

MicroNews

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MUSSON HEADS STRENGTHENED SALES TEAM

Continued expansion of the Microdata sales team was emphasized recently by the appointment of Richard F. Musson as vice president of sales.

In this newly created position, Musson guides the activities of the company's national direct sales force and peripheral product sales representatives. Prior to joining Microdata, he was a principal and vice president of marketing at Data Computer Systems, Inc.

Three new regional managers have also been named. . . James H. McCormick, Jr. in 22 eastern and south-eastern states. . . John A. Machina in 13 midwestern and southern states. . . Fred L. Barla in 13 western states. Each manager is responsible for the coordination of all direct sales activities in his territory.

Upon his recent appointment, McCormick was a regional sales director at Microdata's Washington, D.C. office. His extensive experience in the computer industry includes sales and management positions.

Machina was an OEM area sales manager for Potter Instruments, Inc. He also held positions with Memorex, Computer Automation and Control Data Corporation.

Barla, prior to joining Microdata, was national accounts manager for Computer Automation.

Musson also announced the appointment of Richard

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MICRODATA'S REALITY™ SYSTEM SHOWN TO THOUSANDS



REALITY attracts record crowds at conventions, conferences and private showings across the country.

Since its introduction last year, Microdata's REALITY computer system has received widespread recognition. This low-cost distributive base management system for real-time business applications has been blanketed by the trade press in numerous major feature articles.

In addition to seeing the virtual memory system in such leading publications as DATAMATION, COMPUTERWORLD, MODERN DATA, INFOSYSTEMS and ELECTRONIC NEWS, thousands of present and potential computer users have had the opportunity to face REALITY in person. The system has been up and running at the N.A.D.A. show in Las Vegas, the National Computer Conference in Chicago, and was shown in conjunction with Info '74 in New York. The international exhibit circuit as well, with showings scheduled in the United Kingdom.

Operating REALITY systems are also on continuing display at authorized Microdata dealerships across the United States. Dealers report that demonstrations have proved very popular and that people seeing the system

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Minis Answer Government's Call For Help

By Richard D. Hackathorn
University of California, Irvine

In a recent article, Mr. Donald Carpenter of IBM's State and Local Government Division related some ways in which computer technology can help state and local governments meet the increasing demands for services. The main thrust of Carpenter's article is that, through greater productivity, the computer technology has the potential of shifting government operations from a reactive mode (i.e., putting out fires) to a predictive mode (i.e., preventing fires). The key element in achieving the predictive mode of operation is the

ability of governments to. . . Governments have found that computers, if applied correctly, are indispensable for the automation of complex clerical tasks, such as accounting and payroll. However, a "what if" capability requires something more than just automating clerical tasks — it requires a "what is" capability. In other words, the data handled by a government should be thought of as a critical resource essential for being aware of what is happening, and should be managed wisely.

The perspective of data as a critical resource has been succinctly described by

Charles Bachman, one of base management systems. In his article "The Programmer as Navigator," he likens the development of data management technology to the Copernican revolution of the Fourteenth Century.

In the same manner that the Copernican revolution changed man's view of planetary motion from a sun-centered to an earth-centered view, data base management

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OEM Peripherals Group Formed To Spearhead Expanding Program

Microdata Corporation has formed an OEM Peripherals Group to provide complete coordination of engineering, production, marketing and service of the company's growing line of peripheral equipment.

Organization of the new OEM Peripherals Group, based at the corporate headquarters in Irvine, California, reflects the continuing emphasis being placed by company management in the peripheral products area.

Engineering and production facilities are being sub-

stantially increased with the construction of a new 49,000 sq. ft. building. All phases of product development, from basic research to quality control testing, are being expanded.

The company's established peripheral product lines include single- and dual-disc drives, and 8½" and 10½" tape transports. Recent introductions added 1 x 1 and 1 x 4 NRZI and PE data formatters to the list.

The disc drives provide on-line storage for 25 to

100 megabits, using the 5440 cartridge. The drives offer 1500 rpm rotation and 100 tpi recording capacity, as well as the recently announced 2400 rpm and 200 tpi operation.

