

Satellite Executive BRIEFING

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Industry Trends, News Analysis, Market Intelligence and Opportunities

NGSOs: A Key Driver for the Satellite Industry

by Elisabeth Tweedie

Held in Paris as always, the 26th Annual World Satellite Business Week (WSBW) attracted a record number of attendees: 1,500 from 50 different countries. Unusually, Nathan de Ruyter, Managing Director, Euroconsult opened his presentation jointly with Elona, a digital assistant, who explained that Artificial Intelligence (AI) holds the key to reshaping the communications landscape, particularly with regard to network management, by predicting network congestion and dynamically allocating resources.

In addition, according to Elona, it can also facilitate the autonomous operation of satellites and ground systems, as well as offering personalized service offerings to users. Interestingly, during the rest of the conference,

there was not much discussion about AI and its impact, although Patrick Thera, President, Advanced Technologies, Calian mentioned that they were using AI for early detection of anomalies.

One of the key takeaways from this opening presentation, was the continuing gap between supply and demand, and the consequent downward pressure on pricing. By 2028 total capacity is forecast to be 195 Tbps, most of which, of course, comes from the Non-Geostationary Orbit (NGSO) constellations.

By 2032 total demand is predicted to be 51 Tbps, so it's hardly surprising that a 50% decline in prices is also being forecast. Total satcom revenue is forecast to grow from US\$ 107 Billion to US\$123 Bil. in the ten years

Continued on page 4



What's Inside
From the Editor 3
Better Satellite World:
How Satellite Make Mines
Smarter.....8



Executive Spotlight:
Bruce Elbert, President, ATS
.....18
Product Spotlight:
Jonsa Technologies..... 16
Multilayer Connectivity
by Robert Bell.....29
Mergers & Acquisitions.....22
Executive Moves.....25
Market Trends/Vital Stats.....26
Advertisers' Index27



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Major Developments in the Teleport Sector



One of the major announcements at the recent IBC show in Amsterdam was the merger between teleports iKOMG and STN. The two companies are very dynamic and innovative and bring specific strengths in satellite service provision to the merged company. I had the privilege of interviewing the

Chairman of the Board of iKOMG, David Treadway who spoke about the unique synergies of the merged company. Also at the IBC, I interviewed another up and coming teleport making its mark in the African market and beyond, K-NET. You can view the interviews at: <https://satellitemarkets.com/people/video-interviews-key-executives-ibc-2023-amsterdam>



The teleport sector is something close to my heart as I used to work in a teleport in Singapore at the beginning of my career. So, it's always a pleasure to reconnect with my teleport roots. It's also very heartening to know that



the sector has managed not only to survive but thrive amid all the challenges it has faced over the years. To shed light on this exciting segment of the industry, we recently published a MarketBrief report on "Teleports: The Future is Here and Now." You can read or download the full report at : <https://satellitemarkets.com/news-analysis/marketbrief-report-teleports>

View a video interview with Jake Hlomador, CTO of K-NET and other key satellite industry executives from the IBC in Amsterdam at:

<https://satellitemarkets.com/people/video-interviews-key-executives-ibc-2023-amsterdam>

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NGSOs...

...from page 1

to 2032. Interestingly, although video revenues are expected to decline by 15%, they will still account for nearly 60% of revenue in 2032, and in the last year, Eutelsat has launched two more satellites to serve this market.

de Ruiter, did not specifically reference the media sector in conjunction with Starlink, but at IBC in Amsterdam, several, of the very few mentions of satellite, related to Starlink, or Low-Earth Orbit (LEO) constellations in general. Kevin Fernandes, CRO, Dejero stating that “At IBC we’re focusing our attention on 4k/UHD transmission from the field for remote production and contribution, utilizing the more recently deployed IP networks, such as 5G, Starlink and other LEO satellites to create resilient connectivity.”

In complete contrast to AI, Starlink featured in many panels at WSBW, even when it wasn't on the agenda; which, given its impact on the industry in the last year, is hardly surprising. 66% of the

2,040 satellites launched in the first eight months of this year, were Starlink satellites. Comments ranged from the downright hostile, exemplified by John Finney, Founder and CEO All.Space, who

“...66% of the 2,040 satellites launched in the first eight months of this year, were Starlink satellites...”

asked during a panel on Smart Antennas, “Is there anyone from Starlink in the room?” When no hands were raised, he went on to comment: “That is what vertical integration is. You see, they don't care about us and they don't care about you. They would wipe out this industry if they could, without a second thought. This is reality.”

Others expressed admiration for what the company has achieved. With the caveat, that there are no published subscriber numbers, Euroconsult is forecasting that Starlink will have two million residential users by the end of this year, double the number it had at

everyone's, including Euroconsult's surprise, given that there is currently no committed information rate (CIR) offering. At the end of last year, there were 500 vessels using Starlink. Growth has been phenomenal and Euroconsult is forecasting a seven-fold increase to 3,500 by year end. Factors contributing to this growth include, good data rates, low prices, and no data cap and a self-install antenna. The latter is particularly important for the maritime market. With SES' surprise announcement, that it will be working with Starlink to deliver a managed service to cruise lines incorporating

its MEO service, SES Cruise mPOWER, and Starlink's LEO offering, this growth is likely to accelerate, as the combined managed service facilitates offering a CIR to users. Two service levels will be offered, 3 Gbps and 1.5 Gbps.



