

Satellite Executive BRIEFING

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Industry Trends, News Analysis, Market Intelligence and Opportunities

Update on the African Satellite Market

by Omkar Nikam



The African continent has long been a hotspot of satellite markets due to the region's natural resources and the recent development plans initiated by the government agencies. While satellite broadcasting has been one of the key areas to tap in Africa, the region is gradually progressing towards broadband similar to other regions of the world. In the recent wave of low earth orbit (LEO) satellites, Africa remains one of the most important regions where opportunities are yet to be fully unlocked in terms of scale and growth. According to Space in Africa, in 2020 the annual cumulative budget of space agencies in Africa was more than US\$ 500 million, as compared



to its 2019 budget of less than US\$ 350 million. This increase in budget signifies the continent's ambitious plans to scale its space and satellite capabilities. Companies like Lynk Global, an American LEO satellite operator, has already signed a commercial agreement with Telecel Centrafrique in the Central African Republic. Similarly, Rwanda has filed a request with the International Telecommunication Union (ITU) to put more than 300,000 satellites in space. These recent market movements are enough to signal the potential investment navigators and satellite business giants that Africa is emerging as one of the most important

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CABSAT 2021



After several postponements, CABSAT 2021 finally launched last month in Dubai, UAE. For our company, Satellite Markets and Research, it was the first show that we exhibited in eighteen months. There was a palpable energy permeating the exhibition floor as people were just so happy to reconnect again albeit at a safe distance.



There was a good turnout at the show, especially from the Middle East, Eurasia and North Africa. One bonus of attending was the International Astronautical Congress was held at the same time as CABSAT just in the next hall of the Dubai World Trade Center.



If you were unable to attend CABSAT, you can still watch videos of my presentation at the SatExpo Summit at CABSAT and interviews with key executives from ND Satcom and Spacebridge. Go to: <http://satellitemarkets.com/cabsat2021> to view the videos.

See you at the next show.

Virgil Labrador

Editor-in-Chief

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African Market...

from page 1

ant regions in the satellite market.

The Transformation from Broadcasting to Broadband

Satellite broadcasting companies have leveraged significant opportunities from the African region and continue to record growth in their business. Considering the trend of HD and UHD content, countries are currently undergoing a change from analogue to digital. This shift in technology is set to change the landscape of the satellite broadcasting market. Most of the consumers in Africa are still viewing SD channels as compared to other regions. The North African region has been particularly a hotspot for broadcasting companies. Nilesat, a prominent Egyptian satellite operator, renewed its satellite partnership with Eutelsat. The broadcasting market is still holding strong ground in the African region, but as the connectivity infrastructure is strengthening, it is just a matter of time that the region will record high broadband demand. Airtel, an Indian multinational telecommunications company, has a well-established presence across Africa. Airtel comes under the umbrella of Bharti Enterprises, one of the key investors in OneWeb. Considering the reach of Airtel across several African nations there is a possibility that OneWeb might extend its arm across the enterprise market in the region through companies like Airtel. Moreover, OneWeb's recent agreements in the Middle Eastern region is evident that the company will leverage business and rural connectivity opportunities in Africa. Nevertheless, this scenario will change as the region is undergoing a massive transformation and pav-

"...The African market is progressive but requires acceleration from both public and private entities to fully unlock the sphere of business opportunities..."

ing way for more advanced satellite technologies. The role of 5G will be crucial enhancing the region's overall growth in the broadband market. In 2019, Ericsson and MTN South Africa have signed 5G commercial contract mainly to enhance digitalization. Similarly, Internet of Things (IoT) will be the key to unlock monitoring and tracking market verticals. IoT is essential for tracking and monitoring applications. According to World Economic Forum, "Using satellites to track changes in water, land, construction and vegetation can transform economies – and could unlock more than US\$2 billion a year of benefits for Africa alone."

Foreign Penetration

China has been the top nation to primarily expand its satellite services across Africa. Considering the penetration of foreign companies, China is becoming more dominant in Africa. During the 6th Ministerial Conference of the Forum on China-Africa Cooperation (FOCAC) in 2015, the Chinese President, Xi Jinping, announced an annual financial commitment of USD 60 billion to develop infrastructure in Africa. Since then, China has rapidly spread arms across the African satellite communications market, with a key focus on satellite television (TV). StarTimes is the leading Chinese company to lead the country's flagship satellite TV project. According to StarTimes, under the

project name "Access to Satellite TV for 10,000 African Villages (or" Wan Cun Tong "in Chinese), as of August 2021, the project has been completed in 20 African countries across 8,612 villages." This is a massive market opportunity grabbed by China and considering the country's strong international economic plans, China might emerge as the potential competitor for foreign satellite operators in Africa. Considering this expansion of Chinese footprint, it is safe to say that gradually Africa's digital divide will be bridge with consistent efforts and investment in connectivity projects.