The tape transports, available in all standard densities, offer a choice of 7 or 9 tracks. Both NRZI and PE recording formats are available. Speeds range from 12.5 through 45 ips.

The new data formatters are designed to be mounted inside Microdata tape trans-

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NATIONS trade press editors face Reality at 1974 NCC in Chicago.

Minicomputer Dealers Face Major Challenges

Thinking about your future in mini-computers? Well, how's your byte? Been feeling a little baud with things lately? Your interface sagging, is it? Had a bit to eat at lunch, did you? Heard any good jokes in Cobol, Fortran or RPG?

Well, if you have been thinking about your future in minicomputers, then chances are you're familiar with the language that makes the above paragraph a series of "in" computer jokes. Byte, baud, bit and so forth are all terms familiar to those in the dp industry. And so they must become familiar to the dealer who wants to enter the minicomputer market.

That dealer may not be the dealer as we know him today. Many of the companies now selling minicomputers through dealers are looking for what the dp industry calls the small system house. Typical of the small system house and atypical of the traditional office products dealer is Systems Management, Inc., Des Plaines, Ill.

SMI, formed five years ago and staffed by several

The system which convinced SMI to shed its objectivity mantle and become a dealer, is designed as a real time online operating system, says Milligan. It's in an environment for the smaller user and is what he calls a "distributive data processing system. What I mean is that during the '60s everybody centralized on exceptionally large central processors with low-cost communication lines and low-cost terminals. They were able to put entire data banks in one central location and literally run the nation of terminals with communication lines."

That basic thinking changed in the '70s, Milligan contends, mainly because communication costs are going up and "the rates on the cost of minicomputers are going straight down. In other words you're getting more bytes per dollar and more core per dollar—minicomputers have come way down on price, but gone way up in capability. So a lot of the large companies are converting from big central systems to minicomputers."

With Microdata's Reality system the minicomputer is



REALITY — you speak English, it speaks English™

versely, if the home office has had some updates regarding their data base, they transmit them back to the branch office."

Milligan feels the Reality system is a competitor to IBM's System 3. "You will find that most of the System

source — a dealer or a company that can sell the hardware, program it, reset an entire total software maintenance and show the user how to use his system with the existing operations personnel without having to hire technicians.

the Microdata Reality minicomputer system. SMI was one of about 50 firms in the Chicago area checked out by Microdata.

SMI began life writing customized software for dp users and evolved to do consulting work, to actually run a user's dp department through a facilities management contract; to handle service bureau contracts and design system configurations.

Jack Higginson, executive vice president, and Bob Milligan, marketing vice president, are both as familiar with byte as with hamburger.

Rather than spend a great deal of money in setting up marketing organizations and system support organizations," Higginson remarks, "Microdata decided to go the exclusive dealership route. That way, they reasoned, the dealer has a profit responsibility and will do a good job or get out quickly."

SALES TEAM

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W. Clark as peripheral equipment sales manager. He is responsible for all sales activities of the company's complete line of peripheral products, including magnetic tape, transports, and disc drives.

level, "on location" so to speak. Milligan gives this example of how one major insurance firm makes use of the system. "They installed a Microdata system in their research lab. They are looking at that exact same philosophy, determining if they can put one in every single branch office. They could put all their files online, and service their policy holders with instantaneous response in this distributive data processing environment. Once a day they zap the home office on a dialog basis, which doesn't require a big network of leased lines on a dedicated basis. And they transmit their updates to the home office. Con-

3s which are currently being proposed and installed are batch oriented systems. You punch the data, you verify it, you process it against an edit; and then you reprocess data that was not correct and process your update."

This batch processing, he says, is still linked to the philosophy of the '60s, whereas Microdata is in line with the '70s. "We can install and operate on any kind of communication network. The Reality comes standard with eight communication channels so actually, with a small unit, you've still got room to grow.

Both Higginson and Milligan feel that today's small user is looking for one

The "philosophy in the '60s, of a number of manufacturers, was to sell pieces of hardware, then convince the smaller user to hire technicians full time on his staff," comments Milligan. "But the businessman of the '70s has a lesser risk when he can look to a highly professional firm that can implement both sides of it and then maintain the hardware.

