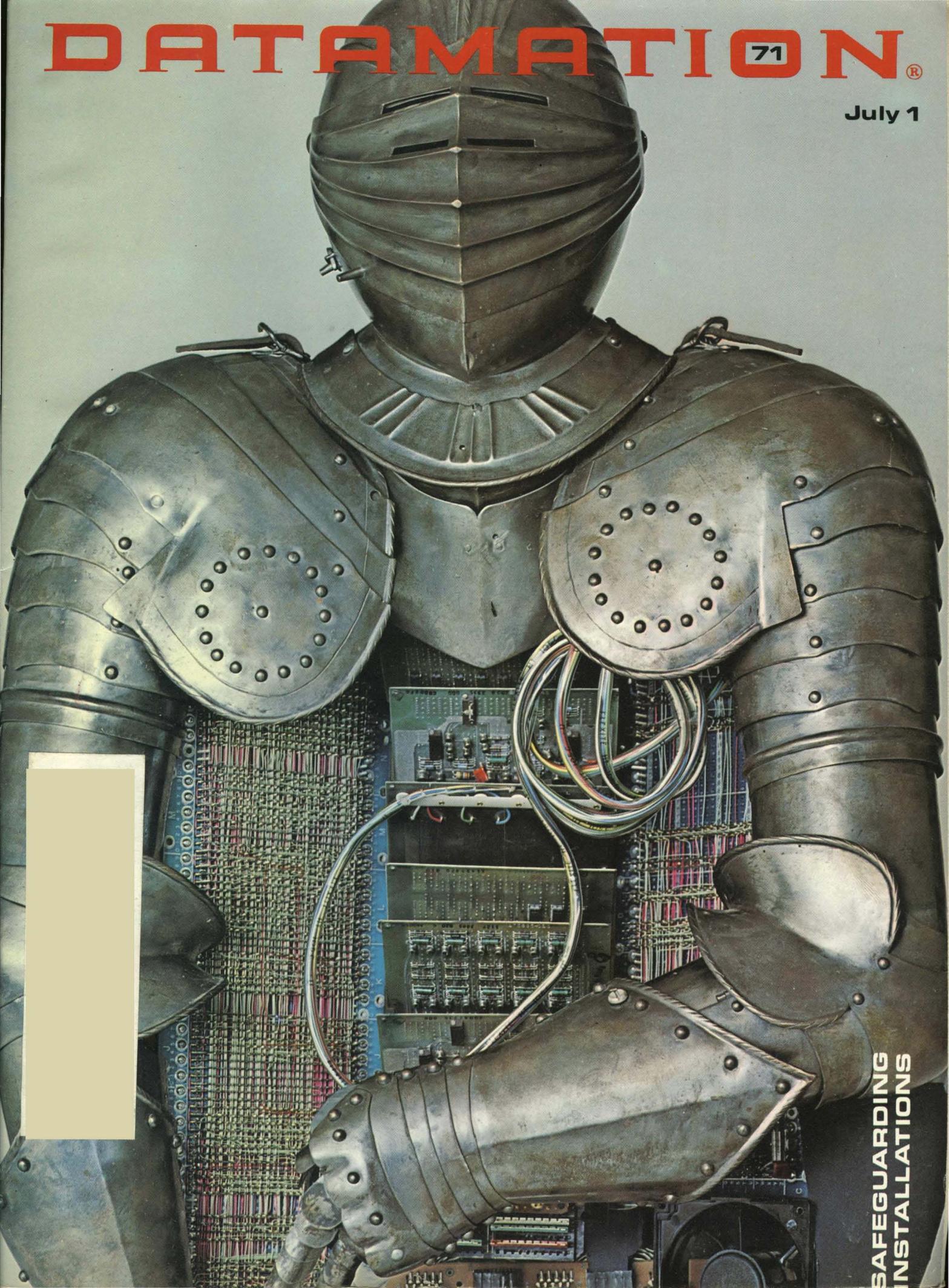
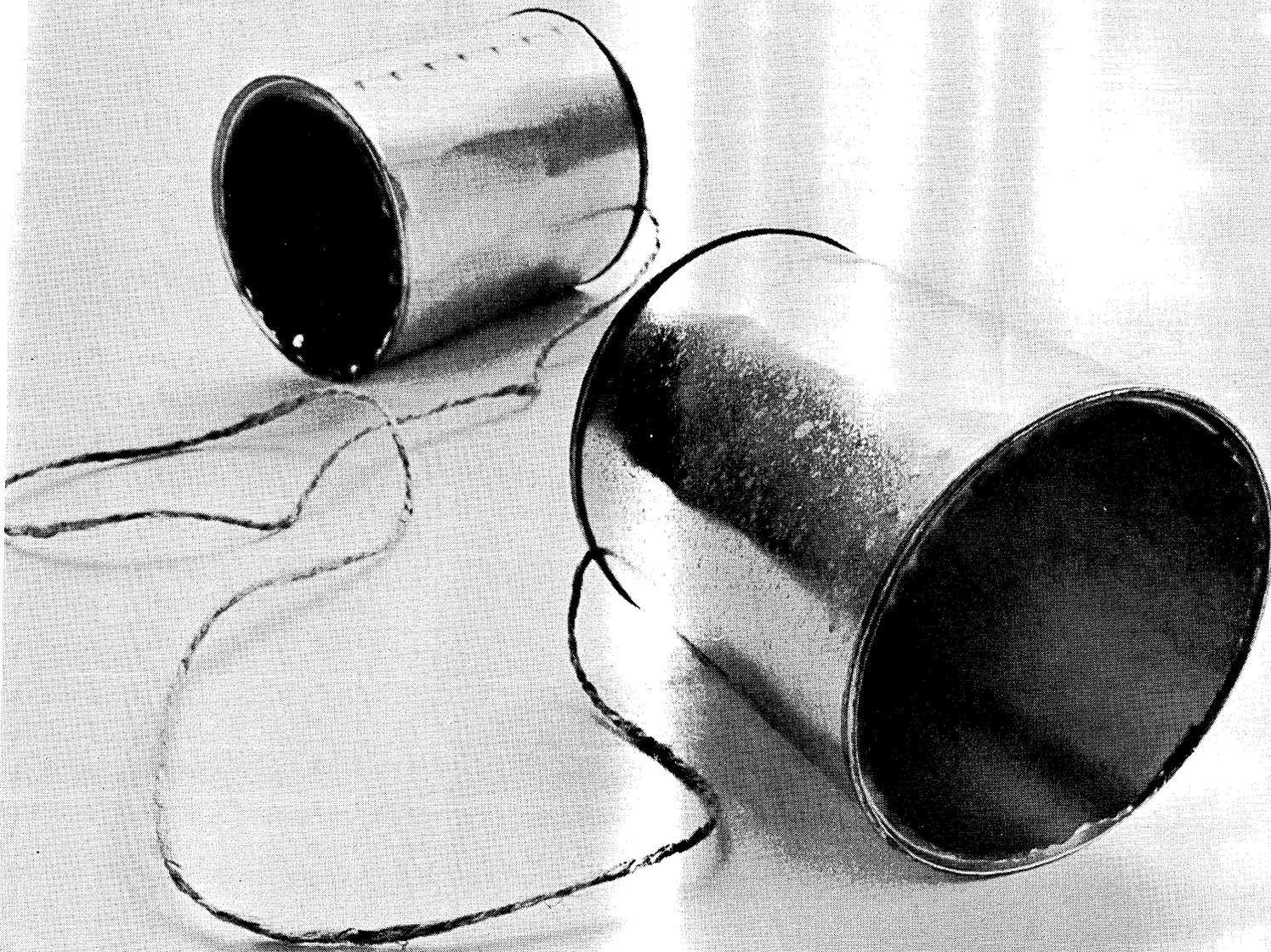


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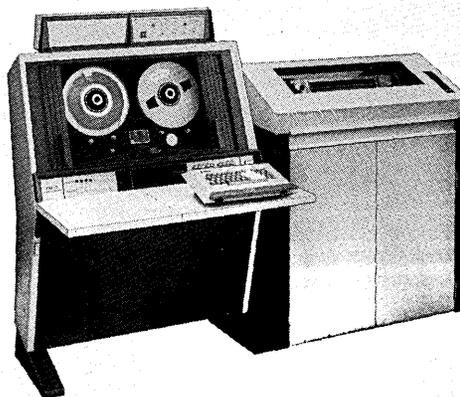


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JULY 1, 1971
volume 17 number 13

MANAGEMENT

30 A Contingency Plan for Catastrophe

D. VAN TASSEL. By definition disasters are unplanned and, perhaps, ultimately unavoidable. But contingency plans can lessen the impact on your computer installation.

GENERAL

34 Physical Security... Facts and Fancies

JOHN WESSLER, EDITH MYERS, and W. DAVID GARDNER. Everyone's for a secure computer installation... until it's time to check the price tag. Here's a look at what a half dozen major users have actually done to safeguard their edp centers.

44 The Rise and Fall of Viatron — Part II

W. DAVID GARDNER. The Viatron story remained consistent to the end — interesting and bizarre.

COMMENTARY

52 Perspective

Frank Marchuk's widely talked of laser computer has been described by one industry observer as the "ideal machine for the year 2000." A 10-trillion bitter, it sells at a bargain \$1.6 million. But where is it? No one who has seen it will talk; and a lot of experts say it can't be done outside of a lab. Marchuk says we'll all find out this month when he plans an "unveiling" in California.

About the Cover

Ross Van Dusen's sturdy knight jousts at no windmills — it's his vitals he guards. Managers apprised of real hazards should move to protect their own installations as effectively.

departments

<i>Calendar</i>	9
<i>Letters to the Editor</i>	13
<i>Look Ahead</i>	21
<i>Perspective</i>	52
<i>News Scene</i>	55
<i>Hardware</i>	62
<i>Software</i>	67
<i>World Roundup</i>	71
<i>People</i>	73
<i>Index to Advertisers</i>	74

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volume 17 number 13

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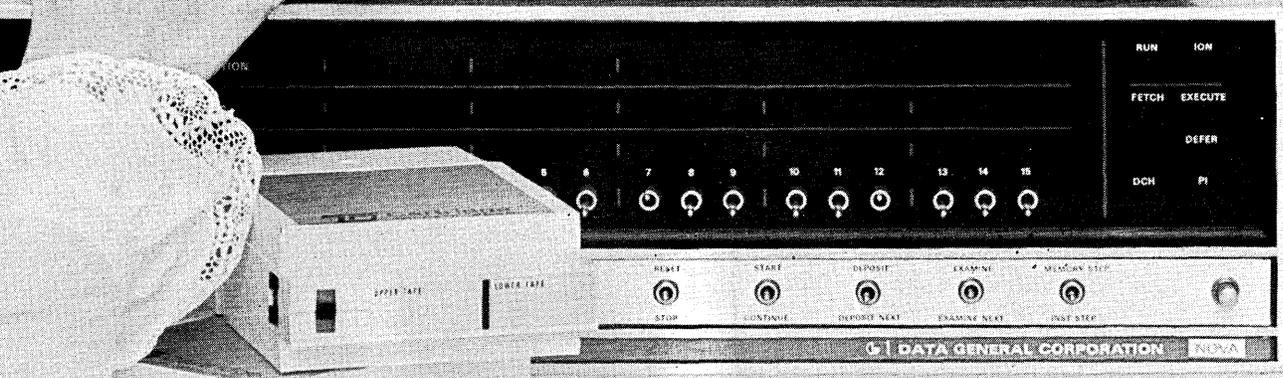
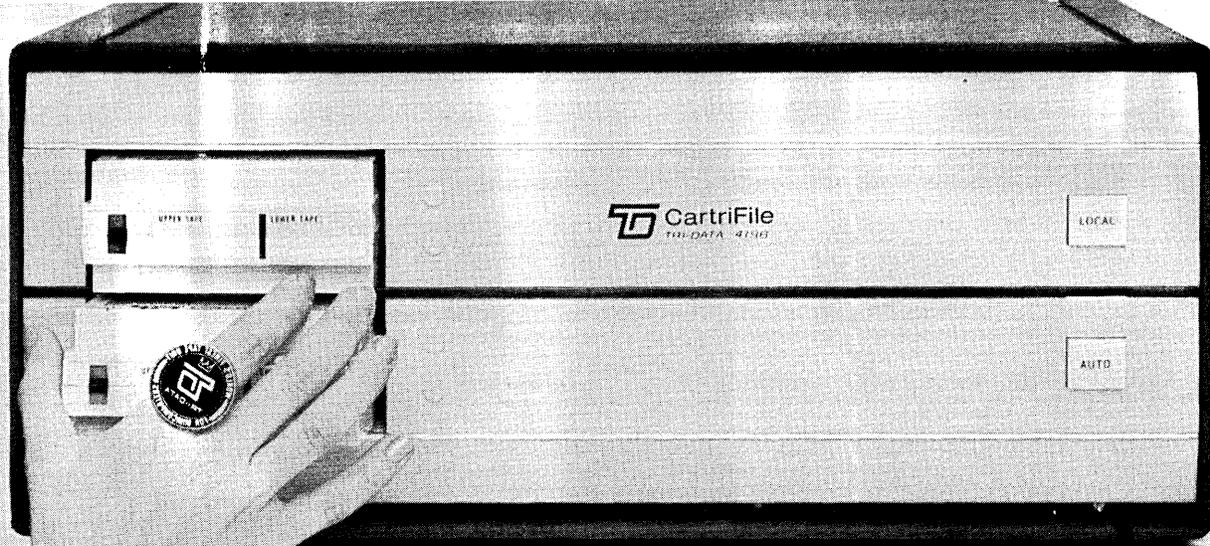
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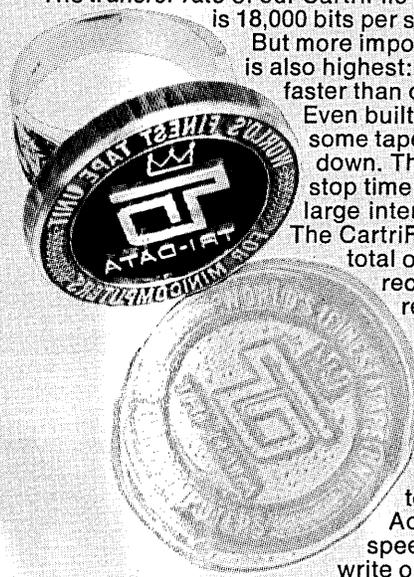
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A
CHANCE

LOSE
A
TURN

key again

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I-
FY

VAL-
ID-
ATE

Hire
extra
people

GO
BACK
3
SPACES

EDIT

PAY!

VERIFY AGAIN

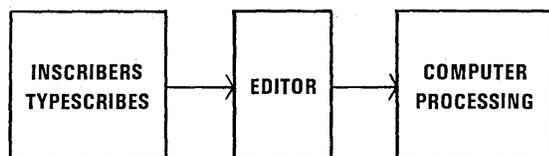
GO
BACK TO
GO

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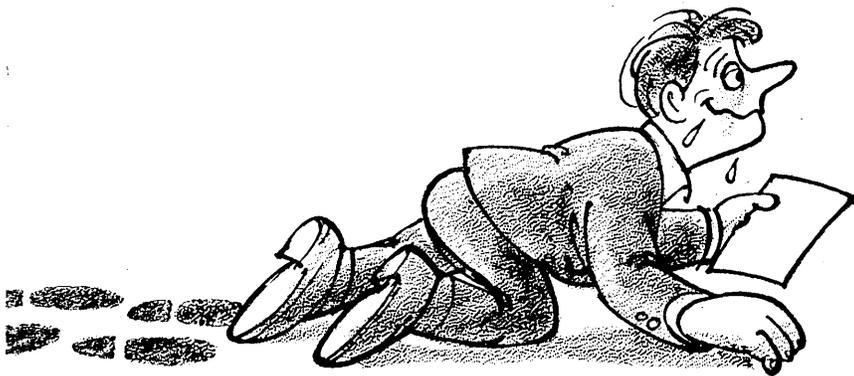
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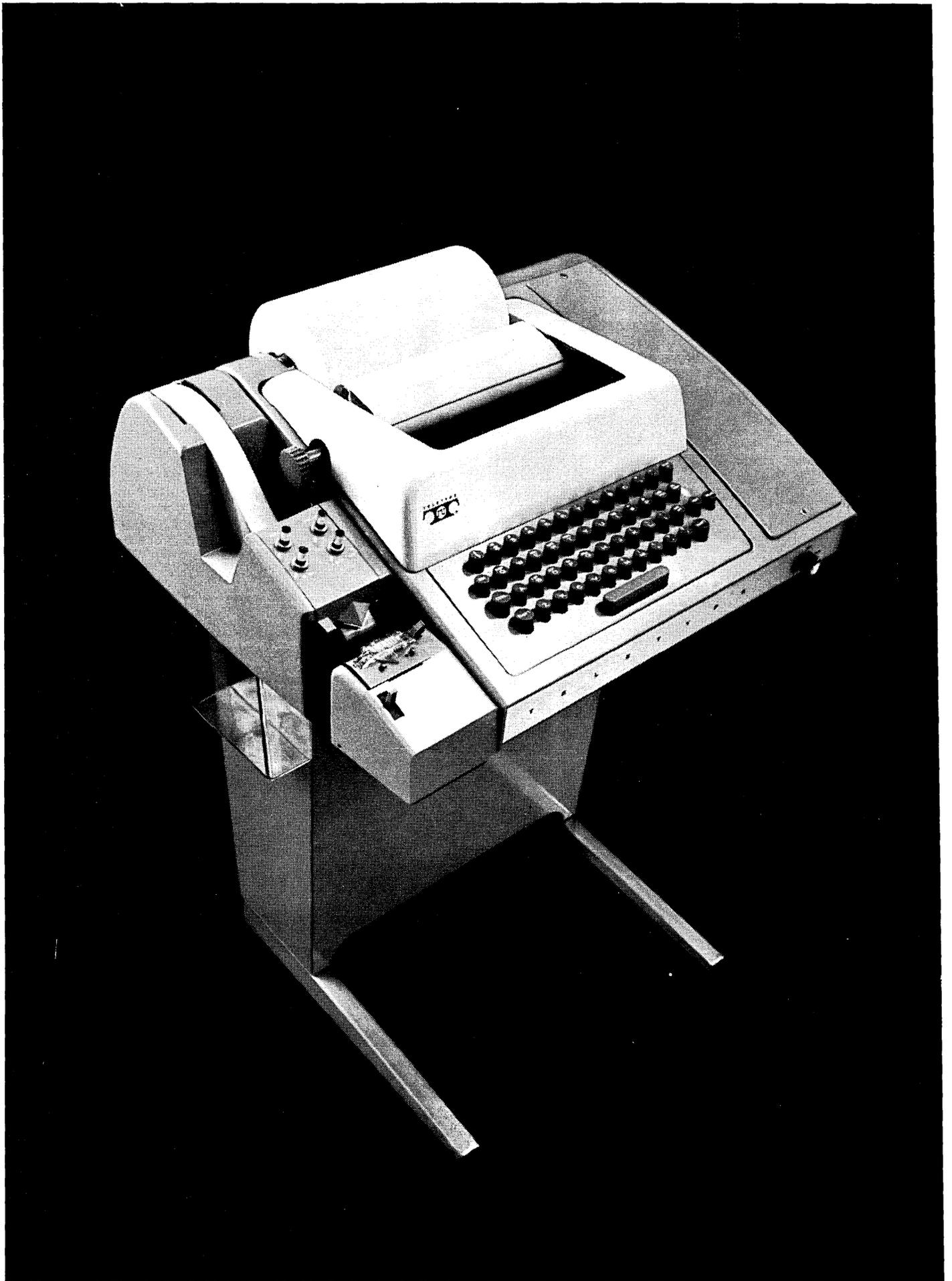
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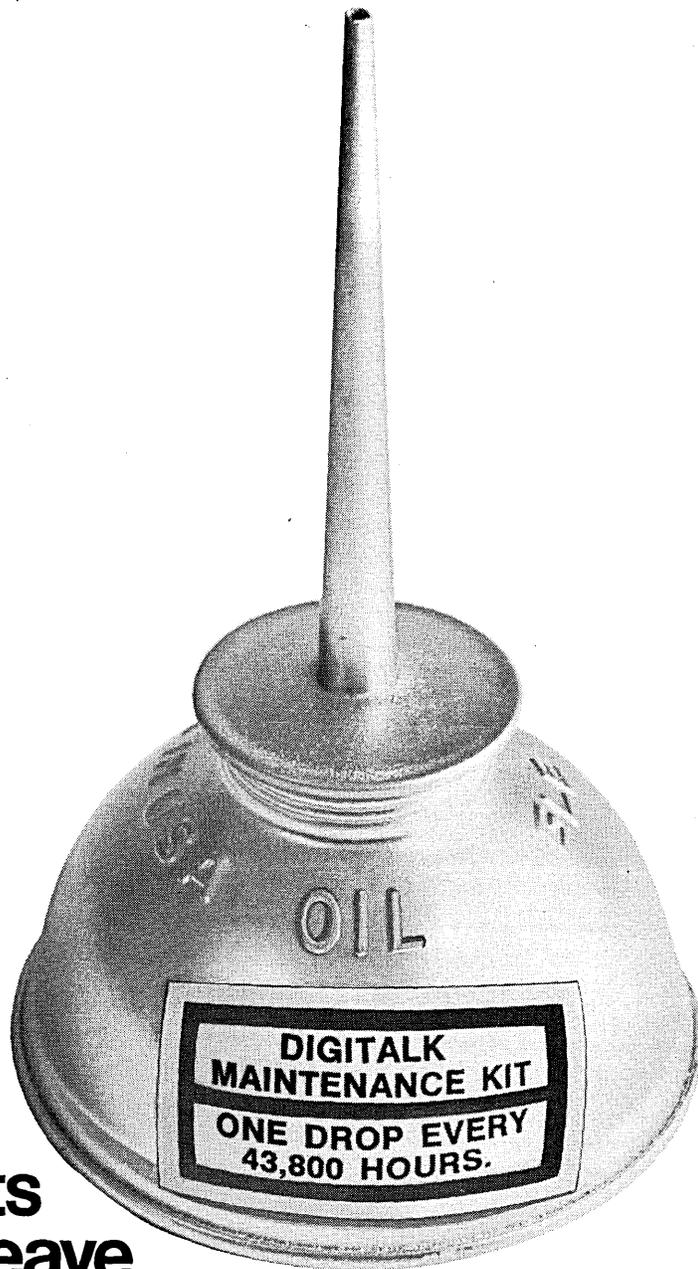
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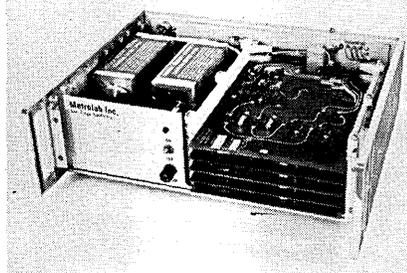
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LETTERS

TSO there!

