

# Bluetooth Controlled Moving Bot

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**Abstract-** First of all we have to know how our project works. Our project is based on the Bluetooth module (HC-05) which is connected to the breadboard and further to the dc gear motors. The Bluetooth module is connected to our laptop or to our android phone which can control the directions of the motors for laptops/pc it can be controlled by compatible interfacing software which is (X-CTU) and for android it is Bluetooth interfacing app which is available at the app stores.

**Index Terms-** Bluetooth; Controlling Bot; Module; XCTU; HC-05

## I. INTRODUCTION

First we have to fix our breadboard to the chassis for further connection we need to attach a driving IC to the breadboard which is (L293D). It controls the movement of the motors. Atmel's Atmega 8 microcontroller is used to control the functioning. After all this we connect the HC-05 module to the breadboard by using jumper wires for all this

We need a programmer circuit for supplying the sufficient voltage to the IC's. After all this we connect the module to our laptop using the X-CTU software which helps us in the movement of the motors.

## II. WORKING

When the connections are completed between the breadboard and the module we connect our laptop to the module via Bluetooth and after this we open the X-CTU software which opens to be a digital notepad in which we can give instructions for the same.

As when we type 'W' on the notepad it moves forward. 'S' is for moving reverse 'A' is for left and 'D' is for right.

## III. COMPONENTS

1. Atmega 8 microcontroller
2. L293D Driving IC
3. HC-05 Bluetooth Module
4. Breadboard
5. Jumper Wires

## IV. HOW IT WORKS

### 1. Atmega 8 microcontroller

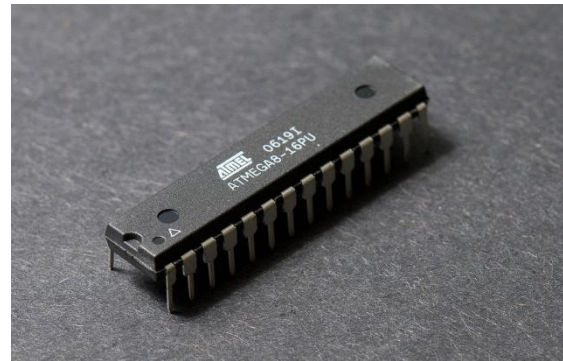


Fig1. Atmega 8

The AVR architecture was conceived by two students at the Norwegian Institute of Technology (NTH), Alf-Egil Bogen and Vegard Wollan.

The original AVR MCU was developed at a local ASIC house in Trondheim, Norway, called Nordic VLSI at the time, now Nordic Semiconductor, where Bogen and Wollan were working as students. It was known as a  $\mu$ RISC (Micro RISC) and was available as silicon IP/building block from Nordic VLSI. When the technology was sold to Atmel from Nordic VLSI, the internal architecture was further developed by Bogen and Wollan at Atmel Norway, a subsidiary of Atmel. The designers worked closely with compiler writers at IAR Systems to ensure that the instruction set provided for more efficient compilation of high-level

languages. Atmel says that the name AVR is not an acronym and does not stand for anything in particular. The creators of the AVR give no definitive answer as to what the term "AVR" stands for. However, it is commonly accepted that AVR stands for Alf (Egil Bogen) and Vegard (Wollan)'s RISC processor. Note that the use of "AVR" in this article generally refers to the 8-bit RISC line of Atmel AVR Microcontrollers.

Among the first of the AVR line was the AT90S8515, which in a 40-pin DIP package has the same pin out as an 8051 microcontroller, including the external multiplexed address and data

bus. The polarity of the RESET line was opposite (8051's having an active-high RESET, while the AVR has an active-low RESET), but other than that the pin out was identical.

The AVR 8-bit microcontroller architecture was introduced in 1997. By 2003, Atmel had shipped 500 million AVR flash microcontrollers.

## 2. L293D Driving IC

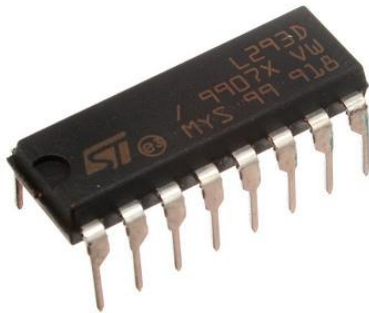


Fig2. L293D Driving IC

L293D is a typical Motor driver or Motor Driver IC which is used to drive DC on either direction. It is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC. Dual H-bridge Motor Driver integrated circuit (IC).The l293d can drive small and quiet big motors as well.

### Working:

The 4 input pins for this l293d, pin 2, 7 on the left and pin 15, 10 on the right as shown on the pin diagram. Left input pins will regulate the rotation of motor connected on the left side and right input for motor on the right hand side. The motors are rotated on the basis of the inputs provided at the input pins as LOGIC 1 or LOGIC 0.

In simple you need to provide Logic 0 or 1 across the input pins for rotating the motor.

### Logic Tables:

Let's consider a Motor connected on left side output pins (pin 3, 6). For rotating the motor in clockwise direction the input pins has to be given with Logic 1 and Logic 0.

- Pin 2 = Logic 1 and Pin 7 = Logic 0 | Clockwise Direction
- Pin 2 = Logic 0 and Pin 7 = Logic 1 | Anticlockwise Direction
- Pin 2 = Logic 0 and Pin 7 = Logic 0 | Idle [No rotation] [Hi-Impedance state]
- Pin 2 = Logic 1 and Pin 7 = Logic 1 | Idle [No rotation]

In a very similar way the motor can also operated across input pin 15,10 for motor on the right hand side.

