

... a powerful new data processing system

The IBM 709-outstanding new features:

- Increased input-output flexibility with the new Data Synchronizer
- Greater input-output capacity -- up to 48 tape units
- Automatic checking while writing information on tape
- Increased storage capacity up to a half billion decimal digits
- Fast, simplified conversion with new "convert" instructions
- Simplified data handling with "indirect addressing"



An advanced combination of new features enables the 709 to handle commercial, scientific, engineering, and management science problems—all with outstanding efficiency. Here for the first time is a large-scale, high-speed electronic computer designed to solve problems of increased complexity and magnitude which confront both modern business and science. The 709 revolutionizes the basic elements of data processing...

INPUT-OUTPUT

The new Data Synchronizer of the 709 is a powerful link between inputoutput facilities and magnetic core storage. Simultaneous reading and writing of many combinations of multiple input-output units is made possible, each unit operating independently of the other and independently of internal processing. This means that records of information may be read and written, while computations are being performed-all at the same time. Up to three Data Synchronizers may be used, each containing two input-output channels. Any combination of six input-output units, one per channel, can be operated simultaneously. For example, three tapes may be operating concurrently with a card reader, a card punch, and a printer.

To assure the maximum effectiveness of this flexibility, a large inputoutput capacity is provided. As many as 48 magnetic tape units, 3 card readers, 3 card punches, and 3 printers are available to the 709 at any one time. As a 'first' in data processing, the 709 features automatic checking of tape information while writing is in process. This is made possible through the use of IBM's new 729 Magnetic Tape Unit with a two-gap, read-write head.

STORAGE

The 709 has an extremely large capacity for storing data and instructions. 32,768 "words" of magnetic core storage, equivalent to over 327,000 decimal digits of storage, enable internal high-speed handling of the most complex and voluminous problems. Random access to any location in memory, and the parallel transfer of information to and from magnetic core storage, make possible the microsecond speeds of the 709 system. Information can be extracted from any given core storage location in only 12 millionths of a second.

For increased storage capacity, magnetic drums offer over 163,000 decimal digits of storage, and magnetic tapes allow up to ½ billion decimal digits of additional auxiliary storage.



PROCESSING

The 709 is extremely fast. Most instructions, including addition and subtraction, require only 24 millionths of a second for execution. Arithmetic calculations can be rapidly performed using any number system. This is made possible by the new convert instructions which enable fast automatic conversion between any number systems. Thus, problem data may be expressed in whatever code is most convenient, and need not conform to the basic language of the computer. Outstanding decision-making ability is a resulting feature of the new logic built into the 709. Comparisons may be made easily for purposes of choosing the best of many courses of action. Indirect addressing has been incorporated into the 709 to simplify the logic of data manipulation and to facilitate internal handling of information.

The 709 is designed for maximum flexibility and ease in programming. More than 180 instructions are available to the programmer. Included are powerful indexing instructions for use with three Index Registers. These Index Registers provide automatic counting and address modification to simplify programming, to speed calculation, and to reduce storage requirements and programming errors. Among the many other important instructions is a special one to facilitate compiling and interpreting. Also included are automatic floating point arithmetic operations. These latter instructions broaden the range of practical scientific calculation and minimize time requirements and programming complexity.

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