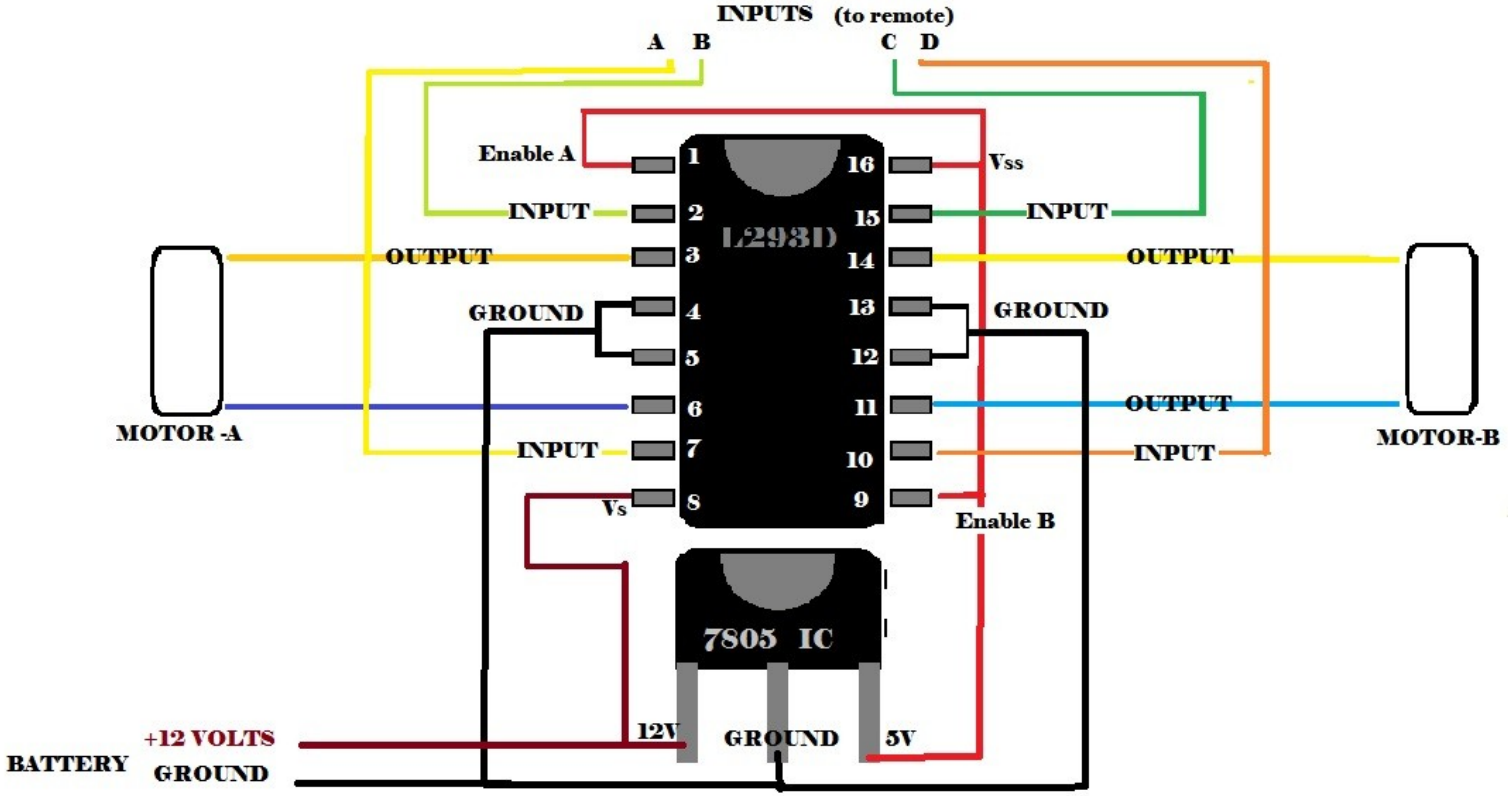
# XLR8

## Electrical Session

Learn to make the brain of your




By

-Robotics clu

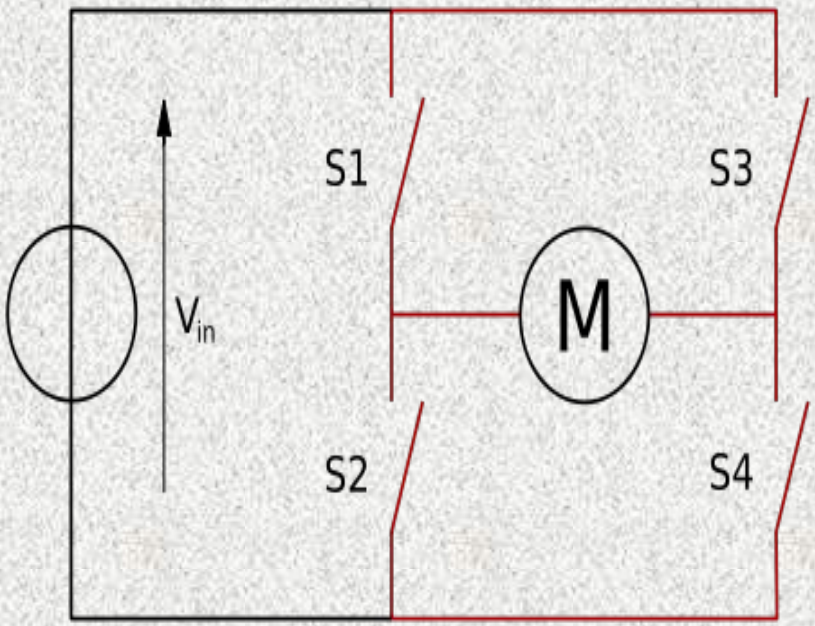
# How to run the motors??

4 motors using just 1 remote !!

**Let’s start with something useful and simple….**

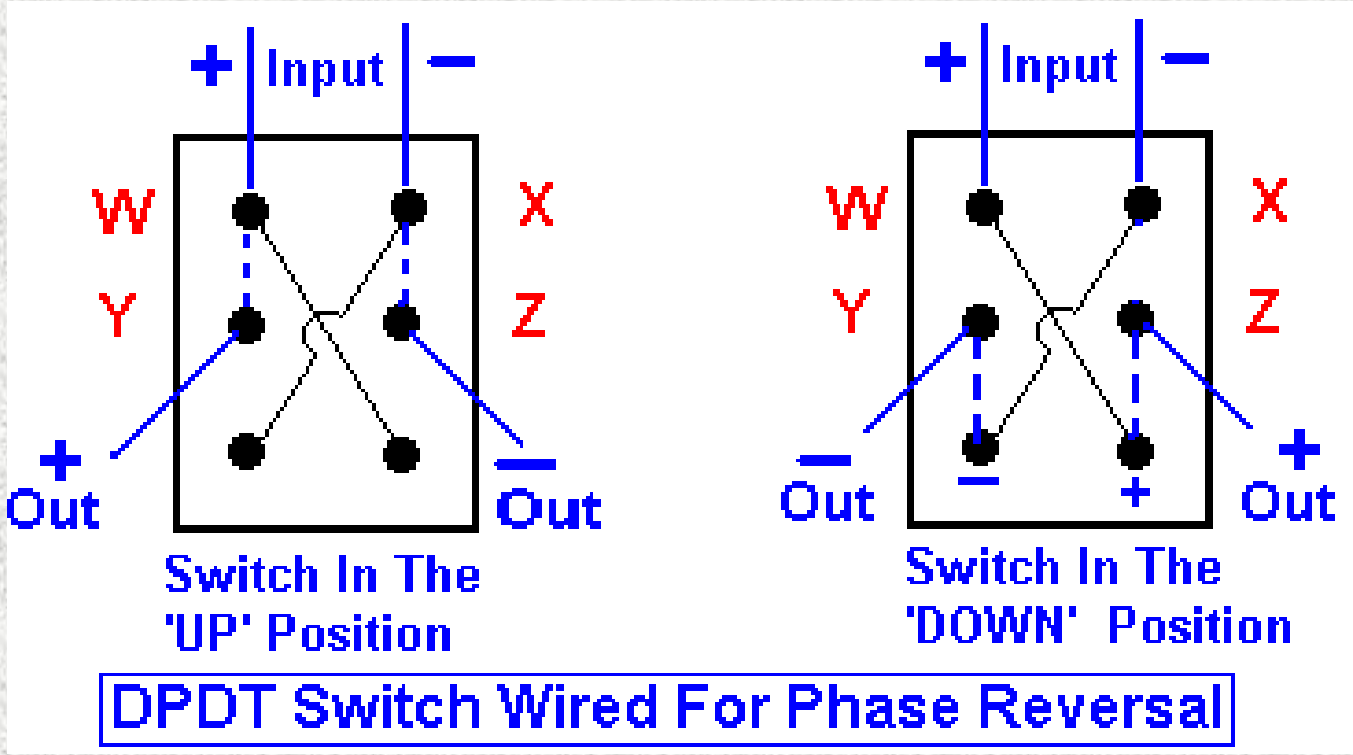
# H bridge

- An **H bridge** is an electronic circuit that enables a voltage to be applied across a load in either direction.
- See it for yourself in which direction current goes when S1 and S4 are on and when S2 and S3 are on.
- Using such a circuit, you can supply current to the motor in two directions!!!!



