

# Satellite Executive BRIEFING

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Industry Trends, News Analysis, Market Intelligence and Opportunities

## The Changing Video Market for Satellites

by Elisabeth Tweedie

Low earth orbit (LEO) satellites are grabbing the majority of headlines, when satellite is being written about. But there is one aspect of their business that to date, has not received much publicity, their role in video contribution for the broadcast and media industries. Historically, all off-site video for news, sporting events and other major productions were transmitted back to base by satellite links. Then bonded cellular came into existence and a lot of that business, particularly for breaking news, and low budget events, transitioned away from satellite and onto cellular. Now, in addition, some of those links are being carried by Starlink and OneWeb, sometimes this is the only link, but they can also be part of a hybrid service with bonded



cellular. When this occurs, the link will seamlessly switch between the two depending on which offer the best path at the time.

The Starlink service can be ordered directly from the website, so no pre-booking required. Users are able to choose between the standard service, which has a limit, albeit a high one of one terabyte a month, and a business class service, which has no limit. Users can also choose between the standard and a high-performance

terminal.

LiveU is one company offering Starlink as part of the mix in its services. Some of its first transmissions came from Ukraine, where the terminals were used for war reporting. A New York based broadcaster also

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## A Sad Loss for the Industry: Zvi Golod



**O**ur industry lost one of its leading lights with the passing of Zvi Golod, the founder and CEO of Satellite Mediaport Services (SMS) last May. On page 8 of this issue, we feature a memorial to his enduring legacy.

I first met Zvi over a decade ago at the Amos Spacecom customer event in Israel. He was a very successful entrepreneur who pioneered several companies in Israel including content distributor Skyvision, Satlink teleport, among others, that have made a big mark in the telecommunications sector in Israel. From the session on ground systems that I moderated at the event, he picked up on my own teleport background and we bonded ever since. From that time we kept in touch and at every trade show where I would bump into him, he kept reiterating his invitation for me to visit his new teleport at Rugby England. He promised me that it would be the "most beautiful teleport I would ever see."

I finally took him up on his offer to visit his teleport in 2019 and it lived up to his billing and more. It was indeed a very beautiful teleport set in the middle of the English countryside. The teleport was built on a former Royal Air Force nuclear bunker which he transformed into a well-designed state-of-the-



**View an interview with Zvi Golod and a tour of the SMS teleport in Rugby, England at: <https://satellitemarkets.com/sms-teleport-2019>**

art satellite facility in a garden-like setting with manicured lawns and touches of his artistic bent including classical statues interspersed with traditional teleport fixtures such as antennas and ground stations.

I also got to know Zvi more during my three-day visit to his teleport. We had a full schedule of interviews and filming to be done in those three days, but Zvi made it a point that we find time to also explore the historical sites around the area. In the evenings, we would have dinner at the teleport and talked not just about satellites,

but of history, art, etc. Zvi was an accomplished engineer and had a hands-on approach to building and managing the teleport but he was also a renaissance man of many interests. At that time, he was already in his mid-70s he still had the energy of a much younger man and many plans for the future. He was not about to sit on his laurels and enjoy the fruits of his successful career. He struck me as someone who loved and enjoyed what he did and that was what kept him going. (You can read more about SMS teleport in articles published the May 2019 and March 2022 issues of the Satellite Executive Briefing).

Zvi has accomplished much in his career and I have no doubt that he would have accomplished even more had he not been taken away from us prematurely.

He will be missed but his legacy will endure.

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**Video Market...****...from page 1**

used Starlink terminals in conjunction with cellular to report on the return to school after the May 2022 Uvalde shooting. And, some of LiveU's customers also used this combination to report on the funeral of Queen Elizabeth II.

Using Starlink, or any LEO system comes with issues not found with GEO satellites. Firstly, since the satellites are constantly moving, relative to the user, it's not sufficient to have a view of a one point in the sky, anything that blocks a view of the sky can pose a problem. Secondly, using a single Starlink terminal bandwidth may provide peaks and trough, as the satellites pass overhead. Something, that is hardly ideal for a video transmission. Some users get round this by using

two bonded Starlink terminals, as it appears that even if they are closely collocated, the peaks and troughs are not necessarily in sync, so this smooths out the

bandwidth. Similarly, bonding with cellular, also works to smooth out the signal. According to LiveU, even though by definition as a LEO constellation, Starlink latency is low, setting a latency of 1.6 seconds or greater is needed to overcome jitter.

Starlink, offers several advantages,

**"...video-on-demand (VoD) was a very attractive proposition. Watch what you want, when you want, with the freedom to binge view..."**

over both traditional geostationary satellite links and bonded cellular. Firstly, it can be available in places where there is no cell service, secondly, depending on the location, it may provide higher bandwidth, and thirdly, it is relatively cheap, particularly when compared to GEO links, and it doesn't have to be pre-booked. All these combine to make it a good option for breaking news, particularly if the budget is tight.

