

An Embedded Bot for Painting the Lengthy Walls Using the Bluetooth Technology Operated Using an Android Phone

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Abstract: For humans it's been a great disappointment for painting lengthy walls like auditorium walls ,street walls, home back and side walls in a same color and same pattern.IN doing so it requires many persons to finish the work in time or in a required span of time. To solve this tedious work we deploy an embedded system using a ARDUINO development board and using ARDUINO IDE. With the help of this bot we can paint the lengthy walls with a short period of time. Here we use BLUETOOTH technology to control this bot. The key use of this bot is to reduce the man work in the above discussed tedious work. Here the whole bot is made into a box in placed on the base of a four wheeled bot .This project help us in reducing the time and it will be automation in painting.

Keywords:ARDUINO-BLUTOOTH TECHNOLOGY-FOURWHEELED BOT

I. Introduction

This projects find use in painting field where there is a need of painting the

lengthy walls which involving labour and much time. With the help of the ARDUINO UNO we control a bot which is used in painting the walls. Here we mainly used a Bluetooth device which is used to control the bot using our android phone. In the bot to paint the walls, it's totally looks like box inside the box we will have two cabins. The two cabins are separated in vertical manner in which one cabin is made smaller and the other is larger. The larger cabin is the place where we have to place the quantity of the paint to be paint. To the one end of the box the smaller cabin is to be closed and the to the other end of the second cabin will be attached paint roller.The paint roller is attached to the one end in a inclined position of 45° , so that the paint correctly falls on the roller when the bot moves in a direction . Now this box like part is made to fix on the base of a four wheeled bot. thus it is a bot to paint the walls. Here the bot is made to move in upward or in downward direction only . Here we use dc motors to move the bot . To control this bot we use Bluetooth

technology. A Bluetooth is connected to the bot and a app by name GHOST REMOTE is used to control the bot. The total set up is made to work by using a power supply(commonly used are +12v,+15v,+20v.....).the car base has two motors connected in opposite to each other such they together form the back pair of wheels and there is the other pair of wheels which form the front section .These wheels bears all the weight of the kit.

Hence the motor used should be of heavy duty.so the thrust to be produced by the

motor is at required level. The one end of the second cabin is made to be open in a manner that the opening will have a 45° , such that the paint form the cabin spreads through the roller slowly so that the paint will be painted uniformly. The power requirements for this bot work will be of few voltages only. The Bluetooth connected to the ARDUINO receives the commands from the android phone and then the bot gets the commands from the ARDUINO , so in this way the communication exists in the project. The way communication exists in this project is shown below:

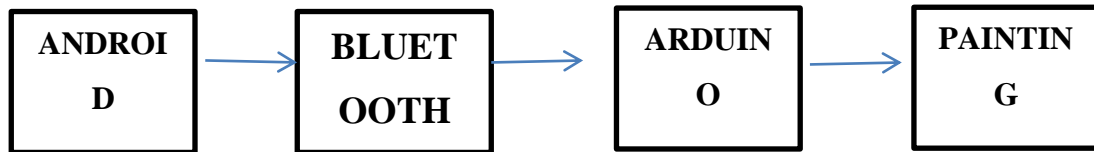


Fig 1: showing the communication between different elements of painting bot

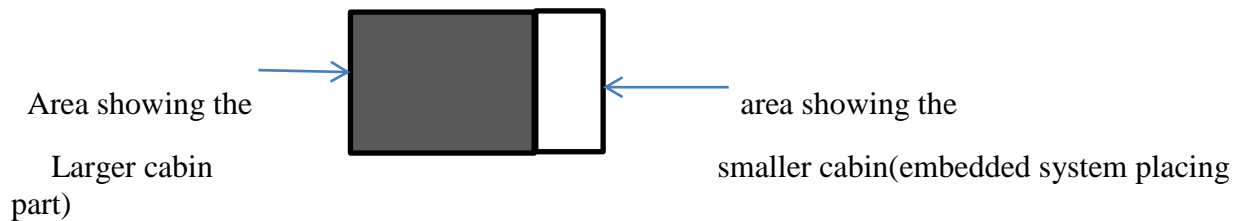


Fig 2: showing the cabin division in the bot

II. Analysis

In this project from the above introduction we had a clear vision on how the bot would look like. Now in this section