Higginson says, "The initial thought was that you could take a user, a book-

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is changing man's view of data processing from a computer-centered view, in which data flows sequentially through computer programs, to a data-centered view, in which computer programs move through the data.

Computer-centered data processing has typically consisted of the merging and sorting of magnetic tape files that are designed to support only a single functional application. The problems with this traditional approach have been: (1) the lack of data integration that would allow data to be shared among functionally different applications; (2) the occurrence of duplicate data that produces inefficiencies in keeping the data current and accurate; and (3) the lack of independence between data and programs that permit systems to evolve easily.

In attempting to alleviate these problems, there has been a trend in the direction of generalized data base management systems. The term data base has been used to denote the aggregation or intergration of these separate files. The important aspect of the data base is that relationships within the data are pulled out of the application programs and are

made part of the data base.

In other words, the data base contains not only the content of the data elements, but also the structure among the data elements. Because of the separation between data and programs, general data management facilities, such as input validation, report generation, and interactive query capability, are available as part of a data base management system to allow the ad hoc "what if" questions to be asked of the data base.

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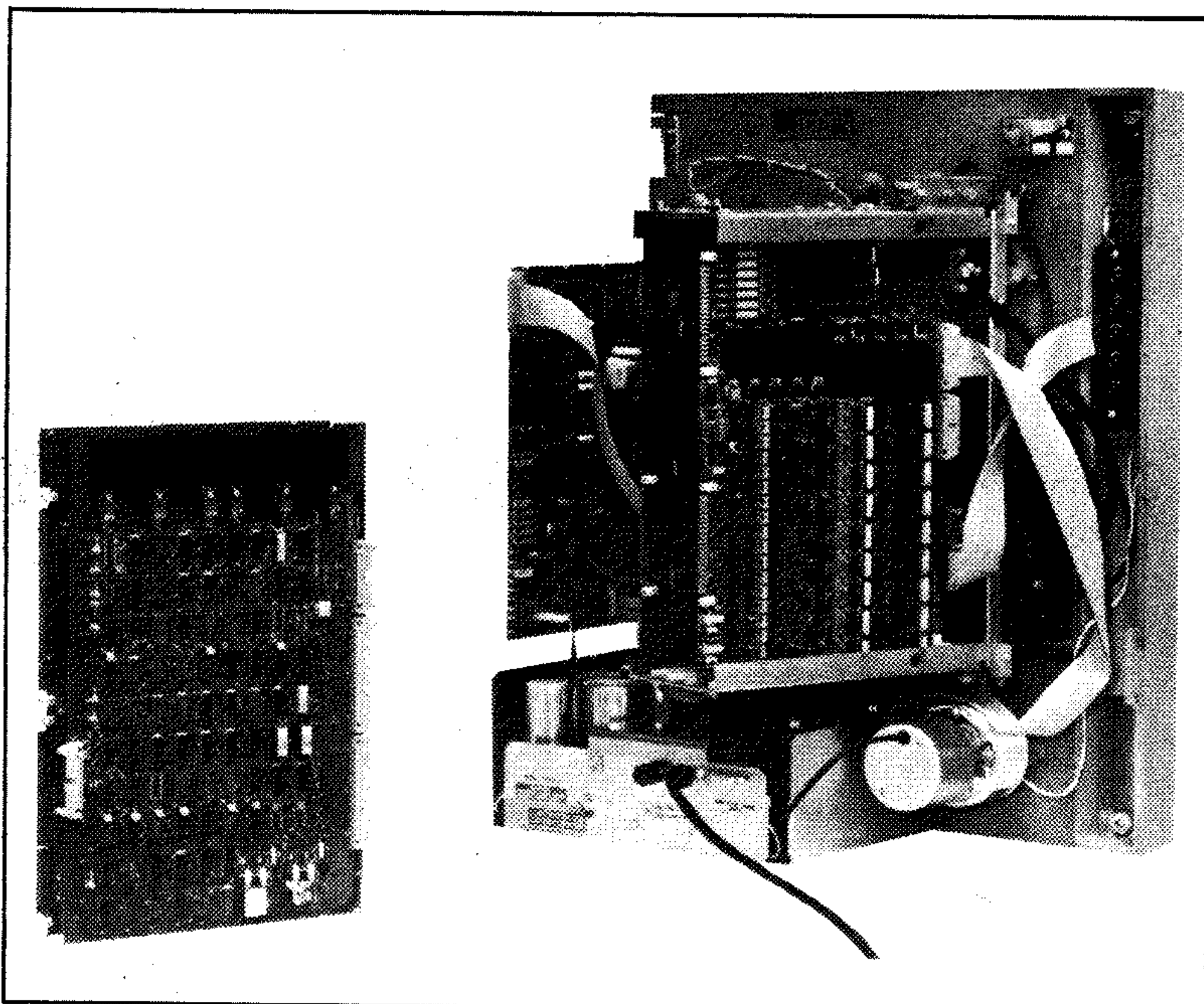
Phase Encoded Formatter Introduced by Microdata

