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Multiple Object Locators for Blind

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Abstract

The abstract is about a concept of a device that would help the blind person locate their misplaced items. Even some of us have experienced it; we tend to keep our keys/bags here and there and end up misplacing them. If it's difficult to find such items even for people like us having proper eye sight, we can understand how difficult it would be for a blind person. So, this work is an idea to help them in their day to day lives. This product has two devices, namely transmitter and receiver module; a transmitting device that would stay with them in the form of wrist band or remote and there would be a receiving device attached to the object. The main objective is to make it simple, compact and economical as well.

Keywords: *IC L293D, RF receiver ,IC HT12E, RF transmitter, IC HT12D*

I. INTRODUCTION

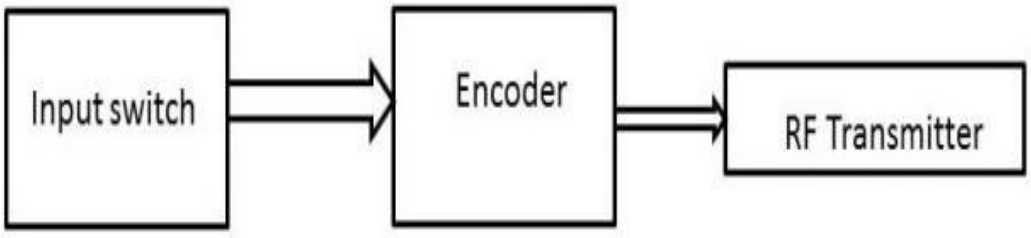

Fig. 1. Transmitter block diagram

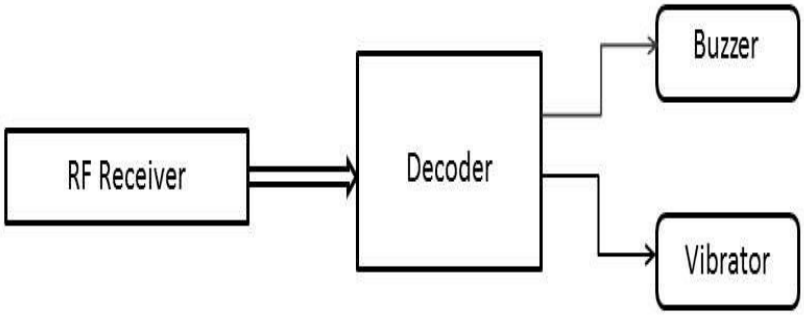

Fig.2. Receiver block diagram

The principle on which this circuit works is wireless transmission. The basic diagram is as shown in Fig.1. At transmitter side, we have switches used to generate address, an encoder and RF transmitter module.

At receiver side, RF receiver module is used which receives data. Further it will be decoded using decoder and output is produced accordingly.

II.TRANSMITTER

The transmitter mainly consists of two basic components HT12E IC and RF transmitter module. It can transmit data to around 8 to 12m without using external antenna. For the purpose of power supply 9V battery is used which is step-down to 6V using IC 7806 voltage regulator. The whole circuit works perfectly well at 6V. The reason behind using 9V battery is that it is economical and easy to replace IC HT12E is a encoder IC with eight address lines (A0-A7) and four data lines (D0-D3). The parallel data from the data pins are converted to serial data and is transferred to RF transmitter through Dout (17) pin [1]. All the data pins are connected to VCC for continuous transmission of logic 1. A 1.1 MΩ resistor is connected in between OSC1 and OSC2 (oscillator pins). The TE is a active low transmission pin.

