RF Controlled Smart Hover Board

Ravi Teja Ch.V
Assistant professor, Department of Electronics and Communication Engineering
Anurag college of engineering, Hyderabad, Telangana, India

C.G.Apuroopa
B.Tech. Student, Department of Electronics and Communication Engineering
Anurag college of engineering, Hyderabad, Telangana, India

K.Sravani
B.Tech. Student, Department of Electronics and Communication Engineering
Anurag college of engineering, Hyderabad, Telangana, India

K.Maneesh
B.Tech. Student, Department of Electronics and Communication Engineering
Anurag college of engineering, Hyderabad, Telangana, India

Abstract- One of the newest – and more compact – forms of transportation already has a lot of names attached to it. They may refer to it as a "mini segway without handle bars" or even a "segway board". Commonly known as a 2-wheel segway hover board. It is designed to move you around even though you are standing. It doesn't really hover but it gives off the impression you are hovering when riding it. It is a board, but tends to scoot along the ground. Typically, the hover board is a steel frame with a central pivot and includes infrared sensors, gyroscopes, a logic board, a pair of electric motors and tilt/speed sensors with one of each located inside the wheels sometimes we may actually lose our self balance because of some distractions where we hurt ourselves, in this contemporary world we actually expect more from a single device but present hover boards are only used to travel. These existing hover board are also heavy and costly. Our present proposed system is an RF controlled smart hover board which can be controlled by the switches present under the feet of the person present on the hover board and this can also be driven or operated with the help of a wireless remote control(RF) which can be used as an movable tray. The switches present under the feets are directly connected to the motors, and an RF receiver which receives the signals from RF transmitter (direction given by user). Input to motor driver which are connected to the motors of hover board. Therefore, hover board can be operated using switches under the feet as well as by an RF remote. We can also use this hover board as helper like passing a cup of tea, water bottles or any other items to the person in other room or to different places .While moving on the hover board we can also charge our mobile phones by connecting our mobile to the USB port of the hover board. This hover board is less in weight and can also so be done in less cost.

Keywords – RF, USB, Hover board, Motor driver.

I. INTRODUCTION

In general robots are wired robots which can travel certain distance because of wire connections of robot which cannot be operated for long distance. So, later on wireless robots came into existence using RF signals which can move the robot for far distance. Communication systems play a major role in maintaining communication between humans even people get entertainment programs or other television or radio broadcasting programs. To overcome disadvantages of wired communications, lead in the development of most advanced wireless communication systems .These wireless communication systems can be used to transmit different types of signals from transmitting end to receiving end. The hover board is operated from a distance using RF transmitter. RF controlled smart hover board can be controlled by the switches present under the feet of the person present on the hover board and this can also be driven or operated with the help of a wireless remote control(RF) which can be used as an movable tray.

II. PROPOSED SYSTEM

A. Block Diagram

our present proposed system is to have a hover board with many uses our hover board can be a comfortable self balanced hover board which can be controlled by the switches present under the feet of the person present on the hover board and this can also be operated with the help of a wireless remote control which can be used as an movable tray like passing a cup of tea or water bottles to who is in other room. While moving on the hover board we can charge our mobile phones by connecting our mobiles to the USB port of the hover board. The switches present under the feet are directly connected to the motors and an RF Receiver is connected to the arduino board which receives the signal from Transmitter.

