

RADIO SYNCHRONOUS MASTER CLOCK

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ABD.RAHIM BIN ISNIN

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**Department of Electrical Engineering
School of Engineering
MARA Institute of Technology
40450 Shah Alam
Selangor
MALAYSIA**

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Abstract

This project is about a microprocessor based digital clock. The digital clock comprises of two stepper motors for the movement of hour's and minute's hand, and a LED display for seconds. Both of the hands are located at the same axis while the led display is made by using four 16 bits decoders to show 60 outputs. Since the digital clock used minutes and hours hand to show the time it seems just like an ordinary mechanical clock, except for the seconds display where it use LEDs.

Unlike a mechanical clock where there is a lot of gears involves for the movements of the hands, this digital clock has only two gears. In another words the complexity of a mechanical clock has been simplify by using a microprocessor. Another advantage of using a microprocessor is that some intelligence can be given to the system. For example the motor use might not be exactly 1 degree of movement for 1 pulse, in this project the motors used give out 1.8 degree of movements for every 1 pulse. Since the number of degree are not equal to the number of pulse, error in movements can not be avoided.

This is where the intelligence of microprocessor is useful. The microprocessor will give out a different number

1.0 Principle of software's operations

1.1 Introduction

The microprocessor kit used in this project has a Zilog Z80 microprocessor, so the language used for this project is a machine language base on Z80 microprocessor.

Firstly the program is written in an assembly language using a word processor, by using the assembly software the program is converted into machine language code. To test the program, the machine language code is written into the RAM of the micro-processor kit by using its keyboard, only after the program is found to be error free and works that it is transferred into an EPROM. The EPROM is then slot into the memory expansion area that is available in the micro-processor kit.

By using this method the program can be executed directly from the second EPROM without the need to write the program into the RAM and thus save time. This technique has also another advantage, which is, if a power failure occur the program will not be lost due to the EPROM but if RAM is used then the user will have to write the program back.