Nathan de Ruiter, Managing Director, Euroconsult opened his presentation jointly with Elona, a digital assistant, who explained that Artificial Intelligence (AI) holds the key to reshaping the communications landscape.

the end of 2022. A similar growth trajectory is forecast for business users, with Euroconsult predicting ~320,000 users by year end. However, it is in the maritime sector where the most growth is occurring, much to

Starlink, were not only in the room, they were on-stage for the “NGSO

Broadband Constellations, Keystones to Global Connectivity” panel and Jonathan Hofeller, VP of Starlink and Commercial Sales, talked about how the company has pivoted its business model in the last year. Ini-



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tially, it managed the entire value chain, selling directly to customers. This was facilitated by the fact that the antennas are self-install. Then, in recognition of the fact that after-sales service and support is often needed, it started working with resellers, which Hofeller described as “an eye-opening experience.” This is causing channel conflict in some places, a fact that has been recognized and is being “worked on.” He went on to describe Starlink as an extremely “nimble” company, which can make it hard for partners who don’t move at the same pace. He quoted an example of discussing an issue on Friday and implementing a new policy to address the issue on Monday morning.

OneWeb, has adopted a policy of being a wholesaler and working with

resellers from inception. Massilimiano Ladovaz, CTO, OneWeb commenting that “we do not wish to take business away from customers.” He also referenced the fact that the reality is, that it is now a multi-orbit world, which given its merger with Eutelsat, is pretty much a given for the company!

One of the opening keynotes was given by Doreen Bogdan-Martin, Director General, ITU, her comments were very encouraging for our industry: “ We truly believe that satellite connectivity holds the promise of increasing global digital inclusion, something central to the ITU’s mission. A mix of technologies is needed, but satellite broadband is sometimes the only option, so it can be a game changer.” One of the caveats, which is well known in the industry, is that

many of the people who are currently not connected, cannot afford to connect. She commented that in Africa some people were paying 15% of their gross income to access fixed broadband. The ITU goal is that the maximum anyone should pay, is 2% of gross income.

Good news for US companies looking for financing was given by Judith Pryor, First VP & Vice Chair Board of Directors, Export-Import Bank of United States (EXIM), who stated very clearly, that EXIM was back, was not dysfunctional (as it has been described in the past) and is currently only financing US\$35B of its \$135B lending cap. This was greeted with enthusiasm, exemplified by Jonathan Baliff, CFO, Redwire, who stated: “The greatest thing to come out of



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this conference is that EXIM is back!”

The issue of cooperation and partnerships was raised in several panels, summed up by Peter Cannito, Chairman & CEO, Redwire: “If you want to go fast, go alone, if you want to go far, go together.” Of the three big new NGSO operators, only OneWeb chose to work with others to build its satellites, both Starlink and Amazon’s Kuiper designed and are building the satellites in-house. (The satellites for Lightspeed from Telesat, will be built by MDA). Starlink, originally started by controlling the entire value chain, and selling directly to the end user, but as already mentioned, reversed that policy, and now works with resellers. OneWeb has always been clear that it is a wholesaler. Naveen Kachroo, Director, Project Kuiper (Amazon) stated “We will work in every region to

find the right combination of partner and our expertise for that particular market.” It already has a partnership with Vodafone for backhaul in Africa. Interestingly, OneWeb is also working with Amazon web services (AWS), even though Project Kuiper will be a competitor.

Eutelsat’s merger with OneWeb and ViaSat’s acquisition of Inmarsat, clearly show that the established

operators certainly see the value in partnerships, as does SES’ decision to work with Starlink. David Wajsgas, CEO Intelsat stated, “Any company that thinks it can fly solo is delusional, it’s all about partnering.” Given all the changes going on at present, it will be very interesting to see which companies have merged and which companies are working together by this time next year. 🌍



Elisabeth Tweedie has over 20 years experience at the cutting edge of new communications entertainment technologies. She is the founder and President of Definitive Direction (www.definitivedirection.com), a consultancy that focuses on researching and evaluating the long-term potential for new ventures, initiating their development, and identifying and developing appropriate alliances. During her 10 years at Hughes Electronics, she worked on every acquisition and new business that the company considered during her time there. She can be reached at etweedie@definitivedirection.com

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How Satellites Makes Mines Smarter

Gold and silver. Buildings and bridges and the cars that drive over them. The computer on your desk and the phone in your pocket. What do they have in common?

They're made from minerals. We pull 18 billion metric tons of them from the earth every year. Iron ore becomes steel. Calaverite produces gold, and silver comes from argentite. Electronics need minerals called rare earths.

advance.

All that smart technology has to be connected. And that's a challenge. Most mines operate in remote places, far from communication networks. That's why miners around the world turn to companies like Speedcast.

And that saves lives. In the last decade, fatal accidents at mines around the world declined by nearly 20 percent even as miners worked 7 percent more hours.

Safer mines are greener, too, because good data helps them better manage mining waste. And when miners are off the clock, broadband brings them entertainment and connection to their homes.

When mineral ores are pulled from the ground, they begin a long journey. Shipped to factories, they are refined into the pure minerals that go into a million different products.

Some even wind up in the equipment that will mine the next billion metric tons of ore. Smart mines make it possible, and satellite and information technology companies like Speedcast help them keep the minerals moving.



Getting Smarter

Getting those minerals out of the ground is hard, risky work. Companies invest millions before filling the first truckload of ore. Keeping the minerals moving takes never-ending attention to safety, efficiency and productivity.