# Make your own Remote-DPDT Switches

- 2 DPDT switches used for 2 Motor each.



Our Main task is to build a circuit that will enable us to drive the motors through switches wirelessly.

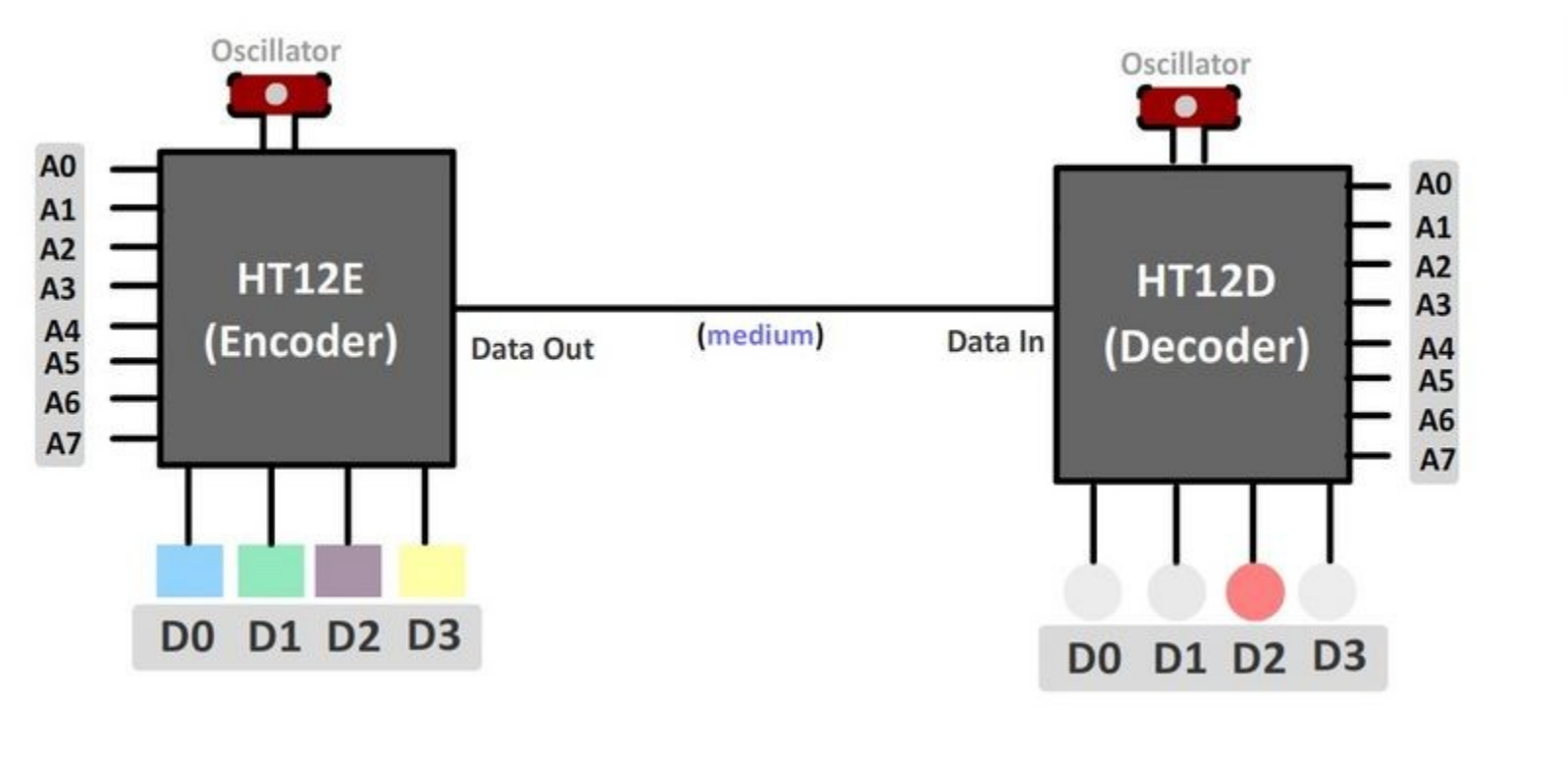
For this we would need some Electrical Components

- **RF Circuit**: A Circuit to enable the wireless communication between our Remote and the car
- **L293D IC**: Something to drive the motor as per command