Sir:

In your April 15 "Look Ahead" section (p. 19), you reported that IBM's TSO will be late and quoted a user as saying the problems of "unspectacularly slow performance" call for coding changes. It'll take more than coding changes. ADR had the equivalent of IBM's TSO system *operational* in its ROSCOE system in March 1969 and promptly removed it from ROSCOE. Since December 1969 when IBM first introduced TSO, we stated to IBM users that TSO would prove infeasible for the IBM 360. We now say it again. It may be that TSO will be feasible for the IBM 370 (that remains to be seen), but it'll never fly on a 360/50 or 65. A properly designed terminal system with facilities for editing, prompting, remote job entry, and terminal retrieval of output can do the job TSO would be expected to do, and it could do it with less core, less execution time, and without significant system degradation. We still believe that ADR's ROSCOE is a more realistic approach to a time-sharing terminal system for S/360 and /370 computers.

MARTIN A. GOETZ
Applied Data Research, Inc.
Princeton, New Jersey

Language barriers

Sir:

About two years ago, a joint GUIDE/SHARE Data Base Task Force (DBTF) was formed to detail the requirements that data base installations of the future would demand of an implementor of a data base management system. Although the requirements, initially outlined in the November 1970 report, are primarily directed at IBM, it is hoped that the approach described will be accepted by the entire industry.

Many of the requirements which IBM representatives responded favorably to included compatibility, extensibility, and data independence features. It is therefore hard to agree with your contention stated in "Look Ahead," April 15 (p. 19), that "IBM Doesn't Want to Speak the Language," when that is clearly not the case. In fact, one of the reasons the

DBTF was organized at GUIDE/SHARE was to provide a more universal set of requirements than the DBTG (CODASYL Data Base Task Group) 1969 report outlined.

If the DBTG report is fought by IBM, consider the possibility that IBM has good and sufficient reason for opposing it on objective grounds. For example, the "universal data description language independent of all processing languages" is defined only for the Schema level in the DBTG report, but the data description language at the sub-Schema (host language) level is most certainly processing language dependent as indicated in your blurb ("... report also contains COBOL language extensions for describing the data in a data base ...").

Before any set of specifications for a data base management system is accepted as an industry-wide standard, it should be subjected to the most careful scrutiny. IBM is not alone in critically examining the work of the DBTG. CODASYL, too, is carefully perusing the reports of its own DBTG and has apparently found them not completely adequate or it would have accepted and endorsed the report. Why say, then, that IBM has "contributed mightily to the delay" and not mention that the organization which spawned DBTG was the ultimate delayer, and rightly so?

Naturally, IBM wants installations to use its machines and wants to make it as difficult as possible for installations to defect. However, it is doubtful that by holding up a CODASYL DBTG report IBM will significantly advance its cause. By the way, will Univac's implementation of the DBTG proposal work on IBM machines? Why is IBM "investigating implementation of the DBTG specs" if it is so completely opposed (which I don't believe it is) to them?

The GUIDE/SHARE DBTF would like to continue its dialogue with the data base community and urges all those involved in data base work to read and comment in detail on the November 1970 report which is available in the GUIDE or SHARE Secretary Distribution dated circa January 1, 1971, or individual or batches of copies may be obtained for a nominal fee from the SHARE Secretary, Mrs. Jean

Johnson, SHARE Headquarters, Suite 750, 25 Broadway, New York, N.Y. 10004.

ALBERT C. PATTERSON IV
New York, New York

The GUIDE/SHARE report contains requirements, not specifications. To be helpful to the entire industry, we hope the user groups, once they've read the CODASYL DBTG report, will detail publicly where their wishes have not been fulfilled. Please see the related News Scene story in this issue, p. 58, for new developments and how to obtain a copy of the April 1971 DBTG report.

Fair play

Sir:

Your remarks regarding IBM's participation in the work of the CODASYL Data Base Task Group are not in my opinion a valid characterization of that participation.

My observation as HIS representative to the task group during the time in question was that the proposals for change submitted by IBM constituted a significant technical contribution to the DBTG report's content. Far from being merely a delaying tactic, the majority of these proposals consisted of necessary corrections to or clarifications of the original specifications. Significantly also, it was an IBM proposal which made the phrase "universal data description language independent of all processing languages" applicable in any true sense to the DBTG data description language. The October 1969 version of the report has a strong single-language orientation.

Fairness dictates that the IBM representatives to the DBTG be given full credit for their professionalism in working to ensure the integrity of the DBTG report.

SUZANNE C. KNAPP
Waltham, Massachusetts

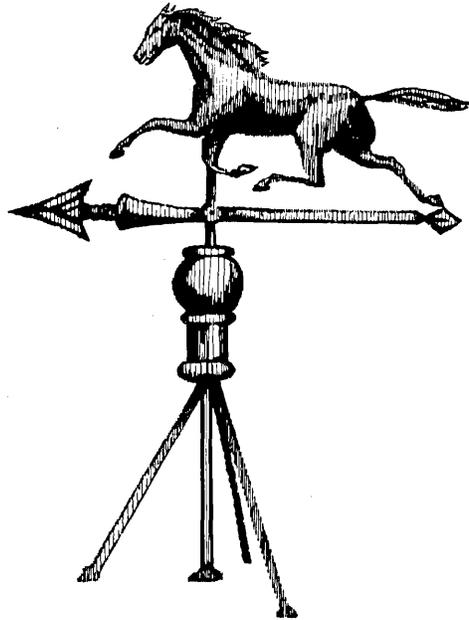
Figure it out

Sir:

In my article "Analysis of Common Carrier Rates" (May 1, p. 28) the instructions for using the nomograph in Fig. 2 are somewhat confusing due to an error of my own making. The instructions should read:

"The nomograph in Fig. 2 can be used for a rapid, reasonably accurate comparison of leased line versus dial-up costs. To use it, a straight line is drawn from the nearest higher rate-

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Letters . . .

step mileage (long tick-marks) on scale C to the point on scale A corresponding to monthly usage in hours. Where this line crosses scale B, the monthly dial-up cost is found. This cost can then be compared to the lease cost shown on scale C."

KARL I. NORDLING
Clearwater, Florida

Third rate

Sir:

I wish to point out an error in your May 1 issue (p. 30) re tariff rates: Table 4, Interstate Rates for Dial-up Service (Night), should read "Initial 1 min." rate instead of "Initial 3 min." rate.

G. W. LAFAVOR
Anaheim, California

Bootstraps

Sir:

I read with a great deal of interest the article, "Computing Signs Help Train the Deaf" (May 1, p. 36), by Fred Gruenberger and Robert Teague.

I am deaf myself, and have been so since age 3½. I received my early schooling in a school for the deaf and received my B.A. in physical sciences from Harvard Univ. I have been with System Development Corp., Santa Monica, since 1959 and presently hold the title of programming analyst, senior. I do not quarrel with the need and necessity for sign language and the development of signs for use in computing circles by deaf people.

But I certainly take issue with two statements made at the beginning of the article: "The total effort expended thus far for the deaf has been in the area of developing the language of signs . . ." "The use of written messages, or the teaching of lip-reading, is dependent upon communication by signs, which requires that each deaf person have the services of an individual interpreter most of the time."

Indeed! What about the efforts of schools, like the one I went to, to teach speech and lip-reading, without resort *at all* to sign language? And what about me and countless other deaf individuals who never had interpreter services? I grant that the Dr. Jones and the Mr. Kirchner mentioned in the article (with both of

whom I am acquainted) have opened opportunities for deaf people to obtain college training, but I do think they did the deaf people as a whole a serious injustice by allowing the article to be printed as it was with those two statements!

And the authors, I am sure, will be interested to know that San Fernando Valley State College itself has several teleprinters of the Teletype model 15/19 variety with which deaf people there may communicate over the telephone. The developer of the PHONETYPE acoustic coupler that makes all this possible is none other than R. H. Weitbrecht, a radio teletypewriter ham pioneer who is himself totally deaf and has a bachelor's and a master's in astronomy. Bob did all this without interpreter services. Our PHONETYPE network numbers in the 1300's now, nationwide, and is still growing.

The authors mightily slighted the abilities and the achievements of deaf people!

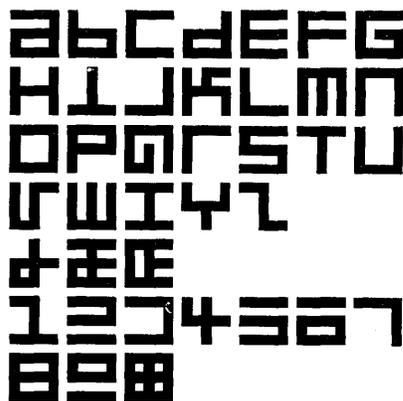
JOSEPH S. SLOTNICK
Marina del Rey, California

Buzz see

Sir:

The subject of man/machine interface seems to always be at a point just below the level where broad-based research is undertaken. Certainly the topic crops up from time to time but generally in the context of a "buzz word" to describe phenomena that fit in no other category.

The letter by Mr. David Ross in your May 1 issue (p. 15) with regard to a man/machine typeface struck a



responsive cord. I enclose a copy of a typeface known as Epp's which has been developed by Mr. Timothy Epp in conjunction with Dr. Chris Evans,

1971

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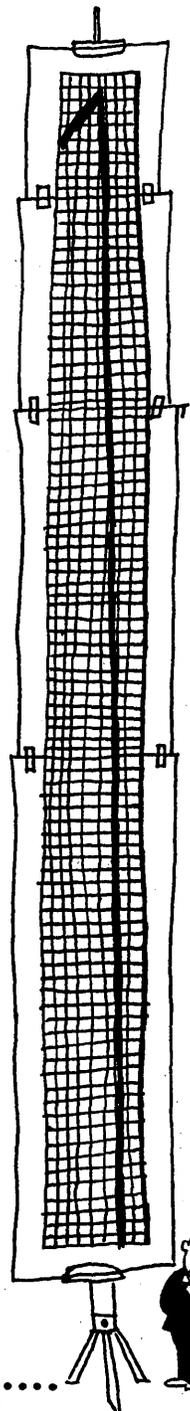
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Letters . . .

an experimental psychologist at the National Physical Laboratory in London.

While I do not in any way suggest the adoption of this specific typeface for use between man and machine without further research, I do support Mr. Ross' position of not now adopting a standard and do most strongly urge continued research and development in this and the many other areas of man/machine interface, such as vision, memory, and decision making processes. What is necessary to accomplish this research and development is to bring together the behavioral and the computer scientists, something that has not been done to date.

GENE ALTSHULER
New York, New York

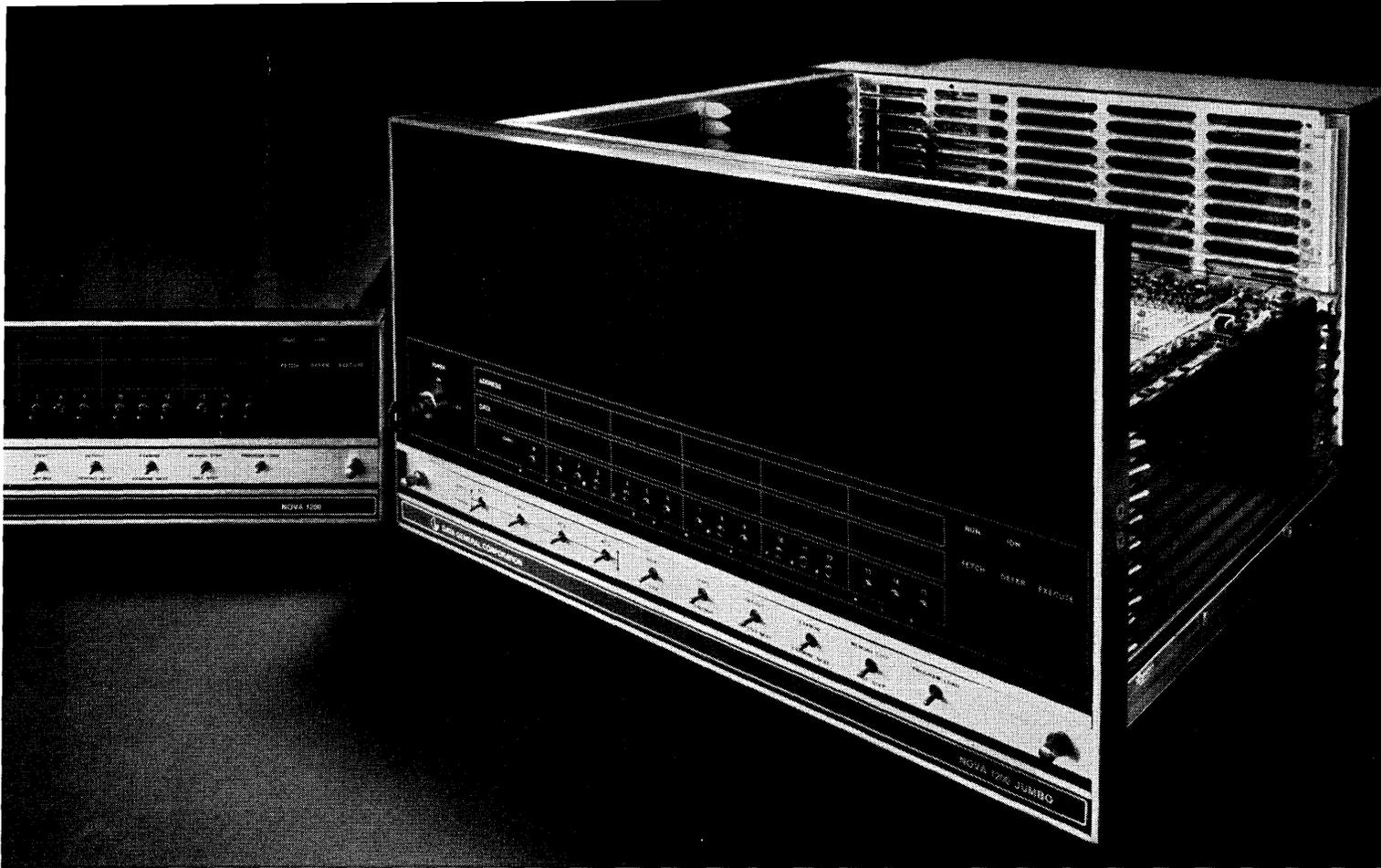
Magic wand

Sir:

I am somewhat at a loss to understand the point Mr. Burkhardt is driving at in his letter to DATAMATION ("Tag Party," May 1, p. 13). He seems to imply that retail consumers will be able to alter NCR color-bar merchandise tags and thus change prices. I would point out to Mr. Burkhardt that a significant amount of "price altering" is done today with today's merchandise tags, but the methods are much simpler than those he referred to; they merely require the switching of differently priced packages on merchandise or the re-application of one ticket on another piece of merchandise.

To keep the record straight, however, a Polaroid camera does not produce the spectral responses required by the NCR color-bar code system and thus cannot be used to duplicate tags. Furthermore, the so-called tag altering by one of Mr. Burkhardt's technicians, which I personally observed, was a failure. The tag would read and pass the six developed redundancy tests, but what his technician failed to notice was that the original unaltered data was captured, not his "modified" data. The felt-tip-pen modifications would not change the original bar-coding spectral qualities which the NCR wand reader senses and thus were "invisible."

W. S. HARRIS
The National Cash
Register Company
Dayton, Ohio



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In its standard 5 $\frac{1}{4}$ " high rack-mount package, a Data General Nova-line computer holds up to 16K 16-bit words of core memory and interfaces for several peripherals or special devices.

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But we've noticed that more and more of our customers are moving up to even bigger systems. So we're introducing the Jumbo Novas.

The Jumbo chassis is

BIG DEAL.

10 $\frac{1}{2}$ " tall (double standard Nova height), and it provides three times the expansion capacity of the standard Novas.

A Jumbo Nova has room for up to 32K of core memory and interfaces for many more peripherals and special devices. We also included convenient plug-in interfacing for major peripherals, like IBM compatible mag tape and disk memories.

Yet, the Jumbo chassis

adds only \$850 to Nova 1200 and Nova 800 basic prices.* That's a big deal for the bigger system customer.

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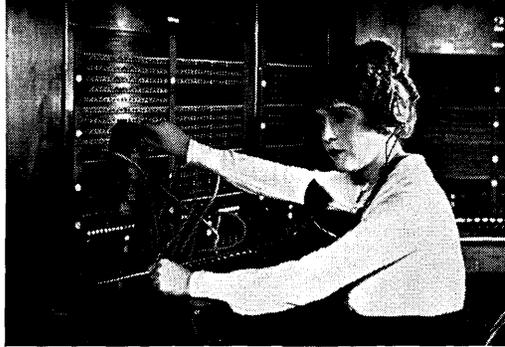
CIRCLE 18 ON READER CARD

*With 4K of core, Teletype interfaces, and Direct Memory Access data channel, a standard Nova 1200 costs \$5450 and a standard Nova 800 is \$6950.

what!



really!



yes, mag
tape
terminals



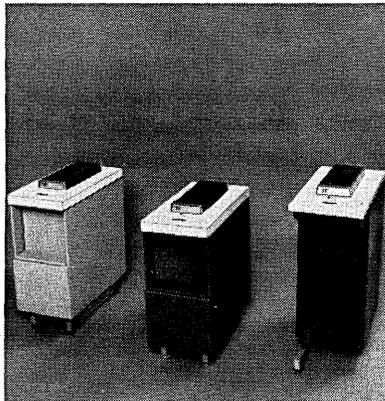
TELETYPE?

It's true.

After helping a jillion feet of paper tape wind and unwind its way through communications systems everywhere, Teletype announces the addition of magnetic tape data terminals.

There are some basic advantages in both mediums. But as you are well aware, the medium that's right for a system depends a lot on the application criteria.

The new magnetic tape data terminals have many operational features that make life less complicated for the operator.



New, modular line of Teletype® 4210 magnetic tape data terminals.

For example, take a look at the tape cartridge, which was specifically designed for reliability required for data transmission.

Its vital statistics are: 3" x 3" x 1".

It contains 100 feet of 1/2" precision magnetic tape.

It will hold 150,000 characters of data, recorded at a density of 125 characters per inch. The equivalent of a 1000 foot roll of paper tape.

This means that your data is easier to store, easier to handle, easier to work with than ever before. And it's reusable.

DATA COMMUNICATIONS

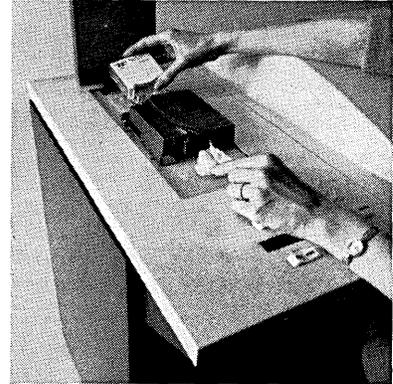
equipment for on-line, real-time processing

The units have a "fast access" switch which will move tape forward or reverse at a speed of 33 inches per second. A digit counter provides a reference point to help locate various areas of the tape.

Four ASCII control code characters can be recorded in the data format to aid character search operations. When the terminal's "search" button is pressed, tape moves at the rate of 400 characters per second

Also magnetic tape adds high speed on-line capability to low speed data terminals.

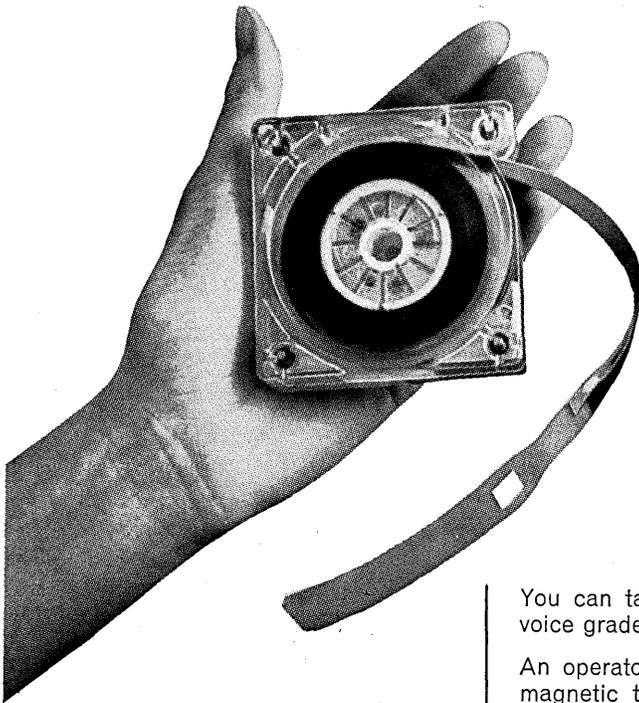
You can zip data along the line at up to 2400 words per minute. For example: Take a standard speed Teletype keyboard send-receive set, and a typical typist. Add a new magnetic tape unit to this combination and the on-line time savings can pay for the magnetic tape terminal in short order.



Straight-through threading makes tape loading and unloading exceptionally easy.

They can send or receive at high or low speed. Or can be used independently as stand-alone terminals on-line.

If you would like to know more about this new line of Teletype magnetic tape data terminals, please write Teletype Corporation, Dept 81-15, 5555 Touhy Avenue, Skokie, Illinois 60076.



until the control code selected is detected. Then the terminal stops the tape automatically.

A "single step" switch is also provided which enables you to move the tape forward or backward one character at a time. In editing or correcting tape, you can send a single character using this feature.

You can take better advantage of voice grade line speed capabilities.

An operator can prepare data for magnetic tape transmission using the keyboard terminal in local mode. Then send it on-line via the magnetic tape terminal up to 2400 words per minute.

These new modular magnetic tape data terminals offered by Teletype are perfectly compatible with model 33, model 35, model 37 and Inktronic® keyboard send-receive equipment.



Teletype 4210 magnetic tape data terminal with 37 keyboard send-receive set.

machines that make data move

July 1, 1971

CIRCLE 11 ON READER CARD



WHY ISN'T YOUR COMPUTER WORKING FULL TIME?

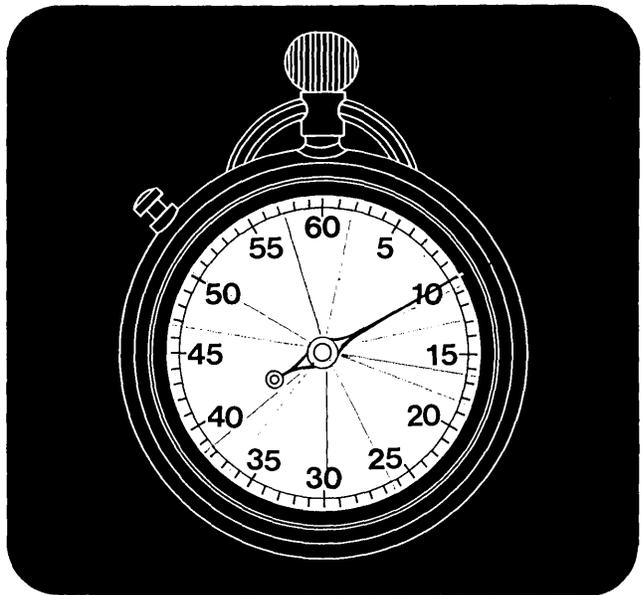
Your system may be loaded to capacity. But chances are the central processor is idle most of the time. Why? Because it's waiting for an I/O channel. Or a peripheral. Or because main memory won't hold more than one job at a time.

Burroughs makes low- and medium-priced systems that work smarter, systems that keep all their resources busy so that a dozen or more independent jobs can be flowing through at the same time. That way, you can do more work with less machine.

