

Satellite Executive BRIEFING

Vol. 16 No. 2 March 2023



Industry Trends, News Analysis, Market Intelligence and Opportunities

LEO Satellites Market

By Elisabeth Tweedie

Given the media attention that it gets, you could be forgiven for thinking that Starlink is the only game in town, when it comes to low earth orbit (LEO) constellations for communications. Nothing could be further from the truth. There are many others, some of which remain on the drawing board and others that have at least got as far as flying demo satellites.



Of these companies, one of the most important one to watch is Project Kuiper. So far nothing has been launched, but last year 83 launch contracts were signed. This is one of the largest ever commercial procurements of launch services; an ambitious statement from a company that has a zero track record in space.

However, that company is Amazon, so financial resources are not the limiting factor that many new entrants have to contend with. It is also necessary to launch half of the 3,236 planned satellites by July 2026, in order to comply with the FCC deadline. In line with that contract, Amazon also acquired a new 172,000 square foot facility in Kirkland, Washington for satellite production. It is intended to produce 1-3 satellites per day. The customer antennas were designed in-house, reportedly, the components cost around US\$ 400. Ultimately, the company says it expects to produce 10 million of these. The first two Kuipersat satellites are scheduled to launch during the first quarter of this year.

Continued on page 4

What's Inside From the Editor 3



| | |
|--|----|
| Small/Medium Satellite Launch Market | 12 |
| <i>by Bernardo Schneiderman</i> | |
| TECHBrief: Capacity Management and ITU Filing Made Easy <i>by Alvaro Sanchez</i> | 21 |
| Better Satellite World: What If Nature Had Internet?..... | 24 |
| Products and Services Guide to SATELLITE 2023..... | 26 |
| Competition in the Satellite Launch Market..... | 35 |
| The Business of Space <i>by Martin Jarrold</i> | 38 |
| Mergers & Acquisitions | 42 |
| Executive Moves | 44 |
| Market Trends | 48 |
| Vital Stats..... | 50 |
| Advertisers' Index | 52 |



COMTECH™
Fluent in the Future

Visit us at SATELLITE 2023 | BOOTH 1703
www.comtech.com



COMTECH™

Fluent in the Future

At Comtech, we're building the future of hybridized connectivity, with technology that integrates terrestrial and satellite communications networks.

Relentless pursuit of a better way:
empowering people to connect
everything and everyone.

Visit us at
SATELLITE 2023®
BOOTH 1703

www.comtech.com

Smallsats Markets



Big things can come in small packages, so the saying goes. In this issue we focus on the Low Earth Orbit (LEO) constellations and the smallsats market. Hard to believe that just a few years ago there were approximately 3,000 satellites orbiting the planet. That has more than doubled now with a projected 2,500 more satellites to be launched per year in the next decade.

With growth comes many challenges and issue and we try to delve on those with the articles in special issue. It certainly will be interesting to watch how this market shakes out in the next few years.



View videos of various satellite facilities worldwide:

www.satellitemarkets.com/satellite-marketcast

Meanwhile, one of the upsides of the post-pandemic world is the return to travel and the re-opening of facilities. We have resumed our series of videos of tours of various satellite facilities world-wide. Check them out at: www.satellitemarkets.com/satellite-marketcast

Enjoy this issue.

Virgil Labrador

Virgil Labrador
Editor-in-Chief



EDITORIAL

Virgil Labrador

Editor-in-Chief

virgil@satellitemarkets.com

Peter I. Galace

Elisabeth Tweedie

Associate Editors

Contributing Editors:

North America:

Robert Bell,

Bruce Elbert, Dan Freyer,

Lou Zacharilla

Latin America:

Bernardo Schneiderman

Europe:

Martin Jarrold (London)

Omkar Nikam (Strassbourg)

Hub Urlings (Amsterdam)

Roxana Dunnette (Geneva)

Asia-Pacific:

Blaine Curcio (Hong Kong),

Naoakira Kamiya (Tokyo),

Riaz Lamak (India)

ADVERTISING

For Advertising enquiries send an e-mail to: info@satellitemarkets.com

Application Technology Strategy, L.L.C.

SATELLITE COMMUNICATIONS CONSULTING

- System Architecture & Engineering
- Business Development
- Satellite Network Design
- Communications Payload and Ground Segment Design
- Due Diligence and M&A Support

Bruce Elbert, President
Application Technology Strategy, L.L.C.

Office: +1 512 9430454
Mobile: +1 310 9181728
Fax: +1 512 9430455
Web: www.applicationstrategy.com
E-mail: bruce@applicationstrategy.com

Satellite Executive Briefing is published monthly by Synthesis Publications LLC and is available for free at www.satellitemarkets.com

SYNTHESIS PUBLICATIONS LLC
1418 South Azusa Ave.
Suite # 4174
West Covina CA 91791 USA
Phone: +1-626-931-6395
Fax +1-425-969-2654
E-mail: info@satellitemarkets.com
©2008-2023.

No part of this publication may be reprinted or reproduced without prior written consent from the Publisher.

LEO Satellites

...from page 1

Obviously, this puts Amazon squarely in competition with Starlink, which is already claiming one million subscribers and 3,600 of the 4,408 first generation Ku-Ka band satellites launched. Starlink also has FCC authorization to launch 7,500 (of the 29,800 requested) of its second-generation satellites.

At the end of December 54 “mini” second-generation satellites were launched. “Mini” because a full-size second-generation satellite needs

to be launched on SpaceX’s Starship which isn’t yet available. At the end of 2021, users in North America were getting download speeds of over 100Mbps from Starlink, this had been cut in half by the end of last year as the number of subscribers increased; indicating that Starlink really does need those additional satellites if it is to continue grow. This will become increasingly important as Starlink is now entering into agreements to provide commercial service in some sectors; maritime for example.

Telesat

It remains to be seen whether Telesat can secure the financing it needs to continue with Lightspeed, its LEO constellation. After a promising start with investments from Canadian federal and provincial governments, fund-raising has stalled, although CEO Dan Goldberg, is reported to be “bull-

ish” about the chance of success and has been quoted as saying that “tangible progress” is being made. Last year, inflation led Telesat to reduce the size of the constellation to 198 satellites from the planned 298, and pandemic related supply chain issues, that Thales its manufacturer was dealing with, forced it to push the launch date out a year to 2026. By reducing the number of satellites, it was hoped to keep within the original CA\$5 billion, but this is now looking unlikely. Unlike Starlink and Amazon’s Kuiper, Lightspeed’s target customers are enterprises and governments.

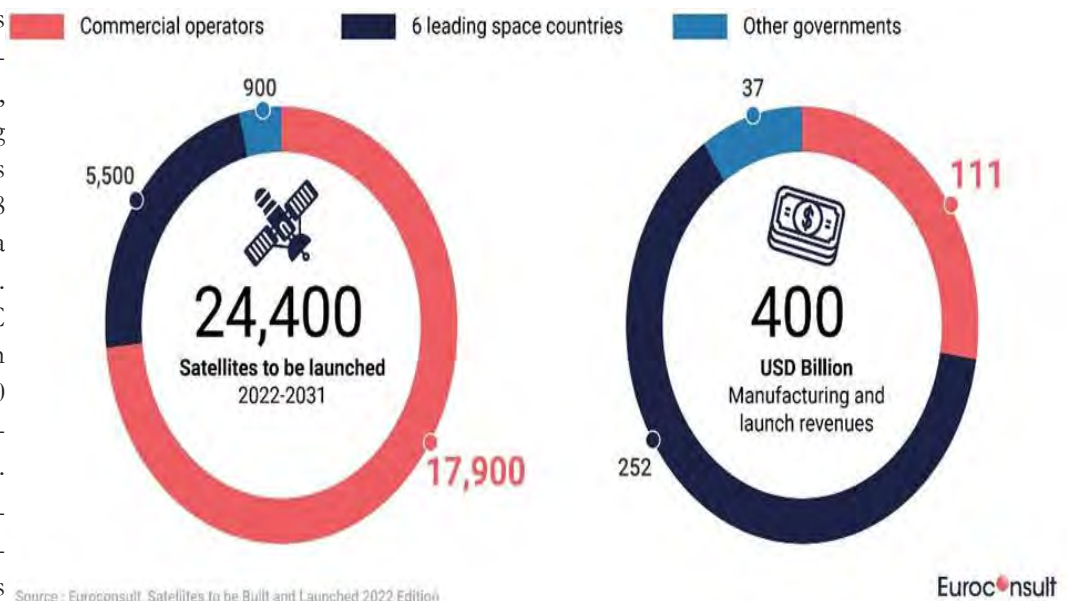
A demonstration satellite is in orbit and recent tests carried out by Spacecom showed an average latency of below 30 milliseconds and data rates of over 50 Mbps.

OneWeb

OneWeb has nearly 80% of its

648 first generation constellation in orbit. The remaining satellites will be launched early this year, and full global service should commence towards the end of 2023.

OneWeb has five main target markets: carrier and enterprise, government, maritime, aviation and land mobile. Several agreements have been signed to support these markets. For example, working with Intelsat for aviation, airlines will be offered a multi-orbit solution for inflight connectivity. OneWeb is also working with Marlink to offer service to several sectors: including energy, maritime, enterprise and humanitarian sectors. The companies will work together to deploy, test and demonstrate several types of user terminals and connectivity services. OneWeb’s LEO constellation will be integrated into the hybrid network services that Marlink



Euroconsult is projecting an average of 2,500 satellites to be launched every year—or 7 satellites a day totaling 3 tons of mass—over 2022-2031.

**20%
PRICE
ADVANTAGE**



INSTALLING
RELIABILITY

**A NEW DIMENSION
IN SATELLITE
COMMUNICATION**



**GET IN TOUCH WITH OUR NEW
HIGH POWER AMPLIFIERS**

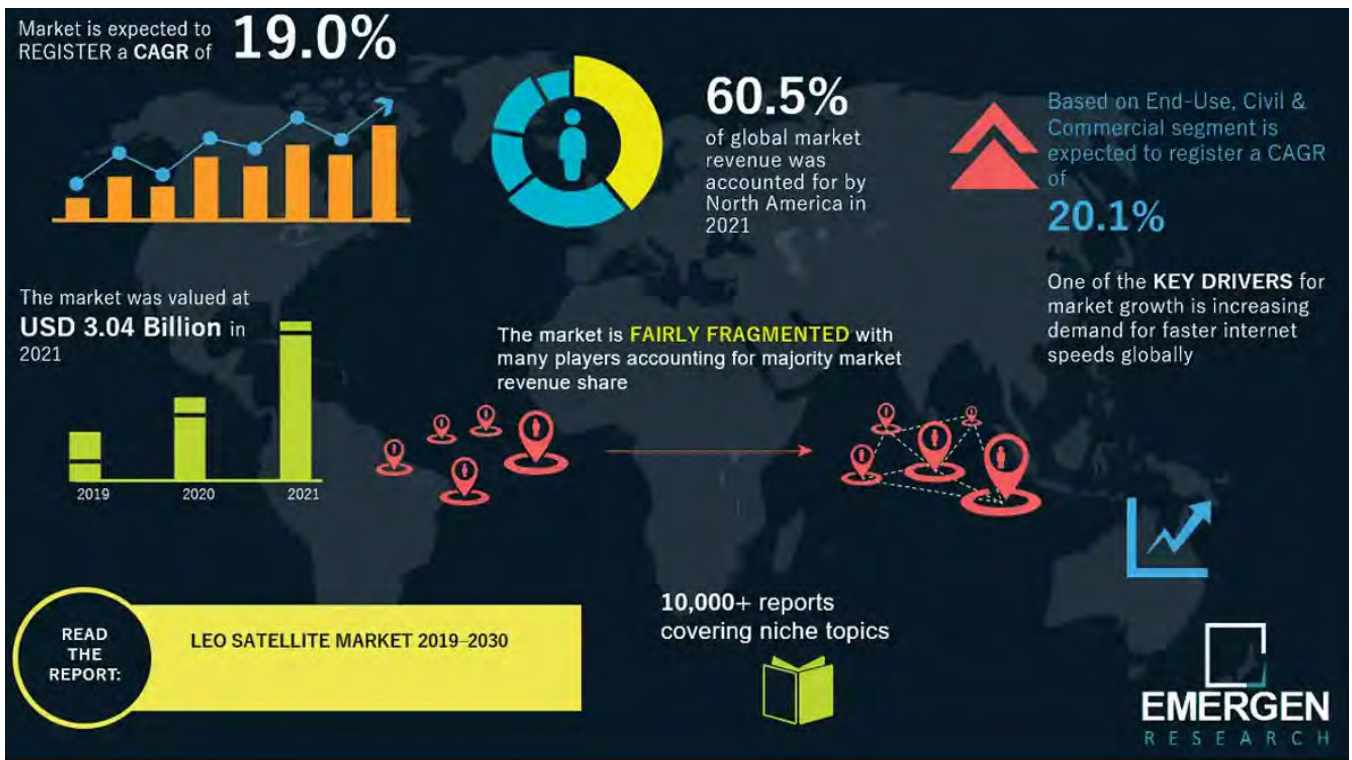
www.ndsatcom.com

 **SATELLITE 2023[®]**

ND SATCOM BOOTH #1122



www.ndsatcom.com



provides to its customers.

