

# Solar Based Bluetooth Controlling Pesticise Sprayer

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## ABSTRACT

Agriculture is a profession of many tedious processes and practices, one of which is the spraying of insecticides in the vineyards. A typical vineyard requires extensive spraying every 4-5 days in the summer and every 3-4 days in the rainy season. The conventional methods are: a person carrying a sprayer and manually actuating a lever to generate pressure and pump the pesticide through a tube or a mobile vehicle carrying an inbuilt compressor and sprayer unit which has to be manually driven by a human operator. These methods are fuel consuming and susceptible to human errors. Another major drawback in human operated systems is that the operator is exposed to the harmful chemicals while spraying. Long term exposure, as in this case, can be extremely detrimental to the operator's health. This is a project which can be viewed as a viable alternate to these methods. The Automatic sprayer is a three wheeled vehicle which sprays pesticide in any given vineyard with almost nil human assistance. The vehicle is powered using an onboard solar powered battery which brings down the running cost. The control of the vehicle is achieved using an inbuilt microcontroller unit which is programmed to respond to the bluetooth device.

**Keywords:-** Microcontroller, Solar panel, Battery, LCD, LDR, Motors, Relays, Bluetooth device.

## I. INTRODUCTION

Agriculture is a profession of many tedious processes and practices, one of which is spraying of insecticides in the vineyards. Sprayers are mechanical devices that are specifically designed to spray liquids quickly and easily. They come in a number of different varieties. In this project we'll take a look at solar operated mechanical sprayers. A sprayer of this type is a great way to use solar energy. Solar based automatic pesticide sprayer are the ultimate cost effective solution at the locations where spraying is difficult. This automatic solar based pesticide sprayer system uses solar energy as source. Solar energy is first used to charge a storage battery. The solar energy stored in the battery is utilized to operate motor which functions as pump. In this project we are trying to make a prototype model for farmers and cultivators for whom spraying of insecticides is harmful and hazardous.\