SES, Eutelsat, Intelsat, and Avanti Communications are some of the prominent satellite operators in the African market. Having consistently leveraged opportunities in the broadcasting market, operators are now exploring broadband opportunities in enterprise and rural markets. In October 2021, Avanti Communications launched a new service called Avanti EXTEND. This new service will cover a wide spectrum of connectivity solutions for 2G, 3G, and 4G verticals. Similarly, in the same month, SES and iSAT Africa signed a three-year partnership agreement to provide 4G services across Sub-Saharan Africa. These recent agreements and partnerships are evident that the spotlight is gradually shifting towards new and emerging with a key focus on rural and mobile services. Though



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foreign satellite operators have an existing strong foothold in both North and Sub-Saharan Africa, navigating for opportunities in emerging markets will help the companies expand their regional presence by creating a competitive sphere before the upcoming wave of broadband.

Tapping the Market Demand

The African market is progressive but requires acceleration from both public and private entities to fully unlock the sphere of business opportunities. While the footprint of established operators has helped international companies to invest more in the African satellite communications market, the following are the key pointers that can be considered while tapping the market as an investor or as an operator:

1. Putting a spotlight on satellite broadband connectivity: Africa is quickly adapting to new technologies, which is most importantly magnifying the enterprise market. Putting a spotlight on the enterprise connectivity needs might give a competitive edge to the new entrants, primarily the LEO satellite operators.

2. Identifying local partners: Partnerships and collaborations fuel the African satellite market. Considering the technology and business initiatives in countries like Morocco, Algeria, Nigeria, South Africa, etc. Local downstream partners will be crucial to distribute and manage satellite services on a regional scale.

3. Keeping a close eye on government opportunities: Rwanda is a very recent example of how governments are taking interest



in the satellite markets. Therefore, tracking and monitoring government satellite opportunities may open new avenues in the rural broadband connectivity market. What does the future look like? According to GSMA's 2021 report, Sub-Saharan Africa is the region with the largest coverage gap, standing at 19%. This scenario presents a promising picture that though the COVID-19 pandemic had a significant impact on the satellite industry, Africa is successfully surfing through this wave. Considering the global competition in the connectivity markets, Africa is yet to fully experience the 4G connectivity. But as new

entrants like OneWeb and SpaceX's Starlink roll out their services, Africa will potentially record rapid changes in the downstream satellite market. Considering the overall technological and satellite business outlook, Africa's internet penetration rate might be doubled in this decade mainly due to the ambitious and extensive connectivity plans rolled out by LEO satellite operators.



Omkar Nikam is an independent space and satellite consultant based in Strasbourg, France. He has eight years of experience in technology and business consulting. He is also the EMEA correspondent for Satellite Markets & Research, USA. Omkar specializes in



Satellite Data Analytics

by Prateek Yadav

The global satellite industry has evolved considerably in the past decade. Technological developments have led to the commercial coming-of-age of small satellites and enhancements in the satellite imagery resolution, stimulating the growth of pioneering firms that are reshaping the industry from inside. There

is an increase in the number of remote sensing and earth observation satellites, and they are collecting huge volumes of data and information about what is happening on Earth. The collected data itself is a valuable commodity, and many firms with integration of artificial intelligence and machine learning technology are able to analyze it with extraordinary efficacy to bring commanding insights for customers. For instance, with effective integration of machine learning and satellite imagery and other data sets, companies like EarthDaily Analytics are able to forecast the information related crop yields, giving customers a competitive edge.

Artificial Intelligence based platforms offer insights on previously inaccessible aspects such as industrial, social, and economic procedures. In addition, machine learning procedures are progressively used to process daily satellite imagery to classify, detect, and analyze objects, locate topographic and geographic features, and observe small

variations over a period of time. Furthermore, machine learning and artificial intelligence automated algorithms can precisely perceive numerous things noticeable on earth from the space such as cars at parking lots, crop yield and geo-sensing in agricultural fields. Moreover, integration of satellite imagery with cloud computing allows researchers to access imagery data from remote

locations.

Factors, such as rise in adoption of cloud computing, machine learning coupled with artificial intelligence in the space industry, are foreseen to reinforce the growth scenario of the satellite data analytics ser-

vices market in upcoming years. For instance, in June 2019, Lockheed Martin launched Global Automated Target Recognition (GATR) which is an artificial intelligence-based satellite image identification platform, the platform makes use of open-source deep learning libraries to perceive and classify large datasets proficiently. Moreover, the companies are making different strategic moves to bring the change. For instance, in March 2021, BlackSky Holding, Inc. entered into a partnership with ST engineering Geo-Insights, an earth observation and geospatial analytics company to offer expanded satellite imaging solutions and analytics insights portfolio for the customers in Southeast Asia region.



Some of the prominent players operating in the satellite data analytics services market are Orbital Insights, Planet Labs Inc., Spire, and Maxar Technologies. In the past few years, the satellite data analytics services market has witnessed several developments in the form of partnerships, product developments, and others, which indicate optimistic growth of the market and signifies firm progress in the future. For instance, in August 2021, Planet Labs expanded its partnership with Google Cloud. Under this new agreement, Google Cloud and Planet Labs will work together to create combined solutions that integrate Planet Labs' high-frequency Earth observation data with Google Cloud's cloud-based substructure to allow to achieve improved data-driven decision-making. In October 2020, European Space Imaging entered into a strategic partnership with Satellogic, satellite imagery, and satellite data analytics companies to increase tasking capabilities and introduce hyperspectral imagery to customers. Further, it will also provide sales and tasking abilities along with introducing hyperspectral images to customers.