Last year Eutelsat and OneWeb agreed to merge, and although the merger still has to be approved by shareholders, it is expected to go through. For OneWeb the key benefit is to be able to use Eutelsat's revenues to support the capex required to build the second-generation satellites. The aim is to create a hybrid GEO-LEO network, which could mean a fewer satellites in the second generation, as when latency is not an issue, traffic could be offloaded to Eutelsat's GEO satellites. The second-generation LEOs are expected to have 5x the capacity of the first generation and a lower cost per bit. They are also planned to be very flexible and modular, so that they can follow market demand.

IRIS²

In order to reduce dependency

on other nations, the EU already has its own earth observation satellites (Copernicus) and satnav system (Galileo). So it should be no surprise to learn that

last November the European Commission announced the formation of Europe's new Infrastructure for Resilience, Interconnection and Security by Satellites (IRIS²). Essentially this is Europe's answer to Starlink, Kuiper, OneWeb, Lightspeed and planned LEO constellations by China and Russia. The objective is to provide a totally European space-based broadband infrastructure. The guidelines for IRIS² include:

- It being a sovereign constellation, which imposes strict eligibility criteria and security requirements. Therefore it is highly likely that Eutelsat will be excluded, as China Investment Corporation holds a stake in the company. Also, OneWeb, with which

it is in the process of merging, counts the British government, Indian based Bharti Enterprises, Japan's Softbank and South Korean based Hanwha among its investors.

- It will be a constellation focused on government services including defense applications.
- It will provide connectivity to the whole of Europe and Africa.
- It will be a "new space" constellation integrating the know-how of major European space industries, but will also have 30% of the infrastructure built by startups.
- It will be a multi-orbit constellation, capable of creating synergies with the existing Galileo (SatNav) and Copernicus (Earth Observation) constellations.
- It will be a vector for innovation, aiming to give Europe a lead in cutting edge technology.

BE PREPARED FOR THE UNEXPECTED

Protect your critical SATCOM applications with the unique **CYBER HARDENED IBUCs**.

C-Band | X-Band | Ku-Band | Ka-Band

- ✔ Cryptographic network protocols with SSHv2, HTTPS, & SNMPv3
- ✔ Secret-Key Authentication
- ✔ Multi-Level Access Control
- ✔ Hardened Physical Ports with ASCII
 - ✔ Timeline History Logs
- ✔ Enhanced Management & Control

SATELLITE 2023
MARCH 13-16 | WASHINGTON, DC
VISIT TERRASAT AT STAND #1529

Learn more at Terrasatinc.com

The initial budget is 2.4 billion Euro, but the total cost is estimated to be around 6 billion Euro. Further investments will come from ESA and private investments. Interestingly, the UK is still a member of ESA.

Although IRIS² will provide many government services including: defense, border surveillance and security, crisis management, control of smart grids and other infrastructure services, it will also provide mass market mobile and fixed broadband for unserved areas.

Rivada Space Networks

Rivada Space Networks (RSN) is another fledgling LEO constellation. It is based in Germany, with filings through Liechtenstein and a US based parent company, RSN aims to build a 600 satellite LEO constellation to provide end-to-end secure communications. The satellites will be in 24 polar planes providing complete global coverage. The satellites will be interconnected by 2,400 laser intersatellite links, creating a mesh network, so data will travel directly from one user to another, or to a cloud insertion point, with no other terrestrial touch points, so providing enhanced security and latencies equal to or better than terrestrial fiber.

The constellation is expected to cost US\$ 3-4 billion. Initial funding and financing is largely coming from investors in the parent company, RSN, however is putting together a Series B round for this quarter. In February 2023, the company has signed a contract with Terran Orbital's wholly owned subsidiary Tyvak Nano-Satellite Systems, Inc. to manufacture 300 low-earth-orbit (LEO) satellites.

"...Whether the LEO systems mentioned here – and there are filings for plenty of others – will all succeed remains to be seen. It would appear that the demand for bandwidth is insatiable, but it will take more than that to ensure commercial viability..."

The company will leverage the unique terrestrial wireless technologies of its parent company to optimize network utilization and facilitate the buying and selling of broadband capacity.

Security of data has always been so, with the increase in data breaches and cybercrime. One of RSN's key attributes is its focus on this. Obviously, providing an end-to-end space network with no terrestrial touch points, is fundamental to this security; in addition Quantum Key Distribution (QKD) provides a very important additional layer. Rivada Space Networks is partnering with SpeQtral to demonstrate the technical compatibility of adding a QKD encryption layer to the satellite network.

RSN's target markets are diverse government and enterprise segments, specifically: secure networks for government; cellular backhaul; global LANs for enterprises; real-time connectivity for the oil and gas industries; global flight and engine monitoring for aviation and similar tracking and connectivity for maritime; high throughput connectivity for media and e-sports; and cost-efficient connectivity for diverse mining sites. An ambitious target for a startup, however, Rivada Space Networks will be the wholesaler not the retailer, so not as challenging as trying to address all

these at once at the service provider level.

One issue that is yet to be resolved is the question of a launch date. Currently 10% (60) of the satellites need to be launched by September this year. RSN, through the Liechtenstein license regulator has asked the ITU for a waiver to delay this; citing Covid and supply chain issues as reasons for a delay. Its first application was denied, and so far no decision has been issued on the second application, which gave an assurance that its "bringing into use" obligations would be met. This means that 50% of the constellation will be in orbit by June 2026.

E-Space

No article on LEOs would be complete without a mention of E-Space, Greg Wyler's latest venture. Although still very much in the early stages, he has assembled an impressive team including Karim Michel Sabbagh former President and CEO, SES. Details about the business model and constellation are still very high level. There are filings for 100,000 satellites, but several reports indicate that ultimately there could be several hundreds of thousands. Orbital debris is a very real problem and the potential for more debris rises with each satellite launched. Wyler aims to counter that and claims that the design of e-Space's



MISSION MICROWAVE

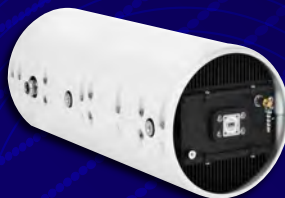
Family of X-, Ku- and Ka-Band BUCs
from 8-800 Watts

STINGER



25 W Ka-Band

JAVELIN



50/100 W Ka-Band

TITAN



200 W Ka-Band



55 W Ku-Band



100 W Ku-Band



200 W Ku-Band



50/80/100 W X-Band

The New Shape of Solid State

Available with Full Ka-Band Coverage for
LEO/MEO/GEO Terminals and Gateways

satellites means that rather than potentially adding to debris, they will actively help remove debris. Attributes that contribute to this, include:

- Self-destruction at the end-of-life. E-Space satellites will burn up on re-entry.
- Automatic de-orbit if a satellite fails.
- Entrain and de-orbit: if a collision occurs, E-Space satellites are designed to capture the other object and immediately de-orbit.
- Size: E-Space satellites are smaller than many of the existing LEO satellites and have a small cross-section, so that only a small section is exposed to the orbital path. They also have fewer parts, so are less likely to release components in the event of a collision.

Unlike Wyler's previous two ventures (O3b and OneWeb) both of which started out with the altruistic mission to connect the unconnected, the target markets listed on the website all have a commercial basis. These include: defense, critical infrastructure, asset tracking, connected vehicles, forestry, digital agriculture, governments and earth observation.

Conclusion

There have already been some casualties in the LEO space. Leosat, failed to raise the required financing and OneWeb, which was bailed out by the UK government and Bharti, had to file for Chapter 11. Whether the systems mentioned here – and there are filings for plenty of others – will all succeed remains to be seen. It would appear that the demand for bandwidth is insatiable, but it will take more than that



One company to watch is Amazon's Project Kuiper--which is a very vertically integrated company with the capacity not only to manufacture satellites but also to launch them and provide ground segment services. The company has procured a dedicated, 172,000-square-foot satellite production facility in Kirkland, Washington.

(image courtesy of Project Kuiper).

to ensure commercial viability.

Although the barriers to entry have fallen considerably in recent years, space remains a risky business. Success depends on many factors; obviously basic economics is one, can the service be provided at the right price point? But, beyond that there are a myriad of licensing and regulatory issues, including meeting deadlines for getting satellites launched and operational, and obtaining appropriate landing rights. Distribution and maintenance for a global system is

major task, frequently dependent on a network of in-country independent contractors. I don't have a crystal ball, so I'm not going to make any predictions as which of these will still be around in five years' time, but I would be surprised if it is all of them.



Elisabeth Tweedie has over 20 years experience at the cutting edge of new communications entertainment technologies. She is the founder and President of Definitive Direction (www.definitivedirection.com), a consultancy that focuses on researching and evaluating the long-term potential for new ventures, initiating their development, and identifying and developing appropriate alliances. 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 etweedie@definitivedirection.com

AvL
TECHNOLOGIES
avltech.com

HARSH WEATHER?

Communicate through extremes



1.6m Manual Point Tri-Band Terminal
Operational winds to 60 mph
MIL-STD-810G tested
MIL-STD-188-164C & Skynet compliant

Let's talk harsh weather comms @ SATELLITE ♦ Booth 2325

The Small/Medium Satellite Launch Vehicle Market

by **Bernardo Schneiderman**

The use of small and medium satellites for applications such as remote sensing, observation, communication, and space exploration is expected to drive the growth of the Satellite Launch Vehicle market (SLVM) during the next decade.

Analytics firm BryceTech which issues a quarterly update on the launch market, reported that in the 4th quarter of 2022, Smallsats represented 89% of spacecraft launched 39% of total upmass (see graph). The number of satellites launched by application are the following: communications 80%, Remote Sensing 10%, Technology Development 7%, Scientific 1% and others 1%.

BryceTech reported that small satellites have broken records and are transforming in space-architectures during the last 10 years. As defined by the US Federal Aviation Administration (FAA), 600 Kg and under reflect five smallest mass classes. Between 601 and 1200 Kg are considered Small Satellites and Medium Satellites are between 1,201 and 2,500 Kg.

The 501-2,200 Kg satellite mass segment has the highest market share and is estimated to grow over the forecast years due to the rise in the number of small satellite constellations from various key manufacturers such as SpaceX, Amazon Kuiper, Cloud Constella-

tion, Urthecast, ISRO, among others.

The land platform has the highest market penetration in the global SLVM during the next 10 years. The market growth is due to cost-effective launch and high success rate and recuperated part of the Launch Vehicle.

Smallsats represent 87% of spacecraft launched between 2013- 2022 and during 2022 represent 95% of spacecraft launched. A total number of 1736 Starlink and OneWeb Smallsat Satellites were launched in 2022 and the remaining 568 were other applications.

In regards to the major countries that are launching Smallsat USA are in the top with 87%, China 7%, India 2%, Russia 1% and others countries 3%.

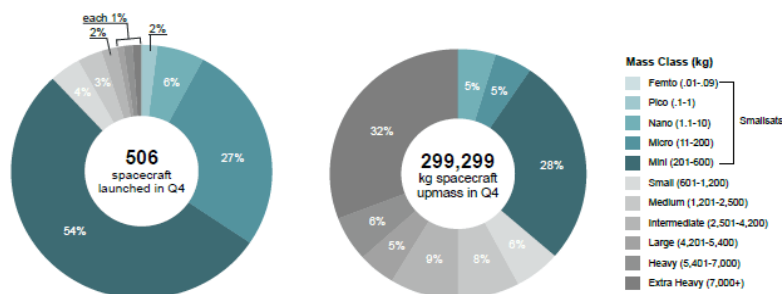
In regards to the category of the Launch Vehicle in 2022 we have for the Micro-Small Launch Vehicle the following rockets (Electron, Vega, Long March 6 and 11 and LancherOne. For Medium we have Falcon 9, Soyuz 2.1, PSLV, Antares 230.

To give a snapshot of the key players in the market, we have profiled several companies in this article. The companies have been selected

based on the stage they are in the market such as product portfolios, market penetration, and research and development initiatives. We reached out to several companies and featured the following companies in this article: Firefly Aerospace, Isar Aerospace, ABL Space Systems, RocketLab, Gilmour Space and Virgin Orbit.

Spacecraft Launched and Total Upmass by Mass Class

Smallsats represented 89% of spacecraft launched in Q4, 39% of total upmass





SEE WHAT COMES NEXT

Join us at NAB Show, *THE GLOBAL EVENT* for the broadcast, media and entertainment industry. Preview powerful technology, best-in-breed products and innovative solutions for your every next.

And — it's our Centennial... an incredible, must-not-miss celebration! Exclusive international benefits and private-access perks are all yours. *REGISTER NOW* with code MP02.



Exhibits: April 16-19, 2023 | Education: April 15-19 | Las Vegas, NV

ONE EXHILARATING EXPERIENCE. FOUR UNIQUE DESTINATIONS.

CREATE.

All things pre-production to post.

CONNECT.

All things distribution and delivery.

CAPITALIZE.

All things reach and ROI.

INTELLIGENT CONTENT.

All things data, AI and automation.

