Title: Constelaciòn de Radio - Satélites.

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Need

• Improve human and technological capabilities.

• Collect data and create a satellite system that only works as a radio telescope.

• Explore different themes grounded in the reception of waves in radio telescopes

Mission Objectives

• Take measurements of waves, infrared, radio and especially the wavelength of 21 cm which corresponds to hydrogen.

• Design, build detectors and amplifiers of the highest possible profit.

• Development of software for the development of inter-satellite interferometry.

• Development of manufacturing, assembly, commissioning and operation.

• Development and strengthening of capacities in undergraduate and graduate students.

Concept of Operations

EN TIERRA:

• Development of the satellite record: mount antenna, communications, command, control and propulsion, comfort, thermal and mechanical design

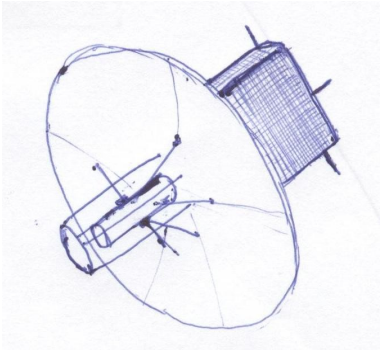
• Development of software for receiving, processing and signal processing.

• Development of software for interferometry.

• Implementation of land-based facility, antennas, computers, databases.

EN EL ESPACIO:

• 08 (eight) Satellites used as radio telescopes, solar panels and motion control based on gyroscopes, momentum wheels and / or propellant propulsion.

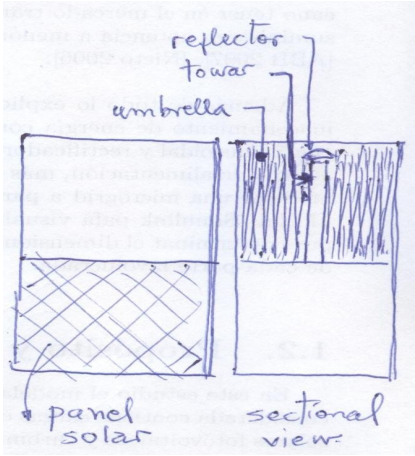


Key Performance Parameters

Resolution data collection and processing, spatial interferometry.

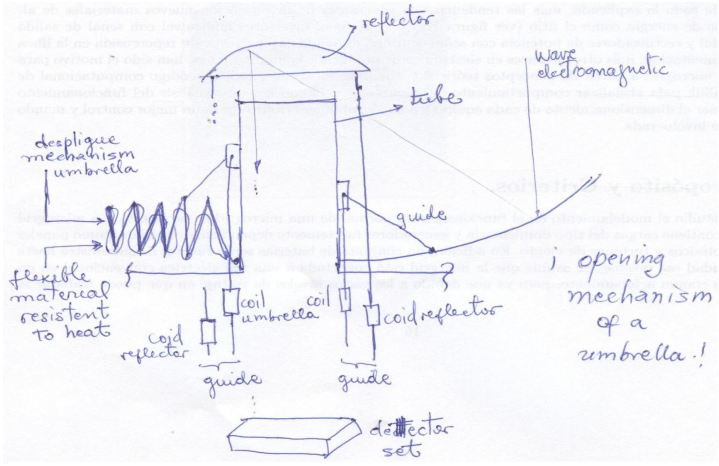
Space Segment Description

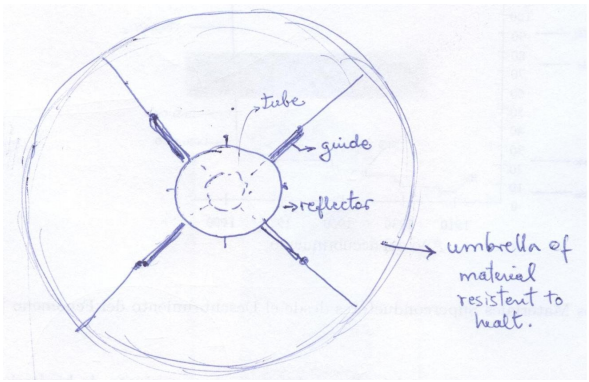
• Number of Satellites: 8
• Mass and volume of each satellite: 14 kg - 0.4 mx 0.4 mx 1 m
• Power supplied by solar panels on each satellite: 100 W.
• Control propellant propulsion and gyroscopes (or inertia wheels).
• Battery Type: Li Ion.
• Antenna Diameter: approx. 1.5 meters.
• Antenna Features: Flexible (umbrella type), supports high temperature.
• Satellite Dynamics: Able to look at any point in space or Earth.
• Dynamic capacity of the constellation: Able to give direction to a point in space or Earth, regardless of the relative position between satellites.
• monitoring stations and data reception: 2 - 6 (located in different places on the planet)
• Station processing and analysis: 1.
• Satellite link - earth.
• Download data from satellite: Daily.