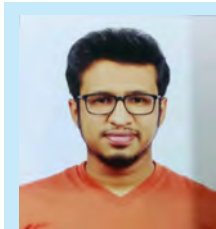
Impact of COVID-19

The COVID-19 crisis led to inimical economic situations in the market across the globe. The measures to contain the spread of the virus resulted in massive disruption in supply chains, declining business revenues, and increased panic among customers. Governments of different nations imposed stringent lockdowns and momentary closure of manufacturing units that impacted the overall production and sales across all areas. The satellite data analytics services market also witnessed a slight downturn in 2020 owing to the COVID-19 crisis. International lockdowns impacted the design, research & development, and manufacturing & launch activities of companies active in the satellite data analytics services market. Stressed global markets with a great emphasis on undertaking the adverse economic situations, owing to the pandemic are also foreseen to cause uncertainty in demand for a considerable number of years.

The COVID-19 pandemic indirectly forced several nations to reschedule the satellite launch activities and manipulate their operations such as signing partnership deals with private players. The pandemic led to the post-

ponement of satellite assignments planned for the launch in 2020. For instance, the Indian Space Research Organization (ISRO) postponed the launch of the GSat-1 satellite owing to the nationwide lockdown imposed to check the spread of the virus. Moreover, Companies like SpaceX uses liquid oxygen (LOX) as propellant for rocket launches. Now, liquid oxygen shortages caused by the COVID-19 pandemic foreseen to hamper the launches. In August 2021, president and CEO of SpaceX mentioned in 36th annual Space Symposium that shortage of liquid oxygen caused by the pandemic is foreseen to hamper the future launch activities in short term as many launch providers rely on liquid oxygen as a propellant which could indirectly affect the satellite data analytics services market. However, with the vaccination drive across the globe, the COVID-19 pandemic is predicted to vanish steadily over the years while the space sector is foreseen to regain considerable traction in upcoming years. 🌍

Satellite Data Analytics Services Market-Download Report (240 Pages PDF with Insights, Charts, Tables, Figures) at: <https://www.alliedmarketresearch.com/request-sample/9421>



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Satellites by the Dozen

The year was 1908 and the automobile was the prestige product of the age. Designed by brilliant engineers with names like Daimler and Benz, they were built one at a time by skilled craftsmen and sold in small numbers to the very wealthy.

In that year of 1908, it all changed – because that was the year when the first Model T rolled off Henry Ford’s assembly line. The car cost 23,000 of today’s dollars, and the price fell every year until – a decade later – Model Ts made up half of all cars in America.

Ford conquered the market by making cars simpler and more standard, and by creating that famous assembly line to produce them in large numbers with consistent quality.

Today, that same revolution is coming to a product that is literally out of this world. For decades, skilled engineers and technicians have been building satellites designed for unique missions and making them one at a time. They have delivered one or two dozen per year, each with a high price tag and each designed to operate for decades in high orbit around Earth.

But the business of space is changing as companies begin putting dozens or hundreds or thousands of satellites in orbit. Satellites whose cameras reveal Earth’s secrets in astounding new detail. Satellites whose antennas bring high-capacity communication to the remotest corners of the globe.

Space is nothing like the roads traveled by the Model T. It is airless, freezing cold and blazing hot, and flooded with radiation. Building for it is hard. But the assembly line has come to the manufacturing of satellites, and nothing will ever be the same again.

Two Weeks to Build a Satellite

In a new factory near Cape Canaveral, Florida,

OneWeb Satellites operates the most automated assembly lines in the business. They run in a clean room the size of 24 basketball courts that keeps them free of contaminants that could lead to failure in space.

Components arrive at the building in a steady stream from a supply chain that stretches around the world. Two weeks later, finished satellites emerge from the other side at a rate of up to two per day.



In between is the assembly line, where engineers, technicians, tools and robotics take part in a complex dance of creation. They build components into standard modules, and automated vehicles carry them to an assembly station, where teams assemble them into finished satellites. At each

step, there are automated tests to check quality. Satellites that fail are sidelined for repair.

And the testing isn’t finished when the satellite is in one piece. It goes next into one of 32 special chambers for two days of testing to make sure it can survive the trauma of rocket launch and work reliably in the airless, blazing and freezing conditions it will meet in space.

Only when it has passed this battery of tests is it ready to be racked and stacked for its journey to the launch pad.

The Space Economy

Forecasters see an exciting future for space and satellite. Step by step, we are laying the foundations of a 1 trillion-dollar space economy reaching from the Earth to the Moon and Mars. And with each step, life on Earth gets better. Fewer lives are lost to disaster, disease and poverty. More food reaches the hungriest thanks to data from space. More people connect to broadband by satellite. And new industries begin putting the limitless resources of space to work for everyone.

Rocket launches are thrilling – and rocket landings are a marvel. But it is on the humble assembly line that the future is taking shape every day.