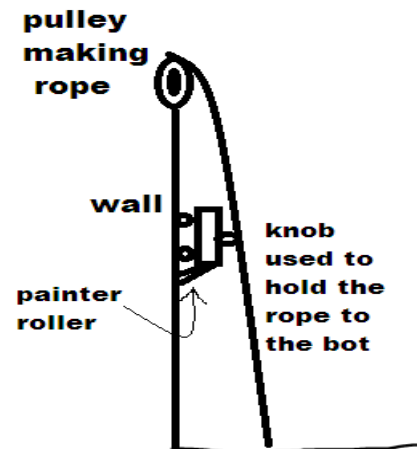
I am going to explain the movement of the bot. Being a four wheeled it can bear the weight regarding the requirements, and regarding the painting pattern it has to move either forward or towards the backward.so in

order to make the bot to move like this we need a motor driver IC. L293D which is used as the motor driver IC. Using this IC we can move the bot front and in backward direction. We have to control this bot so in order fulfill this requirement we use Bluetooth communication standards. Now to establish the command link between the bot and the ARDUINO we use a app by name GHOST REMOTE which is available in the PLAYSTORE at free of cost. Now to make this projects the essential requirements are estimated . in regarding the working technique of the walls upto now what we said is quiet understandable to the extent that the bot can paint horizontally. But regarding the environment and other parameter our bot has to paint in vertical direction also.so to work this in the vertical position we use a small technique called rope way . a rope way is made and the bot is made attached to the rope. The painting technique in the vertical position is shown in the following picture.

Fig 3: showing the technique

behind vertical painting by the bot.

Thus the bot can successfully paints in the vertical position too. Now coming to the pulley section there should be a small



embedded system which can control the rotation of the bot. In that we use ARDUINO with an L293D IC by using a pulley we can control the vertical painting task.

III. BLOCK DIAGRAM

The block diagram of this painting require the following requirements :

HARDWARE REQUIREMENTS:

- ARDUINO
- Bluetooth
- Dc motors
- Power supply
- L293D driver IC
- Bot as described as above

- Roller brush
- Android phone

The block diagram of the bot is as below:.