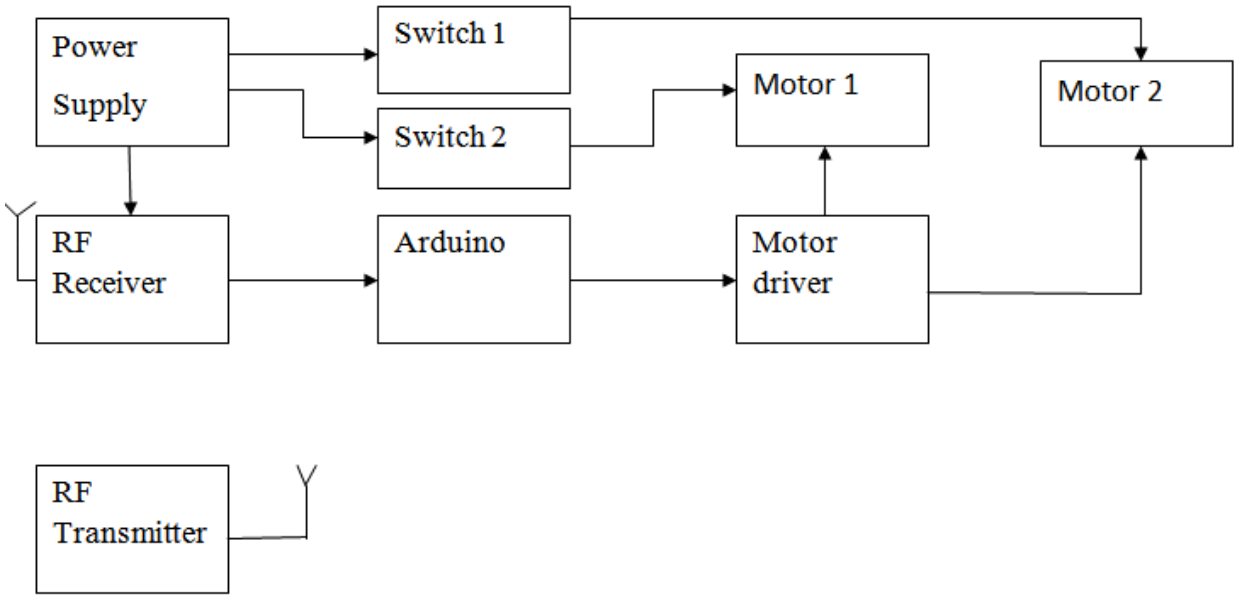


Figure 1: Block Diagram

B. Algorithm steps-

The working of the project can be explained in the following steps:

- Step 1: Power supply is given to the RF remote control and Hover board.
- Step 2: Hover board to receive the command.
- Step 3: when two DPDT switches are pushed to the left the hover board moves forward.
- Step 4: when two DPDT switches are pushed to the right the hover board moves backward.
- Step 5: if one DPDT switch on the left side is pressed then the hover board turns left..
- Step 6: if one DPDT switch on right side is pressed the hover board turns right
- Step 7: To operate hover board with remote press 1 and 3 switches of RF transmitter to move forward.
- Step 8: 2 and 3 switches of RF transmitter to move backward
- Step 9: switch 1 of the RF transmitter is pressed to turn the hover board right.
- Step 10: press switch 2 of the RF transmitter to turn the hover board left.

