 230**

PORTABLE PC

The STM PC, priced at \$3,450, has an internal Hayes-compatible 1200-baud modem, a 25 x 80 liquid-crystal display, and memory upgradable to 512 Kbytes. The portable PC weighs 17 pounds.

STM Electronics Corp., 535 Middlefield Rd., Menlo Park, CA 94025.
(415) 326-6226. **Circle 235**

THE
MARKET
INFORMATION
CENTER
INC.

Research Report Workstation Trends: Personal Computer And Intelligent Terminals

Over 400 companies participate in this detailed survey of PC and Intelligent terminal usage in their organizations. Applications, buying intent, and communication patterns are all included in this authoritative study.

Other Highlights Include:

- ▶ Leading PC and Terminal Vendors Selected.
- ▶ Rankings of most popular applications used today AND planned for in the future.
- ▶ Communications usage and trends. LANS in use and planned.
- ▶ Leading modems and speeds selected for networks.
- ▶ CRT displacement issues covered.

Published December, 1984 Price \$325.00

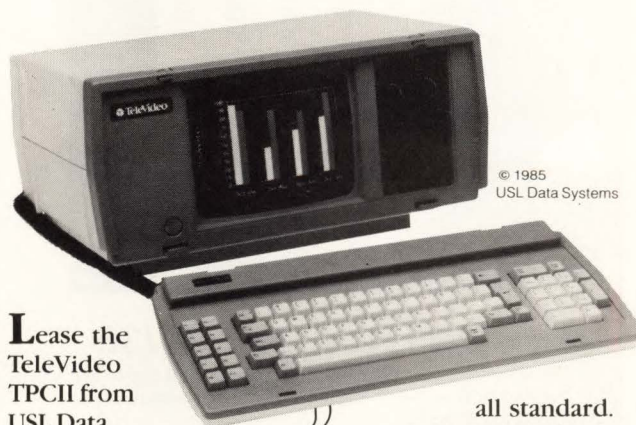
Survey data also available on 5 1/4" disk (PC/MS-DOS) with report for \$525.00.

For inquiries and orders please call or write to:

The Market Information Center, Inc.
100 Pennsylvania Avenue, Suite 350
Framingham, MA 01701
617-879-2273

CIRCLE 64

LEASE TELEVIDEO'S PORTABLE TPCII



Lease the TeleVideo TPCII from USL Data Systems. It's just one of the IBM™ PC compatibles by TeleVideo that we have available. The TPCII offers a 360-Kbyte floppy disk drive, 128 Kbytes of RAM, and graphics capability—

all standard. Call us today for the office nearest you.

USL Data Systems

US

A U.S. Leasing Company

2988 Campus Drive
San Mateo, CA 94403
800/227-6884
415/572-6600 (in California)

Nobody offers more.

CIRCLE 65

PC AT WINCHESTERS

A new series of Winchester-disk drives are plug-compatible with the IBM PC AT and provide from 21 Mbytes to 117 Mbytes of formatted storage. Price: \$1,500 to \$6,990. Each package includes a 5¼-inch Winchester-disk drive, cable, and mounting bracket.

Interface Inc., 21101 Osborne St., Canoga Park, CA 91304.
(818) 341-7914. **Circle 236**

FILE CONVERSION

Media Master is a disk-to-disk format-conversion program for the IBM PC. It lets users access programs and data from CP/M and MS-DOS computers. Media Master lets the IBM PC read, write, and format over 70 different computer-disk formats. From within

one program, the user can display directories or files, copy and erase files, manipulate MS-DOS 2.0 subdirectories, and format diskettes. Price: \$40. Media Master runs on the IBM PC and PC XT with 128 Kbytes of RAM, and PC-DOS 1.1 or higher. **MDG & Associates**, 4573 Heatherglen Court., Moorpark, CA 93021.

(805) 529-5073.

Circle 237

EMULATION PACKAGE

PA-Plus is an IBM 3270 terminal-emulation package for the IBM PC and PC XT. PA-Plus emulates an IBM 3278-2 terminal for users requiring dial-in access to the IBM mainframe. Price: \$100. The package is used with Avatar's PA1000 or PA1000E protocol converters, allowing dial-in access to both the IBM 3270 network and a local or remote asynchronous host computer. With PA-Plus, IBM PC

users can run 3270, asynchronous communications, and PC-DOS applications simultaneously.