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The wide coverage areas of Yamal satellites enable communication services delivery to different parts of the world for the purposes of Oil & Gas, Government, Aviation, Maritime, Education and Emergency segments. Yamal Satellite Capacity is successfully used for communication links and data transmission, TV distribution, occasional use, trunking, backhaul, inflight and maritime connectivity.



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Dead Ringers

by Lou Zacharilla

According to legendary astrophysicist Neil deGrasse Tyson, the phrase “dead ringer” comes from the days when, upon the death of a person, putting a mirror up to their mouth would prove whether the person were living or, if there was no fog on the glass, had joined the chorus of angels and deorbited satellites. Mind you even then there was healthy skepticism among the scientific crowd. So, when a person was buried, a string was run from their coffin to a post or a tree upon which a bell was attached to the end of the string. If a person decided his time had not yet come, or he or she didn’t like what they were seeing Up There (or down under), they pulled the string and rang the bell. Rather than room service or a French pastry clerk appearing, they would be dug up! If there was any justice after a misdiagnosis in those days before malpractice law, hopefully an apology, a beverage and bath were offered.

I suppose it doesn’t take courage to be buried alive involuntarily, but it surely led to a re-evaluation of how to not let things go so wrong for so long. Ultimately, as all skepticism and awareness does, it led to courageous actions and the advance of science.

“Courage” has been called the first virtue. Laurence G. Boldt wrote that “we have no greater enemy than fear. It hems us in (buries us alive) and sucks the joy from life. It leaves us with disgust for ourselves even.” If it takes courage (I like the word “guts,” because it’s more visceral, though less appetizing) to attempt great things and reach true human merit, it takes even more, says Boldt, “to be what we truly are.”

It is plain to see that over the past three years, the space and satellite community has been ringing that bell loud and digging has been going extremely well. What is being resurrected is the core value that, in my view, started to stir back to life when SSPI launched its Better

Satellite World campaign in 2016. www.bettersatellite-world.com

The industry has been growing in diversity of gender, especially when we look at this year’s Future Leaders (Promise Award) recipients and selections. <https://www.sspi.org/cpages/promise-mentor-awards>

They are part of a gang of 20 under 35 years-old who their elders believe are the future of the industry. Very much fogging that mirror with the breath of possibility in every field of discipline we offer.

Similarly, in New York, the Space Business Roundtable has been revived thanks to the New York Space Alliance and the Luxembourg Trade and Investment Office. In September I worked with them to relaunch

a regular series every third Wednesday that in 2021 is focused on ESG. In November we will bring Sabrina Alam, who leads the ESG and Sustainability effort at SES Satellites to the table along with a very interesting voice on the topic, the contrarian writer/researcher Richard Morrison from the Competitive Enterprise Institute to untangle and unpack this issue further. <https://www.sspi.org/events/new-york-space-business-roundtable-esg-social-factors-of-the-new-space-economy>.


These are just a few of initiatives underway that are ringing the bell of the future. “The ESG issue,” according to Hoyt Davidson of investment bank concern Near Earth LLC, “is now on the spreadsheet and part of the evaluation for a company seeking to do a deal.” So the money guys, usually near the end of the line to sign-up for a leap into the grave of moral soil have said that this issue is alive.

I believe it speaks well for an industry that will, if the vision of the great science fiction writers and thinkers

“...If a person decided his time had not yet come, or he or she didn’t like what they were seeing Up There (or down under), they pulled the string and rang the bell...”

is accurate, lead the species toward a destiny so big and unimaginable and transformative that it requires great faith to think we will get it right; to show human potential as we seek the heavens and a destiny clearly implanted but, as Boldt wrote, not fully known because we do not yet fully know who we are. But we claim to be moral beings so let's see if this goes side-by-side with our business drive. It begins with individual acts and decisions.

“My first act of free will,” said psychologist William James, “is to believe in free will.” Nicole Robinson, president of URSA Space decided that it was time to form an organization and advocate for the growing voice of women in the industry. The take-up has been like a tsunami. SSPI-WISE is the association's fastest growing special interest group. This proves, again, that it takes someone to pull that string, find that courage and start to excavate Life.

But it cannot end there. Do-it-yourselfing on this issue does not scale. We all need to invest. 



Lou Zacharilla is the Director of Innovation and Development of the Space and Satellite Professionals International (SSPI). He can be reached at: LZacharilla@sspi.org



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Ground Segment: All Change for a New Satcoms Era

by **Martin Jarrold**

As we as an industry begin returning to the interactive normality which flourished pre-pandemic, our daily pattern of work continues to be significantly influenced by the advantages of the virtual meeting experience. ‘Zoom’-ing for webinars, brainstorming on ‘Teams’, and discussing urgent agenda items on other cyberspace platforms remains as a useful tool. The GVF Webinar Series, which is nearing its 40th event, continues as a great exemplar of this. The Series’ statistics speak for themselves – 16,000 views, viewers from 155 countries, around 150 featured panelists from the satellite industry and its wider stakeholders.

