

# Agricultural Robot

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**Abstract – The main objective of this paper is to design an automated system for agriculture field, which would monitor and manage the agriculture field in the absence of human being. Agriculture field is one of the important sources of food for living beings, hence it should be well managed and well sourced. The farmers face many difficulties regarding farming as the farming is man power oriented experiences. This paper focuses on farming work features like robotic seed bower, robotic water sprinkler, robotic medicinal sprayer, robotic land ploughing and animal detection.**

**Key words – RF transmitter /receiver 433mhz , Relay driver , Encoder & Decoder IC , Motor PMDC 12V , Battery 12V DC 7.5 AH , Regulated Power Supply , Wheel , Bearing and Push Button / Control Switch.**

## I. INTRODUCTION

The main objective is to design an automated system for agricultural field, which monitors and manages the agriculture in the absence of labours / man power.

Agriculture is the most important necessity to living beings survival, because it is the only source of food. So to help the farmers in the agricultural field we have been concentrating on neglecting the man power. It is the one of the important source of food for living beings hence it should be well managed and well secured.

The farmers face many problems and difficulties regarding farming are man power oriented experiences and observations have shown that agriculture farm is affected by lack of man power. So to overcome these problems faced by farmers we have developed a system which helps the farmers to overcome all these difficulties.

Now a days we see that there are many problems faced by our Indian farmers likely to say that the main cause of the downfall of the farmers is the rain. Due to insufficient rain in the country there is no water in the farms for the field to grow.

Our government is also taking major steps towards the development of the agriculture, because our nation has most of the people working in farms than in metropolitan offices. To design and develop a automated robot which should eliminate the man power and time wastage is associated with the presence man power system of agriculture observations has shown that lot man power is used for agricultural work. This contributes heavy expenditure for the farmers.

