

Satellite Executive BRIEFING

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Industry Trends, News Analysis, Market Intelligence and Opportunities

The Military Satellite Market

by Virgil Labrador

The commercial and military satellite market is expected to grow at a Compounded Annual Growth Rate (CAGR) of 76.6% a cumulative US \$195.11 billion over the period 2020-2028 according to Research and Markets.

Military satellites are a measure of the nation's military strength, operability, and the ability to attack or defend itself. These satellites give the military real-time data of movement of troops and arsenal in the enemy borders. They also facilitate high-bandwidth communication over secure channels, track and target enemy encroachment or intruding vehicles, and other military functions. Militaries, across the globe,



are strengthening Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems that essentially need strong and secure communication channels accessible from anywhere by

the defense forces. The C4ISR systems market is slated to grow in response to the increasing demand for better security, control, and co-ordination. This will increase the demand in favor of military communication and Intelligence, Surveillance, and Reconnaissance (ISR) satellites, during the forecast period, according to the report.

The micro, nano, and pi-
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Super November



Satellite industry trade shows are playing catch up after postponements due to the the global COVID-19 pandemic. During the week of November 9-13, there are several shows being held concurrently in the virtual space including Euroconsult's World Satellite Business Week, Africom, CABSAT, Global Milsatcom and the AVIA Video Summit. This is certainly a good sign that trade shows are on its way back and by extension the industry as whole.

Most encouraging is that one of the aforementioned shows, the AVIA Video Summit is a hybrid show, with both a virtual and live component for participants in Singapore. Hybrid shows bode well for the return of live events next year. Being able to attend live events again is the one of the common wish expressed by executives I interviewed in our weekly Satellite MarketCast podcasts. If you haven't listened to our podcast, go to <http://www.satellitemarkets.com/marketcast-2020> or visit our Youtube Satellite MarketCast channel.

We are all looking forward to meeting you all again next year in a satellite show. Meanwhile, we have ample means of connecting through our various digital channels through www.satellitemarkets.com, our Facebook page: <https://www.facebook.com/satellitemarketbriefs>, on Twitter @SatelliteBrief and on LinkedIn at: www.linkedin.com/in/virgillabrador/

Let's keep in touch!

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Military Satellite Market

from page 1

co-sized satellites are mass produced satellite systems available in market, and are currently in service. Since the introduction of nano satellites in 2013, 94 nano satellites were launched into orbit within a year. Following this, the launch cost per nano satellites went up due to the demand. It is expected that, by the end of 2020, there will be over 1000 nano satellites orbiting earth according to Research and Markets.

Asia-Pacific to Drive Growth

The US is the largest market for military satellites followed by China, UK, India, Russia, Germany, and France. Countries like Pakistan, Egypt, Nigeria, Algeria, Ukraine, South Africa, Bra-

“...Militaries, across the globe, are strengthening Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems that essentially need strong and secure communication channels accessible from anywhere...”

zil, Japan, Canada, Indonesia, Singapore and Middle Eastern countries are driving demand for military satellite communications.

The Asia Pacific region is anticipated to have the highest growth during the forecast period, owing to growth in military satellite development in this region by countries like China, India, Japan, and South Korea among others. Japan has launched its first military satellite in Jan 2017 and by the end of the Jun 2018, the country has launched 8 intelligence-gathering satellites into the orbit. South Korea is also currently de-

veloping a constellation of five high-power military surveillance satellites under the project called “Project 425”. Republic of Korea’s (ROK’s) Defense Acquisition Program Administration (DAPA) has invested about USD 900 million for this project and has selected Korean Aerospace Industries, Hanwha Systems and Thales Alenia Space for this project. Project 425 is expected to be deployed in 2023. Other than these countries, China and India are also investing in satellite technology improving their communication capacity.

In recent years usage of com-

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mercial capacity has been growing, and NSR is predicting a CAGR of almost 32% over a ten-year period to 2028, rising from consumption of 30 Gbps in 2018 to 480 Gbps in 2028. Bulk leasing will account for almost 40% of that capacity by 2028.

Military Satellite Terminals

The Strategy Analytics Advanced Defense Systems (ADS) report “Global Military Satellite Terminal Market and Technology Forecast: 2018 - 2028” forecasts that the need for terrestrial terminals to incorporate more reconfigurability, capacity, and capabilities will propel satellite terminal revenue past US\$ 6 billion in 2028.

According to ADS, GaN device performance will enable improved RF capabilities in the terminals, pushing GaN revenue to a CAGR exceeding 20 percent over the forecast period from 2018 to 2028.

Among the key findings of the report include:

- VSAT systems are incorporating software-defined architectures to increase capabilities.
- Systems are also going higher in frequency and working with broader bandwidths to address the need for more data capacity and capabilities.
- VSAT radios and systems are also being called upon to provide more connectivity between platforms and domains.
- Land-based VSAT systems will represent a dominant opportunity in terms of both

expenditures and shipments.

- North America will continue to provide the largest regional market opportunity for the VSAT and component suppliers.

COVID-19 Impact

The current global COVID--19 pandemic has dampened key vertical markets for satcoms such as the aeronautical and maritime markets. Companies who have heavily invested in these markets are scrambling for alternative markets to meet the shortfall in revenues as the aero and maritime markets will take some time to recover. The military and government markets, however, does not seem to have been affected by the pandemic. In fact, according to several satellite executives I interviewed, they expect revenues from military satellite market to grow and are bullish about new opportunities such as Unmanned Aerial Vehicles (UAVs) and Cybersecurity, among others.

Conclusion

The government and military segment will remain the dominant revenue generator for satellite services, as it shifts its focus



Virgil Labrador is the Editor-in-Chief of Los Angeles, California-based Satellite Markets and Research which publishes a web portal on the satellite industry www.satellitemarkets.com, the monthly Satellite Executive Briefing magazine and occasional industry reports called MarketBriefs. Virgil is one of the few trade journalists who has a proven track record working in the commercial satellite industry. He worked as a senior executive for a teleport in Singapore, the Asia Broadcast Center, then owned by the US broadcasting company CBS. He has co-authored two books on the history of satellite communications and satellite technology. He holds a Master's in Communications Management from the University of Southern California (USC). He can be reached at virgil@satellitemarkets.com

For further information read or download a pdf of the MarketBrief report on the Military Satellite Market go to:

www.satellitemarkets.com/pdf/pdf2020/military-marketbrief..pdf



to constellations and missions beyond Low Earth Orbits, with more than US\$ 387 Billion in cumulative revenues according to an NSR report issued in June 2020.

From all indicators, the military satellite market will grow at a healthy pace in the next few years. It's not the easiest market to get into, especially if you are a start-up, but it can pay dividends in the long-term if you build the right relationships and invest in the key technologies that is driving demand in this market.





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Building a Defense VSAT Network for the Egyptian MOD

The Challenge

The Egyptian Ministry of Defense (MoD), which manages the Egyptian Armed Forces, sought to build a new defense VSAT network that was reliable, secure, and could support a broad range of both fixed and mobile applications.

Just like the majority of the defense agencies, they needed a communications solutions that can handle increasingly complex operations. More and more defense agencies require support for more bandwidth-intensive applications such as Intelligence, Surveillance, Reconnaissance (ISR) as well as new emerging use cases such as the connected

solider and the Internet of Military Things (IoMT). As global operations also grow more dispersed, defense users need persistent connectivity no matter where they are—whether that's a remote outpost, an aircraft, a maritime vessel, an on-the-move vehicle, or all of the above.

Defense users expect their mission-critical communications to work—quickly, securely and easily. They need a network that lets them share sensitive and classified data—whether that's sensor data, video feeds, voice or more—to better coordinate resources and to build a common operating picture. Resilient networks that are available no matter what are key—whether on the move, on the pause, at sea, in the air, under cyber-attack or more.

On the battlefield, communications platforms must adhere to size, weight and power (SWaP) requirements, as satellite terminals need to be transported and sometimes carried into conflict areas. As such, terminals must also be quick and easy to deploy. A platform that can handle these

increasingly complex operations is ST Engineering iDirect's Evolution Defense platform.

The Solution

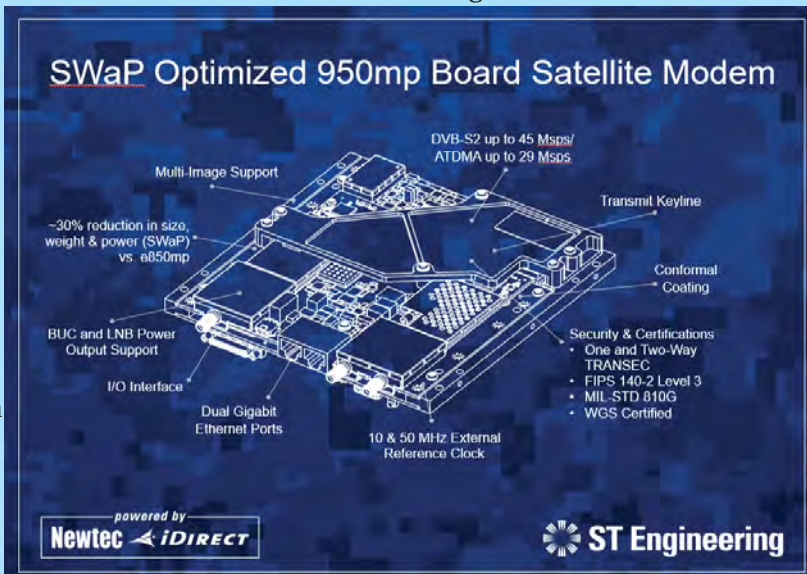
The Egyptian MoD primarily selected the Evolution Defense platform for its scalable and flexible hub solution to respond to multiple requirements. Additionally they needed a platform that had high security standards. ST Engineering iDirect was already the incumbent within the top government agencies and was the market leader among VSAT service providers in Egypt, which facilitated interoperability across agencies.

