

Gesture Based **Driving System**

By,

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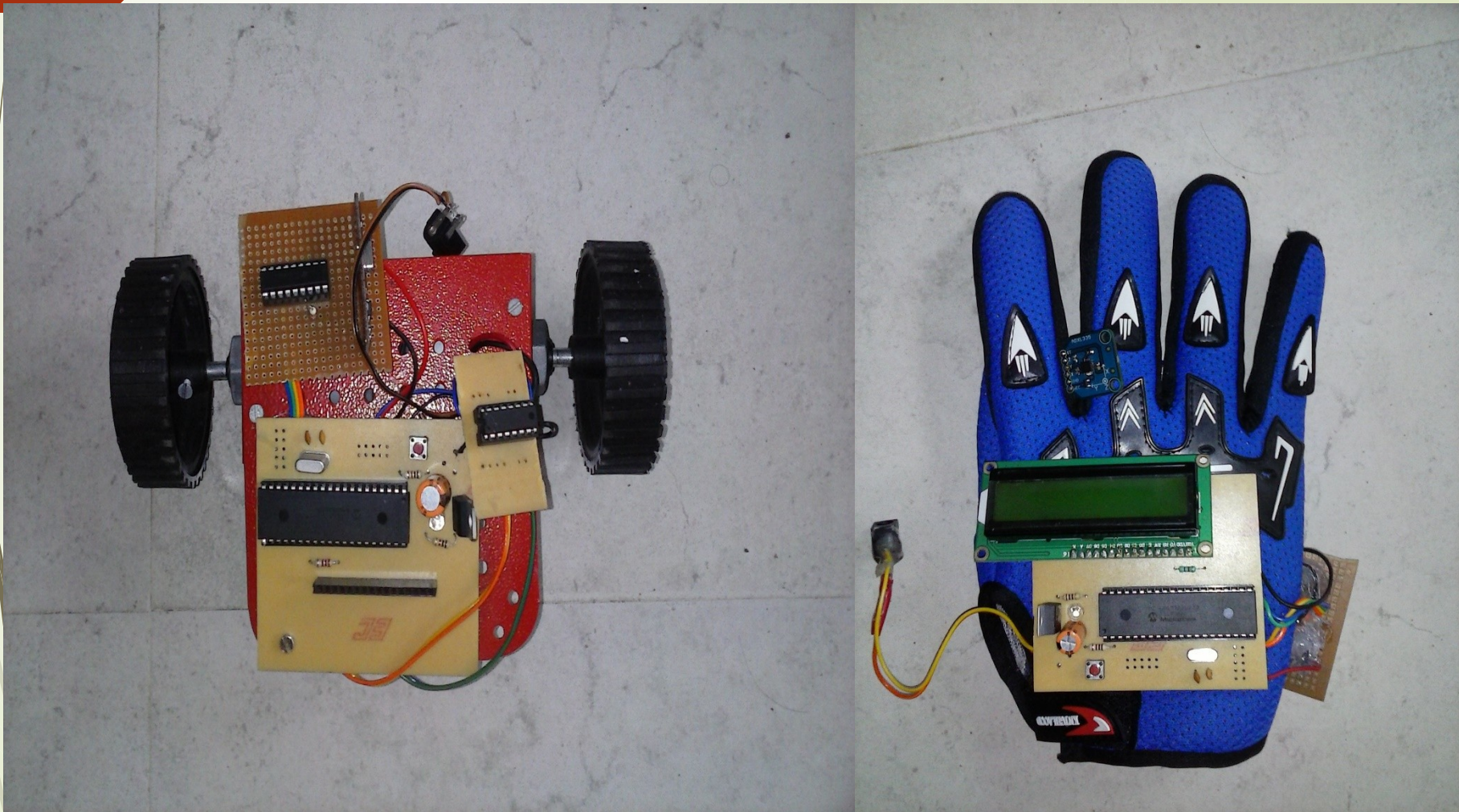
CONCLUSION



REFERENCES

To develop a accelerometer based
Gesture Controlled Driving System
with Pic16f877a microcontroller

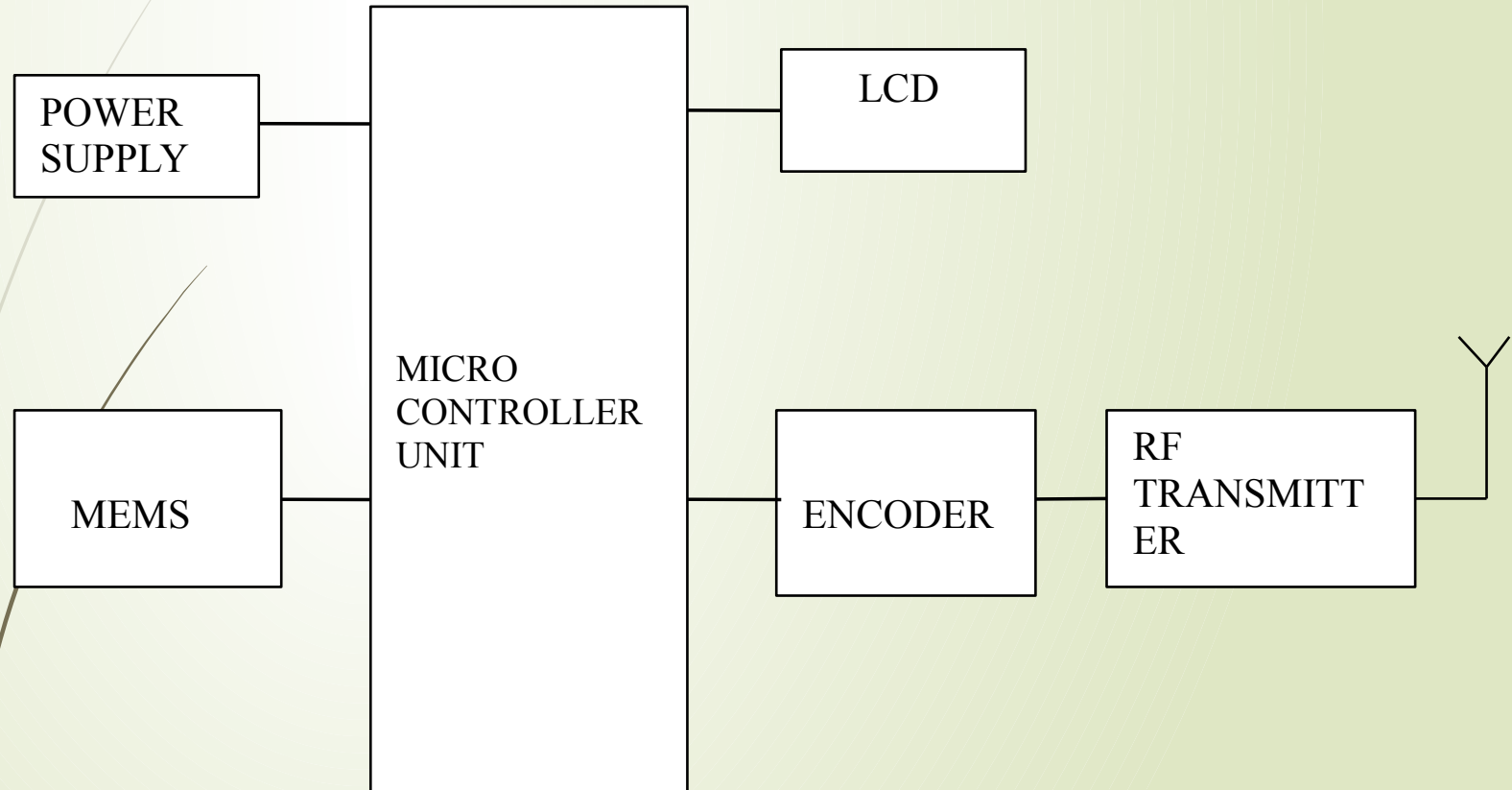
- Gesture recognition enables humans to communicate with machine and interact naturally with any mechanical devices
- Most of the controllers of existing remote cars require users to interface with joysticks and push buttons
- Comparing to these conventional controllers we built, a wireless gesture controller which enables cars to mock hand motion in all dimensions
- The goal of this project is to capture simple hand gestures from the glove and use that input to wirelessly control car