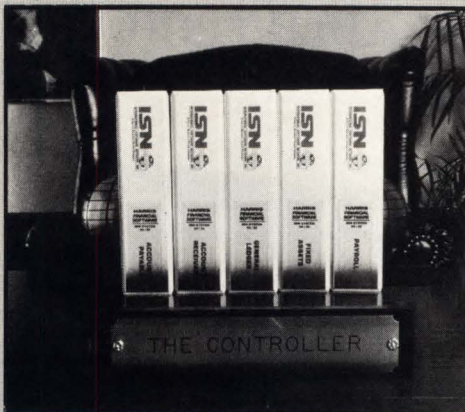
Avatar Technologies Inc., 99 South St., Hopkinton, MA 01748.
(617) 435-6872. **Circle 238**

PC COMMUNICATION

PC/Sail allows communications between asynchronous devices and an IBM System/34, 36, or 38. Price: \$1,600. PC/Sail uses a combination of hardware and software for an IBM PC, and an IBM 5251/12 communication link from the PC to the System/34, 36, or 38. It reads data from an asynchronous device, transmits the data to a host System/34, 36, or 38 in real time, and translates the asynchronous protocol to a standard IBM 5251/12 synchronous protocol.

Granada Systems Design Inc., 303 Fifth Ave., New York, NY 10016.
(212) 686-6945. **Circle 239**

Start with the BEST!



CONTROLLER 34/36

- A complete line of integrated financial and distribution related products — quality assured by the high standards of our technical support staff.
- Easy to use, install and modify — over 1000 packages sold and supported by our nationwide distributor network.
- Easily integrated with your industry specific software.

JOIN OUR GROWING DISTRIBUTION NETWORK

- Professional education and training program for distributor and customer.
- All national leads passed on to distributors.
- Generous dealer discount schedule.
- Professional marketing and advertising materials.
- Ongoing national advertising campaign.

Harris Business Financials
IBM System 34/36

ISN
INTERNATIONAL SOFTWARE NETWORK, INC.

P.O. BOX 13648 • MILWAUKEE, WI • 53213

CIRCLE 66

CEMT COMMANDS

FROM BATCH JOB STREAMS

\$495 — FREE 30 DAY TRIAL

OPEN OR CLOSE FILES

START OR STOP DL-1

SEND MESSAGES TO CRTS

WORKS ACROSS MACHINES

MacKinney Systems

(417) 833-9553

CIRCLE 67

COMMUNICATION SOFTWARE

Sharp APL/PCX software for the IBM PC XT/370 provides micro-to-mainframe communications. Price: \$2,500. The package, which operates under PC-DOS, includes the Sharp APL interpreter, session manager, file system, shared variable processor, three auxiliary processors, and utility software.

I.P. Sharp Associates Inc., 1200 First Federal Plaza, Rochester, NY 14614.
(716) 546-7270. **Circle 240**

UTILITY PROGRAM

Research, a program for the IBM PC and PC XT, helps users graph, study, and forecast changing data. Graphics, statistics, database management, and file-transfer functions are accessed through the main menu. Price: \$695.

Research plots groups of data and prints changes, calculates means and medians, helps users create and add to databases, and reads and writes DIF files. Research requires 192 Kbytes of memory, two double-sided drives or one double-sided drive and a fixed disk, and DOS 2.0.

Economic Software Inc., P.O. Box 10925, Eugene, OR 97440.
(503) 485-6599. **Circle 241**

MULTI-USER SYSTEM

The AM-680 series ELS supports from one to three users. It runs the MS-DOS operating system, and AMOS, Alpha Micro's proprietary multi-user operating system. Prices: \$6,870 for the ELS with a monochrome monitor and \$7,340 with a color monitor. Standard configurations include a 10-Mbyte hard-disk drive, a 360-Kbyte floppy-disk drive, 128-Kbyte memory on AMOS, and 256-

Kbyte memory for MS-DOS. Hard-disk partitioning and file transfer for AMOS and MS-DOS are featured.

Alpha Micro 17332 Von Karman Ave., Irvine, CA 92714.
(714) 957-8500. **Circle 242**

INTEGRATED APPLICATIONS

Multisolver integrates database management, word processing, spreadsheets, general ledger, mailing lists/form letters, checkbook management, budget management, graphics, and invoicing for the IBM PC XT, Compaq, and Columbia personal computers. Price: \$295. The program writes application programs and copies them onto the user's diskette; applications can be tailored to specific requirements.

Software Technology for Computers Inc., 153 California St., Newton, MA 02158.
(617) 244-2590. **Circle 243**

THE IMPERSONATOR: FLEXIBILITY IN COMMUNICATIONS.



