Signal Development & Life Extension of A Satellite

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***Abstract*:- Satellite is an object which is placed into an orbit for an intention. That intention may be a communication, information transformation, research purpose and etc. There are lots of satellites has been launched into the space. But the duration of the satellite will be a limited one. Due to this reason the satellite the information which is send by the satellite also be limited information. The signal which is transmitted through the satellite is also not clear for many times. Through our project this problems can be rectified. In this project we are going to improve the signal which is received from a satellite and the life time improvement of a satellite. In this project we are inserting UV sensors into a satellite. And the UV sensors can improve the signals then these sensors can also improve or extend the life time of a satellite. Then the Bandwidth of a transmitters going to increased by this project. By increasing the Bandwidth of a satellite the transmission frequency can be improved. Due to this increment of frequency more data can be transmitted through a satellite. Through this project in a small duration the satellite can transmits lots of information. So with in the life time it will transmit more information than normal satellite.**

Keywords:- UV sensors, Bandwidth increment, Signals, Life time

I. INTRODUCTION

An artificial body placed in around the orbit round the each or another planet in order to collect the information or for communication. A satellite is a moon, planet or machine that orbits a planet or star. For example, earth is a satellite because it orbits the sun. Likewise, the moon is a satellite because it orbits the earth. Usually, the word satellites refer to a machine that is launched into space and moves around earth or another body in space. Earth and the moon are example of natural satellites. Thousands of artificial or man-made satellite orbit earth. Some take pictures of the planet that helps meteorologists predicts weather and track hurricanes. Some and take pictures of other planets, the sun, black holes, dark matter or faraway galaxies. These pictures help scientists better understand the solar system and universe. That satellites have allows them to see large areas of earth at one time. This ability means satellites can collect more data, more quickly, than instruments on the ground. Satellites also can see into space better than telescopes at earth's surface. That's because satellites fly above the clouds, dust and molecules in the atmosphere that can block the view from ground level. Before satellites, TV signals did not go very far. TV signals only travel in straight lines. So they would quickly trail off into space instead of following earth's curve. Sometimes mountains or tall buildings wound block them. Phone calls to faraway places were also problems. Setting up telephone wires over long distances or underwater is difficult and costs a lot. With satellites, TV signals and phone calls are sent upward to a satellite. Then, almost instantly, the satellite can send them back down to different locations on earth. Satellites looking forward earth provide information about clouds, oceans, land and ice. They also measure gases in the atmosphere, such as ozone and carbon dioxide and carbon dioxide, and the amount of energy that earth absorbs and emits. And satellites monitor wildfire, volcanoes and their smoke. All this information helps scientists predicts weather and climate. The information also helps public health officials track disease and famine, it helps farmers knows what crops to plant, and it helps emergency workers respond to natural disasters. Satellites that face toward space have a variety of jobs. Some watch for dangerous rays coming from the sun. Others explore asteroids and comets, the history of stars, and the origin of planets. Some satellites fly near or orbit other planets. These spacecraft may look for evidence of water on mars or capture close up pictures of Saturn's rings.

II.BANDWIDTH FOR SATELLITE

Bandwidth is defined as a range within a band of frequencies or wavelengths. Bandwidth is also the amount of data that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually expressed in bits per second (bps) or bytes per second. For analog devices, the bandwidth is expressed in cycles per second, or Hertz (Hz).As **bandwidth increases**, more information per unit of time can pass through the channel. The larger the pipe, the more water can flow through it at a faster rate, just as a high capacity communication channel allows more data to flow at a higher rate than is possible with a lower capacity channel. The need for increased channel bandwidth should not come as a surprise. The well known Shannon Hartley theorem model of channel throughout suggests that capacity is a linear function of bandwidth.

