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Remote Alignment of Dish Positioning By Android Application

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ABSTRACT

The project is designed to develop a dish positioning system which can be operated by using an Android application. The main application of using a dish is to receive signal from satellites and other broadcasting sources. In order to position the dish to the exact angle to receive the maximum signal of a particular frequency, it needs to be adjusted manually.

In order to overcome the difficulty of adjusting manually, this proposed system helps in adjusting the position of the dish through an Android application device. Remote operation is achieved by any smart-phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation. This system consists of two motors that enable the dish to move both in horizontal and vertical direction.

The Android application device acts as a transmitter whose data is received by Bluetooth device which is interfaced to a microcontroller of Arduino family. The Bluetooth device sent data to the microcontroller which is transmitted from Android application device. The microcontroller sends control signals to the motors through an interface IC also known as motor driver IC. The Bluetooth device serially communicates with the microcontroller.

1. INTRODUCTION

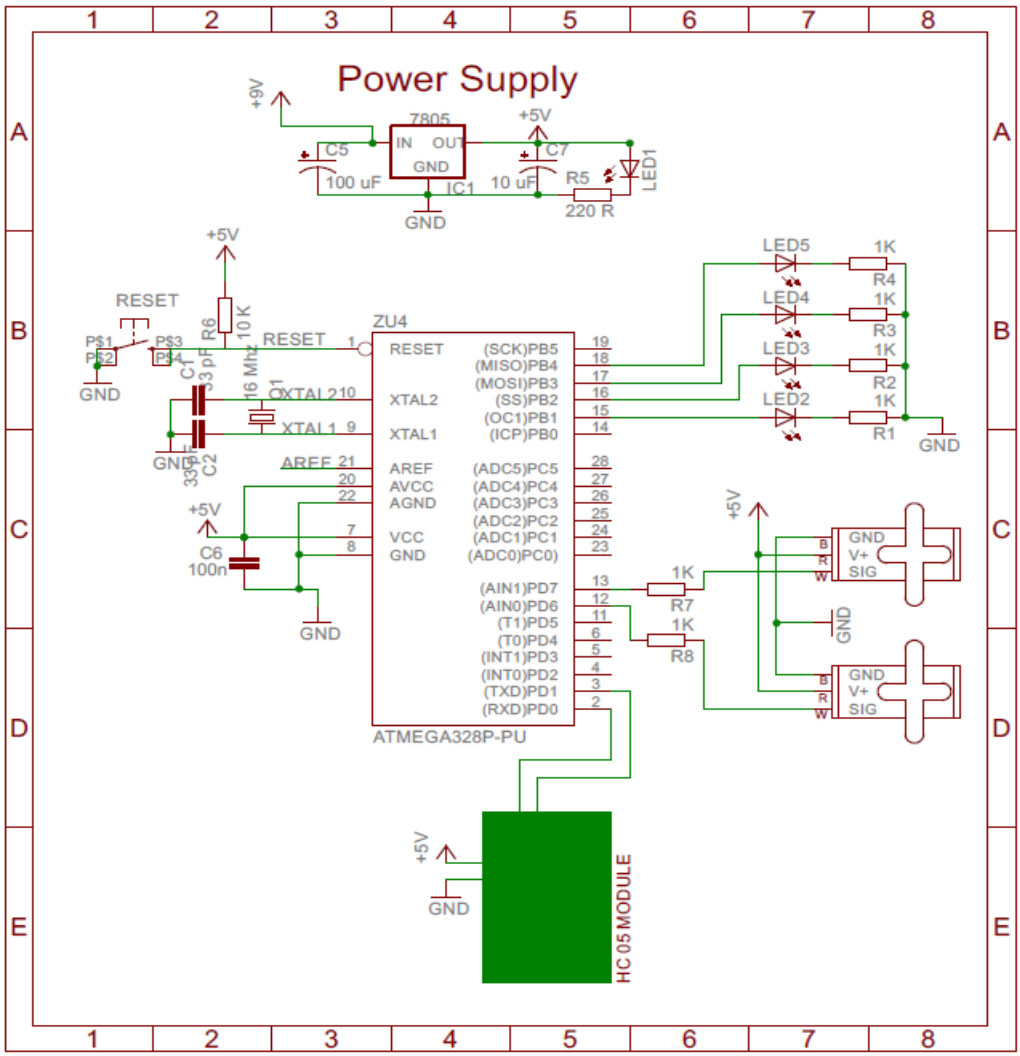
The main idea behind our project is to design a control system which capable of receiving a set of command instructions in the form of wireless data (via Bluetooth) and performs the necessary actions of rotating a Dish in two axis (X axis and Y Axis). We can use any Android device to control the position of the Dish via a Bluetooth module which will be attached on the receiver end.

The receiver unit has a Pan and Tilt Assembly with Servo Motors which is interfaced with an intellectual device called ArduinoATMega328.This microcontroller takes the responsibility of reading the received commands from the mobile unit via Bluetooth module and perform the corresponding tasks of rotating the servo motor in different axis. This system works up to a range of 30 feet which is enough to control devices in a room/hall/factory.

2. SYSTEM DESIGN

- The Bluetooth module (HC05) receives the input for the user i.e. the android application and sends this data to the microcontroller.
- The microcontroller processes the data received and takes the required action.
- The microcontroller controls the servo motors.
- The servo motors are attached to the pan and tilt assembly which rotate the dish.
- The voltage is maintained at 5V by the voltage regulator.
- LEDs are used to indicate the direction of motion.
- The pan and tilt assembly is used for smooth motion of the motors and to avoid tangling of wires.

3. CIRCUIT DIAGRAM



4. COMPONENTS USED

- Voltage Regulator 7805
- Arduino ATMega328
- Servo motors
- Pan and Tilt Assembly
- Capacitors (Electrolytic and Ceramic)
- Bluetooth module HC05
- Resistors
- Battery 9v

5. FUTURE SCOPE

Even though the prototype meets all the project specifications, and the device works as expected, there are still several ways to further improve upon it. We can implement this prototype at homes and further modify it by automatically changing the frequency of the channel using android phone so that the quality of the video and voice is further improved and hence make it more user friendly.

6. CONCLUSION

From the research and analysis of our project entitled as "REMOTE ALIGNMENT OF DISH POSITIONING BY ANDROID APPLICATION", it has proved to remove the disadvantages of DISH in the frequency spectrum disturbance situations or any slight whether disturbance. There is a control system which is capable of receiving a set of command instructions in the form of wireless data via Bluetooth and performs the necessary actions of rotating a Dish in two axes (X axis and Y Axis). We can use any Android device to control the position of the Dish via a Bluetooth module which will be attached on the receiver end such as any smart-phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation. .The processor Arduino takes the responsibility of reading the received commands from the mobile unit via Bluetooth module and perform the corresponding tasks of rotating the servo motor in different axis.

The primary goal with the computer side software was to implement a simple solution for data collecting, that can be later integrated into the framework to plot the EEG/ECG signals in real time on the computer screen. The prototype of the monitor node has not yet been mounted at the time of the submission deadline due to the global availability problems of the transceiver chip. For this reason all the measurements and benchmarks were carried out using the fully functional but not optimal device built on the breadboard.

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