A new phase encoded (PE) magnetic tape formatter from Microdata Corporation mounts directly inside the tape drive to save rack space and eliminate the cost of separate rack mounting. The new unit joins the Microdata NRZI formatter to give the firm a complete line of industry standard magnetic tape formatter units.

Designated Model 6922, the new PE formatter permits daisy chaining of up to four MTUs. In addition, formatter addressing capability allows the use of two formatters with up to eight MTUs per controller.

Model 6922 fully conforms to industry standards for 1/2-inch tape operation and interfacing, with tape speeds from 1 1/2-inch to 45 ips. For added versatility, MTUs with any two standard speeds may be mixed on the same formatter. Units with single- and dual-gap tape heads may also be mixed.

The new Microdata formatter is directly compatible with any industry standard formatter and MTU. In OEM quantities, price of the Microdata tape transport with formatter is under \$4,000 each.



TWO-BOARD phase-encoded formatter

Government

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A computerized data base may be thousands of miles away, but if the user can have timely access to the data in a matter of seconds through an interactive computer terminal, this great distance is of little significance. On the other hand, the user's data may be on magnetic tapes sitting on his desk, but if the user can only process the data at night, then the data are really very distant.

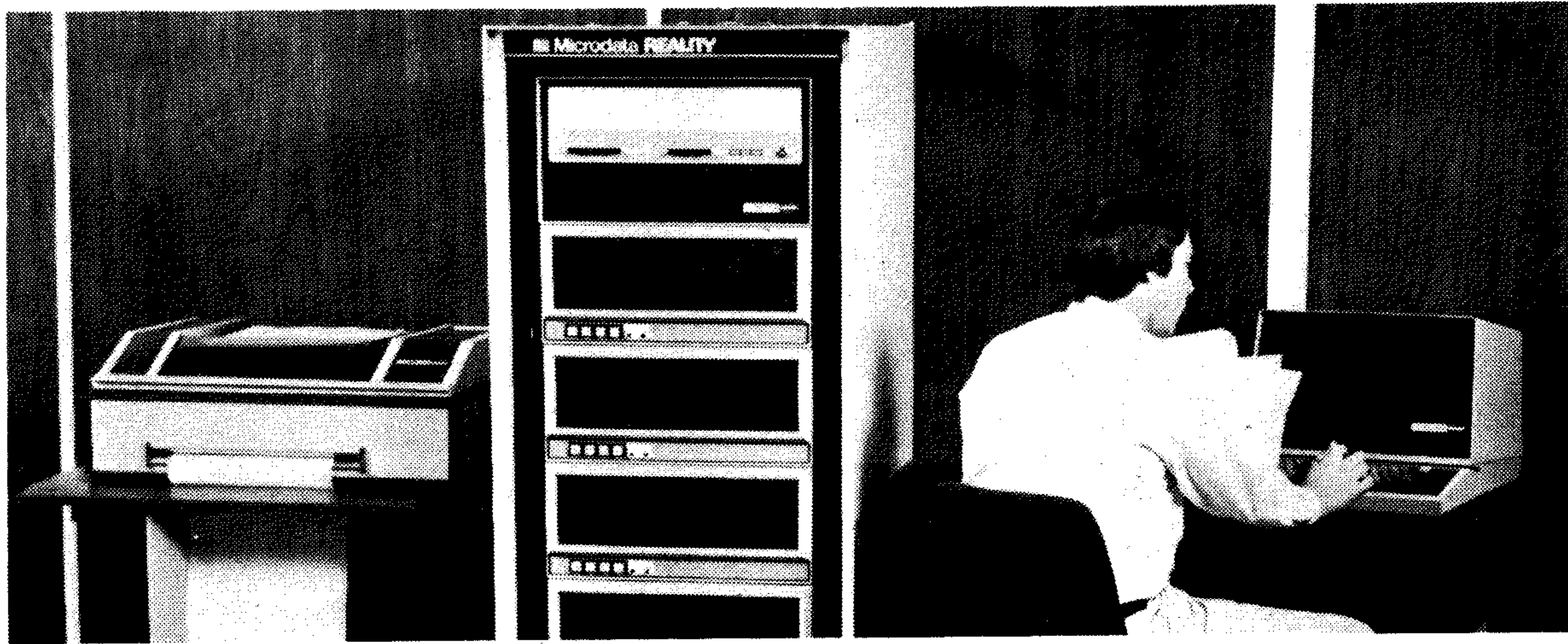
A major difficulty with the modern data base management approach has been that large multi-million dollar computer systems are required to support this software. This fact has limited the approach to only the larger State governments. Within the last several months, however, announcements have been made of minicomputer-based data management systems with price tags starting at around \$50,000. The first of these systems was Microdata's Reality.