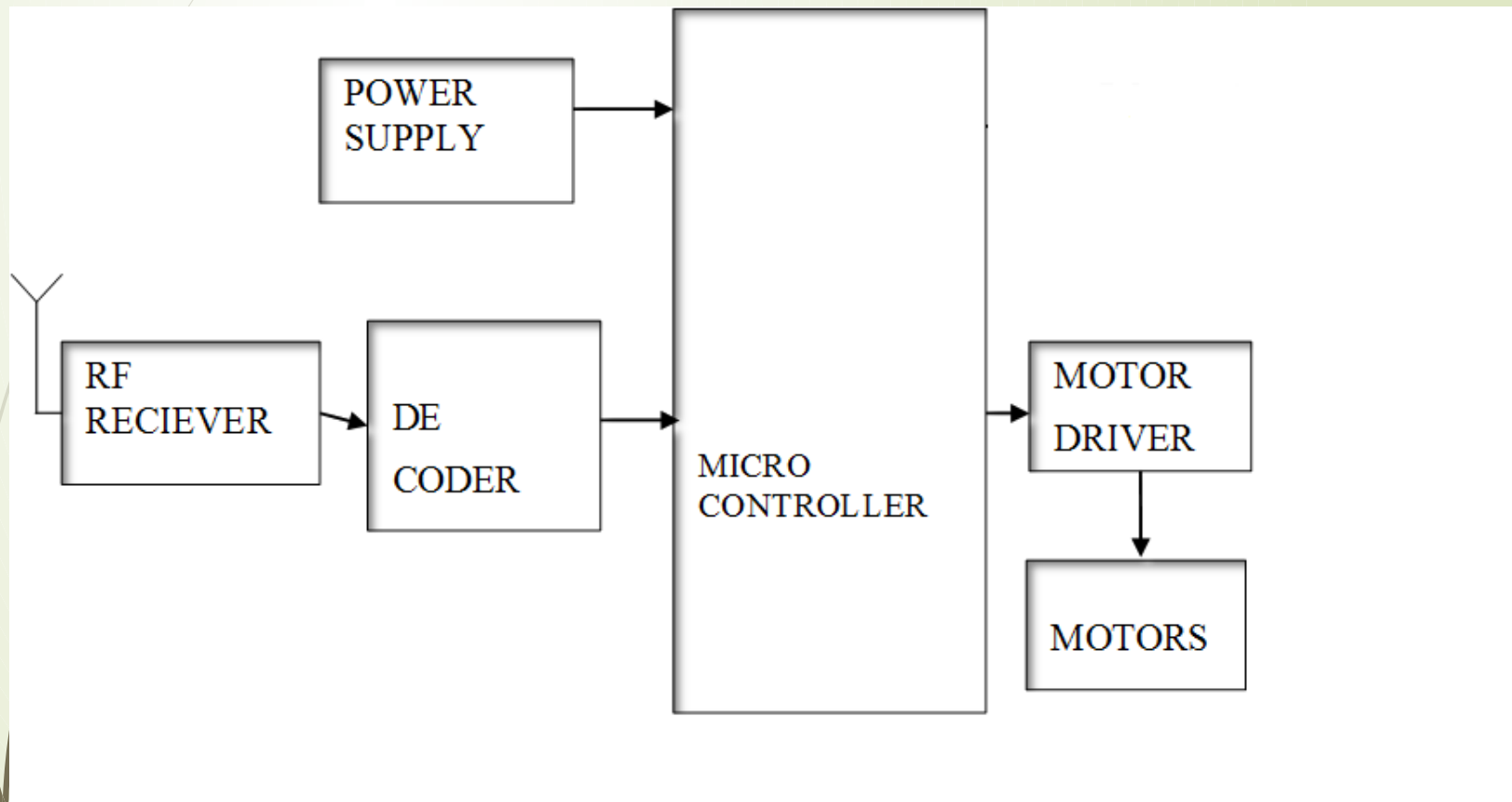
BLOCK DIAGRAM

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TRANSMITTER SECTION



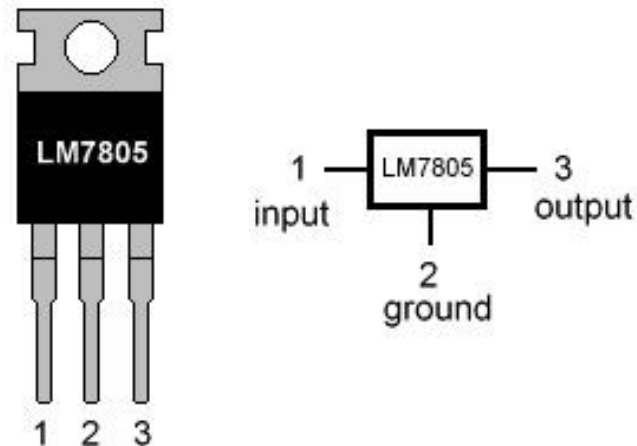
RECEIVER SECTION



POWER SUPPLY

A fixed voltage power supply producing constant +5V is obtained using three terminal regulator IC LM7805.