In December, we will reflect on the year gone by, and forecast on the 12 months to come, in an event entitled ‘Satellite Industry Trends: A Year to Remember, A Year Ahead’. Prior to this, November’s webinar, ‘Ground Segment: All Change for

a New Satcoms Era’, takes place at 3:00pm UK time on the 18th of the month, and (at time of writing) is scheduled to feature senior personnel from GVF member organizations Alcan, C-COM Satellite Systems, Comtech EF Data, and Global Invacom Group, with moderation by NSR.



Perusal of the webinar archive on the GVF website (<https://gvf.org/webinars/>) provides illustration of the series’ previous focus on a range of satellite communications ground segment topics, for example:

- Transformational Antennas – End of the Parabolic Paradigm? (30 July 2020)
- Transformational Antennas



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– Will Terminals Realize the Promised LEO Connectivity Revolution? (13 August 2020)

- Trends and Innovations in Transportable SATCOM Ground Terminals (18 February 2021)

- Satellite Networks Solutions: Development & Evolution of Capability & Performance (25 March 2021)

- Terminal Innovation: Leveraging Satellite’s Mobility Sweetspot (13 May 2021)

- Antenna Innovations: Keeping Up With The Rest of the Industry? (24 June 2021)

The November event will continue the analysis of ground segment, which has all too often been considered the less interesting, non-identical twin, to the satellites

we place into orbit. Launches and the orbiting of spacecraft are “sexy”; outdoor and indoor units on Earth do not have the same visual impact. However, all this is changing, and the industry has already coined the name ‘New Ground’ to complement the now quite familiar term ‘New Space’. With the digital divide having become more obvious than ever, the launching new satellites into various orbits is opening the door to more real-time connectivity, but all the new connectivity possibilities – from higher frequencies, lower latency, higher throughput, and gain – will only be fully leveraged from automation of networks on the ground and new antennas that can receive and transmit satellite signals efficiently across different satellites and constellations. Perspectives to be included in discussion of ‘Ground Segment: All Change for a New Satcoms Era’ will be on forging partnership ecosystems, the latest open architecture Network Function Virtualization and optimization developments, and innovative steerable, application-specific, antenna technology development.

Webinar-related ‘Zoom’-ing during the COVID-19 emergency has illuminated our critical dependence on our communications connectivity. As the 5G world emerges, it is clear that the “Network of Networks” will only be realized through the advantages of satellite communications – Non-Terrestrial Networks (NTN). The first quarter of 2022 will see promulgation of Release 17 from the 3GPP standards body, clearly

ground-segment technology to market, and thereby advancing the competitiveness of satellite communications. This commitment has largely been expressed through the work of the GVF Mutual Recognition Arrangement Working Group (MRA-WG) which was formed to develop a consensus-based framework to improve the efficiency of satellite operators’ terminals type-approval procedures.

Using this framework, once a type-approval is provided to a manufacturer by any participating satellite operator, other operators may mutually recognize the results of the tests conducted during the first operator’s type-approval process, so that tests are not repeated unnecessarily. The MRA-WG

procedure defines a set of standard tests that an antenna or earth station manufacturer should perform in order to apply for type approval from any satellite operator, thus improving the quality and completeness of test data, helping increase R&D and factory testing efficiency.

In furtherance of the desirability for operators to work with antenna manufacturers to improve the antenna terminal qualification process, GVF and the SOMAP group

Ground Segment: CHANGE For a New Satcoms Era

MODERATOR

PANELISTS

Jose Del Rosario
Consultant
Northern Sky Research

Dr. Vagan Shakhgildian
President of Comtech SNT -
Commercial Group
Comtech

Dr. Onur Karabey
Founder & CEO
Alcan Systems

Tony Taylor
Chairman & CEO
Global InvaCom Group

Dr. Leslie Klein
President & CEO
C-CDM Satellite Systems

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codifying the role of NTNs. However, challenges remain such as latency minimization, spectrum scarcity, energy consumption reduction, localization and integration issues, Quality of Experience guarantees, and the support of multiple heterogeneous services, i.e., IoT/M2M and high rate video services.

GVF has a long-standing commitment to satellite equipment quality assurance, to reducing the time and cost required to bring new



1.35M FIT

FLEXIBLE INTEGRATED TERMINAL

MANUAL POINT
OR AUTO-ACQUIRE FLYAWAY
TRI-BAND CONFIGURABLE

AvL's 1.35M FLEXIBLE INTEGRATED TERMINAL IS A FULL-FEATURED TRI-BAND (X, KU OR KA) TERMINAL WITH A COMPACT PACK-UP INTO 2 IATA CHECKABLE CASES.

Operated manually or motorized with auto-acquire, the terminal's optional AvL antenna control system automatically acquires and tracks satellite beacons with an internal receiver. The antenna is ODU and modem agnostic, and optionally provided with multiple modem options.