The most adaptable asynchronous communications tool and terminal emulator written. Built-in communications language allows you to modify the emulations provided or custom design your own. For IBM PC/PC-XT, PC-AT and compatibles. **Pre-configured emulations for:** ADM-3A, VT52 & VT100, IBM 3101 (Model 10 & 20), Hazeltine Esprit, Televideo 912 & 950, Teletype, Dasher D 210. **Features:** XMODEM protocol, captures and transmits files, 60 help screens, 9600 Baud w/o data loss and easy to use.  **Direct-aid**

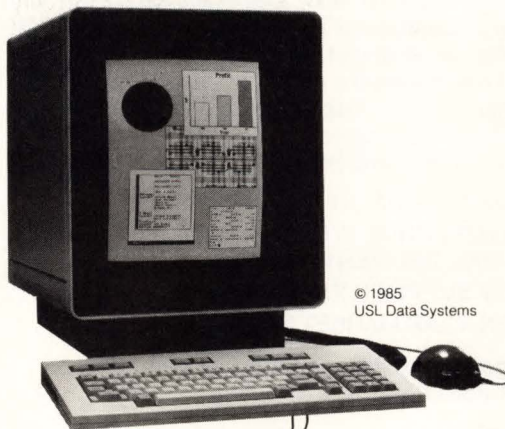
**FOR MORE INFORMATION
CALL 1 800 443 8080**

Also available at participating ComputerLands.

Direct Aid P.O. Box 4420 Boulder, CO 80306 (303) 442-8080

CIRCLE 68

RENT AT&T'S REVOLUTIONARY TELETYPE 5620



© 1985
USL Data Systems

Rent AT&T's Teletype 5620 intelligent terminal from USL Data Systems and get a high resolution dot-mapped screen for complete graphics, plus a unique "window capability" for multiple

sessions under UNIX.

Call us today for the office nearest you.

USL Data Systems

US

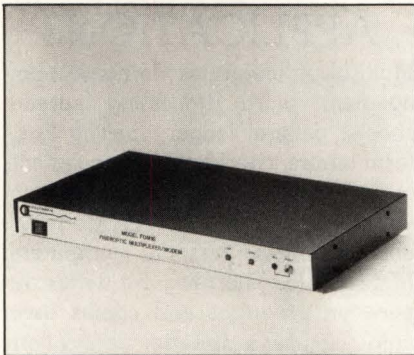
A U.S. Leasing Company

2988 Campus Drive
San Mateo, CA 94403
800/227-6884
415/572-6600 (in California)

Nobody offers more.

CIRCLE 69

FIBEROPTIC MODEM



The Model FOM16 Fiberoptic Multiplexer/Modem is a 16-channel, full-duplex, RS-232 unit. It transmits data up to 19.2 Kbps at distances up to two miles, transmitting and receiv-

ing synchronous and asynchronous data. Price: \$1,900. It has a continuous latch/monitor of link security and transmission integrity, and a direct analog channel for voice communication.

Opto-Electronics Ltd., Unit 9, 2538 Speers Rd., Oakville, Ontario L6L 5K9.
(416)827-6214. Circle 223

SOFTWARE LINKS

Software products are now available to link Decnet local- and wide-area networks with IBM SNA networks. DDXF, a DISOSS document-exchange facility, allows Decnet network users to access final-form document

distribution and library services of an IBM System 370 host supported by DISOSS/370. Price: \$1,500. DHCF allows IBM host-controlled 3270 terminals in an SNA environment to access VAX computer systems in a Decnet network via the Decnet/SNA Gateway. Price: \$1,500. PrE, a printer emulator, lets suitably configured VAX or MicroVAX systems in a Decnet network receive printable data from IBM host-based applications. Price: \$1,000. MicroVMS routines, running under the MicroVMS operating system, include remote job entry, 3270 terminal emulation, application interface, and gateway network management. Prices: from \$10 to \$400.

Digital Equipment Corp., 146 Main St., Maynard, MA 01754.
(617) 897-5111. Circle 231

RESEARCH REPORT

COMPUTER-BASED ELECTRONIC MAIL

An in-depth research report that examines present and future of electronic mail market in terms of economics, standards development, and applications. Discusses terminal options and the different e-mail forms including traditional computer-based messaging systems, telex, facsimile, teletex, conferencing, and PC-to-PC data communications. Includes:

- ANALYSIS OF CURRENT CBMS OFFERINGS
- ALTERNATIVE TYPES OF NON-CBMS E-MAIL DELIVERY
- KEY SUPPLIER PROFILES
- TEN-YEAR MARKET FORECAST

190 pages; 21 exhibits; published January 1985; price \$1,850.00.

For free descriptive literature and a detailed table of contents, contact:

INTERNATIONAL RESOURCE DEVELOPMENT INC.

