

# Silicon Valley Companies Investing in the Satellite Industry

by Elisabeth Tweedie, Associate Editor

When I tell people outside of the satellite industry what I do, frequently their first question is “but aren’t satellites becoming obsolete with all the fiber around?” And to be fair that is a question that some of us in the industry have also pondered from time to time. So it is to say the least, an interesting turn of events that two of the biggest names in California’s Silicon Valley are now investing in satellites.

Given that Silicon Valley is almost universally considered to be the birthplace of cutting-edge technologies, it is nice to have such a vote of confidence in our industry. But does this mean that we have been sleeping and failed to spot new opportunities?

## Getting Top Talent from the Satellite Industry

Google, of course are no strangers to the satellite world, being one of the major investors in O3b. And it is Greg Wyler the visionary and founder of O3b, who is at the helm of one of Google’s latest ventures: WorldVu Sat-

ellites Ltd. WorldVu was incorporated in Jersey, UK, (the same place where O3b is registered) in November 2012. The team now includes Brian Holz former CTO of O3b and Dave Bettinger former CTO of iDirect. In June of this year, using the name L5, WorldVu acquired the Ku-Band spectrum previously allocated to SkyBridge, a late 1990s venture intended to provide global broadband service.

According to information available so far, WorldVu will be a constellation of 360 low-earth orbit (LEO) satellites in two circular orbits, also intending to provide global broadband service. Service has to commence by 2020 according to the ITU and the filings indicate that 2019 is the planned start of operations.

O3b is designed to provide broadband trunking between the latitudes of 45 degrees north and 45 degrees south. WorldVu is apparently targeting individuals, so while not directly competing with O3b, in some areas they will be going after the same customer. A person who has broadband from the local

telco – who happens to be using O3b for trunking – is unlikely to be a customer for WorldVu’s direct to home service.

Which brings us to Google’s motivation for this project, which can be summed up in one word: “eyeballs.”

Google’s primary revenue comes from online advertising. Right now approximately two-thirds of the world have no internet access, so anything Google can do to diminish that figure has to be in its interest. Its efforts are not confined to satellites alone.

In the middle of last year, Google launched 30 high altitude balloons over the South island of New Zealand. These are being used to provide internet connectivity to remote areas. Although still in the experimental stage, one of the goals is to launch enough balloons this year to provide a ring of uninterrupted connectivity around the 40th southern parallel, so that pilot testers at that latitude can receive continuous internet service via the balloons.



**One of Google's recent acquisitions is UAV manufacturer Titan Aerospace of Moriarty, New Mexico, developer of the Solara solar-powered atmospheric satellite.**

Covering all options to provide internet access to unserved areas, Google purchased Titan Aerospace earlier this year. Based in New Mexico, USA, Titan describes itself as a maker of "atmospheric satellites" otherwise known as high altitude platforms or drones.

In a statement Google issued in April when it acquired the company, it said, "It's still early days, but atmospheric satellites could help bring internet access to millions of people, and help solve other problems, including disaster relief and environmental damage like deforestation." Interestingly that is very similar to the statement it issued in June when it purchased Skybox, a satellite imaging company, that will give Google the potential to update its maps once or twice, a day as opposed to the weeks or months between updates at present. That statement also said: "Over time, we also hope that Skybox's team and technology will be able to help improve internet access and disaster relief – areas Google has long been interested in."

### Enter Facebook

Google of course is not the only big name in Silicon Valley that has a vested interest in spreading internet access. Facebook is another; and while as yet, there have been no announcements about specific satellite projects, Facebook is making no secret of its ambitions in this area.

Staff at Facebook Connectivity Lab include hires from Jet Propulsion Lab (JPL), NASA's Ames Research Center and the National Optical Astronomy Observatory. In March of this year Facebook acquired the five person team that made up Ascenta, a British company formerly known as High Altitude Engineering. Andrew Cox, the Chief Engineer and founder of the company, previously worked for Qinetiq and helped start its Zephyr drone program which was sold to Astrium in 2013. He also worked on Dragon for SpaceX.

Facebook is one of the founding members of Internet.org a consortium that

includes, Samsung, Nokia, Ericsson and Qualcomm. The goal of the organization is to make the "internet available to every person on earth." A whitepaper from Mark Zuckerberg, the Founder and CEO of Facebook, on the internet.org website talks about the options that Facebook is considering; these include drones and high altitude long endurance systems, LEO and GEO satellites. The paper also mentions Free Space Optics (FSO) and says that Facebook is "hiring world experts... to explore the full potential of this technology over the coming years."

