

*Magnetic Cores for **Memory in Microseconds** in a Great  
New IBM Electronic Data Processing Machine for Business*

**IBM 705**

# Years ahead of its time... **Here's why...**

Most flexible of any  
commercial data processing machine

Direct input—from punched  
cards and/or magnetic tape

Direct output—on magnetic tape,  
line printers or in punched cards

Independent operation of tape units, card  
readers, card punches and line printers

Far fewer steps necessary than ever before

Variable record  
length—a practical  
necessity for efficient  
data processing

Fastest and easiest programming  
techniques available—  
saves days and even months of  
valuable preparatory time

16 separate and distinct  
accumulators

Special, work-saving  
instructions

## FLEXIBILITY

The IBM 705 is a large, general purpose data processing system—the most flexible ever developed. A simple change of the stored program from one application to another turns the IBM 705 into a very specific, highly efficient, special purpose machine.

The IBM 705 is unique among large electronic data processing machines in the flexibility of input-output devices. Punched cards may be read directly into the Magnetic Core Memory by one or more card readers, without the need for preliminary conversion to magnetic tape. Likewise, punched cards may be created directly through the attachment of card punches. Line printers also may be attached to produce, without intervening steps, printed reports and documents.

The same tape units that are used with the IBM 705 may be disconnected and attached to card readers, card punches and line printers for independent operation. This provides a completely interchangeable set of auxiliary equipment: card-to-tape, tape-to-card, and tape-to-printer. Because of this flexibility, systems and procedures men are free to design the fastest and most efficient electronic data processing routines.

Capacity and flexibility of the 705 result directly in data processing procedures with far fewer steps than heretofore, bringing to the business office the highest degree of automation yet attained.

## LOGIC

The "logic" of a machine is built into it by the designer. Superior logical design is a big factor in making a machine easy and convenient to use, and therefore a more effective data processing tool.

With the background of years of experience in commercial data handling problems, IBM engineers recognized that business data, unlike those in mathematics, come in many different sizes. For a payroll, employee number may be five characters, hourly rate may be three, employee name fifteen or more, year-to-date earnings six or seven, and so on. For inventory and production control, some part numbers take only a few characters, others take more than thirty—irregularity is the rule rather than the exception.

The records which describe an individual situation also vary widely in size. The essential information pertaining to a policyholder in an insurance company may require several hundred alphabetic and numerical characters. In contrast, perhaps less than 20 may be needed to account for a check issued by a bank. Thus it is apparent that to avoid clumsy and time-consuming expedients, the logical design of a data processing machine for business should provide for "fields" and "records" of all sizes. Such a provision is a major feature of the IBM 705.

Another very valuable feature of the IBM 705 is the ease with which relatively inexperienced personnel can program applications. Experience has shown that this ease makes for speed, saving valuable pre-installation time and money.

Not only do the sixteen separate and distinct accumulators aid the programmer, but also the instructions themselves (many of which, such as "add to accumulator", were developed by IBM) permit a given job to be programmed in the fewest possible instructions of any commercial data processing machine.

The "logic" of the IBM 705, based on experience, makes it a fast, easy-to-install, efficient tool for *commercial* work.

## INDEPENDENT OPERATIONS:

CARD-TO-TAPE

TAPE-TO-CARD

TAPE-TO-PRINTER

# The IBM 705 Electronic

Magnetic tape reading and writing  
—15,000 characters a second

Magnetic core memory:  
17 millionths of a second per character  
random accessibility

The fastest electronic storage yet developed

20,000 alphabetic and numerical  
characters stored in magnetic cores

60,000 characters stored on each magnetic drum

Practically unlimited number of  
magnetic tape reader-recorders  
—maximum capacity of more  
than 5,000,000 characters on each reel

## SPEED

The speed of the IBM 705 speaks for itself. Here are the statistics:

Magnetic tape reading and writing are performed simultaneously at the rate of 15,000 characters per second. Tape input-output time can be further reduced by the attachment of an optional magnetic core "record storage" device. Data stored in this device are accessible almost instantaneously and are transmitted to and from Magnetic Core Memory in less than 24 millionths of a second per character. Moreover, the device reduces substantially the number of processing instructions and time required to execute them.

