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NOAA SATELLITE IMAGE RECEPTION USING OFH ANTEENA

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ABSTRACT :-

Satellite imaging is widely used to monitor weather and interpret satellite images. Time limitation in accessing weather satellite image data is still a major problem for satellites. Automatically send images on 137.9125 MHz and 137.1000 MHz. NOAA 18 and NOAA 19 weather frequencies. In this study, data was collected with the help of a quadrangular helical antenna and RTL-SDR. Four-line H satellite imaging to obtain these two frequencies is widely used to monitor weather and interpret satellite images. Limiting immediate access to weather satellite imagery is still a major challenge for the 137.5 MHz design elix antenna. Use WXtoImg software to collect, analyze, edit and display automated transmission images. Although the automatic transmission image of NOAA 18 received a frequency shift of 0.0685% and NOAA 19 had a frequency shift of 0.0686%, the results are clear enough and explainable. Use WXtoImg software to collect, analyze, edit and display automated transmission images. The results show that although there is a difference of 0.0685% and a frequency shift of 0.0686% in the automatic transmission images received by NOAA 18 and NOAA 19, the received weather satellite images are clear and descriptive enough.

INTRODUCTION

Real-time access to local weather satellite image data is still limited and the confidential information it contains is difficult to decipher. Publicly available APT (Automatic Picture Transmission) signals make NOAA weather satellites an alternative method of receiving weather satellite images. NOAA 18 and NOAA 19 satellite weather data are useful in GIS (Geographic Information System) for disaster mitigation, scientific research, economic management, construction planning, cartography, and road planning [1]. NOAA weather satellites carry five types of sensors, one of which is AVHRR (Advanced Very High Resolution Radiometer) [2]. The AVHRR sensor is responsible for detecting electromagnetic waves reflected from clouds and objects on the earth's surface, as well as currents emitted by air and water. The AVHRR sensor consists of 6 detectors that operate on radio waves of different wavelengths, from visible light to thermal infrared.

The APT signal transmitted by NOAA satellites is RHCP (right circular polarization), so a good RHCP antenna is required [3] [4] [5] This article focuses on the use of hardware and software to acquire and identify APT signals on the NOAA 18 and NOAA 19 weather satellites.The best antenna for APT reception at 137 MHz is the QFH antenna (quadruple helix) [6] [7] [8]. We made the QFH antenna using the same size copper pipe. QFH antennas break the idea that receiving satellite images requires a large dish. QFH antennas made of copper pipes also promise ease of production. SDR is an important area for enabling a wide range of software applications that enable communication flexibility and innovation [9]. Many SDR devices are used as NOAA weather satellite receivers [10] [11] [12]. In this work, we use RTL-SDR. This SDR uses Realtek® RTL2832U as the controller and Rafael Micro® R820T2 as the tuner.

LITERATURE REVIEW:-

Our research in the telecommunication field revealed numerous advanced and inventive devices that are beneficial for both research and study purposes. Several studies have been conducted and presented as follows.

1)How to Collect Images from Weather Satellites Using a Special Antenna and Software RTL SDR - Wiryadinata

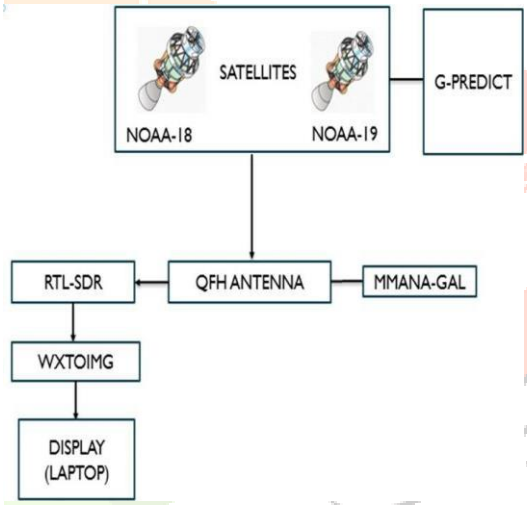
2)Create and improve a device that can send and receive signals from satellites that take pictures of the Earth. Processing - Fathurahman. The type of antenna used, whether it is a V dipole antenna, will cause a 20db reduction in the vertical polarization.

3)Advanced VHF Ground Station for NOAA weather Satellite APT Reception – Dasca.

