Wireless Controlled Door-Bell

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Abstract—*Now-a-day's wireless control of appliance is in practice, because of its advantage like no wire is needed, multiple controlling is less complicated. The controlling range of wireless doorbell is 100M.*

As the wireless doorbell is wireless based project, it is divided into two major section i.e. transmitter and receiver.

Transmitter: This transmitter section is designed around oscillator transistor (BF194B) T2 followed by two transistor (BC148) T1 and T3. Transistor T2 generate special radio frequency determined by trimmer (variable capacitor) and coil. Transistor T1 is used as pulse generator. The output from transistor T3 is given to emitter of transistor T2 in order to get radio frequency from its collector. Trimmer VC1 is used to adjust the transmitter frequency.

Receiver: The receiver section is further divided into two main sections i.e. RF amplifier section and bell trigger section. An aerial is used to receive the transmitted frequency from remote which is further amplified by amplifier and trigger circuit. The whole receiver circuit utilizes seven transistors.

Keywords—Pulse Generator, Rf Amplifier.

I. INTRODUCTION

A doorbell is a signaling device typically placed near an entry door to a building. When a visitor presses a button the bell rings inside the building, alerting the occupant to the presence of the visitor. Although the first doorbells were mechanical, activated by pulling a cord, modern doorbells are electric they are actuated by an electric switch. Wireless controlled Door-bell project provides wireless system to control the door bell. Today the traditional wired type of doorbells are gradually getting obsolete and are being replaced by the advanced wireless type of doorbells that are easier to install due to their hassle free set-ups. In most wired systems, a button on the outside next to the door, located around the height of the doorknob, activates a signalling device (usually a chime, bell, or buzzer) inside the building. Pressing the doorbell button, a single-pole, single-throw (SPST) pushbutton switch momentarily closes the doorbell circuit. One terminal of this button is wired to a terminal on a transformer. A doorbell transformer steps down the 120 or 240-volt AC electrical power to a lower voltage, typically 10 to 20 volts. The transformer primary winding, being energized continuously, does consume a small amount (about 1 to 2 W) of standby power constantly; systems with lighted pushbutton switches may consume a similar amount of power per switch. The trade-off is that the wiring to the button carries only safe, low voltage isolated from earth ground.

Now day's wireless monitoring and control system is in practice, because of its advantage like no wire is needed, multiple controlling is less complicated. Thus we proposed the wireless based technology to control the door bell. Our Wireless controlled Door-bell project has two major part one Transmitter section and second is Receiver section.

Transmitter: This transmitter section is designed around oscillator transistor (BF194B) T2 followed by two transistor (BC148) T1 and T3. Transistor T2 generate special radio frequency determined by trimmer (variable capacitor) and coil. Transistor T1 is used as pulse generator. The output from transistor T3 is given to emitter of transistor T2 in order to get radio frequency from its collector. Trimmer VC1 is used to adjust the transmitter frequency.

Receiver: The receiver section is further divided into two main sections i.e. RF amplifier section and bell trigger section. An aerial is used to receive the transmitted frequency from remote which is further amplified by amplifier and trigger circuit. The whole receiver circuit utilizes seven transistors.