As we would see the above components would work only in some specific voltage range, we would need to build a circuit to convert the DC voltage from a battery to the voltage in specific range

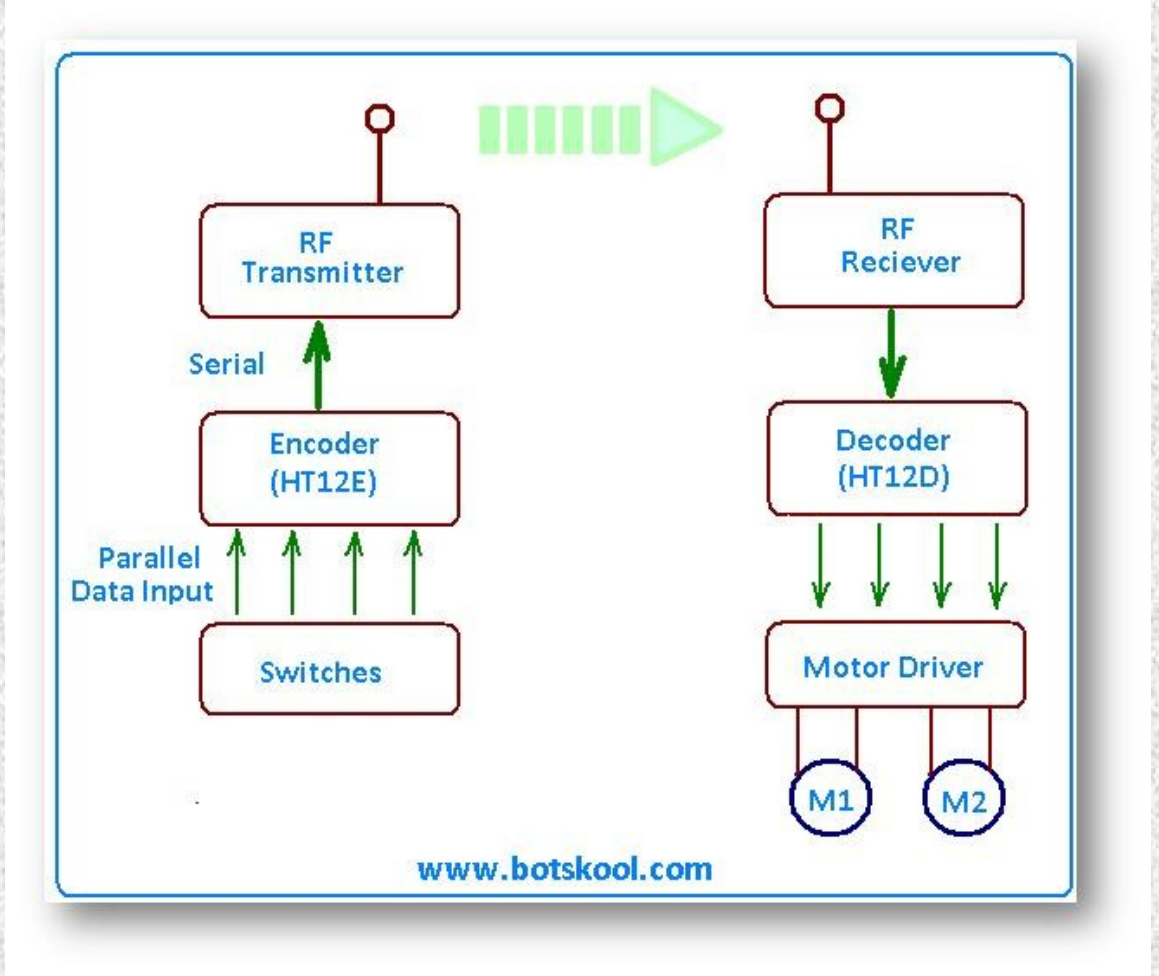
# Radio Frequency Circuit (**RF Circuit**)

- Used in remote controlled robots and implements wireless communication.