The speeds of access to stored data and of performing arithmetic and logical operations are in a class by themselves for commercial data processing equipment. For example, operating on five digit numbers, the IBM 705 performs:

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addition or subtraction in 120 millionths of a second

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multiplication in 800 millionths of a second

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division (6 digits by 5 digits) in less than  
2 thousandths of a second

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logical decisions in 154 millionths of a second

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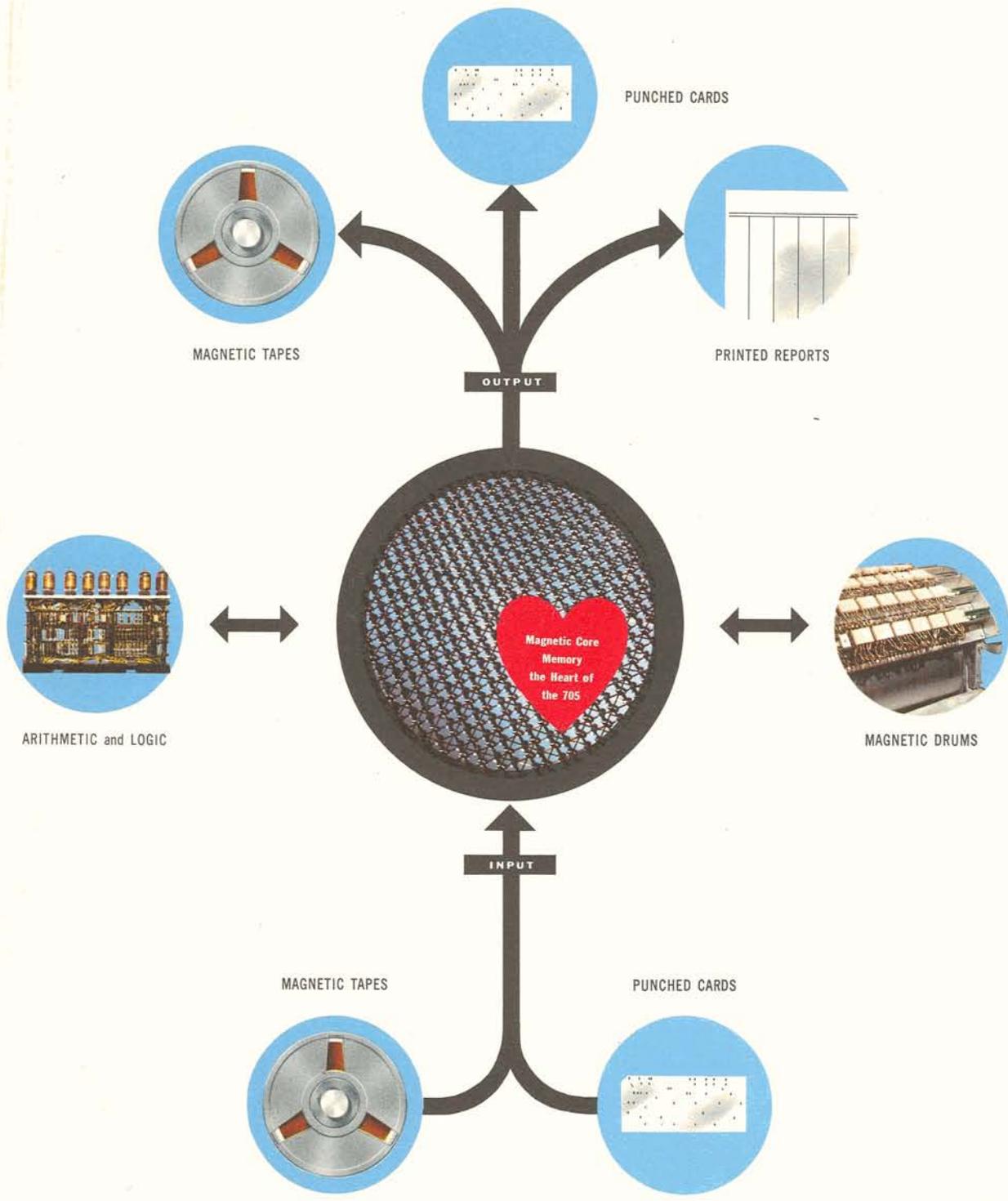
This includes the time required to locate and interpret the instructions anywhere in Magnetic Core Memory and to locate and process the data. The Magnetic Core Memory has a random accessibility of 17 millionths of a second per character. Five characters can be located and moved to a previously specified new location in only 35 one millionths of a second. Not only does random accessibility make these high speeds possible; it also simplifies the work of the programmer.

## CAPACITY

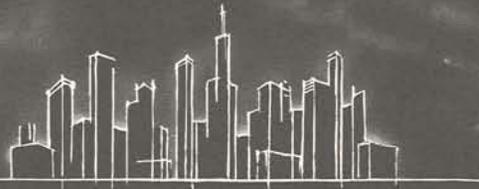
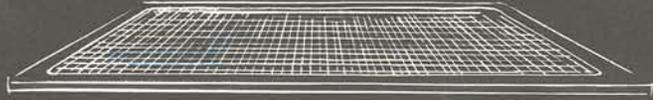
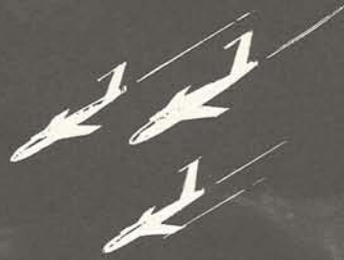
In the high-speed electronic memory of a data processing machine are stored both the data and the program of instructions. The IBM 705 has one of the largest and most efficient high-speed memories of any commercial data processing machine. Twenty thousand alphabetic and numerical characters are stored in magnetic cores—the fastest electronic storage yet developed. Additional capacity is provided by magnetic drums. Each drum can store 60,000 characters and many drums can be used if desired.