That's a job for automation. The mining industry is investing billions in making mines smarter with Internet of Things and asset tracking technology. Today's mines use automated drills and self-driving trucks. Trackers monitor their location and operation. Automatic systems monitor air quality in tunnels and smart video surveillance can warn of dangerous conditions in

Satellite Saves Lives

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Bruce Elbert

President, Application Technology Strategy

Satellite Markets and Research Editor-in-Chief Virgil Labrador spoke with Bruce Elbert, President of the consulting firm Application Technology Strategy. Bruce is a leading satellite industry expert, communications engineer, project leader and consultant with over 50 years experience in communications and space-based systems in the public and private sectors. His areas of expertise include space segment design and operation in all orbit domains, systems architecture and engineering, ground segment systems engineering, development and operation, overall system performance improvement, and organizational development.

In the last few years, what are the key innovations or applications that are having the most impact on the satellite industry?

The most impactful development in the last few years is the efficient design and production of relatively small satellites using either batch or assembly line techniques. This is in contrast to the really manual construction methods of past years when satellites were assembled in laboratory environments by technicians and tested manually by engineers. Efficient small satellite production results in an improved ratio of performance to cost, that is, the satellite is less costly per kg to produce and contains a payload of enhanced performance relative to what we saw even twenty years ago.

Small satellites are not new to our industry, as witnessed by Iridium in 1998 where Motorola achieved reasonably good results with the 66 satellite constellation, but the cost was high and the performance lacking. Today, more can be accomplished which is why constellations like Starlink and OneWeb produce broadband performance to rival the best that MEO and GEO satellites can deliver. Of course, you need many more of them and that yields a financial challenge that is partly addressed by the second innovation: digital processors and software defined networks. Iridium had on-board processors but these were the same G3 CPUs that Motorola sold to Apple for the Macintosh PC of the time. Today, the payload contains a fifth-generation processor that couples with phased array spot beams and complex data routing and processing to make a satellite into a more effective repeater. The overall management of a constellation now benefits from cloud computing, something that was in its infancy in the 1990s but today makes the ground environment into a cohesive whole. Once the satellite operates in the same way as a wireless base station, the result is a very



Bruce Elbert

cohesive wireless infrastructure that can withstand any natural or man-made calamity.

Another key technical innovation comes in the form of reliable and low-cost delivery to space, as demonstrated by SpaceX. In the 1970s, we had hoped that the reusable Space Shuttle would usher in said low cost entry to space. However, design compromises were made to keep within a budget, yet the program produced a very costly system that proved to be unmaintainable and even dangerous to the lives of the astronauts. The unmanned reusable booster is now well known and sold by at least two providers, and the



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reliability achieved is like what we expected in the 1970s from workhorses like Delta and Atlas. More innovation on this front is needed to keep the cost of launching from being an inhibitor to greater use of space as a region of commerce and national security.

On the application side, it would have to be in the mobility sphere—reliable two-way communications from orbit to aircraft and vessels. Mobile satcom in L and S bands had always been narrowband service for voice and low speed data. Inmarsat, Iridium and Thuraya defined this domain in the late 1990s and early 2000s such that critical demands were met in both the commercial/industrial sphere and national defense and security sphere as well. Their user terminals are small and relatively low cost, but the cost of service is high due to the investment in space and small spectrum bandwidth. Moving to broadband, it took innovation in antennas as opposed to satellites to make this work for the average traveler.

On the computing and software side, we recognize the value of cloud computing and data storage, as well as new means of network management that reaches all elements, space and ground. This had been difficult to achieve

in the past due to the plethora of vendor techniques and standards, preventing proper interfacing and integration of function and data. The cloud offers pervasive coverage of a complex constellation and ground network structure, with innovation in terms of replicating all of the elements within the computing environment before it reaches operation. Then, the same construct allows the operator to control all aspects of service delivery, optimizing coverage and capacity to improve operating efficiency.

What do you see as the key trends in the satellite industry going forward?

Going forward, I expect that bandwidths will increase and user terminals will get smaller and cheaper. Bandwidth increases with more spot beams from space and moving to higher frequency bands to add spectrum. In the former, Viasat recently launched its first Viasat-3 extremely high throughput satellite which, experiencing a technical issue with the antenna system, represents the kind of bandwidth resource that CEO Mark Dankberg has talked about for years. While at GEO with somewhat higher delay due to the path length, this class of GEO satellite offers more bandwidth at lower cost per bit than any previous generation and probably lower than what can be

obtained at MEO and LEO. These non-GEO approaches are also moving forward with their innovations, indicated by larger vehicles with more power and inclusion of intersatellite links based on optical transmission rather than microwave.