II. CIRCUIT DIAGRAM

2.1TRANSMITTER

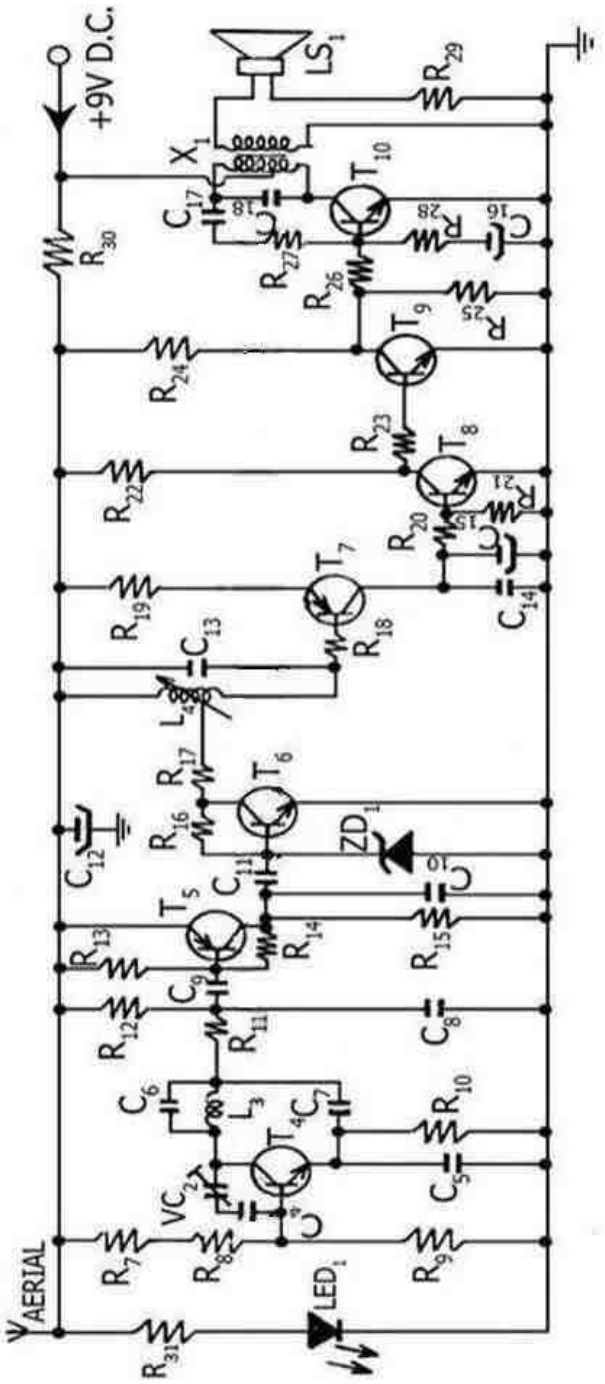

Fig 1: Transmitter Circuit Diagram

2.2 RECEIVER

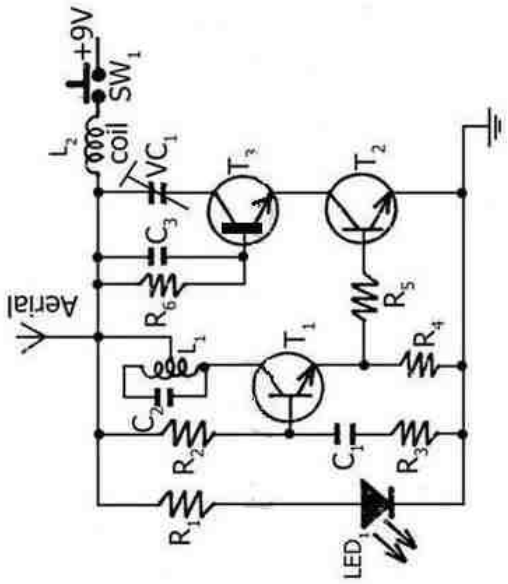

Fig 2: Receiver Circuit Diagram

III. WORKING

Transmitter:- This transmitter section is designed around oscillator transistor (BF194B) T2 followed by two transistor (BC148) T1 and T3. Transistor T2 generate special radio frequency determined by trimmer (variable capacitor) and coil. Transistor T1 is used as pulse generator. The output from transistor T3 is given to emitter of transistor T2 in order to get radio frequency from its collector. Trimmer VC1 is used to adjust the transmitter frequency.

Receiver: – The receiver section is further divided into two main sections i.e. RF amplifier section and bell trigger section.

An aerial is used to receive the transmitted frequency from remote which is further amplified by amplifier and trigger circuit. The whole receiver circuit utilizes seven transistors. Transistor T4 get frequency from hand unit and further send to tuned circuit made from capacitor C6 and coil L2. Transistor T5 is used as comparator which further send amplify voltage to capacitor C11 for filter. The filter voltage is passed through detector stage i.e. rectify and given to base of transistor T6. Transistor T6 is adjusted in amplifier mode for amplifying the signal voltage.

The amplified voltage from transistor T6 is given to base of transistor T7, used in complementary mode. The positive voltage at collector of transistor T7 let transistor T8 in conducting state and T9 in non- conducting state. The positive voltage available at collector of T9 is given to base of transistor T10. Transistor T10 is used here in blocking

oscillator mode which further produces bird sound combining with output transformer.

