# MICROPROGRAM CONTROLLED PROCESSOR

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The main objective of this project was to design and construct a micro-program controlled processor using MSI techniques. This project can be used as a teaching tool to demonstrate the internal operations of a microprocessor.

Microprocessors can be classified into hardwired and microprogram controlled processors. In the latter case the control signals for the registers, ALU and other internal blocks are generated by a control store which consists of a software routine called the Microprogram. Since the processor was designed using microprogram control, its operation can be varied by changing the contents of the control store which makes it extremly flexible. Since it is clocked manually it is ideally suited for demonstration of internal operations of the processor.

This processor is a 8 bit machine and can execute 32 machine code instructions at present. This can be increased by changing the interpreter program in the control store which resides in four EPROMs. The processor has 8 registers and runs on a four phase clock. The data transfer between registers, arithmatic and logical operations involved in fetch and execution of a machine code instruction can be observed at each phase by using manual clocking.

The machine code program to be run was entered in mnemonic form using a BBC computer. The conversion from mnemonics to its equivalent is done by an assembler exclusive to this processor. The data transfer between the BBC and the processor is achieved using an interface with the 6522 VIA in the BBC. The interface consists of hardware and a software routine which is also capable of checking the contents of the memory after execution of an instruction which helps to keep track of its operation.

Thus a microprogram controlled processor which is useful as a teaching tool of the internal operations of a microprocessor was successfully designed and implemented.