Taking internet access to the unconnected is a laudable idea and in the long term will probably pay off. According to the ITU a 10% increase in fast broadband penetration can result in between 0.25% and 1.38% growth in a country's gross domestic product (GDP), as well as a 3.6% increase in efficiency. But in the short term the fact that many of the unconnected billions have no disposable income is unlikely to help the bottom line. Something that O3b worked out, when it broadened its focus from connecting the other three billion to include oil and gas rigs and cruise ships as part of its target market. Fortunately both Google and Facebook have pretty deep pockets.

### Lessons from Past Ventures

This is not the first time that big names have backed new constellations of satellite systems. Skybridge itself was backed by Alcatel, Boeing, Space Systems Loral and Thomson among others. Teledesic was backed by Microsoft and Craig McCaw; Iridium, in its first incarnation was backed by Motorola and ICO by Inmarsat. All of these filed for bankruptcy. So what is going to be different this time?

The most obvious financial differentiator is the advances that have been made in technology, both on the ground and in space. High throughput

satellites hadn't been invented then and consumer hardware was significantly more expensive. The world is also more connected. In 2000 there were 361 million people connected to the internet. Now there are 2.8 Billion and we are just at the beginning of the Internet of Things (IoT). The more people and devices that are connected, the more essential it becomes for others to be join in, which will help drive demand. However, on current schedules WorldVu isn't due to be launched until 2019 and not fully operational until 2020. If the current rate of growth in connections continues in 2020 there will be 7.6B people connected to the internet. Just a tad shy of the 7.7B projected world population for that year. Realistically that's unlikely to happen, there will always be people that is just uneconomical to reach by terrestrial means, but will there be enough to make a viable business for WorldVu,

***"...If the new ideas are not being generated internally then we need to welcome these companies and work with them. As has been said many times before: 'innovate or die'..."***

and if not will the IoT provide sufficient demand to make up the shortfall? The other factor that needs to be considered here is mobility. Laptops and tablets are increasingly used away from the home. By 2020 there may be a Ku antenna small enough to fit on those devices, but there may not be, and if there isn't, then WorldVu will be providing service to public areas and utilities making it a potential competitor to O3b.

**Other Ventures**

Silicon Valley's move into space is not just confined to Google and Facebook.

Space Systems Loral of course has always been based in Palo Alto, Calif.. And Skybox, whose satellites are being built by SS/L is also located in Silicon Valley. So is Planet Labs, another start-up imaging company.

If Planet Labs plans come to fruition, and so far the signs are that they will, the company will have 100 satellites in orbit by the end of the year, making it the largest constellation every launched. The first 28 Doves, as they are known, were launched from the International Space Station (ISS) in February, since then they have been joined

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by a second constellation. Unlike the more traditional imaging companies Planet Labs focus is on frequency of updating the images rather than high resolution, although they can see items as small as an individual tree. These satellites may be large in number, but they are small in size, about the size of a shoe box to be precise. Unsurprisingly given the size, both the manufacturing and launch costs are a fraction of traditional satellites. Many of the components are commercial products used in smartphones and laptops.

Spire, formerly known as Nanosatifi, was also founded two years ago and is also in Silicon Valley. It's launched six cubesats to date. In July it raised US\$ 25 million in series A funding and announced plans to launch another 50 with the aim of increasing to 100 in total. The satellites have a operational design life of two years, so that the technology – a mixture of sensors, antennas and optical and infrared cameras can be constantly updated. Target applications include: freight monitoring, detection of illegal fishing, asset

tracking and search and rescue.

**Conclusion**

What does all this mean for the traditional players? I think it is a wake-up call. If the new ideas are not being generated internally then we need to welcome these companies and work with them.

As has been said many times before: "innovate or die".

Continuous innovation is the name of the game, version nine, according to Chester Gillmore, Director of Manufacturing was about 35% cheaper than the first constellation and was made four times faster. Pretty impressive for a company that only started two years ago!



**Elisabeth Tweedie** is the Associate Editor of the Satellite Executive Briefing. She has over 20 years experience at the cutting edge of new communication and entertainment technologies. During her 10 years at Hughes Electronics she worked on every acquisition and new business that the company considered during her time there. She can be reached at:

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