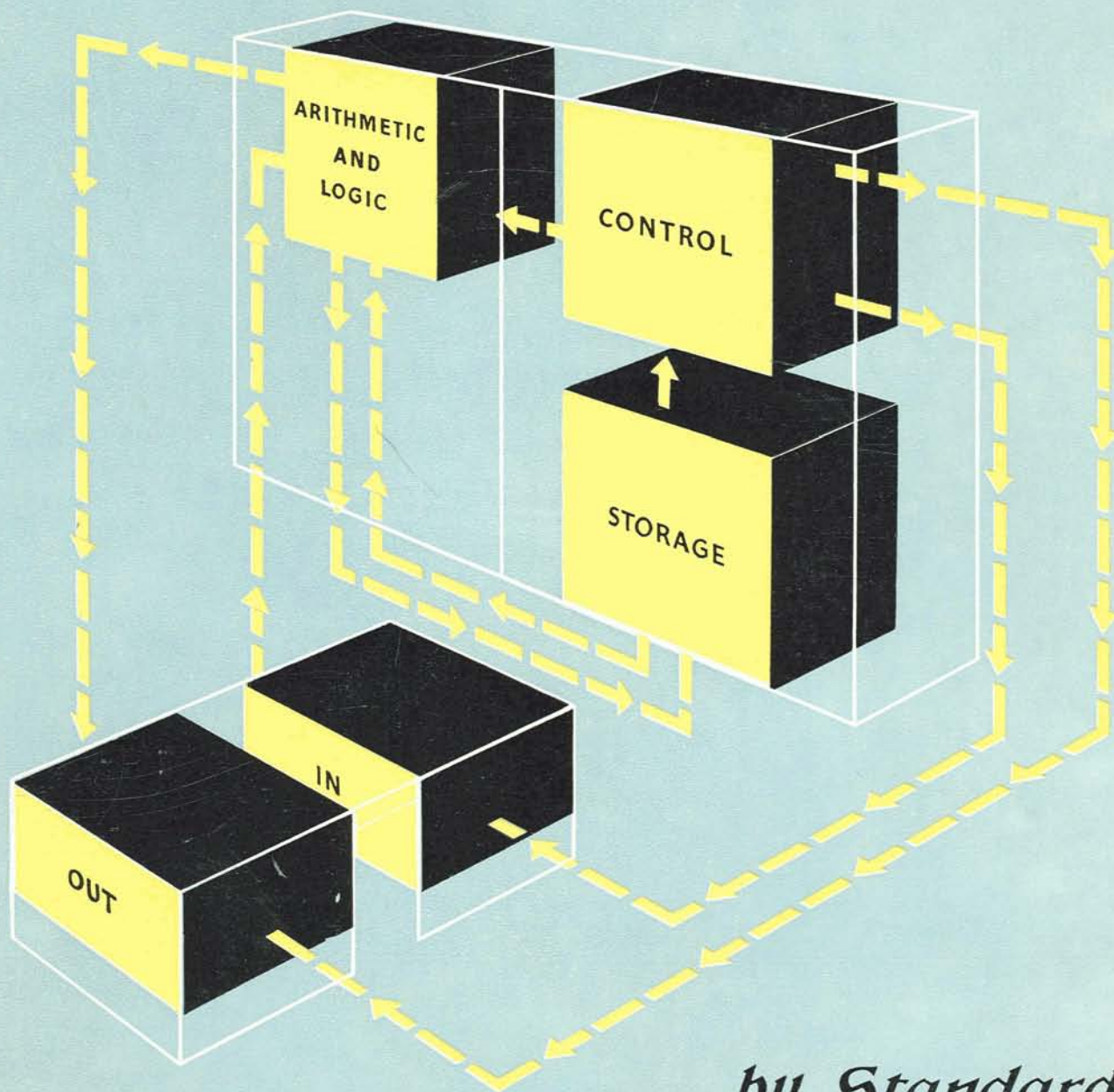


APR 2 1961

Stantec Zebra

ELECTRONIC DIGITAL COMPUTER



by Standard

STANTEC - ZEBRA
electronic
digital
computer

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to
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introduction

Stantec-Zebra, jointly designed and developed by Standard Telephones & Cables Ltd. and the Netherlands P. T. T., and manufactured by Standard Telephones & Cables Ltd., is a general-purpose electronic digital computer suitable for carrying out a large variety of the information processing required to be made in research establishments and in industrial and commercial organisations generally.

Whilst this brochure describes the basic version of Stantec-Zebra special designs for special applications are possible.

A novel programming philosophy evolved by the P.T.T. has been given practical form by the advanced technology of S.T.C., resulting in a computer unique in its operational procedure, of great simplicity, yet fast in operation.

It is a judicious blend of well-tried vacuum tubes, proven semi-conductor devices, and a new equipment practice at once simple, compact and attractive.

As well as being economical in price, purchase carries with it access to an ever-increasing library of sub-routines which greatly reduces both time and skill required in the preparation of programmes.