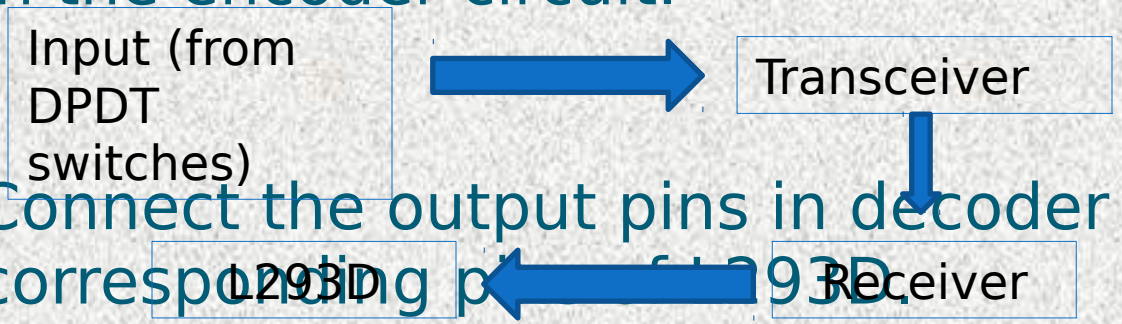
# How it works???

- **Your input is 4 lows/highs in terms of voltage.**
- **Input is encoded sent to the transmitter.**
- **Signal is received by the receiver and decoded.**
- **This input is then sent to Motor driver (here L293D)**
- **More about L293d to come in few minutes!!!**
- **L293D drives the motor according to the input.**



# How to implement it??

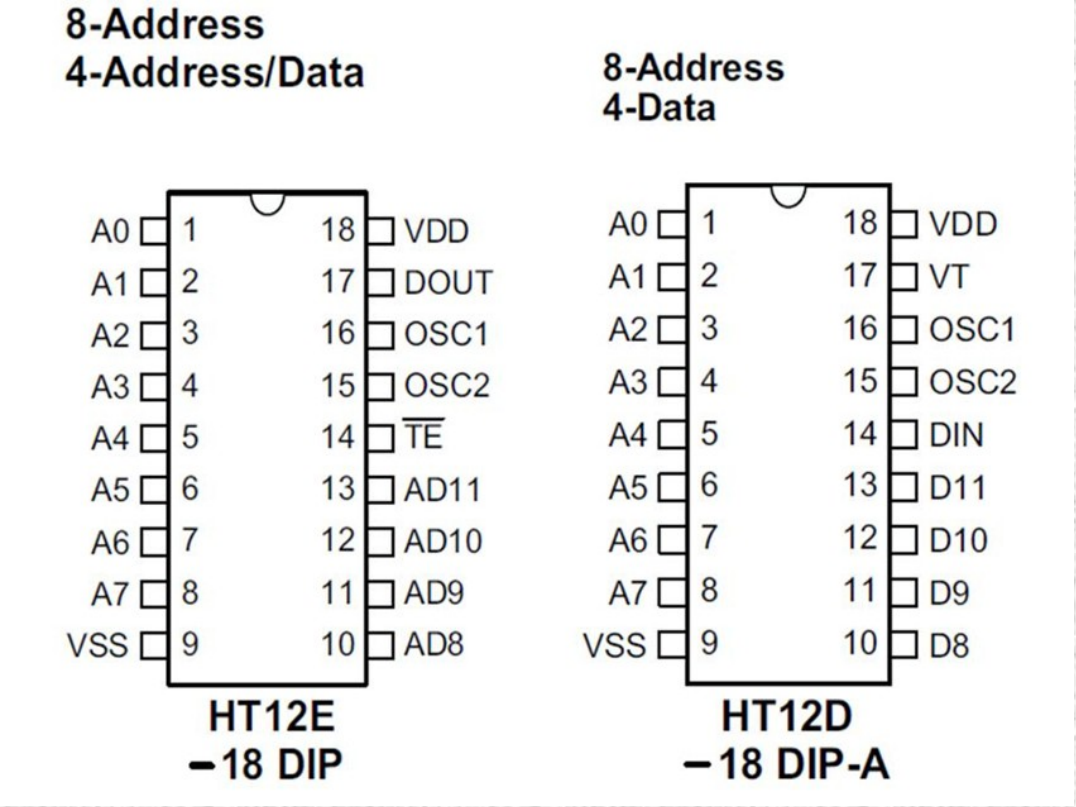
- Connect the input from DPDT switches to channels in the encoder circuit.




- Connect the output pins in decoder circuit to corresponding pins of L293D.

