

System Design with Digital Satellite TV Broadcasting in the District of Obrajillo, Province of Canta

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Abstract- the main objective of the project in remote areas of the capital, which in this case has chosen the people of Obrajillo whose main objective is to bring digital television to the area and for this the methods to be used will be the most adequate and viable while for later execution without first being approved by the authorities in the area.

The method to be used will be the reception of satellite television, through satellite dishes and later broadcast them digitally to households, for future is reflected in their television whose characteristics allow the reception digital television through digital decoders.

Our main focus is that this method to be used is suitable and affordable compared to others and that it is not an expense but rather an investment.

INTRODUCTION

During the last decades it has developed a way to transmit information through various means, in which the wireless technology is the best solution, because it has the ability to reach remote locations, where it would be very difficult arrive if we use a physical medium.

At the present time it is rapidly developing the television service, radically changing to digital television, who is responsible for improving and almost ignore the errors that we have in the traditional TV.

With the digitization of television, the quality of images increases, the quality it is comparable with the DVD images, also the signal is less prone to noise and interference, we could to appreciate a better clarity and sharpness with respect to the analog television.

Satellite Direct TV (TDS) has experienced a breakthrough in the last decade. Each national satellite TV system reaches viewers living outside the borders of the issuing country. To produce a satellite broadcast, we need have located an earth station in a place accessible to the signal from the production center programs. The station is equipped with a large antenna and establishes the uplink with the satellite.

I. GENERAL FEATURES

A. Problematic

In this thesis, the main objective will be see how to improve the quality of broadcast television in the district of Obrajillo, province Canta, for this in first place we have to determine how to access at the satellite system for digital TV, which channels have the system for the people of Obrajillo province, then we would have to see how it will distribute the digital television signal.

After we have to see what equipment will be needed for the stage of reception and retransmission.

And finally we have to see if the people will be willing to bear the cost or financing the access at this new technology.

B. Definition of objectives.

C.

Designing the satellite TV system with digital broadcasting in the village of Obrajillo province of sings for it is given the alternative of doing satelitley directing the antenna properly to the orbital position of a satellite and then rebroadcast locally to obtain the necessary coverage for so there is no kind of interference or signal impairment as so far have.

First signal of a given satellite will be located, then the necessary coverage will be defined.

Then define appropriate satellite equipment and the TV broadcasting system digitally and finally manage possible financial support shared between the municipality and the people.

D. Rationale for research.

Currently the digital television is a new technology which the country has adopted the ISDB-T noma and is in the process of implementation or migration to which the government has defined certain installation strategies in different regions.

Because the analog TV in the village of Obrajillo is a very poor reception due to interference noise, low-power

computers and to the neglect of the government to provide new technology it is that the town has joined and Obrajillo seeks its own resources, technology change.

E.

F. Scope and limitations

1.- scope.

- The thesis will have a scope that will concentrate mainly around the district but also Obrajillo and will be available in areas surrounding the village but only a certain part but the epicenter will be the venue.

2.- limitations.

- Given the location Obrajillo district has to face the landforms that will hinder the link.
- Most people have old televisions and would need to buy a digital tuner for coupling.
- The population given their economic condition needed a free system of monthly payments.

G. Mathematical formulas.

Radio de Fresnel

$$r = 17.32 * \sqrt{\frac{\text{Distancia km}}{\text{Frecuencia GHz}}}$$

Free space loss

$$FSL(dB) = 32.4 + 20 \log(km) + 20 \log(MHZ)$$

Calculation of transmitter

$$P(Tx) dBm = 10 \log(potencia)$$

II. MARCO TEORICO O FUNDAMENTO TEORICO

A. Analogic Television

The television signal has a volume of information, which also occupies a spectral space.

It is considered that the television signal is divided into two parts, such as sound and image, but each of these parties shows some complexity.

Presentado en el Congreso Internacional Students Conference on Electrical, Electronics and Computer Siencie – SCEECS 2016, Bhopal, India del 05 Al 06 de marzo.

Bandwidth of the signal

The occupied bandwidth in a channel in the 6 MHz spectrum. In which two carriers are one for the picture and one for sound.

B. Audio signal

C. The sound located at the upper end of the spectrum. the bandwidth of the audio signal is 50Hz to 15 KHz and the maximum frequency is 25 KHz and the sound signal which occupies a smaller bandwidth than an FM radio station.