- ◆ Tri-band: X-, Ku- or Ka-band wideband
- ◆ Configurable with Ka-band certified modems
- ◆ Axisymmetric 1.35m 12-piece carbon fiber reflector
- ◆ AvL Cable Drive pedestal with integral base and tripod
- ◆ High-wind stability kit
- ◆ Quick band changes & multiple RF packages available
- ◆ Standard 2-port feeds & optional 3-port
- ◆ Pre-configured SSPA/LNB kits
- ◆ Optional AvL terminal power supply



of satellite operators (AsiaSat, Eutelsat, Inmarsat, Intelsat and SES) collaborated to produce guidance for antenna manufacturers regarding expectations for new antenna products, and how to demonstrate compliance with the Satellite Operators' Minimum Antenna Performance specifications. SOMAP offers consistency across the industry for customers and antenna manufacturers, with the group having the final authority for resolving questions regarding the compliance of a particular product. It does not replace the formal type approval procedures for each of the operators, but establishes minimum performance that each of the operators expect when deploying equipment which has not been formally type approved; it does not introduce another standard to replace existing standards originating from ITU, FCC or ETSI, for example, which remain in place, as do the antenna performance requirements which every satellite operator defines themselves.

Proliferation of COTM antenna/terminal products required development of an appropriate test methodology for qualifying such terminals, as exemplified in one facet of the MRA-WG terminal performance and test guidelines set-out in the GVF-10x series documents comprising the terminal type-approvals procedures. (See <https://gvf.org/working-groups/> for more detail.)

GVF collaboration with one of its members on a joint project – Standards Preparation for Satcom on the Move Terminals – under the European Space Agency (ESA) ARTES (Advanced Research in Tele-

“...Proliferation of Comms on the Move (COTM) antenna/terminal products required development of an appropriate test methodology for qualifying such terminals ...”

communications Systems) program, has been followed with a further partnership with another member developing a novel approach for conducting on-site antenna verification using Unmanned Aerial Systems (UAS) which avoids the need to transport antennas under test to an outdoor far-field antenna range.

The GVF-10x terminal type-approvals procedures documentation series, and the SOMAP requirements, were identified as directly linked with the UAS system technology development, with the space agency recognizing the value of this technology. ESA has awarded the member company a contract to develop and validate the technology with support from GVF in the form of technical advice. GVF's recognition of the importance and innovative significance of the technology and product development potential was, and remains, rooted in its contribution to the satellite communications industry's objective of improving the effectiveness of type-approvals processes.

Antenna testing using traditional methods can be expensive and logis-

tically difficult. The multiple antenna testing standards set out by governments or commercial bodies have at their core current test range facilities and many testing requirements have been set, based on their technical capabilities and limitations. With the drone-based measurement technology satellite antennas can be tested anywhere, easily and effectively, a change recognised by satellite operators as better enabling industry growth and innovation.

If you're reading this before 18th November you can register to attend 'Ground Segment: All Change for a New Satcoms Era' at <https://gvf.org/webinar/ground-segment-change-for-a-new-satcoms-era/> and, if after the 18th, you can use the same link to watch the video recording, on-demand and free-of-charge.

Until next time... Keep well, stay safe!



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Tailwind Two Acquisition Corp. to Acquire Terran Orbital

New York, NY, October 28, 2021--Tailwind Two Acquisition Corp. (NYSE:TWNT), a special purpose acquisition company (SPAC), and Terran Orbital Corporation, an operator of small satellites and provider of earth observation solutions, jointly announced today that they have entered into a definitive business combination agreement. Upon the closing of the transaction, the combined company will operate as Terran Orbital Corporation, with plans to list on the NYSE under the symbol LLAP. The pro forma total enterprise value of the combined companies is approximately US\$ 1.58 billion. The transaction is expected to close in the first quarter of 2022.

The transaction is supported by gross proceeds of US\$ 345 million from Tailwind Two's cash-in-trust, US\$ 50 million from a PIPE with participation from AE Industrial Partners, long-term Terran Orbital investor Beach Point Capital, Daniel Staton [1], Lockheed Martin and Fuel Venture Capital, as well as US\$ 75 million of additional financial commitments from Francisco Partners and Beach Point Capital. In connection with the closing of the transaction, up to an additional US\$ 125 million in debt commitments from Francisco Partners and Lockheed Martin may be available subject to certain conditions. Existing Terran Orbital shareholders will roll 100% of their equity into the combined company.

On September 27th, Terran Orbital announced plans to develop a US\$ 300 million, 660,000 sq.ft. space manufacturing facility on the Space Coast of Florida. Upon completion, the newly constructed facility is expected to become one of the most advanced, largest vertically integrated satellite manufacturing facilities in the world, capable of producing over 1,000 satellites and space vehicles annually.

"Terran Orbital is the largest independently-owned manufacturer of small satellites in the United States, serving national interests and enabling our customers to leverage the strength of our platform and insights. With our high volume, innovative manufacturing of small satellites, we will be able to deliver emerging technologies to space faster, more affordably and with greater reliability than anyone. Fundamentally, we are creating the new SaaS, Satellites-as-a-Service," said Marc Bell, Co-Founder and CEO of Terran Orbital. "In addition, our industry-leading earth observation constellation will deliver images of any geography on earth, at any time of day or night, within minutes. This capability will unlock a high-growth, high-margin data-as-a-service business model that will be truly transformational for Terran Orbital, its customers and investors," he added.