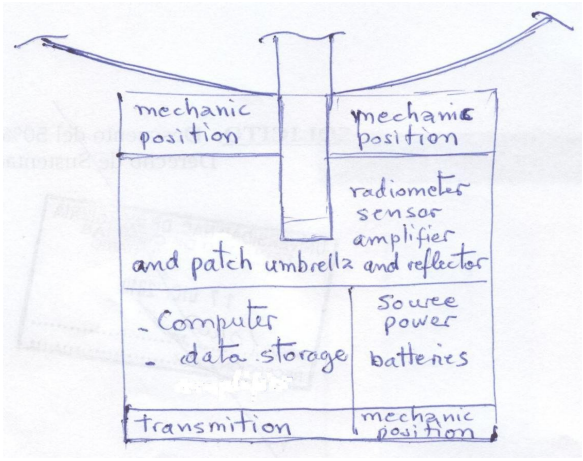
Orbit/Constellation Description

Antennas of 1.5 meters in diameter. Umbrella mechanism to make the dish a body drop and design adaptable to changes in temperature. Appropriate mechanism to capture satellite signals every assurance of continuity of information. Waves after being reflected by two surfaces, entering through the tube to a chamber where the sensors and properly protected.





Solar panels and position control systems and power management that comes from solar panels, a mechanism used in the Position, umbrellas, set the second reflector, electronic systems and high storage density batteries.

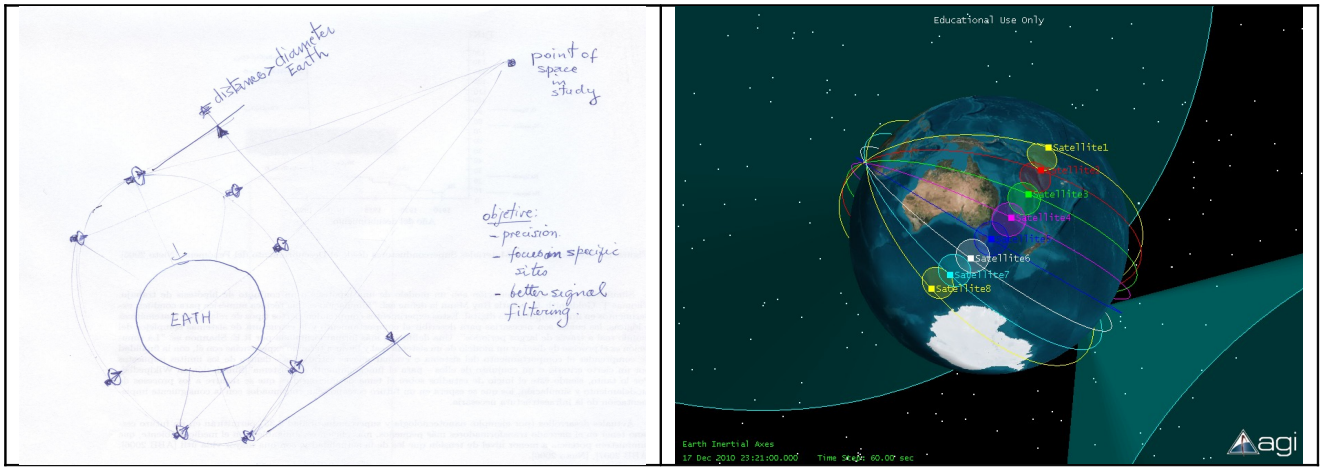


Proper disposal around the Earth, ensuring good selectivity and signal capture to study. In addition, you must have an adequate location accuracy and tracking to study a particular point. With distances greater than the diameter of Earth, you can do an array of radio telescopes with high gain and is expected to achieve significant results. Therefore, placing them at a suitable height above the Earth, is important if you want to have an equivalent to a very large diameter radio telescope.