A key feature is ST Engineering iDirect's TRANSEC capability, which is built into its defense-grade product line and exceeds the requirements set by the Egyptian MoD. Other competitors require a third-party box. ST Engineering iDirect's TRANSEC encrypts everything

from layer 2, data-link layer, and above and adds an extra layer of encryption on top of that. Both one-way and two-way TRANSEC is included.

On the remote side, the 9-Series modems were also a key consideration. The Egyptian MoD equipped their naval ships with 9350 modems, which is designed for high-bandwidth, mobility applications. The SWaP-optimized 950mp is used for troops on the move for its compact size, ease of portability, and low-power requirements.

The Egyptian MoD continues to expand their ST Engineering iDirect network to provide reliable and secure satellite connectivity to their armed forces for mission-critical communications.





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Making Missions Possible

The Internet of Things (IoT) via Satellite Market

by **Bernardo Schneiderman**

An NSR report released last month estimates the Machine to Machine (M2M) and Internet of Things (IoT) via satellite market to reach US \$12.4 Billion from 2019-2029 with small satellites driving growth. Alan Crisp, NSR Senior Analyst and report lead author stated lower price points will unleash unaddressed use cases. Higher volumes will likewise lead to higher ARPUs, changing the overall demand dynamics of numerous verticals. “That is not to say that MSS and VSAT offerings will lose their competitive edge or role in the marketplace. On the contrary, these longstanding platforms will continue to play an enduring role in the IoT growth story,” said Crisp.

NSR identified key growth verticals to watch include Agriculture and Construction will see the strongest increases. The more traditional vertical segments, notably Transportation & Cargo, along with Energy and Maritime, provide a solid revenue base. Not everything is rosy, however. Apart from the challenges posed by COVID-19, funding for small satellite programs, maturing regional or country markets, regulatory challenges, and other macroeconomic factors can all inhibit market growth. One thing remains certain, IoT is an integral part of enterprise networks and consumer needs, requiring satellite’s ubiquity, instant infrastructure, and network simplicity advantages as part of its core.

We tracked more than 20 new companies planning to launch small satellite constellation focus in IoT but the two key characteristics among all the players are low cost data collection terminals and low-cost bandwidth.

Satellite Executive Briefing invited the current players and some future players to provide insights on this important market. We receive the following feedback for our virtual roundtable questions from the following executives: Chris Gray, Vice President, Emerging Technologies, Globalstar; Dan Losada, Vice President, International Division, Hughes; Tara Maclachlan, VP IoT at Inmarsat; Tim Last, Vice President and General Manager of IoT at Iridium; Nathan Robinson, Director, Sales & Marketing, Kepler; and Fabien Jordan, Founder & CEO of Astrocast. Excerpts of the roundtable discussion follows:

Satellite Executive Briefing (SEB): Considering the new wave of Satellite Constellation focusing in IOT how do the upcoming LEO, MEO or GEO constellations figure in your current and future plans?

Globalstar: Globalstar launched its constellation of second-generation LEO satellites in orbit in 2014. For these upcoming constellations, the technology they are using means larger antennas on the

ground, certainly for the two big LEO ones which will use Ku/Ka frequencies. Those new constellations are also looking more at the traditional maritime and high bandwidth Internet connectivity markets. For IoT you need something smaller and less power hungry and Globalstar certainly fits into that category. CubeSats are another interesting area as some of those incorporate our chipsets to take advantage of our network. Regardless

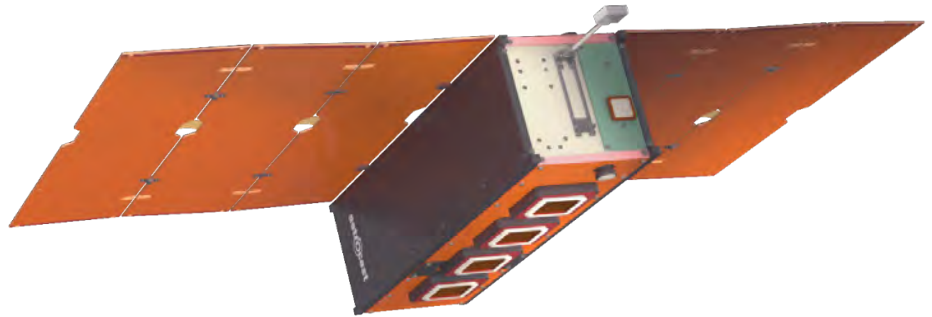
of which constellations are being launched, the media is making more people aware of satellite technology which is a positive for the whole market.

Hughes: As IoT expert Edewede Oriwoh says, the IoT is “not a concept...it is the true technology-enabled network of all networks.” Like any network, the connected network of things must have the reach, resiliency and capacity to be ubiquitous,

dependable and adaptable. That's where satellite plays an important role – with GEO, MEO and LEO constellations each delivering specific advantages.

For instance, GEO delivers the capacity density – even in urban areas—needed for services such as in-flight connectivity and cost-effectively transmitting large amounts of latency insensitive communications, such as aggregated IoT data. LEO has the advantage of lower latency, important for applications like smart home technology or autonomous vehicles. And both LEO and MEO expand satellite coverage areas not served by GEO beams. Our Hughes JUPITER™ Aero system can successfully switch between GEO and MEO satellite beams to enable continuous connectivity on a flight even, for example, over oceans or polar regions. This kind of intelligent, multi-transport connectivity will define our connected future.

Hughes is investing in multi-transport innovation, GEO and LEO satellite constellations. Our new GEO Ultra-High-Density JUPITER 3 satellite will deliver unprecedented capacity across a wide range of service sectors, including consumer, enterprise, aeronautical, government and cellular backhaul. Hughes also has agreed in principle to invest \$50 million in the consortium of the U.K. Government and Bharti Enterprises purchasing LEO operator OneWeb from bankruptcy.



Astrocast satellite

Inmarsat: Inmarsat owns and operates 13 satellites in geostationary (GEO) orbit 35,786km (22,236 miles) above Earth. Our L-band services, which are delivered via the Inmarsat-4 series of satellites, form the bedrock of our IoT offering. Working closely with our global partner ecosystem, our L-band services help industries from agriculture, energy and mining to transport and utilities harness the benefits of IoT and do things more efficiently, more safely and more sustainably, regardless of where they operate.

Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) satellites have gained in prominence over the last decade. This is hardly surprising noting that the cost of building and launching satellites is coming down across the space sector and new technology has provided ways to deliver new capabilities using smaller satellites. However, understanding how they compare with GEO satellites is crucial to determining your approach to

IoT and whether choosing LEO is really the right decision.

For example, as GEO satellites are constantly in the field of view and their orbit is higher, only three satellites are needed to provide near global coverage, whereas multiple LEO and MEO satellites are required in order to create a constellation to provide the coverage across the planet. This can lead to issues where one satellite passes the connection to another, particularly with mobile assets.

Increasingly LEO service providers are focusing on one specific use case and may only have one or a few satellites in orbit. This could mean that a data point is taken once or twice in 24 hours as the satellite moves around earth. Our satellites' distance and orbit mean they stay in position, helping companies monitor and control their assets in near real time and providing the ubiquitous connectivity needed to enable IoT.

Iridium: Iridium has been a



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Internet traffic is increasing globally based on the new realities of remote connectivity – teleworking, distance learning, telemedicine, webinars and video conferencing. It's likely we'll see long-lasting changes to the way we live and work. Given the higher traffic volumes and network complexities, it is imperative for operators and service providers to have satellite infrastructure solutions that provide performance, reliability and quality of experience. At Comtech EF Data, we have the solutions for the new realities of network traffic!

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leader in LEO-based satellite IoT since the launch of our first IoT service, Short Burst Data® (SBD®), in the early 2000s. While some may think new constellations are competitive threats, in most cases we view them as opportunities for potential partnerships and collaboration. Our network is the only truly global, mobile satellite constellation, offering a very resilient, high-quality, and real-time service that leverages dedicated L-band spectrum around the world. These characteristics, combined with the ability to provide two-way communications service through small-form-factor devices and transceivers that can add satellite connectivity to existing solutions, make us ideally suited for satellite IoT services. The combination of these unique capabilities does not exist among newcomers, and therefore, any new services provided by new LEO, GEO or MEO entrants, will rely on less robust signals in either unlicensed bands or in Ka-and Ku-band. Due to the inherent advantages of our network for satellite IoT, we have seen heightened interest for new partnerships and projects within the market. One example is the potential we see to augment or partner with some of the new one-way, high-latency, low-cost smallsat companies where the service price point is not right for the Iridium network. We've made announcements about our interest in these types of partnerships in the past as well. Kepler: As a LEO satellite operator, Kepler is of course

focused on this type of constellation. Though similar to our approach to the wideband (Ku in the case of Kepler) market, we see and appreciate that there are some applications well served by GEO, and some applications well served by LEO. Kepler will focus on areas where our global coverage and economic advantages bring value to IoT applications.

Astrocast: We are part of this new wave with the new Small Satellite constellation.