C. Flow Chart

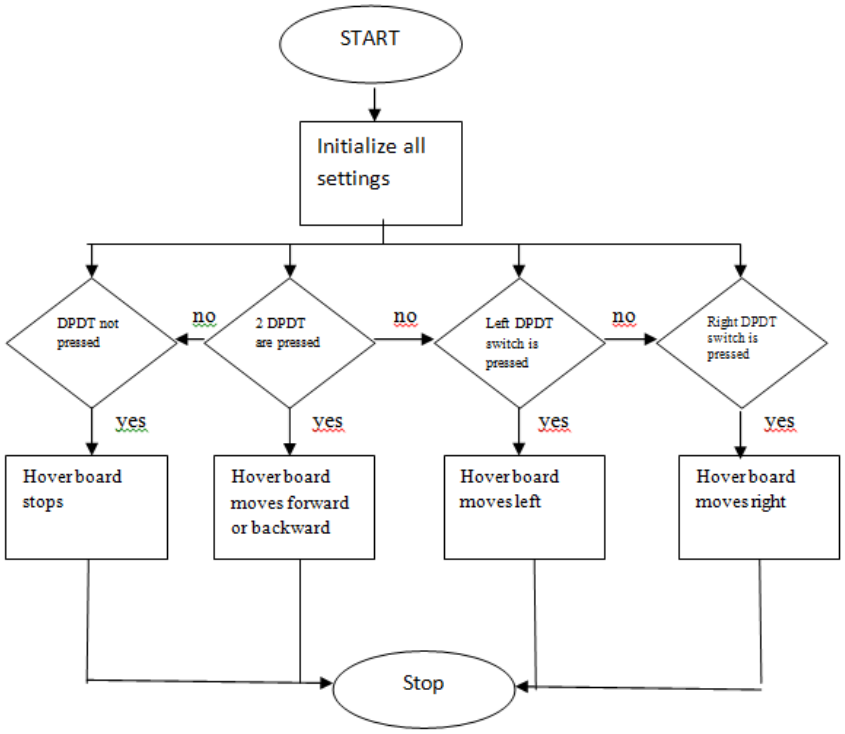


Figure 2: flow chart of hover board using DPDT switches

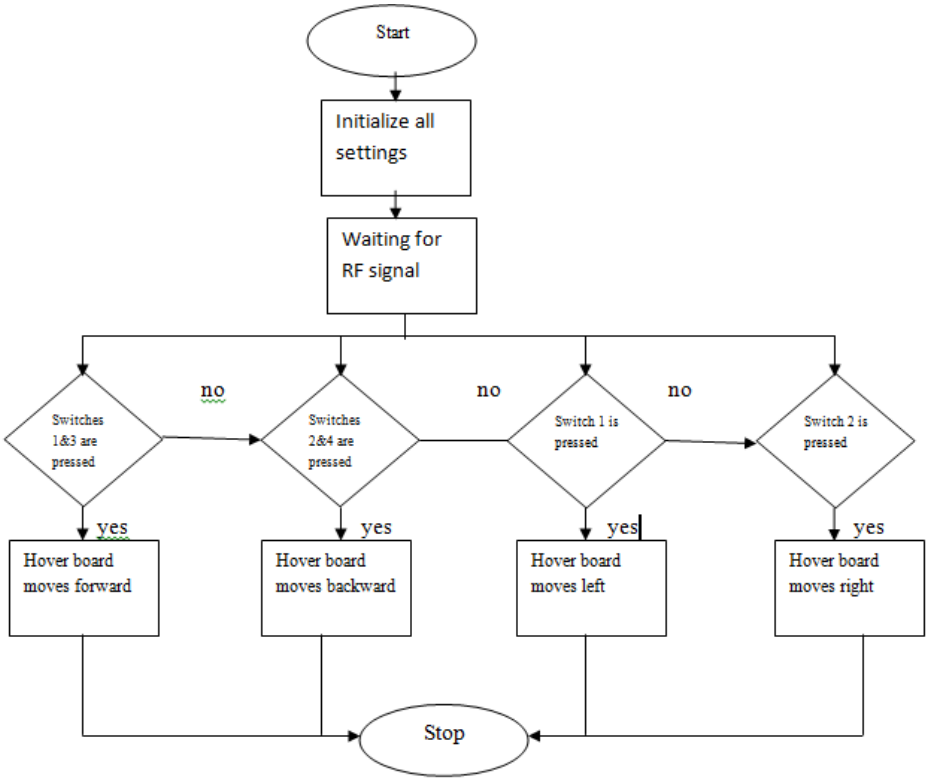


Figure 3: flow chart of hover board using Remote

D. Hardware Implementation

Power supply

9v or 12v battery is used for giving power supply for the switches, RF receiver and motor driver. 7805 regulator IC is used to give constant dc 5v output which is given as operating voltage for the motor driver.

RF Receiver and Transmitter

The RF transmitter transmits the signals which are given by the user to the RF receiver. The RF receiver receives the signals from the RF transmitter and sends the signal to motor driver when connected to power supply.

Motor Driver and Motors

Motor driver is used to drive the two DC motors for the robot. The output of RF Receiver is given to the inputs of motor driver and depending upon the inputs given to the motor driver. The motor output pins (m11,m12,m21,m22) rotates the motors by which the robot moves.

Switches

The switches present under the feet are directly connected to the motors, and an RF receiver which receives the signals from RF transmitter (direction given by user). Input to motor driver which are connected to the motors of hover board. Therefore, hover board can be operated using switches under the feet as well as by an RF remote.

