REMOTE CONTROLLED HOME APPLIANCES

A MINI PROJECT
REPORT

Submitted by

KIRAN U–1NH18EE026
NAVEEN KUMAR KR – 1NH18EE035
ROHAN N– 1NH18EE046

In partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

IN

ELECTRICAL AND ELECTRONICS ENGINEERING

Bonafide Certificate

This is to Bonafide that the mini project report entitled "**Automatic Remote controlled home appliances**" submitted by **Rohan N , Kiran U , Naveen kumar** Department of Electrical Engineering, New Horizon College of Engineering, Bangalore in partial fulfilment for the award of the degree of Bachelor of Engineering , is a record of bonafide work carried out by him/her under my supervision, as per the NHCE code of academic and research ethics.

The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university. The project report fulfils the requirements and regulations of the institution and in my opinion meets the necessary standards for submission.

Guide Name   Dr. Mahesh M
Mrs.Rashmi N   HoD

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Date:

Place:

ROHAN N

KIRAN U

NAVEEN KUMARKR

ABSTRACT

With the new inventions and advancements in technology in the field of electronics, the desire to live a better life is increasing day-by-day. The new technologies have emerged in almost every sector/field like medical field, industries, telecommunication, and aeronautics and now it has also entered in domestic application which is also known as home automation. Apart from their busy and hectic schedule, human beings want their day to day tasks to be done on a click of button. The new technologies and unique methodologies have tried to fulfil this wish of human beings to some extent by means of smart home or home automation. The main object of home automation is to provide a wireless communication link of the home appliances to the remote user and provide convenience and ease of work . There are several ways to automate home. This paper describes the design and implementation of home appliance controlling using IR sensors and IC. Here, IC serves as the main controlling and monitoring unit. It accepts and decodes the signal received from TSOP1738 IR sensor and then the switching applications (turn on/off) is perform via Relay.

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INTRODUCTION

Employment to Population ratio has increased drastically with increasing living standards. Home Automation plays an important role in maintaining these living standards of employed population by providing a secure & convenient environment. Home automation is similar to smart home, digital home, e-home and intelligent household. They both mean a high living condition with many smart devices. It is the residential extension of building automation which is using automation technology, computer technology and telecommunication technology to give the user a developed living condition, entertainment and security. It helps people to reduce house working and household management by its automation. The Home Automation Systems not only benefit the employed population but it also helps the disabled and elderly population. The aim of our system is to build a perfect companion for someone to be at home. The concept of "automation" has existed for many years. It began with a student connecting two electric wires to the hands of an alarm clock in order to close a circuit of a battery and light bulb. Later, companies developed automated systems of their own to control alarms, sensors, actuators and video cameras and, in so doing, created the first automated buildings. The term "intelligent home" followed. Home automation systems are developed in recent years that make use of emerging technologies for the development. Home automation has become a one of the upcoming field that introduces many technologies for making the automation easy and with good performance. Most of the systems make use of a web server and mobile communication for controlling the home appliances. The vision of the system is to provide an efficient remote based system to control everyday home appliances. The system offers users an easy & effective means of controlling their various home appliances from a remote i.e. without physically turning on or off the switch. The system makes use of the IR sensor to enable remote access to the various home appliances. Apart from merely turning the appliances ON & OFF, the scope of the system can be extended to regulate their output power & set their usage time.