NABShow.com

Firefly Space

Firefly Aerospace Inc. is an American end-to-end space transportation company committed to providing economical and convenient access to space for small payloads through the design, manufacture, and operation of reliable launch and spacecraft vehicles. Firefly's launch vehicles utilize common technologies, manufacturing infrastructure, and launch capabilities, providing LEO launch solutions for up to ten metric tons of payload. Combined with Firefly's in-space vehicles, such as the Space Utility Vehicle (SUV) and Blue Ghost Lunar Lander, Firefly provides the space industry with a single source for missions from LEO to the surface of the Moon or beyond. Firefly is headquartered in Cedar Park, TX.

Launch Status News: Texas – October 3, 2022 – Firefly Aerospace, , announced that its Alpha FLTA002 mission successfully reached orbit and deployed customer payloads,



Firefly's Alpha launch vehicle (image courtesy of Firefly Aerospace)

lifting off on October 1, 2022 at 12:01am PST from Vandenberg Space Force Base in California.

With the success of this mission, Firefly is now the first company to launch and reach orbit from US soil in only its second attempt. Firefly also became the first and only US commercial space company with a rocket ready to take customers to space in the highly desired 1300kg payload lift class.

Alpha is an all-composite rocket that uses patented tap-off engine cycle technology, which reduces cost and improves efficiency while maintaining the strength and reliability of the rocket. During the mission, Alpha successfully completed all major technical milestones, including a two-burn maneuver, relighting the second stage during its first orbital flight.

Firefly is completing the Acceptance Testing Protocol (ATP) for its Alpha 3 vehicle in preparation for its upcoming NASA VCLS Demo 2-FB ELaN 43 launch. In addition, Firefly continues the production of multiple rockets at its Texas manufacturing facilities using all the lessons learned from existing flights and testing. Firefly is scheduled for six Alpha launches to take customer payloads to space in 2023, and 12 more in 2024.

Isar Aerospace

Isar Aerospace based in Germany, was founded in 2018 to lower the entry barriers to space. By pushing the boundary as a platform for future technologies and competitiveness. As a launch service provider for small and medium-sized satellites is creating easy access to space for global customers. Offering the first fully privately funded European solution to meet the growing global demand, Isar Aerospace is driving commercial space across all continents.

Launch Status: On January 25, 2023 –Isar Aerospace, and U.S.-based Spaceflight Inc., announced they have signed a multi-launch services agreement. Under the agreement, Spaceflight secured one dedicated launch in 2026 to a sun-synchronous orbit taking off from Andøya, Norway and an option to add an additional dedicated launch to occur in 2025.



Rendering of the Isar Aerospace Spectrum launch vehicle.(image courtesy of Isar Aerospace)

ABL Space Systems

Founded in 2017, ABL Space Systems designs and manufactures the majority of its own infrastructure and launch materials. For whatever parts ABL outsources, the company maintains a firm grip, writing on its website that "not just our suppliers, but our sub-suppliers and investors are highly vetted and audited."

The company is headquartered in El Segundo, California, where much of its design and manufacturing take place alongside assemblies and system integrations. The

company operates two facilities in the Mojave Desert — one at Edwards Air Force Base and the other at the Mojave Air and Space Port. ABL's Mojave Desert facilities focus on research and development, as well as engine and equipment testing. ABL also holds a suite of offices in Seattle "to be responsive to customer needs across geographies," according to the company's website.

ABL's RS1 rocket stands 88 feet (26.8 meters) tall, and is powered by nine of the company's E2 engines in its first stage and a singular E2 in its second. ABL describes the E2 rocket engine as "intentionally boring." The E2 is built, in part, using 3D-printed components that ABL produces in-house and is fueled by a choice combo of liquid oxygen and either RP-1 or Jet-A, which are both widely available forms of kerosene fuel. ABL is charging \$12 million per RS1 launch.

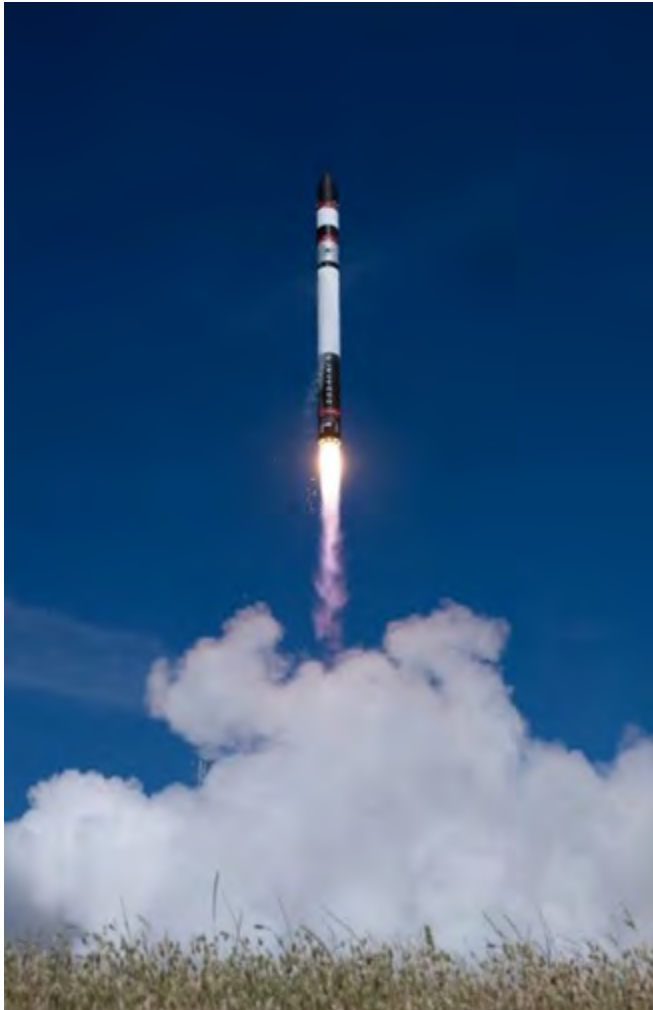
Launch Status: Last Jan 18,2023 ABS planning to launch the RS1. After 10 seconds the stage 1 suffered complete loss of power. This caused a clean simultaneous shutdown of all nine engines. Stage 2 continued to operate more 2.63 seconds but the overall launch failed. Now ABL is investigating the reason for this failure but has already planned for Flight 2 after finding the problem with the Flight 1.

RocketLab

Founded in 2006, Rocket Lab is an end-to-end space company with an established track record of mission success. RocketLab delivers reliable launch services, sat-



ABL Space System's RS1 rocket on the pad at the Pacific Spaceport Complex in Alaska on Aug. 13, 2022. (Image courtesy of ABL Space Systems)



RocketLab's Electron launch vehicle dubbed "Return to Sender" on liftoff (Image courtesy of Rocket Lab)

ellite manufacture, spacecraft components, and on-orbit management solutions that make it faster, easier and more affordable to access space. Headquartered in Long Beach, California, Rocket Lab designs and manufactures the Electron small orbital launch vehicle, the Photon satellite platform and the Company is developing the large Neutron launch vehicle for constellation deployment. Since its first orbital launch in January 2018, Rocket Lab's Electron launch vehicle has become the second most frequently launched U.S. rocket annually and has delivered 155 satellites to orbit for private and public sector organizations, enabling operations in national security, scientific research, space debris mitigation, Earth observation, climate monitoring, and communications. Rocket Lab's Photon spacecraft platform has been selected to support NASA missions to the Moon and Mars, as well as the first private commercial

mission to Venus. Rocket Lab has three launch pads at two launch sites, including two launch pads at a private orbital launch site located in New Zealand and a third launch pad in Virginia in the USA.

Launch Status: Jan 24, 2023 Rocket Lab USA, Inc. successfully launched its 33rd Electron rocket and first mission from Virginia. The "Virginia is for Launch Lovers" mission lifted off at 18:00 EST on January 24th from Rocket Lab Launch Complex 2 (LC-2) at Virginia Space's Mid-Atlantic Regional Spaceport within NASA's Wallops Flight Facility. The mission deployed three satellites to a 550 km orbit for leading radio frequency geospatial analytics provider HawkEye 360. Rocket Lab has now successfully deployed a total of 155 satellites to orbit from the Company's three launch pads across the U.S. and New Zealand.

Gilmour Space

Gilmour Space is developing a range of Eris launch vehicles for LEO, MEO/GEO and LLO. Its maiden orbital flight will be from Australia this year, and is expected to be able to launch up to 1000 kg to LEO by 2025.

"The need for responsive access to space and more frequent orbital launches has never been greater. Gilmour Space has identified this need and we will support the global rideshare market with the 'Caravan' missions onboard our Eris launch vehicles. These rideshare missions begin late in 2024 and will be a regular occurrence on our launch roadmap going forward," said David Jervis, Head of Sales at Gilmour Space.

Gilmour Space will provide launch services from our Bowen Orbital Spaceport in Queensland, Australia. "We are creating flexible launch solutions for dedicated and rideshare satellites to support global commercial and defense satellite customers. In the coming years there will be a regular cadence of Eris rockets launching from Australia to a variety of inclinations. Australia provides one of the most accessible and picturesque launch locations in the world and we are thrilled to provide the satellite market with a launch from 'Down Under' added Jervis.

Launch Status: "We are excited for our maiden test flight, which will launch in 2023. Do watch our social media pages for more details closer to the date.

In addition to our production of launch vehicles, Gilmour Space is developing a small satellite bus called the G-Sat,

WE ARE

back

WHERE THE ENTERTAINMENT AND TECHNOLOGY INDUSTRY REUNITE

Register your interest at show.ibc.org



IBC2023

BACK AT THE
RAI AMSTERDAM | 15-18 SEPTEMBER 2023



Gilmour Space's Eris launch vehicle (image courtesy of Gilmour Space)

a 100 kg-class modular, scalable and launch agnostic satellite bus, designed to support a wide variety of missions including a hosted payload mission “Kangaroo” which Gilmour Space plan to launch at the end of 2024, added Jervis.

Virgin Orbit

Founded by Billionaire Sir Richard Branson in 2017, Virgin Orbit began commercial service in 2021, and has already delivered commercial, civil, national security, and international satellites into orbit. Virgin Orbit’s LauncherOne rockets are designed and manufactured in Long Beach, California, and are air-launched from a modified 747- 400 carrier aircraft that allows Virgin Orbit to operate from locations all over the world in order to best serve each customer’s needs

Launch Status: Last June 2022 Virgin Orbit launched seven satellites into space on its 'Straight Up' mission, that will support the United States Space Force’s STP-28A mission. The rocket was launched at the Mojave Air and Space Port. The Rocket Systems Launch Program (RSLP) and carry payloads for the Department of Defense (DoD)

Space Test Program (STP).

In January 2023, Virgin Orbit launched nine small satellites atop a rocket dropped from a 747 jumbo jet south of Ireland, but the booster suffered a failure during the climb to space and the payloads were lost, according company..

Conclusion

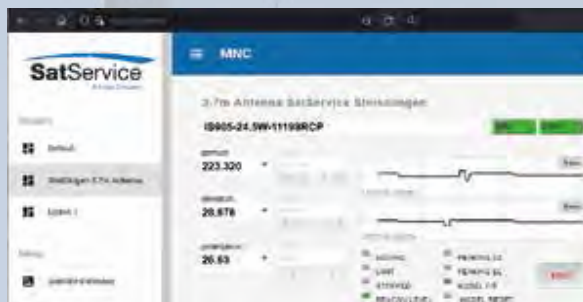
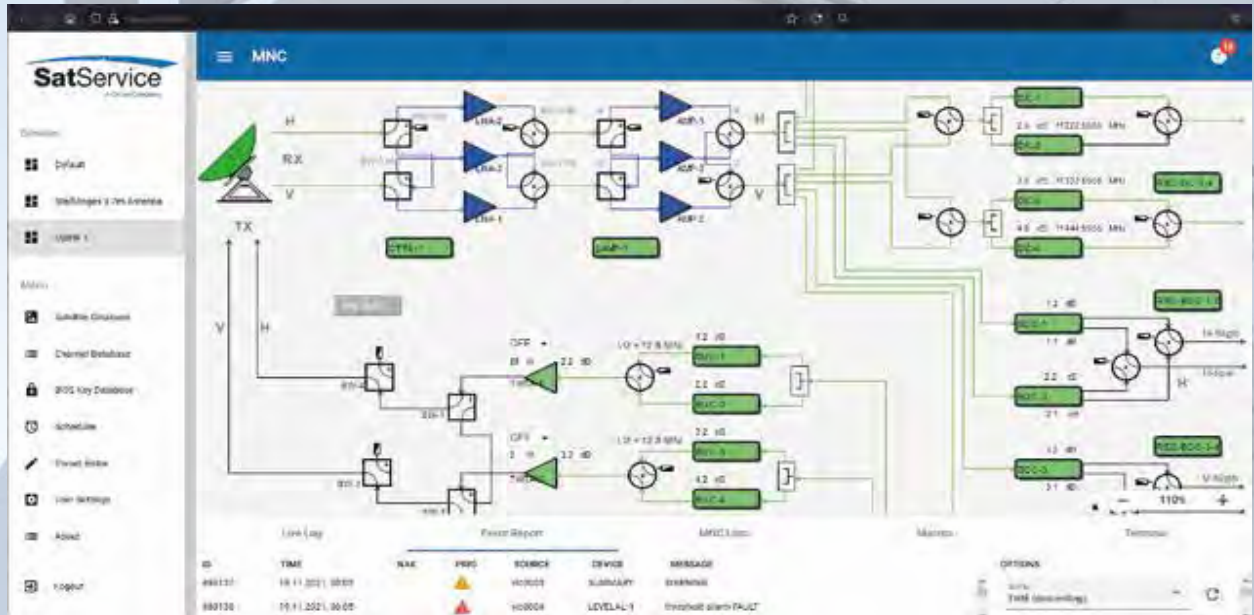
There are many other companies entering the SMLV market from various parts of the world including in emerg-ing markets such as India. They are all trying to capitalize in the projected boom in small-and medium-size satellites to be launched in the next ten years. Frost & Sullivan forecasts an estimated launch demand for 11,746 small satellites for new constellation installations and replacement missions by 2030. Such demand would take the small-satellite launch services market past the U.S. \$69 billion mark and present significant growth opportunities throughout the industry.

