

# EDGE AVOIDER ALARM CLOCK

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**Abstract:** Robotics is the fastest emerging and developing field and has transformed the world of technology. Robots range from RC robots to gesture control robots, from swarm robots to humanoid robot. Autonomous robots are a small part of robotics, which are mainly made by using microcontrollers as the controlling device. Edge avoider robot comes under semi-autonomous robot which would not fall from a desk when placed on it. This paper focuses on the use of an alarm clock on an edge avoider robot thus making it a movable and more effective alarm clock. The purpose of doing so is that when the alarm goes on then due to a constant moving clock the user has to get up and switch it off manually even if he is not willing to do so thus completing the purpose of an alarm clock

## 1. INTRODUCTION

Alarm clock is a needed by every person in day to day life. Now various kinds of alarm clocks are available in the market like digital and analog clock with the basic idea to wake the user up in the morning. But what happens once the alarm is switched off, has the user really woken up or has he again gone to sleep. Here we present a moving alarm clock which starts moving after the buzzer gets on and it will not fall off the table since it is an edge avoider, so you can place it on the nearby table and sleep.

## 2. METHODOLOGY USED

### 2.1 Edge avoider robot

Table 1. Motor control using sensor output

Sensor output A	Sensor output B	Motor1	Motor2
0	0	Rotate anticlockwise	Rotate anticlockwise
0	1	Rotate clockwise	stop
1	0	stop	Rotate clockwise
1	1	Rotate clockwise	Rotate clockwise

It is a semi autonomous robot that reads the surface as logic 1 and the edge as logic 0, this logic is provided by the sensors like ir sensors. It can be made by various ways to provide the

logical output i.e. a microcontroller, logic gates, multiplexer etc. Also the motor is driven using a motor driver ic as the output is usually from the controller.

### 2.2 LM8560

The LM8560 is usually implemented in circuits that do not any oscillator as instead it uses the AC waveform. It enables the alarm clock and has a built in LED display controller. It is cheap and thus is used in many alarm clocks, to provide a timer system. (Basically just set the alarm time to something and use the alarm output as an interrupt)

Instead of lm8560, 8562 IC could be used which also performs almost the same function.

### 2.3 LOGIC GATES

A logic gate is an idealized or physical device implementing a Boolean function, that is, it performs a logical operation on one or more logical inputs, and produces a single logical output

### 2.4 SENSORS

Infrared sensor transmit infrared waves which when reflects is collected by a photodiode which gives out HIGH output(logic 1). When photodiode doesn't receive any signal it gives out LOW output(logic 0).

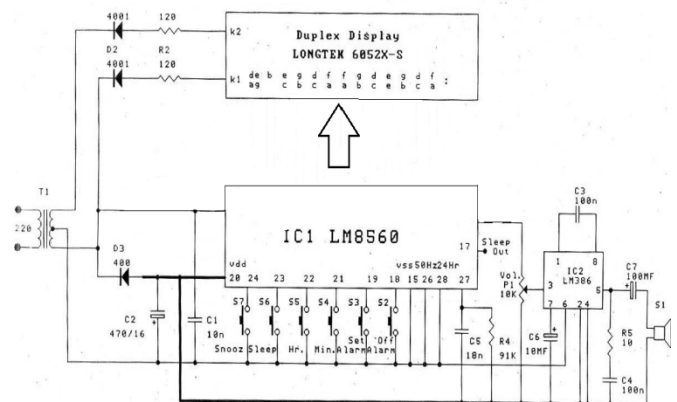


Fig. 1. lm8560 circuit description with display panel

**2.5 LM386**

The LM386 is an IC that amplifies low voltage audio power and thus is used here. It is used mainly in battery-powered devices such as guitar amplifiers, and radios. The IC consists of an 8 pin dual in-line package (DIP-8) and can produce a 0.5 watts power using a 9-volt battery.

**2.6 Display**

It is a normal led display which is used to display the alarm time. The duplex display 6052x-s is used here.

**2.7 EQUATION**

In logic gate operations Boolean algebra is used to equate them.