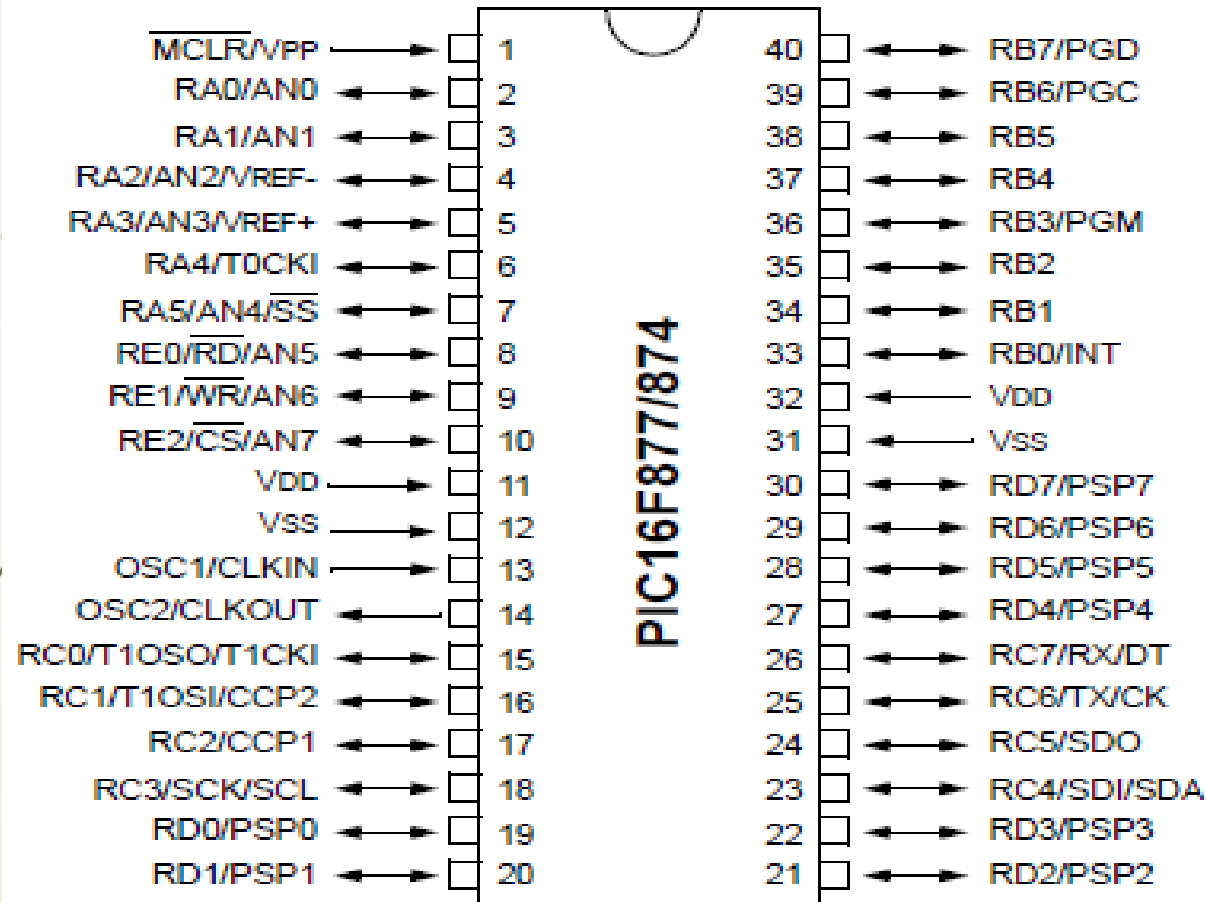
LM7805 PINOUT DIAGRAM



PIC16F877

- ❑ Low power, high speed CMOS FLASH technology.
- ❑ 5 I/O ports – A,B ,C,D &E
- ❑ Flash Program memory 8KB
- ❑ Operating speed: DC - 20 MHz clock input.
- ❑ Up to 8-channel Analog-to-Digital converter.
- ❑ Only 35 single word instructions to learn.

PIC16F877A PIN DIAGRAM



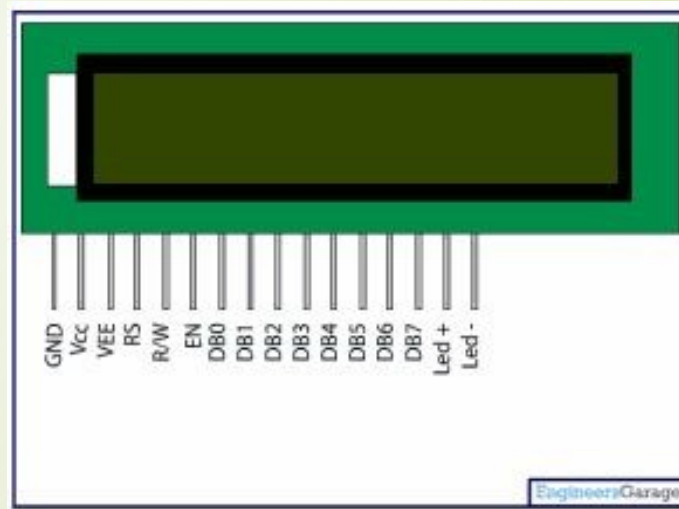
ACCELEROMETER

- An accelerometer is a kind of sensor which gives an analog data while moving in x , y , z direction.
- In our project we use ADXL335 is a triple axis accelerometer with extremely low noise and power consumption.
- Excellent temperature stability.