D. Cable television

“The cable is the transmission of multiple television signals that have undergone multiplexing on a cable, which is used instead of signal transmission by the atmospheric space. The feeder one cable television station collects local television signals and other sources by satellite, and then modulates and does multiplexing in the same cable to other subscribers.”[2]

E. Satellite television

F. “Television signals can also be received from a satellite. The first satellite receivers used C-band microwave signals to capture broadcasters and providers of premium channels (HBO, CNN, etc.) transmitted these TVs no longer used.”[3]

Satellite dish

The satellite dish is a type of antenna that is characterized by carrying a parabolic reflector whose surface is actually a paraboloid of revolution. Satellite dishes can be transmitters, receivers or full duplex, so called when they can transmit and receive simultaneously. They are usually used at high frequencies and have high gain.[4]

Parabolic reflectors have the useful property that any ray originating from a point called focus and collides with the reflecting surface, is reflected parallel to the axis of the parabola, that is, a collimated beam of radiation occurs. Parabolic antenna, common dish among the backyards of homes with facilities for receiving satellite signals, consisting of a small antenna at the focus of a large parabolic reflector that concentrates the signal in the same way that a flashlight reflector de4 focuses a beam of light. Of course the antenna is reciprocal: the reflector concentrates the radiation entering the plate along its axis.[5]

G. LNB

As the transmission frequency of the satellite downlink, a device located at the focus of the dish, which transforms the high frequency signal in a lower frequency signal, for possible distribution through needed coaxial cabling. this band is called intermediate frequency. [3]

III. DEVELOPING

A. Election Of Satellite To Work

To be able to get the satellite signal, we chosen the satellite INTELSAT 805, because is the most suitable to broadcasting digitally, later chosen for its low noise and because it has more definition with respect to the analog signal.



Fig. 1. This is the village of Obrajillo, we will determine where the antenna will place for catch the satellite signal.

For this we have taken into account, parameters such as the surface and under what conditions is the terrain where we want place the antenna, how we can see the next image shows that people are around hills and are located at the bottom.



Fig. 2. the antenna in the direction to the satellite that has been chosen, in this case the direction of satellite Intelsat 805..

Once located the antenna we have to give the direction to the satellite that has been chosen, in this case the direction of satellite Intelsat 805. For this we use Dishpointer, the program that is included on a website, where you have to include the direction of the satellite chosen, so your program can direct it to your antenna. The next image show a graphic where elevation and azimuth is also specified.

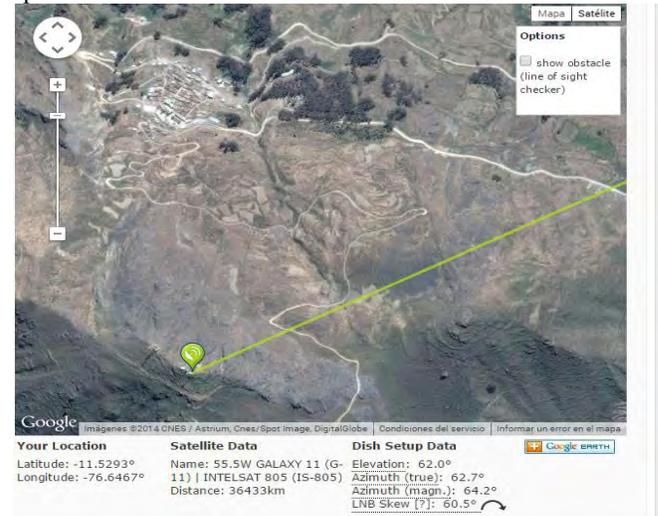


Fig. 3. Elevation and azimuth the antenna.

After obtain the direction of the satellite antenna with the set parameters, the program offers the angle and height indicated.

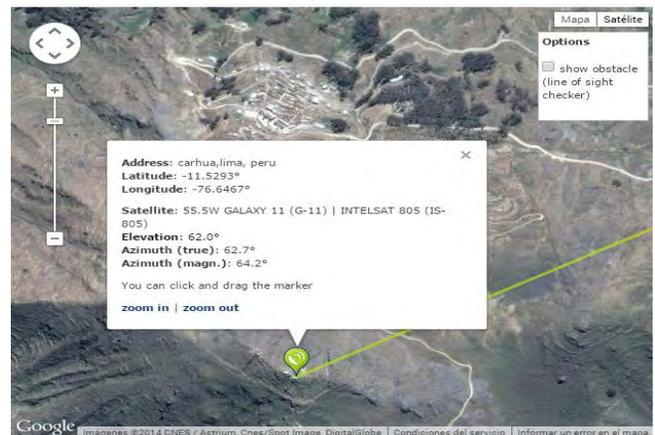


Fig. 4. Direction of the satellite antenna with the set of parameters.

B. Materials used

The equipment to be used for this system are:

1. A satellite antenna centered and focus.
2. A team of satellite reception.
3. A tower to put the antenna.
4. A digital television transmitter 100 w.
5. An antenna Yagi.