"Terran Orbital offers an outstanding solution to address the increasing demand for cost-effective data that is only available from space," said Philip Krim, Chairman of Tailwind

Two. "Tens of thousands of small satellites will be launched over the next decade, and Terran Orbital is ideally positioned to meet this demand, offering the most innovative, cost-effective small satellites that can meet the data demands for governments and corporations. Similarly, Terran Orbital's own earth observation constellation will make the most technologically advanced data about our planet commercially available, which will unlock new markets for data and insights across industries," he added.

"At Lockheed Martin, supporting our customers' missions means not only delivering the most innovative products and services, but also collaborating with future-forward teams," said Rick Ambrose, Executive Vice President, Lockheed Martin Space. "We actively pursue working with organizations that are developing disruptive technologies and leveraging alternative business models. Our experience with Tyvak, which is part of Terran Orbital, has helped us expand our core capabilities to enable hybrid, networked architectures and we look forward to continuing to work together for the benefit of our customers," he added.

Terran Orbital and Tailwind Two's boards of directors have unanimously approved the proposed business combination. Completion of the proposed business combination is subject to approval by Tailwind Two's shareholders and the satisfaction or waiver of other customary closing conditions identified in the Agreement and Plan of Merger entered into by Terran Orbital and Tailwind Two.

Jefferies is serving as sole placement agent on the PIPE and exclusive capital markets advisor to Tailwind Two. Goldman Sachs is serving as financial advisor to Tailwind Two. Houlihan Lokey provided additional financial advice to Tailwind Two. Jefferies is serving as exclusive financial advisor and capital markets advisor to Terran Orbital. Kirkland & Ellis LLP is acting as legal counsel to Tailwind Two and Akin Gump Strauss Hauer & Feld LLP is acting as legal counsel to Terran Orbital.



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Avinash Kaul
Chief Executive Officer
Network18
Managing Director
A+E Networks, TV18



Tina Arwin
Chief Content Officer
Vidio



Tony Zameczkowski
Vice President
Business Development
Asia
Netflix



Beatrice Lee
Chief Executive Officer
Asia Pacific
Rock Entertainment



Khairul Anwar Salleh
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Hughes CEO Pradman Kaul Receives 2021 AIAA Aerospace Comm Award

Germantown, MD, September 28, 2021—The American Institute of Aeronautics and Astronautics (AIAA) awarded **Pradman P. Kaul**, president and CEO of Hughes, the 2021 Aerospace Communications Award.



Pradman Kaul

Kaul received the award, which recognizes outstanding contributions in the field of aerospace communications, for his leadership in the creation and development of the very small aperture terminal (VSAT) and its significance to the satellite communications industry.

“Thank you to the AIAA for this honor. It reflects the innovations and contributions of a long line of engineers at Hughes with whom I have had the privilege of working,” said Pradman P. Kaul, president and CEO at Hughes. “As we celebrate half a century since the start of Hughes, I continue to be amazed and humbled by what our industry has accomplished and how much we still stand to achieve,” he added.

A breakthrough technology in the 1980s, the VSAT commercialized satellite enterprise networks and effectively launched today’s multi-billion-dollar global satellite networking business. As of this year, Hughes has manufactured and shipped more than nine million VSAT terminals of all kinds for customers around the world, representing more than 50% of the global VSAT market share.

“Kaul played a pivotal role in the development of satellite industry innovations that deliver immeasurable

economic and societal benefits every day to consumers, enterprises and governments worldwide,” said Denis Curtin, Fellow, AIAA. “In an exciting time in aerospace communications, we’re pleased to recognize his trailblazing work and a legacy that will echo across the industry for decades to come,” he added.

Intelsat CEO Stephen Spengler to Retire

McLean, Va. October 21, 2021—Satellite operator Intelsat S.A. (OTC: INTEQ) announced today that Chief Executive Officer Stephen Spengler has decided to retire as CEO upon the company’s emergence from its financial restructuring process and the naming of a successor. Until that time, Spengler will continue as CEO and lead Intelsat through the final stages of this process, ensuring a smooth transition.



Stephen Spengler

“We are nearing the conclusion of our restructuring with enhanced financial strength and are ideally positioned to embark on an exciting new business strategy for the next generation of 5G network connectivity,” Spengler said. “This is the right moment to make my retirement plans clear so that work can begin on identifying a new leader for the long term.”

Dave McGlade, Chairman of the Board, said, “Steve has served Intelsat for more than 18 years in various senior leadership capacities and as CEO for the last six and a half years. His deep understanding of our customers’ needs resulted in many years of commercial success. His steadfast stewardship of the Company as we undertook our financial restructuring has also been commendable. He has helped build the foundation for a strong future, and we are grateful.”

Egon Zehnder, a leading executive search firm, has been engaged to lead the search process for a new CEO.

Eutelsat CEO Rodolphe Belmer to Step Down

Paris, France, October 20, 2021—Eutelsat Communications (Euronext Paris: ETL) Chief Executive Officer Rodolphe Belmer has notified the board of directors of his intention to step down at the beginning of 2022. Rodolphe Belmer has been CEO of Eutelsat since March 2016, during which time he has successfully implemented a strategy of strict operating and financial discipline and set the company firmly on its strategic path to address the opportunities of the connectivity sector according to the company. Eutelsat is now in the process of recruiting a successor. In the meantime, Rodolphe will remain in his position until a successor is named.