III. EXPERIMENT AND RESULTS

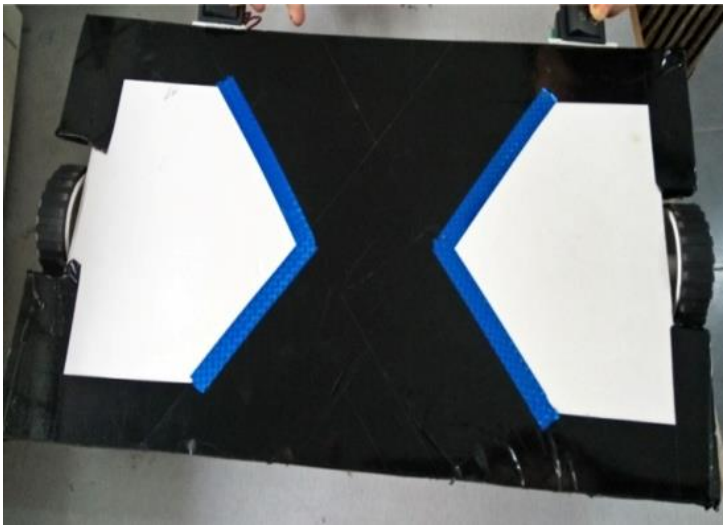
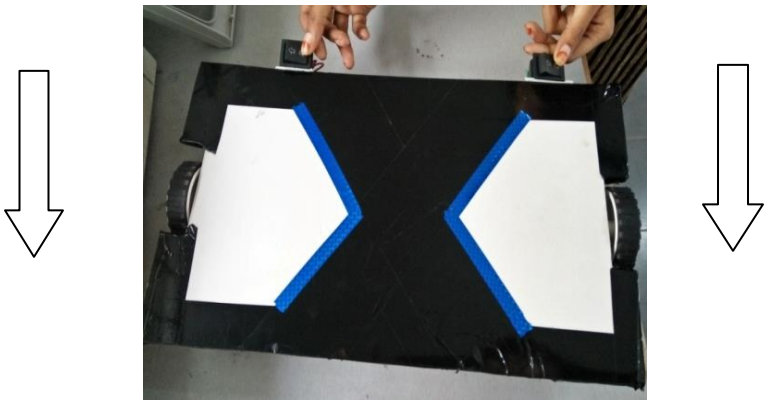
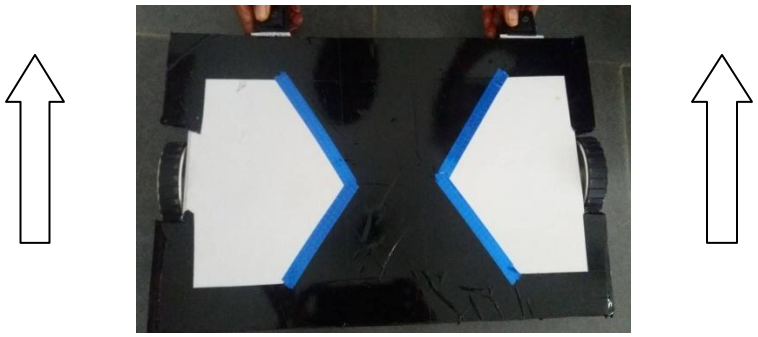


Fig 4: RF Controlled Smart Hover board



(a)



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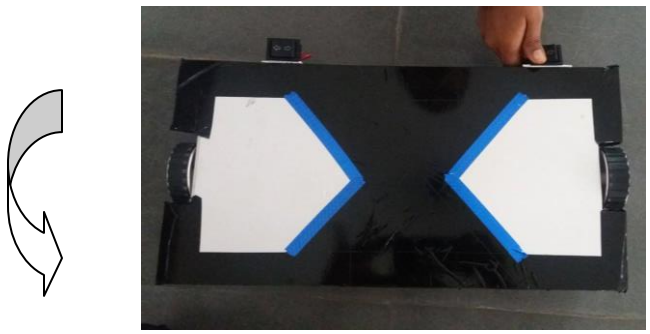