THEORY

IR Remote Control for controlling home appliances can be easily made using Decade Counter CD4017, 555 Timer and TSOP1738 infrared receiver. By using this circuit you can easily control your home appliances using your TV, DVD Player remote control or using a remote. You can use your TV remote to operate this circuit. 2nd and 1st pins of TSOP1738 are used to give power, Vcc and Gnd respectively. 100Ω resistor and 33µF capacitor is to suppress power supply disturbances. When IR rays at 38KHz falls on TSOP1738, output (3ed pin) goes low, since the output is active low. This output is amplified by the transistor Q1 and is given to the clock input of CD4017. 16th and 8th pins of CD4017 is used to give power Vcc and Gnd respectively. Enable (13th pin) is tied to Gnd to enable the IC, since it is an active low input. Output Q2 (4th pin) is connected to Reset MR (15th pin) to make CD4017 a bistable multivibrator. During the first clock signal Q0 becomes high, second clock signal makes Q1 high (Q0 becomes low) and the third clock signal makes Q0 high (since Q2 is connected to MR, third clock signal resets the counter).Lets assume the counter is Reset state (Q0 high and others low). When the remote is pressed, clock signal is generated which makes Q1 is high. Thus LED D1 glows, transistor Q2 turns ON and which energizes the relay. When the remote is pressed again, Q0 becomes high LED D2 glows. LED D1 indicates when the appliance is ON and LED D2 indicates when the appliance is OFF. TSOP1738 detects only those signals whose carrier frequency is around 38KHz. Thus it is accomplished using Astable Multivibrator using 555 timer.

COMPONENTS

1. IR receiver (TSOP 1738)
2. LED (Light emitting diode)
3. Diode (1N4007)
4. Resistors (47ohm, 220Kohm, 330ohm, 1Kohm)
5. Relay – 5V
6. Transistors (BC558, BC548)
7. IC (CD4017)
8. Capacitors (100uf, 0.1uf)

COMPONENTS DESCRIPTION

1. **IR receiver (TSOP 1738)**

The TSOP1738 arrangement are scaled down recipients for infrared controller frameworks. PIN diode and preamplifier are amassed on lead outline, the epoxy bundle is planned as IR channel. The demodulated yield sign can straightforwardly be decoded by a chip. TSOP1738 is the standard IR controller collector arrangement, supporting all significant transmission codes. The sensor can be utilized for Proximity discovery application alongside an IR drove in mechanical technology and security frameworks. It gets IR signal at 38khz recurrence.

2. LED (Light emitting diode)

A light-discharging diode (LED) is a semiconductor light source that transmits light when current moves through it. Electrons in the semiconductor recombine with electron openings, delivering energy as photons. The shade of the light (relating to the energy of the photons) is controlled by the energy needed for electrons to cross the band hole of the semiconductor. White light is gotten by utilizing various semiconductors or a layer of light-transmitting phosphor on the semiconductor gadget.

3. **Diode (1N4007)**

1N4007 is a PN intersection rectifier diode. These sorts of diodes permit just the progression of electrical flow one way as it were. In this way, it tends to be utilized for the transformation of AC capacity to DC. 1N 4007 is electrically viable with other rectifier diodes and can be utilized rather than any of the diode having a place with 1N400X arrangement.

4. Resistors (47ohm, 220Kohm, 330ohm, 1Kohm)

A resistor is a detached two-terminal electrical segment that executes electrical opposition as a circuit component. In electronic circuits, resistors are utilized to diminish current stream, change signal levels, to partition voltages, inclination dynamic components, and end transmission lines, among different employments.

5. Relay - 5V

5V Relay Module is a transfer interface board, it very well may be controlled straightforwardly by a wide scope of microcontrollers, for example, Arduino, AVR, PIC, ARM, etc. It utilizes a low level set off control signal (3.3-5VDC) to control the transfer.

6. Transistors (BC558, BC548)

A semiconductor is a semiconductor gadget used to intensify or switch electronic signs and electrical force. Semiconductors are one of the essential structure squares of current gadgets. It is made out of semiconductor material typically with at any rate three terminals for association with an outside circuit.