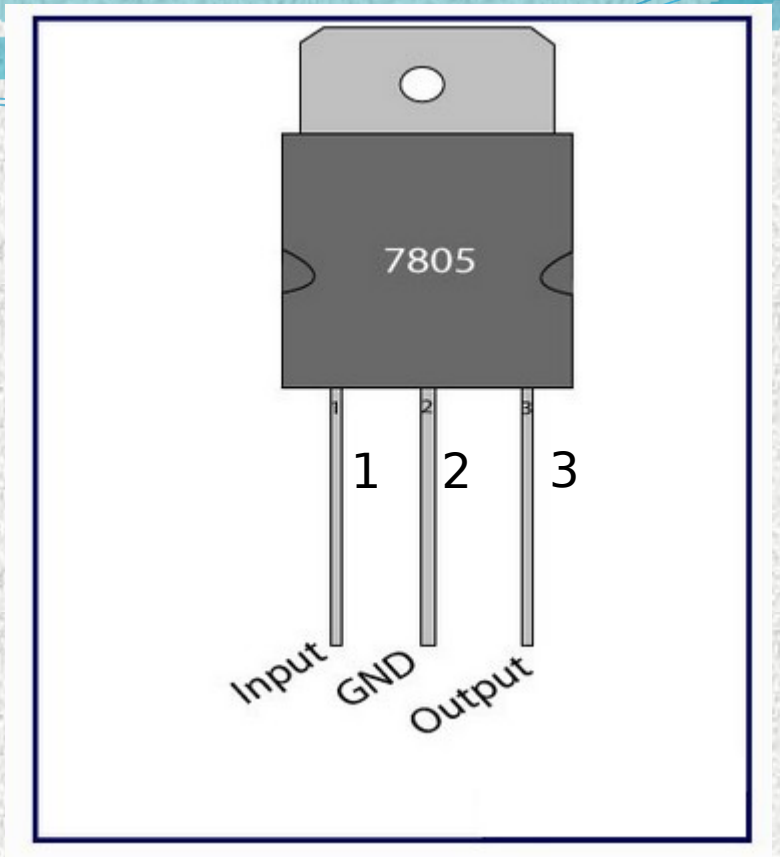
# Interference due to Same Frequency

- **Solution is simple: Change your address bits (both in Encoder and Decoder)**
- **Two Encoder and Decoders talk to each other only if they have same address bit combination.**
- **Your address bit scombination is like your password!!!**



# 7805 IC

- Three terminal positive voltage regulator.
- It is used to convert 12V supplied by the battery to 5V.
- **Don’t forget to attach heat sink** as remaining voltage is wasted as heat.
- Very important component in a circuit as all RF circuits (to be introduced after few slides) and sensors work on




| Pin No | Function | Name |
|---|---|---|
| 1 | Input voltage (5V-18V) | Input |
| 2 | Ground (0V) | Ground |
| 3 | Regulated output; 5V (4.8V-5.2V) | Output |

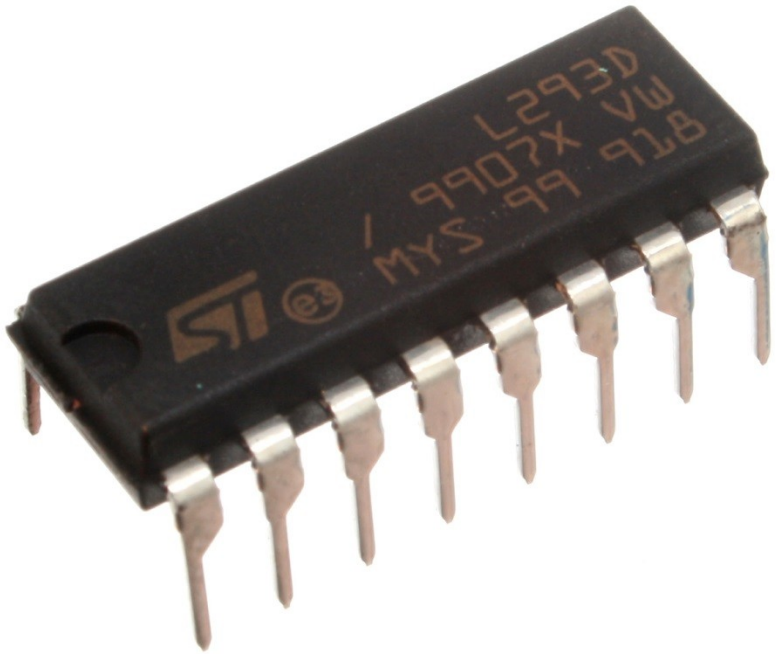
**As we would see later our car would receives a signal of only of 5 volts or less than 5volts.**