Dominique D’Hinnin, Chairman of the Board of Eutelsat: “Rodolphe has made a fantastic contribution to the development of Eutelsat during his more than five years at its helm, putting the company on the strong financial and strategic footing on which it finds itself today. It has been my great personal pleasure to work alongside Rodolphe, and I thank him warmly for his contribution to Eutelsat on behalf of the entire Board. We are fully focused on finding a successor to Rodolphe who will continue to lead the company on this strategic path.”



Rodolphe Belmer

Rodolphe Belmer commented: “It has been my great pleasure to lead this fantastic company for the last six years and to executing its telecom pivot. It has been an exciting time both professionally and also personally.”



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The Global 5G Satellite Communication Market to Grow at a CAGR of 28.91% from 2021-26

Dublin, Ireland, November 1, 2021--According to new research from Research and Markets entitled “Global 5G Satellite Communication Market Analysis, 2021, the market is likely to grow at a CAGR of around 28.91% during 2021-26. It owes to the significant changes in the consumer demand for better and improved bandwidth, seamless connectivity, and low latency. Additionally, high-speed internet connectivity and enhanced safety measures to support multiple end-user industries like aviation, transportation & logistics, consumer electronics, energy & utilities, and heavy industries are also crucial factors further propelling the market growth.



Impact of COVID-19

The COVID-19 pandemic has negatively impacted the Global 5G Satellite Communication industry in recent years, leading to unexpected disruptions in the supply chain and hindering the availability of raw materials across regions. The pandemic further brought numerous challenges like logistics difficulties, lowered production, unavailability of materials, etc. The most severely affected industries were aviation, maritime, and communication that witnessed a decline in investments.

Market Segmentation: Communication-on-the-Move Solution to Hold the Largest Market Share

Based on the solution, the Communication-on-the-Move segment shall attain the largest market share in the coming years due to the soaring demand for installing various telecom towers for better reachability across regions and the surging adoption of Smart devices among people, thereby driving the growth of the Global 5G Satellite Communication Market in the forecast years.

Media & Entertainment Acquired the Largest Market Share

Based on the End-User, the Media & Entertainment segment acquired the largest share in the Global 5G Satellite Communication Market in the previous few years due to

the increasing use of satellites for broadcasting owing to its seamless remote coverage. Alongside that, with massive investments by governments and manufacturers, this segment shall continue to attain the largest share in the forecast years, reveals the author in their research report, Global 5G Satellite Communication Market Analysis, 2021.

Regional Landscape: Asia-Pacific to Attain the Fastest Market Growth


The Asia Pacific region shall grab the fastest growth with the highest CAGR in the forecast period, owing to countries like China and Japan being the major contributors in Asia-Pacific. Factors like the exponential

use of satellite antennas in Telecommunication, Aerospace & IT, and Automobile Industries are immensely supporting its high demand in the region. Hence it is likely to witness the fastest market growth in the years to come.

Market Driver

The rapidly increasing growth of the Global 5G Satellite Communication market drives due to the burgeoning demand to cater to a wide range of applications and eliminate existing technological problems. The high bandwidth, low latency, high system spectral efficiency, high system spectral efficiency, and reduced energy consumption are the performance parameters in the market. Due to the robust demand for the 5G network in multiple applications, a surge to enhance the existing infrastructure to cater to the technological needs for the 5G satellite communication networks is also likely to take the market ahead in the forecast period.

Competitive Landscape

According to the report, the major leading players in the Global 5G Satellite Communication Market are Eutelsat S.A., Airbus S.A.S, Avanti Communications Group PLC, Gilat Satellite Networks, GomSpace A/S, OHB SE, Quortus, SpaceX, The Boeing Company, and the Thales Group. 

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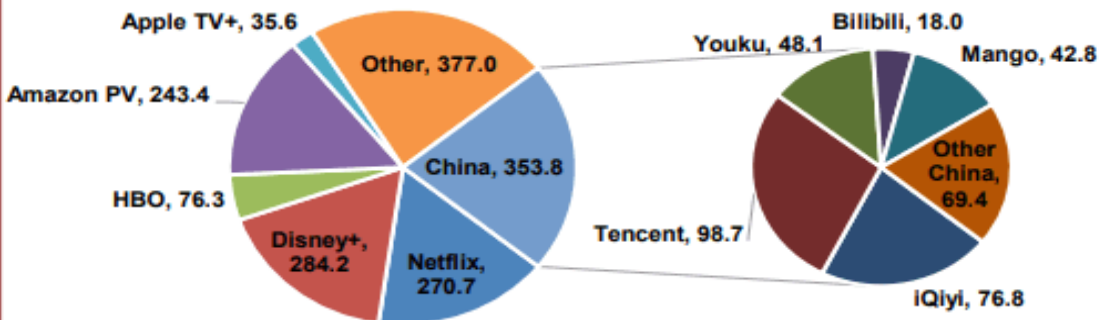


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VITAL STATS

Global SVOD subscribers by platform in 2026 (million)



Source: Digital TV Research