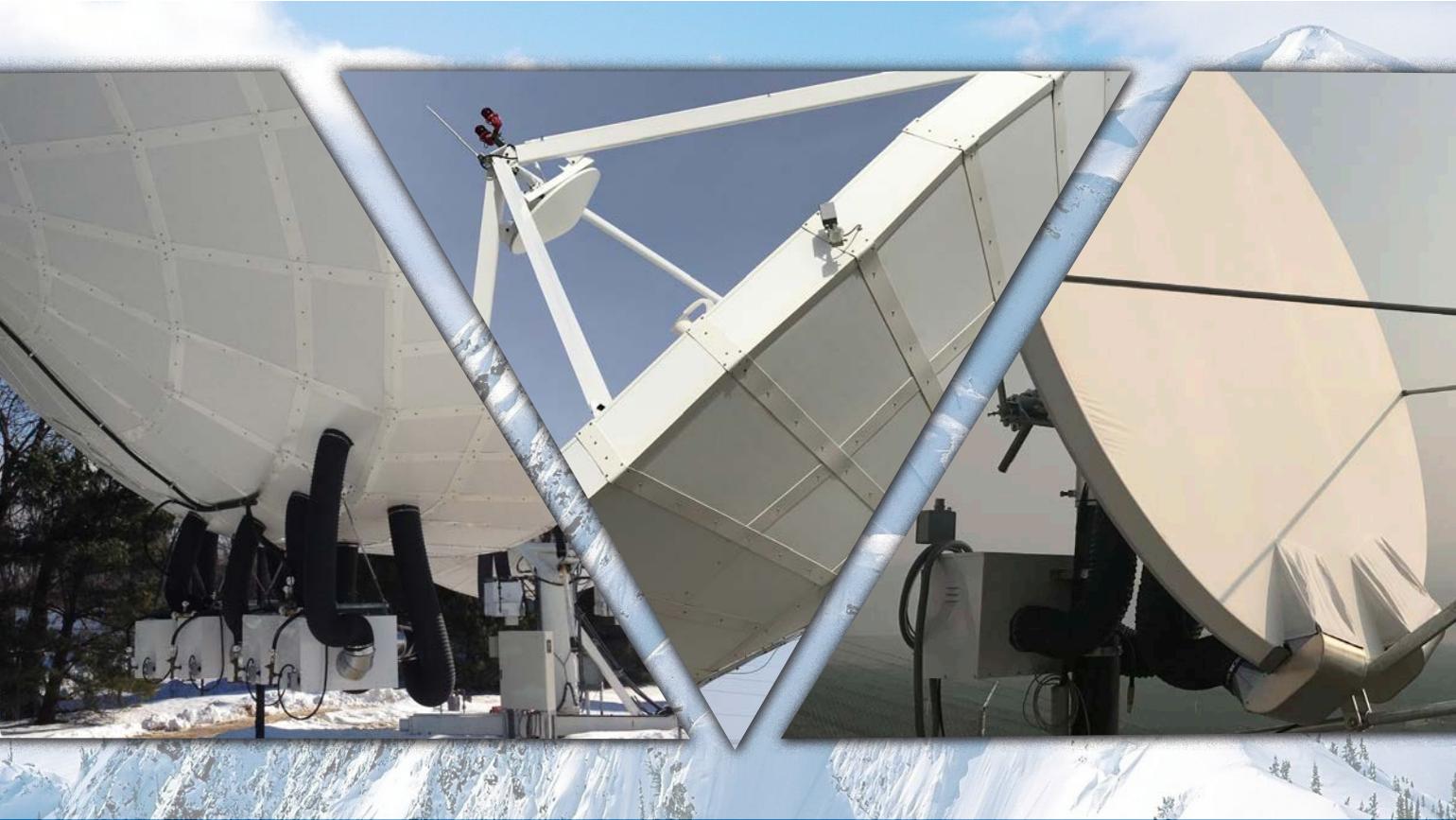
That same phased array approach taken on satellites is also applicable to the ground environment, as demonstrated by Starlink and Amazon. It is well established that large production volumes like those common in Direct-to-Home (DTH) services will find their way into everything from directly-connected mobile phones to these affordable satellite terminals.

How can Application Technology Strategy help satellite companies through the changes and challenges that the industry is facing?

Application Technology Strategy, or ATS, is my own company and represents the experience and knowledge base I've gained over my 50 plus years as a telecom and network professional. As you know, I got my Electrical Engineering degree from CCNY and entered the US Army as a Signal Corps officer where I used the then existing resources, which did not include satcom, to meet critical needs of tactical units. I left the service in 1969 to work specifically with satellites and saw an industrial career with major players of the time, engaged in engineering and operations of both the space segment and the ground segment. This base taught me how to look at each requirement or problem from the perspective of the technologies that it employs and could employ, and to perform the careful study and trades that result in workable and cost/effective resources. So, I have seen it in practice and have had to learn from this experience and this then allowed me to become an industry consultant founding ATS in 2001 just after 9-11. Through many demanding consulting assignments, my knowledge and ability has grown further to reach across domains that a single employer could never have done. I continue to learn and practice in the real world always working closely with the client to understand exactly what they need and can achieve within their resources or those that we can identify and employ. ATS can identify and resolve the daunting problems often unseen and ignored that may result in failure and even crisis. We likewise help the client identify opportunities that are already available on the market or can be introduced with acceptable risk.

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Can you cite some examples of projects you've undertaken recently in behalf of your clients?

I recently assisted a major GEO satellite operator with their plan to implement a new generation of satellite that could expand their coverage and range of services. Working with the strategic planning and marketing team, ATS validated their basic concept for a new satellite and verified what it would entail as far as the specifications and scope of the program and its estimated cost. The company went ahead with the procurement precisely along the lines of what we recommended and has contracted with a major European satellite manufacturer for delivery in the near future. Another activity involved assessing the value of a patented technology for improved Internet service via Ku and Ka band VSAT terminals. We also ended up testifying in court about the uniqueness of the technology and how it improved upon prior art. The client won the case and was awarded a full payment for the value of the patent. We also assisted NASA in how they could consider commercial systems and technologies in a potential replacement of the government owned and operated Tracking and Data Relay Satellite (TDRS) system, which was nearing end of life. Our recommendations proved useful to NASA as they work with potential commercial suppliers.

