DEPARTMENT OF ELECTRICAL ENGINEERING
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FINAL REPORT OF DIPLOMA PROJECT

STEPPER MOTOR CONTROL

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ABSTRACT

The stepper motor control circuit is a simple, low-cost hardwired step per motor control circuit that can be used in low- power application.

This circuit consist of component IC 555 timer astable multivibrator, IC 7474 dual 'D' flip-flop as ring counter, ULN 2003 IC consist of Darlington transistor array, resistor, capacitor, diode and stepper motor. The type of stepper motor is variable reluctance. It has four winding and need 12 volt power supply to moving the stepper motor.

This circuit is operating and moving the stepper motor when the 5 volt is apply to the input circuit and 12 volt is apply to stepper motor. By pressing the reset switch, the stepper motor can stop moving. On releasing the reset switch, the stepper motor again starts moving in the same direction.

Application of the stepper motor control circuit that is using in moving toys such as car control. The total budget to make hardware this circuit is RM 43.75.

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CHAPTER 1

INTRODUCTION

1.1 Specification of the stepper motor control

Stepper motor have four winding, it is most likely a variable reluctance stepping motor. Variable reluctance almost spins freely meaning that it not tends to cog as we twist the rotor with fingers. The rotor in this motor has 6 teeth and the stator has 8 poles, with each winding wrapped around two opposite pole. To rotate motor continuously, powers is apply to the 4 windings in sequence. Assuming positive logic '1' where a 1 means turning on the current through a motor winding, then the motor will spin in clockwise 24 steps or 2 revolution. The stepper motor control use 555 timer as an astable multivibrator (clock generator) that approx 1 Hz frequency. The switch reset used to control the stepper motor for stop moving and moving again when the switch is release. The ULN 2003 (7-bit 50V 500mA) TTL –input NPN darlington driver also need to drive multiple motor winding draws under 500mA.