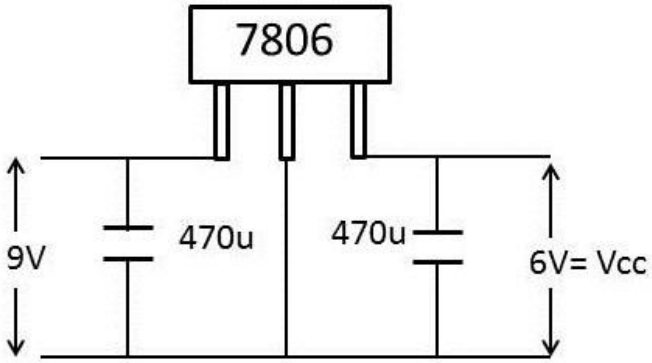

Fig 3 9V step down to 6V using IC 7806

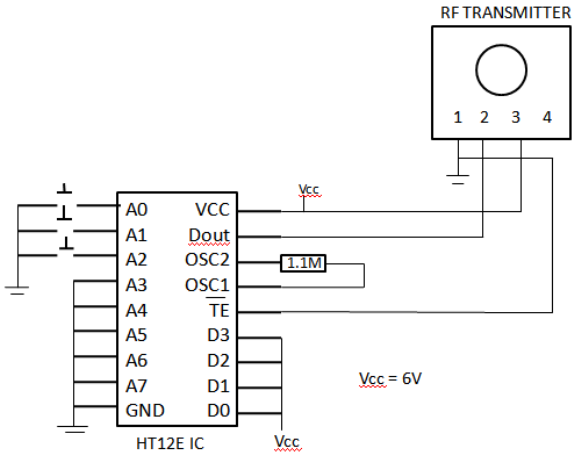

Fig 4 Transmitter circuit diagram

Table.1 RF Transmitter pins

Pin No.	Description
1	Ground
2	Data
3	VCC
4	Antenna

Multiple receivers can be configured using a single transmitter by configuring different address lines. Here, 3 receivers are configured using a single transmitter. Address pins from A3-A7 are directly connected to ground while pins A0-A2 are grounded through switches as shown in Fig.4. When any of the address pin is floating, it is by default considered as logic 1. Hence, for multiplexing, when a respective switch is pressed it is forcefully connected to ground. The data pins are kept unchanged because the changes have to be made from the transmitting end and it becomes inconvenient for user to change address and data pins both. Whatever address is passed from the transmitter, the same has to be passed at the receiver end also. Thus, with the help of the switches, different addresses can be generated from single transmitter and multiple receivers can be configured.

III. RECEIVER

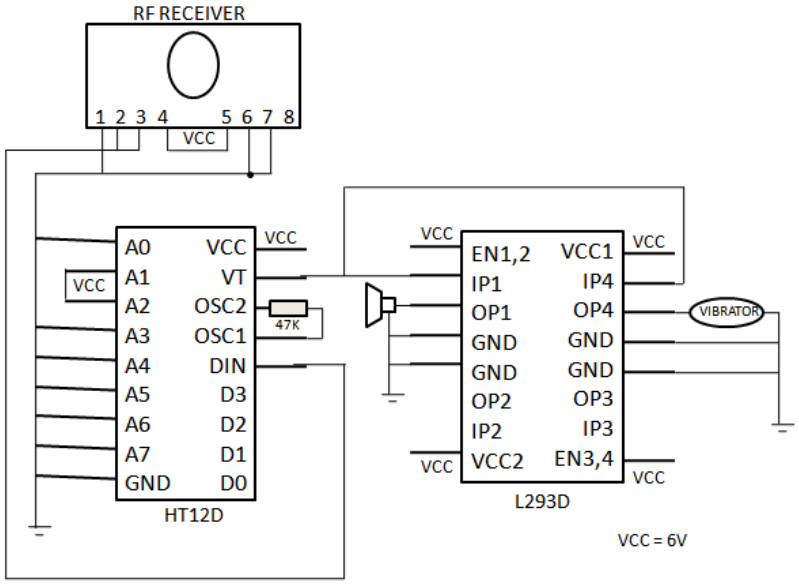

Fig 5 Receiver circuit diagram (with address "01100000")

Table.2 RF Receiver pins

Pin No.	Description
1,6,7	Ground
2,3	Data
4,5	VCC
8	Antenna

The receiver mainly consists of HT12D IC, RF receiver and L293D IC. For output, a buzzer and a vibrator motor is used with each receiver. The serially received data is converted to parallel by HT12D (decoder) IC and is available on its pins D0-D3. The output data pins has internal latch which stores the data until it is changed by another transmission. Here, the data pins are not used hence they are left open.

VT is a valid transmission pin. It gives a continuous high pulse when a successful transmission and reception takes place. When a switch at transmitter is pressed, a receiver with the same address as that of transmitter gets matched. HT12D of that receiver first checks the address three times and if it matches, only then it gives a

continuous high pulse on VT pin [5]. Hence, VT pin will be high till the configuration lasts between the transmitter and receiver. For this reason, the output is connected to VT pin.

This acts as current amplifier, since it takes a low current control signals and provide a high current signal. EN1,2 and EN3,4 are enable pins for port 1,2 and port 3,4 respectively [2].

EN1,2 and EN3,4 are connected to VCC. IP1 and IP4 are connected to VT. The buzzer is connected to OP1 and vibrator motor is connected to OP4 as shown in Fig.5. Hence, when the switch from the transmitter is pressed, a particular receiver (with same address as transmitter) gets configured, VT pin of HT12D becomes high, thus, IP1 and IP4 become high. OP1 and OP4 follow the respective inputs and vibrator and buzzer gets driven. It will continue to remain ON until either the

address form the transmitter side is changed or the power supply is removed.

