Design of Advanced Antenna Positioning System

Rahane Suraj Dildar[1], Mhaske Shital Arun[2], Shingate Sujata Rajendra[3]
UG Student, Department of E&TC Engineering, Pravara Rural Engineering College, Loni.
Email: surajrahane001@gmail.com[1], samhaske95@gmail.com[2], sujatashingate7378@gmail.com[3]
Prof. S. B. Mandlik[4]
Asst. Prof. Department of E&TC Engineering, Pravara Rural Engineering College, Loni
Email: mandliksb@gmail.com[4]

Abstract- The idea is to develop a system which will control the movement of the antenna in all direction. In order to overcome the difficulty of adjusting manually, this proposed system helps in adjusting the position of the antenna. Remote operation is achieved by any smart-phone with android OS. The different directions of the dish are attained by using two servomotors, one move in vertical and other in horizontal direction. The servo motor actions are controlled by the microcontroller.

1. INTRODUCTION

In remotely located areas, or in emergency situations, it is difficult if not impossible to establish communications with satellite networks or other types of networks. Portable, inflatable antennas have been developed to overcome this problem.

Antenna positioning or tuning is very important aspect for getting standard broadcast signals from a satellite. The Antenna must be pointed at a precise angle to get the strongest possible signal. If the Antenna position is adjusted manually, it became too difficult to align it at the optimum position.

The Advanced Antenna Positioning system mainly functions to identify the source of signal. The signal may be of any type and any kind, system automatically identifies the presence of a particular signal and the antenna will remain stationary till the signal link is established. Whenever the signal link breaks between the antenna and the satellite or source the antenna revolves continuously looking for the signal.

This system also has advance connectivity with the LCD screen to show the antenna position.

In modern scientific world, there are threat perceptions to air defense from the enemy nations. Major organizations such as government buildings and offices, various sites of industries, places of financial importance, residence of ministers and VIP's, heritage centers and tourist places and pilgrimages need to be protected against any possible threats from the enemy. For this the air defense system in and around these sites need to be monitored continuously Through Radar Surveillance System. A particular target object has to be detected and monitored. For this such automatic Antenna Positioning Systems are necessary.

Whenever there's no signal or logic low level showing, the controller can drive the motor to look a symbol i.e. logic high at the controller input port. The controller can unstoppingly repeat this procedure to trace the antenna for a selected signal.

2. LITERATURE SURVEY

[1] '**Microcontroller Based Wireless 3D Position Control**' by Amritha Mary A. S.1, Divyasree M V2, Jesna Prem2, Kavyasree S M2, Keerthana Vasu discussed on main application of using a dish is to receive signal from satellite or other broad casting 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. To overcome the difficulty of adjusting manually, this proposed system helps in adjusting the position of the dish through an android application device.

[2] '**Microcontroller Based Wireless Automatic Antenna Positioning System**' by Surya deo choudhary, Pankanj Rai, Arvind kumar, Irshad Alam used to design automatic Antenna Positioning system primarily functions to identify the source of signal. The signal may be of any type and any kind, it automatically identifies the presence of a particular signal and the antenna will remain stationary as long as the signal link is established.

[3] '**Remote Alignment of Dish Positioning By Android Application**' by Prajwal Basnet, Pranjal Grover Preeti Pannu. 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

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maximum signal of a particular frequency, it needs to be adjusted manually.

[4] '**Automated Antenna Positioning for Wireless Networks**' by Amit Dvir, Yehuda Ben-Shimol, Yoav Ben-Yehezkel, Michael Segal. This article addresses a real-life problem which is obtaining communication links between multiple base stations sites. This is done by positioning a minimal set of fixed-access relay antenna sites on a given terrain. To minimize the number of relay antenna sites is considered difficult due to substantial installation and maintenance costs. Despite the potential significant cost saving by eliminating even a single antenna site, a hardly optimal manual approach is employed due to the computation complexity of the problem.