SEB: What is the status of your product portfolio in IOT via Satellite or Hybrid?

Globalstar: Globalstar has a very strong portfolio and one that can meet some unique markets. For those that need to build something fully customized, we have our two chipset options, the STX3 and STINGR. Both use our Simplex one-way small data packet network. The main difference being that the STINGR has an integrated antenna. We just recently launched our ST100 which is an all in one ready to go IoT board, which includes the Satellite modem, antennas, GPS, accelerometer, Nordic processor, Bluetooth and our firmware that can be customized. With the ST100, you just need to add a battery, solar panel and plastics and you have a finished product. We also have our complete product sets, namely the SmartOne C and SmartOne Solar, designed for tracking assets, sending sensor information, etc. The

SmartOne Solar is fully ATEX certified and has up to a 10-year life. We also have our consumer SPOT side that is really part of IoT. We have our SPOT Trace for tracking assets, our recently launch SPOT GEN 4, a one-way personal tracker and SOS device and our SPOT X two-way messaging device that also does tracking and SOS.

Hughes: As both a technology AND services provider, Hughes plays a variety of roles today in the ecosystem and will do so into the future. For example:

- Hughes developed the gateways to enable OneWeb service, and continues to lead the industry in ground system innovation.
- Our JUPITER System is already 5G NSA ready. And we will continue to innovate multi-transport technology that will enable the hybrid networks of the future.
- The Hughes HT2000L terminal is an industry first that allows both satellite and LTE connections in a single device with automatic failover switching between the two paths.

Inmarsat: Inmarsat has a large portfolio of IoT capability which is built around our L-band network; ranging from direct to satellite M2M offerings, edge connectivity additions and spectrum leasing.

Our direct to satellite M2M offerings are enabled by our L-band constellation and include

our Isatdata Pro (IDP) service which is a two-way, short-burst data service for tracking and monitoring fixed or mobile assets globally. It is ideal for simple monitoring and controlling applications such as logistics tracking, monitoring pipelines and tracking machinery in agriculture and mining. Our other direct to satellite service BGAN M2M is a reliable, global, two-way IP data service designed for long-term machine-to-machine management of fixed and mobile assets. BGAN M2M supports higher bandwidth applications giving our customers full visibility and management of their dispersed assets across an entire operational area, which is ideal for applications like monitoring electrical grid infrastructure and oil and gas operations.

In addition to these services we also combine edge connectivity such as LoRaWAN and backhaul it over satellite which provides our customers with additional flexibility for monitoring their data producers. Our recent work with MinFarm Tech provides a highly cost-effective, standalone LoRaWAN network over messaging, rather than over IP. This unique solution enables data from IoT sensors operating on LoRaWAN networks to be optimised for transmission over Inmarsat's IDP service and has significant benefits for the customer.

Finally, we also work with customers who have specific demands to build their own IoT networks/use cases using Inmarsat spectrum, which means they can design the service they offer



Kepler GEN1 6U-XL cubesats, built by Kepler in Toronto, Canada.

their customers, completely to their liking.

Iridium: With the completion of our next generation satellite network, we entered a new era for our satellite IoT portfolio. We continue to support our existing SBD based services, while also creating new IoT offerings with our customers leveraging the new capabilities of our new network. For example, Iridium Certus®, our next-generation satellite broadband service, provides solutions ranging from new message-based and cloud-connected services, to fully IP-capable, real-time communications. Additionally, for the first time, we are delivering a range of finished IoT products to market, including the cellular add-on Iridium Edge device, self-contained solar powered Iridium Edge Solar and fully programmable satellite-only Iridium Edge Pro. Hybrid devices are enabled through our add-on Iridium Edge products, and there is potential to launch hybrid and dual-mode devices if there is a

strong enough return on investment and market demand.

Kepler: Kepler's IoT offering is just now being rolled out, enabled by the launch of our third satellite, TARS, in early September and quickly followed by our first two GEN1 satellites at the end of that month. These three satellites have both wideband and narrowband capabilities, meaning that they add capacity to our existing data backhaul offering Global Data Service, and will enable initial field trials of our EverywhereIoT service. The first device is our IoT developers kit, which will be followed by other devices in 2021.

Astrocast: Our products include the Astronode S is a bidirectional solder-down module for customers who want a simple serial interface connection to Astrocast Network. Its small size allows for its use in embedded applications. Our Astronode DevKit which has the Astronode S architecture at its core, enables

you to quickly and securely connect your assets to the Astrocast Nanosatellite Network.

SEB: What key Verticals will you be focusing on IOT via satellite now and in the medium and long term (3-5-10) years?

Globalstar: Oil and Gas markets have always been a main area for us along with Government opportunities. With a record number of US landfall storms this

season we certainly see an increase in people being prepared with devices as well as FEMA and other first responders. Forestry has also really started to take off with

lone workers and communications needed in those remote areas that are not covered by terrestrial networks. Agriculture is another market we are seeing growth in and that will be an area that will certainly expand over the next few years quite dramatically. This includes animal tracking which is turning in to a much broader area with our partners. We are seeing a lot more interest in sensor technology and we are working on some exciting developments there both with partners and how to update some of our current products via firmware changes. Connected cars of course is always talked

about and at Globalstar we look at all types of vehicles that can be connected in some form or another.

We will in the future be adding in a half-duplex IoT board providing a low power small antenna two-way communication module. What is exciting from our VARs is an openness to a new ecosystem where they will not only create a finished product but will offer that to other resellers and partners as a



hardware only option allowing the other party to resell airtime. This type of cooperation within our community will allow more rapid development and deployment of solutions. As an example, with our ST100 we have seen that from the time a VAR receives the board to having a fully working proof of concept to the end customer for testing is about 6 weeks.

Hughes: As both a technology and services provider, Hughes services enterprise, aero, maritime, consumer, and government verticals. We will continue to innovate multi-transport technology that will enable the hybrid

networks of the future.

Inmarsat: Historically, Inmarsat has supported IoT or M2M in the utilities and oil and gas sectors and these sectors are still key for us. In the last few years, we have expanded our focus to break into the agriculture, mining and transport markets. Even today, much of the world where agriculture and mining take place, or where goods and utilities are distributed, lacks reliable connectivity. This is where Inmarsat's satellite connectivity is playing a vital role in enabling the benefits of IoT in these industries.

For example, we have been supporting electrical infrastructure IoT based applications for some time and one example of this is the solution we are providing to CEMIG in Brazil to monitor the status of their grid and to respond to outages with remote fix capability.

Our I-4 satellites will continue to provide coverage and support to numerous industries, such as mining, well into the 2020s. However, looking into the future we are continuing to invest in our L-band network and are transforming the way a variety of industries can make use of IoT. In particular, our sixth generation (I-6) fleet of satellites represents a step-change in






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the way we deliver our [L-band] services. From the world's most advanced global safety services and low-cost mobile services, to new applications for the 5G era, its capabilities will further strengthen our world-leading L-band offer and how we support many different verticals.

Iridium: As a leader in satellite and industrial IoT, we maintain a robust and varied customer base and partner network. These key markets include heavy equipment and construction Original Equipment Manufacturers (OEMs), agriculture, fleet management, asset tracking, personal tracking, oil & gas, utilities, maritime and aviation verticals. Some of the less penetrated and emerging markets include smart agriculture, Unmanned Aerial Vehicles (UAVs) and drones and autonomous vehicle industries. We have integration partners exploring the addition of Iridium data and location services into solutions for these new and growing markets, and we believe there is a long-term and robust future for satellite IoT.

Kepler: As described in the previous question, LEO has the advantage of providing global coverage from the outset. The tradeoff is latency due to the revisit time of the satellites, but this steadily decreases with each additional satellite brought into the constellation. This guides the markets we can add value to at the outset -- sensor monitoring, certain types of asset tracking, etc. Asset tracking applications are horizontal in

nature and spread across various industries. We've seen significant interest in monitoring applications in the public sector (research, weather monitoring, etc) as well as SmartAg. As the constellation grows there will be a natural expansion beyond these applications as the capabilities of the service grow.

Astrocast: The key markets for Astrocast include Maritime, Environmental, Oil, Gas & Mining, Connected Vehicles, Agriculture & Livestock, Asset Monitoring. Our product is a low-cost miniaturized solder-down communication module that can be easily integrated in any terminal with a small and low-profile L-band patch antenna to connect any IoT device.

SEB: Do you have any specific examples of vertical markets that you are now using IOT via satellite or hybrid?

Globalstar: As I previously mentioned, we have many devices in the Oil and Gas market using the SmartOne Solar. Having a safe device to use in these volatile remote locations with a long battery life is very appealing. A more, slightly unusual market we have got involved in is tracking cattle. Our ST100 board was specifically designed to use as an ear tag on cattle sending tracking data, having a battery and solar panel that can last 5 years, which is about the life span of beef cattle.

We have several partners developing products both as an ear tag and as a tamper resistant

collar for areas that are prone to theft. The testing out there has gone very well, and we will start to see full production this year of some of those products. This solves real world issues for farmers that can spend a million dollars a year on fuel looking for animals which gets cut in half at least by knowing where they are. Some remote herds can reduce by 20% due to cattle wandering off into potentially dangerous locations. Thanks to Geofence alerts, farmers can intervene quickly, meaning a reduction in losses and increased revenues - a double win for them with minimal investment. This has also brought in the ability to track elephants, rhinos, birds, baboons, lions and more due to the price point of both the hardware and the airtime. As an example, with lion tracking we showed that compared to other solutions using the same budget, they would be able to track 10 times more animals for a much longer period of time. That is both exciting and fulfilling to see how this technology can help with the tracking, preservation and combating the poaching of these endangered animals. Another path that is very interesting, and something that we are making easy to do, is for 3rd parties to integrate their existing sensors and use our solutions to transmit data with minimal effort. Knowing some of those solutions that are being developed and tested will again improve efficiencies in business, reduce costs and improve customer satisfaction, everything that IoT promises to do.