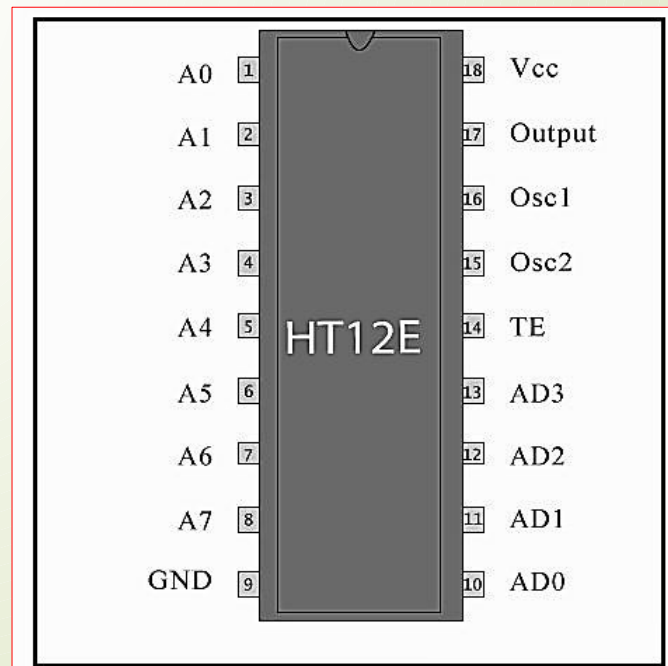
LCD

- Display 16 characters per line and there are 2 such lines-16*2 LCD.
- +5v power supply.
- Two registers command and data.

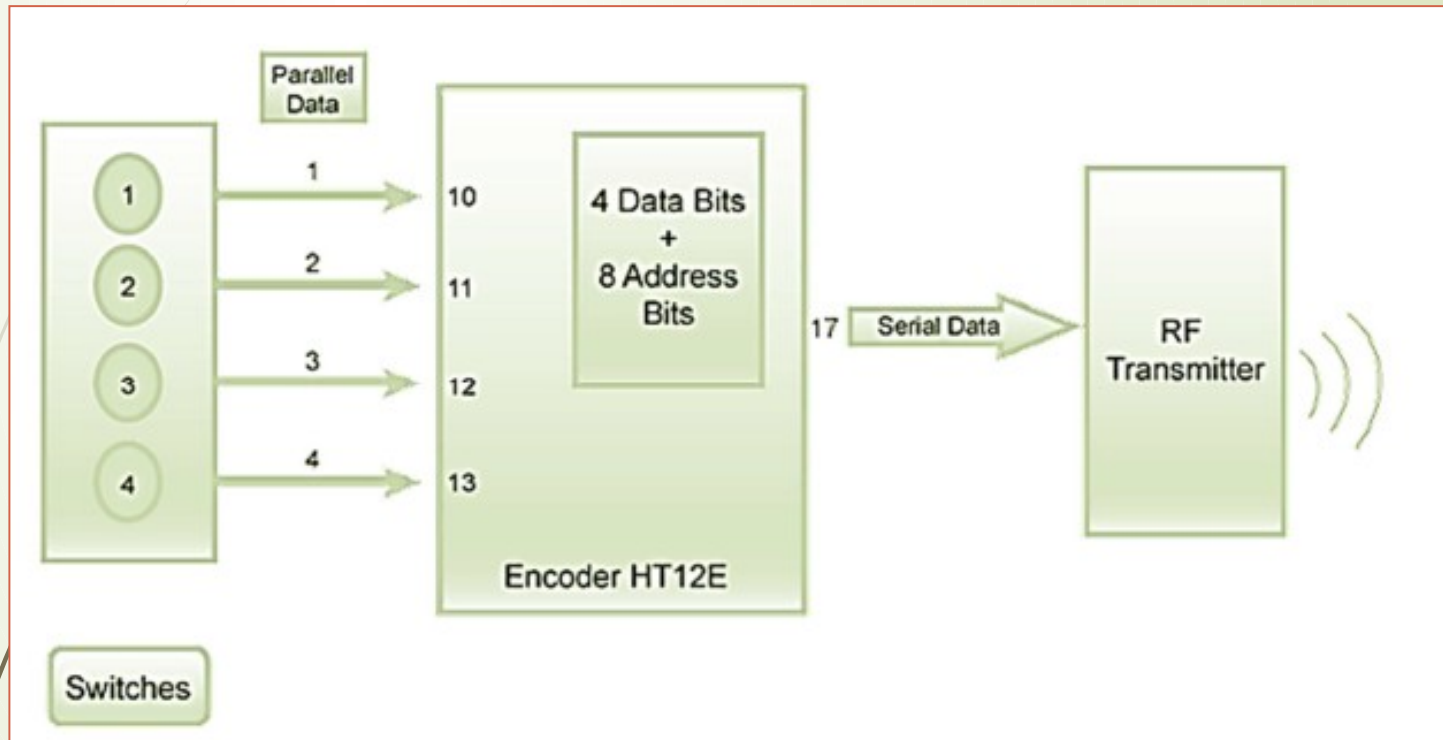


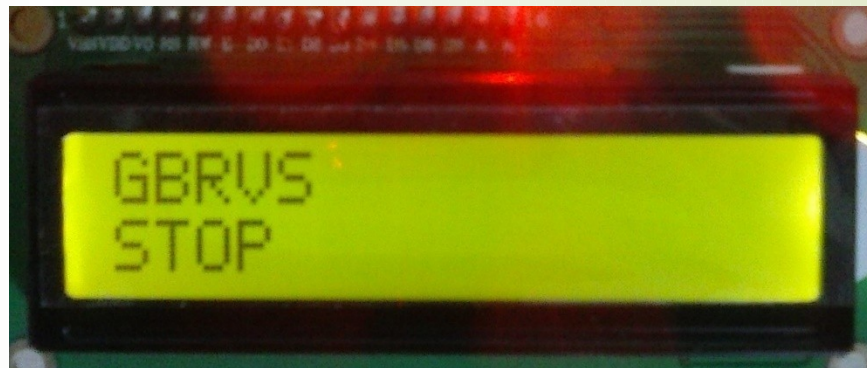
ENCODER

- HT12E is an encoder integrated circuit of 2^{12} series of encoders.
- It encodes the 12 bit parallel data into serial for transmission through an RF transmitter.
- These 12 bits are divided into 8 address bits and 4 data bits