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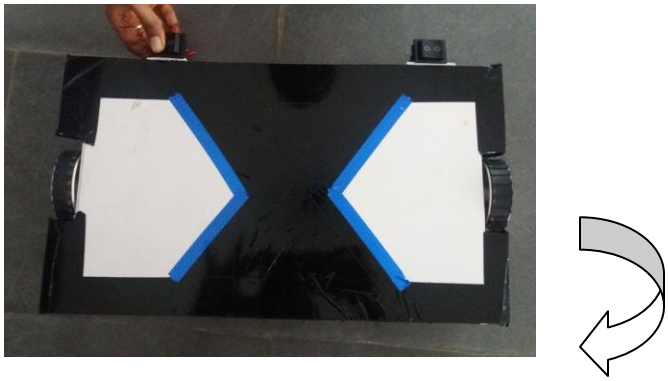

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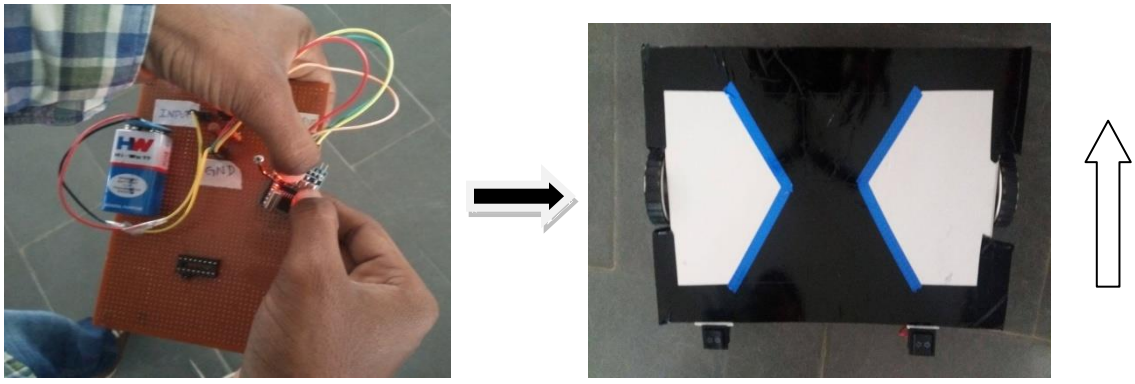

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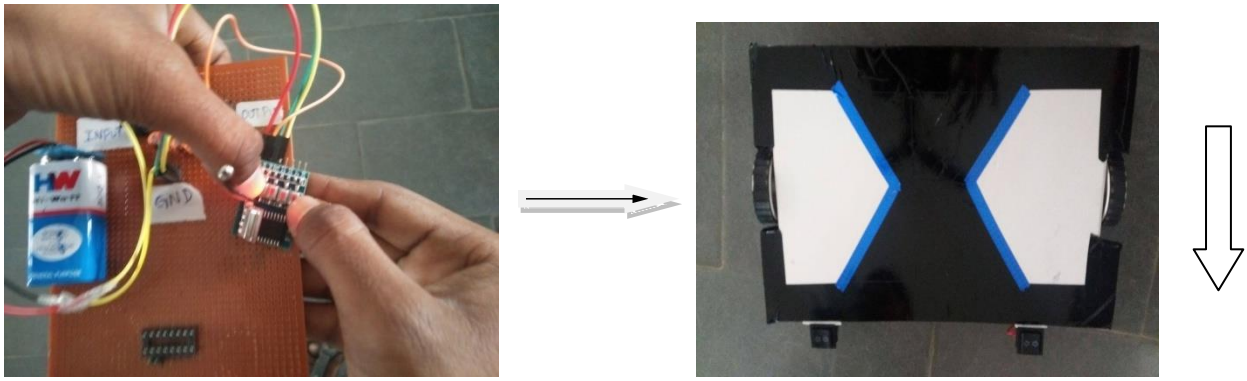