Hughes: Many IoT applications today use mobile satellite services (MSS) or “narrowband” connectivity for reliable, wide-range, low-power transport and cellular networks. In the U.S., Hughes customers use MSS for applications such as smart meter monitoring of energy consumption. Hughes created the GEO Mobile Radio interface (GMR-1) standard for IoT, making it possible for MSS services to tap into GEO satellite connectivity. This transport flexibility diversifies the network for IoT applications that require more bandwidth.

And VSATs have played a key role in supporting M2M applications for the oil and gas industry. At the “upstream” segment of the Oil and Gas sector, VSATs are used to support monitor and control for well heads. In the “mid-stream” segment, VSATs are used extensively for pipeline monitoring and control – often in complement to other connectivity methods so as to provide extremely high availability.

Hughes recently announced our new artificial intelligence (AI) for IT operations (AIOps) solution for enterprise Wide Area Networks (WANs). Already in use across more than 32,000 managed sites, the technology automatically predicts and pre-emptively—or “self-heals”—undesirable network behavior, preventing service-disrupting symptoms in 70% of cases. Hughes is the first managed services provider to deliver a self-healing WAN edge capability to enterprise customers. This innovation targets WAN edge systems, such

“...IoT is an integral part of enterprise networks and consumer needs, requiring satellite’s ubiquity, instant infrastructure, and network simplicity advantages as part of its core...”

as routers, SD-WAN devices and firewalls—regardless of transport type—because a failure in those systems at the edge can be catastrophic for a site and cost hours of network downtime.

Inmarsat: As mentioned, we are working to help businesses from a variety of industries harness the benefits of IoT and do things more efficiently, more safely and more sustainably, regardless of where they operate.

A recent example of this is the work we have done with Rumo Rail, the largest railway operator in Brazil. Due to the remoteness of Rumo’s network, in certain locations drivers, railway engineers and control centres previously had no way to communicate with each other, putting the safety and efficiency of its operations at risk. However, with the support of our partner, Globalsat Group, we have been able to provide Rumo with a bespoke satellite-enabled rail telemetry and communication solution to address these challenges. In harnessing Inmarsat’s Broadband Global Area Network (BGAN) service, the solution means that they can now access uninterrupted, high-quality connectivity to facilitate the transfer of telematics, voice and video

data. This allows the accurate real-time tracking of each train and communication between drivers, maintenance staff and regional control centres, no matter where trains are located on the network.

Another example is our recent work with Farmbot Monitoring Solutions (Farmbot), a partner that has developed a simple, user-friendly remote water monitoring solution that provides real-time visibility of agricultural water supplies. Farmbot is based in Australia where water management is a huge challenge, although due to the remoteness of many places, so is connectivity. By developing their solution around our IDP service Farmbot are helping their customers overcome these issues. The fact that IDP offers two-way messaging makes it particularly ideal as it allows Farmbot’s customers to both remotely monitor water tanks, dams and reservoirs and also activate pumps and other machinery in real time. 



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



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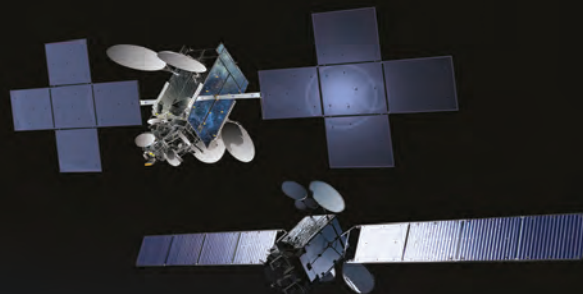


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Interview with Ali Al-Kuwari, President and CEO, Es'hailSat

Satellite Executive Briefing spoke with Ali Al-Kuwari, President and CEO of Qatar-based satellite operator Es'hailSat. Mr. Al-Kuwari has had several leadership positions in major companies for over 20 years. Prior to Es'hailSat, Mr. Al-Kuwari was Assistant Secretary of ICT Qatar. He also held the position of Finance Director at ICT Qatar and was a member of the organization's management team overseeing the strategic investment in the satellite initiative which became Es'hailSat. Mr. Al-Kuwari has a Bachelor's degree in Business Administration and Master's degree in Financial Analysis. He joined ICT Qatar in 2004 following senior financial positions with Ras Gas and the Ministry of Finance. Excerpts of the interview follows:

How has Es'hailSat been coping with the global COVID-19 pandemic? In what way has it affected your business?

The impact of Covid-19 pandemic for businesses in 2020 has been felt across all industries including the satellite industry. However, not all segments within the satellite industry has had similar impact. Energy, aero IFC and maritime segments have had the biggest impact, whereas broadcast and broadband segment had minimal impact.

With all major events and exhibitions being cancelled or postponed in 2020, and travel restrictions in place, the lack of in person meetings and being unable to roll out new solutions and products had caused delays to some of our plans for 2020 and has had some minor impact on our business. Our core business since we started operating had been to support the media industry with satellite capacity for DTH services. And this broadcast segment has had only made a minor impact for us, with customers' expansion plans being put on hold which marginally impacted our growth projections. However, we expect the demand for satellite services to increase over the next few years as broadcasters consider transitioning from a traditional on-premise set-up to a virtual system such as satellite cloud-based service for content storage and distribution.

With majority of the world doing business or interacting online, the demand for broadband has increased, which has increased the demand for satellite capacity for broadband, VSAT services and cellular backhaul. This has positively impacted our business, one which was not projected.



Ali Al-Kuwari

Moving forward, post-pandemic, how do you see your company in the next few years?

Our focus in the mid to long term will continue in the broadcast segment, as the DTH market in the Middle East and North Africa is still a vibrant and growing market. Having satellites in the

MENA broadcast hotspot of 25.5°E/26°E is an added incentive for broadcasters to join the Es'hailSat neighborhood to distribute their channels, as they are instantly able to reach a wide viewership base.

The impact of the pandemic on the satellite industry and the broadcast and telecommunications eco system on the whole, and the slowdown in business activities in 2020 has given us time to review and redefine our longer-term corporate strategy. We started operations as a satellite operator supplying raw satellite capacity to broadcasters and government entities, and gradually started supporting value add services to our customers over the past few years. Given the impact of various incidents of 2020 to the industry in general, we will be fast tracking a few of our strategic initiatives to expand our business and services beyond our initial scope; from managed services for enterprise customers, to providing end to end service to broadcast customers, or expanding beyond the traditional satellite capacity business.

With these initiatives and investments in infrastructure and new satellite programs we see a lot of potential for growth for our company in the long term and differentiate ourselves with targeted offerings to our customers and strengthening our position within our region.

You have recently completed a teleport in Doha,



The new state-of-the-art Es'hailSat state-of-the-art teleport in Doha, Qatar provides a range of teleport services including DTH, turnaround services, playout services, MCPC bouquet services, uplink services, antenna hosting services, datacentre hosting services, equipment colocation services, VSAT hub services, studio facilities, disaster recovery services, among others.

tell us about the services that you are providing in this teleport and how does this complement your satellite business?

Our teleport is a purpose-built facility located north of Doha. The primary purpose of the teleport is for telemetry tracking and command (TT&C) of our satellites and support capacity management. With an area of 50,000sqm, the site provides adequate space to build systems for TT&C, capacity management and other value-added services for customers and stakeholders.

Teleport services include DTH, turnaround services, playout services, MCPC bouquet services, uplink services, antenna hosting services, datacentre hosting services, equipment colocation services, VSAT hub services, studio facilities, disaster recovery services, among others. The teleport is connected via redundant fiber for terrestrial connectivity, with dual incoming power and back-up generators, cooling and other essential utility services. With highly trained staff manning the teleport 24x7, the teleport supports major customers with critical services. We see the teleport as a key service enabler and revenue generator, and it complements our satellite capacity business with enhance service offerings for our customers.

Having the right infrastructure, providing end to end and value-added services and being responsive

to our customers' needs enable us to provide the best in class service to our customers.

What do you see as the key trends in the Middle East satellite market in the new few years and how does your company plan to address these trends?

DTH market in the Middle East and North Africa is a robust market, one with high revenues and high satellite capacity demands. Historically consumers in MENA have been consuming content that are free to air, although PayTV has been gaining large market share with premium high-quality content, with satellite the preferred mode of content distribution. Given the nature of the industry, consumers and the landscape in MENA, we expect the video market in the region to remain robust for the foreseeable future.

However, with the impact of Covid-19, we are seeing trends in some verticals that we believe will have an impact on the industry. Application such as broadband, backhaul & trunking, mobility services will see growth in services and capacity demands. Broadband has been one of the sectors that grew during this pandemic with people increasingly accessing the network for business and leisure. Backhaul & trunking sector has been extremely resilient during this crisis and will continue showing growth as markets open further for business. Mobility sector has been one that was impacted the most this year, but as travel restrictions ease and people start traveling, we will see the demands picking up.