We continue to assist clients by providing our assessment of the capabilities of the non-GEO constellations recently introduced and that are entering development on the global stage. This considers both the satellites with their advanced capabilities along with the gateways and user terminal devices to extend services into new domains such as increased mobility and Internet of Things (IoT). Along with this, we have recommended how major users and operators could improve the integration of all space and ground resources, and their interface to terrestrial systems such as the Internet. Lastly, we have performed due diligence evaluations of satellite equipment manufacturers that resulted in successful acquisition and integration.

"..Going forward, I expect that bandwidths will increase and user terminals will get smaller and cheaper. Bandwidth increases with more spot beams from space and moving to higher frequency bands to add spectrum..."

Anything else you would like to add? ?

It is easy to observe that the satellite communications industry is at a crossroads in terms of the maturity of GEO satellite systems and services, the growth in services and revenues of new players with non-GEO constellations, and the merging of application domains such as earth stations as a service and how previously outside application domains such as earth observation and navigation can be incorporated into these systems in coming years. Through all of this, the satellites themselves must be upgraded in capability to provide bandwidth, coverage and dependability even as the quantity and diversity of platforms increase. 



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Multilayer Connectivity from the Ground Up

by Robert Bell

There are presently almost 6,000 satellites in LEO delivering high-capacity, low-latency service and another dozen or so in MEO, together adding many thousands of gigabits of potential capacity to the market. Starlink is racking up impressive subscriber numbers and pushing into traditional GEO niches like maritime, and OneWeb is right on its heels. The satellite business has developed a level of multilayered complexity never seen before.

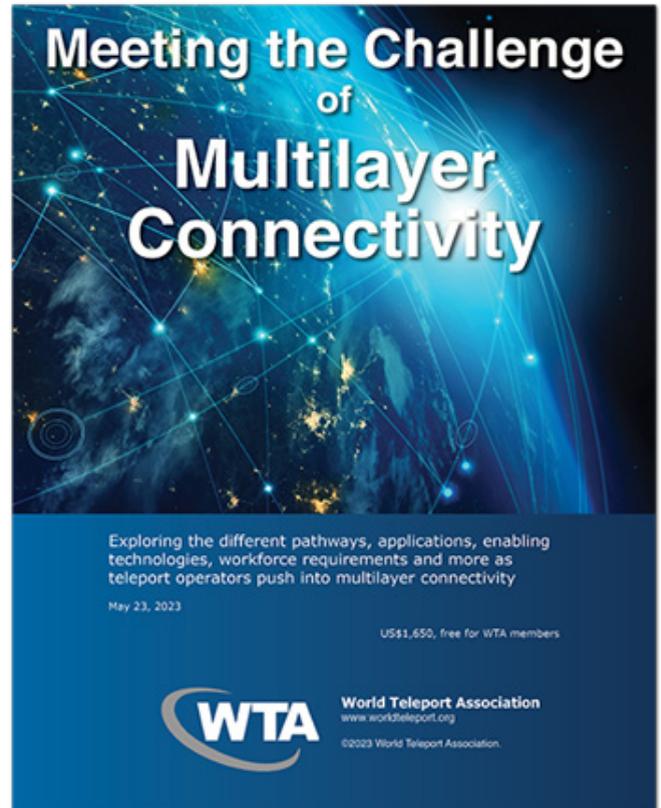
While all that investment, engineering and technical magic has been pouring into the darkness of space, relatively little thought has been given to the ground segment. The commercial teleport – that facility offering an attractive business model to end-users and satellite operators alike, compared with capitalizing and maintaining their own facilities – has barely rated a mention until very recently at conferences or in the pages of trade magazines.

The Ground Segment Adapts

In a new report, *Meeting the Challenge of Multilayer Connectivity*, WTA reports on how teleports are adapting their business models to the availability of multiple orbits in the sky – and joining them to the multiple paths on the ground they have already mastered.

Already, some teleport operators, particularly the larger ones, are evolving into full-service telecommunications service providers with offerings that integrate satellite, fiber optic networks microwave, Wi-Fi and cellular, using sophisticated software to manage it all and provide a competitive edge. Some view multilayer connectivity as movement toward the day when satellite and terrestrial services converge to the point that they become virtually indistinguishable to customers.

The expert contributors to this report offered different perspectives on multilayer connectivity, in part because teleport operators come in different shapes and sizes. Some are focused primarily on serving satellite operators while others provide end-to-end connectivity to enterprise and broadcast customers. But as usually is the case, their inputs



tended to cluster around a few key themes.

Larger Teleport Operators are Ahead of the Pack

Some of the larger teleport operators already provide multilayer connectivity solutions, including satellite and terrestrial, and increasingly consider themselves telecommunications and IT providers rather than satellite companies. But other teleport operators remain focused on satellite connectivity.

LEO Constellations are Changing the Game

LEO constellations offering global, low-latency broadband services arguably are the most high-impact new capability being added to the portfolio of teleport operators. When Amazon Kuiper and Telesat Lightspeedd join Starlink and OneWeb, the impact is difficult to wrap one's arms around. But while teleport operators generally view the arrival of the LEO constellations as a game-changing



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opportunity, the ability of LEO companies to provide services directly to onsumer and enterprise customers could be seen as a long-term threat.

Being Pathway-agnostic is Becoming a Competitive Advantage

Teleport operators that have embraced multilayered connectivity – at least those not owned by satellite operators – tend to be pathway agnostic, citing application, geography and cost as the primary drivers of how they connect their customers. Enterprise customers, for their part, might desire multiple connectivity options for the sake of resilience or because they serve diverse geographical areas that are not fully covered by any single type of link, such as fiber or GEO satellites.