6 Prowitt Street
Norwalk, CT 06855 U.S.A.
(203) 866-7800
WU Telex 64-3452



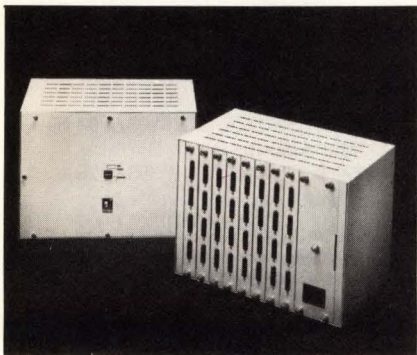
Can't remember
which issue ran
that great feature
you want to
refer to now?

Don't despair . . . just circle the appropriate number on the Reader Service Card at the back of this issue and we'll send you a Computer Decisions 1984 Editorial Index—**FREE.**

CIRCLE 71

PRODUCTS / DATA COMM

DATA SWITCHING



The Alswitch Series 170, a data-switching system for mini, micro, and mainframe computer users, features host-port selection, port contention, dual configurations, auto-connect

ports, speed compensation, host security, a non-blocking design, and tandem operation. A 16-port Alswitch sells for \$5,550, a 32-port system for \$7,150. Alswitch provides up to 256 ports, each running at speeds up to 19,200 bps. An asynchronous interface using EIA RS-232C provides compatibility with computer ports and terminals.

Applied Innovation, 2764 Sawbury Blvd., Columbus, OH 43085.
(614)764-2400. Circle 232

3690 communications-processor systems. Price: \$4,450. The integrated 29-Mbyte hard-disk drive can be installed into any Comten Series 3690 communications processor running under the Comten COS2/90 communications operating system. **NCR Comten Inc.**, 2700 Snelling Ave. N., St. Paul, MN 55113.
(612) 638-7777. Circle 233

Express enhancements: Both cpu use and memory-paging requirements have been slashed in Express, the database management system from Management Decision Systems (Waltham, MA). Price: \$85,000. Improvements include full-screen data entry and editing, and integrated forecasting. Circle 234

INTEGRATED DISK

The Comten Model T-7362 disk drive stores system-software load modules and memory dumps in Comten Series

RENT, LEASE OR BUY THE DATA PRODUCTS YOU WANT

Whether you want to rent, lease or buy, we have the financing options to fit your needs. We also stock a broad inventory of products so you can have exactly the equipment you need without waiting. And we back up every shipment with product support, including maintenance and prompt follow-up on any problems or questions.

If this sounds like the kind of service you want, call us today for the office nearest you.

USL Data Systems

US

A U.S. Leasing Company

2988 Campus Drive
San Mateo, CA 94403
800/227-6884
415/572-6600
(in California)

© 1985 USL Data Systems

Nobody offers more.

PROTECTIVE COVERS

Use a clear 1/8" thick plastic cover to protect your CPU, DISK DRIVES AND KEYBOARDS from accidental input or shutdown.



DATACOVERS are available for immediate shipment for the following systems:

- IBM 3370 & 3375 DISK DRIVES — \$15.00
- IBM 5381 CONSOLE — \$17.00
- IBM 4331 & 4341 CONSOLE — \$15.00
- IBM 4300 SIDE SWITCH — \$15.00
- IBM SYSTEM 38 CONSOLE KEYBOARD — \$15.00
- IBM 5251 & 5291 KEYBOARD — \$15.00
- IBM 3880 CONTROLLER — \$19.00
- IBM 3350 & 3340 DISK DRIVE — \$15.00
- IBM 3274 CONTROLLER — \$17.00
- IBM PC TO 5251 EMULATION KEYTABS — \$7.95
- IBM 4381 COMPUTER — \$22.00
- STC 3670 MAG TAPE DRIVE — \$15.00



Special COVERS made on request.