How? By a technique called *dynamic multiprogramming*. It's the industry's most significant development in terms of total systems productivity.

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Dynamic Multiprogramming is explained in our new brochure. Ask your Burroughs representative for a copy. Or write to us in Detroit, 48232.



Burroughs



LOOK AHEAD

PERIPHERAL PRICE WAR DECLARED AGAIN . . .

IBM isn't leaving much for the competition. The new policies, which bring IBM prices smack against most competition, apply to an estimated 80% of the big company's installed peripherals on rent. The obvious strategy was to get most of these units bought or leased very quickly (at 15% off if purchased and 8% or 16% off if leased for a year or two years). Users feel that with the discount and elimination of extra-shift charges on leases only, they are bound to be successful. So the independents have only a few months at the most to woo these users with better deals--preferably in both price and performance. There is much argument about whether many of these firms' profit margins are truly broad enough to survive another cut.

After that, the competition will be shooting at IBM leftovers: new undelivered peripherals, leasing company installations, and--camaraderie be damned--each other. As for new peripherals, it's felt the 3330-compatible makers will have slimmer pickings initially, since they will deliver after IBM, and it's expected most 3330s will either be bought or go under two-year leases.

. . . BUT THIS TIME DWARFS GET IMPACT

IBM's new pricing policy could mean, says a major consultant, that complete systems will average 6-7% less--about equal to what unbundling has cost. IBM's shadow--RCA, which chose to raise prices--is particularly distressed, as must be Control Data, a major maker of oem peripherals as well as systems. During the first year of the new policy, IBM is expected to lose \$100-200 million in rental revenues but regain half of this through purchases under the 15% reduction offer. It may gain another fraction through increased buying of its software services, due to the peripherals savings.

. . . AS FEDS GLEEFULLY ENVISION BARGAINS

Federal dp buyers may include disc and tape drives in an upcoming rfp. As currently planned, the purchase will seek to replace installed IBM printers, secondary memory units, and keyboard terminals with less expensive equipment. Even if this procurement isn't expanded, IBM still holds a competitive leverage on printers. Independents are expected to cut their prices and erase the advantage. If they don't, the IBM pricing policy could reduce federal interest in peripherals that are plug compatible. IBM's new terms will be cranked into the FY'72 Federal Supply Service schedule and may persuade other system makers to offer similar concessions.

MEANWHILE BACK AT THE TELEPHONE COMPANY

AT&T and Western Union were busily strengthening their defenses last month against an attack from MCI, Datran, and other challengers in the wake of FCC's decision permitting wide-open competition in the specialized data service market. Fox Stoddard, AT&T's private line marketing manager, said his company may expand series 11000--now an experimental, geographically

limited broadband service--into a regular nationwide offering that would include lease of individual voice-grade channels. Such a move, says a knowledgeable source, could hit MCI hard. Meanwhile, Western Union was scheduled this month to ask FCC approval of 2400-baud and 4800-baud data com service. A 9600-baud service is planned for "early next year." Western Union's recently approved hybrid digital microwave link between Cincinnati and Atlanta, scheduled for completion next year, will enable a typical customer, using an analog local loop, to cut his modem cost from \$2000 to \$700, says a WU source. An MCI source counters that his system will eliminate modems completely for many users.

TOO LATE WITH
TOO MUCH?

A firm whose name cannot be disclosed is actively developing a retrofit kit for 2314 disc drives that within a month would convert these into systems with twice the density and half the access time. The leasing companies are interested, since it's a way to renew expiring leases. So are the independents, who have been or are about to build double-density 2314-like systems for what they consider to be a healthy demand. A large user, about to return five 2314 systems to a leasing company, wonders why someone hasn't come up with a retrofit kit sooner.

PAROLE COMES FASTER
THRU JOBS BY COMPUTER

A computerized job match system soon will be used in California's Dept. of Corrections to help prisoners find jobs and to considerably reduce their time in prison. Some six to eight months before a prisoner's earliest possible release date, a list of skills learned in prison would be added to a file containing the jobs he had before entering prison and matched against jobs available outside. If a match is made, the date for his first parole hearing could be advanced. The department says persons sentenced to up to 10 years could be out in a year. Federal and state funds totaling \$120,000 are being used to experiment with the system, which could be implemented throughout the state by mid-1973. Interestingly, the department in its studies is using an SDC DS-2 general-purpose data management system owned by the Senate Reapportionment Committee.

RUMORS AND
RAW RANDOM DATA

Boothe Computer Co., the San Francisco leasing firm, was playing for keeps when it sank money and marketing talent into Courier Terminal Systems, the Phoenix crt terminal firm. Now holding an 83% interest in Courier, Boothe says it will combat IBM's lower priced 3270 terminal by slashing prices on its E-60 and E-260 units by some 25%, in order to maintain a 10% edge. Although the 3270 will be delivered in spring of '72, Courier's new price will be effective in January . . . IBM will offer a 7074 emulator on the 370/155, with delivery in March '72. It already has announced one on the 165 . . . General Electric lost \$7 million in its time-sharing operation during the last fiscal year, an improvement over the \$21 million deficit in 1969.

PDP-11 BASIC-PLUS

MAKES CONVENTIONAL BASIC

LOOK VERY

SMALL

That's the way it looks when you run BASIC-PLUS on our RSTS-11 Resource Timesharing System. BASIC-PLUS gives RSTS-11 enormous problem-solving ability.

BASIC-PLUS has data processing language features that increase efficiency for on-line order entry, inventory control and payroll applications.

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BASIC-PLUS has extended program statement coding that expresses complex steps concisely, more efficiently. Beautiful for computation applications like structural design and simulation.

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And BASIC-PLUS is just the software.

On the hardware side, RSTS-11 lets any terminal access line printers, card readers, DECTapes and small or large disk files. It will take on up to 16 terminals, each with a capacity of up to 16,000 bytes of memory and the ability to open 12 data files at once. And it will take on fixed or removable disks and industry-compatible magtape any time you're ready.

Yet with all this power and versatility, RSTS-11 can be delivered, ready to interface with your teleprinters, typewriters or CRT's, for under \$50K.

That's far less than similar HP and Honeywell systems.

And only RSTS-11 has BASIC-PLUS.

Write for more information. Digital Equipment Corporation, Main Street, Maynard, Massachusetts 01754, (617) 897-5111.

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. New high reliability. Protected power supplies. Strong security features, at specially designed SUPERCENTERS. And soon, dual systems throughout on our NEW MARK II service.
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But that's just the tip of the iceberg. GE's NEW MARK II can do lots more for you. More to get the most from time-sharing and your own in-house capabilities.

If you manage an EDP operation, we'll come out and show you just how much more you can do with our NEW MARK II. Let's talk about it. Call me collect at (301) 654-9360, Ext. 700.

Sincerely,

Handwritten signature of Paul W. Sage

Paul W. Sage, General Manager
Information Services Marketing Department

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You are looking at the most versatile display system ever announced.

This is IBM's new 3270 Information Display System. And there's a lot more to it than meets the eye.

Because the more you look at it, the more ways you can think of to use it.

To start with, the 3270 is really a whole family.

With thirteen units you can combine into 78 different kinds of display systems to meet your varying needs.

Thirteen different units to help you get information in and out of your computer faster and more efficiently than ever before.

And to protect your information you can add safeguards—including a new card reader. It permits only persons with specially coded magnetic cards to use your system.

Your 3270 system can be a single terminal that displays up to 1920 characters of information. Or one that displays 480. Either screen gives you a brighter, steadier image than ever before.

Your 3270 system can include



printers that produce 66 characters a second. And ones that go at 40 characters a second.

It can be a network that knits together your entire organization. With up to 32 displays linked to a control unit. Or one display and 31 printers. Or any combination in between.

If you're in insurance, you could improve customer service by checking policyholder records while the customer or agent is on the phone.

If you're in banking, you could quickly check and update the status

of any customer account.

If you're in health care, you could use the optional Selector Light Pen to order prescriptions or laboratory tests.

If you're in manufacturing, you could keep track of production by comparing the current status of work in process against schedules.

Whatever business you're in, IBM's 3270 system gives you all the advantages of displays: the ability to get information in and out of your computer in a flash.

Plus one more advantage: the ability to put together the information display system that's just right for you.

And, of course, you can use it with System/370 and System/360.

The IBM 3270 Information Display System. It's worth looking into.

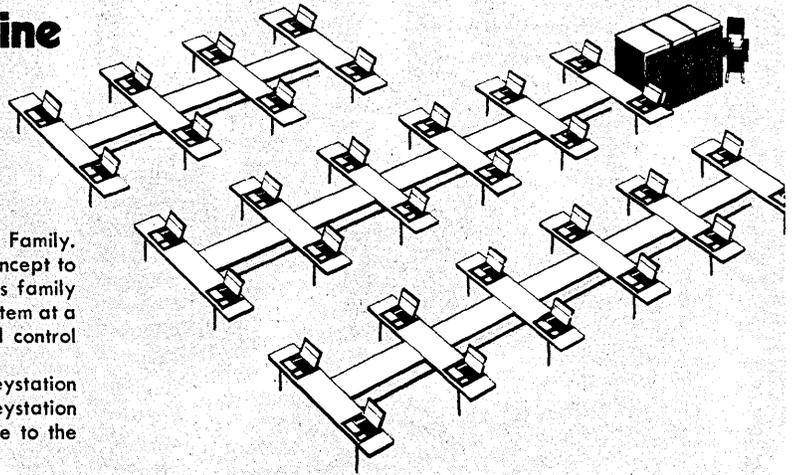
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Here it is! A new member of the famous KEY-EDIT™ Series 100 Family.

KEY-EDIT 100/85 extends the widely accepted KEY-EDIT concept to the introductory user. It contains most of the advantages of its family members but allows the user to move to the shared-processor system at a low cost with future potential growth in sophisticated edit and control techniques assured.

With the KEY-EDIT 100/85 your total monthly cost-per-keystation can be as low as \$100 per month. This is the lowest cost-per-keystation of any keypunch or key-to-tape replacement system available to the high-volume input user today.

And we can prove it.



The KEY-EDIT Series 100 Family

The KEY-EDIT Series 100 family of data preparation systems gives users a wide range of capabilities to meet the demanding requirements of modern computer operations. Systems features within the family allow the KEY-EDIT user to grow to larger models quickly and easily with no operating changes.

But KEY-EDIT users get more than a system. They get reliability.

Reliable delivery. Reliable service. Reliable people.

Most of all, people. Marketing people. Technical people. System engineers and designers.

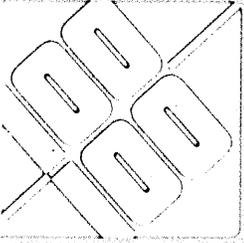
Contact them for further information on how the KEY-EDIT Series 100 family can work for you. They're located in seventeen cities from coast to-coast.

Governments. Industry.

can use KEY-EDIT™

The Incredible Reducing Machine.

KEY-EDIT



The Incredible Reducing Machine that started it all.

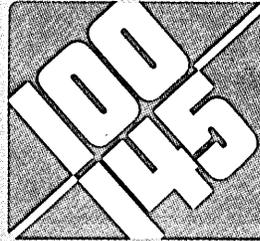
This is the KEY-EDIT model that made Consolidated Computer a world leader in data input equipment. Introduced little more than a year ago, more than 100

KEY-EDIT™ systems are installed and working in cities throughout North America and Europe. And they're serving an equally diverse mixture of government, industry and business.

KEY-EDIT is known to these users as "The Incredible Reducing Machine" because it reduces data preparation problems to an absolute minimum. KEY-EDIT 100/100 combines all the advantages of the shared-processor with powerful editing and control features.

The KEY-EDIT 100/100 is now available with a variety of newly designed data stations with many optional configurations and new color models.

KEY-EDIT



The Incredible Reducing Machine for communications and remote editing.

This communications-oriented addition to the KEY-EDIT™ family, with powerful control and editing features as standard, can be tailored to a variety of user processing needs.

The KEY-EDIT concept provides an easily understood transition to shared processor data capture for the smaller business.

Larger companies can use the 100/145 as an economical terminal processor, linking remote branches with headquarters location.

With a powerful editing and control processing capability, the 100/145 becomes a high-performance introductory system to large users for evaluation and specification development.

Users can select from a variety of data capturing devices, card readers, paper-tape readers, and other peripheral equipment to make a powerful integrated data input system.



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617-891-0210

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fire, flood, riot, etc., etc., etc.**

A Contingency Plan

M Every computer system is vulnerable to disaster, accident, and sabotage as well as plain mismanagement. As a result, like other unpleasant realities, security measures such as entry controls, fire alarms, and off-site storage sites should be considered in advance of need. Considering the large investment business and universities usually have in their computer center some catastrophe security measures are a must. Put another way, if your organization could continue to function for days or weeks after a sudden disaster to the computer complex it is probable that much of the computer center is not needed. In a more typical situation, when the computer center goes down all company work is affected and in some situations all work stops.

Disasters—fire, flood, riot, environmental problems, hardware and software failures, and sabotage—can and do happen. Yet all too often management ignores this possibility and the security and protection that was given journals and ledgers in precomputer days is not given computer files. If management decides that the possibility of disaster to the computer center is not serious enough to warrant taking precautions, this may be a sound management decision. The important thing is that management should face the problem and decide what, if anything, should be done.

There have been several major disasters in computer centers in recent years. One of the most spectacular took place on July 3, 1959 in the Pentagon computer center. Most people would expect this to be one of the safest and best protected computer sites, but at that time it obviously wasn't.

At 10 o'clock in the morning there was a need for some tapes from the vault. This was the first trip to the tape vault for the day. When the clerk opened the vault door, flames shot out. An electrician had left a

300-watt bulb burning on a "fireproof" ceiling. The fire this caused had smoldered all night and the minute the vault door was opened oxygen hit the smoldering particles and in seconds a sheet of flame and smoke blocked all visibility in the room. Before the fire was over 19 firemen had to be treated for smoke inhalation and the entire computer area was destroyed. All tapes were lost, but programs were saved because they were stored in fireproof cabinets.

After the fire, it was discovered that the supposedly fireproof ceiling was only fire resistant. Several other things were also wrong. The master switch was located where it was difficult to reach, instead of being near an outside door. During the fire, no one could get to it to shut off the power. Consequently, the firemen were pouring water on electrical gear which was still running.

Needless to say, all this has changed. Since that day all military computer center managers are supposed to establish accessible routes and exits. Master power switches capable of turning off all power are strategically located near an outside door. All rooms are equipped with smoke detectors as well as fire alarms that are hooked directly to the base fire station. Rooms, including floors, are insulated with fireproof material. Good housekeeping of trash and maintenance work is required. Fire prevention inspections are encouraged by the fire department.

A different type of disaster took place when Dow Chemical's computer center at Midland, Michigan was invaded by war protestors on Nov. 8, 1969. No employees were in the center at the time. A thousand tapes were damaged and cards and manuals were thrown around. Damage was said to be \$100,000.

A similar, albeit more spectacular and widely publicized, case took place in Montreal, Canada at Sir

for Catastrophe

by D. Van Tassel

George Williams Univ. On Jan. 29, 1969 students set fire to the computer center causing \$2 million damage to computer equipment. An IBM 1620 and a CDC 3300 were destroyed. In addition all magnetic tapes, programs, and cards were thrown out the ninth floor window and destroyed. In this case besides the equipment, which can be easily although expensively replaced, the administrative and research files and programs were also destroyed.

Dissatisfied employees sometimes believe the risk of punishment is more than offset by the urgency of bringing to the employer's attention their own plight. In precomputer days there were several cases of plug boards being destroyed or stolen. In a recent case an edp employee used magnets to destroy every file possible. Extensive damage was done in a very short time. In fact, at last report, the auditors were not sure whether the company could reconstruct enough information to stay in business.

The important thing to notice in these incidents is that dissatisfied persons are learning what to destroy. Not too long ago in Los Angeles someone took a

**... dissatisfied persons
are learning what to destroy.**

couple of shots at a computer. This was naive. If the culprit had aimed his shots at the tape storage room he would have done considerably more damage. All it takes is one elementary course on computers to learn what to damage.

Companies with large computer files are particularly vulnerable. The manager of a major U.S. airlines

recently assessed the value of their current seat reservation system. When asked what would happen if a dissatisfied employee fouled up the computer system for at least a day, his pessimistic but realistic response was: "First it is entirely possible for many members of our computing staff as well as software or hardware problems to do this to our reservation system. And it could cost us as high as a million dollars of revenue a day during the down period."

Catastrophe normally connotes finality or total disaster. Instead, management should consider a catastrophe as any event that significantly disrupts the normal order of the system. As this definition implies, there are hierarchies or levels of catastrophies. A catastrophe may run the spectrum from a temporary shutdown of the system caused by a power failure, software problem, equipment malfunction or a self-inflicted wound by an improperly trained or misoriented employee, to the more critical conditions brought by flood, riot, fire, earthquake, tornado, or the complete loss of electric power for a prolonged period, as was experienced in New York in early 1965.

Since the level of catastrophe can range from the trivial to total, it is best to develop levels of response. When there is no contingency plan, there is a tendency to treat all processing interruptions the same—usually with panic.

The response to an interruption in processing will normally depend on its duration. Generally there are three approaches to a processing interruption. If the interruption is too brief to have any significant effect on operations, nothing is done. The second type of interruption is of longer duration and management usually reschedules work so that critical applications are given priority when operations resume. Either

Contingency Plan . . .

extra operating hours or off-premise computer time is scheduled to allow delayed work to be processed. The third type of interruption is a major disaster—flood, fire, vandalism, etc. In this case operations are shifted as soon as possible to a back-up computer site so that essential computer functions can still operate.

It is not always clear what level of response should be taken. Power failure, software trouble, or hardware problems can range from the trivial to the serious and still not be obvious at the inception. Also emergencies are more likely to occur on weekends or night shifts than the short day shifts.

To avoid waiting too long for a "trivial" software bug or hardware problem to be fixed the contingency plan should indicate what immediate actions have to be taken, including who to notify and how to get corrective action started. Such a strategy might include an immediate call to the data processing manager, a call to the computer engineer, and notification of the back-up site that time may be needed.

Establishment of wait periods will avoid the situation of the computer going down Friday night and staying down all weekend. The idea of the wait period is that after a certain length of down time (say four hours), no matter what the reason, certain responses are necessary. The allowable wait period will depend on the amount of down time which can be accepted without the need for action. In a heavily used center a small down time period is serious while a computer center that normally runs only 12 to 16 hours a day will not be seriously affected by an eight hour loss.

On-line systems can usually tolerate little down time. A back-up system available at all times is too

. . . emergencies are more likely to occur on weekends or night shifts than the short day shifts.

expensive for most users. But installations with one system for on-line processing and another for batch processing can switch the batch processor on-line if necessary for back up.

Time-sharing companies are an obvious place where interruptions can be quite expensive, since no revenue is coming in while the computer is down and long periods of down time will lose customers. The dollar cost of one day delay in clearing transit checks can be calculated fairly accurately by a bank. If a wholesaler is unable to process incoming orders promptly customer dissatisfaction will cause loss of business. Because of the rather large loss possible under these circumstances, it is best for such installations to appoint one person responsible for the computer center processing should an emergency arise.

This disaster or emergency monitor, instead of the data processing manager, should have full responsibility for developing emergency guidelines. He should be responsible for deciding when an emergency situation exists. His responsibilities should also include location of a back-up site, scheduling necessary personnel, off-site file maintenance, and software avail-

ability.

The day-to-day maintenance of off-site files can be left up to the computer librarian. But the decision of which files and how often to store files off-site must be made by those responsible for the files. Because the actual user should share in the decision and cost of maintaining back-up files at another storage site, it is not fair to make the disaster monitor carry the whole decision.

Today it is actually easier and cheaper to maintain a duplicate file at another site than in the days before computers, or in the edp card days. Today all types of computer files including source programs can be copied in minutes on magnetic tape and cheaply stored.

Some installations rely on on-premise libraries to protect computer files but this overlooks at least two catastrophe possibilities: (1) total disaster, and (2)

. . . it is not at all uncommon for the source program and documentation to be lying on some programmer's desk.

that it is not at all uncommon for the source program and documentation to be lying on some programmer's desk.

It is generally possible to provide for some system back-up in case of disaster to the computer system in the normal maintenance contract with equipment vendors. Since it is much easier to negotiate before signing the contract than afterwards, this factor should always be considered before signing a hardware contract.

On-call maintenance support will generally satisfy the requirements of most batch type systems. Large scale, real-time, and time-sharing installations will require around-the-clock on-site engineering support. In addition, redundancy of system usually will be necessary.

If the installation is depending on off-site back-up it is not too wise to make preliminary agreements and then forget about them. Instead, a periodic check should be made to see if the agreement still holds. One manager who had made arrangements for back-up with another installation was surprised when he found that the installation he was depending on had changed hardware three months earlier without notifying him. Another manager discovered that the computer center which previously had guaranteed him eight hours a day if necessary, had increased their work load so much that no time was available.

It is doubtful that any back-up computer could handle the full load of most installations since normally the back-up computer has a work load of its own. Instead limited essential processing is the most that is hoped for.

Software catastrophe is the most common headache for management. Software errors often look like hardware errors at first glance. Since the majority of errors are in the software, the necessity of thorough testing cannot be overemphasized.

Software error can cause an installation to have to turn to outside computer help in a hurry. In business

applications output for one file is often input for the next job. Thus troubles can multiply rapidly.

Along with maintaining operational software (programs) at a back-up site there is also the job of supplying the software for the system. If the back-up site hardware is compatible with present software there is no reason why a copy of the system software cannot be sent to the off-site storage location as an added protection in case of total disaster.

If management feels that a back-up site is necessary, then an attempted run at the back-up site should be tried. Not only must the hardware be compatible but so must the software. Whether your software or the back-up site's software is used, problems can develop. The back-up site's software may be incompatible. On the other hand if company owned software is used both computers must have identical memory size and peripherals, and logical addresses must be the same. If your company has two computer sites this problem can be overcome by company control of software and hardware. Some state installations (California State Colleges, California Water Resources) have acquired identical computers and maintained identical software to guarantee compatibility of both software and hardware.

If a computer center is not fortunate enough to have such tight control over the back-up site the only conclusive proof of compatibility of software and hardware is to successfully run production programs. This will give an opportunity to test out the back-up maintenance of files, operator instructions, program documentation, and programs. Only programs and files stored at the off-site location should be used for the test run. A test run also will point out problems of alternate input media, handling source documents at the alternate facility, available working space, and storage space.

The possibility of temporary manual processing should not be overlooked. If it is impossible to resume computer processing for a week it normally would be better to revert to manual processing than no processing at all and possibly closing the business down.

Even if a periodic test cannot be made of the off-site computer preparation there should be an occasional audit of duplication and storage of off-site files. Checks should be made to see that original procedures are still being followed, new files have been added, and obsolete files returned to the center.

Improperly trained or motivated people can be the cause of a disaster in a computer center. Prevention of this situation is part of the overall security program. During an emergency situation overtime hours will usually be needed. In addition critical people may be unavailable. Both these situations should be considered in advance and conditional approval of overtime established. There should be some freedom in using people in positions that they do not normally work. The use of rotating duties for personnel will help provide trained people during critical periods.