One obvious implication is that the greatly reduced cost of performing data base management means that smaller government units that could not afford to do so previously can now "get their feet wet."

In the 1972 NASIS report

ware level, a fixed instruction set computer and a microprogrammed computer are identical to the user.

Microcommands are very similar to software instructions and are easily understood by software programmers with limited assembly



Minicomputer Dealers

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keeper, an accountant, an engineer or whatever, and teach him to become a total data processor so that he could then bring good programming and good systems into the user's office. That didn't work. They also thought when a man had become a data processor and had learned to program, he was so good that he could walk into anybody's shop, automatically write programs and know exactly what they were looking for. That didn't work either. What either of these propositions creates is a shortage of good data processors who understand applications. They create an empire type of situation where the data processor runs around like a king."

The Microdata 3200, each microcommand simultaneously does a data manipulation, jump, and conditional skip.

When placed into read only memory, microprograms are called firmware. Microprogramming is now also being used in the con-

backup operation.

Milligan and Higginson are quite optimistic about the success of the marketplace and describe it as evolving at a "much more feverish pace." One reason, they say, is that the user is becoming aware that he can put in an online system easier than before. "He's probably on the service bureau," says Milligan, "is paying the bureau between \$1500 and \$8000 each month and is getting after-the-fact accounting."

The SMI team identifies their users as falling into two categories. One is the individual who has never really converted to a computerized system and finds himself in a situation where he has to obtain the information rapidly to take care of his

is used for highly specialized applications, such as in peripheral controllers.

2. Fixed Instruction CPU Implementation

Microprogramming applications of this type processor are inflexible and usually are limited to the original design.

3. General Purpose Vertical Microprogramming

Vertical machines are usually small, have multiple command formats, general purpose file registers, single-phase clocking, flexible ALU functions and data paths, and separate ALU and branching commands. Applications are many and range from general purpose CPU

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corporation where data processing systems have grown so large and so involved that smaller groups must wait in line to get their data processed."

Milligan adds that departments of large companies that can justify mini-computers are getting them outside the confines of the data processing department, "which, for a number of years, have not been able to service these guys."

"The big systems have gotten muscle-bound," comments Higginson.

But the main problem in marketing minicomputers, they say, is getting in the front door for the first time. "We have to be very professional. We must convince the customer that this is something good, and it works,

records and reads NRZ-FBI compatible 1/2-inch 9-track tapes, with speeds from 12.5 to 45 ips at 800 BPI tape density. Model 6920 serves as a direct replacement of any industry standard format and is compatible with industry standard mag-

REALITY™

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for the first time are impressed with its simple operation.