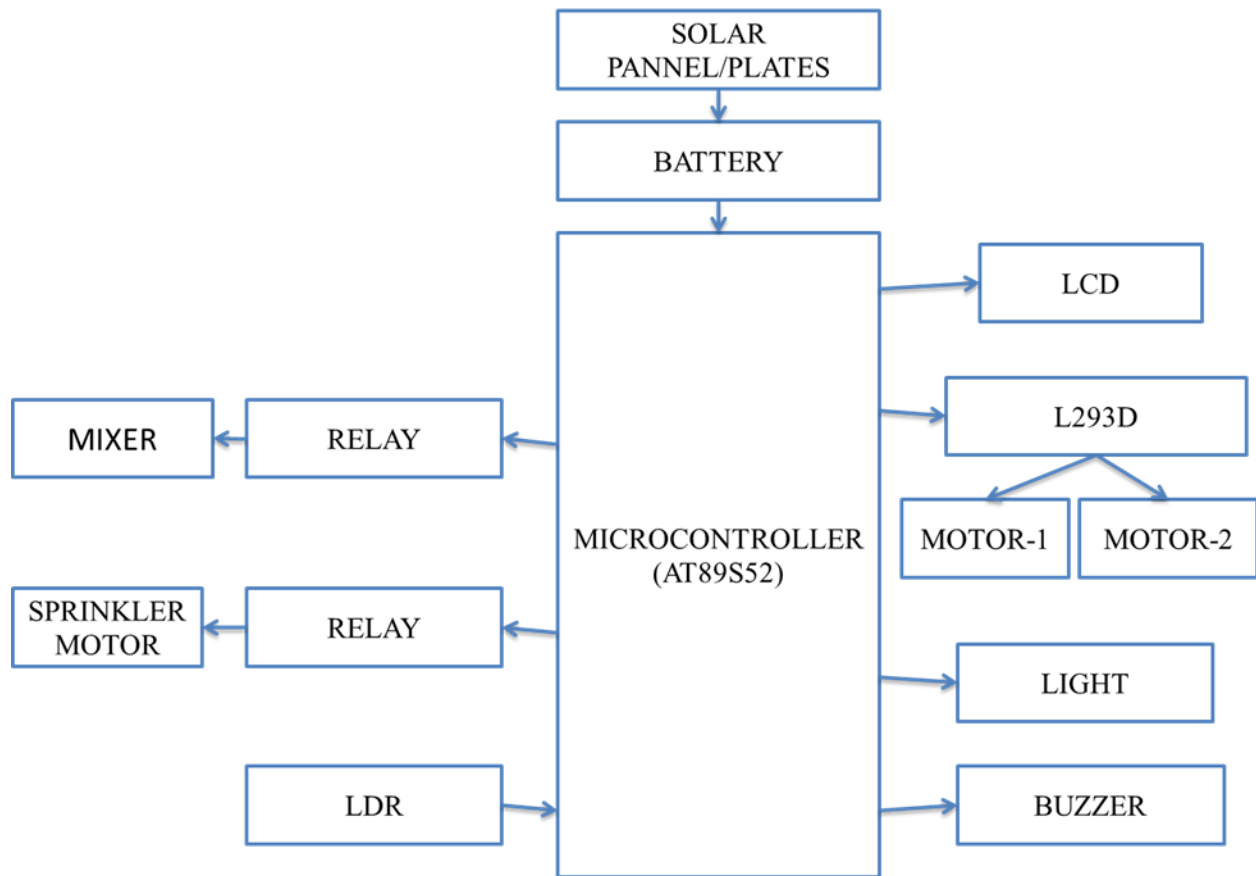
## B. RECIVER SECTION

## II. DESIGN AND DEVELOPMENT OF THE SYSTEM

### A. TRANSMITTER SECTION



BLUETOOTH DEVICE



The Above Fig A & B Shows the Proposed System

### C. WORKING/OPERATION

Microcontroller is the brain of the desired system. It consists of two sections one is transmitter section and another is receiver section. In transmitter section it consists of Bluetooth device whereas Bluetooth, Solar panel and Storage battery which works as input. In receiver section it consists of Microcontroller, LCD, LDR, L293D Motors, Relays, Buzzer, Light, Sprinkler motor, Mixer. Whereas LCD, Sprinkler motor, Mixer shows the output of the prototype.

The sun rays are collected by the solar panel, where it converts solar energy into electrical energy and it is stored in the storage battery. We can also use direct electrical energy for spraying whereas battery acts as backup for nighttimes. By using Bluetooth we send instructions/commands to the microcontroller unit.

The operation takes place in the microcontroller unit to display commands on LCD display therefore we can operate the complete operation such as sprinkler motor, mixer and L293D motors for movement of the prototype. It consists of two relays one it is used to operate mixer for mixing the pesticide and another it is use for sprinkler motor to sprinkle/spray the pesticides for vineyards.

Therefore instructions/commands as follows:-

- 1-stands for MIXER ON, 2-stands for MIXER OFF, 3-stands for MOTOR ON, 4-stands for MOTOR OFF, F-stands for FORWARD MOVING, B-stands for BACKWARD MOVING, R-stands for TURN RIGHT, L-stands for TURN LEFT.

When pesticides level is low, then the buzzer indicates “PESTICIDES LOW” in LCD displays as well as in Bluetooth also, if

it is full it shows as “NORMAL” in LCD displays as well as in Bluetooth device. When prototype is operated, generally during nighttimes where there is a drop in light intensity therefore LDR senses and light blows. Hence the process is completed and repeated for sprinkling/spraying the vineyards.

#### **D. METHODOLOGY**

In our present life we are using manual sprayers which are fuel consumption and harmful to the humans life. With the help of the above proposed system we can overcome those problems. The solar panel produces electrical energy and electrical energy stored in storage battery, by using the Bluetooth device we send instructions to the receiver section, where it displays the instructions on the LCD display and operation of the prototype takes place. It consists of relays which are used to operate mixer for mixing pesticides and another to run sprinkler motor for spraying the vineyards. The buzzer indicates the presence of pesticides for spraying and LDR sense the light intensity and it is operated automatically. With the help of this system we can overcome the problems which are faced earlier and it has greater advantage in future with this advanced technology.

#### **E. HARDWARE REQUIPMENTS**

- MICROCONTROLLER
- LCD
- LDR
- BATTERY
- SPRINKLER MOTOR
- MIXER
- RELAYS
- L293D DRIVER

#### **F. SOFTWARE REEQUIPMENTS**

- KEIL COMPILER
- EMBEDDED C

#### **III. ADVANTAGES**

- Reduces fuel consumptions and bring down running cost due to solar powered working.
- Simple to use, easy to manufacture, longer durability and reliability.
- It does not create any pollution, as it is noiseless.
- Prevents the operator from exposing from chemicals and pesticides.
- The sprayer not only minimizes the drudgery of the work but is also more effective than the conventional ones.

#### **IV. FUTURE SCOPE**

The solar sprayer is mainly used for spraying liquefied pesticides. It can also be used as automatic spray painting robot. The developed system can be used for spraying the fertilizer, fungicides. The pesticide sprayer operates with minimal pollution. The same technique and technology can also be extended for all types of power sprayers in future we have a greater advantage with this advanced technology.

#### **V. CONCLUSION**

The proposed system of the prototype results that it was successfully able to fulfill the human need for spraying the pesticide in vineyards. While comparing with the previous pesticide sprayers this is more efficient and we can overcome health hazards.

#### **ACKNOWLEDGEMENT**

Existing system does not have minimum requirements for human needs such protection from pesticides regarding health issues, consumption of solar energy, no fuel consumption, does not create any pollution and

so on. In this project the above requirements are fulfilled with the advanced technology by sending instructions with the Bluetooth device and this project provides greater advantage in future.

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