Home Automation & Security Management Using Voice Command & Tilt Sensor

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Abstract:

In this idea, household devices will be controlled by user voice command. The voice Command will be given by Smartphone. The Connection between device and Smartphone will be maintained via Bluetooth. Precious household furniture's or product's security will be managed by tilt sensor.

When a user will enter in his room then he will connect the Bluetooth module of our device by his smartphone. Then he will give voice command to control a specific device. For example, after entering or by staying in the Bluetooth range user will connect his/her app to our device Bluetooth module via Bluetooth and say that "light on" and the light will be on. A chip will be attached to precious product and if it is displaced from it's place then security alarm will be on.

Components:

- Arduino UNO

- Bluetooth Module (HC-05)

- Solid State Relay (with MOC 3021 optocoupler under BT 136 Triac)

- Android phone (with "BT voice control for Arduino" app installed)

- Power Supply

- Load (Light, Fan)

- Tilt Sensor-AT407

- Speaker

- Resistors

- LED (Red, Green)

- Breadboard

Block Diagram:
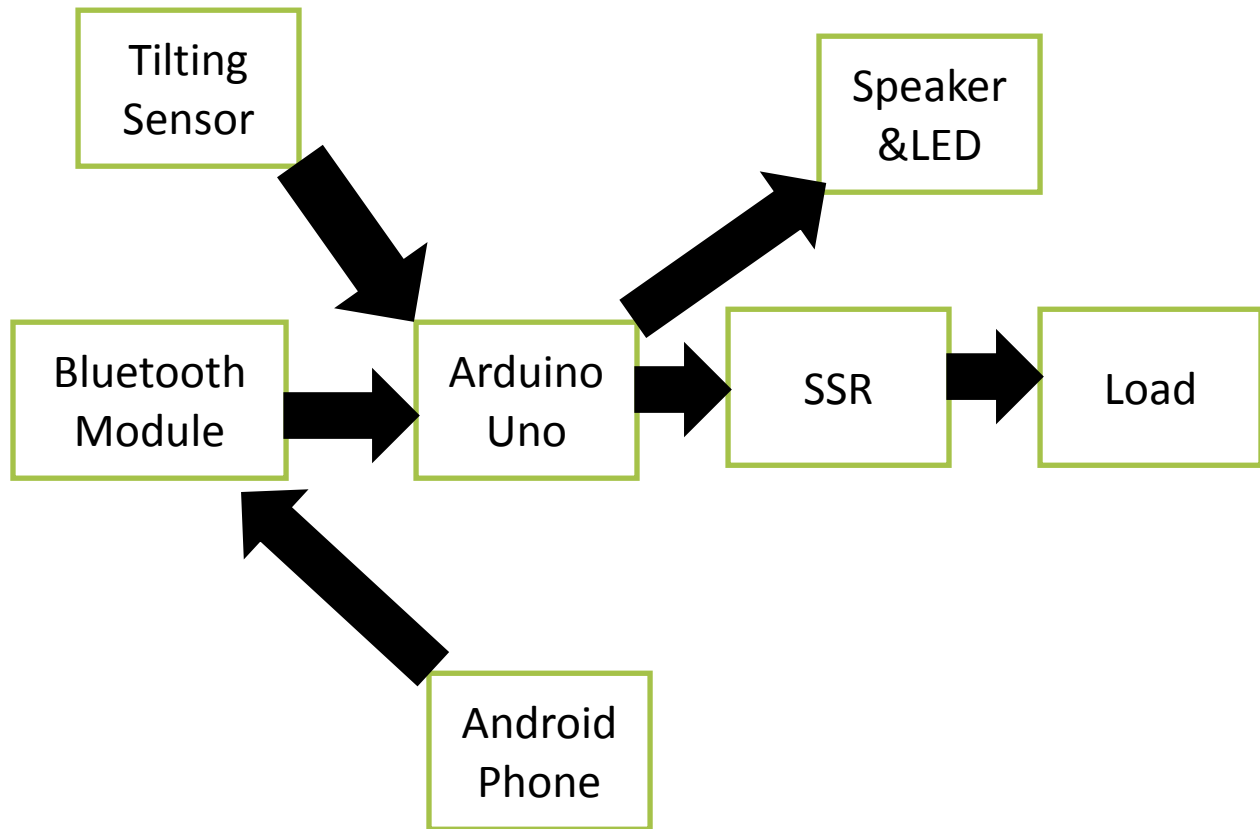
Android phone will connect to Bluetooth Module HC-05 and user's command will be forwarded to it via "BT voice control for arduino". Then the Bluetooth Module will forward the command to arduino. The arduino will pass the signal to solid state relay (SSR) and according to that SSR will take action to the load. Tilt Sensor will always update the tilting position of it to the arduino and according to that arduino will take action to the speaker and LED.