In many cases, shown is sold, and the response from the buying public has been rewarding. REALITY systems have been purchased by a broad cross-section of users. These include automotive parts distributors, banks, insurance companies, retailers, real estate developers and time sharing firms. Customers also appreciate the system's speed. REALITY is faster than large scale processors and can accommodate up to thirty-two terminals.

In addition to putting many users in touch with the computer for the first time, the REALITY system is also implemented by firms presently using small business systems. For example, over 25,000 System/3 computers are in operation, and the REALITY system works with their existing RPG-II software.

Microprogramming

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emulation to dedicated firmware functions. This type machine provides the lowest cost microprogramming approach for general applications. The Microdata 1600, and Micro-One computers fall into this category.

4. General Purpose Horizontal Microprogramming

This approach has the flexibility of the vertical machine but each microcommand includes branching as well as ALU functions. The Microdata 3200 falls into this category.

5. Custom Horizontal Microprogramming

These machines are highly specialized, with wide command words, many parallel functions, little decoding of commands, multiple clock phases, with sophisticated ALU's and hardware architecture.

Microprogramming is used in three general areas: general purpose computers, special purpose computers, and dedicated processors or controllers.

In the general purpose computers, microprogramming is used to implement standard instruction sets; add special application oriented instructions; add architectural extensions; add special "background" firmware functions; and to add

clude MFC selection, tape motion, write record, read record, erase record, file mark search, IRG detect, and error detection. The latter function incorporates VRC generation/checking, LRC checking and CRC generation/checking.

CORPORATE PROMOTIONS

George E. Olenik to senior vice president — James C. Fosberg to vice president finance and administration — Richard Vahlstrom to technical director — John W. Keogh to director of end-user marketing for Reality — Duane F. Newton to vice president peripherals — William J. Ackley to vice president manufacturing —

Donald A. Savitt to vice president computer engineering — E. M. Malone to vice president software — Robert J. Dempster to vice president systems — Larry Ferguson to product manager for peripheral equipment — Tony Ursino to national end-user sales support manager.



MICRODATA'S 48,000 sq. ft. addition moves along on schedule. When completed in early 1975, it will double the company's current plant size.

Microprogramming Opens Doors for Programmers and Engineers

Microprogramming has been used for at least 20 years in computer design. Most of that time, however, it remained a tool of the computer designer and was buried quite deeply in the architecture of the computer. Now it is emerging as a tool to be used by programmers and systems applications engineers as well as computer designers. Its use is proving to be very effective in reducing cost and increasing processing power in many computer applications.

Microprogrammed processors are being used in applications such as communications switching and concentration, business systems, prototype setting, process control, point of sale, data acquisition, smart terminals, remote job entry, scientific processing, automated testing, graphics, and in many general purpose CPU applications.

Microprogramming was first used to implement the control sections of large computers. This use made it possible to emulate computers with extensive, sophisticated instruction sets on smaller models. At the soft-

ware technology in State governments, it was noted that during the 1970-72 period there was a shift toward fewer, but larger, computers. With increased data processing budgets, this shift was interpreted as a sign of reduced computer proliferation and more efficient use of existing computer resources. Another underlying reason for this consolidation trend is that governments now realize that data base capabilities, until now available only on large computer systems, have an important function to perform. With the introduction of minicomputer data base management systems, it is now possible for a data base to be distributed physically throughout the government. Such an arrangement may improve the reliability of overall operations. Or, it may increase the level of interaction between the user and his data base, thereby improving the accuracy of the data.

Since this new technology vastly increases the number of viable alternatives, there will definitely be major impacts on the ways that governments manage their data. The challenge will be to guide the technology in directions that produce the greatest benefits for improved government services.

language or machine language experience. The typical operations that are performed by a single microcommand are as follows:

A. Data Manipulation Commands

Load a register with a constant.

Add a constant to the contents of a register. Move data from one register to another.

"AND," "OR" or "EXCLUSIVE OR" the contents of two registers.

Shift a register.

Set or reset a control flag.

Initiate a memory access.

Initiate an I/O cycle.