If a company's total assets are computer hardware and software then it may be obvious that it should be insured. But if the computer center is just part of a business it is easy to overlook insuring the critical parts of the computer center. Computer hardware often represents a large investment and is usually insured if owned, but the value of the information is more often overlooked.

Not only should the actual information be insured, but also the value of the supporting software. Such insurance is now offered by some insurance companies. The cost of reconstructing destroyed files, the loss of revenue, and the cost of carrying on normal business while files are being reconstructed should all be considered when buying computer center insurance.

There have been several recent examples of disasters involving computer centers. The most widely reported one was the bombing of the Univ. of Wisconsin Army Mathematics Research Center last August. Several computers were damaged, but more damage took place from the Hurricane Celia when it sped through Corpus Christi, Texas at speeds of 162 mph earlier in the month of August.

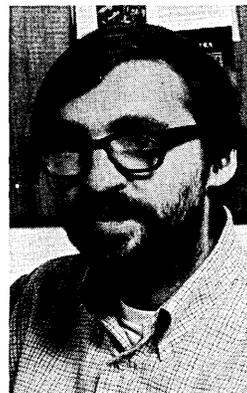
Two facts become evident from these two examples. Protection against a well-planned bombing or a 162-mph hurricane is almost impossible. But damage

Protection against a well-planned bombing or a 162-mph hurricane is almost impossible.

can be lessened by simple precautions such as back-up files, auxiliary power sources, fire protection measures, and site location.

Users without back-up files were ruined by the hurricane. Site location was important. Computers surrounded by glass showcases suffered greatly. After the hurricane users with auxiliary power sources were the first to start running again. Other users with back-up sources in other cities were able to start work sooner than those who had to wait for machine replacement or repair.

The greater the preparation, the less the risk. Such a small thing as keeping off-premise back-up files can mean the difference between a total disaster and just a major set-back. Each computer installation must decide on the necessary precautions to take, balancing the resulting expense against the chances they are willing to take. ■



Mr. Van Tassel is currently the computer user liaison at the Univ. of California at Santa Cruz. Previously he was a lecturer in the Department of Business at San Jose State College. He has written numerous articles on two subjects of particular interest to him: computer security and privacy. He holds a BA in English from the Univ. of Southern California and an MA in mathematics from Los Angeles State College.

Theoretical considerations aside, what's REALLY been done to safeguard installations?

Physical Security...

M This computer protection business is either a residual panic from the rash of computer center bombings and bombscares, the tardy realization of some people that the computer is important to their business operation, or the latest flash of entrepreneurial zeal. Whichever opinion you subscribe to more than likely depends on how close you have been to a computer disaster.

The small cadre of computer security consultants don't think the great majority of users take security seriously at all. Support for their viewpoint is seen in increasing insurance rates and the continually lengthening list of incidents.

User reluctance to protect computers is also borne out by the fact that in the past few organizations, other than certain agencies of the federal government, have had secure computer installations; apparently there was no general concern over the vulnerability of the computer until militant political groups decided they made a superb target for bombings.

Now that the subject is finally popular, we set out to discover just what companies have done to protect their installations—as opposed to what they should or may do.

RCA—the corporate group, not the computer division—has three edp centers, one in New York City, another in Cherry Hill, N.J., and the third in Los Angeles. Late in the summer of 1970 a security survey was conducted under the direction of John Sandlin, director of MIS administration and corporate information system centers. Sandlin said the survey was sparked by receipt of a questionnaire from a consultant, and it covered physical security, disaster prevention, data integrity and procedures.

It revealed that physical security in all centers was maintained primarily by smiling young receptionists and elderly guards. The L.A. center is on the ground floor of a plate glass building, the NYC center is in the RCA Building where one bombing had already occurred (he noted that this had tightened building security), and the Cherry Hill center is in a separate building.

In L.A. the police were asked for advice. "They scared the wits out of us with some of the things they

said could happen," reports Sandlin. And they advised how to handle bomb threats and where to get riot-proof glass. Higher priced guards were hired, too.

In New York the police were equally helpful and indicated there were "a lot of nuts running around Fun City." Since this center is located off a single elevator which limits access, and building security, according to Sandlin, is tight at night, no guards were hired. "It isn't worth the money," he said. During the day a receptionist keeps an eye on things.

At Cherry Hill the guards got a raise and lock alarms were put on all exterior doors.

Disaster prevention took the form of testing all fire extinguishers—a number were empty and many weren't well displayed—and fire and smoke detector systems. For a smoke test, a supervisor climbed a ladder and blew cigar smoke at the sensor. It detected it. Checks of power and water shut-offs showed poor preliminary planning. The power switch at Cherry Hill not only cut off the center but also three other buildings. The master water main shut-off is 100 feet from the building and a key is required to get to the standpipe. RCA also put a supply of fireproof plastic coverings at each center to be thrown over the equipment in case of water leakage.

The "worst problem," according to Sandlin, is employee disaffection. This came under the data integrity

For a smoke test, a supervisor climbed a ladder and blew cigar smoke at the sensor.

portion of the RCA survey and its controls are employee background and credit checks and limitations on access to data. He noted that deep background checks of individuals is impossible unless a company is engaged in government work. Concern over invasion of privacy also limits such inquiries.

The other part of data integrity is off-site storage of important data. RCA has a vault at Iron Mountain and

Facts and Fancies

by John Wessler, Edith Myers, and W. David Gardner

keeps tapes on shareholder records, pension and payroll records, and MIS data. Sandlin said a processing drill was conducted with the stored data that showed the company "would have been inconvenienced" if the N.Y. center had gone out of commission without the back-up. In fact, he said, it would have taken 9.2 man-years and 478 computer hours to reconstruct the master files and documentation. Other results of the test were that duplication of two discs of data on payroll could possibly prevent a three-man-year reconstruction job.

RCA updates the tapes at Iron Mountain monthly. At Cherry Hill, off-site storage of daily dumps from the real-time system is handled by the intracompany mail. Three days of data on tape is constantly floating through the company mail routes.

Sandlin said the survey resulted in a security checklist—a formalized approach, not a solution. It showed where each center was vulnerable, and the responsible party at each center established protective procedures. The centers, he said, "are not 100% protected, but I don't think we could bear the cost of 100% protection." He added that RCA "is not trying to build fortresses of its centers."

Another company that has tightened up on the security of its installation is New England Telephone, one of the largest users of computers in New England. Until just a few weeks ago, there was what one company official describes as "free access" to the phone company's main computer installation in Boston. Today, it is difficult if not impossible for anyone who does not have business in the installation to get in.

"We have initiated a magnetic card entrance system," says L. Richard Thompson, the firm's general computer systems supervisor. "We have just one entrance door now and the other doors are used for emergency exits only. The new measures have greatly cut down on traffic in the computer room." Prior to the institution of the recent tight security measures, anyone who got past the guard at the company's front entrance—a relatively easy matter—had "free access" to the computer floor.

New England Telephone maintains duplicate tapes

and Thompson said the firm utilizes the grandfather-to-father-to-son approach, making it simple to update and maintain duplicate tapes. The firm has not arranged for back-up computation facilities, because there is no system comparable that could take over in the event of an emergency, Thompson says.

The Bank of California has what certainly could be described as near-total security at its Los Angeles data center. This facility is so secure, in fact, that a DATA-MATION reporter couldn't get in to see it. Says Herman H. Kalene, vice-president of operations: "We've spent a lot of money on our security system. So why violate it by letting in unauthorized people?" The bank spent more than \$200,000 in installing their security system and spends over \$35,000 monthly to keep it going, including salaries of guards—their own and some supplied by Burns Detective Agency.

Kalene says every employee with access to the computer room, including cleaning and maintenance people, has a security clearance provided for the bank by the FBI.

A closed circuit tv system keeps constant surveillance not only of the building and all its entrances but sidewalks for a block on either side as well. They also have an elaborate network of door alarms and door controls. These are controlled from the security system's nerve center where guards also monitor all tv cameras, protected by an enclosure of bullet-resistant glass. "Even I can't get in there," says Kalene. His badge isn't the right color.

The bank has never experienced an attempt at cracking its security system, nor bombs, nor bomb threats. But they're ready. Employees are drilled regularly in emergency procedures.

Several blocks away is a dp center which has been closer to threats and even to actual bombings. It belongs to the city of Los Angeles and is located in several sites in the L.A. City Hall. Like the bank's, the city's computers are protected by screened access (but reporters aren't barred) and bullet-resistant glass enclosures. There's a big red button in one of the computer rooms that is connected directly to the police department. When pushed it brings armed officers to the scene almost instantly. The button is

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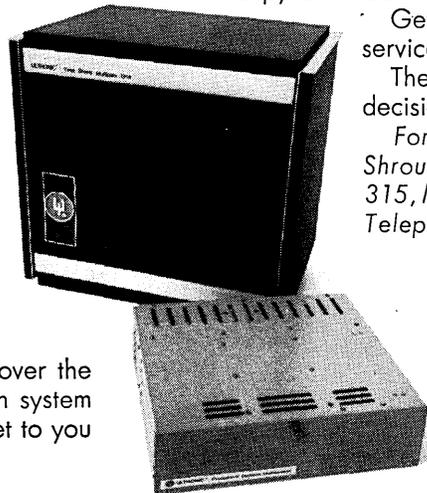
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Physical Security . . .

located now on a post in the center of the room where it was moved from a spot on the wall against which people accidentally leaned once too often.

Threats but no actual bombings plagued Los Angeles County's Welfare Data Center before its recent move from downtown Los Angeles to a highly secure new center in Downey. Gordon Milliman, county dp director, said the center was receiving regular threats, "often as many as three a day." Each time the center had to be evacuated. While all the threats weren't traced, the management did at one point detect a pattern. Calls were coming in before or after lunch or just before quitting time and were traced to employees—wanting either a longer lunch period or to go home early.

But some of the threats could have been real. There's no way to check and computer room bombings have happened. It's a matter of weighing cost against risk and either can win. (A large Midwest machine tool manufacturer became concerned about the security of a computer installation handling its payroll. The dp manager was asked to develop a security plan. He looked into it and realized he would have to go beyond the computer room and provide security for the loading dock and the mail room as well. He worked out a plan and presented it to his superiors. They looked it over and rejected it. It cost too much.)

Larry E. Winship, manager of management information systems at CRE's Sylvania Lighting Products Group in Danvers, Mass., feels that the current flap over physical security of computer installations is something of a red herring. "If anyone is determined to wreck a computer installation, it's almost impossible to stop him," says Winship. "For most installations, it's too costly to provide complete and absolute protection."

The approach at Sylvania's Lighting Products Group—which has two IBM 360/40s and a host of smaller computers and peripherals—has been to provide complete back-up for the installation, should it become inoperable in any way. Duplicate disc files

"If anyone is determined to wreck a computer installation, it's almost impossible to stop him."

and tape files are maintained. The tape files are updated daily. Duplicates are stored in a vault at an off-site location. Discs are dumped twice a week onto tapes and likewise are stored in the off-site vault. "All this is fairly cheap," says Winship. "It takes one man about two or three hours a day to do the job."

Besides the difficulty of providing total physical security for an installation, Winship feels there is another factor that enters into the picture: the mystique that tends to surround computers.

"The whole atmosphere of data processing is disturbing to begin with," says Winship. "It's important, I think, that our employees and our customers know and understand computers and particularly our computers. I think the operation should be as open as

possible. Otherwise everyone tends to get suspicious."

The Massachusetts Institute of Technology has tightened up security measures at its computer installations in recent months. "We've made the doors a little thicker," says Robert H. Scott, MIT's director of information processing.

While the recent difficulties at other university installations appear to be something of a spur for the tightening at MIT, Scott says that the university has always been concerned with physical security of its computer installations. "We've stressed security for privacy reasons primarily," observes Scott. "And, also, we think that the atmosphere at an installation should be controlled so the computer operators can do their jobs. They don't like distractions. They tend to increase errors."

In the instructional and research side of MIT's computers, physical security is left up to the particular department or individual in charge of the project in question. Scott says that when the data on a project is particularly hard to duplicate, create, or find, then the project is likely to have effective physical security measures.

In the administrative and business areas of MIT—where Scott has responsibility—there is complete backup. Scott says there are duplicates of tapes stored at two off-site locations and that MIT has made arrangements with other computer installations to take over MIT's computer workload in the event of an emergency. If anything drastic were to happen to MIT's installation, no more than five days would be lost before the off-site installations would be processing MIT's material.

"I have no idea where the back-up installations are located and I have no idea where the duplicate tapes are stored," says Scott. "It's set up like that so I couldn't give up that information if I had to."

There are several companies now that specialize in security matters, offering consulting and other services. Examples are Data Processing Security, Inc.; Dataguard Systems; and Computer Audit Systems, Inc. Others have branched out into various security services from their main line of business—such as Mosler and Diebold. And still others, whose main business has always been security, are giving special attention to the problems of computer centers—such as the Burns and Pinkerton organizations. Meantime, computer consultants in general are alert to the security problems of their clients.

Ted Freiser, vice-president of John Diebold & Associates, which, among other consulting services, performs computer security audits for clients, sees security as a total company problem encompassing everything from the personnel department's hiring policies to the maintenance department's sick leave practices.

He recalls one company in the highly competitive oil industry which housed its dp center in "a \$7 million fortress" only to entrust highly proprietary printout to a commercial messenger service. And another in the also-competitive toy field which kept its own computers highly secure was running sensitive design programs through a service bureau.

A Diebold client company in the Midwest, located in a riot-prone area, had bricks thrown through their computer room windows and came up with a too-hasty remedy. They bricked up the windows—then encountered even more serious problems with heat. ■

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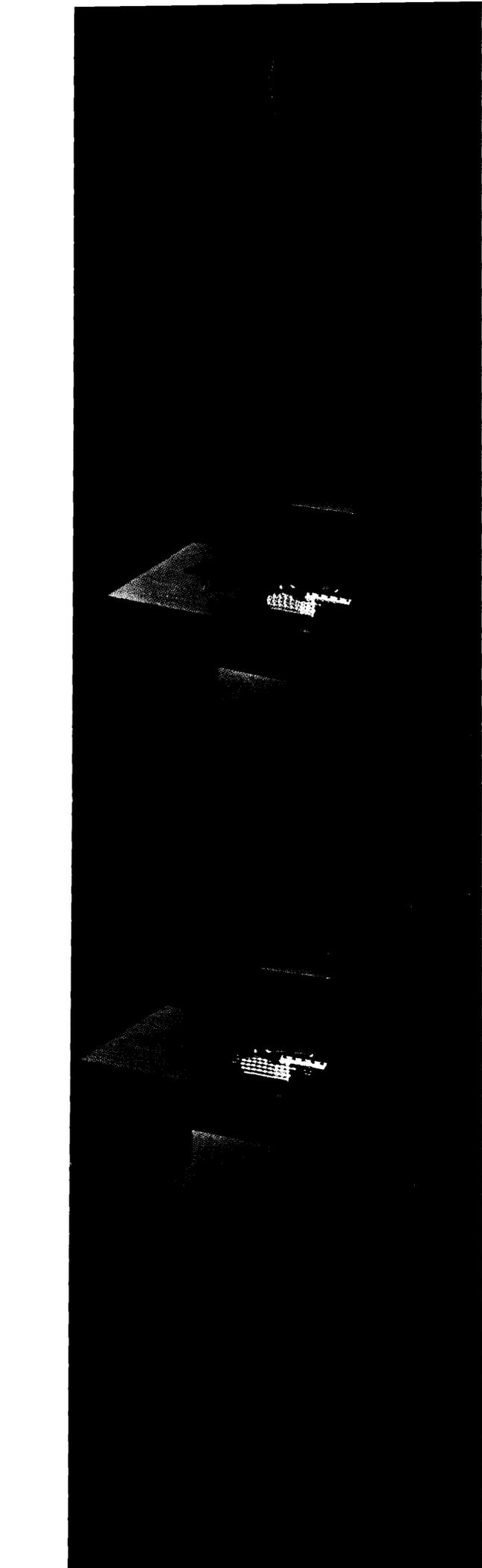
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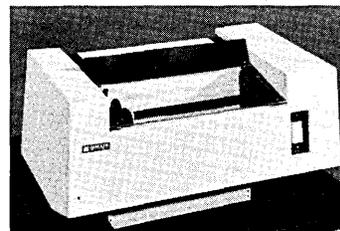


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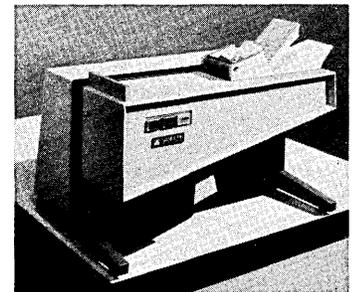


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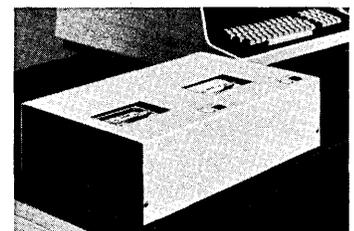
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Bennett's executioners wielded the axe in his own livingroom—and didn't even stay for dinner

The Rise and Fall of

MIn hindsight, Viatron's "sales only" policy looked like just another form of the corporate hara-kiri committed by the firm in late winter and in the spring of 1970. Not only did the sales policy flop, but it created additional confusion in Viatron's marketing approach—which, by that time, could be considered vague at best.

One marketing problem was obvious: Viatron had three marketing heads in three months. Other marketing difficulties were not as obvious, although they caused more grief to the firm in the long run. In late 1969, Viatron switched from a heavy reliance on its own marketing force to reliance upon a network of some 40 dealers scattered across the country. As it soon became apparent, there were many problems with the dealership approach, not the least of which was that Viatron had difficulties communicating with and controlling its new marketing force.

"Our first approach of using the media and sending demonstration teams around the country worked immensely well," says David Sudkin, former Viatron marketing vice president. "Under the old approach, we developed 30,000 solid letters-of-intent. And more than 50% of these were from Fortune 500 companies." Developing these orders, it has been learned, cost somewhat under \$2 million for advertising.

Viatron reported in February of 1970 that it was producing System 21s at the rate of 600 a month. Although this was far below the firm's original target of 5,000 to 6,000 units a month, it was still a respectable number. Viatron employees were jubilant over the units that were being shipped out of their Massachusetts plant, but there is evidence that this created an illusion of actual sales when in fact many of the systems shipped—perhaps even the majority—piled up in dealers' warehouses. One dealer in Texas, for example, reported that he had 350 units in inventory in a warehouse.

The "sales only" policy hurt the dealers, too. Not only did the policy make it difficult for them to unload System 21s, but it caused problems for the machines already out in the field on lease. One California dealer reported that five System 21s he had installed were returned when Viatron instituted the sales policy in spite of the fact that the five machines were on lease. The customer had hoped to install a large network of System 21s and the five test systems he had were of little value unless they could be integrated into a network. But the customer declined to purchase the rest of the machines to complete the network so the five on lease were dropped. In another example of dealer problems, California dealers complained that Viatron's direct sales representatives

... many of the systems shipped piled up in dealers' warehouses.

were cutting into the dealers' territories.

Viatron's approach to servicing was also changed. At first the company planned a servicing program "using the military concept of remove and replace depot maintenance rather than the more expensive traveling serviceman." The replacement idea, which had been a subject of great fanfare by the company, was dropped, however. Finally, Control Data Corp. took over the servicing and maintenance of Viatron equipment.

There are those who think that no company in the world can efficiently gear up rapidly from zero to 1,300 employees in 2½ years. Viatron tried—and encountered the inevitable problems inherent in fast growth. (Actually, Viatron probably didn't have to grow so rapidly. Lead time over the competition is of

paramount importance in the computer industry, but there is still no other computer company on the scene trying to do what Viatron tried to do and it is possible that there won't ever be.)

At any rate, Viatron's difficulties of grappling with a high growth rate were aggravated by its penchant for changing its basic business game plan with regularity. It wasn't just the marketing concept or the servicing approach or the financial plan that was constantly changed—virtually no phase of Viatron's operations appeared to be immune from drastic and rapid change.

Furthermore, Viatron began moving into new product areas at a fast pace before problems on the System 21 had been ironed out. Two 16-bit small computers, scheduled for delivery in the spring of 1970, were announced, at startlingly low rates—\$99 a month with 4K memory and \$199 a month with 8K memory and additional features. In addition, Viatron was working on two more computers—a cut-rate mod-

newsletter described the phenomenon like this: "The personnel of Viatron, from secretaries to president, exude vitality, excitement."

From the free soft drinks, coffee, popcorn and potato chips to the one month's vacation and liberal stock options, Viatron's benevolence and paternalism towards its employees fired them with an enthusiasm seldom—if ever—found among any company's rank-and-file employees.

"You have to remember," says ex-marketing vice president David Sudkin, "that Ed Bennett's PhD is in psychology. There was this tremendous spirit at Viatron. Bennett used the same thing to motivate us at Viatron that he used to raise the \$40 million—greed. Everyone had a stock option. He made everyone think he'd be a millionaire." Indeed, when Viatron's stock rose above \$60 a share, there were several paper millionaires in the firm. The stock holdings of Bennett's secretary, for instance, were worth considerably more than \$500,000. Other secretaries and computer

Viatron — Part II

by W. David Gardner, New England Editor

el that was to sell for \$2,000 and a high performance model that would round out the top of the line.

Then there was the family of ocr devices that "will revolutionize the optical character reading industry." There was the semiconductor memory—the firm claimed to have fabricated a memory with a "10,000 bit read/write memory chip." Another team was working on digital wrist watches and there was an effort under way to produce electronics for a line of Japanese calculators.

In the spring of 1970, the firm decided, in essence, to move into the semiconductor business by spinning off its microelectronics facility as a separate profit center. The plan was to design and develop mos circuits and systems for customers. All of the new product areas had more or less the same thing in common: Nothing much ever became of any of them and they all drew valuable resources away from System 21.

Meanwhile, there were some key segments of System 21 that weren't working properly. The company was late in producing a cassette-tape-to-computer-tape device which was an integral element in most configurations that had been ordered by customers. The absence of the tape-to-tape device was holding up customer evaluation of System 21 and, as a result, retarded deliveries. Opinions differ about the seriousness of the delay. One former Viatron marketing executive believed that many customers stopped taking Viatron seriously when they couldn't get shipments of complete systems, while Bennett says the delay of the tape-to-tape device didn't represent a serious problem.

While outsiders began having their doubts about Viatron (one detractor said "it's like giving \$40 million to the Marx brothers") the firm's employees remained deeply committed to the company, displaying a remarkable esprit de corps. One Wall Street

operators were worth hundreds of thousands of dollars each on paper.

To this day, ex-Viatron employees—even those who ended up disagreeing heartily with Bennett—appear to harbor no ill will towards him. Indeed, many ex-Viatron employees return to visit him in his new office in Lexington, Mass., and he receives them in much the manner of the college professor who is delighted to see his former students return. Bennett says he knows of no one who feels "ravished" by his experience at Viatron and he talks with genuine compassion when he says he is sorry that so many lost their jobs at Viatron at the same time the job market turned sour. In addition, it is evident that Bennett himself took a severe financial beating. Any possible gains Bennett

... many ex-Viatron employees return to visit him ...

made on Viatron were more than wiped out by the drubbing he took on the convertible debentures he purchased. ("None of the insiders got rich on that company," he says.)