4.RESEARCH METHOD

Block Diagram
Flowchart

Block Diagram :



Satellite:

The satellites are artificial objects which orbits around the Earth or other planets.NOAA owns and operates 11 satellites.We are going to simulate with NOAA-15 or NOAA-18 or NOAA-19 Depends on the signalThe NOAA uses 2 satellites a morning and evening, to ensure every part of Earth is observed at least twice after every 12 hours. It is real-time observation

Antenna:

QFH stands for Quadrifilar Helix or Quadrifilar helicoidal.QFH antenna is used to capture image from low level geosynchronous satellites.and downlink frequency range is 137MHz. They are circularly polarizeIt's uplink d

MMANA-GAL:

MMANA- GAL is an antenna analyzing tool based on moment method.It is used for simulation of antenna.

SDR:

SDR is software defined radio system that uses software for modulation and demodulation of radio signals.

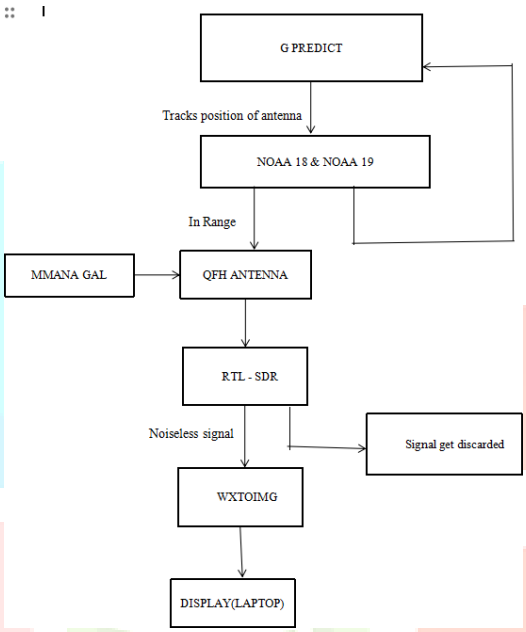
WXTOMING:

It performs amount of signal processing The information signal received by QFH antenna is separated by RTL-SDR WxtoImg:Wxtoimg is a fully automated APT and WEFAX weather satellite decoder.Wxtolmg is used as a audio to image converter It gives stunning color images day and night.

G-PREDICT:

It is used for the satellite
G-predict is a real-time satellite tracking and orbit prediction application.
It can track a large number of satellites and display their position.
It can also predict the time of future passes for a satellite.
It is a free software licensed under GNU (General Public License).

FLOWCHART :



FLOWCHART WORKING:

Satellites are human-made objects that orbitthe Earth or other planets. NOAA owns and operates11 satellites, and we will use NOAA-15 or NOAA-18 or NOAA-19 for our experiments. Depending on the signal. In antennas, QFH stands for quadrangular helixor quadrilateral helix. The QFH antenna is used to capture images from low altitude geostationary satellites. SDR is software- defined radio that uses software to modulateand demodulate radio signals. Wxtoimg is a fully automatic APT and WEFAX weather satellite decoder. Wxtolmg is used as an audio to image converter.

Provides beautiful colors during day and night G forecast. Used for satellites. It can track multiple satellites and display their positions. It is also possibleto predict the delivery time of future satellites.It is free software licensed under the GNU(General Public License). MMANA- GAL.MMANA-GAL is an antenna analysis tool based on real-time methods. simulation rau antennasThe result of the antenna design and fabrication resulted in two V double dipole and double crossed dipole antennas operating at 137.1 MHz for NOAA satellite receivers 19.137.62 and 137.912 receiving NOAA 15 and 18. - 28.028, VSWR 1.08 27.The return value obtained for a double V dipole antenna at a frequency of 137.1 MHz is -30.421dB, standing wave ratio is 1.063, impedance is 51.642Ω and gain is 0.2B.There is no size difference for frequencies 137.62 MHz and 137.912 MHz

CONCLUSION

The result of the antenna design and fabrication resulted in two V double dipole and double crossed dipole antennas operating at 137.1 MHz for NOAA satellite receivers 19.137.62 and 137.912 receiving NOAA 15 and 18. - 28.028, VSWR 1.08 27. The return value obtained for a double V dipole antenna at a frequency of 137.1 MHz is -30.421 dB, standing wave ratio is 1.063, impedance is 51.642Ω and gain is 0.2B. There is no size difference for frequencies 137.62 MHz and 137.912 MHz.

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