ENCODING





RF MODULE

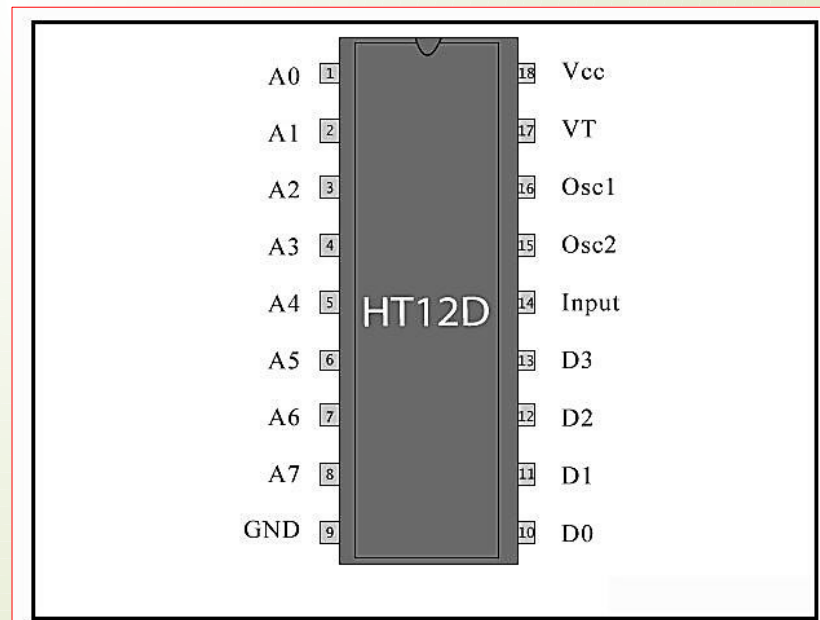
- RF module as the name suggests operates at radio frequency
- This comprises of an RF transmitter and an RF receiver.
- An RF transmitter receives serial data and transmits it wirelessly through RF through its antenna connected at pin 4.
- The transmitted data is received by an RF receiver operating at the same frequency as that of the transmitter



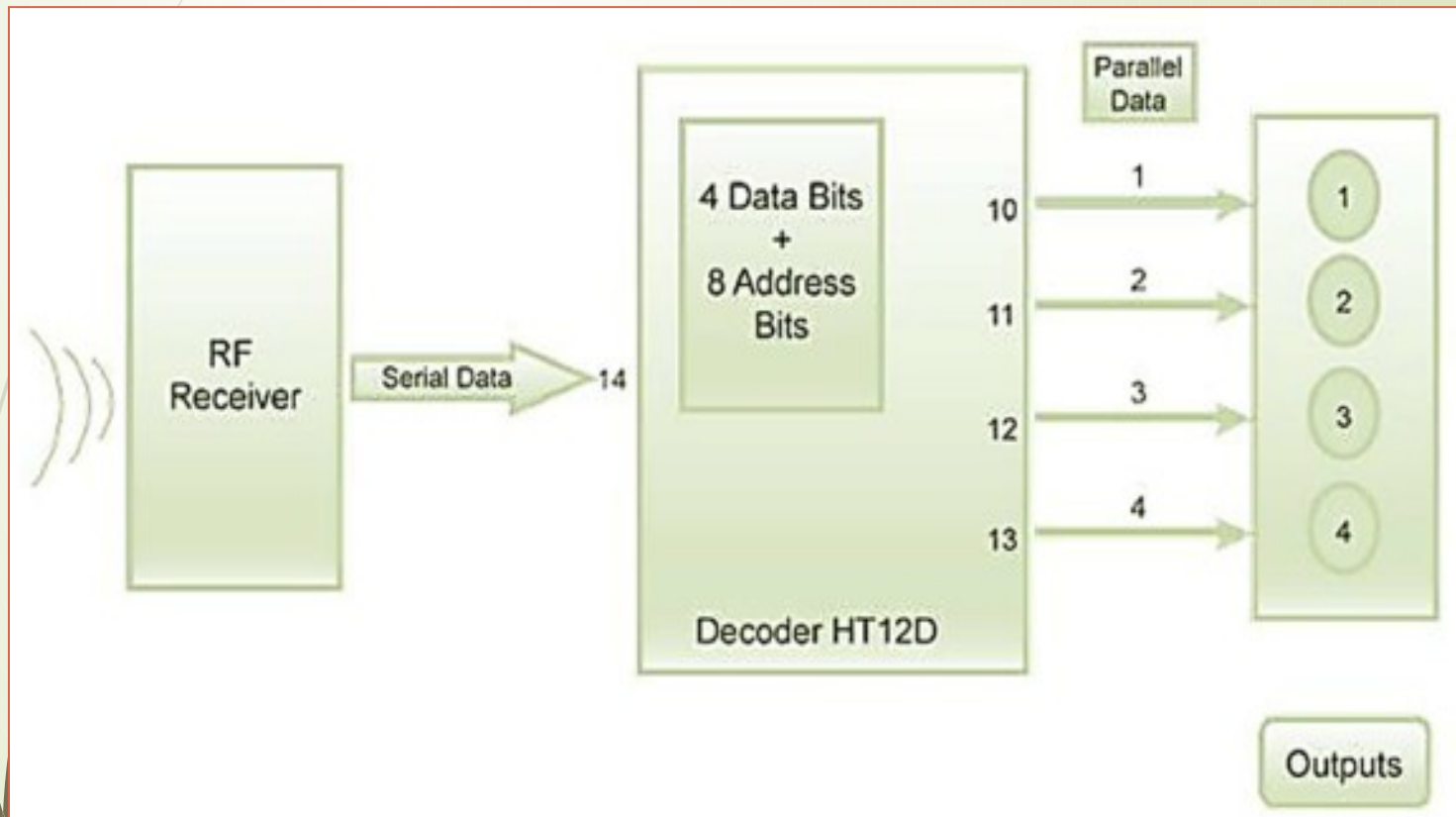
DECODER

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- It is a decoder integrated circuit that belongs to 2^{12} series of decoders.
- It is capable of decoding 12 bits, of which 8 are address bits and 4 are data bits.
- The data on 4 bit latch type output pins remain unchanged until new is received.