Let- A be the output of sensor 1, B be the output of sensor 2, C0 AND C1 be the input to motor1 C2 AND C3 be the input to motor2

Thus

$$C0 = A^{-1}B^{-1} \tag{1}$$

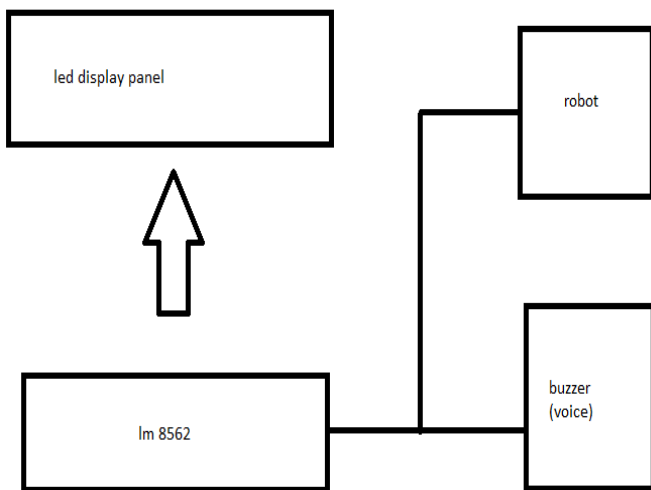
$$C1=B \tag{2}$$

$$C2= A^{-1}B^{-1} \tag{3}$$

$$C3=A \tag{4}$$

**3. WORKING**

The edge avoider alarm clock works as when the alarm is set on then the output high goes to buzzer. The same output is used as an input to the robot thus only when the alarm is about to go on then the robot starts moving and otherwise the robot stays in off mode.



**Fig. 2. Block diagram of edge avoider alarm clock**

**3.1 lm8560 output**

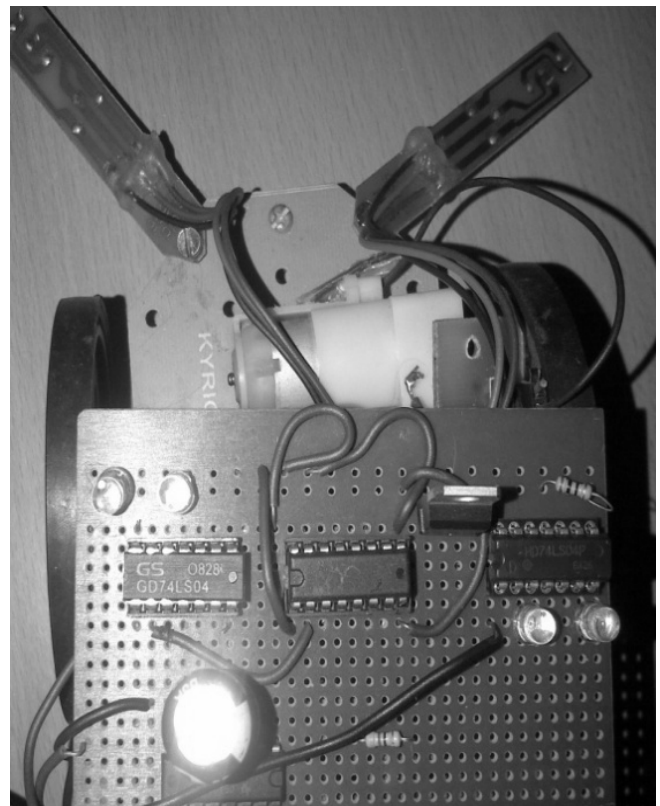
- A. The output for drive display Duplex Model numbers (pin 1-14).
- B. The output provide alarm signal at pin 16.

**3.2 To set the time**

- A. Press the switch S6 to set hours.
- B. Press the switch S4 to set minutes.

**3.3 To set the alarm time**

- A. Press the switch S3 to hold down.
- B. Press the switch S5 to set hours.
- C. Press the switch S4 to set minutes



**Fig. 3. model of the robot in grayscale**

**3.4 To set the time turn on- off the Electric appliance.**

- A. Press switch S6
- B. Press switch S4 to set minutes.
- C. Press switch S5 to set hours.

**3.5 Time dilation alarm to repeat alarm**

If we want to repeat the alarm, we can extend it for another nine minutes, on pressing the switch S7.

#### 4. CONCLUSION

It is a very cheap and effective alarm clock as once the alarm is set it starts moving and the user has to get up to stop the alarm, otherwise due to continue moving it won't be easily catchable

#### 5. ACKNOWLEDGEMENTS

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