Technological trends that we see will address the above demands, will be using High Throughput satellites to provide higher capabilities with reduced cost; software defined networks to provide flexible and optimized networks; or hybrid GEO/MEO/LEO network to provide a flexible and seamless connectivity between regions. These are areas that we will be actively exploring to address the demands of our customers and market.

What else can we expect from Es'hailsat in the coming years, i.e. any plans for new satellites or services?

As a company, our aim is to be a global satellite operator providing world class services to strategic stakeholders and customers, who value broadcast

“...DTH market in the Middle East and North Africa is a robust market, one with high revenues and high satellite capacity demands. Historically consumers in MENA have been consuming content that are free to air, although PayTV has been gaining large market share with premium high-quality content, with satellite the preferred mode of content distribution...”

and telecommunications independence, high quality of service and wide geographical coverage. With an initial focus within our base in MENA, we have established ourselves as a reliable and innovative company supporting the key broadcast and telecommunications markets in the region.

Coming out of a difficult year for the industry in 2020, where we have been consolidating our business and putting in place longer term plans, over the next few years we see these plans coming to fruition

We aim to roll out new products and services over the next 12 months to enhance our offerings to our customers within the eco system for broadcast and telecommunications sectors. For example, integrating on premise and cloud-based playout solutions along with an OTT solution enhances the value we provide to broadcast customers in terms of flexible on ground solutions and widening their reach.

Longer term we will continue to work with our customers to meet their connectivity requirements with services such as IOT, M2M and EO, which will require large amounts of satellite capacity. We also see much potential in the mobility area, both in land and maritime, where satellites remain the primary solution for connectivity.

From a strategic corporate perspective, we will also be engaging with partners in the industry for new satellite programs to expand our reach beyond the MENA region. We plan to build scale through partnerships with leading international satellite operators, with newer state-of-the-art satellites in other prime orbital locations around the globe, offering customers flexible and reliable services. 

Steering Sub-Saharan Communities to a Digital, Connected Future

Sub-Saharan governments have been looking for some time to harness new ICT technologies to improve living conditions through affordable and inclusive ICT services, and to help bridge the digital divide in remote and rural communities. With less than 40% of the population having access to internet connectivity, progress has been slow. Shortage in teachers and medical staff, especially in remote locations, also impacts the living conditions in many areas.

The spread of the COVID-19 pandemic led to the closure of schools and prohibition of public gatherings in many countries. This has created a ripple effect on the economy, businesses, civil services and on citizens overall well-being. Education and Health services are among the services most affected, and near-and long-term impact on the future of the youth (and adult) population can not be understated. The new reality has also demonstrated the importance of digital networks and services to economic resilience, the continuity of essential public services and overall social-economy wealth.

Israel-based satellite operator Spacecom believes that the response to these challenges should be effective and sustainable well through post pandemic life. By combining efforts with selected partners, Spacecom was able to design new ways to deliver efficient and cost effective access to crucial services to under-connected, un-connected and remote communities. “We use an integrated, holistic approach to providing access to modern services to the citizens, with the integration of modern digital technologies serving as the enabler of equitable, qualitative, and efficient delivery of SDG-related services for all,” said Dan Zajicek, CEO of Spacecom.

“Moreover, as part of Spacecom’s commitment to the community, “we were happy to join the Global Education Coalition for COVID-19 Response launched by UNESCO, with the aim to support the delivery of Quality Education in Sub-Sahara,” Zajicek added.

As cloud services rely on broadband internet access and stable electricity, “always-on connectivity” is at the core of Spacecom Digital Community Platform (DCP), utilizing

AMOS satellites, with additional ICT building blocks and physical elements. All elements are integrated and reusable, allowing sustainable, scalable and cost-effective deployment of multi-sector solutions. These will be used by services in areas such as Education, Health, Agriculture, Banking, Finance, Commerce, filling Forms, applying for IDs and Passports and more.

Located at the heart of the communities, like Community Centers, Schools or Clinics, the DCP allows for modular design. It includes a satellite connectivity kit, a media server, Wi-Fi access hotspot and additional elements as required. These can include:

- low-cost sustainable power solutions;
- a complete health center kit with medical devices designed for solar power supply;
- offline, online and interactive education systems;
- digital class equipment;
- specialized connected devices (such as tablets) for healthcare and agriculture workers, for teachers and students, and more.

It provides access to me-

dia-rich content stored locally or on the internet, specific for services as healthcare, education or agriculture, as well as entertainment, news, weather, government messages and OTT access to national broadcast, local TV and radio.




Spacecom's cloud-based central management system, serves as a platform that manages a variety of applications, through secure, remote access, enabling service owners to safely access and manage their respective applications.

Spacecom's cloud-based central management system, serves as a platform that manages a variety of applications, through secure, remote access, enabling service owners to safely access and manage their respective applications. The content management system manages the distribution of digital content, tools and applications between the cloud-based repository and the communities.

This provides quick syncing of crucial information, such as medical records or students home-schooling progress reports, while maintaining appropriate data privacy and security. To ensure effective use of local and remote resources and minimize operational costs, typically associated with satellite capacity, Spacecom has significantly reduced the satellite capacity OPEX while

preserving high-quality communication by making use of satellite multicast efficiencies.

Inclusive digital transformation opens new opportunities for rural regions, enhance the digital and financial inclusion and promote digital literacy, thus reducing urban-rural gaps in living and in business conditions by addressing some of its root causes. "Spacecom's and its partners goal is to em-

power remote communities, with an emphasis on scalable digital solutions that will impact the lives of millions and allow governments to increase the efficiency, security and effectiveness of their public services. For us digital equality is not just a slogan, it is the basic right and need of modern life of every citizen everywhere, and we are working hard to enable it," said Zajicek. 



Listen to an audio podcast interview with Spacecom CEO Dan Zajicek at:

<http://satellitemarkets.com/people/interview-dan-zajicek-ceo-spacecom>

Where's My Stuff?

It's the moment you dread. You reach into your pocket or handbag – and your phone isn't there. A flash of panic runs through you. Where is it? Lost? Stolen? You rush online and use the "find my phone" feature to see where it is. And there it is at the restaurant where you left it last night.

It's one thing to lose your phone. It's another to lose an asset like a mining dump truck that costs millions. Companies with serious mobile assets and equipment in the field need their own "find my phone" feature. And they have one thanks to satellite connectivity.

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Satellite asset tracking is part of the Internet of Things, where machines talk to machines in ways that help

help human beings. When emergency agencies send portable generators and trailers into disaster zones, they need to know where they are and how to get them back. Energy companies exploring for oil or gas move drilling rigs, tanks and pumps from one place to another all the time. When they know exactly where that equipment is, they can plan better for tomorrow. Truck fleets have to make on-time deliveries and coordinate pick-ups. That's hard to do unless your trucks are telling you where they are and where they're going. Those are just some of the ways that customers use asset tracking technology from Globalstar.

Here's how it works. A small device attached to

each asset reads its location from GPS satellites. It transmits that location to Globalstar satellites, and the company turns it into valuable data for its customers.



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When you know where something is, it can tell you a lot. Did it arrive on time? Is it in the right place? How far is it from its next destination?



Click here to view a video on asset tracking:

<https://youtu.be/y6j40YVKUOI>

For the people who have to manage those assets, it's like a pair of magic glasses that lets them see the whole operation with one glance. That saves time and money, and keeps people safe. "Find my phone" is great, but it only works when your phone is in

range of the cellular network. Globalstar satellites work everywhere: from roadways and waterways to forests, mountains and prairies.

Satellites let the Internet of Things work in places it never could before. All from a little gadget you can hold in your hand – and a powerful network of satellites and ground stations circling the globe.

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



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SATELLITES FOR DIGITAL ECONOMY



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Satellite Executive Briefing highlights key products and services now available in the market.

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- Customized Ka/Ku band VSAT antenna with high quality accessories —

The VSAT antenna can correspond with branded electronic devices which include BUC, integrated LNB, Feedhorn, and transceiver. Antenna performance depends what the electronic devices are used by the clients.

- Heavy Duty Mount/ Non- Penetrating Mount/ TriMast Mount —

The mounts are made up of galvanized steel with coating that can prevent from the corrosion in the harsh climate. No matter which triangle or square base the clients select, it is able to provide the maximum supporting.

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

A large advertisement graphic for JONSA. It features a central globe with blue lines representing satellite orbits. In the center, a large white parabolic antenna is mounted on a tripod. Surrounding the globe are several other satellite components: a feedhorn, a BUC (Block Up Converter), an LNB (Low Noise Block), and a transceiver. The JONSA logo is prominently displayed at the top center of the graphic. At the bottom left, there is the JONSA logo with three stars above it, the website www.jonsa.com.tw, and the email saccount@jonsa.com.tw. At the bottom center, the slogan "Link Jonsa VSAT Antenna Cover Your Life" is written. At the bottom right, there is a QR code.