B. Branch and Jump Commands (within the Microprogram)

Unconditional jump.

Return jump.

Skip on a condition.

In some computers, such as the Microdata 1600, each microcommand does either a data manipulation or a branch or jump. In some cases two data manipulation functions are done simultaneously on one command. In other computers, such as the Microdata 3200, each

problem which Microdata has attacked with English language used with the Reality system. "You program Microdata in English and there's no special language required. It's a micro language where instructions given in English have very definite meanings for the accountant or for the engineer or for the salesman. He can direct the machine and do very specific things with his own data base. He could design his own data base, his own reports, design the screens, design the system as he wants it and write it in his own language. This is then turned over to us, and we set up the system behind it that will take his meanings and interpret them for the Microdata system. That's called 'proc systems' or procedural systems. So he's done all his own programming, all his own design and we just do the translation."

Teaching a user how to utilize English in his own environment takes about one day, Higginson says. Although a "typical" system is hard to define, he says the average Reality that's being sold, "is about 16K (thousand) core, 20 million bytes of online storage, two CRTs, one 300 line per minute printer, one tape and one tape drive that is used primarily for a

control section of minicomputers and microprocessors, for emulations and for direct firmware applications. Its use is rapidly expanding for a number of reasons, the most significant of which are as follows:

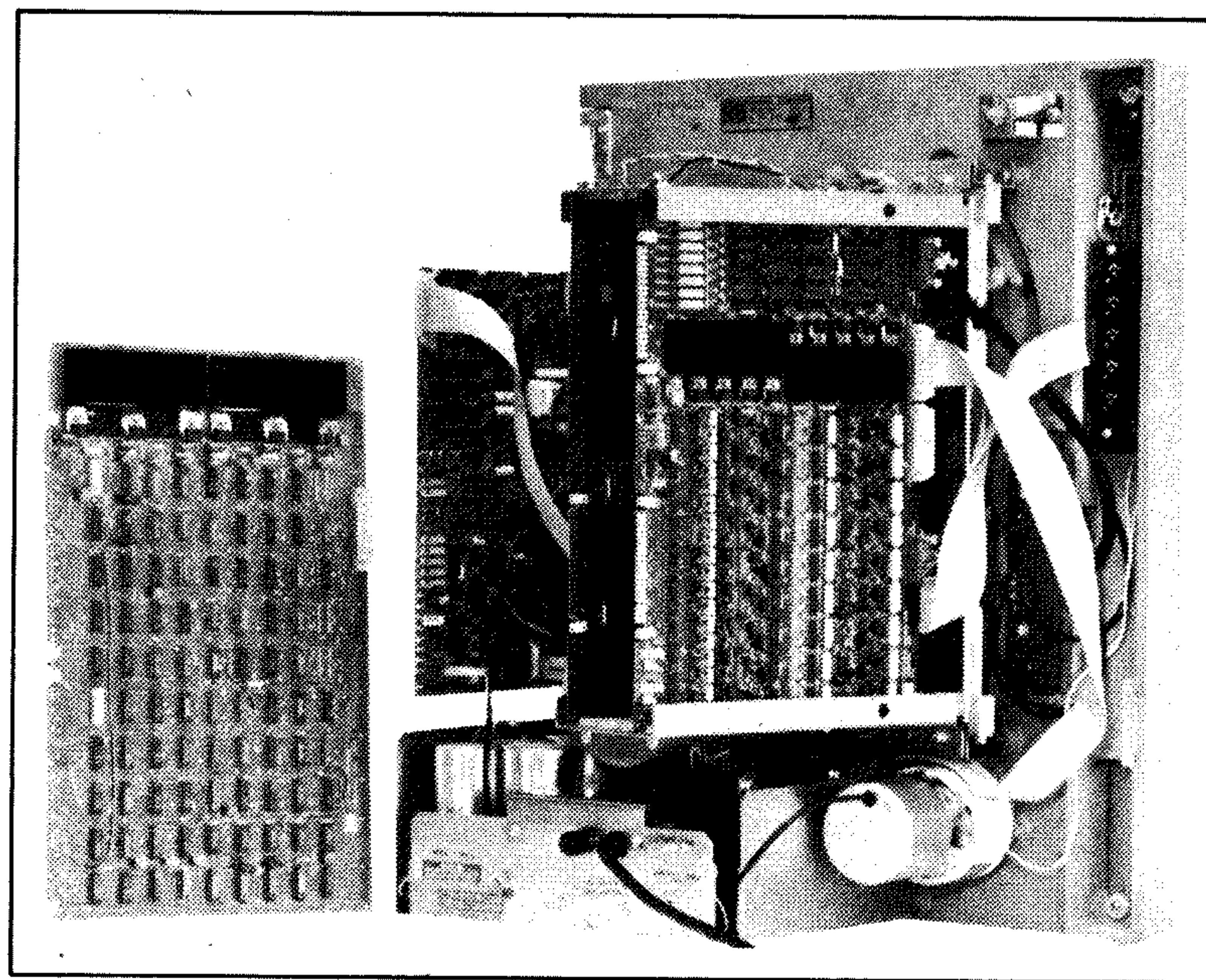
- New and better hardware and programming techniques have been developed for its applications, such as high density, low-cost control memory, end alterable control memory.
- There is more understanding of how microprogramming can increase the power of a CPU at lower cost, and to provide proprietary, tailor-made instruction sets.
- Recognition has grown that microprogramming can replace many hardware functions because it is more flexible, powerful, and is lower in cost.

