



————— FLOW OF INFORMATION.
 - - - - - FLOW OF CONTROL.

BLOCK DIAGRAM OF EMIDEC 1101.

SECTION 1 - GENERAL DESCRIPTION

A block diagram of the EMIDEC 1101 computer is given opposite. It will be seen that the operating centre of the machine consists of the control unit, arithmetic unit, immediate access store and drum. This centre is linked, on the one hand, with various input devices which read data from punched cards, paper tape, or magnetic tape, and on the other hand, with the output units which record the computer results on magnetic or paper tape, on punched cards, or as printed forms and tabulations. The input and output devices are known collectively as "peripheral" units and the maximum number of peripheral units which may normally be used with EMIDEC 1101 is 16 (for full details of peripheral units, see Section 7).

The computer employs the binary system for all arithmetic operations. The input and output units will however be using information in the normal decimal form and a conversion is therefore required on reading into the computer; this conversion is performed automatically by the machine itself. Magnetic tape is normally used as an auxiliary form of storage rather than as input and output, in which case no conversion is necessary.

From the programmer's point of view the central unit of the computer is the immediate access store which consists of a ferrite core matrix providing 1024 "registers". Each register has a capacity of 36 binary digits or "bits". A binary representation of 36 bits is the standard unit used in computer working and is termed a "word".

The immediate access store registers are used, in a way to be explained later (see Section 2) for holding both the program instructions currently being performed and the data to be worked on.

The registers are linked with the control unit which comprises a laced core matrix, and which, in turn, is linked with the arithmetic unit containing a 36 stage parallel accumulator capable of accumulating positively or negatively and of shifting left or right.

The lacing of the control unit matrix is designed to carry out various operations in the arithmetic unit, without recourse to detailed programming steps. Thus, for instance, any one of the 1024 registers (except for a few special-purpose registers) may be used by the programmer for the accumulation of data, since the control unit can automatically transfer from one register, through the accumulator in the arithmetic unit, to another register. The control unit similarly provides for automatic conversion to or from binary numbers on input or output. As far as program instructions are concerned

the control unit is designed to read and carry out instructions in the serial order in which they are stored, unless this order is suspended by a special direction.

While the immediate access store is used for current working, further internal storage is provided by magnetic drums with electronic head-switching to give fast access time. The standard drum has a capacity of 16384 words stored in 256 tracks of 64 words each. Up to four drums may be used with one computer, and in special cases, more may be fitted.

Drums are used for large-scale storage of data, and also for storing those stages of a program which are not being currently performed but which will be called into the immediate access store when required. Transfers to and from the drums are made in units of four words and the contents of any number of such units up to sixteen (one complete track) can be transferred at a time. Beside the storage tracks the drum also carries five working tracks, (not used by the programmer) including the clock track. The clock-track regulates the pulse timing for the whole machine. The pulse repetition rate is 100Kc/s.