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Ku-16/30W BUC

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- Lowest consumption (65W)
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- Versatile (18-56 vDC)



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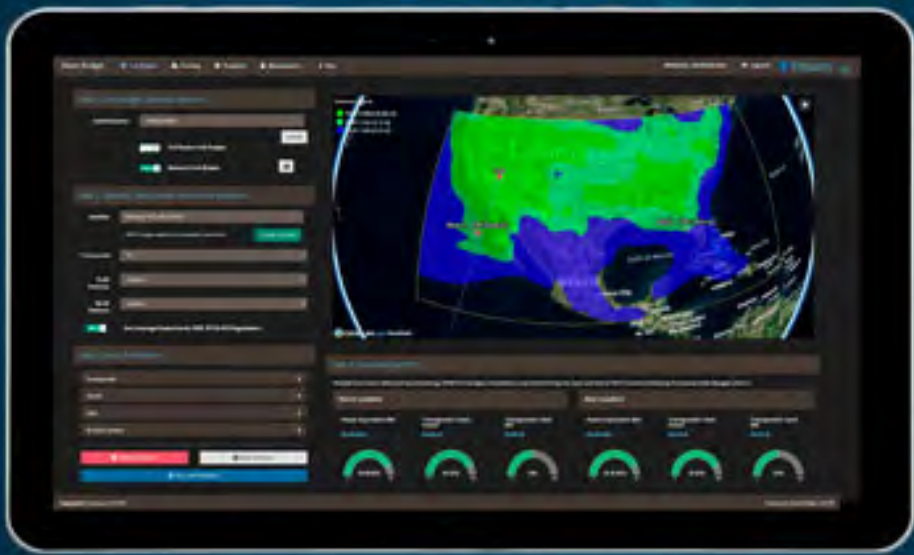
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For more information go to: <https://rf-design-online.de/>



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„FlexLink S9E“ 8:8 - 16:16 Switch Matrix



„FlexLink K4“ 32:32 Switch Matrix

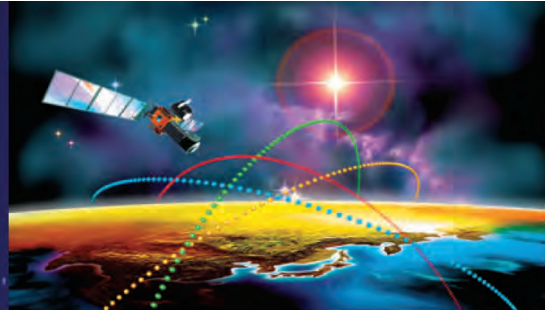


„FlexLink K7-Pro“ 64:64 Switch Matrix

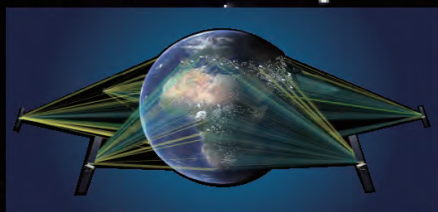


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Satservice ACU2-ODM Step-Track Antenna Controller

SatService is proud to announce that it's well known step-track antenna controller module sat-nms ACU-ODM has now got a successor ACU2-ODM. It is based on a new and more powerful hardware platform and provides the following new key features:

- TLE (NORAD-NASA), Intelsat 11 Parameters Tracking
- Polarization Prediction
- Jackscrew protection mode
- Beacon Receiver direct control
- Target Editor
- NTP time synchronization



The new DIN Rail module sat-nms ACU2-ODM is fully compatible with the recent version and will therefore be used for all existing indoor and outdoor ACU systems and related upgrade kits. SatService ACUs can be used for all types of satellite communication ground station antennas.

SatService is a German manufacturer, system house and reseller for professional equipment and services for satellite ground stations.

For more information go to: www.satservicegmbh.de

XMW's SES mPower Series

XMW Inc. is very pleased to officially announce its upcoming launch of the SES mPower Series. This series fully covers a complete and extensive line of products including LNB and BUC, ranging from 5W up to 40W, fulfilling all requirements of SES. This new series of BUCs are engineered to have the smallest and lightest form in order to meet new mobile applications for airborne, maritime, and vehicle, as well as portable and fixed antenna systems. Redundancy systems for both LNB and BUC are also available for services that require the highest standards for reliability and function. The SES mPower Series is expected to launch in early 2021.



Ka Tri-band 20W BUC for mPower

Ka Tri-band LNB for mPower

For more information go to: www.xmwinc.com

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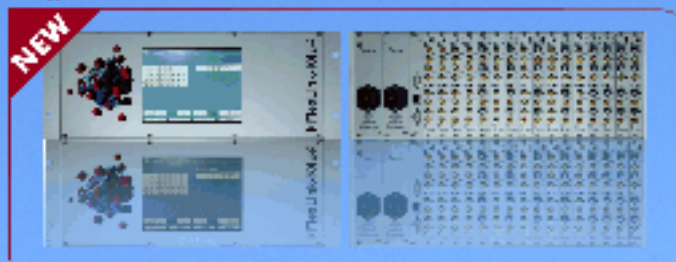
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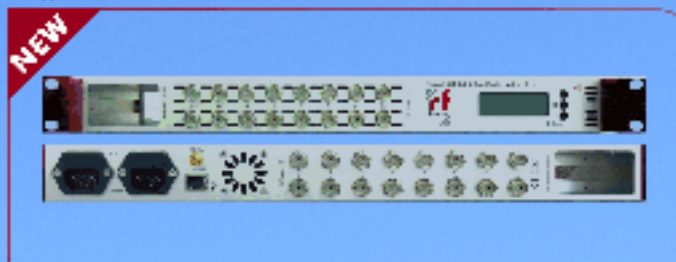


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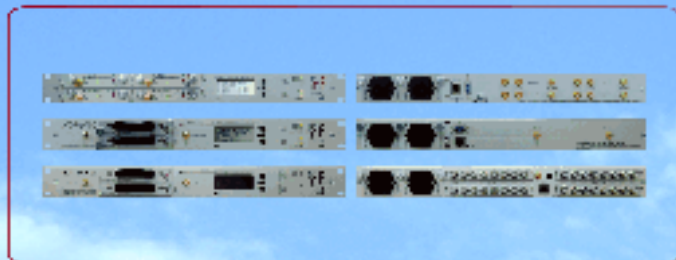
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When the Future Depends on Being Flat

by Robert Bell

It's not often in a technology business that billions in investment and revenue depend on one of the humblest components of the tech system. But that's certainly the case for the existing MEO and fast-emerging LEO markets. Those billions have gone into building spacecraft and launching them, gaining regulatory approvals and landing rights, and developing the complex systems to manage orbital paths and device handoffs. With those items under control, the entire business proposition has come to rest on the development of a low-cost, high-performance antenna able to acquire and hand off multiple satellites passing overhead.

That's where the new crop of flat-panel antenna (FPA) innovators comes in. In a recent report, New Antennas, New Opportunities, the World Teleport Association looked at these companies and their products, the markets where they are likely to find their first success, and their potential impact on the ground segment operations of teleports. The following are the key takeaways from that report.

Conquering Cost

Arguably the biggest challenge for FPA developers is bringing their costs to within a competitive range of parabolic antennas. The price differential today is measured in orders of magnitude, with parabolic antennas available at prices that are acceptable to consumers of relatively modest means. Volume production, innovation in integrated circuit technology and the ability to piggyback on related manufacturing lines are the keys to driving down the cost of FPAs. Those, in turn, rest on the engineering innovations that FPA developers are commercializing, each of which represents a bet on a different path to success.

Improving Performance

In terms of performance, today's FPAs stack up poorly against parabolic antennas, especially for

communications between GEO satellites and fixed points on the ground. FPA developers also have significant power consumption issues to resolve, owing to the fact that electronically steered antennas are made up of thousands of power-hungry radiating elements. Again, it's all about the engineering and the painstaking work of making it better with each generation of the product.

Finding Buyers

FPAs are making their first impact in mobility markets, primarily in the military and in commercial aviation. Due to pricing issues, adoption has been strongest in comms-on-the-move military applications, which are less price-sensitive than commercial ones, and the form factor for FPAs explains their early success in aviation. Opinions differ widely on when and how deeply FPAs will penetrate other, related markets, such as ground mobility, maritime and enterprise. Almost all the respondents agreed

that FPAs are not a threat to replace dish antennas entirely. In particular, large, fixed dishes will remain part of the satellite landscape for the foreseeable future. These, of

course, are core to the business of teleport operators.

A Life Beyond MEO and LEO

The success of LEO satellite constellations – and to a lesser extent, MEO constellations – and FPA technology are closely intertwined. Most of the experts we contacted felt that the LEO constellations are absolutely dependent on the ability of companies to introduce functional FPAs to the marketplace at affordable prices. The reverse is not quite true, however. While conceding that an absence of LEO and MEO constellations would significantly limit demand for FPAs, many interviewees nonetheless see a niche for this technology in a GEO-only world.

“...The success of LEO satellite constellations – and to a lesser extent, MEO constellations – and FPA technology are closely intertwined....”

Waiting and Seeing

The satellite and teleport operators who contributed to the report appear by and large to be taking a wait-and-see approach to the emergence of FPAs. Most interviewees said they view the LEO and MEO markets as the key to generating sufficient demand for FPAs to drive costs down significantly. For fixed GEO applications, they do not anticipate FPAs replacing parabolic antennas in the foreseeable future. “If FPAs were magically the same price and performance as parabolics, we would convert entirely to the use of FPAs for every fixed GEO application,” said one respondent with a company that operates satellites.

One interviewee said HTS satellites in GEO could expand the utility of FPA antennas by virtue of their own high power and flexible beam steering capabilities. In effect, some of the requirements that otherwise would be levied on the antenna are handled by the satellites, this interviewee said.

That said, it is nearly impossible for anyone to predict when FPAs, given their current limitations and challenges, might begin making inroads into mobility applications beyond aviation, according to this interviewee. “That’s the \$1 million question,” the interviewee said.