There are generally five forms of microprogrammed computers, each of which is used in different areas of application.

1. Microprogrammed Sequencer/Controller

This type has a very simple instruction set and limited or no ALU capability. It

The other type is the division or subsidiary of a major



SINGLE-BOARD NRZI formatter

Microdata Announces New NRZI Formatter

Microdata Corporation has introduced the first industry standard formatter designed to mount directly inside tape drives. Contained on a single 9 1/4" x 14" printed circuit board, the new formatter receives its dc power directly from the magnetic tape unit (MTU). Compact design and integrated power supply combine for simple drive mounting, eliminating the additional cost and space requirements of separate rack mounting.

Designated Model 6920, the new Microdata formatter

locally," says Milligan.

netic tape units, including the Microdata Series 6000 and 6800 drives. Up to four MTUs can easily be daisy-chained.

The new formatter provides complete drive control and delivers full MTU/formatter status information to the controller. Control logic interprets controller commands and generates control signals to time, sequence and carry out the various MTU/formatter operations.

Control capabilities include special "escape" functions which may require a long time period to execute.

In the dedicated processor or controller the firmware has complete control of the program. There are no instructions of any form in read-write memory, only data, partial results of algorithms, flags, pointers, or status.

Microprogramming is being applied on a large scale in existing areas and into new areas because of two basic reasons:

1. The requirements for the speed, flexibility, and low cost provided by microprogramming are growing.
2. It is becoming much easier to use microprogramming because of new read only memory technology, improved microprogramming techniques and tools, and the advent of powerful new microprogrammable computers.

OEM

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ports. They also interface with any industry-standard tape transports.

CRT display terminals, being manufactured at the company's new facility in San Juan, Puerto Rico, will be added to the peripheral line in early 1975.



SERIES 9000 Disc Drive

Disc Drives Feature Ceramic Linear Motor

Microdata's Series 9000 cartridge disc drives, offering 100- and 200-track/inch recording density in single and dual disc configurations, feature a Radial Ceramic linear motor.

Use of a ceramic permanent magnet provides for a low-cost high-performance ratio while substantially increasing product efficiency.

The ceramic magnet is enclosed in a steel housing, virtually eliminating stray magnetic flux in the area of the heads and disc. The 1/2" core gap makes it impossible for the armature to hit or short to the magnet or

core due to torque stresses.

Integrated modular assembly, including magnet, armature, carriage way and head carriage on one subplate mount, allows for quick field replacement without the need of special tools.

A linear magnetic field for all cylinder addresses is created by the armature staying within the magnet. Low inertia of the armature and use of a "square" aluminum wirewound armature allows for low power consumption and heat dissipation.

The Series 9000 disc drives can provide up to 10 million bytes of on-line storage in only 8.75 inches.