By July of 1970, the employees' enthusiasm had dampened considerably. The value of their stock options had been declining sharply; Viatron's high-flying stock was selling for one-tenth of its high. More graphically, the firm had instituted a series of layoffs in an attempt to reverse the expense growth momentum. Employees from production line workers to top executives were given their walking papers. No one was safe. Not even the board of directors. And, as it soon became all too evident, not even Ed Bennett and his right-hand man, Joe Spiegel. Indeed, the firing of a member of the board of directors in July led to

Rise and Fall . . .

Viatron's famous "living room coup."

One thing about Viatron: It seemed incapable of doing anything in the conventional manner. The events leading up to the living room episode were typically bizarre. By early July, Viatron had serious enough problems that it was not adverse to being acquired by another firm. Such negotiations require great discretion and business acumen, neither of which could be said to be among the stronger points of Viatron.

A prestigious Wall Street firm that specializes in arranging corporate acquisitions had a client that was interested in making an acquisition in the data processing field. The client, a large New York Stock Exchange firm, already had a firm base in the office products field. The Wall Street go-between firm apparently showed an interest in Viatron, but Charles S. Morrill, Viatron's director of corporate affairs, directly contacted the large firm interested in making the acquisition and this was regarded as a no-no by Bennett.

Precisely what happened at this point is not clear, except that the deal fell through. Morrill says he had approval to contact the company directly while Bennett says he did not. Morrill feels that Bennett blew up the incident out of proportion to create a smoke-screen to make it easy for Bennett to discredit Morrill. There had been some friction between the two men. At any rate, Bennett fired Morrill and the latter, still a member of the board of directors, immediately began drumming up support among the other directors to sack Bennett and Spiegel.

One week later, when the directors met in Bennett's living room, Bennett apparently had no inkling there would be trouble. Dinner had been prepared to be served to the directors at the conclusion of the meeting. The agenda, however, never got that far. Morrill had rallied the directors around to his side during the previous week and Morrill, Roger R. Phillips, James J. Cannon, Jr., and Professor Pearson Hunt ousted Bennett and Spiegel. The Bennett era was over.

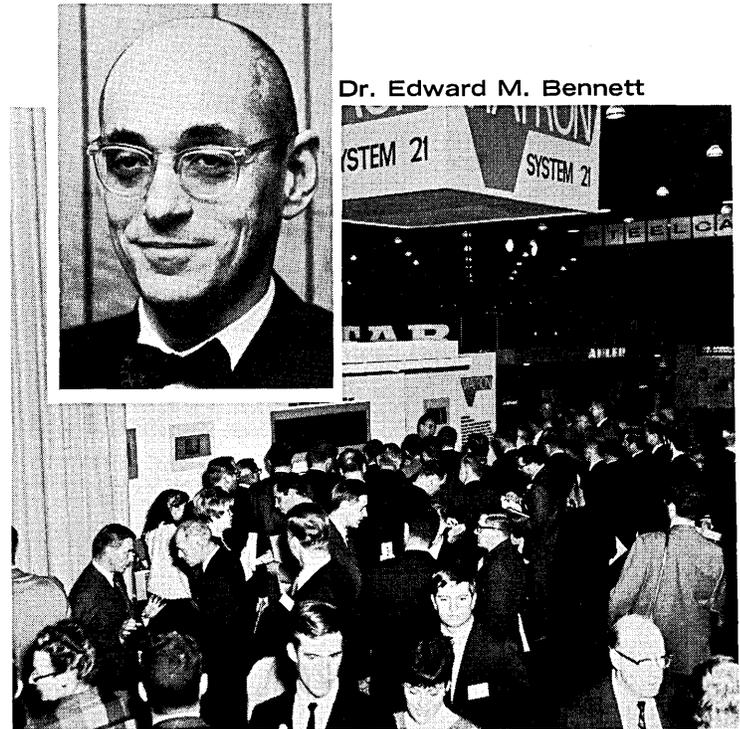
The immediate aftermath of the "living room coup" illustrated the extent of the control that Bennett and Spiegel had exercised over Viatron, its directors and its employees. That night, Phillips and Cannon slept in Viatron's headquarters building so, in the words of Morrill, the new management could take "physical possession of the company." New guards were posted at the building and they were given photos of Bennett and Spiegel and told not to allow either in the building.

To lead the new management team as president, the directors named Phillips, an attorney who had previously worked for the Colgate-Palmolive Company; and Hunt, who is Edmund Cogswell Converse Professor of Finance and Banking at the Harvard Graduate School of Business Administration. As chairman of the board, Hunt's name alone was of immense value to Viatron because he enjoyed the reputation of being one of the country's foremost authorities on corporate finance, a subject in which Viatron had rather obvious weaknesses. But in many ways, the new management team had the same weakness of the Bennett team—none of the members had backgrounds in commercial electronic data processing. Like Bennett and Spiegel, Cannon and Morrill

were from MITRE, the government think-tank. Hunt was an academician and Phillips worked with a soap company. (When he left Viatron later, Phillips went to work for another soap firm.)

No one would deny that the new management team inherited enormous problems and these problems, coupled with the fact that no single person on the new team had a solid overview of the entire company, worked against the new management ever gaining solid control over Viatron.

"Viatron was a big firecracker," says Bennett. "And the guys who picked it up didn't know what to do with it. The stabilizing points were Joe Spiegel and I. If anything happened to me, then Joe could take over and if anything happened to Joe, I was there." In-



Dr. Edward M. Bennett

The Viatron booth at a Chicago trade show during height of the company's fame.

deed, there was little continuity of management and Bennett says he was never contacted by the new team for advice. Viatron continued to sink under the new regime.

There were some flashes of success, however. The company sold 30 systems to New England Telephone, which reported that it had had "very good success" with 18 Viatron evaluation systems. Other big orders were reported in the works. The company continued laying off employees, dropped its drive into new product areas, and in general pursued a tough retrenching and austerity program that began to lower expenses and increase sales. Even Viatron's stock, although never a particularly reliable barometer of anything, spurted briefly in the fall of 1970.

The Phillips-Hunt team was also not unaware of the possible advantages that might accrue to the company if Viatron were to be acquired by another firm. Many companies were reliably reported to have examined Viatron with the idea of possibly acquiring the troubled company, and many acquisition propo-

sals were said to have reached the chairmen of the boards of several interested companies. Nothing ever materialized in this area, however, and the feeling seemed to be that firms potentially interested in acquiring Viatron could not untangle the firm's business affairs to the point where it was possible for them to get a clear picture of precisely what they might be getting if they acquired Viatron.

A team of top executives from Motorola was inspecting Viatron's facilities at the time when Bennett and Spiegel were ousted. It could not be determined exactly why Motorola was examining Viatron in such close detail, but some Viatron people had been hopeful that Motorola might acquire Viatron. Later, the hope was that Viatron would be acquired after it completed its court proceedings with its creditors. The feeling was that Viatron—with a huge tax loss carryforward—would still be a nice acquisition, if its slate could be wiped clean in the courts.

By October of 1970 it became evident that Viatron's trade creditors—the largest debts were represented by semiconductor firms—were closing in. The word spread in legal circles in Boston that the city's "bankruptcy bar"—attorneys who specialize in bill collecting—could be in for a feast. And looming ominously several weeks out was a bill for nearly \$500,000 that Viatron would owe as interest on its debentures.

Although the Phillips-Hunt management team continued an aggressive trimming operation into the fall of 1970, there just wasn't enough time or money to save the company. Charles Morrill, the man who organized the living room coup, feels the management team performed well, that it pared the company and its objectives down into more manageable proportions. Morrill regarded the Phillips-Hunt team as interim management.

As far as the new management was concerned, Bennett's description of Viatron as "a big firecracker" was an apt one—there always was a fuse burning somewhere in Viatron and as soon as it was extinguished, it seemed that two more fuses would be found burning somewhere else in the company. At that point, in the fall of 1970, the biggest fuse was represented by the hundreds of trade creditors who were owed money by Viatron. They ranged from the Coca-Cola Bottling Co. to International Business Machines. The largest creditors, however, were the semi-

The largest creditors, however, were the semiconductor firms . . .

conductor firms and the hardest hit was American Micro-Systems, Inc., the MOS specialty house, which was owed more than \$1 million by Viatron.

By October, the trade creditors had organized into an effective group and by December the debenture holders were doing the same thing, all of which meant that Viatron was headed for a three-way tug-of-war—management, trade creditors, and debenture holders—that would make it become more difficult to get wheeling as a going business enterprise. By mid-December, it became evident that all hope of getting Viatron back on its feet again by itself was lost; Roger

Phillips resigned as president and Pearson Hunt resigned as chairman of the board. At the same time, the other members of the "living room coup" group resigned their posts as directors.

The firm made Robert Dockser, a Viatron senior vice president, president of Viatron, but at the same time named Exeter International Corp. to work with the company in a consulting role. Many believe that Exeter International, a firm that specializes in attempting to save failing companies, ran Viatron until the Securities and Exchange Commission forced the firm into Chapter X proceedings in April of 1971.

Viatron being Viatron, the beginning of the end was appropriately bizarre. After remaining in business in spite of logging more than \$40 million in losses against slightly more than \$3 million in sales and after successfully holding off a brace of companies, each with claims of more than \$500,000, a petition in

. . . the beginning of the end was appropriately bizarre.

bankruptcy was filed against Viatron in February of this year by three companies with claims totaling just \$3,901.

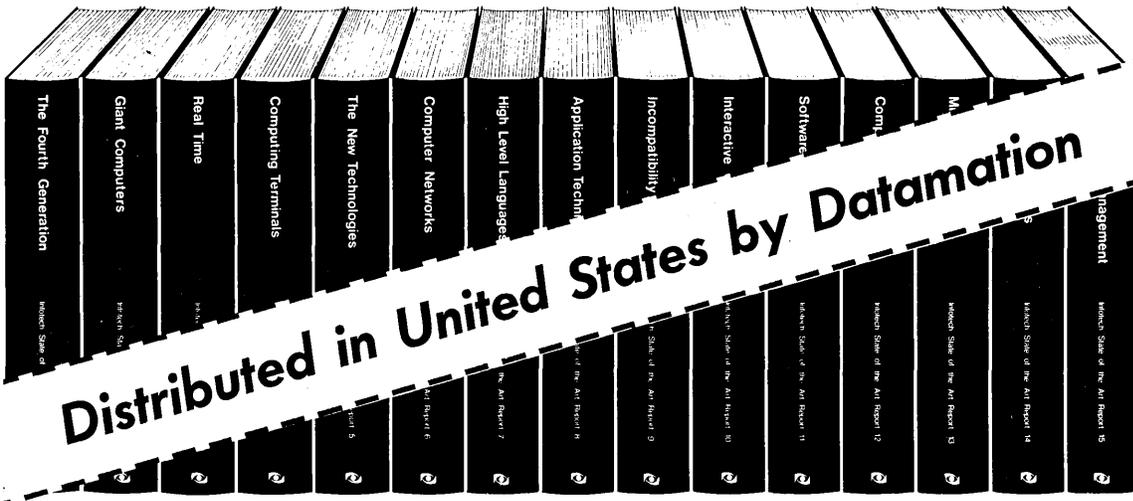
With that, the fate of Viatron was up to the court. The petitioners were Manpower, Inc., of Minneapolis, Certified Business Forms, Inc., of Newton, Mass., and National Data Communication Systems, Inc., of Summerville, Mass. No one can say whether Viatron's affairs will be completely unraveled or whether it is even possible to completely unravel them. Nevertheless, there are many who feel that the firm's concepts and products are still sound enough for Viatron to continue functioning either as a separate entity or as a part of another company. Time will tell.

Meanwhile, Ed Bennett and Joe Spiegel are functioning again in business. This time, however, the game is energy machinery, not electronic data processing. The company is the First Lexington Corp. and already it has made its first acquisition—the Universal Valve Corp.—and there may be more in the works. The plan is to make it a major supplier in North and South America. Bennett is still intrigued with the Japanese industry and there could be an acquisition there, too.

Although he had to be burnt by the Viatron experience, Bennett doesn't show it. The enthusiasm—one might even call it a zest—is still there. And the wit is still there too; in an oblique reference to the living room coup, Bennett says: "That won't happen again. Joe (Spiegel) and I have our wives on the board this time."

It all comes out in a gush; the plan now is for the First Lexington Corp. to acquire companies with assets. No equity financing, but still not a conglomerate. There may be more acquisitions by the end of the year. The Japanese electronics would complement heavy American machinery. Cryogenic safety valves are the coming thing. Farther along there might be process control equipment, disposable electronic medical instruments, and picture-phone. Bennett pauses for a minute and says: "You know, pretty soon you're back in the Viatron business again." ■

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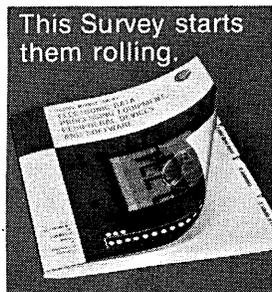
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PERSPECTIVE

an interpretive review of significant developments

He Dreams the Impossible Dream ... or Does He?

A lot of industry experts said it couldn't be done outside of a lab, and this week the world should find out if they were right or wrong.

For Frank Marchuk has said he will unveil a working model of his CG-100 laser computer, which shapes up on paper as something just short of a miracle, some time during the first week in July. It was being planned as a modest unveiling to be held for a "select" audience in a new facility in Irvine, Calif., for which Marchuk's Laser Computer Corp. was negotiating in late May. At this writing three facilities were being considered, but no lease had been signed.

Marchuk's lack of production facilities have been one cause of widespread skepticism in the industry. He claimed in May to have three working prototypes with production scheduled to begin in July at the rate of 2.8 machines per month. One of these was to have been delivered in May to a "small bank on the eastern seaboard" for a 90-day free trial. The prototypes, says Marchuk, were fabricated in Newport Beach where the company has had a portion of the fifth floor of an office building since its



Frank Marchuk

founding as Computer General Corp. in May 1970. Subassemblies, he said, were produced in Taiwan.

The firm also was negotiating in May for three buildings in Phoenix, but these negotiations were in early stages. Plans for acquisition of a for-

mer Honeywell facility near San Diego had fallen through when that facility was leased to someone else.

In the meantime, according to Marchuk, rfq's for the machine, billed as a 10-trillion-bit, 20-nsec system selling for \$1.6 million (it first was priced at \$1.2 million, but Marchuk said the public found this too low), were pouring in. In mid-May he said he had sold 178 machines and had scheduled delivery for the first 45 production units. He said the last delivery scheduled was to Boeing Computer Services which would take delivery of models 43, 44, and 45 beginning in March of '72. A spokesman for Boeing declined to comment on the order.

Financing his ambitious enterprise did not, in May, appear to be considered an obstacle by Marchuk. He said the company had been financed to that point with "all my own money," money received primarily from selling off a group of seven electronic firms he operated under the umbrella of Marchuk Industries, a consulting firm he founded in 1956. One of the latest of these sales was of his interest in Microelectronic Evaluation Center, Inc., Santa Ana, Calif., a semiconductor testing facility described as a \$2-million operation when it started up last June, to Gordon L. Metcalf, his former partner in Marchuk & Metcalf, a separate consulting firm which established MEC. Metcalf said the sale was for "cash and a note" but declined to state the amount. Metcalf, who had been a principal in Computer General Corp., resigned at the time of the MEC sale and had "no comment" on the future or capabilities of the firm now known as Laser Computer Corp.

Software from Sigmatics

Another \$275K was to come from proceeds of a \$3,750,000 stock offering that Sigmatics, a Newport Beach software firm, told the SEC it would make last January. In a supplement to its offering circular dated April 6, Sigmatics said the \$275K would be in-

vested in a 15% equity ownership of Laser Computer Corp. under an agreement which would make Sigmatics sole provider of the laser company's software. Interestingly enough, this same supplement, dated one month before the first prototype CG-100 was to be delivered, stated: "No completed prototype of the Laser Computer System has been manufactured, and prospective investors should be apprised that a prototype may never be developed, and that if developed, the System may never be marketed on a profitable basis."

As for outside money, Marchuk said in May he wasn't looking and, in fact, was literally in a position of having to "fend off" offers. "Major insurance companies are calling us daily," he said.

Marchuk, at that time, was having to "fend off" a lot of things. He said he was getting 100 phone calls per day, one every three minutes, and at least one every two hours from a foreign country. It was this overwhelming interest in the laser computer, he said, plus fear of spying and sabotage, that necessitated the cloak of secrecy with which he has surrounded both his machine and himself.

Something for the Year 2000

The specifications for the CG-100 which have been released were described by one industry observer as "reading like he has designed the ideal machine for the year 2000. He has made up for everything that is wrong with current computers." Features billed include data nonvolatility guaranteed for 25 years, storage cost of 10^{-7} cent per bit, less than 1 error in 10^9 bits, associative memory organization, an arithmetic execution time and rate that "far exceeds that of any computer system," no moving parts in the main memory, automatic error control and correction, and plug-to-plug compatibility with standard IBM peripherals. The CG-100 is supposed to operate with a mix of communication lines and transmission rates, variety of remote terminal types, any number of minicomputer controller units, and any kind of peripheral device. Just one, says Mar-

chuk, equals the power and capacity of 50 360/65s. This is a lot for \$1.6 million.

Precision Instrument Co.'s Unicon trillion-bit nonerasable laser memory currently sells for \$1.6 million. Interestingly, Marchuk for some six months (one visit every other week, according to PI president Konrad Schoebel) has been interested in buying a quantity of PI's Unicons. He first was talking of 40, said Schoebel, then reduced the quantity to eight. "We'd sure like to have such an order at \$1.6 million each," Schoebel sighs, "but I don't ever expect to get it."

Marchuk says he is interested in the Unicon units not for the CG-100 but for a later model, the CG-400 which has been designed but not yet built, though they plan to build two this year. The CG-400 would have holographic input/output capability and nondestructive readout. It would be less expensive than the 100 and without its speed and updating capabilities. This makes for an interesting exercise in arithmetic when you consider the 100 is to sell for \$1.6 million and the Unicons which he would use in the 400 models also sell for \$1.6 million each.

The "top five computer" companies in the country have expressed interest in the CG-100 and three of these (unnamed) have asked to discuss licensing arrangements, says Marchuk. He said Laser Computer Corp. plans to issue licenses to foreign companies and currently is negotiating license agreements with a major company in Sweden and one in the Orient, but will not license other U.S. computer manufacturers.

IBM, he says, was not one of the firms talking licensing but was one of those interested and has submitted rfq's for three systems. An IBM spokesman was unable to confirm or deny this but noted it is against IBM policy to issue such rfq's. And it would appear that the question is academic, for rfq's, it seems, don't carry much weight at Laser Computer Corp. At one point Marchuk, who said he had to buy a special rubber stamp saying "no bid," claims he stamped more than \$80 million in rfq's with the stamp in less than six weeks.

With all this going for them, it would

appear that Frank Marchuk and Laser Computer Corp. don't have too much to worry about. There was a minor worry expressed by Marchuk to a reporter last July: "We've got to get this thing going before the Japanese jump in. With their technology in optics they should be about ready."

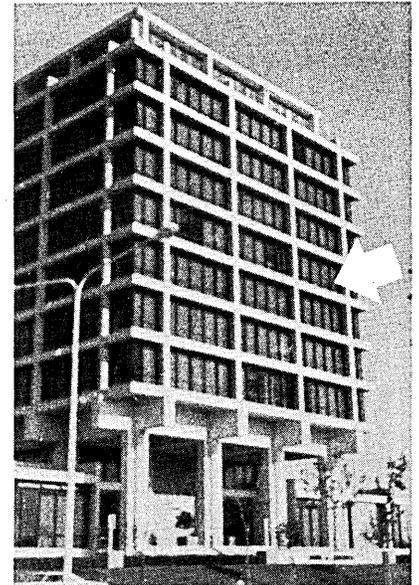
This is somewhat reminiscent of Viatron Computer Systems Corp., which in launching its ill-fated venture pointed out that its computers and terminals might be the only U.S. force able to stop an anticipated invasion of the market by the Japanese, an invasion which never materialized.

There's another Viatron parallel here too. By-then-deposed Viatron president, Dr. Edward M. Bennett, talked last fall at the Northeast Electronics Research and Engineering Meeting on raising money for new companies (Dec. 15, p. 61) and said, in effect, that money-seekers should communicate to prospective investors that they could always get someone else to put up the backing. Marchuk has gone a step further by implying he doesn't need backing.

And technologically he's gone a step or two beyond the laser or optical computer. He says he already is working on theories for computers in the period through 1985 which will make the optical computers look the way the optical computers make standard computers look today. He said in May he would expose some of these theories in talks to seminars at Stanford Univ. and California Institute of Technology and before this would file "a number of patents" covering the new technology.

No one at Stanford had heard of Frank Marchuk or his proposed talk, but he did talk at CalTech to an audience of some 200 obviously skeptical, head-shaking, and sometimes laughing students whose technical questions he generally parried with "that's proprietary."

Marchuk plans a rapid expansion for his company "to meet the demands created by the industry-wide interest in the CG-100." From a force of 60 in mid-May he said the firm would grow to 250 by year-end. Specific growth plans, he says, will be divulged at the July unveiling. He also plans at that time to tell the world



Home of the Laser Computer

more about himself.

In addition to staving off the phone calls prompted by mushrooming interest in the CG-100, he says his reason for being reluctant to reveal details of his personal background is, "I don't want to hog the credit."

He apparently has been this modest and retiring throughout the 20 years he claims to have spent in the computer industry ("I started with the first system"), as there aren't many people around today who know him or anything about him. He has spent most of his professional years, he says, as an independent consultant having consulted for 40 firms in the industry. Two which were named don't have anyone left who remembers him. Someone who did in a company he approached but which didn't hire him described him as "capable in details below the general knowledge but without the depth of knowledge which would enable him to contribute anything to us."

He has claimed to be a member of IEEE, but no record of his membership exists. He said he was a long-time director of the Los Angeles Chamber of Commerce, and that group hasn't heard of him either.

But, if dreams come true and if he pulls off what he has promised in this first week of July, the whole world will remember him.