C. Project Financing

Manage the support of the municipality for funding, allow the development of the community, so we can promote the tourism and the residents will enjoy digital technology. But the main thing is to take into account why this method is chosen, unlike others and how this technology will serve with respect to the results, finally all the requirement for implement the solution.

D. Planning

The different points listed to achieve the main objective of the project:

1. Identify and define an exact location for later assembly the system.
2. Determine the type of antenna to be used for satellite reception.
3. Make sure the antenna type is appropriate and necessary equipment to determine any error.
4. Determine the type of satellite that is to be elected.
5. Ensure that the proper way for the installation does not have any impediment or obstacle to the passage of the signal.
6. Determine everything necessary to ensure the safety of personnel.
7. Ensure that all staff have the right clothes to maneuver equipment.
8. Ensure the opening needed for the signal to be as uniform throughout the country.
9. Install decoders, both reception and transmission and verify that they are compatible with the antennas.
10. Check that the terminals are properly spliced to avoid false contacts.
11. Install all terminal equipment.
12. Connect the test equipment at the ends of the installation and should be calibrated if is necessary.
13. Record all data and details that are needed.

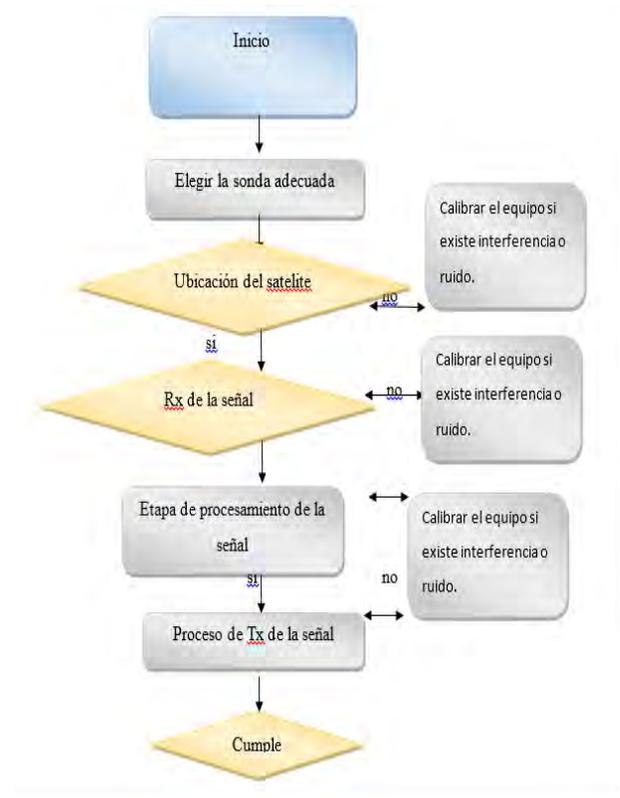
E. Geographic location

Obrajillo is a village in the municipality of Canta, two hours drive from Lima, Peru. It is surrounded by beautiful countryside. The Chillón River cuts the settlement. The village is known for the cultivation and sale of trout.

Location: Mountainous terrain, Department of Lima, province of Canta, height: 2600 msnm. Access: Coming to Canta (Km 105 of the Lima-Canta road), passing 3 Km



IV. FLOW CHART.



The flow starts with choosing the appropriate area where will located the antenna, determine the placement of the satellite to work, given the right direction so there is no noise, then the selected signal is processed, the signal will be transmitted later to all the people, you have to ensure a good signal otherwise is need calibrate the equipment. Finally the signal is relayed around the town.

V. CONCLUSIONS

You could see how you can access certain TV channels locating satellites which are not encrypted.

The distribution of the signal obtained was achieved through a yagi antenna which covers the dimension calculated the coverage needed to reach the established users.

In the third part, explained the considerations that we must take into account every step to make it through calculations we can determine the characteristics required our teams to work.

Finally, we saw how much of the financing at the project is important for the authorities of the town, for the benefits it would bring this project.

VI. RECOMENDATIONS

Research committees for the major needs for the technology of the country are centralized in the capital, try to spread to neighboring provinces and try to provide solutions that contribute to the growth of communities by providing ideas for projects that involve small investment, later the product is quite satisfactory and It spent some years but the community reach a constant gain, generated for both the authorities and the people themselves.

It is recommended try to reach the maximum population of the town but given that the houses are well separated one from another, increase the coverage is need but the costs would rise.

It is recommended regarding the calculations are assuming values that have not yet been real evidence but rather with simulators that bring us closer to reality.

The financing part for this project is carried out entirely by the authorities, because the people would not be willing to assume those costs.

RECOGNITION

This thesis has a special recognition for the course teacher, Avid Roman Gonzalez and my thesis advisor Eng. Natalia Vargas Cuentas.

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