A Review Paper on Stratellite

Anjali Chokrayat
Department of Electronics & Communication
Vivekananda Institute of Technology, Jaipur
Jaipur, India

***Abstract*- The focus in this review paper for new technology about to satellite, it's similar to satellite but its station is stratosphere. Firstly introduces the wireless communications and then switches to fourth generation in wireless communications. Then discusses about High Altitude Airships, the "STRATELLITES" which are actually unmanned Kelvar balloons filled with helium gas which are used instead of towers for wireless communication, each of which replace hundreds of towers and reduce the cost of wireless communications. They also overcome the disadvantage of simple towers which could not provide proper coverage in the hilly areas.**

Keyword – Unmanned Kelvar Balloons, High Altitude Airship

INTRODUCTION

Wireless communication is a simply data communication without the use of landlines. This may include cellular telephone, two-way radio, fixed wireless (broadband wireless), laser (free space optics) or satellite communication systems. Mobile wireless technologies are going to act as glue towards bringing together the wired and wireless to share and distribute information seamlessly across each other's areas of reference.

Since from the beginning of wireless communications, there have been many developments in each generation. Considering4G is the future generation of wireless communication.

4 GENERATION

To achieve the goals of true broadband cellular service, the systems have to make the leap to a fourth-generation (4G) network. 4G is designate to provide high speed, high capacity, low cost per bit, IP based services. The goal is to have data rates up to 20 Mbps. Most probable the 4G network would be a network which is a combination of different technologies like current cellular networks, 3G cellular network, wireless LAN, etc.

4G Mobile CommunicationSystems

Future mobile communicationssystem are:

Broad-Band Wireless Systems

Intelligent Transport Systems

High Altitude Stratospheric Platform Station Systems.

High Altitude Stratospheric Platform Station Systems (HAPS)

High-altitude platforms (HAPs) are aircraft, usually remote controlled airships or airplanes positioned above 20 km, in the stratosphere, in order to compose a telecommunications network or perform remote sensing, for civilian or military applications. These aircraft may be airplanes, airships or balloons, manned or unmanned. The stratosphere is the layer of the atmosphere where the temperature starts to increase with altitude. proximately after the troposphere, which has a constant temperature of about −60 °C, the stratosphere starts at an altitude of 7 km at the poles and 18 km at the Equator, extending to around 50 km A observable fact for the HAPs concept was the initial definition of a frequency band for its telecommunications services on the World Radio communication Conference 1997 (WRC-97), organized by the International Telecommunication Union (ITU), which trade with the regulation of the use of radio frequencies. At this conversation, the term "High Altitude Platform Station" (HAPS) has been established, defined as a telecommunications station located at an altitude of 20 to 50 km and at a specified fixed point relative to the Earth.

In the 1990 and 2000 decades, several projects were launched, but very few had continued. In 2014, 2 major Internet companies like Google and Facebook, announced investments in new HAP projects to supply Internet access in regions without communication substructure (terrestrial or satellite), bringing back attention to the development of HAP.

STRATELLITE

A Stratellite is a high-altitude airship that hovers in a fixed position in the lower stratosphere and carries one or more repeaters to create wireless communication networks. Stratellites, classified as both unmanned aerial vehicles and high altitude airships, are the inspiration of Bob Jones, a former NASA scientist.

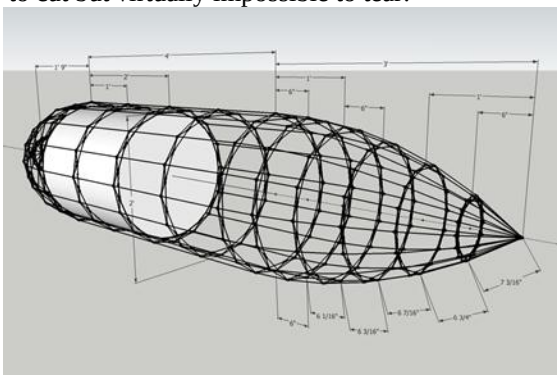
Each Stratellite would be capable of supplying cellular telephone and Internet communications from an altitude of 13 miles (approx.20 km).The wireless network produced by a single Stratellite will cover a roughly circular geographic area of 3,00,000 square miles. Sanswire consider that as few as fourteen Stratellites would create an overlapping radius of coverage around the continental United States.

The radius of the commercial version of the airship is 100 feet. The rigid frame, made of advanced composite materials, will measure 245 feet in length and fill the nearly 1.3 million cubic feet of volume with a mix of helium and nitrogen. According Sanswire, at that scale a Stratellite would be able to carry up to a 5000-lb. payload at 8,000 feet for 10-15 hours of continuous operation.