—Edith Myers

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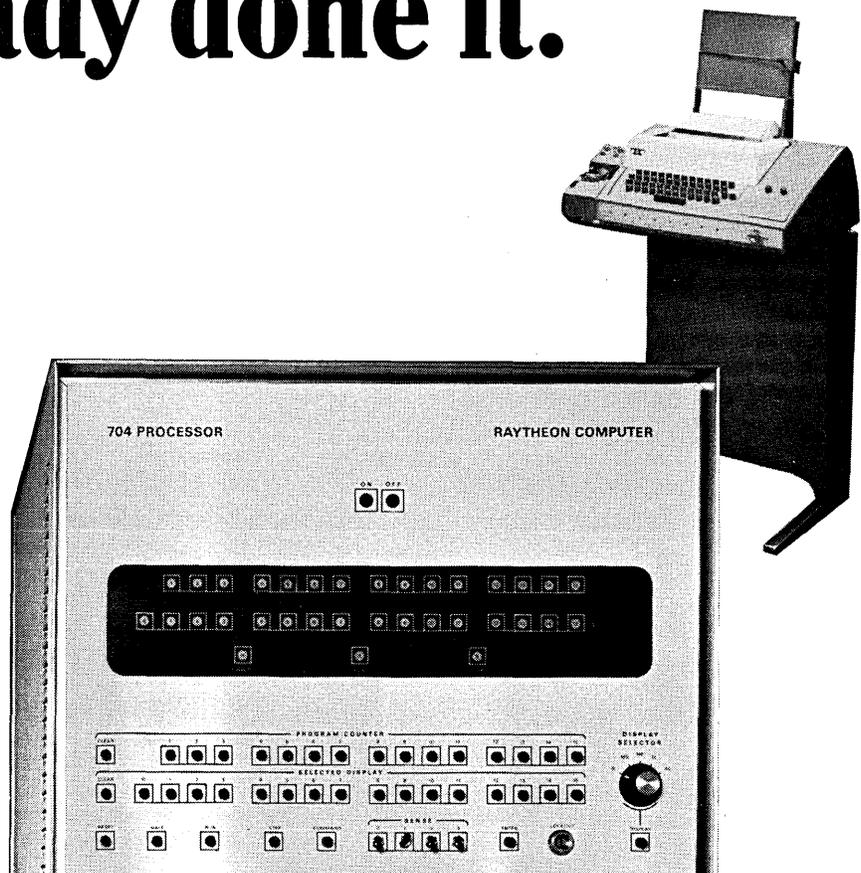
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GSA Wants to Be Feds' Master Buyer

Government Services Administration (GSA) is planning to become the central procurement and leasing agent for all general-purpose computers used by federal agencies, administrator Robert L. Kunzig told Rep. Jack Brooks' government operations subcommittee.

Kunzig also indicated his agency plans to pay closer attention to sole-source procurements, requiring federal dp users to get GSA approval for such buys. He said GSA would need additional staff to implement its new policy.

He indicated GSA also is planning procurement of independently made peripherals to follow up earlier tape and disc drive buys and said that "bid solicitation covering third-party maintenance services needed in Washington, D.C., and St. Louis are close to issuance."

Kunzig alluded to a plan for contracting outside machine time on a central basis. One goal, he said, is to find out whether commercial service bureaus can handle some of the feds' present in-house work load at lower cost than can federal service bureaus. He said GSA is drafting a bill which, if enacted by Congress, would enable the feds to lease more dp equipment on a multiyear basis.

The GSA administrator estimated that federal dp systems procurement represents about 8% of the overall adp market volume in which commercial prices prevail. "The number of independent peripheral equipment manufacturers listed in the federal supply schedule rose from 42 in 1969 to 119 in 1971."

Kunzig said federal computers are now being utilized an average of 379 hours per month. Out-of-service time averages 34 hours/month, and time not available is 124 hours/month. Available time amounts to 184 hours. On systems costing \$1.5 million, average utilization is 498 hours/month.

On June 30, 1971, according to Dwight Ink, assistant director, Office of Management & Budget, the feds were using 5,400 general-purpose

computers. Some 88% of the total was accounted for by the Dept. of Defense. Ink said the government currently owns 64% of the systems inventory, versus 58% in 1967. IBM's share is 26.5%, followed by: Univac, 19.2%; Digital Equipment Corp., 9.5%; Control Data, 7.7%; Honeywell, 7.3%; NCR, 6.1%; XDS, 4.3%; Burroughs, 3.9%; and RCA, 3.5%. The feds spent \$2.1 million on adp in 1970.

Loss Dampens Memorex Anniversary Party

Memorex Corp. celebrated a decade in the industry May 19 by dedicating its new Santa Clara, Calif., world headquarters. The site recently won a McGraw-Hill award as one of the nation's 10 outstanding new manufacturing installations. Memorex has grown from eight people producing computer tape in a small building in nearby Mountain View, to more than 6,000 employees in the U.S. and abroad building and selling a host of computer-related equipment, and, of course, tape. After the keynote speech delivered by Bank of America president A.W. Clausen, Memorex president Laurence Spitters, Santa Clara mayor G.G. Gillmor, and other officials joined in a ribbon-cutting ceremony.

The cake and cookies mood of the day was soured somewhat when it



LUNCH AT MEMOREX: Patio at Memorex Corp. employee center. In background is the 58,000-sq. ft. headquarters building.

was later announced to a special meeting of stockholders that the difference of opinion over accounting practices had finally been resolved — in favor of the accountants. Memorex must amortize sales to its ILC Peripherals Leasing Corp. over a four-year term instead of listing proceeds as immediate income. While this has no long-term effect on the balance sheet, the delayed first-quarter interim report showed a 59¢/share loss for the combination of Memorex and ILC against a 53¢ profit a year ago. Sales were off \$2 million, and Memorex attributed this to poor conditions in the computer industry.

Data General Japan Deal Has Impressive Backing

Not many months ago, a company called Viatron Computer Systems Corp., of Bedford, Mass., raised \$40 million with the thought that its computers and terminals would be the only U.S. force able to stop an anticipated invasion of low-cost Japanese computers and peripherals.

The story is now history: Viatron went broke and the Japanese invasion never materialized.

The sequel may be even more interesting. One of Viatron's neighbors, Data General Corp., of Southboro, Mass., is invading Japan, so to speak. The minicomputer manufacturer has signed a licensing agreement with a Japanese firm which will manufacture and market Data General's products in Japan and Asia. In the eyes of those who had been predicting a takeover of the U.S. computer industry by the Japanese, this is tantamount to bringing coals to Newcastle.

Furthermore, the agreement is a big one: the Japanese company, Nippon Mini-Computer Corp. of Saitama, is predicting a production run of from 500 to 600 Data General Novas in a year or two. In addition, once the agreement has the blessing of the Japanese Ministry of International Trade and Industry (MITI), the Nova line can be expected to have a big jump on the competition. No other

U.S. minicomputer company makes minis or has a licensing agreement in Japan.

"Normally we couldn't have touched a deal like this because we just don't have that kind of money," says Allen Z. Kluchman, Data General's marketing director. "The agreement requires no cash outlay on our part."

Seven Japanese firms formed Nippon Mini-Computer Corp. with the assistance of MITI and with an initial capitalization of \$890,000. MITI's role in the licensing agreement is regarded as important since MITI can be expected to give Nippon preferential treatment in Japan and in exports from Japan. Among the seven Japanese firms participating in the agreement are Sharp Corp., Toyota Engineering Co., and two leading Japanese commercial banks. Nippon is beginning its marketing operation in July, with deliveries of Novas scheduled to begin shortly thereafter. Initially, Novas will be assembled in Japan from subassemblies shipped by Data General. Later, Nippon will do its own manufacturing.

The exclusive three-year agreement covers only current Data General products, and any new products will be available on a new royalty basis. Also, the licensing agreement stipulates that Nippon buy a "minimum amount" of Data General equipment during the first year the agreement is in force.

The agreement was negotiated by Data General's president Edson de Castro, who said that the mini market is beginning to "take off" in Japan. Nippon will also mount a marketing campaign throughout Asia, including the Peoples Republic of China. The U.S. State Dept. approved the agreement. The provision permitting Novas to be shipped into Communist China is regarded by some as an example of the easing of tensions between the U.S. and China.

Certain restrictions have been placed on Nippon which would limit sales to the U.S., although it is possible in rare cases that Japanese Novas could be imported here, as a component in a large system. Nippon is also restricted from shipping more than 20% of its Data General-licensed products outside Asia. This provision would tend to limit Nippon sales in

Europe.

Generally, Japan has lagged in the manufacture of minicomputers. Panasonic has sold some 200 minis in Japan and has even introduced two in the U.S., but the products to date have not been well received in the U.S. Many regard MITI's decision to go with the Data General machine as an indication that MITI felt U.S. minicomputer technology would be needed if Japan was to be competitive in the field.

Analysts See Change in Market for Minis

Shipments of general-purpose computers to U.S. markets are not expected to increase in 1971, and future predictions of growth are being scaled down considerably, according to computer stock analyst Jack Lukin of the investment banking firm of Burnham & Co., New York.

Relying on figures from Arthur D. Little, International Data Corp., and Quantum Science, Lukin had predicted 17% annual growth in revenue through 1975 only three months ago. Now it looks to him as if an increase for this year, at least, is not in the offing.

In the software and professional services submarket, Lukin characterizes performance as having been extremely disappointing. He notes that there has been a decline in user efforts to implement new applications and a resultant softening in demand for programmers and analysts. But those still employed are proving to be far more flexible and productive than in recent years. So, apparently, end users are benefiting.

In the peripherals market, Lukin sees too many manufacturers of other than plug-compatible equipment, firms that entered these markets believing widely held market projections that have subsequently proved to be overoptimistic. And competition may even intensify, he said, perhaps with price shaving. (This comment was made before the IBM announcement.)

Lukin is even less optimistic about the minicomputer market. He notes that minicomputer cpu and memory prices have declined significantly as a

result of increased competition as well as lower production costs attributable to technological improvements and higher production rates. But marketing and other overhead costs have not declined commensurately, and profit margins are under pressure.

International Data Corp. goes further in its "Dedicated Application Computer Market" study completed in May. IDC sees the mini market changing so rapidly that within a few years it may not exist in its present form. Although the number of units shipped continues to grow, there are serious marketing problems, IDC continues. Few new users are being attracted to minicomputers, and suppliers seem to be following market demand rather than creating it.

Soft on Sales, It Opens Software Supermarket

Item: There are hundreds of minicomputers within easy driving distance of the Boston area.

Item: Input Output Computer Services Inc. (IOCS) of Cambridge has minicomputer software applications and peripherals it wants to sell, but doesn't have enough salesmen to cover all the users of minicomputers.

Solution: The Input Output Computer Services Minicomputer Applications Mart, a showroom that is essentially a supermarket.

"We're always open during business hours," says Thomas A. Farrington, IOCS president. "Most people call before they come. For the most part we demonstrate applications, but we also demonstrate hardware."

The young firm's products are offered with Digital Equipment Corp.'s PDP-8 minicomputer line. IOCS' "supermarket" has two PDP-8s, which it uses to demonstrate its own proprietary products as well as Tennecomp cassette tape units and Eclectic Computer Corp. magnetic tape units. IOCS sells the peripherals and the PDP-8s along with its own products.

"But, naturally, we are most interested in selling our own products," says Farrington. "Our biggest product has been our Anagrafic digitizing tablet." The \$17,500 configuration includes a PDP-8, a graph pen digitizing



TOM FARRINGTON'S SHOWROOM: Mostly, it offers software; but you can take a look at hardware, too, at this novel "supermarket" in Cambridge.

tablet, and a teletypewriter.

"Anagrafic offers a convenient means to digitize, analyse, and process graphical data of almost any type," he explains. "It is necessary only to touch the desired data points of the original presentation with a special stylus, and the data is entered into the computer in the form of X and Y or other selectable coordinates."

First products have been designed for people who are not heavily skilled in the use of computers. The firm's Minicomputer Applications Mart provides a simple and unassuming means of demonstrating the products to people who are generally unfamiliar with computers.

Besides its Anagrafic system, IOCS is betting heavily a series of payroll systems called PAY I, II, and III. Designed for use by non-computer personnel, the PAY systems vary in price from \$1995 for a basic paper tape system to \$3100 for a complete magnetic tape system. Farrington started IOCS in May of 1969, and the firm now has 12 professionals working for it.

Software by Mail at \$1 per Day

There's something new in software marketing — mail-order software. And it's offered by a company whose underlying philosophy is "software should be cheap."

The company is Dylakor Computer Systems, Inc., Van Nuys, Calif., and its mail-order offering is called Dyl-

250, which rents for \$31 a month. "We want to become the McDonalds of the computer industry," says president Jim Case. He describes Dyl-250 as "a parameter-driven program which tailors itself to the task at hand without programming or compiling and can perform just about any utility programming job." It is offered to 360 users (minimum 32K 360/25) with either OS or DOS systems.

The \$31 price, says Case, is based on \$1 per day. An RCA version, for Spectra 70/35s and up, is available at

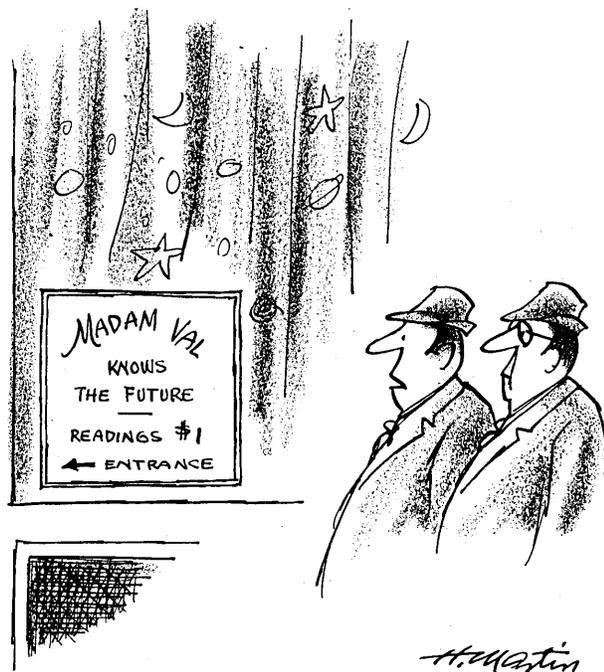
a slightly higher price, \$3 per day. This version was converted for Dylakor by Walt Disney Productions, which is using it at no charge and is the only company using it so far.

Dylakor has 31 installations of the 360 Dyl-250 and needs 500 to break even, but "we're aiming for 1,000." The first 31 were not mail-order sales. The company sent out its first direct mail piece complete with an order form in mid-May. Within a week of the mailing they'd received five firm orders and had sent out five Dyl-250 packages consisting of a neatly packed "mini-reel" of tape, a users manual, and a supply of parameter sheets. "Anyone can install it," says Case.

The first five mail-order customers, who will be allowed to return their packages at no charge to them after 30 days if they're unhappy, were: MICA Co., Chicago; Computer Processing Corp., Valley Stream, N.Y.; Thatcher Glass Mfg. Co., Elmira, N.Y.; PCS Data Processing Inc., New York City; and Michigan Millers Mutual Insurance Co., Lansing. Bill Newcomer, executive vice president, said the first mailing went predominantly to the New York and Chicago areas.

The idea could catch on.

(Continued on page 58)



"I'd be happy to know what's going on right now."

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Finally, Some Progress by Cobol Standards Unit

A group concerned with standardizing computer business language seemed to be getting somewhere this spring — but it's been six long years. The controversial CODASYL Data Base Task Group has received approval for its data description and data manipulation language specification from a parent committee called the Programming Language Committee (PLC).

The implications of the assent are complex — and by no means final — for data base development. Vendors and users, in their organizations and on volunteer committees like CODASYL, have already spent thousands of man-hours trying to achieve a goal articulated in the DBTG report. "A point has now been reached where in designing systems capable of handling our current demands, it is essential to develop data bases that are available to and suitable for processing by multiple applications that can be interfaced by multiple languages," the report says.

The development and acceptance of common data base languages are obvious keys to that goal. Users said these languages will be as important to the industry in this decade as programming language development was in the 60s, and that is why careful consideration of the DBTG efforts is mandatory.

History of the CODASYL Programming Language Committee proved its power. Its charter since 1959 has been development of COBOL specifications. The American National Standards Institute (ANSI) drew from it to develop in 1966 a subset called Standard ANSI COBOL. And if the DBTG project passes through further steps of CODASYL acceptance, it may someday be the foundation of ANSI standards for data base languages.

Some users and vendors are now basing implementations on it.

The most important section of the report is the universal data description language, independent of all processing languages, for describing data in a

data base. This seems to have received approval by the 13 user and vendor members of the task group and the 16 members of the PLC. The committee has recommended to CODASYL that this language be further developed and maintained by a new committee outside its COBOL domain. Much of the controversy revolves around the second part of the report: COBOL extensions for "describing that part of the data base known to a program" and the data manipulation language, for retrieval and updating, which is an enhancement of COBOL.

IBM was both a major contributor and opponent to the report. (IBM and RCA were the only members in DBTG that voted no.) According to IBM's position paper to the PLC, it objects to the data manipulation language, which it described as being too complex, lacking in data independence, and not clearly adaptable to advances in computer architecture and technology.

Primarily, IBM feels the applications programmer should have little concern with the "underlying data base management system technology," presumably relegating that to the system itself. "In regard to the retrieval and updating of information in a data base, the language should not require the programmer to be concerned with objects other than the data items, records, and relationships which pertain to the application. For example, the programmer should not have to be directly concerned with storage, addressing, access techniques, or methods of representing relationships in secondary storage . . . the language should allow the programmer to state what is to be done — as opposed to how it is to be done."

A DML, "free of such implementation considerations, is potentially capable of much wider use and is technically superior," the paper adds.

Despite IBM's opposition, the PLC voted 12-4 to take the next step on the DML (with Burroughs, RCA, and Xerox Data Systems joining IBM in dissenting). It is being returned to the task group to be formatted for publication in the *COBOL Journal of Development*, which presents "current state of the official COBOL language." (Continued on page 60)

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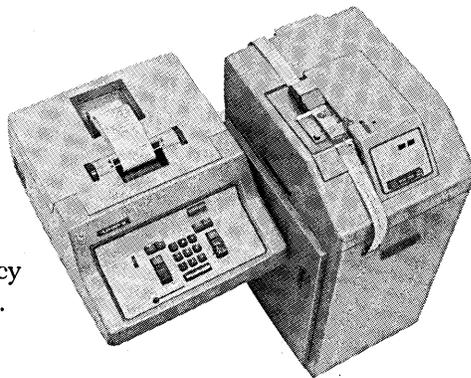
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NEWS SCENE

The actual DBTG report, April 1971, will soon be available for \$3.50 from the Association for Computing Machinery, 1133 Sixth Ave., New York 10035. ACM also has the CODASYL Systems Committee 500-page technical report (\$8), "Feature Analysis of Generalized Data Base Management Systems," based on 10 currently available systems. IBM user groups, SHARE and GUIDE, are disseminating the results of a joint study, "Data Base Management System Requirements."

NEWS BRIEFS

Ruling Could Be Precedent

Computer users applauded a judgment by the Federal Court of Appeals in St. Louis which upheld a 1969 decision in a suit by F. B. Clements Co. against Service Bureau Corp. Clements had won its claim that SBC misrepresented the capabilities of an inventory control system it had installed in 1963. The court affirmed that a mis-

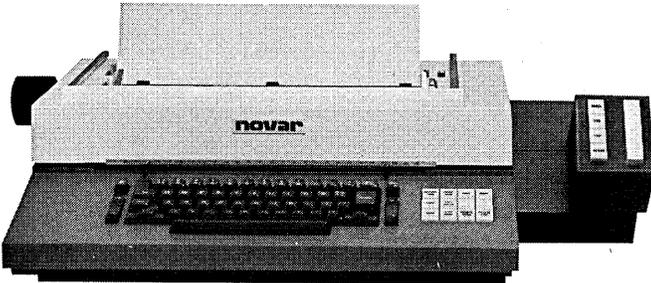
representation stemming from lack of knowledge is fraudulent under Minnesota law. Clements is a Minnesota distributor of auto and electrical products which claimed that the SBC system produced inventory reports which showed no relationship to the actual amount of stock on the firm's shelves. Says a lawyer: "Despite the court's careful limitation to Minnesota law, the case will be used as precedent elsewhere and will help computer users in negotiations with vendors for damages when a system doesn't work." The decision is akin, in significance for the consumer, to the suits against General Motors for the faulty Corvair. The original damages of almost \$500,000 were decreased by half, however.

Fabri-Tek Maintenance Pact

Fabri-Tek, a supplier of oem core memories since 1959, has announced its first agreement with a third-party maintenance company, MAI subsidi-

ary Sorbus Inc., which will provide nationwide 24-hour maintenance service for Fabri-Tek's recently announced line of IBM 360-compatible main memory extension products. The company's oem customers will continue to be serviced directly by Fabri-Tek field engineers.

Fabri-Tek's new end-user customers require immediate local service capability, and this means a large and widespread force of customer engineers; Sorbus has over 80 service locations and a maintenance staff of about 1,000. Eight Fabri-Tek regional service centers will be maintained for continuing training of Sorbus customer engineers and to serve in a trouble-shooting capacity and as spare-parts depots. The agreement with Sorbus culminated several months of discussions with many of the large third-party maintenance firms. Fabri-Tek currently has about a dozen end-user installations and is increasing them at a rate of 8-10 a month. Arrangements are in the works to provide similar maintenance services in Canada.



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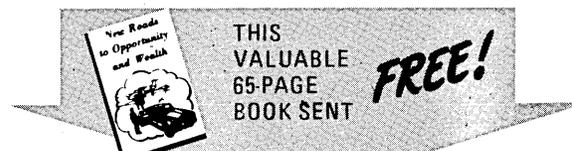


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CIRCLE 32 ON READER CARD

DATAMATION

U.S. Needs Trade Edge

WEMA president R. C. Mercure, Jr., speaking to a group of western states' Senators and Congressmen, urged that the federal government take action to create a coherent national science and technology policy and to give U.S. manufacturers an even competitive chance in world trade. He noted that long-range policy objectives have not been developed to guide the lawmakers in reducing the effects on the electronics and information technology industries and their personnel of the recent rapid shifts in national priorities in defense and space spending. Mercure suggested government and industry work together to establish a national science and technology policy stated in public law.

Mercure's recommendations for enhancing the U.S. competitive position in world trade were that the President be authorized to negotiate aggressively with Japan for admission of U.S. high-technology products Japan now excludes; that U.S. industries be

allowed to sell the same products to communist countries as our NATO allies do — without all the red tape that makes us less competitive; that Congress pass pending legislation giving more funds and freedom to the Export-Import Bank and tax incentives to manufacturers of products for export; and that the U.S. prepare for participation in the European Multipartite Accord on component standards (see June 1, p. 56).

1971 WEMA Directory

The Western Electronic Manufacturers Assn. (WEMA) 1971 directory is out and available at a variety of prices depending on where you are and how you buy it. The directory lists WEMA's 564 member companies with their product lines, key personnel, method of financing, number of employees, and address and phone number. If you're out of California and order by mail, it'll cost \$15.25. In-California

mail orderers will have to pay \$16, while those who can pick up a copy at a WEMA office will be charged \$15.75. WEMA is located at 2600 El Camino Real, Palo Alto, Calif. 94306.

Price Lower for B-R CRTs

Bunker-Ramo Corp. has reduced its crt terminal prices by 22%. This is the second price cut from the company in less than a year. Guy Mallery, B-R Business and Industry Div. vp of marketing, cites "increased production volume, new manufacturing facilities, and use of MOS, MSI and LSI as the main factors for the lower prices.