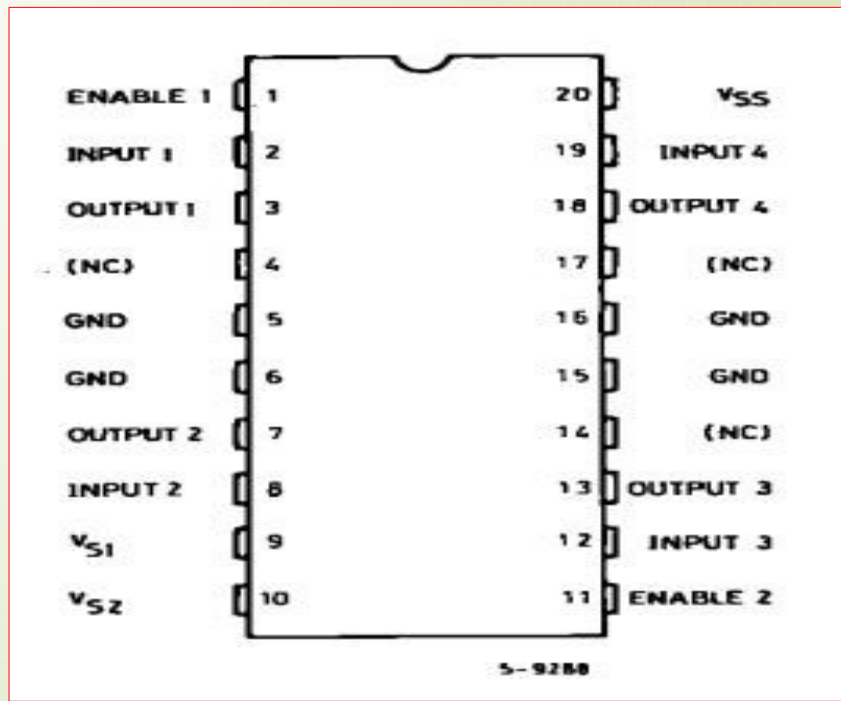


DECODING



MOTOR DRIVER

- L293D is 16 pin IC
- Dual H bridge motor driver IC
- Each H bridge can drive a motor in bi-direction
- It is current enhancing IC as output from pic16 is not able to drive the motor itself.



DC MOTOR

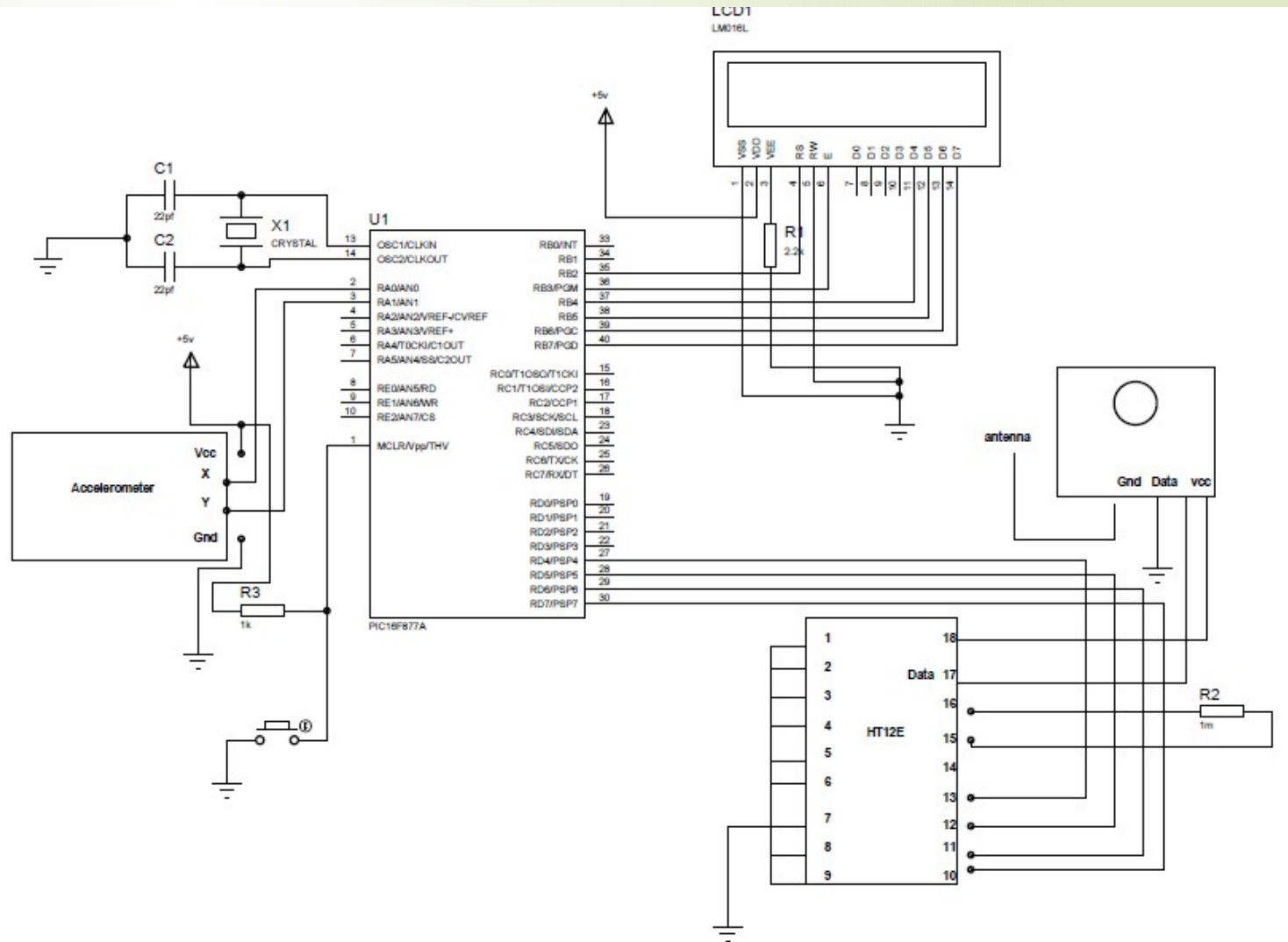
- low cost DC motor suitable for most robotic and general applications. It has a output shaft with a hole for easy mounting of wheels or pulleys.
- Input Voltage: 6-12 V
- Stall Current: 500 - 600 mA
- Shaft length: 2.4 cm