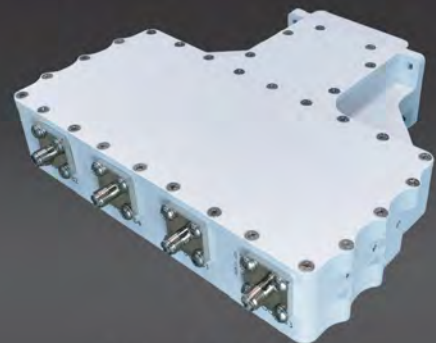


Robert Bell is Executive Director of the World Teleport Association, which conducts research into the teleport and satellite industry and offers a Teleport Certification program to service providers. New Antennas, New Opportunities is available for free to members and for sale to non-members at <https://www.world-teleport.org/store/ViewProduct.aspx?id=16584423> He can be reached at: rbell@worldteleport.org

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Virtual CABSAT 2020 in ‘GVF’s Cyber-Space’

by **Martin Jarrold**

With a total of more than 2,700 views on the GVF YouTube channel of the recorded webinars of the GVF-Satellite Evolution Series, in addition to the views of the live broadcasts over Zoom every alternate Thursday, the series continues to draw some significant audiences, now regularly from over 120 countries. The series has been widely recognized for its professional production approach to presentation and for the quality of its dialogues.

Since I wrote about the 24 September webinar Global Transitions: Digital Economy, Digital Infrastructure, Connected Communities, Digital Planet which included a contribution from the UN, no less, we have had two further moderator-led dialogues in the GVF series, and two further webinars produced for the program of the virtual ConnectTechAsia 2020.

In the GVF main series A Regional Perspective on C-Band – The Next Battleground? brought an important re-focus to the subject of competition for satellite

spectrum amongst a variety of other topics, and following on 22 October was The Regional Satellite Operators’ Voice. Then 5 November will bring Humanitarian Assistance & Disaster Response: The Evolving Role of Satellites in Disaster Response. Recordings of all these events can be sourced at <https://gvf.org/webinars/>.

The webinars produced for

saw CABSAT 2020 postponed to October; October saw the physical exhibition put back until May 2021; but, November 2020 sees Virtual CABSAT 2020, within which GVF will present its own virtualized content in the form of pre-recorded sessions.

Virtual CABSAT...

In the first of these GVF Secretary General, David Meltzer, will be in conversation with a representative of the International Telecommunication Union Radiocommunication Bureau. ‘In Conversation with ITU: The GVF Asks...’ will feature Mehtap Dufour, Senior Radiocommunication Engineer with the Satellite Systems Coordination

Division of the Space Services Department, who was originally scheduled as one of the GVF SATEXPO Summit keynote speakers at the March 2020 event.

Questions are planned to revolve around how WRC-19 satellite-related outcomes of particular interest for the MENA region have played out over the last 12 months and looking ahead to



the program of the virtual ConnectTechAsia 2020, are not the only content produced for insertion into events with which GVF regularly partners, and which the pandemic has driven into cyberspace. GVF always has a big profile at CABSAT, with each year of the in-person exhibitions featuring an embedded GVF Summit. The month of March

WRC-23 at key and pivotal satellite-related agenda items; trends and discernable patterns in ITU orbital slot filings, both global and MENA-specific; the satellite industry's role in mitigating the economic and societal effects of the pandemic being recognized and enshrined in future decisions on spectrum allocation; the commercial satellite communications industry's focus on frequency bands beyond the established use of C-, Ku- and Ka-band; the increasing integration of satellite communications and satellite remote sensing/Earth observation impact on global regulatory environment and the work of the ITU.

In the first of two panel sessions the focus will be on 'Satellite's Disruptive Evolution | In Orbit, On Earth'. Featuring David Meltzer as moderator, the panel will comprise Dave Rehbehn, VP International Division, Hughes Network Systems; Simon Gray, SVP Humanitarian Affairs, Eutelsat; Imran Malik, VP Global Sales Fixed Data, SES; and, Michael Di Paolo, Director of Business Development, SpaceBridge.

The term "disruptive evolution" has an established place in satellite industry dialogs. In-orbit technology is changing, quickly and in a big way. Along with some of the very latest GEO satellites about to achieve near-terabit throughput capacity (and at much reduced cost per Gbps), existing MEO constellations evolving into more powerful systems, and the first spacecraft of the LEO mega-constellations already orbited, the capabilities of the space seg-

ment are increasingly matching the bandwidth requirements of an increasingly inter-connected broadband world. Space infrastructure on the ground is also undergoing a game-changing shift. Amongst other trends, teleports are evolving, and antennas/terminals are expected soon to feature a long-awaited cost-effective form-factor and performance departure from the traditional parabolic paradigm.

Likely questions for this discussion will be:

[1] How are the capabilities of the space segment increasingly matching the bandwidth requirements of an increasingly inter-connected broadband world?

[2] How are GEO satellites evolving, in terms of their changing capabilities and in terms of the relationship between their investment cost and performance returns on that investment? [3] Are the emerging NGSO constellations a competitive threat to existing GEO and MEO, or an evolution of complementary in-orbit capabilities to further extend satellite's reach into newer markets?

[4] What are the principal and pivotally game-changing characteristics of the evolution in infrastructure in the ground segment, including teleports, which will most impact the space segment?

[5] What are the specific space segment innovations that Hughes, Eutelsat, and SES are currently developing and rolling out? [6] New antenna technologies have long-been keenly awaited, but just how critical are they to the future expansion and growth of the satellite industry in

serving the needs of legacy and new end-user vertical markets?

[7] For which of these end-user vertical markets, both established and emerging, are the new antenna technologies the most critical?

[8] Does any one variant of the new terminal technologies represent a particularly outstanding solution to the industry's and customers' needs?

[9] Which end-user applications require ground segment innovation because the new antenna technologies do what parabolic antennas cannot, and how does this vary between, say, aeronautical, maritime and land mobile?

[10] What are the key characteristics/factors/features of how the new antenna technologies work that make them such an important advance?

The second panel discussion will feature Alvaro Sanchez, CEO, Integrasys; Jack Buechler, VP Business Development & Product Management, Talia; Nicholas Laughton, Manager Systems Operations LEO, Telesat; and, Joel Schroeder, Director Land Mobile, Intelsat. Moderated by yours truly, the dialogue theme will be 'Satellite's Resilience Evolution |Challenging Markets, Robust Connections'.

Whether it's a question of rapidly evolving legacy and emergent user-market demand drivers, or of the responses of the satellite industry to these demand pressures, the satcoms industry is in dynamic flux and its resilience is being put to the test on different fronts. Customer/user-markets such as aeronautical, maritime,

and military, are all exhibiting greater demands from their satellite connections, and the satellite industry is bringing elevated technology and service capabilities to the market in response. Users of satellite networks depend on the reliable and robust connectivity that is characteristic of today's platforms, but there are potential vulnerabilities. This session will explore the current state-of-play in relation to two of those potential vulnerabilities. Cybersecurity is a vulnerability far from being specific to satellite and is a core concern across the entirety of the IP-enabled global ICT infrastructure. This session will explore satellite-based services in support of cyber security and to assess technical feasibility and commercial viability for diverse, current and future, vertical sector users of satellite. Interference is a vulnerability that the satellite industry has been successfully addressing through both technology advance and human capacity-building.

Potential questions to be tackled here are:

[1] In describing the satellite industry as “resilient” to changes in, and challenges presented by, the end-user markets it serves, what does this mean for you? How is this resilience evolving and being put to the test in the face of newer markets and different challenges?

[2] Let's take a look at some currently challenging markets. Focus, if you would, on the various markets with which you are each, respectively, most familiar. Which aspects of those markets most preoccupy your organization in terms of ability to meet

“...Users of satellite networks depend on the reliable and robust connectivity that is characteristic of today's platforms, but there are potential vulnerabilities...”

customer demand?

[3] When customers present challenging demands, does it more often focus on technology performance and future proofing, or on service guarantee quality and flexibility?

[4] In your analysis and from your perspective when you employ the descriptions of satellite communications as “reliable” and “robust”, what do you mean to convey with those terms?

[5] Given that “reliable” and “robust” can never mean invulnerable, what are the kinds of vulnerability that currently concern you? Is the vulnerability landscape changing?

[6] Assuming that this landscape is in dynamic flux, what evolving threats do you perceive as soon to present newer challenges?


[7] Let's take the example of cybersecurity. It must naturally be significant concern across all end-user verticals, but how does this concern manifest itself in specific individual markets and what do different customers expect satellite to deliver? Related to this, are cybersecurity concerns featur-

ing in QoS agreements and guarantees?

[8] Interference is a multi-faceted issue, from adjacent satellite interference to terrestrial mobile wireless interference. Where do you see the greatest continuing threat, how are interference problems evolving, are present prevention and mitigation strategies enough, and what more can/needs to be done?

[9] For each of the space segment and ground segment, where, in your opinion, are the most important innovations facilitating improvements in networks robustness?

[10] Are there any particular features of the MENA market which present regionally specific issues relating to market challenges and connectivity/applications robustness?

For now, with these analyses, the Webinar Epoch goes on! 



Martin Jarrold is Vice-President of International Program Development of GVF. He can be reached at:

martin.jarrold@gvf.org

Speedcast Complete Sale of Speedcast Managed Services to NBN Co.

Sydney, Australia, Nov 2, 2020--Following a two-year partnership, which has delivered NBN Co's Business Satellite Services to businesses across Australia, Speedcast International Limited has announced it has sold selected functions of its wholly-owned subsidiary and dedicated entity, Speedcast Managed Services, to Australian government-owned infrastructure provider, NBN Co.

