



DISH POSITION CONTROLLER USING TV REMOTE

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Abstract

Nowadays, most of the people have Dish TV connection at home and this connection requires an antenna to function. Over a period of time, the antenna of dish TVs tends to change in angle and may go out of alignment. It may then require some adjustment to receive good reception. When it comes to professionals the dish TV antenna can be adjusted using a signal meter to get the best possible strength otherwise need to adjust the alignment manually. In order to overcome the difficulty of adjusting manually, this project will help to adjust the position of dish through a conventional TV Remote. The aim of this project is that to make the movements of dish by two dc motors in vertical and horizontal direction using TV remote as per our need. In this system TV remote acts as transmitter, and there is an IR receiver which receives the coded signals and given to the microcontroller. The microcontroller sends the control signals to the motors which are interfaced by the motor driver IC.

Index Terms: Dish TV Antenna, DC Motor, TV Remote, Transmitter, IR Receiver, Microcontroller

1. INTRODUCTION

The invention of the television was the work of many individuals in the late 19th century and early 20th century. Direct-to-Home (DTH) television is a method of receiving satellite television by means of signals transmitted from direct broadcast satellites. In order to receive these signals, it has to be in the direct line of sight of the antenna. For getting best signal, following should be done: The line of sight view to the particular satellite is free of obstacles and obstructions. Adjust the antenna reflector to azimuth angle obtained for the

particular satellite. This adjustment is the east-west movement of the reflector on the mount and is given in azimuth degree. While the transmission and broadcast is uninterrupted most of the times, in some cases or situations, it may not be very clear or may stop altogether. The antenna of dish TVs tends to change in angle and may go out of alignment. It may then require some adjustment so that you can receive good reception. 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. To overcome this difficulty the proposed system helps in adjusting the position of the dish through a simple TV Remote.

A. Survey of Existing Systems

Television is one of the most important inventions of the twentieth century. It is a good and healthy source of both entertainment and education and it started in India in September 1959. The first programs presented on television were meant for schools and rural area. It shows people to see what is going on around them by giving current news, weather reports, sporting events, or information about places and criminals around the world. Television receive broadcasting signals and turn them into pictures and sound. Hungarian engineer Kalman Tihanyi designed a television system utilizing fully electronic scanning and display elements and employing the principle of charge storage within the scanning tube[1].

Richard, V., Editor, Motor Control Electronics Handbook, Mc Graw-Hill, Boston. Nowadays, the most popular motor is a servo motor that is used to control and drive for heavy load application. On the other hand, the servo motor cost is extensively high for this application [2]. It describes expert design and application which

help in controlling all types of motors with precise, adaptable intelligence. Featuring the latest in electronics technology from the best and brightest in the business, it gives everything from the fundamentals to cutting-edge design tips, including real-life examples with software code. More and more critical in motor design, sophisticated electronic controls provide greater efficiency, finer speed and torque regulation, and better motor protection.

Chatterjee S., Industrial Electronics and Control, New Delhi: Tata Mc Graw-Hill Publishing Company Limited. Using the remote control improves the advanced technology. And using the microcontroller develops the motor to maintain the desired position. Although this is the first approaching step to the control system, automation system and robotics systems, these can greatly serve to the industrial control [3]. It describes the principle of operation and applications of both the magnetic control devices as well as the electronic control devices as well as the electronic control devices, using thyristors. It explains electronic control of heating, welding and solid state motor control circuits, these circuits have been verified and tested by experts, in the laboratory.

Satellite Dish Positioning Control By DC Motor using IR Remote Control by Me Me Kway Oo ,Chaw Myat New and Hla Myo tun [4] is designed to develop a geosynchronous satellite dish positioning system which can be operated by using a remote control. Satellites are controlled by a ground station antenna (dish) an earth that sends commands and receive information from the satellite.