## II. BLOCK DIAGRAM

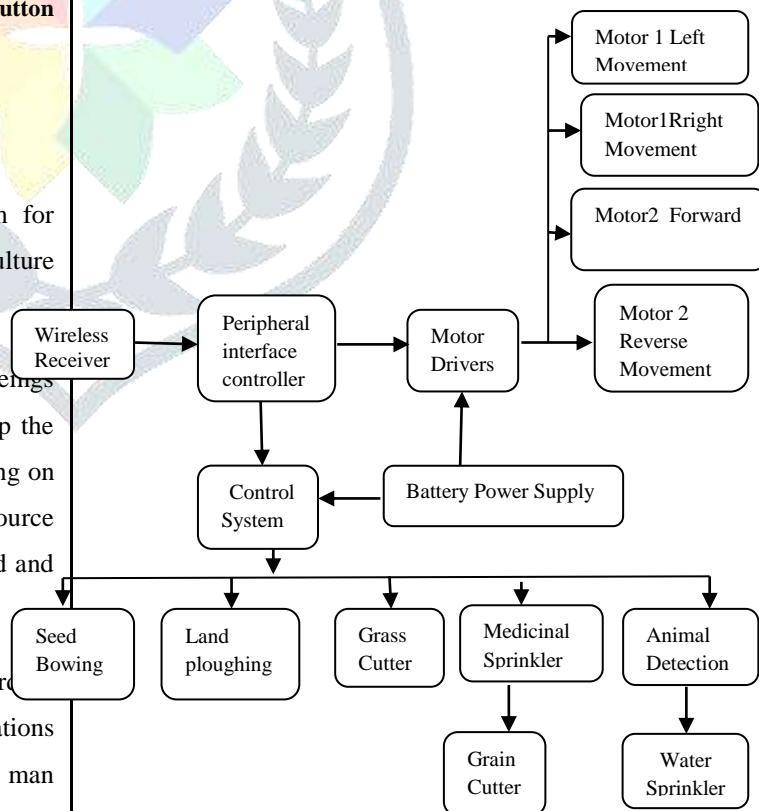


Figure 1: Block Diagram of the Project

### III. IMPLEMENTATION

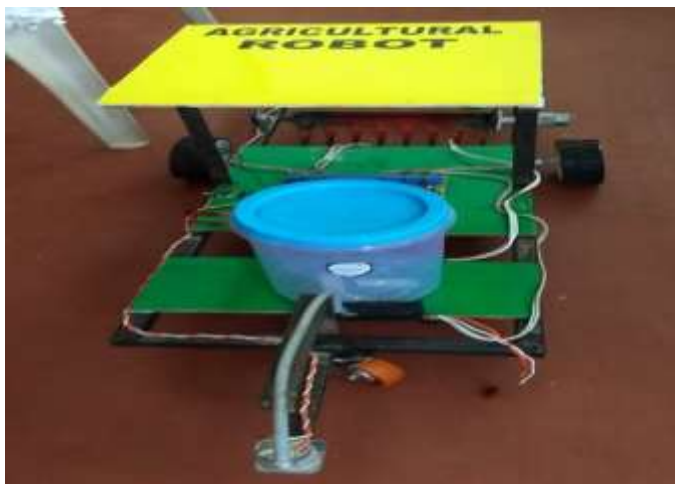


Figure 2: Hardware System of the Project

The project works on wireless RF technology. Here a wireless RF transmitter is designed which is with the user (farmer). The robot consists of a wireless RF receiver and associated circuit like microcontroller and control system and mechanical assembly for the different agricultural application. The transmitter consists of different keys for different application. The wireless transmission and reception works at a distance of 80 meters with all the obstruction.

The robot is designed to work on the battery power supply. The robot gets the power mainly from the batteries. These batteries get power by charging it electrically and the vehicle is moved with the help of the motors. The plougher ploughs the land which rotates with the help of some mechanism. After the ploughing is done the seed shower helps in sowing the seed. The sprinkler sprinkles the water above the sowed seeds; it takes the water from the water tank. The cutter cuts the grass, weeds.

### IV .MAJOR COMPONENTS

- RF TRANSMITTER / RECEIVER 433MHZ



Figure 3: RF transmitter /receiver

RF 8 includes the RF transmitter with eight numbers of switches and RF receiver includes the eight numbers of relays, which can be treated as wireless transmission. So the particular RF transmitter and receiver unit can be handling very easily and we can integrate with existing systems. All eight keys over the remote control operate the related relay on the receiver board i.e. each button operates particular relays respectively. Contact of the Relay can control anyone of the equipment in momentary mode (until key is pressed) or latch mode (toggle on each key press). The particular relay shows the indicator of LED, shows current status. The transmitter uses a RF transmitter working 433MHz with Manchester encoding to transmit data about which button is pressed.

At the receiver end the RF receiver module extracts the data signal from carrier frequency HK-8B decoder IC from HobbyKits4u decodes this signal and sets the corresponding output high. Here the active high output can be used to operate the relay via ULN2803 relay driver, which is an octal transistor array.

#### RF Transmitter:

The RF transmitter module contains the small size PCB which is capable to handle the transferring a radio wave and modulated radio wave to transfer the data. The data can be sending along with a micro controller, which will offer data to the module which can be transmitted. These transmitters' controls the requirements i.e., the maximum acceptable transmitter power o/p, band edge and harmonics requirements.

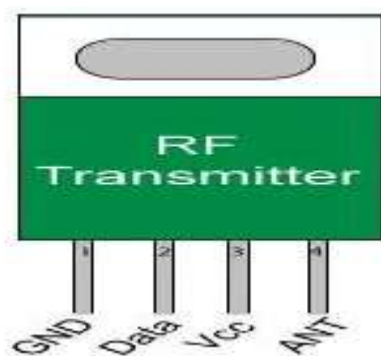


Figure 4 : RF Transmitter

**RF Receiver:**

The RF receivers block receives the transmitted signal to recover the signal. There are two types of RF receiver modules, i.e., the super-regenerative receivers and super-heterodyne receivers. The super-regenerative modules design contains the low power which is made up by a series of amplifiers to recover the signal from the modulated. These modules are generally inaccurate as their operation of frequency significantly with power supply voltage and temperature. The main advantage of Super heterodyne receiver modules is it will exhibit a high performance over super-regenerative. Hence it increases in the stability and accuracy over a large temperature and voltage range. Stability will occur from a stable crystal design which leads to a relatively more expensive product.



Figure 5 : RF Receiver

**V.ADVANTAGES**

- Reduces the losses incorporated with labor oriented farming.
- Improves the efficiency of the farm.

- The agriculture farm can be improved.
- Reduces the water losses as is it employs automatic watering for plants and pesticides.
- This is reliable, light weight system.
- It is the multifunction robot.
- Works on semi-automatic technology which works on batteries and solar power.

**VI.APPLICATIONS**

- It is used as a seed bower , water sprinkler , pesticide sprayer , grass cutter and grain cutter.
- It is used for ploughing.

**VII.SCOPE FOR FUTURE DEVELOPMENT**

It can be operated from a distance by using a wireless remote control. It can be operated automatically by feeding programs in it so that it can work also in the absence of the human being.

**CONCLUSION**

- The proposed system have remotely controlled which reduces the man efforts, wastage of water well as power consumption.
- Work load on the farmers is decreased and health problems also.
- This system also used for automatically grass cutting by using cutter.
- Successful in developing a robot whose construction is enough to withstand the challenges of the field.

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