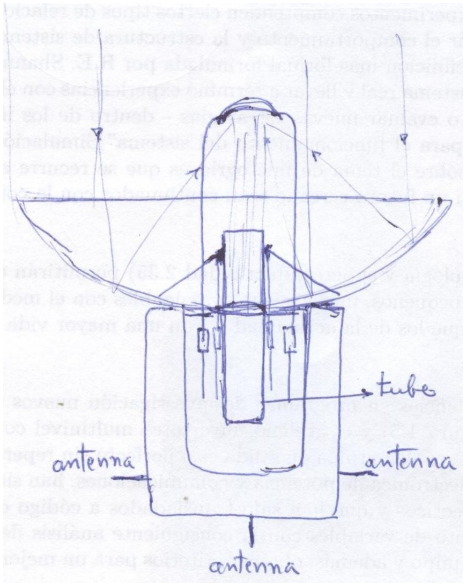
The development of software for exact positioning of each satellite pointing direction coordination between satellite radio telescope, receiving signals and tracking target during the observation period, transmission of signals to terrestrial base, confirming receipt of data and commands . Is also about the development of efficient processes for handling and storage of DATs. Processing and data analysis was performed by parallel computing. The results are thinking of going to publish in indexed journals and websites of the project. If necessary, umbrella-type antenna can be placed in its original position.

Since the wave beam enters the body of the satellite, you can place other equipment and instruments not included in this paper. Additional instruments may be a suggestion of Axel Space or

other institutions or individuals in the scientific community.



Lightweight mechanical structure, resistant to the launch, testing and service, with adequate protection for embedded systems in outer space. Exterior walls covered with solar cells and multiple antennas for communication with Earth will. Drive shaft by means of coils, to maintain tension in umbrella and reflector position in the second.



Implementation Plan

The idea is original, try to emulate the large terrestrial telescopes, with a single satellite under construction simple, repeatable, robust, low cost, which represents an advance in the understanding of the cosmos, and motivating a strong impact on Peruvian and international society, likewise in the world scientific community. The project cost is $ 6 million initially propose to construct 8, but the intention is to build as much as possible with the consequent improvement of interferometry. Requires the following infrastructure: rooms for conducting talks and training of students involved, testing environments suitable for assembly, design, construction and monitoring.

Asociación Chotana de Ciencias (AChC) – National University of Engineering (UNI)

The ACHC is headquartered in the town of Chota (Cajamarca), at 2200 m, early climate, clear skies during most of the year, away from big cities. The ACHC (www.achc.org.pe) is an organization dedicated to issues of science and technology. Comprised mainly of engineers with master's degree. Conventions and agreements of cooperation with other research and development in Peru: UNI, etc. We propose to work through an agreement with the National Engineering University (UNI) - Lima, PERU. UNI (www.uni.edu.pe) has environments, experience and equipment derived from Nano Satellite Project "Chasqui (www.chasqui.uni.edu.pe). Work engineers and researchers and 20 graduate and undergraduate students in the fields of Physics, Mathematics, Electrical Engineering, Electronics Engineer, Systems Engineer, Mechanical Engineer, who will receive a financial incentive for participation in the project and encourage the R & D. The design and techniques developed, will long for further development, involving ingenuity, hard work, effort, dedication and global thinking to enter and remain in the current research topics in radio astronomy and satellite development and human capacity building with highly trained in theory and experimental capable of continuing to create new solutions, or developing research projects both as work, for graduate studies or development projects in collaboration with local or international level. Also proposed a collaboration with AXELSPACE referring to them for the development project.

Risks:

Slow administrative procedures.

Delays in procurement of inputs.

Delays in getting appropriate environments for assembly and testing.

Manager: Jorge Luis Mírez Tarrillo (AChC - UNI).

- **Sub Manager**: Abraham Zamudio Chauca (UNI).
- Héctor Bedón (UNI), Javier Solano (UNI), Carlos Guerrero y Manuel Campos (AChC)

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