CIRCUIT DIAGRAM

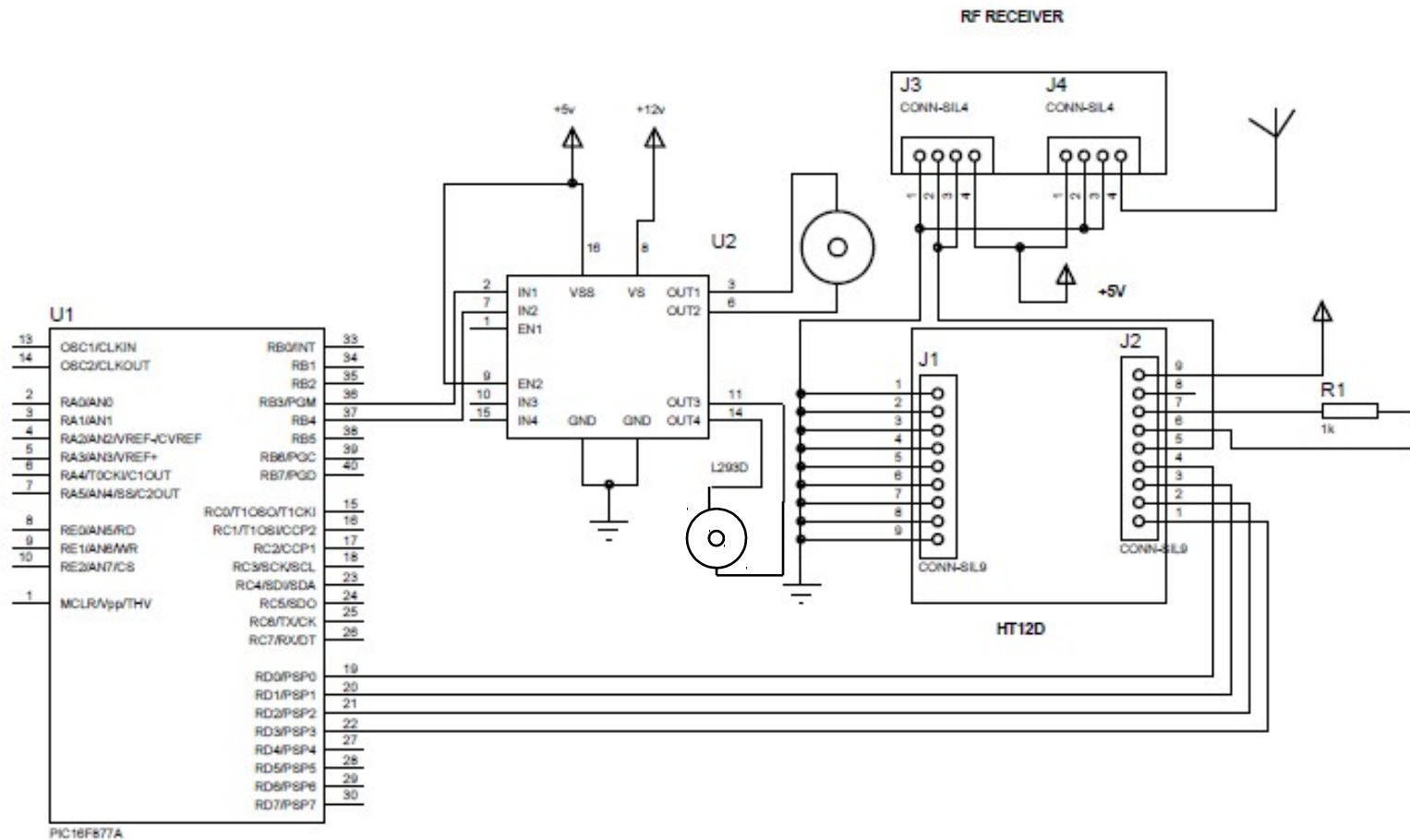
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TRANSMITTER SECTION



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RECEIVER SECTION



TRANSMITTER SIDE

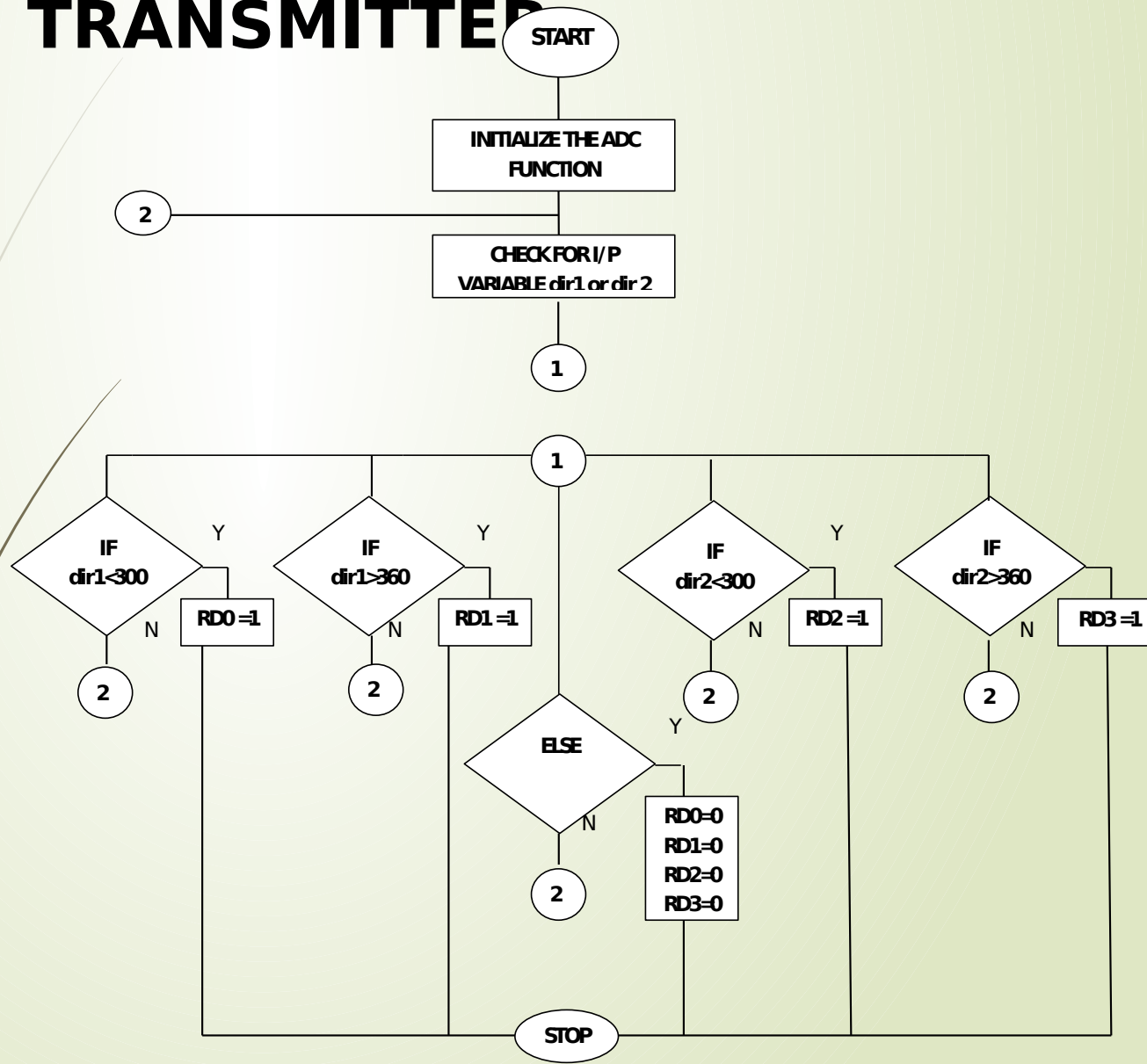
- ▢ Accelerometer will detect the gesture and send analog output to the ADC of Pic16 on the corresponding axis.
- ▢ The Microcontroller will send the command based on threshold set on the ADC of respective axis to the RF encoder Module .
- ▢ The Encoder Module (IC HT12E) will send the corresponding Data bit using RF transmitter to the RF Receiver.