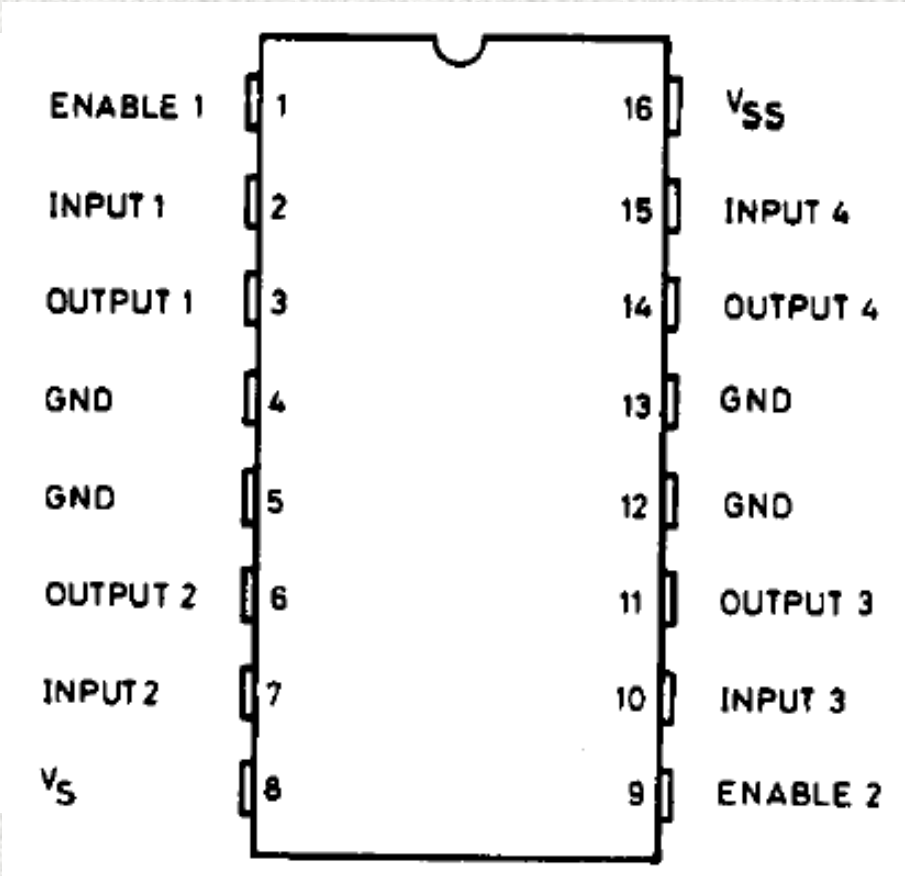
**But our motor needs around > 9V to run and about 12 V to run efficiently.**
**So how do we run motors of 12 Volts???**