7. IC (CD4017)
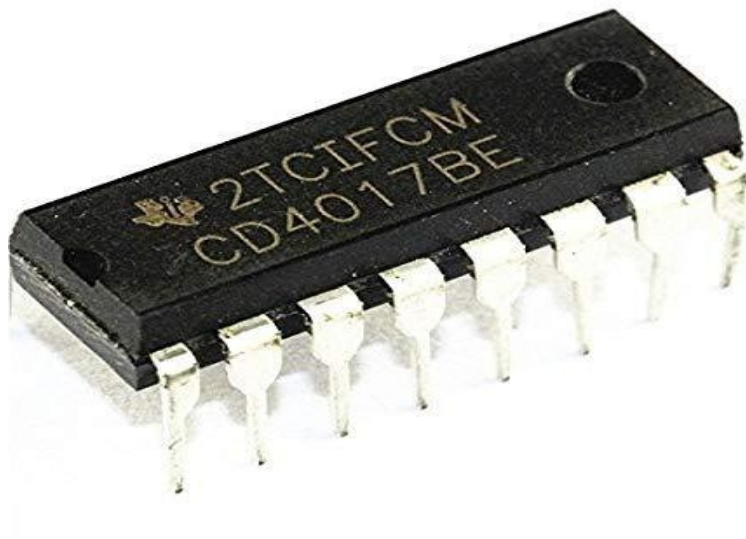
The CD4017 is a CMOS Decade counter IC. CD4017 is utilized for low reach tallying applications. It can tally from 0 to 10 (the decade tally). The circuit planned by utilizing this IC will save load up space and furthermore time needed to plan the circuit. CD4017 is as 'Johnson 10 phase decade counter'.

8. Capacitors (100uf, 0.1uf)

A capacitor is a gadget that stores electrical energy in an electric field. It is an inactive electronic segment with two terminals.

WORKING OF PROJECT

The 38kHz infrared (IR) beams produced by the controller are gotten by IR beneficiary module TSOP1738 of the circuit. Pin 1 of TSOP1738 is associated with ground, pin 2 is associated with the force supply through resistor R5 and the yield is taken from pin 3. The yield signal is enhanced by semiconductor T1 (BC558).

The intensified sign is taken care of to clock pin 14 of decade counter IC CD4017 (IC1). Pin 8 of IC1 is grounded, pin 16 is associated with Vcc and pin 3 is associated with LED1 (red), which shines to show that the apparatus is 'off.'

The yield of IC1 is taken from its pin 2. LED2 (green) associated with pin 2 is utilized to demonstrate the 'on' condition of the machine. Semiconductor T2 (BC548) associated with pin 2 of IC1 drives hand-off RL1. Diode 1N4007 (D1) goes about as a freewheeling diode. The machine to be controlled is associated between the post of the transfer and impartial terminal of mains. It gets associated with live terminal of AC mains through regularly opened (N/O) contact when the transfer stimulates.