The new prices apply to the 2200-N series of terminals, which have been available since May 1. With the new series B-R is offering only two lease contracts, a two-year agreement and an open-end deal with a 90-day cancellation notice. Users of existing 2200 series terminals will get the advantage of the new prices and terms after Nov. 1. ■



H. Levin, MBA, Personnel Management, Member of ACM and DPMA



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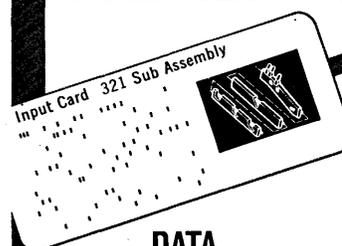
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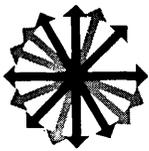
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CIRCLE 34 ON READER CARD



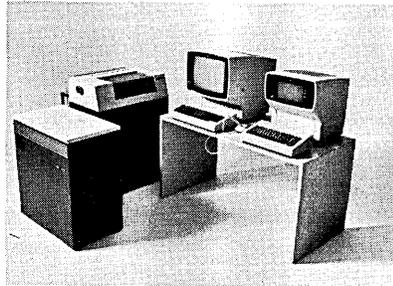
Display System

Two versions of the model 3270 crt terminal display 480 or 1,920 9x7 dot-matrix characters, have a dual-brightness control and also feature special keys allowing operators to enter data at a selected point on the screen using a specified format. The 3270 can attach either directly to

PRODUCT SPOTLIGHT

model 25 and larger 360s and 370s for operation at 10-650kc, or over telephone lines at 1200, 2000, 2400,

or 4800 baud rates. If only a single display station is required, a model of



the 3270 containing its own control circuitry may be used.

Three keyboards are offered—a 66-

key keypunch replacement, a 66- or 78-key typewriter model, or a 78-key computer operator model whose extra 12 keys are for special program functions designated by the user. A light pen and a 40- or 66-cps printer can also be attached. Monthly rental for a configuration including twelve 1,920-character display stations and a control unit will be about \$1900, or \$71K on purchase. A similar configuration of 480-character stations would rent for \$1400/month, or can be purchased for about \$58K. Deliveries begin during the second quarter of next year. IBM CORP., White Plains, N.Y. For information:

CIRCLE 558 ON READER CARD

Data Entry

Communication capability is now available in this manufacturer's product line-up, allowing transmission at up to 2000 baud over voice-grade lines between a CMC 5 and the central processing site. From 1-12 Keystations and a supervisory console are provided along with a 7-track (556 or 800 bpi) or 9-track (800 or 1600 bpi) tape unit, the all-important controller, a disc file for storing up to 10K records of 112

characters each, and a model 33 tty. The CMC 5 is hardware and software compatible with its larger siblings, the models 7 and 9. A field length of up to 64 characters is permitted, as is a record length of up to 112 characters, with up to 32 fields per record.

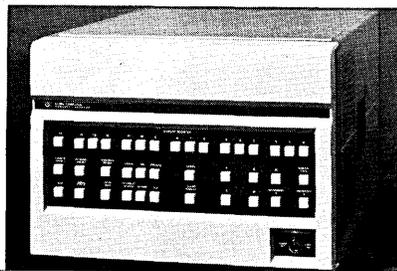
The model 511 data communicator handles the communication chores (optionally), and a line printer is also offered. The controller is responsible for checking data format, assembling and transferring data to portions of the disc, and allocating

storage to each Keystation. The operating system also directs automatic operations such as skipping of columns, duplicating of records, and inserting of repetitive information. Available in the fourth quarter of the year, a six-station system with supervisory console and tty will rent for \$990/month. COMPUTER MACHINERY CORP., Los Angeles, Calif. For information:

CIRCLE 559 ON READER CARD

Minicomputer

Both hardware and software-compatible with previous H-P computers, the model 2100A mini offers folded planar core memory (all stored in the mainframe) in several configurations ranging from 4-32K of 980-nsec, 16-bit words. Other features include 80 instructions implemented with MSI/LSI ROM, two addressable accumulators, memory protect, power fail/auto restart, memory parity checking, two-channel DMA, and a multi-



level priority interrupt scheme. This all adds up to approximately a 40-100% performance increase over ear-

lier models. FORTRAN, BASIC, ALGOL, and assembly languages are offered, as is one of the more comprehensive application program libraries in the industry. The minimum \$6900 price includes a 4K model with memory parity and protect, power fail/auto restart, and an extended arithmetic unit. Additional 4K chunks of memory are priced at \$3500. Oem models will also be available in the fall. HEWLETT-PACKARD CO., Palo Alto, Calif. For information:

CIRCLE 556 ON READER CARD

Cassette Transport

The Model 2020 cassette tape transport system provides three independent Philips cassette drives, a controller, interface, and software for use with minicomputers. Features include simultaneous reading and writing on separate tape decks, backspace record capability, and high speed bidirectional search for addressable files. Interfaces are presently available for Nova, PDP-11 and -8, with more on the way. Software in-

cludes modifications to the minicomputers' assemblers to permit recognition of the cassettes as I/O devices, well as appropriate editing and utility programs. A keyboard controlled executive is also provided. System capacity is 900K 8-bit characters and read and write rates are 667 cps. Average search time is 20 seconds. The price is \$6900, with reductions in quantity. Deliveries begin next month: CANBERRA INDUSTRIES, INC., Meriden, Conn. For information:

CIRCLE 516 ON READER CARD

Memory System

Available in September to oem's will be a non-destructive read-out plated wire memory system with 125 nsec read access time, 150 nsec read cycle time, and a 300 nsec write cycle time. The selection scheme is a diode matrix with a capacity of 16K bytes (2K words of 72 bits). The price list says that until 1973 the HS-150 memory systems will be priced at 5.5¢/bit. TOKO, INC., Tokyo, Japan. For information:

CIRCLE 562 ON READER CARD

Voice Response

Having built voice response system components for oem's for the last several years, this firm is moving more and more into the end-user segment of the marketplace with such systems as the DIGITALK 4000. Approximately \$5K buys the necessary electronics and communication equipment to transmit the 10 ordinal and 26 letters of the alphabet in ASCII code between computers and touch-tone telephones, hooking onto the Direct Access Arrangement (DAA) supplied by the telephone company. An additional \$2K added to the purchase price puts 27 more application-oriented words (which may be in phrases) into the vocabulary.

One of the nicer features of the 4000 is that as a company's transmission capacity increases, additional DIGITALK 4000 boxes can be appended to the phone rotary as needed—instead of purchasing a larger scale system that might not be fully used for years. The 4000 accepts data from the user, stores it, reads it back to him for verification, and then forwards it to the computer when the user desires. A four-digit security code must be successfully entered before the system will talk to the user. Installation is included in the \$5K price, and availability is currently 60 days ARO. METROLAB, INC., San Diego, Calif. For information:

CIRCLE 561 ON READER CARD

Disc System

Both tape and disc devices attached to PDP-8s can be operated with the same controller with no hardware or software changes according to this firm. It's actually marketed as a system, consisting of DECTape mtu storage and the Diablo Systems model 31 cartridge disc drive providing 838,000 words of storage accessible in 70 msec. The transfer rate of the disc is 50kc continuous. Up to eight discs and tapes can be intermixed, with the discs responding to the DECTape instructions. The 3100 system also works with PS-8 software. A single disc configuration is priced at \$10,400. The first DECTape unit costs \$4800, and each additional disc and tape unit runs \$5300 and \$2900, respectively. SYSTEM INDUSTRIES, Sunnyvale, Calif. For information:

CIRCLE 520 ON READER CARD

(Continued on page 64)

July 1, 1971

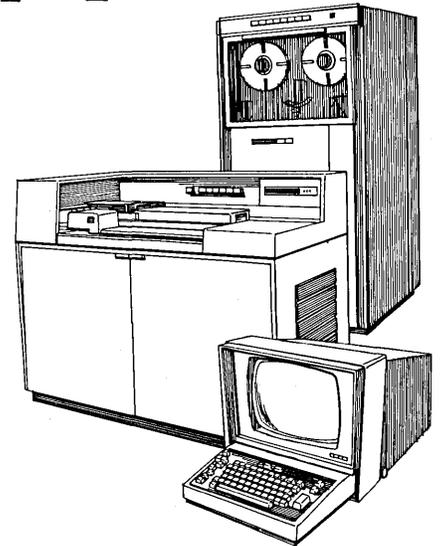
Control Data publishes 1971 catalog of OEM peripheral equipment

A new catalog of Control Data peripheral devices for OEM private label re-sale is now available. It covers a complete line of products for mini-computer and special system manufacturers as well as large system manufacturers. Among them: optical readers, computer tape transports, disk memories, printers, terminals and many other input-output items.

Featured are new high-speed disk memories, advanced tape transports, card readers and punches, optical document and page readers, all of which offer performance equal to peripherals marketed under Control Data's own nameplate.

Full OEM support

OEM peripherals are backed by Control Data Sales and Service offices in all major cities throughout the United States as well as population centers abroad. Service and spare parts are available at all times



— far more so than from any other supplier.

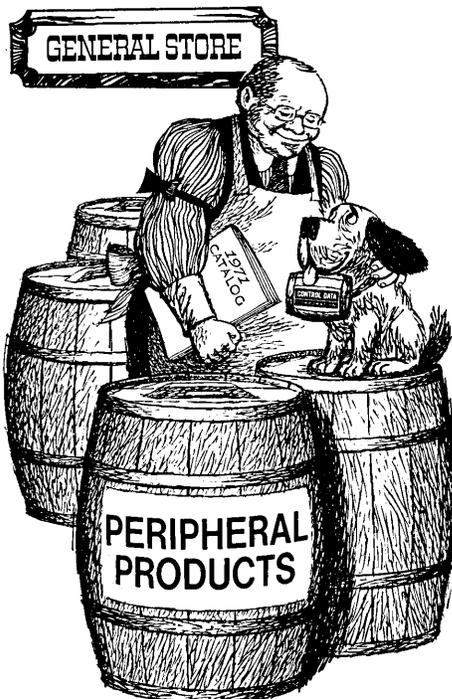
CDC technology stands at the front of new developments: disk memories with extremely high speed voice coil positioners...super fast line printers with high legibility...sophisticated optical readers for documents and page processing.

Free catalog offer

Control Data's new OEM purchasing guide for 1971 shows this equipment, tells about CDC services, gives details of such important points as IBM plug-compatibility and data-compatibility. Interested manufacturers can obtain a copy without cost or arrange a demonstration if desired by contacting Control Data Peripheral Products Sales. Write Control Data Corporation, Dept. D-7-1, Box 1980, Twin Cities Airport Station, MN 55111. Or call our HOT LINE collect:

612/853-3535

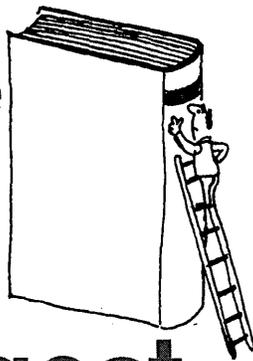
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Minicomputer

Depending on the target application, several types of ROM are used on the Micro 1600 for logic storage. Single and dual cpu configurations are offered, and there are 32 general-purpose registers using MSI/LSI which can be assigned buffer register, accumulator, index register, or program counter functions under program control. The ROM containing the microprogramming can range up to 16K of 200-nsec 16-bit words, while the main memory can be expanded up to 64K of core using 4K and/or 8K blocks. Basic systems start at something under \$5K in moderate quantities. MICRODATA CORP., Santa Ana, Calif. For information:

CIRCLE 563 ON READER CARD

Core Storage

Many 360 model 40 and 50 users will doubtless keep that equipment for one reason or another, and here is a line of add-on memories to help reduce the cost of maintaining those systems in the years to come. The CORPAK 40 and 50 are available in all standard IBM add-on increments and may be used to add on, replace the original IBM extension, or to replace the original core memory. They will be maintained by Sorbus, Inc. The price for 64K of 360/40 add-on memory is \$59,592, or \$1280/month on a two-year contract. Model 50 users can obtain 128K for \$141K, or \$3177/month. INFORMATION CONTROL CORP., Los Angeles, Calif. For information:

CIRCLE 525 ON READER CARD

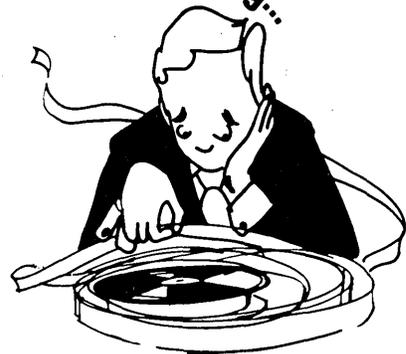
Disc Drive

End users and oem's are offered the model 7900A disc drive, combining a single permanent disc and an interchangeable 2315-type cartridge. Average access times to the 8 megabyte capacity are about 50 msec. The 7900A is not affected by pitch and roll motion, so units could be used in demanding environments, it is claimed. First deliveries to oem customers will be in September, and end users can obtain theirs in November. The price of \$16K includes power supply and controller. HEWLETT-PACKARD CO., Palo Alto, Calif. For information:

CIRCLE 564 ON READER CARD

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feet
of nothing
at a
cost of
\$2,328....**

**that's
a lot to
pay
for
nothing...**

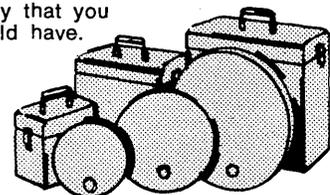


Magnetic tape protection is a basic. Many things can happen to a computer tape after the initial recording and some of them can be disastrous.

Fly a tape to San Francisco to an important conference and discover that it was stored too close to the powerful motors on the plane. Perhaps your new research center is near a large power generating station... then your tapes can be in danger.

Perfection Mica makes containers that will give you basic protection from magnetic distortion or erasure either in transit or in permanent large storage.

Write us about how our protection works. It will save you vital information. This is truly a low cost assurance policy that you should have.



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CIRCLE 15 ON READER CARD

DATAMATION

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S/3 Peripherals

Here are three more 96-column card peripherals offered oem's by a firm that would seem to have the lead in offering a variety of "funny card" equipment. The 9625 is a table-top model sold in two versions: the \$1200 model -01, complete with all read sensing and basic electronics, read checking, 96-column buffer, motor controls, transport, and 600-card capacity i/o stackers; and the model -02, including read sensing circuits, transport, i/o stackers, and casework, listing for \$800.

The model 9635 reader/punch is

rated at 300-cpm reading, and 60-cpm punching, with punch rates going higher depending on the number and location of columns to be punched. The 9645 printing reader/punch additionally offers 64-character card printing in any combination of reading, printing, and punching of 96 columns. This unit sells for \$5500. Both of these models feature 600-card primary input stackers, a 400-card input stacker, and two 400-card output stackers. Deliveries on all peripherals start this month. DECISION DATA CORP., Warminster, Pa. For information:

CIRCLE 567 ON READER CARD

Tape Drive

Depending on how an oem or end user customer fills out the order sheet, the 7970 series tape transport can have 10-45 ips speed, 7- or 9-track heads for read-after-write, read only, or read NRZI and phase-encoded modes. Additionally, densities range from 200-1600 bpi, with transfer rates going up to 72 kilobaud, and rewind speeds up to 160 ips. Oem's are offered 160 ips searching capability. A single capstan drive mechanism is used. Basic models start at \$3900, with the most sophisticated model ticketed for \$8650. HEWLETT-PACKARD CO., Palo Alto, Calif. For information:

CIRCLE 565 ON READER CARD

Cassette Storage

The model 2000 cassette drive uses Philips-type cassettes for reading or recording information at 5 ips. The bi-directional units have 20 msec start and stop times, and 60 ips search speeds. Dual capstan drive provides a data transfer rate of 5000 baud at this drive speed, with optional speeds ranging from 2-15 ips. Also available are 10 msec start/stop times, read-after-write capability, one- to four-track heads, and others. Oem's may purchase the 2000 cassette drive for something under \$200/unit in quantities of 100. DYNAMIC PERIPHERALS INC., Nabnasset, Mass. For information:

CIRCLE 560 ON READER CARD

Batch Terminal

The secret of the System 515 remote batch terminal being a physical and logical replacement for the IBM 2780, CDC User 200, and Univac DCT 1004 is really no secret at all—it merely depends on which software emulation package the user needs. The 515 provides a 132-column, 135-lpm printer, and a 300-cpm reader. Additional features include automatic answering for dial-up lines, multiple record transmission, horizontal format control, 2000-baud transmission rates over dial-up lines, or 2400 baud on leased lines. The terminal will be serviced by Raytheon for \$120/month, with the System 515 selling for \$18,880, and renting for \$490/month on a one-year contract. The terminal is available off the shelf. M&M COMPUTER INDUSTRIES, INC., Orange, Calif. For information:

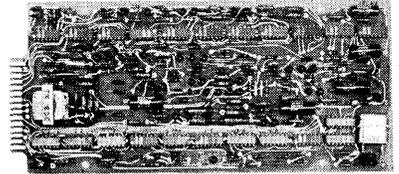
CIRCLE 566 ON READER CARD

Interactive Display

Character and vector display are the capabilities of the vb-c system. It features a 21-inch diagonal crt, 1K x 1K resolution, eight levels of intensity, zoom logic, graph plotting mode, light pen, alphanumeric 128 ASCII set, independent scaling of axes, and subroutine logic. Options include a function box, an x-y tablet, keyboard, and slave scopes. Display capacity goes up to 1500 characters or 6,000 inches of vectors. The vb10-c is for use with all configurations of the PDP-10 computer and connects to the multiprogramming system through i/o and memory bus. Software is available from DECUS (Digital Equipment Computer Users Society). A basic vb10-c is priced at \$35K, with delivery four to five months ARO. DIGITAL EQUIPMENT CORP., Maynard, Mass. For information:

CIRCLE 519 ON READER CARD

Bell-Compatible OEM Modems Off-The-Shelf Delivery

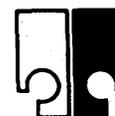


Tel-Tech OEM Modems. Hard to believe. Crystal controlled, TTL IC logic. Ultra-reliable operation. Error-free performance. Compact. Economical. And maintenance-free.

Our Bell-compatible 103 (up to 300 bps) and 202 (up to 1800 bps) asynchronous OEM modems consist of merely one small, low-profile PC card. Even an optional 5 baud reverse channel can be incorporated on the same card. Should you desire synchronous operation, we'll provide another PC card for that. And, our Bell-compatible 201's (synchronous at 2000 or 2400 bps) use only two compact, low-profile PC cards. If you require a PC card of different dimensions, we're set up to reconfigure our OEM modems to your exact requirements.

And—for your central sites—up to 10 modems can be accommodated in one of our 19" racks and share a common power supply.

Prices start at less than \$200/modem in small OEM quantities. Hard to believe. But true.



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CIRCLE 16 ON READER CARD

The Victor 2-Step.

Now you can side-step five of the seven steps it takes to prepare compatible computer input under conventional data collection systems. It's your shortest route to compatible computer input.

No more batching, coding, keypunching, verifying, editing and merging, and retrieving error listings. With our Victor Series 800 all you do is prepare your source document on our console. It handles all the intermediate steps for you—automatically. Right up

to actual data processing.

What's more, our Series 800 gives you built-in flexibility. It's a stand-alone computer creating hard copy documents needed for your accounting and billing operations (payroll checks, invoices, accounts payable) while at the same time it transmits data to a pooled magnetic tape unit.

How did we do it? It's simple enough. With the Victor

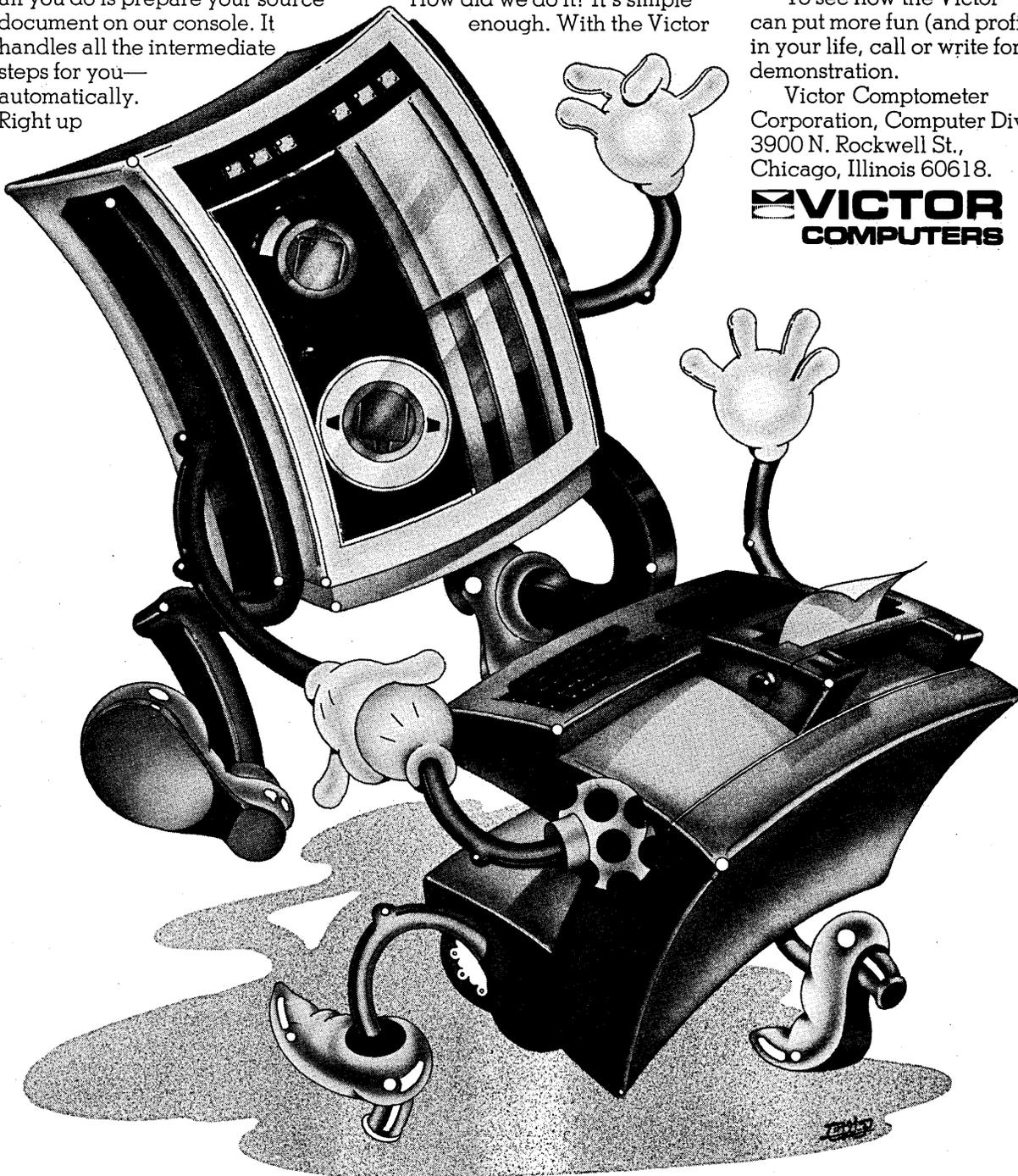
Series 800, we simplified. Each console* has a true internal programable memory.

It pre-edits, formats, field checks and error checks all data entered and then transmitted to the pooled magnetic tape unit. In order to save you space, time and, last but not least, money. Right now and in the long run.

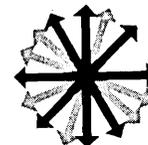
To see how the Victor "2-step" can put more fun (and profit) in your life, call or write for a demonstration.

Victor Comptometer Corporation, Computer Division, 3900 N. Rockwell St., Chicago, Illinois 60618.

VICTOR
COMPUTERS



*Up to 16 consoles can be feeding data into one pooled magnetic tape unit at one time.