Call or write:
Dept. R

3657 HiDale • Lake Orion, MI 48035
(313) 362-4013

CIRCLE 72

CIRCLE 73

ADVERTISER INDEX

Abbott, Langer & Assoc.	136	International Resource Development Corp.	154
ADR	1	International Software Network, Inc.	152
Amdek	7	ITT Courier	14-15
American Hoechst Corp.	Cover 3	Keyword Office Technologies, Inc.	101
Ashton-Tate	73	Leading Software Technologies Corp.	87
AT&T Information Systems/Data Products	131	Lear Siegler, Inc.	37
AT&T Information Systems/Unix	8-9	Liebert Corp.	80-81
Berol USA	147	3M Co.-Interactive Systems	109
BTI Computer Systems	29	MacKinney Systems	149, 152
Cambridge Systems Group	6	M/A-Com Linkabit, Inc.	112
Compaq Computer Corp.	13	Mannesmann Tally	127
Compuserve	107	The Market Information Center, Inc.	151
Concord Data Systems	57	NEC Telephones, Inc.	105
CPT Corp.	59	Northern Telecom, Inc.	54-55
Datacover, Inc.	155	Oberon International	95
Datasouth Computer Corp.	125	Personal Computing	161-162
Decision Data Computer Corp.	33	Pilot Executive Software	27
Digital Equipment Corp./Corp. Mktg. Svce.	2-3	Precision Visuals, Inc.	51
Direct Aid, Inc.	153	QMS Inc. (Quality MicroSystems, Inc.) ..	97
Dow Jones Software	38-39	Qume Corp., CRT Div.	Cover 2
DunsPlus	19	Racal-Milgo	60-61
Emerson Electric Co.	65	Simware, Inc.	17
Equinox Systems	10	Software AG	44-45
Gandalf Data, Inc.	53	Software International	5
Gartner Group	144	SPSS, Inc.	11
Genicom Corp.	119	Tektronix/I.D.G.	122-123
*Graham Magnetics, Inc.	66	TeleVideo Systems, Inc./Terminals ...	25
Group Operations, Inc.	143	Texas Instruments	121
Hayden Book Co.	137-142	Triangle Software Co.	47
Hayden Direct Marketing	132-133	Uccel Corp./SSD	Cover 4
Hayden Software	110-111	USL Data Systems ..	149, 151, 153, 155
Honeywell Information Systems ...	30-31	VM Software, Inc.	43
IBM-ISC/Workstations	34-35	Wang Domestic	21-23
Ilar Systems, Inc.	144		
Information Builders, Inc.	85		
Informer	88-89		
Innovation Data Processing	150		
InteCom, Inc.	102-103		
Integral Systems	49		

*Regional Ad

ADVERTISING OFFICES

Sales Representatives

Advertising Sales Director

Nick Bubany, 10 Mulholland Drive
Hasbrouck Hts., NJ 07604, (201) 393-6012

Sales Support Manager

Emily Ruffing, (201) 393-6023

Eastern Regional Sales Manager

Lori Lippin

(212) 245-6087, (201) 393-6024

Connecticut: Janice Healy,

(203) 938-9818, (201) 393-6025

Pennsylvania: Beth Haggerty,

(215) 295-1992, (201) 393-6007

New Jersey: Cynthia Peyton

(914) 352-0726, (201) 393-6007

Mid-Atlantic: Bonnie Breslauer

(703) 379-0346, (201) 393-6025

Southeast: Elizabeth Medley

(404) 233-6316, (201) 393-6007

Northeastern Regional Sales Manager

Chris Dobbrow

(617) 358-4147, (201) 393-6021

Molly Ryan, (617) 443-4303,

(201) 393-6021

Midwestern Regional Sales Manager

Richard Julius

(312) 337-0588, (201) 393-6007

Mark Hickey, (312) 446-6893,

(201) 393-6025

Texas/Southwest: Deborah Goldsmith

(214) 669-1161, (201) 393-6024

Western Regional Sales Manager

Virginia Pohlman

(415) 332-3075, (201) 393-6025

San Francisco: Heidi Spencer

(415) 788-5119; (201) 393-6022

Cherie LaFrance, (408) 475-6752,

(201) 393-6022

Los Angeles/Northwest: Denise Sinnott

(818) 289-5425, (201) 393-6007

Orange County/Southwest

Kathleen Kosanovich,

(213) 433-3545, (201) 393-6022

Jay Leech, (714) 492-1641,

(201) 393-6024

Tokyo: Haruki Hirayama, EMS, Inc.