In designing, building and operating electronic digital computers for their own use, both Standard Telephones and Cables Ltd. and the Netherlands P.T.T. have had the benefit of half a century's experience in the telecommunication field. The design and manufacturing knowledge that has produced equipments such as telephone exchange and transmission line equipments which are required to give reliable service for many years has been applied to the design and manufacture of Stantec-Zebra.

Stantec-Zebra has been designed to make use of the programming methods developed over a number of years by a highly experienced team of skilled mathematicians. It provides the user with a simple and yet extremely powerful programming code and a very large proven library of fast sub-routines.

The development has resulted also in special design features. The arithmetic and control parts of the machine are simple in construction, giving great reliability, ease of maintenance, compactness and low power consumption. At the same time an adequate store capacity (8 192 words) has been provided.



description

Stantec-Zebra is made up of three items of equipment as illustrated.

1 The Computer Cubicles

These contain the Store, Arithmetic and Control Units and also incorporate Monitor and Test equipment.

2 The Control Desk

On this are mounted the Input and Output Equipments and the Operating Controls.

3 The Power Cubicle

In this the Power Supply Units and the Master Pulse Generators are equipped.

1 the computer cubicles

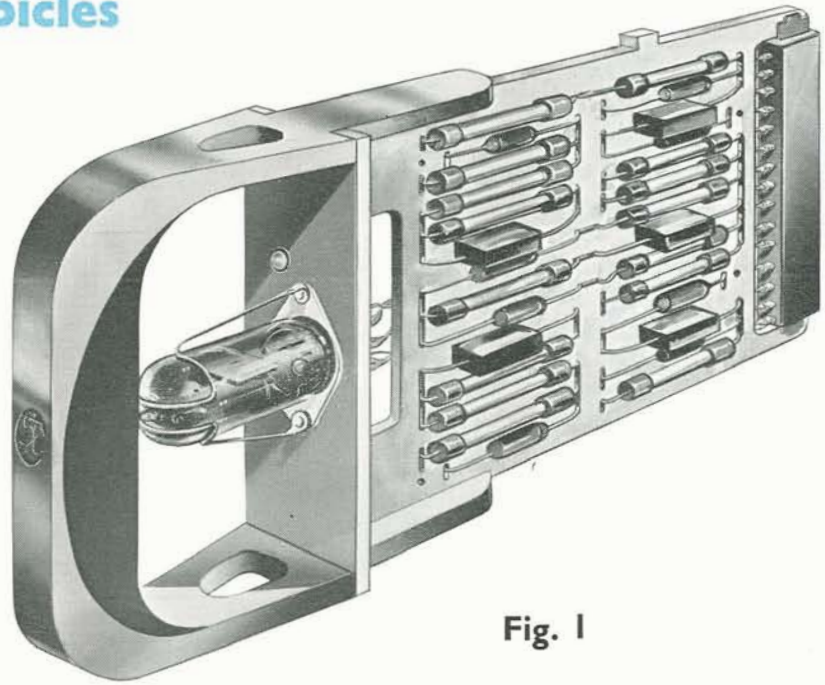


Fig. 1

These cabinets each approximately 6' 6" high, 3' 3" wide and 2' 0" deep, are provided with doors giving access to both sides of the apparatus.

The arithmetic and control circuits are built-up from small units, see Fig. 1, designed to plug-in to the connecting circuitry to form complete functional units. The use of such units is of great assistance in instituting maintenance routines and in the rapid clearance of fault conditions. Replacement of faulty units enables necessary repairs to be carried out away from the computer which is maintained in service.

Fig. 2 shows a number of units plugged into their sockets which are interconnected by a circuit panel employing printed wiring techniques.

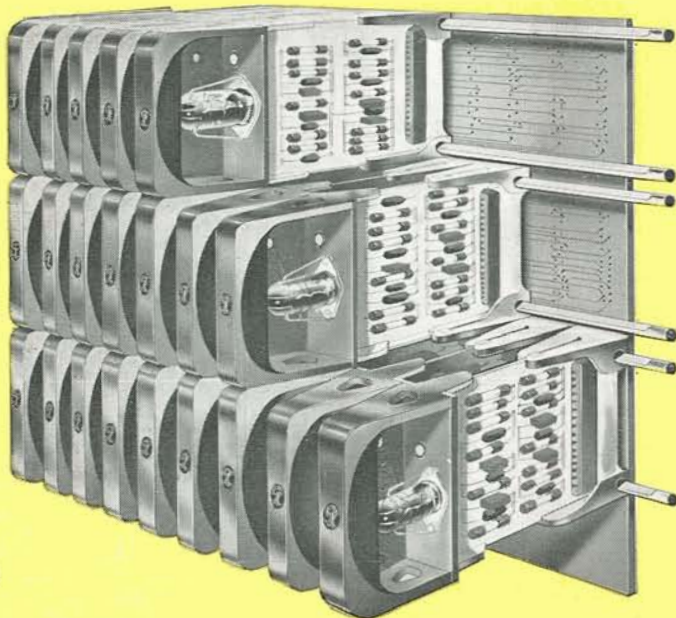


Fig. 2

The store consists of a magnetic drum, Fig. 3, (which shows the drum before read/record heads have been fitted) rotating at 6 000 r. p. m. and which contains the main store with a capacity of 8 192 words and 15 immediate access stores, each of 1 word length. Reading and writing circuits for the stores are built up in unit form in a similar manner to that used for the arithmetic and control circuits. The main store of 8 192 words is contained on 256 tracks, and switching between tracks is carried out at extremely high speed by means of symmetrical junction transistors.