As-a-Service Models will Proliferate

The trend toward multilayer connectivity could accelerate the adoption of Ground Station as a Service – or, as one respondent put it, Everything as a Service – operating models, that could see the industry buy less hardware and subscribe to more services.

Multilayer Connectivity Growth Will Come from Enhanced Services

While teleport operators see significant growth opportunities in multilayer connectivity, most of that will come via enhanced or value-added services in existing vertical markets, such as enterprise or mobility. For teleport operators that are not in the managed services business, the opportunity lies in hosting antennas and other gateway equipment needed to connect the LEO constellations to the Internet. Many existing teleports have considerable excess capacity to accommodate this equipment because much of their hardware has been virtualized.

Nothing New About Hybrid

Most of the operators we spoke with said they already offer customers multiple pathways to connect, including satellite, fiber, microwave, and cellular. “We’ve been in this hybrid connectivity business for a while,” said an executive with a satellite services and technology provider. Many, though not all, operators increasingly view themselves as managed services providers, providing connectivity by whichever means

“...The drivers of multilayer connectivity include the ongoing decline in satellite bandwidth costs, technical advances that make it much easier to seamlessly switch between different pathways, and customer demand...”

makes the most sense based on application, geography or cost. “If we could put smoke signals in, we probably would,” an executive with one global operator quipped.

The drivers of multilayer connectivity include the ongoing decline in satellite bandwidth costs, technical advances that make it much easier to seamlessly switch between different pathways, and customer demand.

“I don’t think the satellite option on its own is viable anymore,” said an executive with a global connectivity provider specializing in services to Europe, the Middle East and Africa. There are always going to be last-mile issues that require operators to include options like microwave, and teleports usually need fiber connectivity, this executive explained. Plus, many customers are demanding backup options.

It is important to note, however, that not every teleport operator is trying to be all things to all people. But the trend toward multilayer connectivity is clear. “When I look at 2025, I see a way higher level of integration, not only LEO and MEO but also beyond satellite – much greater integration with cellular, Wi-Fi and the whole terrestrial grid,” an executive with a technology provider said. “It’s all about the connectivity and transport that are best for the desired application at the lowest possible cost.” 



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. Meeting the Challenge of Multilayer Connetivity is available for free to members and for sale to non-members at <https://www.world-teleport.org/store/viewproduct.aspx?ID=22154400>. He can be reached at: rbell@worldteleport.org

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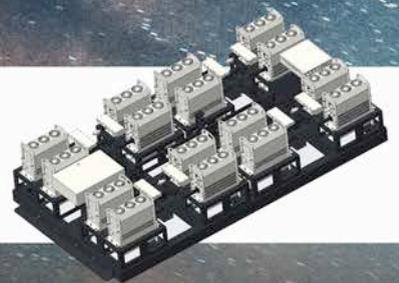
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MERGERS & ACQUISITIONS

Stellant Closes Acquisition of Power Systems Technology Product Line from Comtech

Torrance, Calif., November 7, 2023 — Stellant Systems, Inc. and Comtech (NASDAQ: CMTL), announced today that the companies have closed, effective November 7, 2023, on the previously announced sale of Comtech’s Power Systems Technology (PST) product line. Stellant is a portfolio company of Arlington Capital Partners, a Washington D.C.-area private equity firm with extensive experience investing in regulated industries.

Net cash proceeds received at closing by Comtech approximated US \$32.5 million and were used in part by Comtech to pay down outstanding

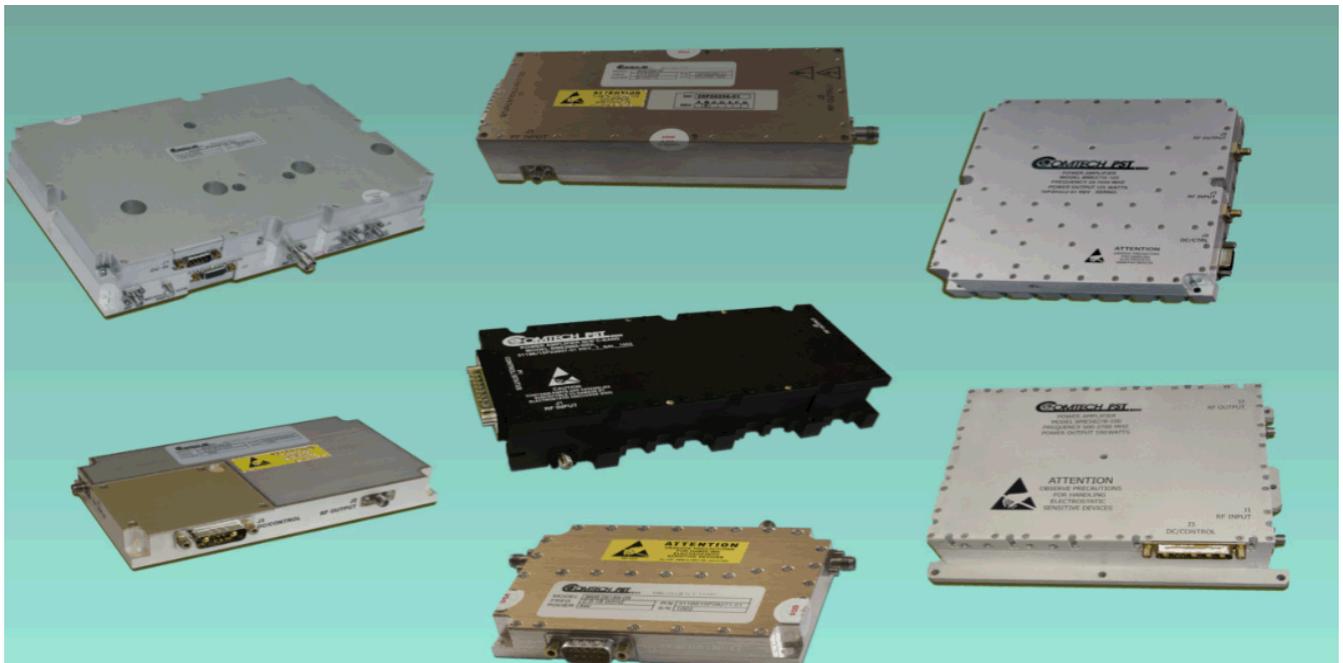
of Designations with its existing Series A convertible preferred shareholders, who both consented to the transaction. Comtech will provide financial and other information concerning the impact of the PST transaction during its next regularly scheduled quarterly earnings conference call to review the results of its fiscal quarter ended October 31, 2023, the exact date and time of which will be announced in advance.