The capacity of magnetic tape also is important. The 705 accepts a practically unlimited number of magnetic tape reader-recorders. There are 2400 feet of tape on one reel. Information is recorded at 200 characters to the inch, providing a maximum capacity on *one reel* of more than five million characters. This is equivalent to more than 60,000 punched cards—on one reel of tape!

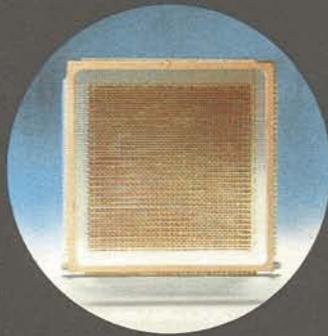
# Data Processing Machine



## **Experience in Advanced Design**



## **Experience in Data Processing**



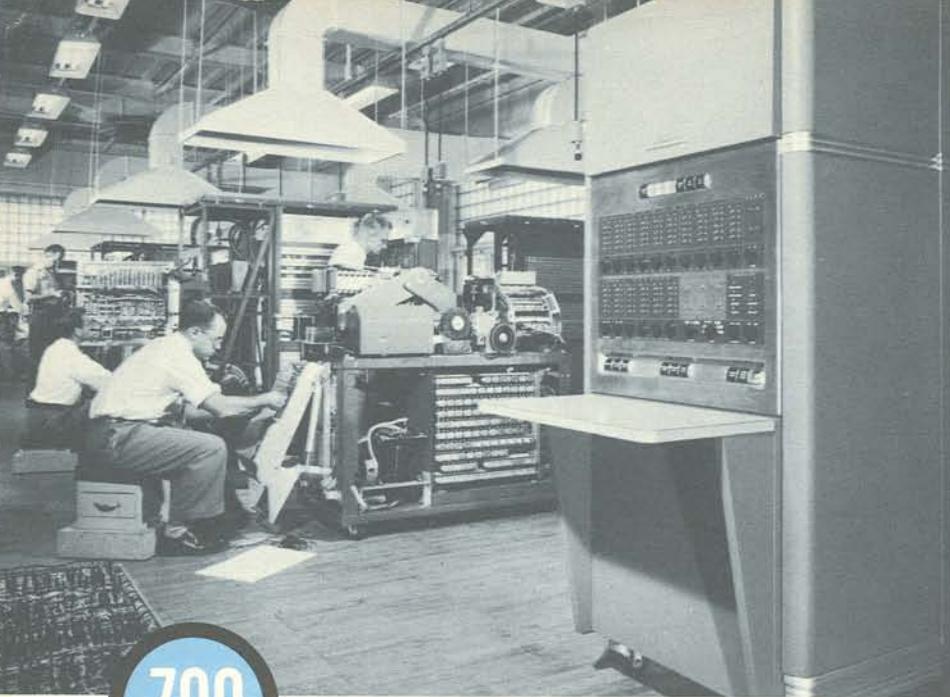
The IBM laboratories at Poughkeepsie, N. Y., are a great world center of electronics research and development. Here, for the defense of the United States, is being built a giant information processing machine that makes all others seem small by comparison. It uses magnetic cores on an unprecedented scale. They are essential to the speed and accuracy with which it must operate.

In the fast moving technology that surrounds data processing development, yesterday's design is not good enough. Machines only a few years old already are obsolescent. In the IBM 705, and in magnetic core memories, IBM is making available to business new techniques and new components that have been tried and proven on the frontier of electronics.

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Within a period of 14 months, beginning early in 1953, IBM manufactured and installed 18 giant electronic data processing machines. Within days after delivery they were in full operation. In many cases they are being used on three shifts with a record of outstanding performance.

Experience in the analysis of commercial data processing problems, and experience in the design, manufacture and installation of electronic equipment best suited to those problems are combined within the IBM organization.



700  
SERIES

650

CPC

607

604

***In Production . . .***

***Five types of IBM  
fully electronic data processing machines***

Data processing requirements differ according to size and kind of business. IBM manufactures electronic equipment designed to meet the needs of virtually any business.

Largest and fastest for the most complex commercial problems is equipment in the 700 series. Advantages of the stored program and large capacity, but at lesser speed and cost, are provided by the 650. The CPC, designed originally for scientific work, is now being used by many companies as a highly effective business data processing tool. For low cost and rapid calculation combined with considerable logical ability, the 607's and the smaller 604's are hard to beat.

Whatever your needs may be, there is IBM data processing equipment designed to meet them.



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