Extension of this project:

In future, we have a plan to control the other house hold electric devices such as air conditioner, computer,TV etc… and the chip for security management will be attached wirelessly such as Bluetooth.
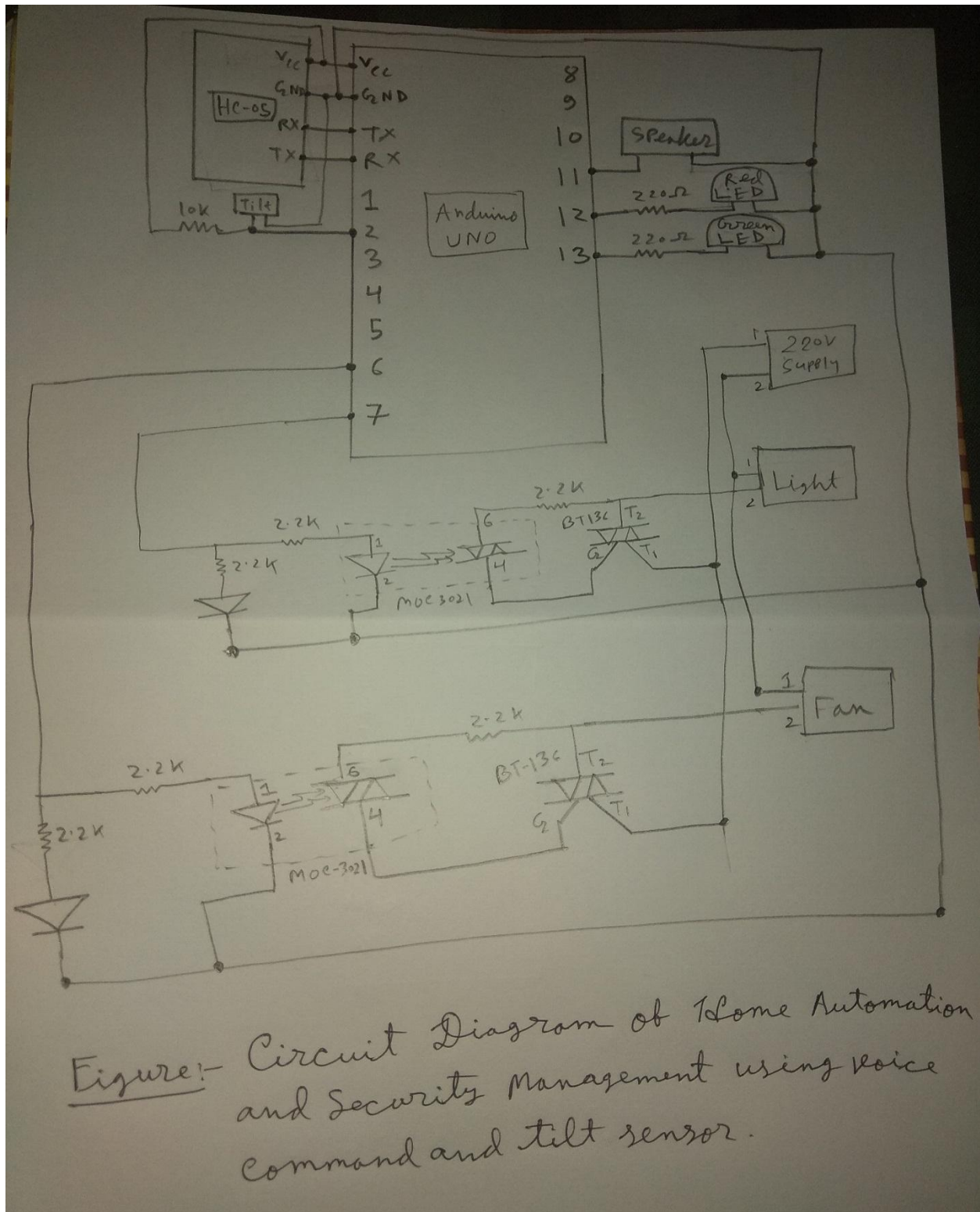
Circuit Diagram:

Figure:- Circuit Diagram of Home Automation and Security Management using voice command and tilt sensor.

Difficulties Faced:

Our main challenge was converting DC to AC. We have to design a solid state relay to accomplish this challenge. The design of solid state relay has been attached above in the circuit diagram. We have used MOC-3021 optocoupler with BT-136 triac to trigger the simple arduino signal to handle the AC load.

When we give command to on the load then arduino gives 5V to MOC-3021 then 4 and 6 pin of it become short which gives pulse to the gate of BT-136 trica which passes electricity to the load.

When we give command to off the load thenarduino gives 0V to MOC-3021 then 4 and 6 pin of it become isolated thus no pulse is forwarded to the gate of BT-136 and no electricity is passed to the load.