Cable: EMSINCPERIOD, Tokyo

Direct Action Cards/Recruitment/

Quick Ads

Frank Marino, (201) 393-6028

Helen Ryan, (201) 393-6027

Publication Staff

Promotion Director

Rayna Gillman

Production Manager

Craig Balick

Circulation Director

Barbara Freundlich

Associate Production Manager

Richard Macnamara

Promotion Copywriter

Roger A. Shapiro

Production Assistant

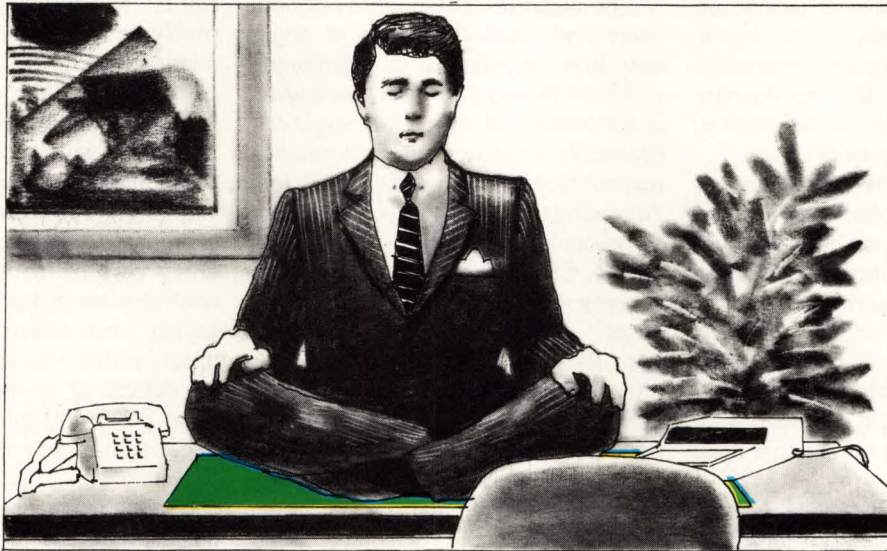
Frances Nelson

Fulfillment Manager

Cindy Stump

YOUR CAREER

by Mary Miles, New England Editor



GETTING YOUR DANDER DOWN

Lord Clarendon may have been right when he said that anger is the "most impotent of passions . . . [it] hurts the one who is possessed by it more than the one against whom it is directed," but that sage advice is almost as easily lost as your temper.

Although anger is a natural response to the frustrations everyone experiences day in and day out, during the hours from nine to five, managers and subordinates alike must quell their fury or risk exposing the most human, least professional side of themselves to their colleagues. After all, in some milieus, nothing could be more daunting than having your coworkers and subordinates see you lose control. Equally damaging, however, can be the suppression of anger, especially if it results in a case of ulcers, high blood pressure, colitis, or migraine headaches. Says Marilyn Machlowitz in her book *Inside Moves* (Careertrack Publications, 1984): "Either you'll harbor those feelings until you feel depressed, or you'll

save them up until you explode in a fit of temper." You lose both ways.

But no one really has to lose. Nor does the human condition doom everyone to a choice between tantrums or illness. In *Rogers' Rules for Success* (St. Martin's/Marek, 1984), Henry C. Rogers writes that getting angry need not be synonymous with losing control. "Many a promising executive has been shot down by an inability to handle anger," writes Rogers. Besides being a serious impediment to effective problem-solving, he adds, mishandled anger can also "alienate you from those you need as allies to get the job done."

There are healthy, constructive ways to deal with irritating people or frustrating situations just as there are strategies to deflect other people's anger. In *The Managerial Woman* (Pocket Books, 1977), Margaret Hennig and Anne Jardim suggest that isolating a causal pattern is a first step in managing anger, both your own and

that of your subordinates: "Is there a pattern in terms of time? In terms of the people involved? Did it tend to happen when you were criticized? Challenged? When you felt left out?" According to these authors, identifying the most likely source of your ire will prepare you to deal with similar situations of provocation more effectively in the future.

One lesson to be learned from Hennig and Jardim's analysis is that rather than identifying irksome repetitions, people allow themselves to fall prey to and be surprised by the same situation time and again, and that in itself causes them to become angry—not only at the ostensible irritant, but at themselves as well. However, in the workplace, says Robert D. Hertz, a psychoanalyst who specializes in work therapy, it should come as no surprise to most managers that their subordinates feel considerable anger toward "the system," which they believe is rigid and constrictive, or is responsible for

poor working conditions, low pay, insecurity in the job, or frustration of life goals. Typical nonspecific complaints, such as "No one understands me," or "Why doesn't anyone ever listen to me?" or "They're always picking on me!" or "Nobody really cares," are all expressions of legitimate frustration and anger despite the fact that they are not said in direct response to rebukes, insults, or antagonism from others.

Similarly, managers will feel anger when they perceive that they are in a bind. "You may feel you have nowhere to turn, that your chances of being productive are being thwarted, or that the kind of support you need from subordinates or superiors to meet your goals is just not there," says Hertz. "If you constantly feel out of touch and out of control, frustration and intense anger build up."

In the confines of the office, managers and subordinates release these feelings both overtly and through passive aggression. "Both kinds of anger sabotage the workplace," says Hertz, "but passive aggression is more insidious. Because overt anger is visible, it may be easier for managers to deal with. You can discuss issues with a subordinate who expresses his or her dislike. But today the prevailing attitude says you have to be nice and you must be liked. Open expressions of anger, therefore, are unacceptable. Subordinates may smile, but they may not complete their work on time or listen carefully—and no one is aware that it may be anger that's at the bottom of constant screw-ups."

Will you be sharp enough to realize that behind a subordinate's composed demeanor lurks discontent? Will you be able to enlighten or chastise a staffer who doesn't realize that repressed anger may be the cause of his or her habitual foul-ups? As Hertz notes, as difficult as it is to criticize an agreeable subordinate, a frank discussion may help reveal and solve some problems.

Group counseling, lunchtime seminars on stress management, or a recommendation for individual therapy are other approaches managers can take to help troubled staffers.