In order to keep up with market demand, Frost & Sullivan anticipates innovative solutions will be coming

Visit us at
SATELLITE 2023 - Booth #2419

SatService
A Calian Company

sat-nms Monitoring & Control System



- web browser client
- easy re-configuration
- operator friendly GUIs
- smart work flows
- vendor independent

The new *sat-nms* Monitoring & Control System is part of SES mPOWER

Check it out on www.satservicegmbh.de

SatService GmbH | Hardstrasse 9 | 78256 Steisslingen | Germany
sales@satservicegmbh.de | phone: +49 7738 99791 10
www.satservicegmbh.de



The repurposed Virgin Atlantic passenger jet, with the 70-foot-long 57,000-pound LauncherOne rocket tucked under its left wing (image courtesy of Virgin Orbit)

across the value chain including launch, manufacturing, and supply chain. In such an evolving market it will be critical for market participants to develop long-term sustainable partnerships to maintain and establish robust business operations.

SpaceFund, a venture capital firm that specializes in the NewSpace economy, is tracking about 165 rocket companies from around the world. Nearly 75% are focused on designing and developing small launch vehicles. The ability to shrink sensors and other components into more compact payloads has really helped change the game for commercial launch providers. Smaller satellites require smaller rockets, which require less fuel. The economics are even better if the company employs reusable rockets such as SpaceX and Amazon's Blue Origin.

The next few years will see which companies will eventually rise to the top and those that will go by the wayside

amid the intense competition in the SMLV market. 

See related article on Competition among Satellite Launch Providers on page 33 of this issue.



Bernardo Schneiderman is the Principal of Telematics Business Consultants. He can be reached at: info@tbc-telematics.com

Capacity Management and ITU Filing Process Automation Across Multi-orbit Networks

by **Alvaro Sanchez**

Managing satellite capacity in multi-orbit ecosystems involves the coordination and optimization of resources across different orbital regimes, such as low-Earth orbit (LEO), medium-Earth orbit (MEO), and geostationary orbit (GEO). With the increasing number of satellites being launched into orbit, managing capacity has become more critical to ensure the efficient use of resources and avoid interference.

The most appropriate approach to managing satellite capacity is to use advanced software tools that can optimize the sharing and pooling of resources across multiple orbits. These tools can take into account factors such as satellite availability, coverage areas, data rates, and latency to maximize the efficiency of satellite resources. Moreover, these smart tools can balance and optimize satellite capacity ensuring that the available resources of a satellite across multi-orbit environments, such as its bandwidth and power, are used efficiently and effectively to meet the needs of its users. Managing the pool of satellite capacity dynamically involves allocating capacity to different types of users, and agreements based on their specific needs and priorities. For instance, FlexCap developed by INTEGRASYS, is the latest technology available in the market to automate capacity management efficiently, the key functionalities are divided into four main goals:



VeryFiling's Capacity Management System Interface.

1. **Dynamic Bandwidth allocation:** Satellite capacity can be allocated dynamically based on the changing needs of different users or applications.

2. **Capacity Leasing and flexible booking:** Satellite operators can also lease capacity to different users or resellers, allowing them to monetize unused capacity or generate additional revenue from their satellite network. The tool can allocate the capacity leases in each satellite or transponder, to plan and organize the available capacity.

3. **Customer contracts:** Satellite operators can enter contracts with the customer, providing them with guaranteed capacity over a certain period. The cost and revenue of these contracts depend on the terms and conditions of the agreement, such as the duration, the quality of service, and the pricing model. FlexCap allows the user to upload the agreement information to plan de capacity in real-time.

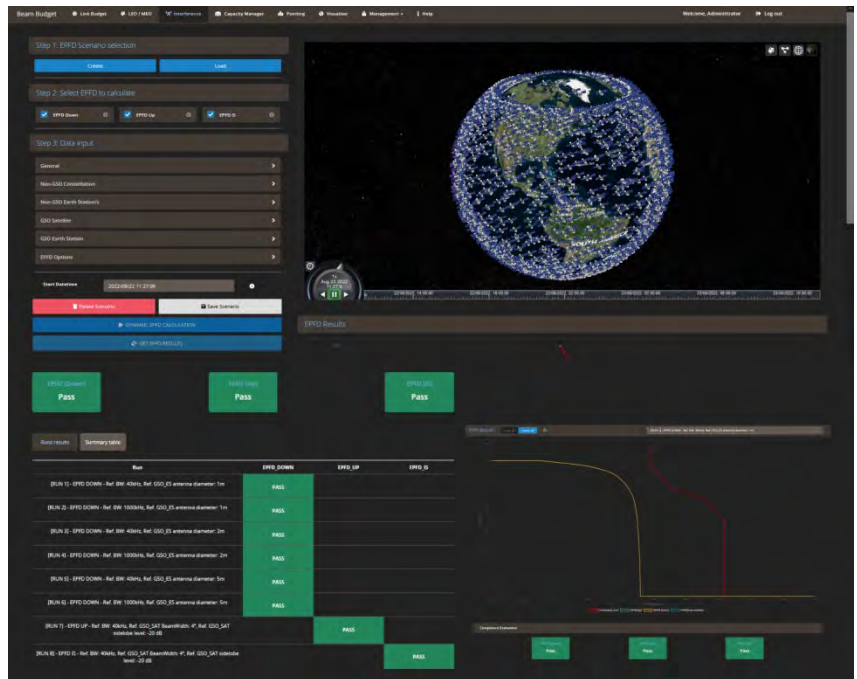
4. **Traffic shaping and capacity demand per hour:** It can be used to optimize the performance of the satellite network. This involves prioritizing certain types of traffic, limiting bandwidth for certain users or applications, or shaping traffic to fit within the available capacity. For example, transactional, emergency response agencies, or military operations.

By dynamically managing the pool of satellite capacity, satellite operators can optimize the performance and efficiency of their multi-orbit networks while meeting the diverse needs of their users, and applications.

In addition to these technical solutions, regulatory frameworks and coordination mechanisms are also essential for managing capacity in multi-orbit ecosystems. International organizations such as the International Telecommunication Union (ITU) play a critical role in coordinating the allocation of radio frequencies and orbital slots to avoid interference and ensure the efficient use of resources within multi-orbit environments. It develops international regulations and standards for radio communication systems and satellite networks, and it coordinates the use of radio frequencies and orbital slots to prevent interference and ensure the efficient use of resources. This involves developing regulations and standards for different orbits, such as LEO, MEO, and GEO, and ensuring that satellite systems in different orbits do not interfere with each other. The ITU also manages the satellite filing process, which involves satellite operators submitting formal requests to the ITU for the use of specific frequencies and orbital slots.

However this process takes a lot of time, and resources not only from satellite operators, who apply to obtain a license but also from regulators, who need to review the process and give a pass or fail. To navigate the ITU filing process for a satellite launch license, satellite operators must seek assistance from experienced consultants or legal advisors who specialize in satellite communication and regulatory compliance. They also need to be aligned with the ITU and national regulatory authorities to ensure that their application complies with all relevant regulations and standards.

Nevertheless, the ITU filing process can be automated, using software applications that can review the requirements and test the calculations to adapt them to the regulations. For instance, VeryFiling the new ITU user-friendly EPFD calculation (up, down, inter-satellite) software aligned with ITU standards, allows satellite operators to test their constellations and adapt them to the ITU regulations before requesting approval. With Veryfiling, customers are certain to obtain a pass result with less skilled users, obtaining high-accuracy calculations with optimized processing times and complete reports. This technology has two modes, the industry mode which counts on an interface prepared to



VeryFiling's ITU Filing Software Interface.

test their current setting and make the appropriate changes, to obtain the license, and the Regulator mode which is an easy interface that evaluates instantly if the filing is pass or fail. Additionally, VeryFiling can minimize expenses and internal resources, as the technology can be used by anyone, with a very low quantity of inputs, it is capable of extracting a customizable and complete report exportable to pdf or excel.

Overall, automating satellite capacity management, and ensuring a reliable satellite ecosystem, are essential, therefore software solutions are the greatest ally for satellite operators. These software solutions can help them to manage satellite capacity more efficiently and effectively, automate the ITU filing process, and optimize resource allocation across multi-orbit networks.



Alvaro Sanchez is the CEO of Integrasys and the Marquess of Antella (Noble Title from 17th century in Spain). Alvaro is a software and industrial engineer and holds a Master Degree in Management, Sales & Marketing from ESIC Business School. Alvaro during the last 10 years has worked at Integrasys as management, sales and other executive roles where he was very successful growing the sales, revenue, profit and responsibilities within the company. He can be reached at: alvaro.sanchez@integrasys-sa.com



Network Automation, Spectrum Superiority and Cyber for SatCom, and Defense



**Buy/Sell,
Design & Manage**



**Deploy &
Monitor**



**Interference
Geolocation**



**Interference
Mitigation & Removal**

**REQUEST YOUR DEMO
BOOTH 1403**

What if Mother Nature Had Internet?

Nature inspires us. It brings us serenity and wholeness. It can also scare the living daylights out of us, whether from a hurricane, flood or shark attack.

Wouldn't it be great if nature could warn us about those risks in time to help? Well, it can – thanks to a technology that is out of this world.

Our planet is vulnerable in ways we never imagined a few decades ago – and satellite has answers.

From Tracking Animals to Tracking Sewage

In the fight to protect endangered species, animal tracking collars send signals into space that help us fight poaching and learn more about the unique needs of each species.

Sewer systems designed decades ago can overflow in heavy rain, pouring raw sewage into surrounding waters. Detectors connected by satellite provide operators with critical real-time data to identify overflows so they can be stopped.

Out to sea, autonomous vessels are roaming the oceans. They gather weather data, identify illegal fishing and watch for signs of climate change. The information they gain is vital to science, to the environment and our safety.

Robots also roam beneath the waves. They are called autonomous underwater vehicles, and they monitor the health of the oceans, map the sea floor and search for wreckage. And how does all this data get from the oceans to the land? By satellite.

Keeping Sharks at Bay

But while protecting the health of the seas, we some-

times need protection of our own. Many beaches are equipped with buoys to catch sharks that might threaten swimmers. Each buoy dangles a baited hook in the water for sharks to bite. Years ago, the sharks were left to die. But now a generation of “smart buoys” send alerts by satellite that let responders free the sharks and move them far from shore.

Deep in forests, sensors monitor weather and soil for conditions that lead to wildfires. Transmitted by satellite, the data can trigger warnings of danger ahead. And if wildfires do break out, firefighters depend on their satellite phones to coordinate action and call for reinforcements.

Saving Lives, Saving Species

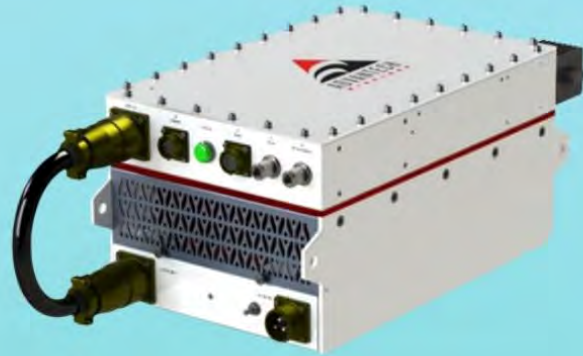
Far above, in space, satellites are protecting our communications and electric grids. Our planet is constantly bathed in a stream of charged particles from the sun. Most of the time, the Earth's magnetic field shields us.

But big solar flares can let those charged particles blast into our atmosphere. We avoid damage most of the time thanks to warnings from orbiting satellites.

These services – and many more – come from a satellite company called Iridium. Its constellation of interconnected satellites circle the Earth to provide voice communications and bring the Internet of Things to every corner of the globe, saving lives, saving species and helping keep our world sustainable. Thanks to companies like Iridium, the Internet of Things can reach as deep into nature as it does into our daily lives.



Produced for Satellite Executive Briefing by Space & Satellite Professionals International. See more stories and videos of satellite making a better world at: www.bettersatelliteworld.com



Introducing **GENESIS** - the new series of Ku-band SSPAs and BUCs from Advantech Wireless Technologies.

