

MYRIAD I

Introduction

Extracted from the brochure dated 1965

The Marconi Company embarked on the development of computers to meet the requirements of radar data processing. Basic research into storage and computing problems indicated that radical reductions in size were possible. The resulting compact layouts enabled increased speeds of operation to be achieved with a reduction in the complexity of circuits. The result is the Myriad computer. Myriad therefore uses well-proven techniques but operates at a speed faster than other commercially available computers. The intrinsic high speed of the logic renders obsolete the artificial means used to speed up basically slower machines. The resulting simplification has led to smaller size, greater reliability, and a reduction in cost.

The whole machine is contained within the control desk (6 ft x 3 ft x 2.75 ft high) and the design is such that it will withstand stringent military environments. Special attention has been paid to easing maintenance and a computer program can usually locate any faults.

The basic elements of the computer consist of a number of silicon semiconductor and resistor devices integrated into TO-5 cans. Many of the interconnections are thermo-compression bonds within the cans, giving high reliability. This technique produces very high speed devices, the stage delay of a standard logic module being 8 nanoseconds. Input and output operations by program take 6-8 microseconds.

There are at present two languages available - Myriad User Code and Algol; work is in progress on a real-time language - Coral.

Myriad has been designed as a general purpose on-line computer. It is ideal for civil and military radar data processing and can be used in fixed or transportable roles. Because it is designed on the 'Highway' principle, external peripheral equipment can be associated with the computer depending on requirements. A wide range of systems can be provided in conjunction with English Electric-Leo Marconi Computers Ltd. and English Electric Automation. The machine is eminently suitable for plant monitoring and control functions and a complete range of peripherals can be supplied to enable the computer to sample and control any process. Myriad is also suitable for commercial applications especially as a satellite computer to a larger machine; or for complex scientific calculation in Universities and Laboratories. It may be used on-line to a number of users and simultaneously control a simulator or experimental plant.

Brief technical description

Myriad is a fully parallel computer using 24-bit words to represent data and machine instructions. Data is held as pure fixed point Binary Fractions in the range $-1 < x < +1$, negative numbers being represented in 2's complement form. The computer obeys a single address instruction code in sequence, unless directed elsewhere by 'Jump' or 'Link' instructions or 'Interrupt' signals.

The order code allows up to 64 variations though not all are used in the standard machine. The orders are ideal for real-time data handling, but still ensure that the machine is truly general purpose. For data handling, modifier bits may be used in an instruction word to modify the action of that instruction. Two 24-bit registers (A and B) and an arithmetic unit are provided: a 48-bit register (AB) can be made by combining A and B.

Two basic storage modules are available. A 4096 word 24-bit coincident current ferrite store having one core per bit; its cycle time is 1.2 microseconds and data access time is 0.4 microseconds. The other offers 16,384 word storage with a cycle time of 1.4 microseconds. Two modules of either kind can be accommodated giving a maximum storage capacity of 32,768 x 24 bits words.

Transfers of data and instructions are through a "Memory" register 'M'. An "Address" register holds the address of the location being used. Each storage module has an M and Address register to facilitate storage expansion. All timing waveforms are produced by an internal system.

Transfer of information to and from peripheral equipment is via 24-bit 'Highways', completely controlled by the computer. A sophisticated interrupt system with eight priority levels allows the peripherals to initiate data transfer. Myriad returns to its main program within 5 microseconds of such an interruption, without using the A and B registers.

An extensive program library is available; check and fault location programs, a user-orientated symbolic address compiler and an interpretive Algol compiler have been produced. A real time program language, Coral is being developed. The Facit high speed paper tape reader and punch are used for reading in and punching out programs.