Capacity = bandwidth*log (1+SNR)

Personally, one the most interesting evolutions occurred several years ago with the widespread development of 8o2.11ac devices. For the first time in my personal memory, the wireless industry created a widely used standard that was ahead of the capacities of RF signal generators and analyzers. In fact, we saw many of the test and measurement vendors accelerates the development of wider bandwidth instruments to support the bandwidth requirements of 8o2.11ac in a timely manner. Looking forward, the next major milestone for RF test equipment will be the ability to test the 5th generation of cellular devices (5G). Researchers are actively prototyping 5G candidate technologies such as massive MIMO, GFDM. And millimeter wave communications today. Given how drastically these technologies will change the requirement of test equipment, a 2020 deployment date is not so far away. In fact, RF test equipment will likely require 2 GHz of bandwidth by 2017-2018 to support a 2020 deployment. By any standard, achieving 2GHz of instantaneous bandwidth would be a major milestone in the test and measurement industry. Although we at NI claim to have the widest bandwidth high performance VSA, there is obviously a need for bandwidth improvements in the near future.

The high frequency switch allows to be transmitted the high frequency signal to be transmitted along the high frequency transmission line when the high frequency switch is set in the propagation state, and allows to be cut off high frequency signal to be transmitted along the high frequency transmission line when the high frequency is set in the cutoff state. According to the invention, when the high frequency switch is set in the propagation state, the high frequency signal generated by the high frequency oscillator transmits the high frequency switch. Therefore, the high frequency signal is transmitted to the high frequency transmission line, and is supplied to the antenna to be then radiated as a electric wave. When the high frequency switch is set in the cutoff state, the high frequency signal generated by the high frequency oscillator does not transmit the high frequency switch. Therefore, the high frequency signal is cut off and is not radiated from the antenna. By switching the high frequency switch between the propagation state and the cut off state, pulse signal wave can be radiated from the antenna. By using a high frequency switch that can obtain a large ON/OFF ratio, and has excellent and reliability, a reliable high frequency transmitter can be achieved. A high frequency transceiver of invention comprises:

- A high frequency oscillator that generates a high frequency signal.
- A first high frequency transmission line that is connected to the high frequency oscillator, and transmits the high frequency signal.
- A branch that has first, second and third terminals, and selectively outputs to one of the second terminal and the third terminal the high frequency signal which is supplied to the first terminal connected to the first frequency transmission line.
- A second high frequency transmission line that is connected to the second terminal, and transmits a high frequency signal supplied from the second terminal.
- A splitter that has fourth, fifth and sixth terminals, outputs to the fifth terminal the high frequency signal which is supplied to the fourth terminal through the second high frequency transmission line, and outputs to the sixth terminal a high frequency signal, which is supplied to the fifth terminal.
- A third high frequency transmission line that is connected to the fifth terminal, transmits the high frequency signal outputted from the fifth terminal, and transmits the high frequency signal to the fifth terminal.
- An antenna that is connected to the third high frequency transmission line, and radiates and receives the high frequency signal.
- A fourth high frequency transmission line that is connected to the third terminal, and transmits a high frequency signal outputted from the third terminal.
- A fifth high frequency transmission line that is connected to the sixth terminal, and transmits the high frequency signal outputted from the sixth terminal.
- A mixture that is connected to the fourth and fifth high frequency transmission line, and mixes the high frequency signal supplied from the fourth and fifth high frequency transmission lines to output an intermediate frequency signal.
- And the high frequency switch that is inserted into at least one of the first to third transmission lines such that the high frequency signal passes through the dielectric part in the propagation state.

Bandwidth(BW)=fo/Q

(OR)

Bandwidth(BW)=f2-f1

Where,

- BW- bandwidth of given circuit
- fo- center frequency
- f1- Upper frequency
- f2- Lower frequency