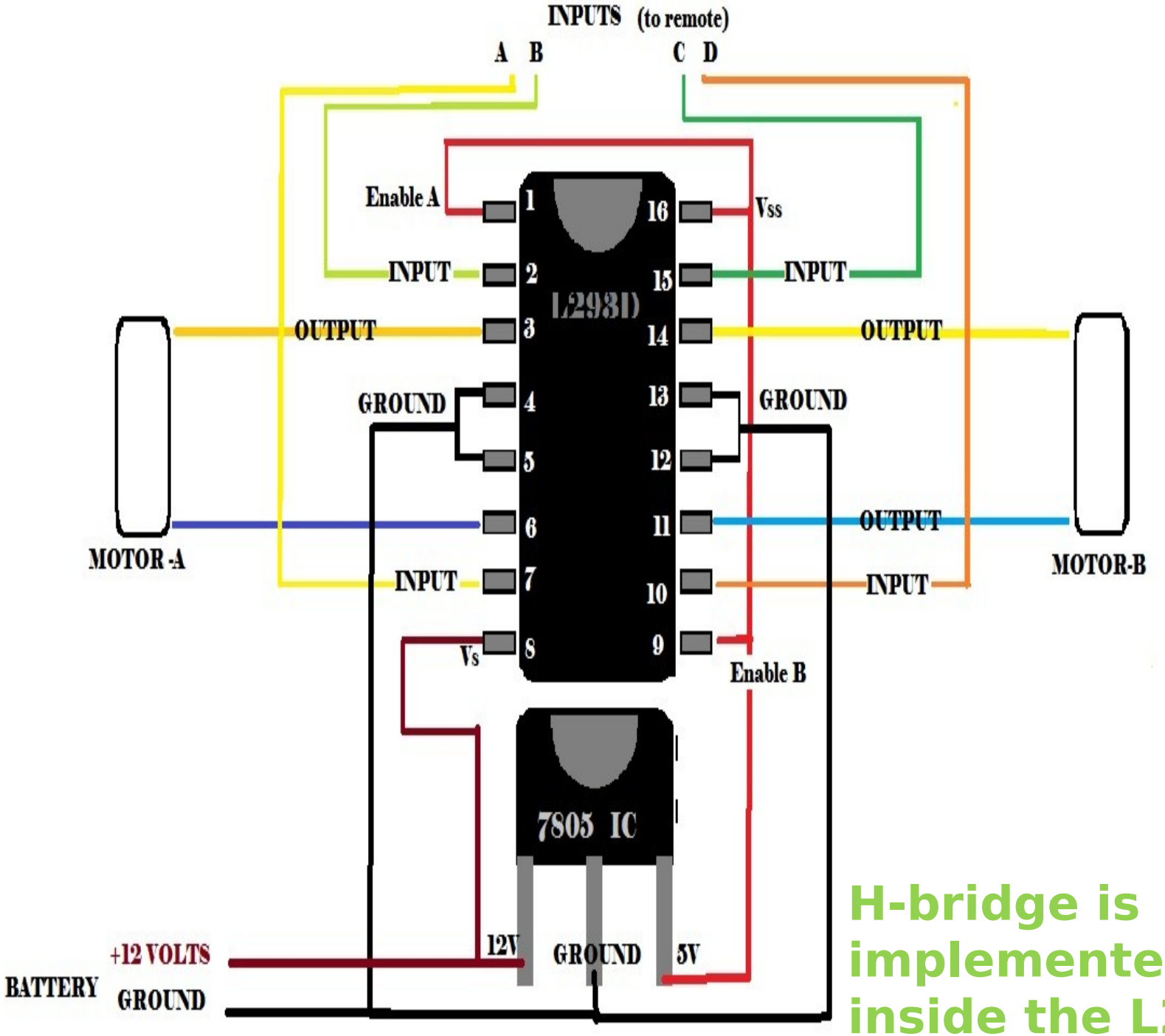
We need a circuit that acts as a switch

i.e.  when it gets 5volt signal it switches 12 volts to the motors.

# L293D – Motor Driver IC

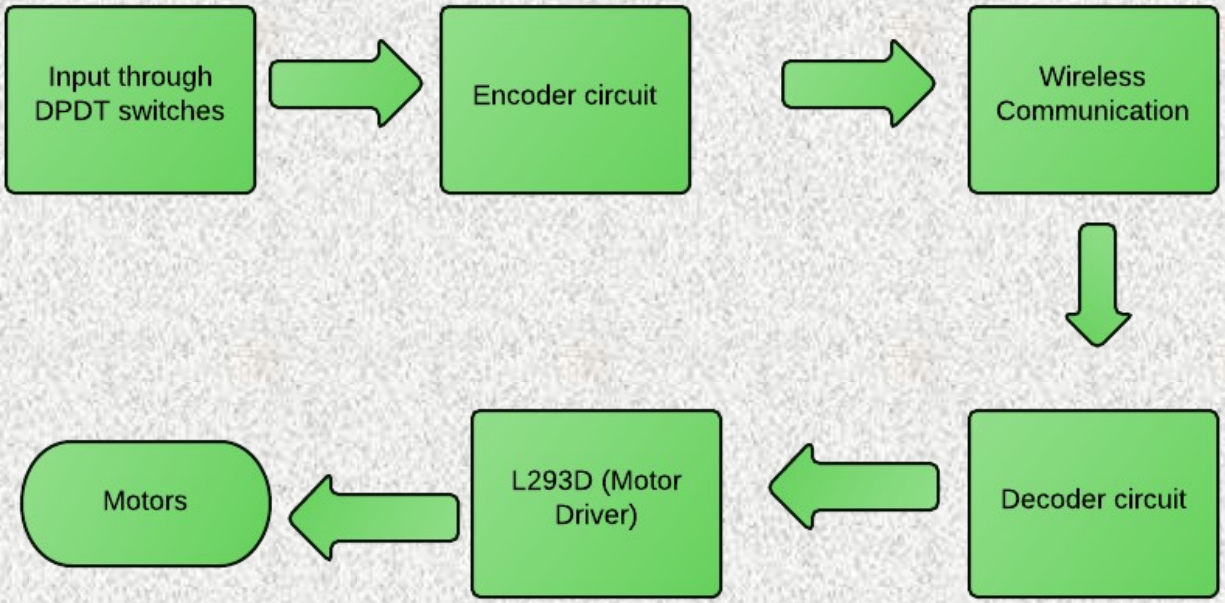





H-bridge is implemented inside the L293D

- When a button is pressed the information is encoded and converted into a signal.
- The transmitter sends a signal in the range 5 volts.
- At the Receiver the voltage signal gets decoded again , and the information is received.
- The output from the receiver is also of 5V finally.




# We have our answers now

# Any Doubts ???

# Thanks !!
# And Keep up the Enthu!!

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