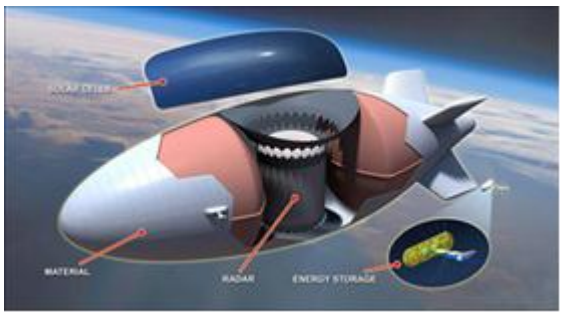
This altitude(hight in air) places the airships above both commercial air traffic and weather effects but significantly lower than standard low earth orbits. The North American Aerospace Defense Command projects that eleven such airships could provide radar coverage of the entire maritime and southern borders of the United States.

CONSTRUCTION OF STRATELLITE

The starting Stratellite was 188 feet larger, 60 feet wider and 42 feet hight.It is provided with a new steering method which uses a hybrid electric system that drives large, slow-turning propellers. This gives the airship whirlybird-like agility by being able to move both up and down, and side to side. The outside layer is made out of a high-tech material called Spectra - a fabric used in bullet-proof vests and parts of space shuttles. Spectra contain fiber 10 times as strong as steel of the same weight and has the unique feature of being easy to cut but virtually impossible to tear.



The inside layer, made from a thin but strong polyester film called Mylar, is fitted inside the envelope and filled with a mixture of helium and air as helium is an inert gas and is therefore not flammable and not dangerous. With this design, the helium expands as the airship rises, forcing air out and lifting the airship. The cycle continues, allowing the airship to gain more and more altitude until the helium has expanded to fill the envelope completely. Because the force is so low inside the envelope, a puncture would only result in a very slow leak, taking a long time to totally deflate.



General characteristics
A. Length: 245 feet in (75 m)
B. Width: 145 feet in (44 m)
c. Height: 87 feet in (26.5 m)
D. Volume: 1.3 million feet^3 (420,000 m^3)

Performance
Service ceiling: 70,000 ft (21,000 m)

Outer layer or envelopes, made of Dynamo (high-tech material sometimes called Spectra)

Navigation: 6 onboardSystem units connected to the ship's engines

Payload capacity: 3,000 lb (1,451 kg)

Cruising altitude: 65,000 feet (20,000 m)

Filled gas: Helium and Nitrogen

Line-of-sight: 300,000 mile^2 (480,000 kilometer^2)

Maximum duration aloft: 18 months

STRATELLITE TECHNOLOGY AND ADVANTAGES

Stratellites are actually unmanned(remote controlled) Kevlar balloons filled with helium. They usage thin-film photovoltaic cells sprayed on their surfaces to generate electricity, which drives propellers that work with GPS technology to keep the stratellite, located over one spot on the Earth's surface. Prototype airships are projected to carry payloads as large as 5,000 pounds, and later models are expected to carry over 20,000 pounds of radars and other remote imaging equipment, navigational aids, and telecommunications relays. Stratellites are aforethought to remain on station for a year at a time and will cost a fifth as much as a comparable satellite

Due to the drawback satellite we use stratelliteas alternate source of communication. First drawback of satellite is a signal latency, in which cause problems in establishing broadband links. Most telecommunication satellite are in geostationary orbit to remain above a certain point on the earth's surface. that orbit, however , is 22,250 miles above

the earth, which means signal is departure up to the satellite and back to the earth literate nearly 45,000 miles, which equates to about a quarter of a second. Even user of satellite voice links notice the delay.

The second drew back is that satellite are expensive space launches, an additional level of regulation by national space authorities, and an orbital allotment by the international telecommunication union.

ADVANTAGE OF STRATELLITE

The basic advantage is that Decreases signal latency which is min cause of communication. Also it is Less expensive to lunch means one fifth cost of satellite is required. The service an area of 3,00,000 square-miles provide. It also provide Two-way high speed data communication, High speed broad-band access even in remote sensing .For a country two stratelllite are enough instead of thousands of towers.

DISADVANTAGE OF STRATELLITE

First problem is that may lead to traffic problems in stratosphere. It would require efficient ground control and maintenance. This technology is so far, so it non-commercialized, and is in a prototype stage for further developments.

Application
Military uses.
Board surveillance
Detection of Oil spills
Detection of private ship
Natural disaster management
Remote sensing
Navigation
Telecommunication
Mobile comm.
Television
Metrology
Monitoring of beach clear liner

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