GENESIS epitomizes the latest in hardware and software technologies, making it the most feature-rich satcom SSPA in the industry. Initially available in 200W, and 250W variants, GENESIS delivers a host of high-end features, including some that are unique to the **GENESIS** family:

- Secure SNMPv3 interface
- Modular construction – fast production & simple serviceability
- Full M&C capability with embedded Webserver
- Field-removable power supply and fans
- Forward and reflected power monitoring & true RMS power detection
- Device-level monitoring for detailed fault analysis and diagnostics
- Embedded logic to manage multi-amplifier redundant and phase-combined systems, negating the need for any external controllers.

Additional frequency bands and higher power levels based on the **GENESIS** platform will become available in the coming months.



PRODUCT SPOTLIGHT

Spotlight on key products and services to be showcased at **SATELLITE 2023**
Washington, D.C., March 14-16, 2023

ACORDE Technologies

visit ACORDE booth # 2137



ACORDE manufactures reliable and field proven solutions such as compact and lightweight BUCs (X/Ka) and LNBs/LNAs, introducing new and efficient technologies such as GaN, and versatile approaches such as dual and quad sub-bands integrations. ACORDE offers built-to-spec up to Q/V-band under MIL-STD-810G/461E for ground, naval and airborne platforms.

For more information go to: www.acorde.com

Amphinicy Technologies

visit Amphinicy at booth # 2451



AMPHINICY
TECHNOLOGIES

Amphinicy Technologies is a provider of advanced software solutions and all-around software support for the satellite industry, with a focus on ground infrastructure. Since its beginnings more than 20 years ago, more than 100 projects have been delivered to international space and humanitarian agencies, leading satellite operators, mission operation centres and satellite equipment manufacturers. Building on this experience, Amphinicy created its own products: Blink, an ultra-fast, software-defined modem and Monica, a modern monitoring and control solution for the ground segment. The company operates from offices in both Zagreb (Croatia) and Luxembourg.

At Satellite, Amphinicy will be showcasing the following products:

- **BLINK**-a fully software-based, ultra-fast satellite telemetry acquisition system for Earth observation. It is modular, flexible and scalable, and can support missions from AIV to operations, with post-processing and reporting capabilities
- **Monica**-a state-of-the-art ground segment monitor and control solution, built primarily for the satellite industry. It is robust, secure and reliable, demonstrates high performances and can scale from a single ground station to a network of hundreds of thousands VSATs
- **SatScout**-a powerful mobile application framework for commissioning and certification of VSAT terminals and antennas

For more information go to: www.amphinicy.com

AVCOM of Virginia

visit AVCOM booth # 1910



AVCOM of Virginia is a global leader electronics technology company with 30 years of experience in the design, manufacture and support of cost-effective high quality, RF spectrum analyzers, signal monitors, beacon receivers, and test equipment products; serving the commercial and military SATCOM and telemetry markets. Made in the

U.S.A.

At Satellite come see live demonstrations of our products featuring the new BR-MOD-1 Satellite Beacon Receiver Module and the SA-MOD-1 spectrum analyzer based on Avcom's software-defined-radio technology platform designed to exceed today's performance challenges. The analyzer is intended for embedded applications required to operate under challenging conditions.

For more information go to: www.avcomofva.com



AvL Technologies

visit AvL at booth # 2325



AvL Technologies designs and produces mobile satellite antennas, terminals and positioner systems. AvL's robust terminals combine rugged packaging, stout wind performance, ease of operation and 24/7/365 customer support. AvL leads the industry in the delivery of systems that operate with the next generation of military satellites, including Xtar and WGS.

For more information go to: www.avltech.com

AMKOM Design Group Inc.

visit Amkom at booth # 2836



Amkom Design Group Inc. is committed to designing and manufacturing world-class amplifiers of varying frequencies in a full portfolio of Commercial Off The Shelf (COTS) products and offering custom design services for the VSAT and Sat-commarkets. All of Amkom's products and services are developed to meet or exceed customer expectations while complying with applicable requirements. AM-KOM has chosen the best of both worlds as it implements the most mature, proven efficient and reliable GaAs + GaN High Power Amplifiers with added internal overdrive protection. The company adheres to an absolute "No Corner Cutting" concept in their design. Its weatherproof and robust Hyper-Light package is constructed with the most advanced mechanical precision engineering in mind. The company specializes in doing custom work as well as having a line of COTS products.

For more information go to: www.amkominc.com

Comtech

visit Comtech booth # 1703



Comtech is a leading global provider of satellite and space communications and terrestrial and wireless network infrastructures to commercial and government customers around the world. Headquartered in Melville, New York and with a passion for customer success, Comtech designs, produces and markets advanced and secure wireless solutions.

At Satellite, Comtech will be showcasing its Elevate Hub--a Multilayered, Multi-Orbit Hybrid Architecture designed to be fully integrated with LEO/MEO/GEO space traffic orchestration. Equipped with a powerful new NMS, the Comtech ELEVATE Hub is able to coordinate high traffic over multiple LEO Satellites, while dynamically controlling Doppler effects, bandwidth allocation, and adapting to each satellite or beam specific power density requirement. Comtech ELEVATE provides constant search and lock guidance to both hub and remote antennas, by using Comtech's new ACU algorithms.

For more information go to: www.comtech.com

Integrasys

visit Integrasys booth # 1403



Integrasys is a privately owned company specializing in engineering and manufacturing of Satellite Spectrum Monitoring Systems, VSAT Installation & Maintenance, and Link Budgets in the satcoms and broadcasting markets. Integrasys has been leading for 30 years the innovation in the satellite industry with new solutions which saves time, effort, and OPEX for

satellite industry companies. At Integrasys our mission is to provide the industry with the best quality and fastest technology available in carrier monitoring systems, with the customer service and care that our customers deserve.

For more information go to: www.integrasys-space.com

Flyaway and Maritime Antennas from JONSA Technologies

visit **Jonsa** at booth # 2052

Jonsa Technologies from Taiwan is a trustworthy manufacturer of communication antennas, and our monthly production capacity has been over one million in a variety of antenna products. We are waiting for the new partner who will cooperate with us and create a win-win situation together.

Our best-selling product in Jonsa includes:

0.6M/0.9M Auto and Manual Flyaway

- Ring focus antenna with 8 segments reflector
- Support Ku and Ka band as an option
- Carbon fiber reflector with light weight, high strength and one person can finish the installation within 3 minutes.

VSAT (E74/97/120) antenna

- Customized VSAT antenna products
- Correspond with electronic devices, such as integrated LNB and Feedhorn
- Support Ku and Ka band as an option

0.6M/0.9M Ka and Ku band Maritime with radome

- One-touch commissioning
- High gain and carbon fiber antenna
- Support beacon receiver, DVB, and digital tracking system

For more information, please visit www.jonsa.com.tw or email saccount@jonsa.com.tw



Mission Microwave

visit **Mission Microwave at booth # 1621**



Mission Microwave Technologies was founded in 2014 to create the next generation of Solid-State Power Amplifiers (SSPAs)

and Block Upconverters (BUCs). We use advanced GaN transistors, unique power combining technology, and novel full-system designs to create the industry's most efficient, lightweight, and compact high-reliability SSPAs for mobile communications applications.

Mission Microwave supports the satellite terminal industry with high performance X-, Ku-, and Ka-band products from highly integrated transceivers in the 10-80 watt range to large-scale amplifiers up to 400 watts for gateway installations. Customers rely on Mission Microwave to provide the highest level of capability, reliability, support, and on-time delivery.



Mission Microwave X-, Ku-, and Ka-band GaN BUCs

For more information, go to: www.missionmicrowave.com

ND SATCOM: The future is now. The Future is SKYWAN 5G

visit **ND Satcom at booth # 1122**



INSTALLING
RELIABILITY

Dive into a new dimension of satellite communication with SKYWAN 5G. Just when you thought you heard it all – from reliability to flexibility to scalability – **ND SATCOM** breaks the barrier with new engineering features that anticipate your business needs and further optimise the performance of your business. We listen, we innovate, we lead. This is why our standards of excellence, proven track record and 5th generation SKYWAN keep customers coming back for more. We are the only trusted solution

provider in Europe for demanding market sectors such as aviation and the military, where the concept of reliability has far-reaching impact. For more information, go to: www.ndsatcom.com

RF-Design

visit **RF Design at booth # 1216**

RF-Design is developing, manufacturing and marketing high quality RF equipment, RF distribution and RF-over-fiber solutions. At the SATELLITE 2023 we will demonstrate our latest RF Switch Matrix systems, as well as new RF-over-fiber and RF distribution products.

RF-Design's field-proven QLink RF-o-Fiber system now comes with additional features, offering better performance and more flexibility that is highly beneficial for RF signal distribution applications via optical fiber. The QLink system combines a compact outdoor enclosure and a 1RU/19" indoor rack mount chassis, both of which can be equipped with maximum 5 TX and/or RX optical modules for transmitting and/or receiving 1 to 5 RF signals over fiber. Due to its modular design, it can be field expanded even throughout operation (hot swappable modules), thus perfectly suited for uplink and/or downlink applications at satellite ground stations and VSAT systems.



www.rf-design-online.de

For more information, go to: www.rf-design-online.de

...designed for perfect signals

RF Switch Matrix Systems



RF-over-Fiber Solutions



RF Line Amplifiers



RF Monitoring Systems



- ▶ **Unique – Innovative – Clever RF Switch Matrix Systems**
- ▶ **RF-over-Fiber Solutions for Indoor & Outdoor Applications**
- ▶ **Line Amplifiers (Single, Dual, Quad, 1+1 & N+1 Redundant)**
- ▶ **Innovative & Unique RF Monitoring Solutions**
- ▶ **Single & Quad Redundancy Switches**
- ▶ **Active Splitters & Combiners**
- ▶ **Custom Made Products and Solutions**
- ▶ **Perfectly Suited for Satellite Earth Stations, Teleports, VSAT ...**

Satservice GmbH

visit Sateservice at the Calian booth #2419

SatService GmbH, a designer, manufacturer and reseller in the field of satellite communications, specializing in ground station and teleport equipment. We are pleased to present the latest technologies and our very own sat-nms products, at this year's Cab-sat show. Designed & manufactured in Germany, SatService provides competitive and customer dedicated products as well as system solutions with high quality and quick reaction time. Our strength is the combination of system engineering and integration know-how with highly sophisticated products.



Our sat-nms product line consist of Monitoring & Control, Network Management Systems, Motorized Antennas and Antenna Tracking Systems, Beacon Receivers, Distribution Amplifiers, Matrixes, Converters and Fiberoptical Links.

SatService is your reliable and innovative Partner in the field of satellite communications.

For more information, go to: www.satservice.gmbh.de

Terrasat Communications

@IBC visit Terrasat at Hall 1 booth # 1529



With more than 18 years of experience in manufacturing high quality power amplifiers,-**Terrasat Communications** will be showcasing its new IBUCs with GaN technology and Cyber Hardened dedicated features that give you endless and powerful support to your system. Get wht you pay for, more than just an IBUC!

For more information go to: www.terrasatInc.com

WORK Microwave

visit WORK Microwave at booth # 1409



What's your Mission?

At **WORK MICrowave**, we have the solution. Our mission is to help your data to cross the edges between Space and Ground. RF and digital. Optical and digital. Virtual and hardware on your ground station.

We develop ground segment equipment for any of your mission.

For more information, go to: www.work-microwave.com

Walton Enterprises

visit Walton Enterprises at booth # 2418



W. B. Walton Enterprises, Inc. AKA Walton De-Ice has been the satellite industry leader in Earth Station Antenna De-Ice systems for over 40 years. Beginning with our flagship, Hot Air Plenum De-Ice as the most economical and efficient method of keeping snow and ice from accumulating on antennas ranging in size from 3.7 meter up to 32 meters. As the industry has evolved and antenna size requirements became smaller Walton De-Ice has lead the way in providing methods of signal protection such as our patented Snow Shield and Ice Quake/Rain

Quake for antennas ranging in size from 0.65 meter up to 6.5 meters. Available in heated or passive solutions, when considering budget and operating budget no other method of antenna de-icing compares in cost and efficiency. With the emergence of LEO Tracking antennas and mobile solutions the Walton Portable Radome has no competition when protecting terminals from weather such as rain, snow, ice, heat or blowing sand. Virtually invisible to RF and the ability to withstand wind up to 85 MPH/137 KPH. For more information, go to: www.de-ice.com



Meet us at
SATELLITE 2023 in Washington DC!
Booth 1409, March 14-16

What's your mission? We have the solution.

Our mission: Help your data to cross the edges
between Space and Ground.

Any state-of-the-art technology:
Optical and RF.
Virtual ground station or hardware.



New Space



Deep Space



Governmental



Communication

We develop ground segment hardware
and software for any of your mission.

Tell us about your mission!

visit Xiplink at booth # 2803



Xiplink, Inc.

XipLink is the technology leader in wireless link optimization using industry standard SCPS TCP acceleration, UDP enhancements, data/header compression, link bonding and Internet optimizations to deliver a better wireless experience over stressed communication links.

Our award-winning XipOS software dramatically improves web experience and optimizes other Internet traffic in markets such as maritime, cellular backhaul, ISP backhaul, military and hybrid networks.

The XipLink solution is packaged into appliances or virtual images and sold through OEM, Integration and Service Provider partners around the world. XipLink is a private, employee owned company with headquarters in Montreal, Quebec Canada and field personnel worldwide.