The negative consequences of both overt and passive displays of anger vary from organization to organization and from project to project, but a widely acknowledged truth is that anger can drastically affect workers' performance and concentration in positive ways, too. According to Thomas Tutko, professor of psychology at San Jose State University, San Jose, CA, managers and subordinates can learn to use their anger constructively rather than destructively. Inappropriate behavior often becomes a habitual response to unpleasant situations, observes Tutko. "The cycle starts when you lose your cool, regret it, apologize, and then feel upset and guilty that you've done something wrong," says Tutko. "If you can break this vicious cycle, you can become more productive."

Tutko, who teaches athletes how to turn rage into motivation and concentration, suggests that one way managers and their subordinates can redirect their anger is by identifying its causes, recording them in writing or on tape, and then mentally rehearsing more rational, constructive approaches to the anger-provoking situations.

Marilyn Machlowitz offers managers another strategy for dealing with their own anger. She advises them to describe an irritating situation in three parts: "In the first part, tell the person exactly what the situation is. Second, indicate how that situation makes you feel. Third, present the consequences of those feelings in such a way that the other person sees the payoff or penalty." For example, you might say, "Fran, when you interrupt me, I feel like a jerk. And it weakens our presentation, makes it seem unplanned. We can do better." This kind of statement allows you to sound off a bit, but does-

n't degrade or humiliate the other person.

In dealing with angry subordinates, Tutko advises managers to listen carefully. In such situations, he says, asking staffers to offer their own solutions to problems is a smart strategy. Open-mindedness rather than retaliation, mediation rather than defensiveness, will help managers defuse their own anger and that of their subordinates.

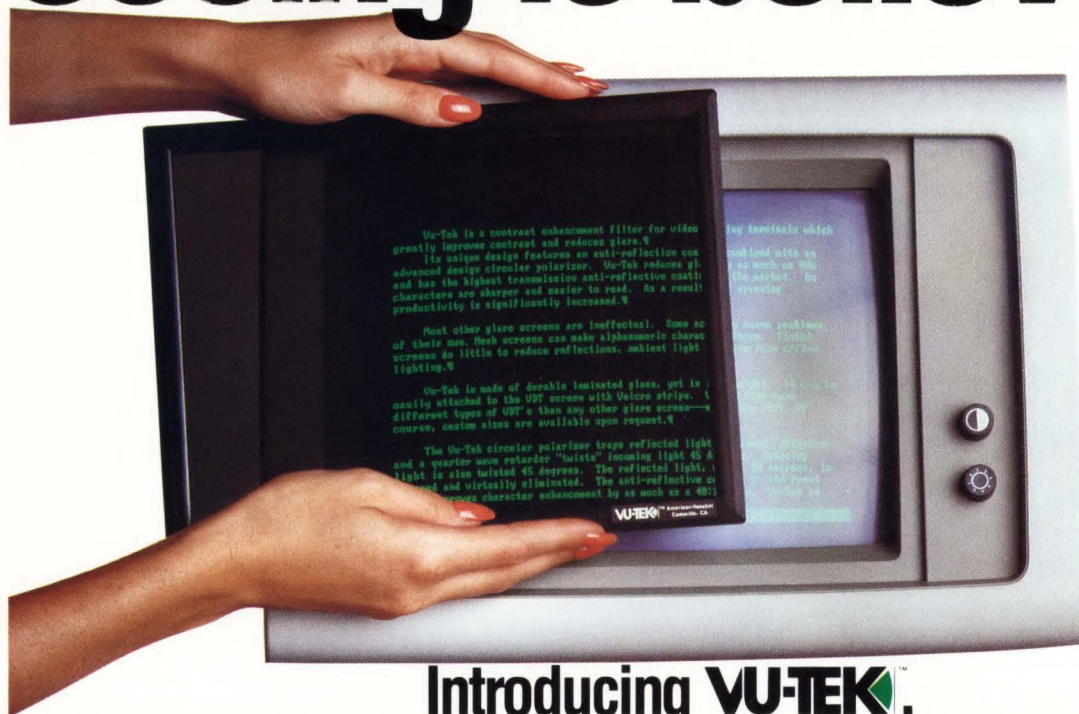
Another effective way of dealing with anger directed at you has its basis in empathy. "If you can identify with an angry person," says Tutko, "you can neutralize his or her anger quickly. By saying 'I can understand why you are upset,' rather than attacking the person or defending yourself, you put the other person off-guard and reduce the anger and anxiety of both of you."

Acting with empathy and rationality will move you two steps closer to the golden mean, but are there times when you can legitimately blow your stack? According to Tutko, the overt expression of anger is appropriate under some circumstances, such as when a subordinate endangers a project or even coworkers because he or she hasn't followed directions. "Even when you are being attacked and the other person really doesn't have anything to offer, it's better to confront than clobber," he says.