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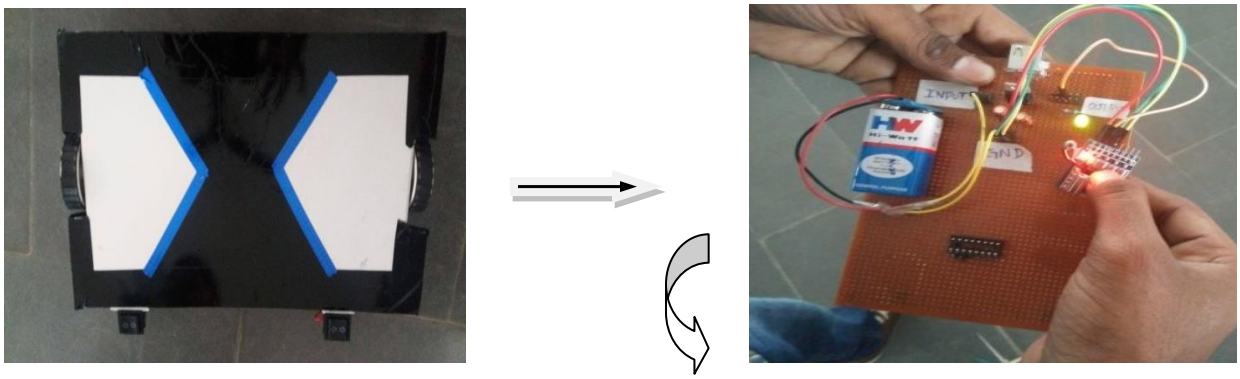

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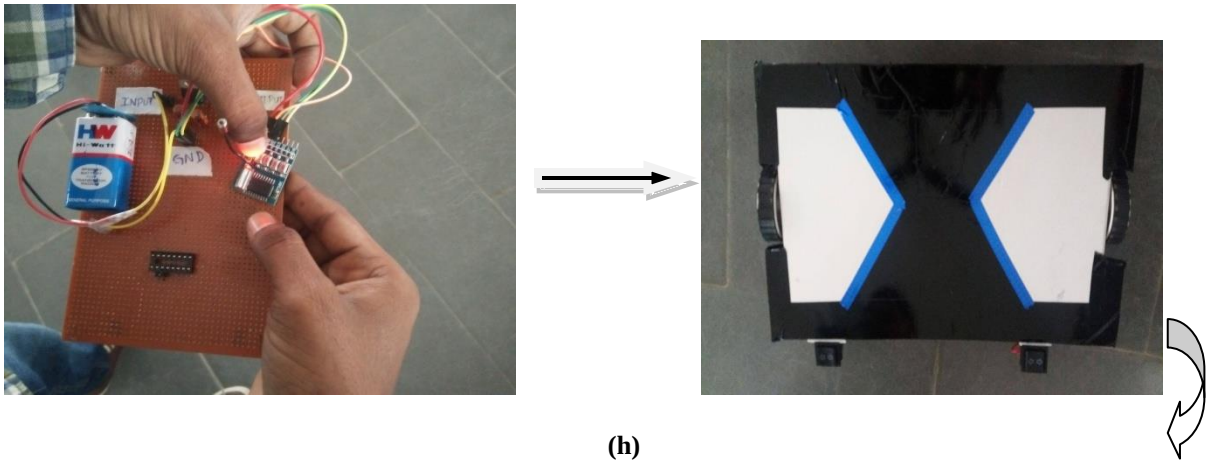

(h)

a) If the two DPDT switches are pushed to left then hover board moves forward

b) If the two DPDT switches are pushed to right then hover board moves backward

c) If the left side DPDT switch is pressed then the hover board turns left

d) If the right side DPDT switch is pressed then the hover board turns right

e) The switches 1 and 3 of RF Transmitter are pressed to move forward

f) The switches 2 and 4 of RF Transmitter are pressed to move forward

g) If the switch 1 is pressed it moves right

h) If the switch 2 is pressed it moves left

IV. CONCLUSION

The project has been successfully designed and tested. It has been mainly designed to make aware of smart hover board which can be controlled by remote control. Many existing systems have discussed about the robots and have proposed many applications for reducing these efforts. The proposed hover board can be controlled manually and can also be operated externally. When the commands given by the disabled person sitting in one place, according to that commands the motors will move which in turn moves the robot.

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