“Dish Positioning By Using IR Remote” [5] by S. A Maske, Mr. Shelake Aniket Vishwasrao , Mr. Shinde Anup Sanjay and Mr. Mugade Nitin Krushnat describes about a dish positioning system which can be operated by using a remote control. It uses a microcontroller of 8051 family which is interfaced to two motors that causes the dish movements in horizontal and vertical direction according to the commands generated by microcontroller. By operating a TV remote, coded signals are transmitted from it to IR receiver that is interfaced to microcontroller. IR receiver decodes the data (signal) and sends it to microcontroller that initiates the motors for

movements through motor driver IC interfaced to motors.

Satellite dish positioning system can be provided with computer system without microcontroller. But microcontroller is a single chip it is low cost, small size and high performance. So, microcontroller is most suitable for auto positioning system. In this system, a satellite positioning system has been developed. A dish control system is critical to its tracking capability. Dish are controlled the manual operation which is time consuming and less accurate. This system is used remote control to start the motor moving in the desired direction. Microcontrollers are widely used all over the world and it is based on the latest technologies. Using the remote control improves the advanced technology. And using the microcontroller develops the motor to maintain the desired position. Although this is the first approaching step to the control system, automation system and robotics systems, these can greatly serve to the industrial control.

1) **SYSTEM ARCHITECTURE:** The paper describes to develop a dish positioning system which can be operated by using a conventional TV remote. The system is made up of two dc motors that enable the dish to rotate both in horizontal and vertical direction, remotely controlled by infrared means. One IR sensor is used to receive the remote commands which are fed to microcontroller that decodes the data to rotate the motor in desired direction via motor driver IC. The TV remote acts as a transmitter whose data is received by an IR receiver which is interfaced to the microcontroller. General block diagram of the proposed system as shown in Figure 1 .

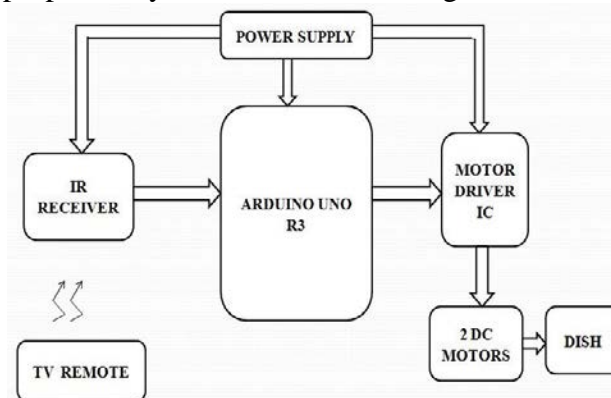
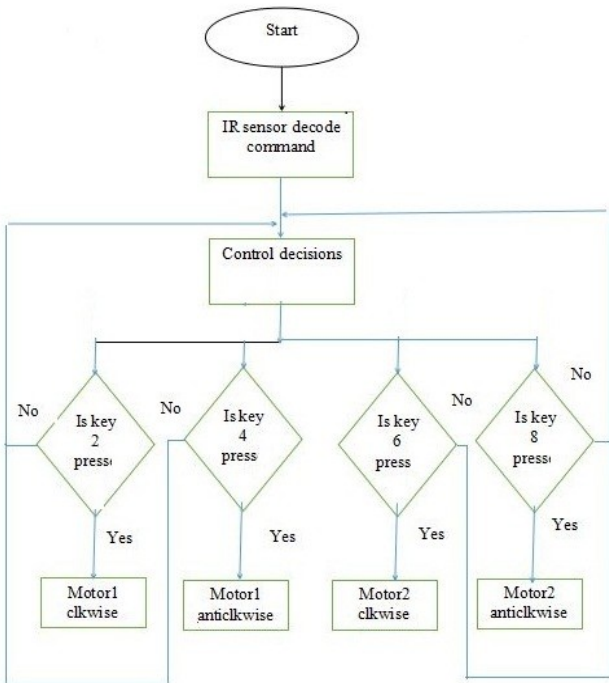


Fig. 1. Proposed Block diagram of Dish Position Controller Using TV Remote

The proposed idea is designed in embedded platform. ATMEGA 328 micro-controller platform is used for developing this system.