There are, however, times when you can let your subordinates have it. After all, it's your job to direct them in the right way of accomplishing their jobs. "You can vent what is known as 'clean anger,'" says Robert Hertz. "If it fits the situation, and you handle it well, the results will be positive. The style of management by tantrum no longer makes sense. Today there's more concern for workers' rights and feelings—a sense of responsibility not only to the firm, but to other human beings. Instead of demeaning those who have done wrong, tell them why you're angry, then let go of the anger and work toward a solution." This philosophy may call for redefinition of goals and directions; it may mean getting rid of a habitual blunderer; or it may mean starting a project all over again. But it will help managers move toward goals rather than them being stuck in emotion. □

Managers must quell their fury or risk exposing the least professional side of themselves to their colleagues.

Seeing is believing.



Introducing VU-TEK™.

No other glare screen does more to increase productivity.

A glaring problem VDT operators face.

More than 90% of all employees who regularly use VDT's may suffer from eyestrain.* And that can make your business suffer, too.

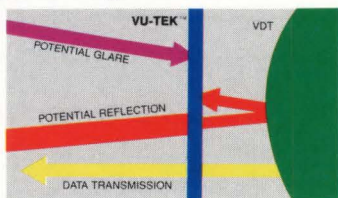
The cause of eyestrain? Glare. Reflection from office lights. And hard to read characters.

The result. Impaired vision. Headaches. Fatigue. More work breaks and absenteeism.

And reduced office productivity.

VU-TEK™ reduces glare up to 99%.

VU-TEK contrast enhancement filters help increase operator productivity by eliminating up to 99% of reflected VDT glare while also improving character clarity. VDT operators can now work more efficiently and comfortably.



VU-TEK's dramatic effectiveness is due to an advanced circular polarizer that traps glare preventing it from reaching the VDT operator's eyes.

No other glare screen is more effective than VU-TEK.

VU-TEK increases character legibility.

VU-TEK uses a special distortion-free anti-reflective coating on the front glass surface to improve character contrast and clarity.

The result...bright, clear, easy to read VDT's.

Fits leading VDT's. Easy to install.

VU-TEK fits more than 800 different VDT types. Custom sizes are also available.

VU-TEK is lightweight, durable and attaches in seconds.



"See for yourself" free trial.

End the glaring problem with computer automation — with VU-TEK.

To order your VU-TEK or arrange a 30 day free trial, call collect 1-805-987-5026. Or mail the attached coupon for more information.

VU-TEK is the result of research by American Hoechst, a member of the Hoechst Group of companies, with worldwide sales of \$14.5 billion, and annual research expenditures of over \$630 million.

*National Institute For Occupational Safety and Health Study, August 1981.

American Hoechst Corporation
Specialty Film Products

CIRCLE 35

VU-TEK™ The difference is clear.

© American Hoechst Corporation, 1984.

For additional information on VU-TEK™ contrast enhancement filters mail to:
American Hoechst Corporation
Dept., 805 Via Alondra, Camarillo, CA 93010
Name _____
Company _____
Street _____
City, State _____
Zip _____
Phone () _____

WHEN YOU WARE THESE HOT NUMBERS BY UCCEL, SUCCESS IS AUTOMATIC.



AUTOMATE YOUR PRODUCTION WORKFLOW WITH UCC-7 AND UCC-11, AND YOUR DATA CENTER ALMOST RUNS ITSELF.

UCC-7 with UCC-11 is the most advanced real time production control system on the market. As a totally integrated system, it is designed to address all areas of production control and run within the IBM MVS/PCM environment.

By itself, UCC-7 is a superior production workflow management system that provides efficient scheduling, smoother workflow,

greatly reduced personnel budgets and real time immediacy. Add to that the comprehensive job tracking and restart capabilities of UCC-11, and you have the most advanced production control system on the market. To further ensure your automatic success, UCCEL has created RPT (Report Processing and Tracking), a UCC-7 subsystem designed to route, distribute and ar-

chive your output. And for larger companies, UCCEL offers NCF (Network Communications Facility), a subsystem designed to extend the capabilities of UCC-7 to remote locations.

To find out more about the hot numbers by UCCEL, call UCCEL today at 1-800-527-5012. Automatic success may be just a phone call away.

FORMERLY UCC • UNIVERSITY COMPUTING COMPANY • UCCEL Corporation, UCCEL Tower,
Exchange Park, Dallas, Texas 75235 UCCEL is a servicemark of UCCEL Corporation 1-800-527-5012

UCCEL
Systems software
that makes you
look good.