IV. MODEL DIAGRAM

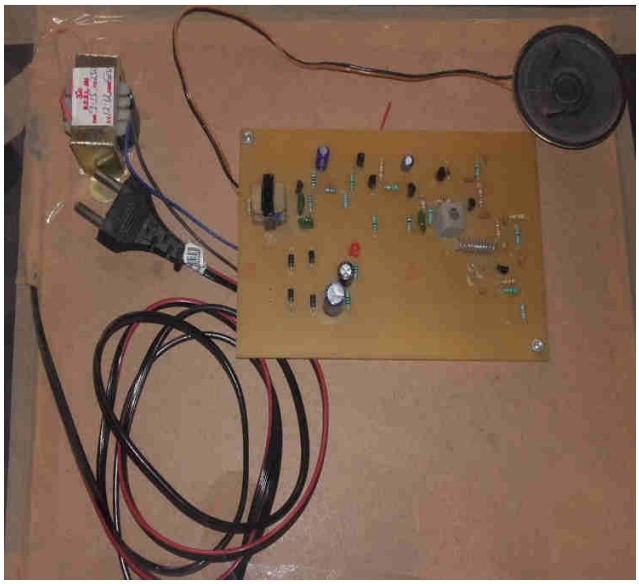

Fig.3 :Receiver

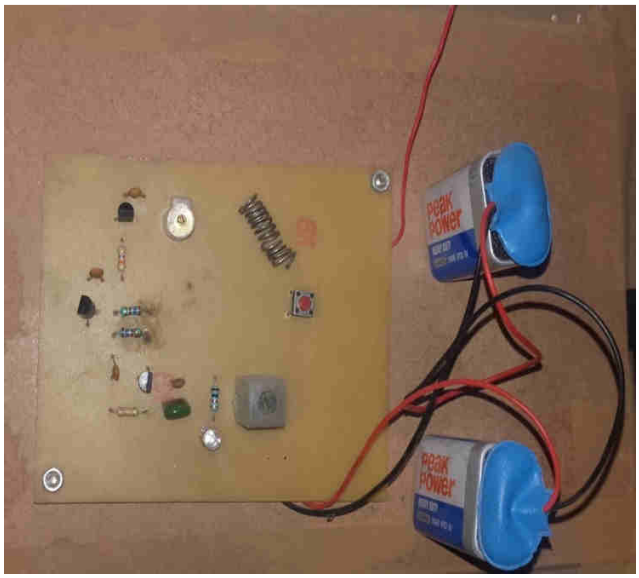

Fig. 4: Transmitter

V. SIMULATION

We have to change our attitude to building projects and use items such as this to learn how things work and modify them to suit our own requirements. This doorbell uses quality components. It's not rubbish. The circuit is quite unbelievable. You can't obtain some of the components individually and the effectiveness is magic. We have so much to learn! The first thing you will notice is the clever circuitry. Some of the design goes against everything we have learnt in electronics. That's why we have to study other people's designs and realise "the more you know, the more you realise you don't know."

The oscillator circuit is very interesting, but first we will look at the RF oscillator. The doorbell operates on the 303MHz band and the 30 meters range (100ft) is obtained without the use of an antenna! The circuit is actually radiating from the printed track of the tank circuit. The Tank Circuit is a single-turn coil and a small capacitor (5p & 4p in parallel).

In this project we show how to add a small antenna to the circuit to get double the range plus two other improvements to increase the range.

Some of the improvements will load the circuit and alter the frequency at which it operates. Others can be done without any effect on the circuit. Fortunately, the transmitting stage is what we call "tight" and is not affected by surrounding "stray capacitance."

Normally, this stray capacitance is a person hand or body, touching or coming near the transmitting (output) stage and altering the frequency. The circuit has been kept near the power rails by the use of a choke in the positive rail. The positive rail is then reflected to the negative rail via the battery. This feature helps us when we want to add an antenna. A 7cm length of tinned copper wire is connected to the collector of the transistor and bent around the board so that everything can be put back into the case.

When the project was tested inside the author house, the range was increased to double. When the transmitter was taken outside, the range was over 60 meters (200ft) and the full range could not be tested as the sound from the doorbell was too faint to be heard! We have to know what type of components can be purchased cheaply and what to expect from them. In this case the transmitting transistor has the highest gain - so they have taken a special effort to get a good quality transistor.

VI. RESULT

One of the main reasons for presenting this project is to show how to get the best range from a transmitter. Normally you need very expensive equipment to help you, but a very clever alternative is to use our method. All you have to do is place the receiver about 15 meters from the transmitter and in a very poor reception area. The aim is to get the receiver to be at the extreme end of the range so that if you move the transmitter away by as little as a meters, the receiver will not detect the signal. Now the receiver is a very sensitive RF indicator. By moving the transmitter to different places, the receiver should not detect the signal. You are now ready to add an antenna to the transmitter and determine its effectiveness. We have already mentioned the transmitter circuit is classified as "tight" and adding an antenna should not shift the frequency.

VII. CONCLUSION

The presented circuit of wireless controlled doorbell is employs two major section i.e. transmitter and receiver. The working principal of the circuit is based on both circuit. This transmitter section is designed around oscillator transistor. The output from transistor gives to emitter to generate radio frequency from its collector. We also adjust this transmitter frequency using trimmer.

The receiver section has two main sections i.e. RF amplifier section and bell trigger section. An aerial is used to receive the transmitted frequency from remote which is further amplified by amplifier and trigger circuit. The whole receiver circuit utilizes seven transistors.

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