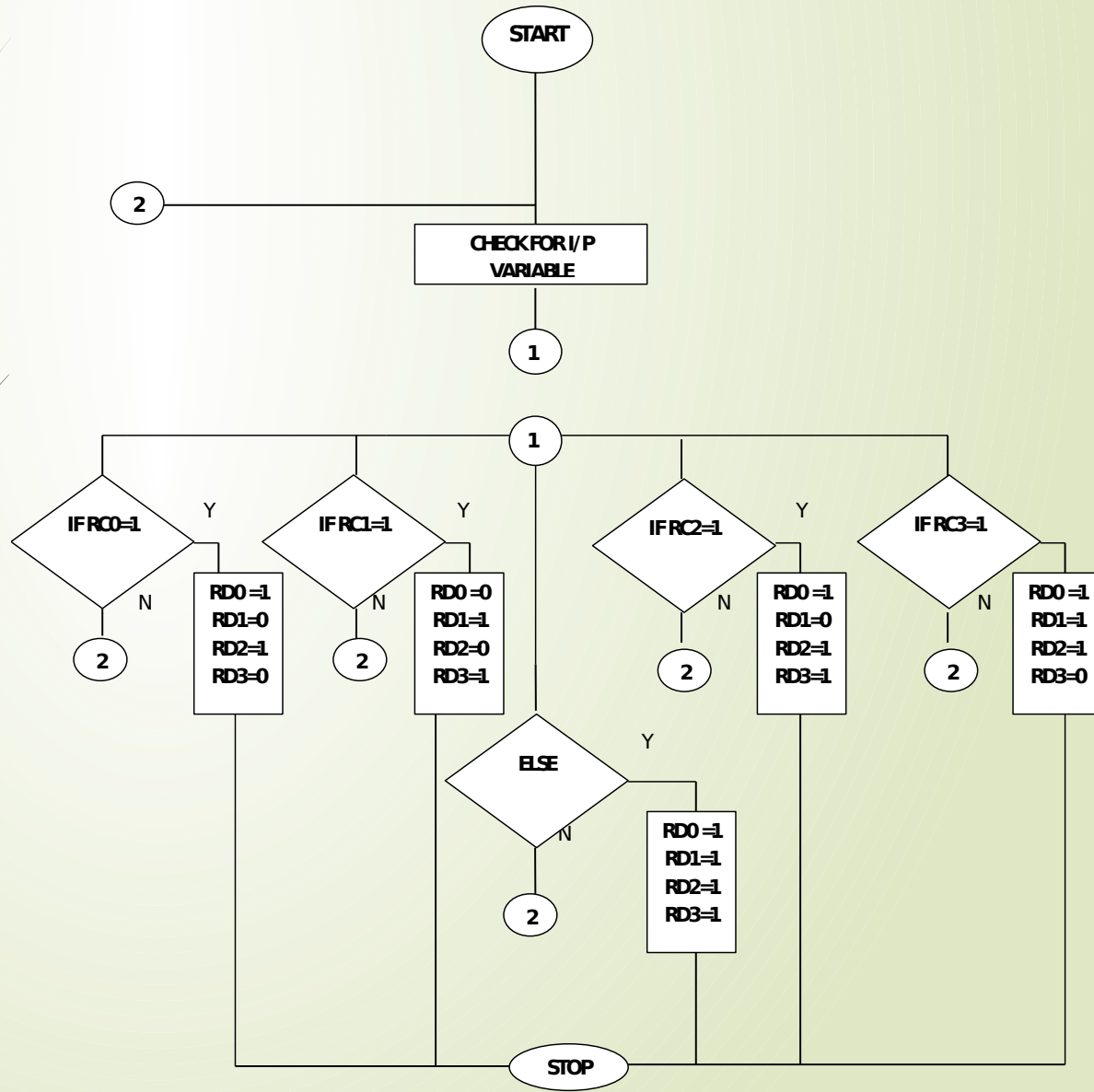
RECEIVER SIDE

- ❑ The RF Receiver will send the command to IC HT12D and the corresponding Data bit will be pulled high.
- ❑ By checking the status of Data bits of the Decoder IC the microcontroller will send the command to the motor Driver to start or stop the motors.
- ❑ It will Receive the commands from the pic16 and will Reverse the polarity/direction whenever required.

FLOW CHART

TRANSMITTER





ADVANTAGES

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- Gesture based systems are simpler and easier to operate
- It helps in building a bridge between machines and humans than primitive text user interfaces or even GUIs(graphical user interface) which still limit the majority of input to keyboard and mouse
- Physically disabled can gain benefit

DISADVANTAGES

- ❑ The user has a huge device on his hand which obstruct the user do normal hand movement
- ❑ Fine movement is difficult to achieve when working with bigger objects

APPLICATIONS

□ Applications can find their way into cost effective solutions for

1. Vehicle navigation
2. Wheel chair control
3. Hospital Bed control
4. Self control humanoids

FUTURE SCOPE

- ▮ It can be improved to control any devices by any part of body not just by hand.
- ▮ Adding GPRS and GPS
- ▮ Adding Zigbee module

CONCLUSION

- In the race of man vs. machine, hand gesture controlled systems comes as an example of companionship of man and machine.
- Taking the technology to the next level from speech recognitions and wired communications is the technology of gesture controlled systems

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Thank You