Monitor and Test facilities include CRT displays for examining the contents of any store, meters and keys for measuring and varying test voltages, and keys for manual operation of the machine when step-by-step tests are carried out.



Fig. 3

2 the control desk

The input to Stantec-Zebra is by means of punched paper tape through a photo-electric high-speed reader with a maximum speed of 200 characters per second. One input reader is normally provided; the machine is designed to work with several input devices in parallel if such an arrangement is desired.

Two output devices are normally provided; punched paper tape at a speed of 25 or 50 characters per second and direct printing at a speed of 7 characters per second. Several output devices in parallel may be used if so desired. Printing and punching devices designed to work at much higher speeds are being developed and can be used when these become available.

A small Control Panel, containing the necessary keys, lamps, etc., essential for operational control of the computer, is fitted on the Control Desk.

3 the power cubicle

This is a cabinet approximately 6' 6" high by 3' 3" wide by 2' deep and contains the necessary HT and LT supply units. The power consumption of the complete computer is approximately 3 kVA.

SPECIAL FEATURES

- (1) The computer can be used for double length calculations.
- (2) Special features are incorporated to make decimal floating point arithmetic available.
- (3) All 'short' stores can be used as instruction modifiers ('B' line facility).
- (4) With the aid of interpretive routines the machine can read programmes written in different codes.
The normal machine code is extremely flexible and fast in execution.
A simple code has been designed especially for the unskilled user.
- (5) A large library of proven sub-routines is available. These are performed at very high speed.
- (6) Storage capacity of 8 192 words is combined with very simple logical circuitry to give a medium-sized computer of great reliability.
- (7) Training schemes for users are being made available, both for programming and for maintenance.

programming facilities

The machine has been designed as a practical equipment to make use of programming methods developed over a number of years.

The normal code used is built up from 'operational' digits, each of which produces a simple logical operation within the machine. This has made possible the construction of a simple arithmetical and control section.

The operational code is one of great flexibility and power. By its use the programmer is not confined to a small number of predetermined operations as is more usual, but can construct for himself an almost unlimited number of operations. Facilities such as order repetition and order modification ('B' line facility) are performed very elegantly.

A range of basic programmes available to all users of the machine has been prepared by an expert team of mathematicians who have taken every advantage of the flexibility of the operational code. The use of these basic programmes results in overall operational times which compare favourably with those achieved by other machines using pulse repetition rates of up to four times that of Stantec-Zebra. Special attention has been paid to increasing the speed of floating point and double length operations.

As a further result the machine can read programmes written in a greatly simplified code. Thus it is possible for a comparatively unskilled person to programme specific problems after very little instruction. Numbers can be in fixed or floating point form and the basic fast sub-routines used without modification.

brief specification

Mode	Serial-Binary.
Word Length	33 binary digits (includes 1 sign digit).
Main Store	Magnetic Drum with a capacity of 8 192 words. Revolution speed 6 000 r.p.m. Maximum access time 10 ms. Word time—312 μ s.
Computing Store	15 immediate access stores, each of 1 word length.
Optimum Operation Times	Addition } 312 μ s Subtraction } Multiplication } 11 ms. Division } 35 ms. An average operational time of all operations (measured over numerous programmes) is 2 ms.
Input	Punched paper tape with a maximum speed of 200 characters per second. One input device is normally provided. The machine is designed to work with several input devices in parallel if such an arrangement is desired.
Output	Two output devices are normally provided. (1) Punched paper tape with a speed of 25 or 50 characters per second. (2) Direct printing at a speed of 7 characters per second. Several output devices can be used in parallel if so desired. Alternatively, it will be possible to use printing devices of much higher speed when these become available.
Monitor and Test	Monitoring CRT displays allow the contents of 4 stores to be examined at any one time. Variations of high tension voltages can be used to detect incipient component failures. Test programmes are provided to be used with marginal testing facilities. Plug-in electronic units are employed incorporating plug and socket arrangements of well-proven design ; spares are provided so that suspect units can be removed for test and, if necessary, repair. This feature also allows a maintenance test routine to be established. Test keys are provided to enable orders or instructions to be set-up under manual control.
Power Supply	Approximately 3 kVA is required by the machine.
Approximate Dimensions	Computer (with monitor and test equipment) two cubicles each = 6 ft. 6 in. \times 3 ft. 3 in. \times 2 ft. 0 in. Power Cubicle = 6 ft. 6 in. \times 3 ft. 3 in. \times 2 ft. 0 in.

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