CIRCUITS DIAGRAM
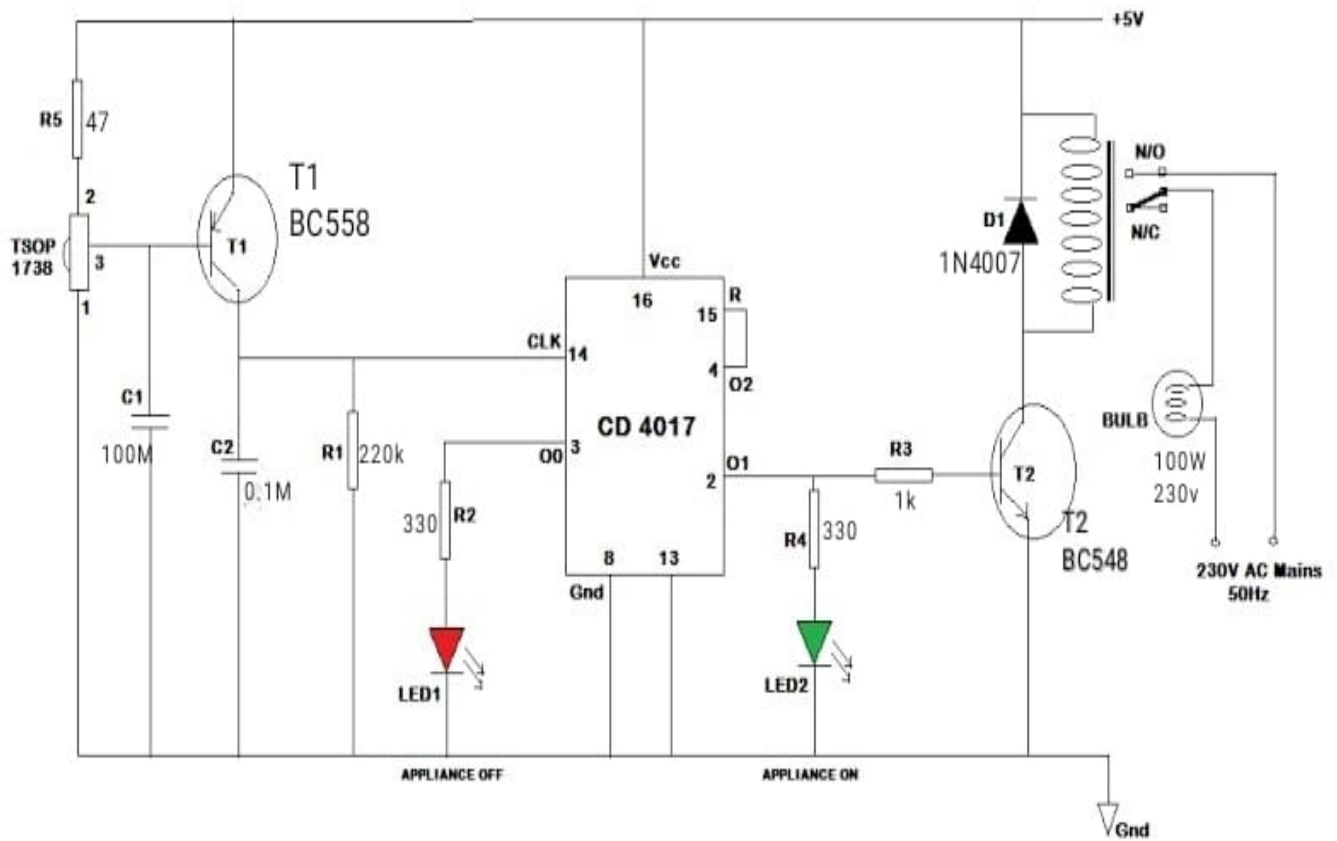
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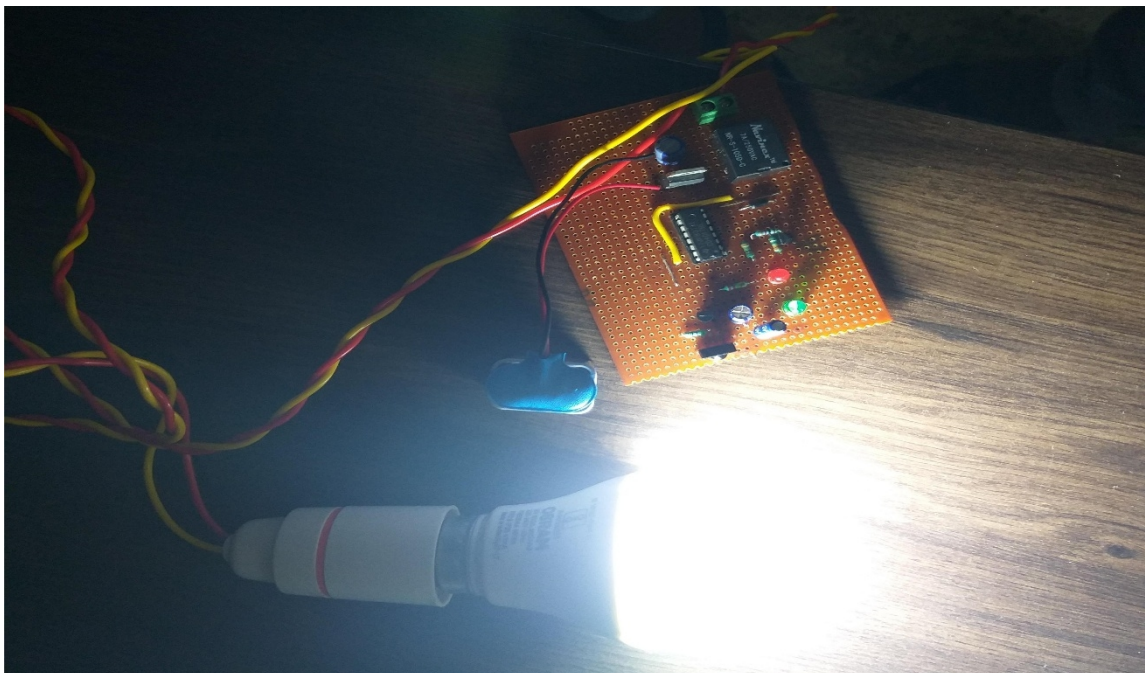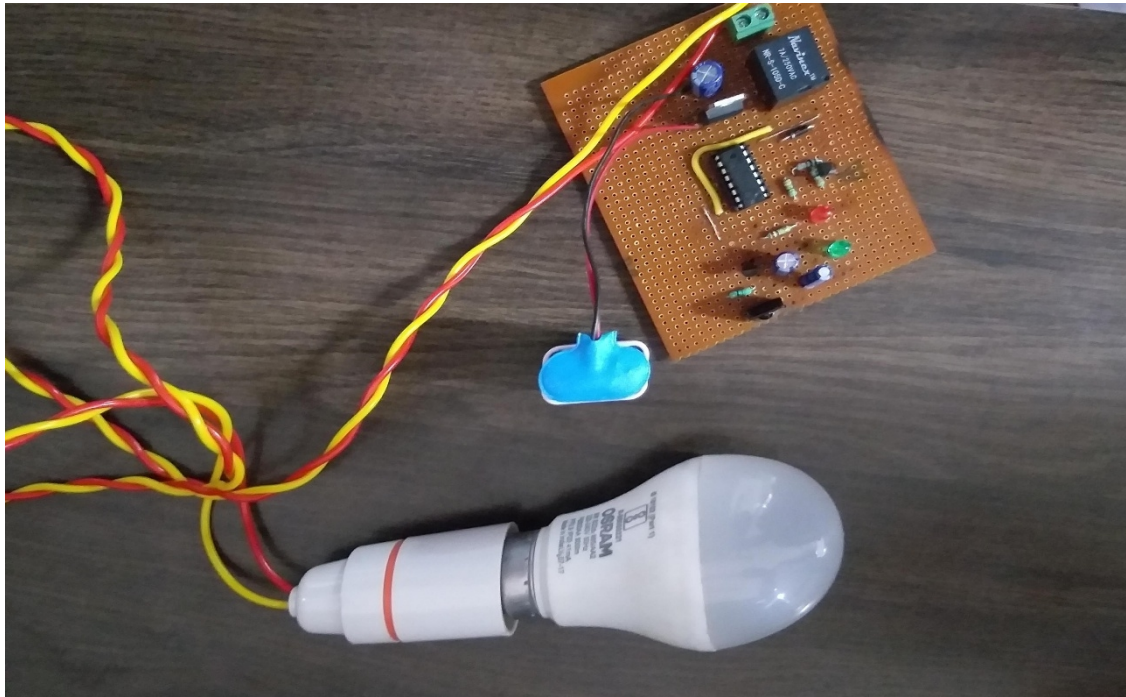
CONCLUSION

The endowment of innovation to humankind is to make life more straightforward. In this work, a controller for different home apparatuses is planned, introduced and actualized as demonstrated in circuit. The plan is tough, strong and durable which is worked with an accessible smaller IC's and RF module. From any spot around the house any machines can be control voluntarily without the necessity of view. The transfer activity which is associated with the heap to be controlled is worked with radio recurrence which communicates just when a switch is squeezed. Numerous gadgets can be control utilizing diverse recipient with various tending to mode utilizing single far off.

APPLICATIONS

- Used to switch on and off any home appliances like TV, Lights, Heaters etc.

- Can be used in hospitals to on and off any appliances without touching the switch physically.

- Used in orphanages, where the tenets are very aged.

- In the pandemic situations it's very useful.

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