Stellant Systems is a manufacturer



and nearly 1,000 employees. For more information, visit www.Stellantsystems.com.

Comtech Telecommunications Corp. is a leading global technology company providing terrestrial and wireless network solutions, next-generation 9-1-1 emergency services, satellite and space communications technologies, and cloud native capabilities to commercial and government



debt on its existing Credit Facility. In connection with the consummation of the closing of the transaction, Comtech entered into a Third Amended and Restated Credit Agreement with its existing lenders and a Second Amended and Restated Certificate

of critical spectrum and RF power amplification systems to the space, defense, medical, science and industrial markets for both domestic and international customers. Stellant has three domestic manufacturing facilities

customers around the world. Comtech leverages our global presence, technology leadership, and decades of experience to create the world’s most innovative communications solutions.



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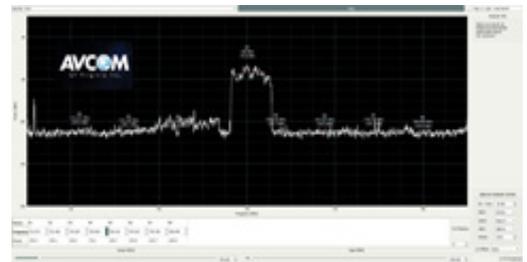
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Ovzon to Replace Chairman of the Board

Stockholm, Sweden, October 19, 2023 - Magnus René, Chairman of the Board of Ovzon AB announced his wish to leave the Board of Directors. The Board has decided to appoint the Board member Regina Donato Dahlström, with broad operational experience from the telecom industry, as the new Chairman of the Board until the next annual general meeting. Magnus René has been a Board member in Ovzon since



Magnus René

2018, CEO during the period May 2019-April 2021 and Chairman of the Board since 2021. He is leaving the Board with immediate effect.

"I have been engaged in Ovzon for almost 6 years as Board member, CEO and Chairman of the Board. The company's important project Ovzon 3 is now heading towards completion and the company is thus entering a new phase. It is a good time to hand over the chairmanship. Ovzon is a great company with a great team and it has been a pleasure and an honor to lead the work of the Board as well as to work with management and employees", says Magnus René.

"Magnus has been an invaluable asset to Ovzon during this period, both as operational CEO and as Chairman of the Board. My fellow Board members, as well as the entire Ovzon team would like to extend our gratitude to Magnus for these years. Personally, I feel very inspired to take

on an even greater responsibility in the company, now as Chairman of the Board, at this very exciting and important stage for the company," says Regina Donato Dahlström.

A new Chairman will be appointed through ordinary procedures during the next annual general meeting.

Ovzon offers mobile satellite communications services, SATCOM-as-a-Service, to customers across the globe. The services combine high data speed with high mobility. Ovzon's SATCOM-as-a-Service meets the growing demand for global connectivity for customers with high performance and security requirements such as Defense, Emergency Services, NGOs, Media and Commercial organizations. Ovzon was founded in 2006 and has offices in Stockholm, Sweden, Herndon, VA and Tampa, FL in the USA.

iRocket Appoints Kelyn Brannon as CFO

New Hyde Park, NY – November 6, 2023 --Innovative Rocket Technologies Inc. (iRocket) announced the appointment of **Kelyn Brannon** as its new Chief Financial Officer (CFO). Brannon, who was previously CFO of Astra Space and the original head of finance at Amazon, is also a member of the iRocket board of directors. She brings decades of experience in corporate finance and previously led three companies through successful IPOs.

iRocket is developing a new launcher that addresses the space and satellite industry's need for faster, more frequent, and less costly access to space. Bringing Brannon on board as CFO helps the company maintain

its fiscal responsibility as it fulfills its commitments to the U.S. Department of Defense, with a rocket engine that is powered by clean sustainable propellant and ready for reuse within 24 hours.



Kelyn Brannon

"At a time when rapid access to space is becoming increasingly critical, iRocket's technology and approach to reinventing launch is extremely promising," said Kelyn Brannon. "I'm at a point in my career where I can be particularly selective about the companies I support. I'm inspired by the iRocket value proposition and expect it will transform how the U.S. and our allies approach national security and emergency response."

