EDUCATIONAL Z-80 MICROCONTROLLER

by

SAVVA CHARALAMBOS

Project Report

Submitted to

the Department of Electrical Engineering

of the Higher Technical Institute

Nicosia Cyprus

in partial fulfillment of the requirements

for the diploma of

TECHNICIAN ENGINEER

in

ELECTRICAL ENGINEERING

June 1990

SUMMARY

Man, during his entire life, designs more sophisticated machines using microelectronics or digital electronics so as to have the ability of producing better results in much less time ie. the work to be done is more easier, the machines are more efficient, producing more quantity of better quality.

The microprocessor may be, is the best design that has ever been designed by man. Of course, day by day the, microprocessor is being improved to carry out more difficult and complicated tasks.

Such a microprocessor will be used to design, construct and test a Z-80 microcontroller and use this microcontroller for educational purposes.

First, a block diagram will be constructed so as to see and understand the general idea of the microcontroller under construction. Additionally, the operation of the microcontroller will be discussed with the aid of the block diagram. Then, the various parts which are to be used will be examined and see the abilities of each one.

Following this, the final design and a detailed circuit diagram will be presented and a full explanation will be done.

Troubleshooting procedures and methods will be used and explained to test the microcontroller such as free-run testing, self test diagnostic program, signature analysis and also some other tests using the oscilloscope and the multimeter.

Finally, from the results, it is evident that this microcontroller has many applications such as waveform generator, driver for stepper motors, an alarm system, a temperature controller and also it can be combined with other devices such as printers, keyboards, VDU but to connect these an interface is needed.

CONTENTS