For more information, go to: www.xiplink.com

the TECHNOLOGY LEADER in WIRELESS LINK OPTIMIZATION

- Recognized leader for satellite-based acceleration and wireless link optimization
- Best quality of experience to the end user
- XipOS provides the highest link utilization and bandwidth capacity to the network operator
- Both small and extremely high capacities up to tens of Gigabits per second
- Hyrid Networks - Interconnect GEO, NGENO, cellular data, terrestrial wireless and wireline links into one optimized network with ultimate bandwidth flexibility!



MARITIME



CELLULAR BACKHAUL



MILITARY & GOVERNMENT



VSAT NETWORKS



HYBRID NETWORKS



xiplink.com | 855-408-2483



CABSAT

16–18 MAY 2023
DUBAI WORLD TRADE CENTRE

CREATIVE. CONNECTED. CONSCIOUS.

**THE MEASA REGION'S LEADING EVENT FOR
CONTENT CREATION, BROADCAST, PRODUCTION,
AND SATELLITE INDUSTRIES**

Tap into new business potential as thousands of key buyers, thought leaders and decision makers from over 120 countries come together to design, shape and co-create the future.

CREATIVE

Discuss and dive into trends, challenges, innovations and opportunities.

CONNECTED

Explore, meet and exchange experiences with a diverse range of stakeholders including industry executives, integrators, engineers, solutions providers and more.

CONSCIOUS

A focus on sustainable practices across the content creation and delivery ecosystem with special conference content and workshops.

Get in touch with us to exhibit, sponsor or visit: www.cabsat.com

    @cabsatofficial

#CABSAT2023

Organised by



مركز دبي التجاري العالمي
DUBAI WORLD TRADE CENTRE

Competition Heating Up in the Satellite Launch Market

by **Bernardo Schneiderman**

At the SmallSat Symposium held in Mountain View, California in the heart of Silicon Valley from February 7-9, executives from satellite launch companies discussed during a panel that they are estimating strong demand for launch services but are struggling to make money as competition, particularly from SpaceX, driving down prices.

Companies offering small launch vehicles like the Vega C from Arianespace say that pricing pressure from SpaceX ride-share missions make it hard for them to make money on their launches. Demand for launches of smallsats is higher than ever, industry executives warned that price pressures and lack of access to capital could cause many companies to go out of business in the near future. (Spaceryde, a Canadian launch startup, just announced bankruptcy early February 2023).

Rocket Lab executives mentioned launch companies need to adapt by attracting more government business, which is less price sensitive and often has requirements that drive them to dedicated launches. He added that some commercial customers that fly initially on ride-share missions will shift to dedicated launches over time as they deploy operational constellations.

“What’s happening is that commercial companies are growing more mature in terms of small satellites and small constellations,” said Dan Hart, chief executive and president of Virgin Orbit during the conference. “That overlaps to a fair degree with some of the needs of the national security community.”

Bill Weber, chief executive of Firefly Aerospace, said his company’s Alpha rocket is attracting interest from customers who don’t feel like Transporter missions are a good fit. “They are saying, ‘Transporter does not work for our mission set,’” he said. But some admitted they underesti-

ated the cost and complexity of developing small launch vehicles. “I think there has to be a reflection of factoring in that de-

livering a reliable and regular launch service is expensive,” said Giulio Ranzo, chief executive of Avio, prime contractor of the Vega series of rockets. “Pricing needs to take this into account. There is no easy solution to finding a lower price launch service.

Meanwhile, some key news in the launch market include the following:

Blue Origin wins first NASA business for New Glenn

Blue Origin has won its first NASA award for its New Glenn rocket, with the agency selecting the large rocket to launch a pair of Martian smallsats. NASA announced Feb. 9 it selected New Glenn for the launch of the two Escape and Plasma Acceleration and Dynamics Explorers (ESCAPADE) spacecraft. The rocket will launch ESCAPADE in late 2024, with the spacecraft entering orbit around Mars 11 months later.

The award, a task order under NASA’s Venture-Class Acquisition of Dedicated and Ride-share (VADR) contract, is the first contract NASA has issued for New Glenn, the large rocket Blue Origin has been working on for several years but has yet to launch. Blue Origin has previously won business from several commercial customers, including Amazon, which awarded the company a contract last April for 12 launches of Project Kuiper Satellites, with an option



for 15 more.

Firefly's first U.S. Space Force launch targeted for May 2023

The chief executive of Firefly Aerospace Bill Weber said the company is preparing to launch its first mission for the U.S. Space Force in May. The mission will attempt to demonstrate industry capabilities to send a payload to orbit on 24 hours' notice.

Firefly in September won a US\$ 17.6 million contract to launch a Millennium Space small satellite to low Earth orbit, a so-called 'Tactically Responsive Space mission that is part of a broader effort by the U.S. Space Force to accelerate the timeline for deploying payloads to orbit. Weber said during the conference the company views the upcoming mission as an opportunity to show it can provide reliable and predictable launch services not just to the military but to all customers. "Responsive space is not just a government mission," Weber said. "Predictability, full rate production, dependability, schedule, that's what we're trying to weave into the business." Firefly's expendable Alpha small launcher made its first launch attempt in September 2021 but the vehicle did not reach orbit as one of the first stage engines failed during ascent. A second test flight in October 2022 successfully reached orbit although the satellites were deployed in lower orbits than originally planned.

The Space Force's Tactically Responsive Space program is viewed as a potential lifeline for small vehicles that are facing lagging demand in the commercial sector in large part due to the popularity of SpaceX's big-rocket rideshares. Weber said there is still a demand for dedicated vehicles to reach specific orbits and Firefly is not competing for the same customers that are buying rides on SpaceX's Transporter missions.

Virgin Orbit intend to compete for national security missions

Virgin Orbit's chief executive Dan Hart said his company intends to compete for Tactically Responsive Space and other national security missions. "The idea of how to acquire space capabilities for national security is changing" due to the geopolitical environment, Hart said at the symposium. Traditionally the military plans its satellite



Firefly's Alpha launch vehicle. (image courtesy of Firefly).

launches years or decades in advance. But with satellites now considered military targets, there will be times when the military might need a satellite launched immediately to replace damaged assets. "That's a new idea," Hart said, and DoD needs the launch infrastructure to support that.

Virgin Orbit's LauncherOne is an air-launched rocket that deploys from a modified Boeing 747 carrier aircraft at high altitude. The vehicle flew four successful missions but its latest launch from the United Kingdom Jan. 9 failed to reach orbit. Adam Spice, chief financial officer of Rocket Lab, said the company considers the U.S. government the main customer for its Electron small launch vehicle. "In order for companies to be viable and healthy, you've got to look outside of those science experiments, the one offs, you really got to start building a solid base of recurring launches, which is really today largely government." Today, he added, "I think it's very important to have a strong government relations function in the company."

Small satellite sector should prepare for SpaceX's Starship


Small satellite manufacturers should prepare for the

FEATURE

emergence of rideshare flights on the SpaceX Starship spacecraft and Super Heavy launch vehicle, according to panellists speaking at the SmallSat Symposium.

“If you are not preparing for how you’re going to launch your product on Starship and how you’re going to change your business model to work with Starship, you are going to be in trouble,” said Abhishek Tripathi, mission operations director at the University of California, Berkeley, Space Sciences Laboratory. Tripathi, a former SpaceX Dragon flight reliability director, noted his potential bias, but advised companies to reorient their businesses to take advantage of what are expected to be relatively inexpensive rideshare flights. “If that means that I need to partner with a space tug to get to my final orbit, okay,” Tripathi said. “Let me go and talk to a bunch of space tech companies.”

SpaceX shook up the market in 2021 when it launched the first Falcon 9 Transporter rideshare flight. “When the first Transporter mission started going, the number of smallsats launched on small launchers just fell off a cliff,” said Fletcher Franklin, BryceTech senior program manag-

er. Still, it’s too soon to dismiss the small launch vehicle sector. “I see the small launchers still proving out capacity,” Franklin said. Certainly, companies with a lot of tenacity will keep driving the small launch activity for several years,” he added. 



Bernardo Schneiderman is the Principal of Telematics Business Consultants. He can be reached at: info@tbc-telematics.com

STRONG



Tardigrade

Resistant to extreme conditions, with unique characteristics in the animal kingdom such as being able to survive in the vacuum of space or withstand very high pressures of almost 6,000 atm; they can survive temperatures of 73 K and up to 423 K, prolonged dehydration (they can go up to 10 years without obtaining water) or ionizing radiation.



Ka-Band Low Noise Amplifier (LNA) Frequency converter Block Up Converter (BUC) Solid state Power Amplifier (SSPA) Block Down Converter (BDC) **X-Band** Transceivers (TRX) Test Loop Translator (TLT) Low Noise Block (LNB) **Q-Band** Redundancy

GVF at SATELLITE 2023: Orbiting Cell Towers, Satellite IoT & ‘Mastering the Business of Space’

by Martin Jarrold

The SATELLITE 2023 in Washington, D.C. this month features two conference panel sessions brought to you by GVF. ‘How a Cell Tower in Space Connects to the Cell Phone in Your Pocket’ (Tuesday 14 March, 3:00-4:00 pm, room 146C) moderated by Secretary General David Meltzer, and ‘Why Your Business Needs Satellite IoT Services’ (Wednesday 15 March, 10:45-11:45 am, room 146 A/B) moderated by Brad Grady, Research Director with NSR. GVF is also exhibiting at booth #1657, along with our GVF Training partner, SatProf, Inc.

Joining David Meltzer to discuss ‘How a Cell Tower in Space Connects to the Cell Phone in Your Pocket’ will be Christopher Boyd, Vice President of Product Management, Kratos; Whitney Lohmeyer, Faculty, Olin College of Engineering; Frank Patry, Chief Information Officer, Omnispace, LLC; Vagan Shakhgildian, President, Comtech Satellite Network Technologies Corporation; and, Tyghe Speidel, Co-founder & CTO, LYNK.

Despite significant advances in terrestrial network coverage, much of the world’s population remains out of range for mobile and internet access. While satellite phones have for some time offered an alternative, expensive hardware and costly service plans have been a barrier. Satellite systems have long complemented cellular/mobile communications in providing backhaul services, but now the emerging, practical realization of the cell/mobile tower in space concept has introduced a new communications paradigm, capturing the imagination of not only the broad telecommunications industry, but also that of a wider public familiar with such names as

SpaceX/Starlink and Apple, and all at a time not long following the pandemic-delayed publication of the

3GPP Release 17 standard. Its identification of satellite Non-Terrestrial Networks (NTN) as a critical component for the world’s 5G networks is background to the excitement which has greeted the announcements of the launch of early-stage technologies to support satellite-to-device connectivity services. With NTN within the new 3GPP standard the objective is direct connectivity from satellites to smartphones for voice and data services, built on the seamless integration of NGSO constellations with terrestrial infrastructure.



Direct satellite-to-device technology is a transformative development, and in being translated into commercial reality brings the satellite services market to an inflexion point; entering into the mainstream and leveraging mass-market equipment production. It enhances MNOs access to new customer segments; it creates opportunity for satellite operators to secure connectivity for existing mobile customers when they roam beyond the range of terrestrial mobile signals; users can communicate directly with a satellite without the need for a terrestrial gateway.

This session will examine how direct space-to-cell connections work, examining solutions approaches to such issues as calculating the link budget from a satellite to a cellular/mobile phone, satellite spectrum sharing with terrestrial systems whilst avoiding interference, and allowing for the significant distance between orbit and

GLOBAL CONTENT DISTRIBUTION



STN

End to End Solutions

SATELLITE
& IP

PLAYOUT
& CLOUD

STREAMING
& OTT

OCCASIONAL
USE

CO-LOCATION
SERVICES



WWW.STN.EU



SALES@STN.EU



+386 1 527 2440

devices on Earth.

For GVF's second panel discussion on 'Why Your Business Needs Satellite IoT Services,' Brad Grady will be joined by Jat Brainch, Chief Commercial & Digital Officer, Inmarsat Global; Jean-Philippe Gillet, Vice President & General Manager, Networks, Intelsat; Glenn Katz, Chief Commercial Officer, Telesat; Tim Last, Vice President & General Manager of IoT and Aviation, Iridium; and Jonny Spendlove, Senior Product Manager of Connectivity, John Deere. This panel will explore the benefits that satellites can provide in connecting b2b markets where rollout of 5G networks does not extend. For businesses located in areas not served by terrestrial networks, e.g., mining, farming, and energy, satcoms can provide vital links needed to connect employees and machines. Satellite IoT services save lives, time, and money for businesses running complex logistics, operating vehicle fleets, or managing mobile crews.

Away from the conference rooms and on the exhibition floor, GVF and its training partner, SatProf, Inc. can be visited at booth #1657. GVF's training has a near two decades long history and in serving the technical training needs of some 27,000-plus students to date is recognized as the established global standard for satellite communications skills training and certifications. The training portfolio is based on realistic, online, interactive simulations of key skills covering operation, installation and maintenance of VSAT, marine, and mobile/SNG satellite terminals, in addition to general and specialized satcom theory.