[5] '**Dish Positioning By Using IR Remote**' by Prof. S. A Maske, Mr. Shelake Aniket V, Mr.Shinde Anup S, Mr. Mugade Nitin K. In this paper, microcontroller was designed to develop a dish positioning system which can be operated by using a remote control. The main point of using a dish is to receive signal from satellites and other broadcasting sources. In order to get the exact angle of position of the dish, it needs to be adjusted manually. To overcome the difficulty of adjusting manually, this paper helps in adjusting the position of the dish through a remote control

[6] '**Background Positioning for Mobile Devices**' by Denis Huber School of Electrical and Computer Engineering Technical University Berlin. This paper discussed about positioning of Mobile devices. Modern smartphones today can use up to three different methods to locate their position. Satellite Positioning, Wifi Positioning and Cellular Positioning

From the referred published papers we have learned to design automatic Antenna Positioning system will take minimum efforts, minimum time and is more correctly.

We have learnt that Antenna positioning can be done by following ways:

1. Microcontroller based antenna positioning
2. Android based antenna positioning
3. IOT based antenna positioning

The components to be used can vary depending on the applications like to monitor any attacking objects. The accuracy, precision, reliability and flexibility can be taken through this project module.

3. BLOCK DIAGRAM AND DESCRIPTION
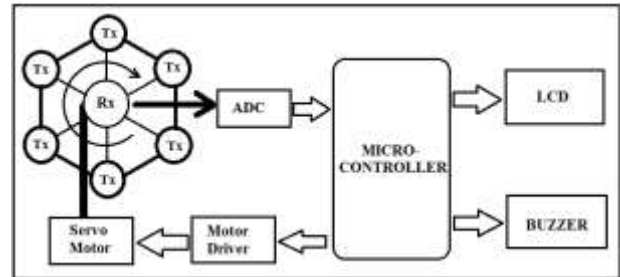
3.1. Block diagram:

Figure 1: Block Diagram of Advanced Antenna Positioning System

3.2. Block / circuit diagram description:

As shown in above block diagram we propose a system to provide the secure application for Antenna Positing System.

The design principles are based on simple phenomena. The tracking system has an antenna which contains several transmitters, a delay circuit and a base receiver. The receiver is placed at the center point of the antenna. Whenever the receiver receives a signal with adequate strength, a logic high pulse is generated by a mono-stable configured around a 555 Timer. To avoid interference and unnecessary triggering, a time delay is provided. And 8nos. of IR receiver (photo diode) arranged around the antenna to detect the position of antenna. All the receivers output are connected to the microcontroller through a signal conditioning circuit for a compatible output to the Microcontroller. The logic level is continuously checked with proper time delay. As long as the controller senses the logic high the motor will stay at that place assuming the signal is available to the antenna and the position of antenna will display on LCD in degrees.

Whenever there is no signal or logic low level appearing, the controller will drive the motor to search a signal i.e. logic high at the controller input port. The controller will continuously repeat this process to track the antenna for a particular signal.

4. PROPOSED RESULTS:

4.1. Expected Outcome:

To develop Advanced Antenna Positioning System that can work in remote areas automatically. The signal traced by system must be real time.

4.2. Advantages:

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1) An IOT application can be used here, so that we can control the positioning of antenna anywhere in the world.
2) A large number of desired antenna headings may be stored in memory for subsequent use.
3) The system can identify many type of signals.
4) Range of detection can be increased.

4.3. Applications:
1) To monitor any attacking objects.
2) In missile launching systems.
3) In monitoring of systems in satellite communication systems.
4) To monitor anti-missile systems.
5) In mass communication systems in moving vehicles.
6) In solar panels.

5. CONCLUSION:

The Automatic Antenna Positioning System primarily functions to spot the presence of any signal. The thought is to develop a system which can manage the movement of the saucer altogether direction. The most application of employing a dish is to receive signal from satellite and alternative broad casting sources. So as to position the dish to the precise angle to receive the utmost signal of a specific frequency it has to be adjusted manually. So as to beat the problem of adjusting manually, this planned system helps in adjusting the position of the antenna.

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