## 3. HC-05 Bluetooth Module

This module is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices and building personal area networks (PANs). Range is approximately 10 Meters (30 feet).



HC-05 SUB-MODULE

Fig3. HC-05 Module

These low-cost Bluetooth Sub-modules work well with Arduino.

1. HC-05 is a more capable module that can be set to be either Master or Slave..The module has two modes of operation, Command Mode where we can send AT commands to it and Data Mode where it transmits and receives data to another Bluetooth module.
2. But they have some other model number on the reverse side. Most of these boards support operation at 5V power and interface to 5V Arduino signal levels with some technique of level shifting.

## 4. Breadboard

A breadboard is a construction base for prototyping of electronics. Originally it was literally a bread board, a polished piece of wood used for slicing bread. In the 1970s the solder less breadboard (AKA plug board, a terminal array board) became available and nowadays the term "breadboard" is commonly used to refer to these. "Breadboard" is also a synonym for "prototype". Because the solder less breadboard does not require soldering, it is reusable. This makes it easy to use for creating temporary prototypes and experimenting with circuit design. For this reason, solder less breadboards are also extremely popular with students and in technological education. Older breadboard types did not have this property.

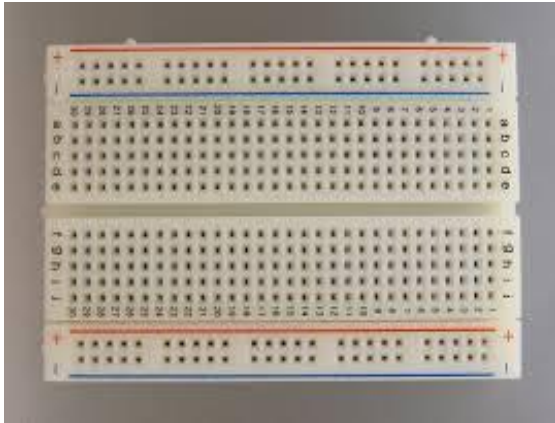


Fig4. Breadboard

A strip board (Vero board) and similar prototyping printed circuit boards, which are used to build semi-permanent soldered prototypes or one-offs, cannot easily be reused. A variety of electronic systems may be prototyped by using breadboards, from small analog and digital circuits to complete central processing units (CPUs). Jump wires (also called jumper wires) for solderless breadboarding can be obtained in ready-to-use jump wire sets or can be manually manufactured. The latter can become tedious work for larger circuits. Ready-to-use jump wires come in different qualities, some even with tiny plugs attached to the wire ends. Jump wire material for ready-made or homemade wires should usually be 22 AWG (0.33 mm<sup>2</sup>) solid copper, tin-plated wire - assuming no tiny plugs are to be attached to the wire ends. The wire ends should be stripped  $\frac{3}{16}$  to  $\frac{5}{16}$  in (4.8 to 7.9 mm). Shorter stripped wires might result in bad contact with the board's spring clips (insulation being caught in the springs). Longer stripped wires increase the likelihood of short-circuits on the board. Needle-nose pliers and tweezers are helpful when inserting or removing wires, particularly on crowded boards. Differently colored wires and colour-coding discipline are often adhered to for consistency. However, the number of available colours is typically far fewer than the number of signal types or paths. Typically, a few wire colours are reserved for the supply voltages and ground (e.g., red, blue, black), some are reserved for main signals, and the rest are simply used where convenient. Some ready-to-use jump wire sets use the colour to indicate the length of the wires, but these sets do not allow a meaningful colour-coding schema.

## V. CONCLUSION

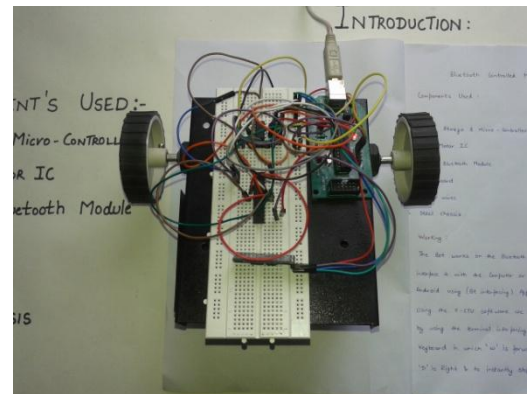


Fig5. Presenting the Bluetooth controlled Bot

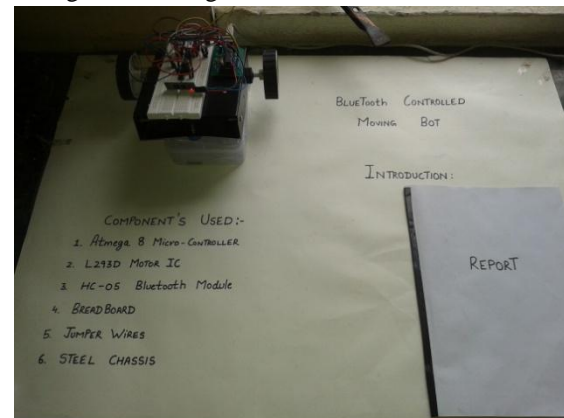


Fig6. Presenting report on the project

## REFERENCES

- [1].<https://arduino-info.wikispaces.com/BlueTooth-HC05-HC06-Modules-How-To>
- [2].[https://en.wikipedia.org/wiki/Motor\\_driver\\_L293d](https://en.wikipedia.org/wiki/Motor_driver_L293d)
- [3].[https://en.wikipedia.org/wiki/Atmel\\_AVR](https://en.wikipedia.org/wiki/Atmel_AVR)
- [4].<https://en.wikipedia.org/wiki/Breadboard>.