In addition to Amazon and Astra Space, Brannon has been CFO of other leading enterprises, including Calypso Technology, Calix, and Arista Networks. While serving as CFO of Arista Networks, she successfully led a \$4 billion accelerated IPO process, reduced worldwide tax liability by three percent through reorganization efforts, and helped nearly double the company's revenue run-rate to more than \$700 million, all while managing personnel growth from 500 to over 1200 individuals worldwide. Brannon also held senior finance positions at Sun Microsystems, Lexmark International, and Ernst & Young, and is a member of the American Institute of Certified Public Accountants.



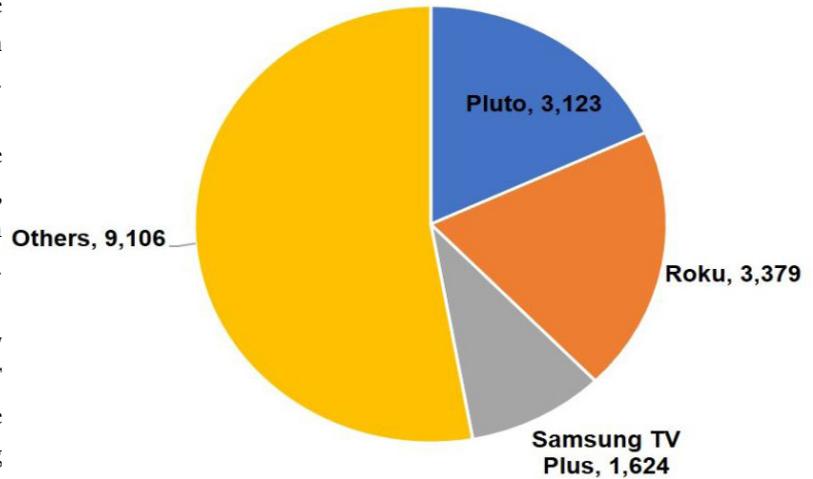
FAST Revenues to Reach US\$ 17 Billion

Middlesex UK, October 12, 2023 - Global Free Advertising Supported TV (FAST) revenues for TV series and movies will reach US\$ 17 billion in 2029, up from \$8 billion in 2023. The US will contribute 38% to the 2029 total; down from 56% in 2023 according to Digital TV Research.

Global FAST revenues will increase by \$9.4 billion between 2023 and 2029, with the US supplying \$2.1 billion in additional revenues to reach \$6.5 billion.

By 2029, the US will be the only country generating more than \$1 billion in FAST revenues. The UK and Canada will be close to \$1 billion, with these three countries taking nearly half of the world's total. Simon Murray, Principal Analyst at Digital TV Research, said: "Pluto TV, Roku Channel and Samsung TV Plus will account for nearly half the global FAST revenues by 2029. The rest of the FAST market will remain fragmented,

FAST revenues by platform in 2029 (\$ million)

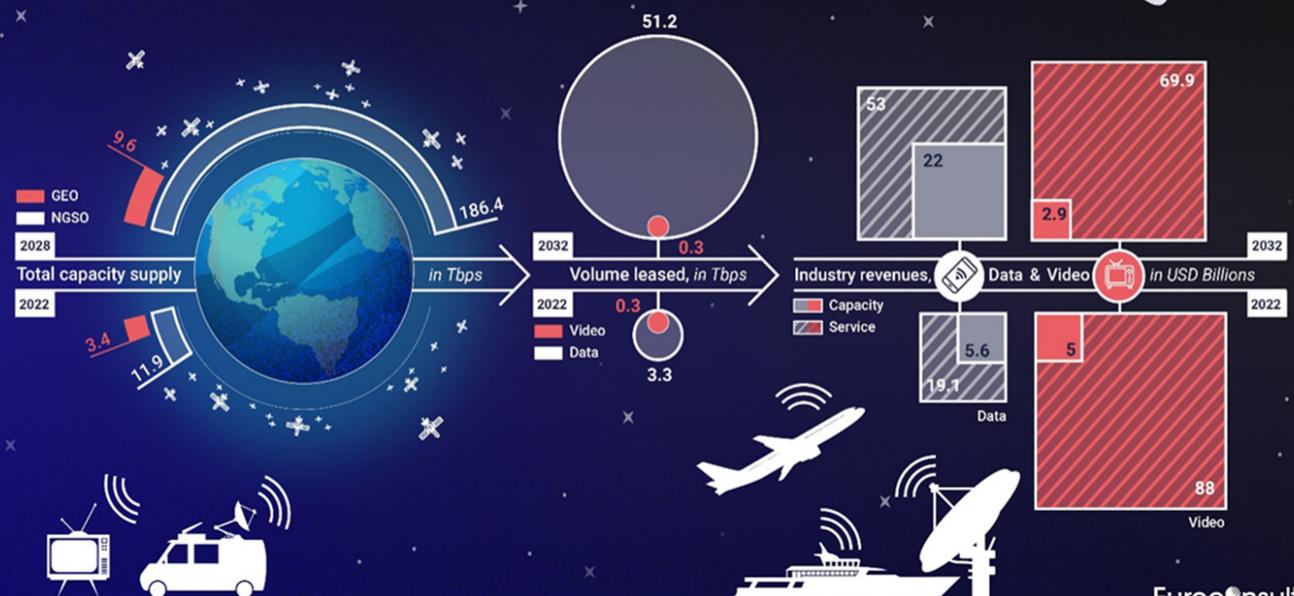


with far less globalization than in the SVOD sector.”

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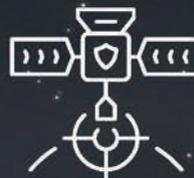
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