III. BANDWIDTH DIAGRAM

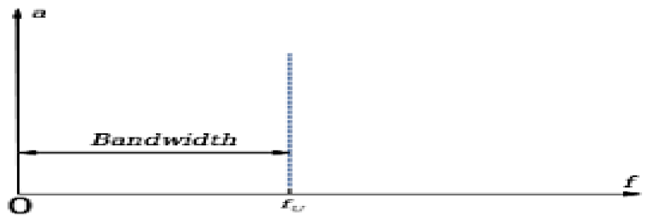

Figure: 1 bandwidth

3.1UV Sensors

UV sensors measure the power or intensity of incident ultraviolet (UV) Radiation. This form of electromagnetic radiation has shorter wave lengths than visible radiation, but is still longer than x-rays. UV sensors are used for determining exposure to ultraviolet radiation in laboratory or environmental settings. They are transmitters that respond to one type of energy signal by producing energy signals of a different type. Generally, these output signals are electrical signals that are routed directly to an electrical meter for observation and recording. The generated electrical signals from UV sensors can also be sent to an analog to digital convertor (ADC), and then to a computer with software for generating graphs and reports.

Types:

There are many types of UV sensors. Examples includes

- UV photo tubes
- Light sensors
- UV spectrum sensors

3.2 UV photo tube sensors

UV photo tubes are radiation sensitive sensors that are used for monitoring UV air treatment, UV water treatment, and solar irradiance. These sensors are used for flame detection in gas and mixed fuel (gas and oil) burners. UV phototubes consist of glass bulb filled with gas, containing two electrodes suitably shaped. When supplying both electrodes with AC voltage, if an ultraviolet electromagnetic radiation hits the phototube, the electrons, emitted by the negative biased electrode and captured by the positive biased one, start ionization process leading to the generation of an electric discharge and hence to production of electric current.

Light sensors:

Light sensors are general purpose devices for measuring the intensity of incident light. Photo junction devices are basically P-N junction light sensors or detectors made from silicon semiconductor P-N junction which are sensitive to light and which can detect visible light and infra red light levels.

UV spectrum sensors:

UV spectrum sensors are charge coupled devices (CCD) that are used in specific photography. These UV sensors are also used for measuring the portion of the UV spectrum that sunburns human skin. Ultraviolet light detectors, germicidal UV detectors, and photo stability sensors are also commonly available.

Specification:

Selecting UV sensors requires an analysis of specification such as

- Wavelength range
- Accuracy
- Power range
- Weight
- Operating temperature

Wave length range is the range of wavelengths, in nanometers (nm), that UV sensors can detect. UAV radiation ranges over wavelengths from 315nm to 400nm. UVB radiation covers wavelengths from 280nm to315nm. UVC radiation is defined as between 100nm 280nm. Because UVC radiation is more energetic, it is also the most harmful. Accuracy is a measure of how effectively UV sensors measure ultraviolet radiation. Power range and weight are also important parameter to consider, especially for UV sensors that are used in the field. Operating temperature is defined as a full required range. UV sensors are mainly used in many different applications. Examples include pharmaceuticals, automobiles, and robotics. UV sensors are also used in the printing industry for solvent handling and dyeing processes. In addition, UV sensors are also used in the chemical industry for the production, storage, and transportation of chemicals.

IV. TECHNIQUES USED

- Bandwidth increment in the circuits.
- Frequency modulation.
- Multiple circuits.
- UV sensors usage.
  From this technology three drawbacks can arise. They are
  - Sound creation
  - UV radiation
  - Structural unbalancing

Rectification of drawbacks

Noise reduction:

- We can use the shielded cables for wiring
- Ground signal common wiring to a single point
- Shield small component with a metallic ventilated enclose tied to ground
- Isolate remote sensing
- Filter incoming power with RF filter line reactor or isolation transformer
- Building noise cancelling headphones

UV radiation:

- UV radiation protection clothing
- Sun screening techniques
- UV radiation detectors

Structural unbalancing:

- High resistive material usage
- High temperature protective materials
- High strength material
- Less weight materials

Advantages:

- More information can received from satellite.
- Time period will be reducing for transmitting the information.
- Life time can be improved more.
- Cost can be reduced.
- Clear signal can be received.
- Can sense lot of things.

V.CONCLUSION

Through this project we can improve the life time of a satellite as well as signal improvement. Then the cost of launching another one satellite can be saved. We can get lots of information from the satellite. Transmissions of signas are got in very clear manner. We can reduce the wastages stored in space. High frequency can be achieved without noise creation.

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