SOFTWARE REQUIREMENTS

- ARDUINO IDE
- GHOST REMOTE software

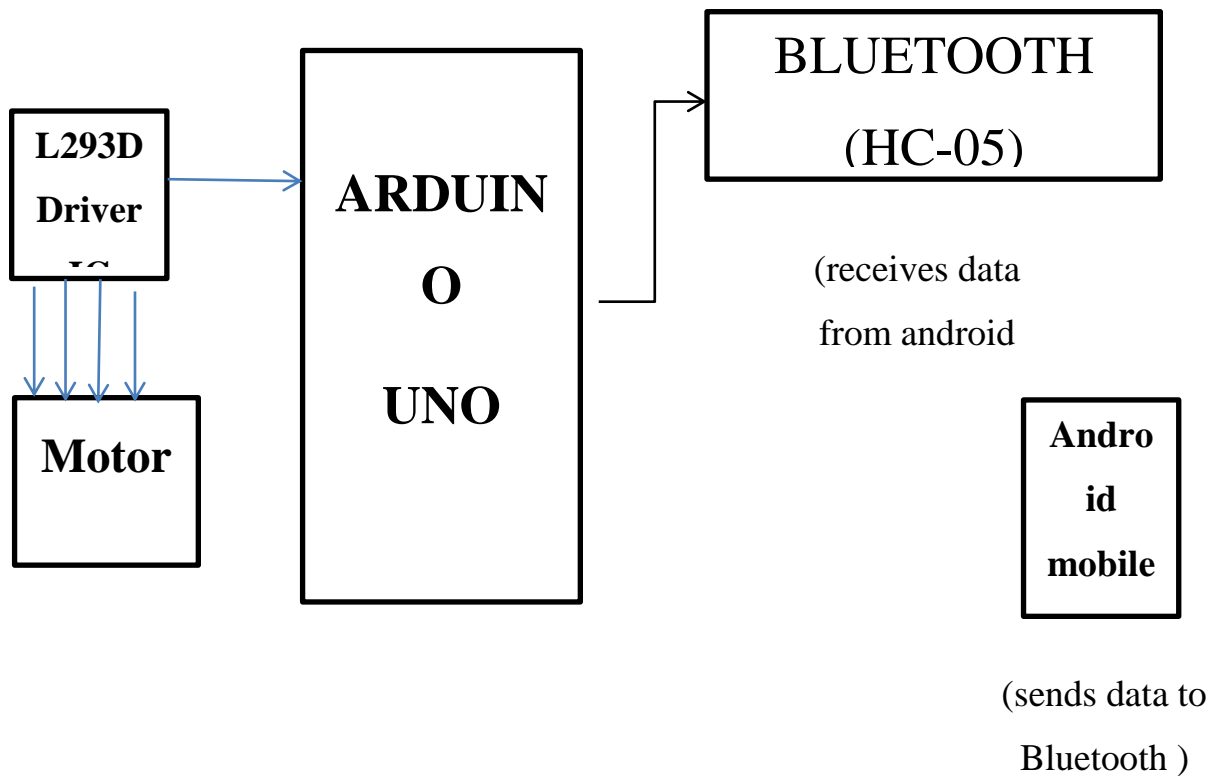


Fig:4 Block Diagram

OPERATION:

This bot uses a Bluetooth device which is by name HC-05 available in the electronic

market. The features of this Bluetooth device are

- It follows the SPP(serial port protocol) which is made especially

for the transparent wireless serial connection set up.

- It has a 3 Mbps modulation and 2.4 GHz radio transceiver and it is build with CMOS technology with Adaptive Frequency Hopping Feature(AFH).
- It has low dBm power and requires less voltage may be of 1.4v and with a internal build antenna
- It follows the AT commands

The general picture of HC-05 is as shown below:

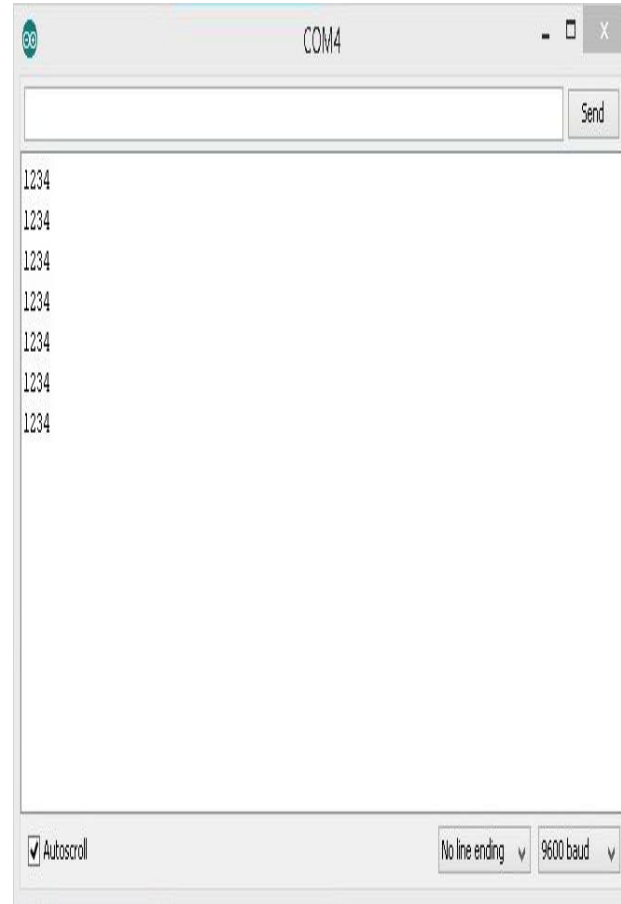


Fig 6: showing the data received by the HC-05

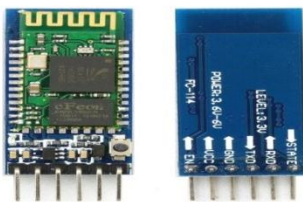


Fig 5: Showing the HC-05

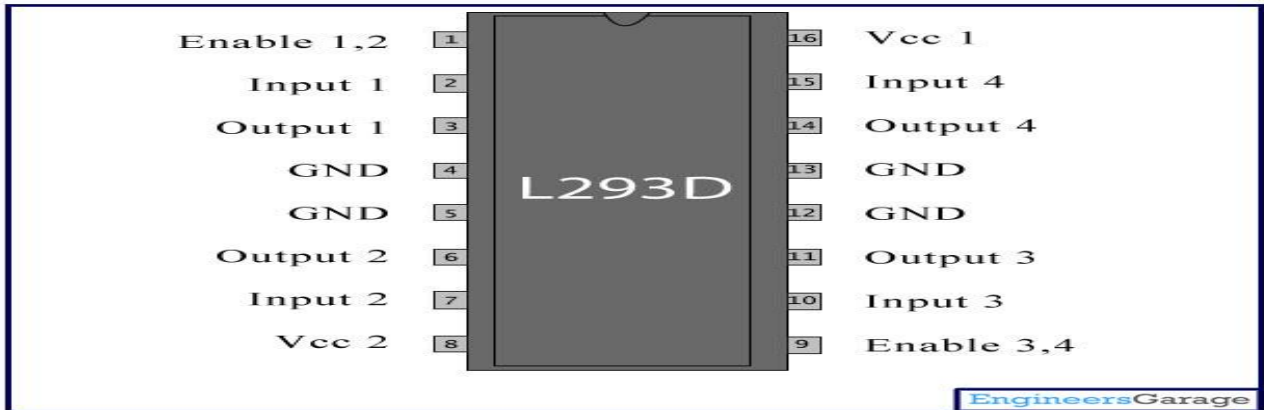
and the different pins to it

With the help of AT commands the HC-05 gets in connection with the arduino and receive the data from the android phone.

Majorly the commands send through the android Phone is of character data type. Hence its quick to receive single character

set data. Thus we have fast communication with that. In this project we majorly uses L293D driver IC to control the whole bot. the L293D driver IC has 6 input pins and four out put pins i.e., two pair of output pins

and these two pair of out put pins are used to connect two motors which forms the back section of our bot. The L293D IC has the input ins as following:



Input 1	Input2	Input 3	Input 4	TYPE OF OPERATION
1	0	1	0	Clockwise direction
0	1	0	1	Anti Clockwise direction
1	0	0	0	To the left
0	0	1	0	To the right

Fig 7: showing the input and output pins of L293D IC

Table 1 : showing the operations made by the L293D IC

IV Conclusion:

Thus With the deployment of an embedded system using a ARDUINO development board and using ARDUINO IDE. With the help of this bot we can paint

the lengthy walls with a short period of time. Here we use BLUETOOTH technology to control this bot. The key use of this bot is to reduce the man work in the above discussed tedious work. Here the whole bot is made into a box in placed on the base of a four

wheeled bot .This project help us in reducing the time and it will be automation in painting. The bot can be used to draw the ZEBRA CROSSINGS, STREET LINES , etc.,

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