As well as the well-established technical training portfolio, the booth personnel – joining David Meltzer from GVF will be Irina Petrov, Vice President for Marketing & Membership, and from SatProf, Ralph Brooker (President) and Greg Selzer (Vice President, Operations & Business Development) – will be available to answer questions about the latest training initiative from GVF and SatProf, and their partner, SSPI. Based on a combined 80 years of experience in space and satellite, and observing that the satellite industry is undergoing a uniquely fast ramp-up in human resource recruitment fueled by rapid innovation which is in turn powered by high levels of investment, rising pressure on available RF spectrum and falling cost of access to space.

The requirements of accelerated growth in the in-

"...The requirements of accelerated growth in the industry's employment needs and changes in employment patterns were the challenges that the Space Business Qualified certification program was designed to meet..."

dustry's employment needs and changes in employment patterns were the challenges that the Space Business Qualified certification program was designed to meet. Traditionally, requisite skills and knowledge are acquired via on-the-job experience and/or in graduate programs. Whilst still of value these routes are slow and costly, whereas SBQ saves hundreds of hours and thousands of dollars with an online learning and certification program of online courses, taught through a mix of self-paced, interactive tutorials, videos, illustrations, and testing to validate understanding and reinforce learning, increasing the effectiveness of people working in every discipline, and enhances their ability to rise in their profession.

Delivered through efficient, effective self-paced learning SBQ offers a 360-degree view of the industry and the wide range of activities needed to successfully operate in a space-based business:


- People entering the industry will quickly gain a comprehensive understanding to accelerate their success, whether in finding a job or taking on new assignments.
- Long-time employees moving into new fields will fill gaps in their knowledge and be better able to apply experience to challenges in greater responsibilities.
- Employers will more effectively onboard new personnel and improve employee retention.
- Students specializing in a particular engineering, science, legal or regulatory disciplines will gain a broader grasp of the industry.

Space & satellite is a complex business at the intersection of technology, communications, surveillance, government and commercial markets and SBQ puts it into perspective:

MARKET INTELLIGENCE

- For engineering and technical staff, SBQ prepares them for transition to sales engineering or management positions.
- For people in sales, marketing and business development, SBQ gives new staff an understanding of industry capabilities, regulatory constraints and emerging opportunities.
- For finance, insurance, and legal staff, SBQ offers context on business models, customer needs, technologies, and regulatory matters.
- For employees in procurement, logistics and regulatory compliance, SBQ provides the background needed to turn an engineer's request for purchase of a particular component into a disciplined procurement process.
- For staff on the management track, SBQ provides a view of the industry that enhances their ability to evaluate opportunities, identify potential partnerships, determine strategy and execute plans.

- For new graduates, SBQ is a convenient, low-cost program – and a valuable credential – that eases entry into the space and satellite industry.

Adjacent to this column is a new editorial feature from GVF/SatProf/SSPI (see the sidebar). In each issue this feature will provide some brief analytical insights, identified by GVF and Lou Zacharilla at SSPI, to promote understanding of the business of space today. 

Martin Jarrold is Vice-President of International Program Development of GVF. He can be reached at: martin.jarrold@gvf.org



Mastering the Business of Space

The Space Business Qualified (SBQ) portfolio currently features Fundamentals Courses providing a thorough grounding in getting into space, achieving orbit, spacecraft design, space communications and the business of space. Content is on the concept and business level rather than depending on in-depth knowledge of mathematics, physics or engineering, because it aims to equip students for success in the business of space and satellite. For a free audit of the courses visit <https://www.spacebq.org/take-course>.

Statistics tell the story behind the demand for SBQ:

- Employment in the core U.S. space industry is at 10-year high – 18.4% increase over 2016-2020 (U.S. Bureau of Labor Statistics)
- U.S. private space sector employee average pay is US\$125,214 over double the average for all U.S. private-sector jobs (US\$62,247) & 27.3% more than the average salary of US\$98,340 for STEM occupations
- The Center for American Progress – Staff turnover costs U.S. organizations 16-213% of the lost employee's salary
- SHRM and Globoforce – Employee retention is the most significant concern for almost half of HR leaders
- LinkedIn Talent Solutions – Companies rated highly on employee training saw 53% lower attrition
- Online training is preferred as more people work from home
- 2021 statistics from a provider of compliance-based training courses and resources includes ('39 Statistics that Prove the Value of Employee Training', lorman.com)
 - 89% of employees want training available anywhere, anytime
 - 93% of employees want easy-to-complete training
 - 76% of employees believe their companies should provide more digital skills training
 - 44% said their employers currently do so



CesiumAstro Acquires TXMission

Austin, Tex., January 17, 2023 – CesiumAstro Inc., a provider of phased array communications technology for space and airborne systems, announced that it has acquired TXMission Ltd., a United Kingdom-based communications company that develops software-defined radios and modems for satellites, ground stations, HAPS (high-altitude platform systems), and airborne platforms. Financial terms of the transaction were not disclosed.

Founded in 2018, TXMission (pronounced “transmission”) has a rich portfolio of field-proven communications waveforms and hardware products that will complement CesiumAstro’s product lines, including their Quest™ and Connect™ software-defined radios built for the satellite and ground station markets.

“TXMission’s modem capabilities are unrivaled, and together we can build a stronger end-to-end communications solution for our customers,” said Shey Sabripour, founder and CEO of CesiumAstro. “Acquiring TXMission provides a foundation for establishing an office in the United Kingdom, where we are investing to grow our presence.”

TXMission will become CesiumAstro’s first office in the United Kingdom, expanding the company’s ability to deliver mission-critical solutions to its European customers while gaining access to high-skill talent and manufacturing capability in the region.

Optimal Counsel LLP acted as legal advisor to CesiumAstro.

GAPSAT Acquires QBX to Provide Critical Spectrum Solutions

Douglas, Isle of Man, January 16, 2023– GapSat Development Group Limited, a BVI company providing satellite operators with in-orbit geostationary communications satellites on an interim basis, has acquired QBX Limited, an Isle of Man based satellite solutions and consulting services company with a portfolio of satellite radio frequency spectrum and intellectual property.

Satellite spectrum and associated geostationary orbit slots are a finite resource and increasingly regarded as key strategic assets for the telecom and data communications industry, in the same way as patents are for emerging high technology industries. And with wireless and mobile broadband playing an essential role in bringing high-speed, low-cost communications to the developing and developed world, the demand for mission-critical orbit spectrum resources is increasing and a so-called 'race for space' is emerging.

Gregg Daffner, CEO of GapSat said: "Given the rapid expansion of satellite communications in recent years, especially for HTS and UHTS, scarcity of spectrum has become a critical issue and satellite operators have been steadily moving up the spectrum ladder to higher frequencies. We have seen the move from C-band to Ku-band and to Ka-band and more recently, an interest in developing Q and V-bands. With the acquisition of

QBX providing us with high priority orbital slot filings and patents to develop a global geostationary satellite constellation, GapSat is now ideally placed to meet the growing demands of the communications infrastructure sector."

The assets comprise a patent for radically new techniques to improve in-flight safety and communications for geostationary aero-mobility services and a suite of three ITU geostationary satellite slot filings using conveniently placed orbital locations to provide for full global coverage/service from the resulting geostationary constellation, using the Ka, Q/V and E/W bands for long-term spectrum future-proofing.

With a strong background in developing existing in-orbit satellites for sale or lease and the addition of this new portfolio of radio frequency spectrum and intellectual property, GapSat is currently seeking potential partners that could be existing satellite fleet operators, aero systems integrators, aero instrumentation manufacturers or financial investors, to develop the assets for data services in the marine and aero mobility sectors.

Mark Posen, Managing Director and Principal Consultant at RPC Telecommunications Ltd, commented: "These filings have good ITU priority in parts of the geostationary arc where it is almost impossible to make usable new filings. Development of innovative approaches to leverage existing satellite spectrum is critical for satellite operators to address this increasing scarcity and complement their existing infrastructure and reach." 



Wideband Satellite Software Modem

THE FIRST SDR AVAILABLE AT

 **aws marketplace**



AWS
Ground Station




**Blink Pure-Software
Modem**



**Downstream
Processing and
Distribution**



Software that understands the satellite industry.

www.amphinicy.com

Kayhan Space Appoints New Chief Commercial Officer

Lafayette, CO. February 23, 2023



Matthew Shoupe

-- **Kayhan Space** announced that it has named **Matthew Shoupe** as **Chief Commercial Officer** to lead sales, marketing and product strategy for the company.

The announcement comes as Kayhan Space prepares to expand its product offerings in response to an increasingly congested space operating environment.

Shoupe brings more than 13 years of industry experience in the highly specialized area of sales and product development for astrodynamics-based software and software-as-a-service (SaaS) applications supporting satellite owner-operators. He joins Kayhan Space direct from LeoLabs, where he served as Senior Director of Commercial Space and gained industry-unique expertise leading sales and product strategy for the company's services for constellation operators, including tracking a growing database of satellites and space debris in Low Earth Orbit.

Prior to LeoLabs, Shoupe led sales for a.i. solutions' commercial FreeFlyer software for space mission design, analysis, and operations, where he worked with commercial and government customers including NASA and the US Air Force.

Shoupe will play an integral role

in the product development, sales, and successful customer adoption of Kayhan Space's cloud-based software solutions, including its flagship Pathfinder™ space traffic management platform, which is already utilized by hundreds of satellites in space. Pathfinder collects and fuses space object data from various sources, leverages precise orbit prediction algorithms to determine upcoming conjunction events or potential collisions with high accuracy.

Shoupe will be expanding the Kayhan Space team and product set to meet the urgent needs of satellite operators and the space economy by reducing the risks associated with operating and orbiting key assets in congested space.

AvL Technologies Appoints Guy Clerici as CEO and David Bowne as President

Asheville, N.C., March 7, 2023 –

AvL Technologies owner and founder **Jim Oliver** has appointed **Guy Clerici** as Chief Executive Officer (CEO) and **David Bowne** as President.



Guy Clerici

Oliver is moving toward full retirement this year. Clerici brings more than 20 years' experience as AvL's general counsel and business consultant, plus a lifetime of business experience having grown up in a family of product manufacturing leaders to his new role

as AvL's CEO.

After earning degrees in finance, law and corporate tax law, Mr. Clerici was responsible early in his career for guiding owners in the successful growth of their businesses. With first-hand experience assisting hundreds of closely held businesses to succeed,



David Bowne

Mr. Clerici returned to North Carolina in the early 1990s to join in the purchase and management of several national market, Charlotte-based product manufacturing operations.

Clerici met Oliver soon after moving to Asheville in 2001 and has been an integral part of AvL's development and success as the company grew from 8 to 200+ employees today. Mr. Clerici fully and energetically shares Jim Oliver's vision and core values of providing industry and government with extraordinary service, great products, and continuous improvements, while maintaining an excellent work environment for all in the AvL family.

Bowne is President of AvL and brings more than 35 years of experience in SATCOM and related industries, most recently as CEO of I.F. Engineering Corporation/CrossPoint Technologies in Dudley, MA. Mr. Bowne also has served as Vice President of Sales and Business Development for ND Satcom, Vice President of North American Sales for General Dynamics SATCOM Technologies, and Director of the Small Antenna Group (Worldwide)

Es'hailSat سهيل سات

Qatar Satellite Company الشركة القطرية للأقمار الصناعية

Satellite services for Television, Telecommunications, Broadband and Government networks across the Middle East, North Africa and beyond.



Corporate Networks



Playout



VSAT



Government Services



Television Broadcasting



Teleport Services



Cloud and Hosting



Telecommunication Services



Mobility Services

Space to deliver your vision



www.eshailsat.qa



for Vertex Communications.

“I’m excited to formally bring Guy Clerici to the AvL team and have him lead the company into the future. He brings the right mix of expertise in legal matters, finance, manufacturing and business management. David Bowne brings the incredible depth of experience in SATCOM and manufacturing that ensures AvL will continue to lead the industry with the rugged and reliable SATCOM products our customers expect,” said Jim Oliver.

“There’s a reason Jim Oliver is in the Space & Satellite Hall of Fame – he is an innovative engineer and entrepreneur, and an engaging business leader. I’m honored to take the reins from Jim to lead this great company and the seasoned team he has assembled over the years. I know my background will bring new insights to the business,” said Clerici. “Together with David and our experienced team of more than 30 engineers, AvL will continue to invest in research and development and work with customers to bring exciting new products to market. With unprecedented technological development in all aspects of the SATCOM marketplace this is an exciting time for AvL and for our industry,” he added.

AvL Technologies, Inc. specializes in the design, development and production of mobile satellite communication antenna systems and terminals. AvL’s visionary approach to mobile satellite antennas and positioners has established the company as a global leader in innovation and reliability. The industry leading AvL product line features a full range of rugged, rapidly deployable, mobile antenna systems and terminals, including multi-band and multi-orbit configurations. AvL antenna systems enable efficient and

cost-effective voice, video, and data connectivity to be established quickly, without the need for specialized training.

WTA Names Vivacom’s Vladimir Rangelov as Teleport Executive of the Year 2023

New York, NY, March 6, 2023 - The World Teleport Association (WTA) named **Vladimir Rangelov**, Director of Broadcasting Services at **Vivacom**, as the 2023 Teleport Executive of the Year.