The microcontroller will first check the status of IR receiver. By checking the conditions such as the key pressed is two, eight, four or six. By analyzing that condition the microcontroller will control the motors in which direction it rotates. When the key pressed is two the Motor 1 will rotate in clockwise direction, When the key pressed is eight the Motor 1 will rotate in anticlockwise direction, When the key pressed is eight the Motor 2 will rotate in clockwise direction, and when the key pressed is six the Motor 2 will rotate in anticlockwise direction. The algorithm of the program which is



used in this project is explained by the flow chart given below in figure 2.

Fig. 2. Flow chart of Dish Position Controller Using TV Remote

2) **SYSTEM DESIGN AND WORKING:**
The circuit diagram for the proposed system is shown in Figure3 below. The circuit is drawn using Proteus-ISIS Professional v7.7.

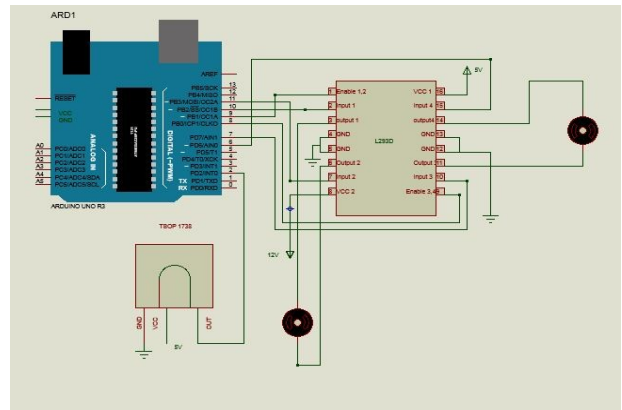


Fig. 3. Circuit Diagram of Dish Position Controller Using TV Remote

The circuit diagram consists of ARDUINO UNO board with ATmega328 IC, the IR receiver TSOP1738, two dc motors, motor driver IC L293D and power supply. The TV remote acts as transmitter which will transmit the IR signals and it will be received by the IR receiver TSOP 1738. The TSOP 1738 has three terminals as signal output, vcc and ground. The signal output terminal is connected to the arduino uno via digital pin2. The received signal is decoded by microcontroller in arduino and the corresponding output signal is given to the motor driver IC L293D which will interface the arduino with the DC motors. Power supply is connected to the arduino and the IR receiver. 9V supply is given to the motor driver IC L293D.

II. RESULTS OF IMPLEMENTATION

The prototype of proposed system is implemented as shown in Figure4. The position of dish is controlled by using the IR remote, the movement of dish is done by rotating the two dc motors in clockwise and anticlockwise direction. Thereby gets the movement in both vertical and horizontal direction.



Fig. 4. Implemented Model of Dish Position Controller Using TV Remote

III. CONCLUSION

The proposed model of remote controlled dish positioning system can adjust the position of dish remotely by using IR remote. It will reduce the difficulty in adjusting the position of dish manually. If the dish position is adjusted manually, one cannot direct the dish towards the best possible position. This proposed system is intended to adjust the dish position through

a simple TV remote by pressing the buttons corresponding to the direction of the The advantages of the proposed system are less complexity, easy to implement and low cost. Also, an automated system helps to reduce the human intervention and saves time. This system will help to improve the quality of dish TV by taking the maximum signal strength.

IV. FURTHER SCOPE

The future scope of the system is that positioning of dish can be implemented using RF will improve the efficiency of the system. It will increase the range between the remote and the IR receiver.i.e, using RF transmission the dish position can be controlled from a distance of 200meters. Also, it can improve by interfacing sensors and control processes. Also to make it very simple it can be used just as just a monitoring system and can provide SMS alerts

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