Speedcast Managed Services helped build and operate the Business Satellite Service on NBN Co's satellite network. This included the design, integration and commissioning of the new network on NBN high throughput satellite (HTS) systems, with more than 50 beams and a comprehensive terrestrial in-

frastructure capable of providing a range of high-data internet service offerings.

The network design included the development of unique operations support system (OSS) and business support system (BSS) environments. This network went live on 30 Sept 2019 and Speedcast Managed Services has been operating it on behalf of NBN Co.

Under the sale, Speedcast Managed Services employees, assets and equipment now revert to its sole client, NBN Co, to support the ongoing requirements of the National Broadband Network. Accordingly, the Master Equipment and Services Supply Agreement (MESSA) signed between NBN Co and Speedcast on

2 February 2018 will come to an end with immediate effect.

Speedcast will continue to work as a Retail Service Provider to deliver NBN Co's Business Satellite Services, building on its long-time presence in Australia providing managed connectivity services to enterprise, government, energy and maritime customers.

"We are proud of what our partnership with NBN Co has delivered and look forward to continuing our relationship and providing many more Australian businesses with essential connectivity," said Joe Spyttek, President and Chief Commercial Officer at Speedcast. er on new initiatives." 

AAC Clyde Space Acquires US SpaceQuest


Uppsala, Sweden, October 15, 2020--AAC Clyde Space has reached an agreement to acquire 100 percent of the shares in SpaceQuest, Ltd in an all shares deal in a payment of 24,000,000 new AAC shares to the current owners of Space Quest. The acquisition is subject to approval by the AAC Extraordinary General Meeting (EGM) and The Committee on Foreign Investment in the United States (CFIUS).

SpaceQuest is a successful small satellite company operating in the world's largest and most dynamic space market. It operates a highly profitable Space as a Service (SaaS) business including mission operations of in-orbit satellites, allowing AAC Clyde Space to rapidly grow the SaaS business line. Through AAC's global reach, SpaceQuest's offering will be marketed to the global audience in need of mission critical data from space.

SpaceQuest is a pioneer in small satellite technology that has built and launched 20 spacecrafts and supplies satellite components for many commercial aerospace companies and institutions, such as NASA, the Depart-

ment of Defense, and Universities. It designed its first satellite 20 years ago. Currently Space Quest operates a fleet of satellites that hosts experimental payloads for several clients and collects AIS (Automatic Identification System) messages used in numerous maritime applications in a "Space as a Service" model.

With the acquisition of SpaceQuest, AAC extends its operations to the US with a new location in Virginia, growing its workforce to 107 staff at three different locations (Uppsala, Glasgow and Fairfax). The combined group's pro-forma revenue is approximately 51 MSEK in Q1-Q2 2020.

With the acquisitions of SpaceQuest and of Hyperion, the AAC proforma group revenue for 2020 is estimated at 135 MSEK (approximately US\$ 15 million), a 35% increase over the previous published estimate. Adding two profitable companies to the AAC Group facilitates AAC's goal to be EBITDA and operational cash flow positive in the near future according to the company. 



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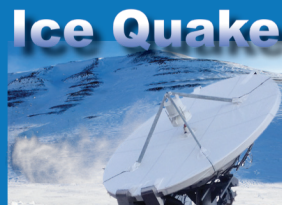
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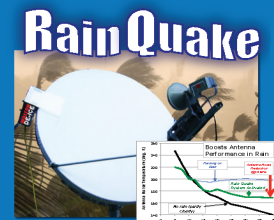
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Jordi Hereu is the New President of Hispasat

Madrid, Spain, October 9, 2020—The Board of Directors of HISPASAT, the Spanish satellite



Jordi Hereu

communications operator, approved the appointment of Jordi Hereu as the company's new president yesterday. The appointment took place after an extraordinary Shareholders' Meeting in which the Sociedad Estatal de Participaciones Industriales (SEPI), which holds 7.41% of HISPASAT's shares, proposed Hereu to preside over the company relieving Rosario Martínez Manzanedo.

A graduate in Business Management and Administration, Hereu also holds an MBA from ESADE. He started his career in 1991 in Port 2000 and CILSA, linked to protecting the Logistics Activity Zone (ZAL) of the Port of Barcelona. Since 1999 he has held several positions in the Barcelona City Government, serving his functions as the council member for the Les Corts district until 2004, and as a councillor for Security and Mobility of the Barcelona City Government until 2006. After two years in this last position, Jordi Hereu was appointed the fifth deputy mayor of the Barcelona City Government and was the mayor of Barcelona from 2006 to 2011.

After his time in public administration, Jordi Hereu co-founded the company Fledge Barcelona

and presides over IdenCity and Barcelona Plataforma Empresarial, both specialising in strategic consulting. HISPASAT's new president said he is now "taking on a new professional challenge and commitment to reach the company's goals, ensuring its growth and creating value for its shareholders and interest groups."

Gilat Hires BG Eyal Zelinger as Global Defense VP and GM

Petah Tikva, Israel, November 3, 2020 — Gilat Satellite Networks, a provider of satellite networking technology, solutions and services, announces that it has hired BG (Res.) Eyal Zelinger as its Global Defense Vice President and General Manager. The retired Brigadier General from the Israel Defense Forces (IDF) will head Gilat's Defense business to maximize opportunities worldwide. Appointment effective December 1st, 2020.

BG (Res.) Eyal Zelinger brings a wealth of experience of over thirty years in the IDF C4I branch. During his service he managed the development and operation of the IT systems, cyber defense, communication infrastructure, and served IDF's highest strategic leadership. He retired at the rank of a Brigadier General after serving as the Chief Signal Officer & C4I/J6 Chief of Staff, a position he held until August 2015.

"Gilat is a significant player in the Israel Defense arena. As part of our strategy to strengthen our Defense focus and expand it to global markets, I am most pleased to bring on-board a dedicated Vice President and Gener-

al Manager to head the Defense Unit," said Michal Aharonov, Gilat's management member and VP Global Broadband Networks at Gilat. "I believe that Eyal Zelinger's strong background and vast knowledge well-positions Gilat to embark on major SATCOM prospects in the Defense market worldwide," he added.

Jerry Welsh Appointed CEO of ICEYE US

San Francisco, Calif., November 2, 2020--ICEYE today announced that Jerry Welsh, who joined ICEYE in 2017 as COO/

CFO, will take on the CEO role for ICEYE US. Welsh, an operations and technology expert who specializes in scale-up strategy



Jerry Welsh

recently oversaw the completion of ICEYE's US\$ 87 million Series C financing. He will lead a team focused on deploying capital to scale operations and serve the needs of US customers.

The US organization is further strengthened by the addition of Eric Jensen, who departs Boeing's satellite division as an industry leader in US government solutions. With over a decade of experience in aerospace engineering, sales, and product strategy, Jensen will focus on delivering ICEYE's unique capabilities to US customers.





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5G to Become Catalyzer for Satcom Growth, Generating US\$ 32.5 Billion

Cambridge, Mass., October 27, 2020 – NSR’s 5G via Satellite: Impacts, Demand and Revenue Potential to 2029 report, released today, forecasts deep 5G impact in the satellite ecosystem with close to 10 Million active units by 2029. Beyond the obvious use cases, like Cellular Backhaul and Trunking, a wide spectrum of applications will experience accelerated demand from 5G, including IoT, Private 5G for Corporate Networks, Mobility or even more conservative users like Government/Military.


“While 5G use cases generate a lot of hype, one must not underestimate the transformative power of 5G in how satellite networks are designed,” states Lluc Palmer, NSR Senior Analyst and report author. “Incorporating and standardizing technologies like SDN/NFV or Cloud, 5G Network Management System will be at the core of how future satellite networks are built, offering the scale and flexibility to optimally operate future VHTS, constellations and software defined satellites under standardized ser-

vice orchestration.”

This standardized service orchestration will disrupt how the different steps of the value chain relate to each other, including mainstream Communications Service Providers. With satellite networks now being managed from a 5G core, satellite becomes seamlessly integrable with the

and consumer devices via Satellite that now will have access to a vast addressable market counted in Billions.

NSR is the leading global market research and consulting firm focused on the satellite and space sectors. NSR’s global team, unparalleled coverage and anticipation of trends with a higher degree of confidence and precision than the competition is the cornerstone of all NSR offerings. First to market coverage and a transparent, dependable approach sets NSR apart as the key provider of critical insight to the satellite and space industries.


NSR’s 5G via Satellite: Impacts, Demand and Revenue Potential report is the first and only report that looks into the broad and deep implications of 5G on the Satellite Communications industry. The report combines the wide and well-grounded NSR analysis for each key vertical market in a single report with specific focus on the impact and opportunities that 5G brings to the satellite industry. 



mainstream Telco ecosystem, eliminating barriers for satellite adoption and unlocking uncountable opportunities.

Non-Terrestrial Networks were part of the definition of 5G from the beginning. In fact, the new access technology (5G NR) is modified to allow direct connectivity from mainstream devices to satellites. While performance levels might have limitations for some use cases, this is a game changer for applications like IoT

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The **Summit II** high-power, modular, soft-fail redundant SSPA systems are wide bandwidth and ruggedized for outdoor applications. They can be configured with 4, 8 or 16 amplifiers and are field expandable. All of the amplifiers are phase combined into a single system that can generate extremely high levels of RF output power – 10,000 watts or more.

To learn more about the **Summit II** high power systems, visit advantechwireless.com/summit-II/



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