Rangelov will accept the award at the 2023 Teleport Awards for Excellence Luncheon on March 14 during the SATELLITE 2023 conference in Washington, DC. The Teleport Executive of the Year award is presented to an individual for demonstrated entrepreneurship, leadership and innovation in the development or operation of a teleport-based business.

“Vivacom is a fine example of a small, regional teleport operator achieving strong growth through agility and flexibility to adapt to the new needs of broadcasters,” said executive director Robert Bell. “Despite the occasional prediction that consolidation will doom smaller companies in this market, smart innovators continue to grow their companies and refine their value to customers.”

Rangelov has served as Director of Broadcasting Services at Vivacom, based in Sofia, Bulgaria, for over 6 years. He previously held two senior manager roles at the company beginning in 2008. His leadership has resulted in more than 10% year-over-year teleport services growth for Vivacom



Vladimir Rangelov

in 2021 and a 24% increase in revenues over the past two years. Before joining Vivacom, Rangelov served in various managerial roles at tower company NURTS as commercial director, board member and CEO, ALCOMTECH JSC and ELTA-R.

Rangelov also supports local educational institutions by sharing his knowledge and experience with students interested in the telecommunications industry. He also serves as a consultant and provides connectivity solutions for different astronomy projects conducted by Sofia University and scientific research missions for the Bulgarian Antarctic base.

The WTA (www.worldteleport.org) has been helping its members aim higher since our founding in 1985. Today, WTA is the leading partner in growth for teleport operators, advocating for their commercial interests and promoting excellence in their business practices, technology and operations. The association publishes best-practice reports and presents webinars on technology changes and their business and market impacts. 

Embedded Beacon Receiver and Spectrum Analyzer Modules Featuring BR-MOD-1-9 and SA-MOD-1-9

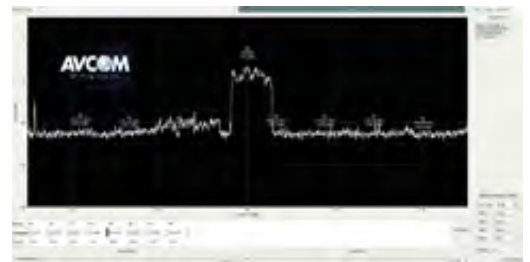
Track CW beacon and modulated carriers
Compact, Rugged Design
For Integration in On-The-Move Applications
Monitoring & Control (M&C) via Ethernet
Integrates with Avcom's EVO-GUI
Comprehensive API for Easy Integration
Extended Temperature Range
Low SWaP (Size, Weight, and Power)



Rack-mounted Extended L-Band Spectrum Analyzer Featuring the EVO-RSA-3040A



- SDR Technology
- Extended L-band; 400MHz – 3GHz
- Up to 8 inputs Available
- Ethernet Remote M & C via included EVO-GUI Software



AVCOM includes its GUI Software.
No License nor S/W keys required.

www.AvcomOfVA.com
+1-804.794.2500
Salesrfq@avcomofva.com



Visit us at Booth # 1910

Capacity Pricing Continues to Decrease in line with the expansion of HTS Supply and Services

Paris, France, February 23, 2023-In their latest edition of the FSS Capacity Pricing Trends report, Euroconsult reported that fixed-satellite service (FSS) capacity pricing is decreasing at a rapid rate due to services supported by next-generation geostationary (GEO) and non-geostationary orbit (NGSO) HTS systems such as Starlink undercutting the market. At the highest industry level, FSS capacity pricing continued to erode in 2022, as the global volume of leased and used capacity increased at a rate that far outpaced the growth in satellite operator revenues.

Over the past five years, global averages for capacity pricing in video and data markets have fallen by approximately -20% (-4% CAGR) and -67% (-20% CAGR) respectively. For data markets, Euroconsult's newly introduced forecasts anticipate this general trend continuing over the next two years with annual declines of -8% to -15% projected across most regions. For most data and broadband markets, this sharp downward trend has brought significant disruptions to the industry, largely due to the abundance and ever-falling cost base of new HTS capacity which supporting aggressive pricing levels.

The influence of both GEO-HTS and NGSO-HTS capacity is expanding both regionally and vertically in terms of market reach. However, while the coverage of NGSO broadband constellations is inherently

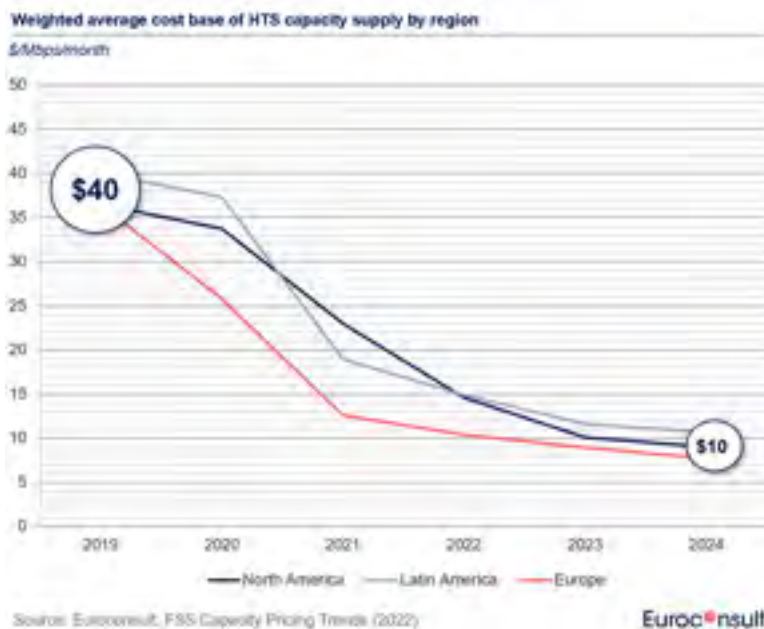
near-global, regional HTS capacity pricing dislocations are likely to become further pronounced over the next several years, notably in regions such as Russia and South Asia where national regulatory and import substitution policies are likely to limit near-term impacts of new, lower-cost HTS capacity supply.

The dynamics laid out in the report highlight drastic changes for the industry, which had previously thrived for decades on revenue-maximization strategies underpinned by relatively limited competition and

a well-maintained equilibrium between supply and demand that often contributed to situations of capacity scarcity. The scale, compelling value and capability offered by Starlink and other next-generation GEO-HTS systems and NGSO-HTS constellations may mark the onset of a structural shift away from the traditional model of wholesale leasing of dedicated (uncontended) bandwidth by service providers

towards the resale of best-effort (contended) managed broadband offerings supplemented by value-added service add-ons.

Compared to traditional satellite broadband services, the low latency, high-data rates, and high priority data allowances supported by next generation NGSO-HTS capacity, alongside its compelling pricing and high value for money, have been the biggest cause for waves in the market. To illustrate, based on a global analysis of over





ITS ELECTRONICS INC.
MICROWAVE COMPONENTS AND SUBSYSTEMS

Solutions that deliver exceptional performance and reliability



Defense and Security



Aviation



Broadcast

With more than 35 years experience, ITS Electronics has the broadest range of RF, Digital, and IP Satcom products of any supplier.

With global presence we provide the highest performance products to commercial and defense customers for any LEO/MEO/GEO ground segment, mobile or airborne applications.

www.itselectronics.com
sales@itselectronics.com +1-905-660-0405

1,000 consumer and business satellite broadband service plans, Starlink’s equivalent price per GB of priority data was found to be 10 to 50 times lower than the vast majority of competing legacy offerings on the market today, and at a similar or lower total monthly cost.

For granular forecasts of reference pricing levels across major regions, applications, and frequencies for 2023 and 2024, as well as an in-depth insight of the previous year, the FSS Capacity Pricing Trends report leverages an extensive database of over 2,000 capacity pricing contracts and quotes, with new features such as detailed analyses on the evolution of the capacity supply cost base over time, as well as specific analyses of NGSO constellations.

About the Report

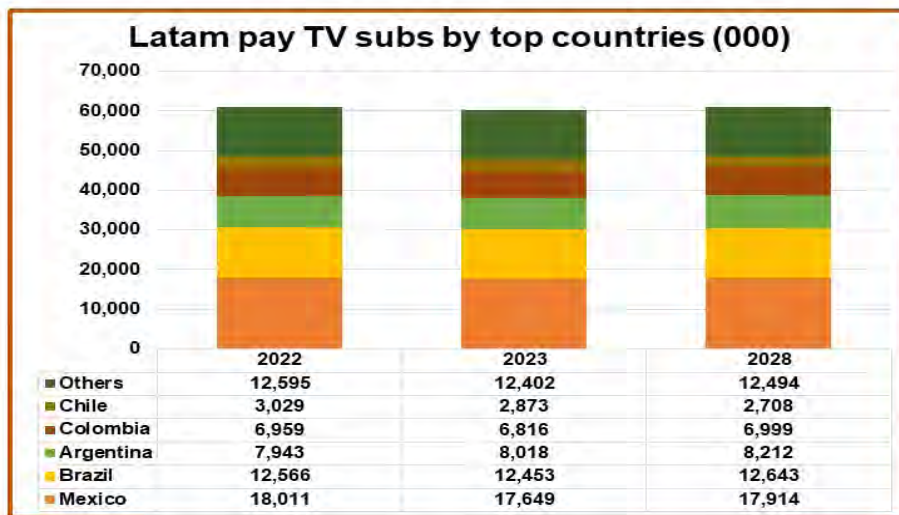
The FSS Capacity Pricing Trends report provides an assessment of the current dynamics for the pricing of satellite capacity in the capacity of sustained technology innovation and the additional satellite capacity associated with new generation satellites. The report includes coverage of nine regional markets, together with a specific review of the mobility and government vertical markets. The publication presents an analysis of how pricing parameters have evolved over the past 12 to 18 months and documents the average and specific pricing

data points. The report also reviews the evolving cost of building and launching FSS, HTS, and NGSO satellites, and provides granular forecasts of pricing levels across the various frequency bands, applications and regions for the upcoming years.

About Euroconsult

The Euroconsult Group is the leading global strategy consulting and market intelligence firm specialized in the space sector and satellite enabled verticals. Privately owned and fully independent, we have forty years of experience providing first-class strategic consulting, developing comprehensive market intelligence programs, organizing executive-level annual summits and training programs for the satellite industry. We accompany private companies and government entities in strategic decision making, providing end-to-end consulting services, from project strategy definition to implementation, bringing data-led perspectives on the most critical issues. We help our clients understand their business environment and provide them with the tools they need to make informed decisions and develop their business. The Euroconsult Group is trusted by 1,200 clients in over 60 countries and is headquartered in France, with offices in the U.S., Canada, Japan, Singapore, and Australia. For more information go to: www.euroconsult-ec.com.

VITAL STATS



Latin America’s pay TV subscriber base will stay steady at 61 million, although this is down from the peak of 73 million in 2017 according to new research from Digital TV Research.

**Protect Your
Earth Station Antennas
From Ice, Snow, Rain, and more**

WALTON
DE-ICE



Antenna De-Ice Systems:

- **HOT AIR**
- **Ice Quake**
- **Snow Shield**
- **Portable Radome**

Walton Advantages:

- **Uniform surface heating**
 - **Minimizes reflector distortion loss**
 - **Maximizes accuracy**
- **Most powerful and cost-effective system on the market**
- **40+ years field-proven leadership**
- **24/7/365 Support & Field Services**

Trust The Experts in De-Icing Solutions

+1 (951) 683-0930 | sales@de-ice.com | www.De-Ice.com

W.B. Walton Enterprises, Inc. P.O. Box 9010 San Bernardino, CA 92427, USA

Visit us at:

SATELLITE 2023
LEANING IN • LINKING UP

Booth #2418

March 13-16
Washington, DC

ADVERTISERS' INDEX

| | |
|--|--|
| Acorde Technologies37 www.acorde.com | RF Design.....30 www.rf-design-online.de |
| Advantech Wireless.....25 www.advantechwireless.com | SatService GmbH.....19 www.satservicegmbh.de |
| Amphinicy Technologies.....43 www.amphinicy.com | STN.....39 www.stn.eu |
| Application Technology Strategy.....3 www.applicationstrategy.com | Terrasat Communications.....7 www.terrasatinc.com |
| AVCOM of Virginia47 www.avcomofva.com | W.B. Walton Enterprises.....51 www.de-ice.com |
| AvL Technologies.....11 www.avltech.com | Work Microwave.....32 www.work-microwave.com |
| CABSAT 2023.....34 www.cabsat.com | Xiplink Inc.....33 www.xiplink.com |
| Comtech.....cover and page 2 www.comtech.com | |
| Es'hailSat.....45 www.eshailsat.qa | |
| Integrasys S.A.23 www.integrasys-space.com | |
| ITS Electronics49 www.itselectronics.com | |
| IBC 202317 www.show.ibc.org | |
| Jonsa Technologies28 www.jonsa.com.tw | |
| Mission Microwave Technologies.....9 www.missionmicrowave.com | |
| NAB 2023.....13 www.nabshow.com | |
| ND Satcom.....5 www.ndsatcom.com | |



Read the latest news, analysis, market trends, executive moves and many more at:

www.satellitemarkets.com