FINAL PROJECT

DIPLOMA IN ELECTRICAL ENGINEERING

FACULTY OF ELECTRICAL ENGINEERING

MARA UNIVERSITY OF TECHNOLOGY

13500 PERMATANG PASIR

PERMATANG PAUH

PULAU PINANG

ELECTRONIC METHOD IN MEASURING PARTICLE MOTION

DATE SUMMIT : 4TH . NOVEMBER 1999

MARA UNIVERSITY OF TECHNOLOGY
PENANG BRANCH

A report is submitted to the Faculty of Electrical Engineering, MARA University Of Technology in partial fulfillment for the Diploma In Electrical Engineering.

1. signed by .....
   (Mior Yusof bin Mior Othman 96390207)

2. signed by .....
   (Sharulnizzat Bin Ismail 96236722)

Approved by :

.....
(Mr. N. Debnath)
Project Supervisor

Accepted by :

.....
(Pn. Nooritawati)
Coordinator Of Electrical Engineering

ABSTRACT

Our project is about "Electronic Method In Measuring Particle Motion". This electronic device use to measure velocity and acceleration of moving body. In physical aspect, a moving body creates their own velocity and acceleration. The value of this particle motion can be calculated by Newton's Law of motion which state that v = s/t and a = v/t. Our device count the time taken by a body that moving through a two points which the distance between them are already fixed to 100cm. Our circuit operates in digital condition which the sensitivity is very high since the circuit only works at two states, LOW and HIGH. Otherwise this circuit also consist of analog part which stands for start counting point and end counting point that establish by the LDRs , LEDs and NPN bipolar junction transistor. This project can be used in industrial application such as mechanical instrument. The velocity and acceleration is important thing in completing mechanical devices.

CONTENTS	***PAGE***

Abstract 1

Introduction 2

Part explanation and their characteristic

Detector

a. LDR 3

b. LED 6

c. Resistor 7

Pulse generator

a. Transistor 10

b. Relay 13

c. Diode 19

d. 7400IC 21

Start-end pulse generator

a. J-K Flip-Flop 22

Constant pulse generator

a. 555 Timer 25

BCD- to-7 segment decoders/drivers 28

Operation 31

Foreclosure 33

References

Appendages

INTRODUCTIONS

The "*Electronic Method In Measuring Particle Motion*" device works by eight block part which are consist of :

- Two blocks of detector (at starting point and at ending point).
- Two blocks of pulse generator (at starting point and at ending point).
- Block of start-end pulse generator.
- Block of constant pulse generator.
- Block of control gate.

Each block works by their own functions to make the circuit operates as we consider. For this circuit, we are using LDRs, resistors, NPN bipolar junction transistors, relays, 7400 ICs, 7473 ICs, 555 timer and common cathode LED display as a counter.