Here, a transmitter is multiplexed with 3 receivers using three address pins of transmitter. When switch at A0 is pressed and other two remain floating, the address generated is “01100000”. With this address the first receiver can be configured. To configure second receiver, switch at A1 is pressed with A0 and A2 floating and address becomes “10100000”. Similarly, with the address “11000000” the third receiver is configured.

IV.SOFTWARES

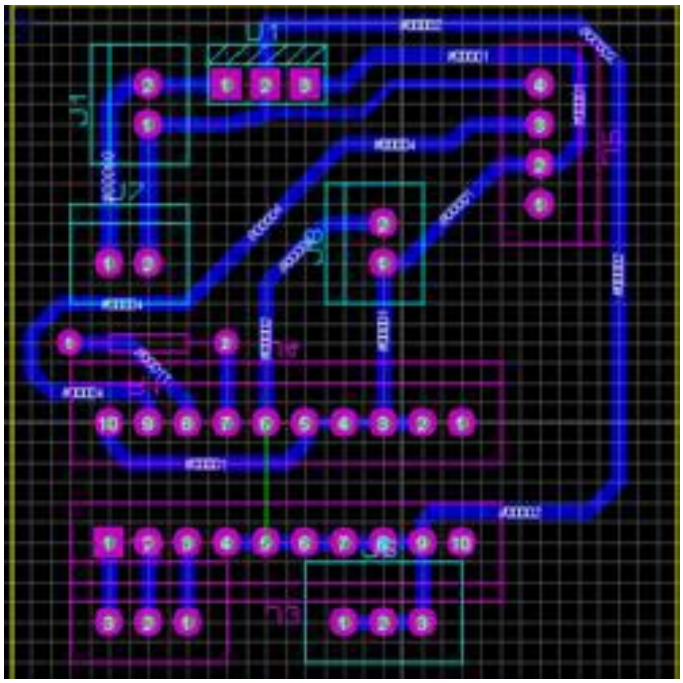

Fig. 6.Transmitter PCB Layout

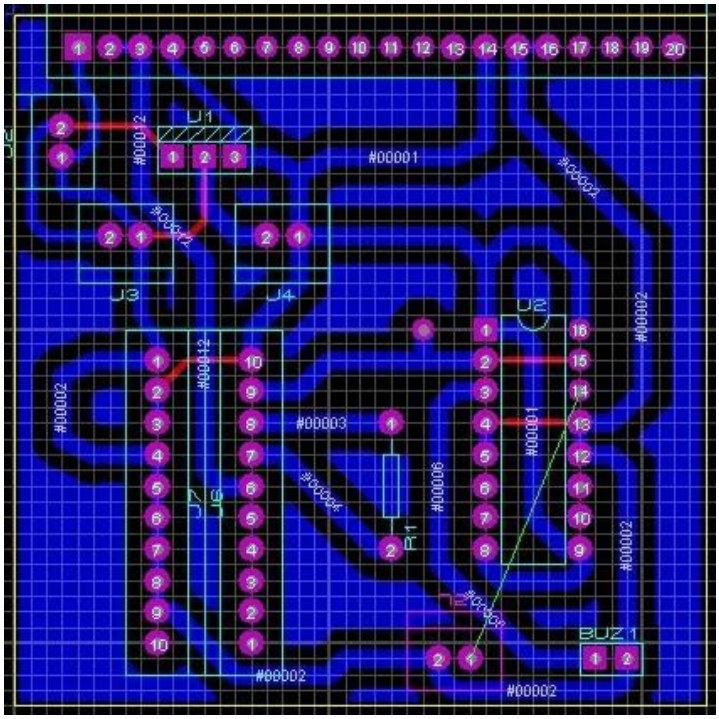

Fig 7 Receiver PCB Layout

For the designing of PCB layout Proteus software is used. The dimensions for transmitter are 4x4cm and for receiver its 5.5x5.5cm. The primary aim was to make it compact, so design has been made accordingly.

FUTURE SCOPE

1) IP Certified Water Proofing or water repellent nano coating to avoid damage from odd splashes and rains etc.
2) Wrist band should be comfortable and pleasant to touch for prolonged use. It
3) Should not cause harm to the human skin hence efforts should be made to make use of elements which are skin friendly and have anti-allergic properties. TPSiV is one such thermoplastic elastomer which is currently being used in many fitness band/ smart watches.

4) Industry grade aluminium casing for better durability to avoid damage from accidental drops.

5) Could be modified to work as wireless switch to control home appliances like fans etc. via relay mechanism.

6) Further miniaturisation by making use of SMD but at the cost of increased cost of product. Hence it could be made optional.

CONCLUSION

In this work, a product is made to help blind people to locate their misplaced objects. The design of product is simple and compact. It is economical and easy to use. It is built with the help of available ICs and RF module. In this design mentioned, one transmitter controls three receivers whereas number of receiver can be increase.

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