Mini Simulation

MINI-SIM is a BAL program for System/360 or 370 equipment that generates programs for PDP-11 and Varian 620 series minicomputers. Once generated, the programs are exercised by the simulation portion of the MINI-SIM program to insure that they'll work in the target computer. Approximately 16K bytes of memory are required, plus a bit-for-bit representation of the memory capacity of the target minicomputer, so that an 8K PDP-11, being a 16-bit word machine, would require 32K bytes. The MINI-SIM mainframe simulator is priced at \$3750, including the source program and supporting documentation. Options to the program include modules for simulating various peripherals. These are priced at several hundred dollars. TRIPPE SYSTEMS INC., San Francisco, Calif. For information:

CIRCLE 555 ON READER CARD

Program Editor

Available to the numerous users of the Varian 620 family of computers is a program editor for correcting assembly language and FORTRAN programs, as well as free text. It is designed for use with a minimum 4K mini using a tty, but user options permit selection of paper tape reader/punch peripherals, too. While typical editors handle one source statement at a time, this one loads the entire source program into core and permits random access to the desired statements without having to go search a tape for each correction desired. Additionally, the program can check for parity failures in the tape, note their location, and find the statements in which they occur. The program editor is priced at \$280, including the operating instructions. DIGITAL METHODS LTD., Ottawa, Canada. For information:

CIRCLE 554 ON READER CARD

Cross-assembler

Rounding out the library of cross-assemblers supporting the MAC line of minicomputers—which includes LEAPFORT and LEAP 360/DOS—is LEAP 360/os. Source programs written in the MAC assembly language can now be assembled on System 360/370 machines using OS, offering current and potential MAC users an alternative to the purchase of additional peripherals for the MAC to support assembly functions. The program effectively provides 32K words of memory, obviating program segmentation with its accompanying programmer headaches. This amount of storage also offers a much larger list of symbols to be used. Together with documentation and a one-year warranty, LEAP 360/os sells for \$1K. LOCKHEED ELECTRONICS COMPANY, INC., Los Angeles, Calif. For information:

CIRCLE 552 ON READER CARD

System/3 General Ledger

General Ledger/3 is an RPG II full ledger system for the model 10 (configuration I) having 12K and disc storage enough to accommodate the 8-12K byte programs. Included in the package are routines for chart of accounts, general ledger, monthly

balance sheet, monthly P&L statement, monthly budget analysis with projection, and year-to-date P&L statements. The user posts to a data collection sheet which becomes the general journal.

General Ledger/3 source deck, object deck, program listings, documentation, and operations manual is

priced at \$500. It is also available for a monthly rental of \$30. Installation assistance and training are priced separately. LOGIC SYSTEMS CORP., Roanoke, Va. For information:

CIRCLE 551 ON READER CARD

PDP-8 and -11 Monitors

Two real-time monitors, one for the PDP-8 and the other for the PDP-11, enable the user for a small cost in core to divide the system by task and function into a number of job streams. The streams are user defined and can make use of any device linked to the processor. The number of streams that can be established for a system depends on the processing speed of the its job mix and I/O de-

vice speed.

The monitors provide function isolation so that the operator has the illusion of a dedicated system. Should there be a conflict between jobs for an I/O device, a test of device status and queuing can be written into the stream control, or the monitor can handle the queuing. Another feature of the monitor is re-entrance, which permits the sharing of subroutines by any number of display or teletypewriter terminals. The common

routines can be held in an intermediate store maintained by the monitor.

Both monitors work in a basic 4K memory. The PDP-8 system requires approximately 900 words of core and the PDP-11 version needs 500 words. The price for each the basic monitor systems is \$2000. Purchase is by mail order and delivery is 30 days ARO. SYSTEMS CONCEPTS GROUP LTD., Ottawa, Canada. For information:

CIRCLE 557 ON READER CARD

Tape Library Program

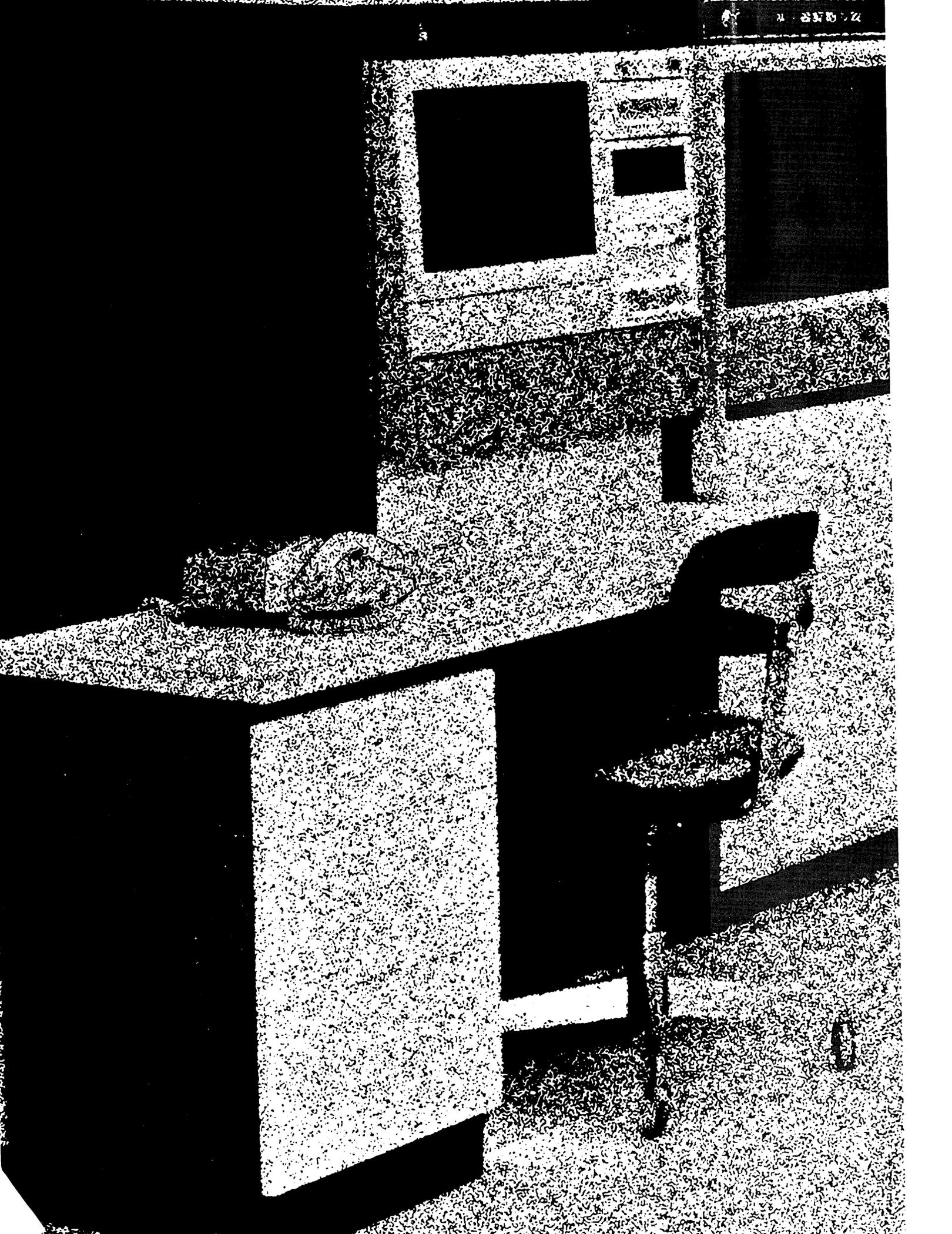
An automated tape library management system called TIMS (Tape Inventory Management System) provides tape librarians with such information as inventory location, remote site location, responsible individual or organization, data set name and number, volume sequence, scratch date (three types of retention are available), and descriptive title in the form of retention, transaction er-

ror, volume scratch, and processing statistics reports. Other reports produced on demand or by automatic scheduling include a transaction register, complete volume inventory, condensed volume inventory, volume warning, and available scratch listings. Management is provided a report depicting current and past transaction error rates, inventory error rates, inventory status, age, and value of the entire library.

TIMS is available for OS and DOS

installations, is written in COBOL and BAL, and requires approximately 32K of core and some common peripherals. The program can be purchased for \$3K or leased for \$50/month. Two days of on-site assistance and a user's manual are provided, as is program maintenance. MANAGEMENT COMPUTER SYSTEMS, INC., Oklahoma City, Okla. For information:

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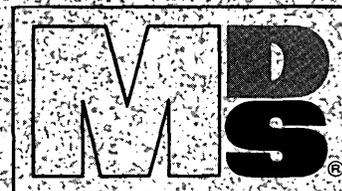
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Avis is going to be No. 1. That's their goal. And Greenwich Data Systems is helping them get there by designing and installing "The Wizard of Avis,"* the car rental industry's first totally computerized reservations, car control and customer accounting system.

Actually, we started designing "The Wizard" for Avis in 1969,

and completed functional specifications in June 1970.

Avis picked Greenwich Data Systems because we're already No. 1 in on-line, real-time tele-processing systems. And because "People Make the Difference" at GDS.

All of our people have worked on sophisticated data processing projects like the PARS reservations and control package, NASA's Apollo moon landing missions and American Airlines' SABRE system.

If you need to design, develop, program, implement, audit or manage a large computer system of any kind, contact us today. Chances are we can save you time, trouble and money. Ask Avis.

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*"The Wizard of Avis" is a service mark of Avis Rent A Car System, Inc.

The Wizard of Avis.
It has nerves of steel, an electronic mind,
and a heart of gold.

Avis is about to revolutionize the rent a car industry. We're building a computer system that will be the most advanced in the business even though our present system is already the best in the business.

It will be called The Wizard of Avis.

Avis is still a lot of wonderful things for us and for you.

The Wizard will convert all Avis rental, administrative, and reservation terminals and hook them up directly to a central location at Avis World Headquarters.

The Wizard will also be programmed to be nice to people.

What all this means to you is that you'll be able to rent a sparkling new Plymouth or other fine car from Avis in less time, with less trouble, and for less money than ever before.

The Wizard will make renting a car ridiculously easy.

And ridiculously fast. Because The Wizard will remember everything.

It will remember all the information you give it when you make your reservation. And it will remember where every car it has been and will be. Then it will automatically locate the exact type of car you want and have it waiting for you wherever and whenever you need it.

It will also record all your reservation information on your rental agreement. And even if you should lose the agreement (gosh! the thought!) The Wizard will duplicate it.

You can't make things much easier than that.

The Wizard will save you trouble.

Whenever you rent a Plymouth from Avis, you'll know exactly what you're getting. Because

The Wizard will maintain a running history of every Avis car operation.

It will know the make, the model, the year, how far it's gone, and what shape it's in.

Since it knows all this, it also knows what cars to rent out and which ones not to rent out.

Which means you won't have to worry about getting a bad car.

The Wizard will save you money.

You tell the rental agent the type of rate you're seeking. The Wizard takes over. And does the rest.

The Wizard will make it hard for humans belong at Avis to make mistakes.

All Avis terminals that are hooked up to The Wizard will have something special called a "prompter." Each time a car is rented, the "prompter" will flash a series of messages to guide the rental agent through the complete transaction.

The "prompter" will make sure the rental agent doesn't forget anything.

When will The Wizard begin?

The first part of The Wizard will be ready in a few months when it will begin handling computer accounts.

The new reservation system will be ready in early 1972. The first automated car rental counter terminals will be in operation a few months later.

And the full system, by the end of 1972.

Meanwhile, you'll just have to be content with the best reservation system in the business.

It may seem like a long time to wait for The Wizard, but look at it this way.

That may be the last time Avis will ever ask you to wait.

Avis is going to be No. 1. We try harder.

WORLD ROUNDUP

MORE MONEY FROM BONN, BUT LESS FOR HARDWARE

The West German government will more than double what it spends for computer technology during the next three years. Dr. Wolfgang Finke, deputy head of technology at the Ministry for Science and Education in Bonn, says his agency is earmarking \$150 million in grants for dp development at the end of '74, vs. \$71.5 million to be spent this year.

Finke says the expenditures will reflect a new policy where grants for training and education programs and the establishment of an effective software sector will take precedence over hardware development. The exceptions for hardware support will be in mass memory devices for data banks and special devices for environmental monitoring by computer.

Most of the money goes to two companies: Siemens and AEG-Telefunken, with the largest portion to the latter. The biggest bill has been for the development of the Telefunken TR 440 processor intended for use in radar surveillance systems. It's learned that the West German government wouldn't complain if Siemens and Telefunken were to merge their computer interests. But there is no intention of enforcing the type of marriages which characterized British and French government intervention in their computer industries.

Finke's department is raising its spending plans in all categories of science and research, with the total bill seen doubling from \$1.1 billion this year to \$2.5 billion a year by 1974.

NEW FRENCH TERMINAL

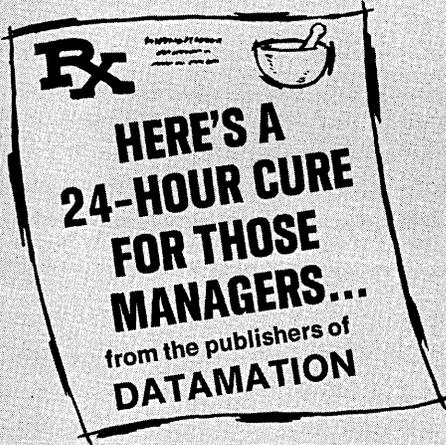
La Societe d'Electronique et Nucleaire has developed a new data entry terminal and is talking licensing with U.S. and Japanese firms. With keyboard, video screen, two tape cassettes, and microprocessor, it sells for \$4000 and can be used for I/O and text editing, information retrieval, and satellite data collection, among other things. Forecasts are for 3,000 units by the end of '73.

EUROPEAN BRIEFS

Interdata has extended operations into Scandinavia through Nordisk Electronic AB, Stockholm, its new exclusive distributor for Denmark and Sweden . . . IBM has set up three research centers in Italy to work with universities and education research groups on developing computer-aided and programmed instruction methods . . . The West German rail company Deutsche Bundesbahn is operating an experimental computer-based information system at Frankfurt for time-table display and management operations. The aim is to develop procedures for a system covering 300 stations and involving trains travelling between 1,300 destinations. The West German railway system is a cornerstone of some of the major trans-European express passenger and freight routes and is one of the most effectively developed transportation systems running.

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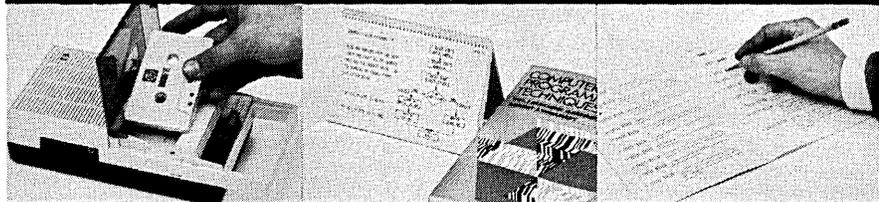
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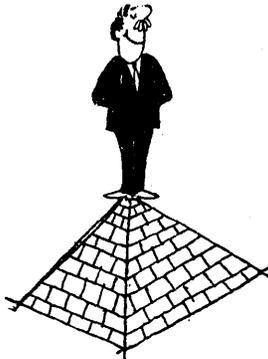
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PEOPLE

Robert C. Easton is the new president of Farrington Mfg. Co., Springfield, Va. Easton moved up from a position as secretary of the company to replace Edward J. Eggart of the Philadelphia, Pa., management consulting firm, Worden & Risberg, which took over Farrington's "normal operations" when the firm's top management resigned under pressure. Eggart's appointment was said to be temporary. Easton takes over leadership of a company in reorganization under Chapter 10 of the Federal Bankruptcy Act . . . Granger Morgan, founder and for two years project director of Computer Jobs Through Training, a traveling computer training course project operated through the Univ. of California at San Diego, will leave the project at the end of the current academic term to return to a career as a science teacher and a researcher. With Morgan's departure, the project, dedicated to teaching dp concepts to disadvantaged students, faces a double problem: replacement of Morgan and a need for new funding.

In its efforts to turn idle computing power into revenue producing efforts, Boeing Computer Services, Inc., has formed a systems development group to sell program packages. Heading the group is Dick W. Judy who will examine product development through Boeing's computer technology. Judy was Boeing's corporate director of computing when the service company was formed last year and later was named vice president of operations for the company which



is headed by president Robert W. Tharrington . . . Meanwhile, Marvin E. Stone was named vice president, operations, succeeding Judy. Stone has been with Boeing for 30 years. There was no indication in the company announcements as to what

kinds of software products Boeing intends to market.

Fred A. Vierra was appointed director-management information services for Samsonite Corp., Denver . . . Boothe Data Systems elected D. P. Boothe, Jr., and Paul W. Williams, Jr., members of its board of directors . . . The New York Stock Exchange's reorganization of its Electronic Systems Center which develops and operates its automation programs resulted in appointments of two new vice presidents, Edward De Laura, who had headed the department of opera-

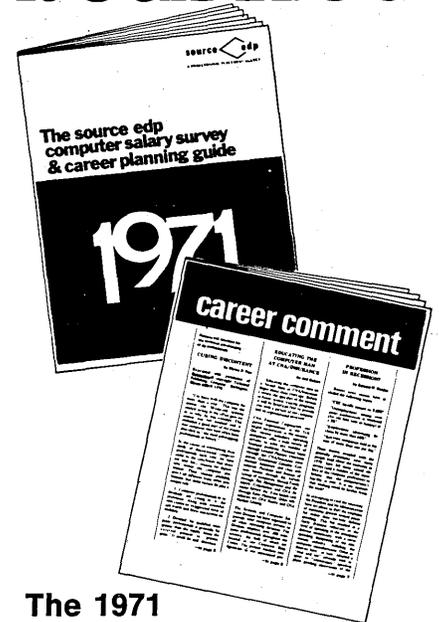


D. W. Judy C. Reuterskiold

tional development and planning in ECC since its inception, and Alan L. Loss, former management consultant.

Another IBMer has left to join RCA in Marlboro, the Boston suburb where the company moved recently to do battle with IBM's data processing division. He's Patrick A. Beeby, appointed division vice president of technical operations in RCA's newly formed systems development division. Beeby has been with IBM 20 years, most recently with the IBM systems development division as manager of recognition systems. Beeby will head RCA's computer product labs in Marlboro and its systems programming lab in Cinnaminson, N.J. These are the organizations giving support to hardware and software development . . . Julius Honig, former vice president of marketing, is the new general manager of Digital Development Corp., San Diego maker of off-line memory systems . . . The new man to talk with about systems and communications at American Express is Carl Reuterskiold, newly named vice president-systems and communications at American Express Card Div. He will direct systems design and development, maintenance and development of communication networks, methods and procedures, and management sciences. He left American Airlines to take the new post. ■

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Infotech 48

KLH Associates 15

Magnetic Shield Division, Perfection Mica Company 64

Metrolab, Inc., A Subsidiary of Cubic Corporation 12

Mohawk Data Sciences Corp. 68, 69

Novar Corporation 60

Qantel Corporation 58

RSVP Services 61

Raytheon Data Systems Company 54

Sanders Data Systems, Inc. 42, 43

Sea-Land Service, Inc. 49

SEACO Computer-Display Incorporated 39

Science Accessories Corporation 4

Source EDP 73

Tally Corporation 1

Tel-Tech Corp. 65

Teletype Corporation 10, 11, 18, 19

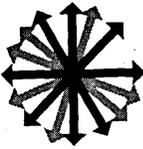
Tri-Data Corporation 5

Valtec Corporation 9

Varian Data Machines Cover 2

Victor Comptometer Corporation, Computer Division 66

Westinghouse Electric Corporation, Computer and Instrumentation Division Cover 4

ADVERTISERS' INDEX 

Addo-X, Inc., ADP Division 59

The American Business Press 24

American Technological Institute 72, 78

BASF Systems Inc. Cover 3

Bürroughs 20

California Computer Products, Inc. 74

Cambridge Memories, Inc. 9

Cincinnati Milacron Company 8

Collins Radio Company 14

Consolidated Computer International Inc. 28, 29

Control Data Corporation 50, 51, 63

D.A.T.K. Inc. 60

Data Action 6, 7

Data Dissemination Systems Inc. 61

Data General 17

Datamation Industry Directory 16, 64

DATAMATION Magazine 75

Digital Equipment Corporation 23

Data Processing Management Association 38

Electronic Associates, Inc. 2

GTE Information Systems 36

General Electric Information Services 25, 26

Greenwich Data Systems, Inc. 70

IBM 27

Inforex, Inc. 40, 41

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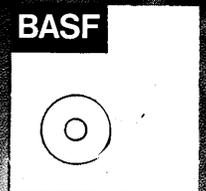
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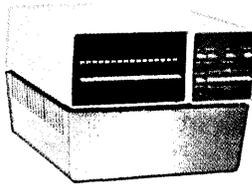
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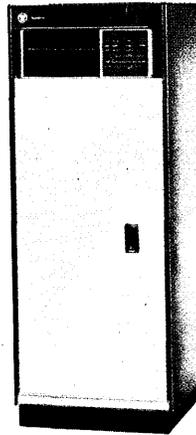
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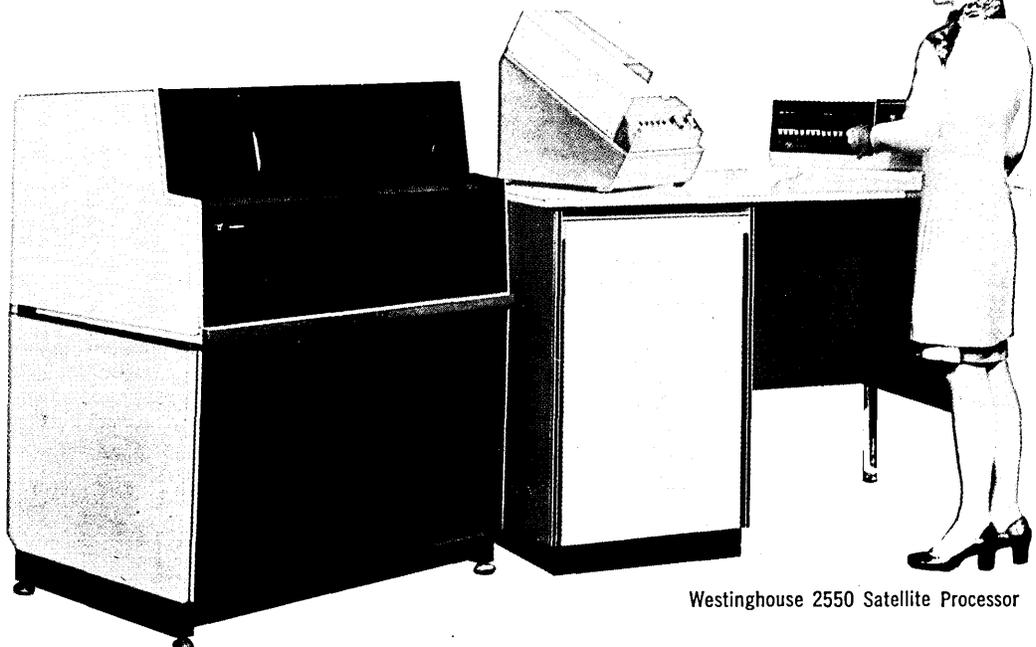


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