

Stratellite Communication

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Abstract- *Satellite communication is the backbone of wireless communications, and global positioning system A Stratellite is similar to a satellite, but is stationed in the stratosphere rather than in orbit. The Stratellite is designed to carry certain payloads into the Stratosphere determined by the requirements of the customer. The concept allows for ascent and descent and stationary operation. Short and long time missions are possible with the Stratellite with possible launch capabilities setup within 24 hours at any location.*

I. INTRODUCTION

A Stratellite is a high-altitude airship that is in a fixed position of the lower stratosphere and carries one or more repeaters to produce wireless communication networks. Stratellites is , classified as both unmanned aerial vehicles and high altitude airships, these are the inspiration of Bob Jones, who is a former NASA scientist[1]. 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 circular geographic area of 3,00,000 square miles.



Fig: 1

Sanswire consider that as fourteen Stratellites would create an overlapping radius of around the continental United States. The radius of the commercial version of the airship is about 100 feet. The rigid frame, made up of advanced composite materials, that 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 to the Sanswire, the 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 places the airships above both commercial air traffic and weather effects but lower than standard low earth orbits. The North American Aerospace Defense Command projects that eleven such airships would provide radar coverage of the entire maritime and southern borders of the United States.

Construction:



Fig: 2

In earlier the Stratellite was 188 feet larger, 60 feet wider and 42 feet height. It is provided with a new evolving method which uses a hybrid electric system that drives large, and slow turning propellers. This gives the airship able to move both up and down, and side to side. The outside layer is made up of a high-tech material like Spectra –which is a fabric used in bullet-proof vests and parts of space shuttles [2]. Spectra contain fibre and it is 10 times as strong as steel of the same weight and it has the unique feature of being easy to cut but impossible to tear.

The inside layer, made from a thin and strong polyester film called Mylar, it is fitted inside the envelope and filled with a mixture of helium air as an inert gas and is therefore not flammable and also not dangerous. With this design, the helium expands as the airship to rise, forcing air out and lifting the airship.

The cycle continues, in allowing the airship to gain more and more altitude until the helium is 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 [3]. 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 feet³ (420,000 m³) Performance Service ceiling: 70,000 ft (21,000 m) Outer layer or envelopes, made of Dynamo (high-tech material sometimes called Spectra) Navigation: 6 onboard System 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 mile² (480,000 kilometer²) Maximum duration aloft: 18 months

Stratellite technology and advantages:

Stratellites are actually unmanned (remote controlled) Kevlar balloons filled with helium. The usage is a 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[4].

Stratellites are designed to remain on station for a year at a time and will cost fifth as much as a comparable satellite Due to the drawback the satellite we use stratellite as alternate source of communication [5]. First drawback of satellite is a signal latency, in which it causes problems in establishing broadband links. Most telecommunication satellite is in orbit to remain above a certain point on the earth's surface

Stratellite technology and disadvantages:

It is difficult for the stratellite body to gain super pressure, which is important for the stratellite body to float in the stratosphere. Stratellite communication needs a systematic ground control and maintenance. This kind of technology is yet to be commercialized. Unlike satellite, stratellite communication is based on the weather conditions. This kind of communication creates more traffic in stratosphere.

Stratellite Communication:

Stratellite can be available up to 3, 00,000sq mile area. stratellites carry over 20,000 pounds of radar, other equipments and communication relays. They are planned to remain on station for one year period of time [6]. They are far cheaper to launch and to maintain.

Thus, for a country 2 stratellites are enough instead of using 1000's of cell phone towers. There are many rural

and remote areas where the internet facility is not yet available. If stratellites are introduced, it will become easier to provide signal even in rural areas..

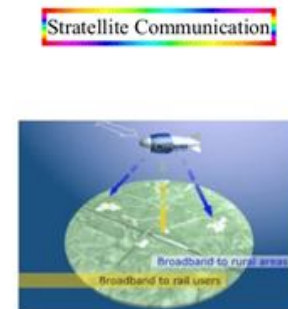


Fig: 3

Stratellite application:

Once a Stratellite network is in place, it will provide a national broadband wireless network that will provide voice, video, and internet access to all parts of the country. By linking several Stratellites together they can provide a wireless broadband network that will cover thousands of miles.

With the help of Stratellite network, the subscribers will be able to sit in their place and be connected on their laptops to the internet at high speed. If the subscribers need to go to the office, town, or even to another city, they can close their laptop and take off, reopening the laptop at their new destination and still be connected to the internet. This would allow the subscribers to be ease of not having to find local access numbers, tie up phone lines, deal with modem hassles, and more importantly, slow speeds.

In addition to internet use, they proposed telecommunications uses which includes cellular, 3G/4G mobile, MMDS, fixed wireless telephony, HDTV, real-time surveillance and others.



Marketability and cost:

Stratellites reduces the cost of installation of huge cellular towers, as they are present in the stratosphere. Stratellites are easily affordable to maintain and update them [7]. But stratellite costs a lot for launching it into the stratosphere. By planning the launch properly we can reduce the cost a bit

Stratellite communication and working:

Interior of the balloon is filled with Helium gas. Helium gas not flammable and it is inert a gas. This gas enlarges the balloon, pushing out air and it elevates the airship. Electricity is generated with help of solar cells which are spread on their surface [8]. Generated electricity drives the propellers which work with GPS to keep the stratellite stationary.

Services:

At the height of 13 miles all the Stratellite can have vivid line of sight communication which will be able to provide coverage across metropolitan and rural areas. This idea if victorious would be revolutionary for undeserved areas where the broadband are not as popular as those cables are really costly. Stratellite will allow two way high speed data communication. This ensures that users can receive signal without help of any wires, cables and cellular towers.

II. CONCLUSION

Stratellite is a possible technology. If this kind of technology comes into real life it can be beneficial for people in remote areas. They play a vital role for our future generation. This is a promising technology which can provide better communication. We users can get more benefits from this technology like high speed data transfer and hugely spread. Process of launching the stratellite can be costly, but it is like one time investment which can be beneficial for our future generation.

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