However, Starlink is not the only LEO being used for contribution. OneWeb was recently used to transmit a UEFA Champions League match be-

advance planning, and with football leagues there isn't always enough notice of upcoming games, which presents a logistical challenge. Using a Kymeta flat panel antenna the signal was encoded into a standard MPEG stream and transmitted to Globecast in the UK for traditional satellite up-link to the international broadcasters carrying the match. Zixi transport technology was used, and was able to cope with the frequent handovers and delivered an error-free stream.

**Changing Viewer Preferences**

So that is a change on the contribution side of the industry, and as I mentioned in my article about NAB earlier this year (April-May 2023, *Satellite Executive Briefing*), the way content is being viewed, is also changing. When streaming first made its way into the viewing landscape, the perceived wisdom

at the time was that its success was due to three things. Firstly, cost, viewers were resentful of paying large monthly fees to cable and satellite companies for bundles of channels, half of which they neither wanted nor watched; and secondly, advertisements; viewers were sick of having their favorite programs interrupted by advertisements, most



tween the Faroese team KI Klaksvik and Ferenevaros of Hungary. The Faroe islands are somewhat isolated, having only two fiber links to the rest of the world, both of which have been cut in the past. There are no traditional satellite trucks based on the island, and the only way to get them there is by ship, something which requires



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of which they had seen multiple times anyway. And thirdly, video-on-demand (VoD) was a very attractive proposition. Watch what you want, when you want, with the freedom to binge view.

The first still holds, significant numbers of viewers are maybe even more price sensitive than they were ten years ago. Inflation may be coming down, but many have seen a noticeable decrease in their disposable income in the last couple of years. The second and third arguments are starting to look weaker, as advertising supported video-on-demand (AVoD) and free advertising supported linear TV (FAST), are increasing in popularity, as I mentioned in the previous article (April

2023). More data has emerged since then, highlighting just how significant this trend is. Deloitte Global is predicting that by the end of 2023, almost two-thirds of viewers in developed countries will use at least one AVOD service, and that all major subscription video-on-demand (SVOD) services will have launched an ad-funded tier, in order to keep subscribers. It goes on to predict that by the end of 2024 half of the providers will also have launched a free ad-supported streaming TV (FAST) service. Research conducted last year, showed that in Germany whilst 38% of viewers would prefer to pay 12 euros for an ad-free SVOD, 41% would prefer a free service with 12 minutes of advertising per hour. In the UK the difference was even more

marked, with 44% preferring the free service with 12 minutes of advertising, versus 39% who would prefer to pay £10 for an ad-free service. Deloitte is also predicting that by 2030, most online video service subscriptions will be partially or wholly ad-funded.

The increase in AVOD is also corroborated by Samsung. Samsung has a 61% market share for smart TVs in Europe, and its latest report, “Behind the Scenes: Decoding the Streaming Landscape” examined data from five European countries (UK, Italy, Spain, France and Germany). In the first half of last year, time spent viewing AVOD increased by 5% and time spent viewing SVOD decreased 5%.

Interestingly, in the UK, the latest



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Media Nations Report from Ofcom, showed that older viewers, (over 64), are starting to turn away from broadcast TV. The research showed that they watched 8% less than broadcast TV in 2022 than in 2021, and 6% less than in 2019 (the last pre-pandemic year). At the same time, their take-up of streaming services, Disney+ in particular increased to 12% in 2022, versus 7% in 2021. One would assume that for this channel in particular, the uptake is being driven by the presence of grandchildren.

## Innovations

Traditional broadcasters, recognized the move to streaming several years ago, and developed their own streaming offerings to compete with the likes of Netflix, Amazon Prime and Hulu and now many, including Disney+ have developed an advertising supported tier. A new player in the streaming market place is STN, based in Slovenia in Central Europe, and one of the top 20 global teleports ranked by the World Teleport Association (WTA). STN is one of the founding partners of MENAFLIX, a streaming service targeted to Arabic speaking viewers the world over. MENAFLIX can be accessed free of charge through an app available for Apple and Android devices, and also through Roku and Amazon.

STN CEO Mitja Lovsin said: “As a founder of MENAFLIX and long-time operator in the MENA region, STN is known for its cutting-edge technology. As OTT viewing grew in popularity, we expanded our portfolio of services, so that we could

work with customers who wanted to convert their traditional video streams to streaming and on-demand services. From the very beginning we were careful to select partners for MENAFLIX, that fully understand the MENA marketplace and share our vision of providing the very best in customer service and attention to detail. We are delighted to now be able to offer our customers the opportunity to join MENAFLIX, the rapidly growing, Arabic language OTT service.”

The service provides live and on-demand channels from the entire Middle East region, including news, entertainment, religious, children’s programming and radio. By utilizing programmatic advertising for the live free-to-air channels, MENAFLIX TV allows channels to expose their content worldwide and generate a new revenue stream from personalized advertisements.

As always, satellite players continue to innovate to keep and increase business as their markets evolve, it will be interesting to see what the video market looks like in a year’s time. 📶



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](http://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](mailto:etweedie@definitivedirection.com)



**MENAFLIX is a new streaming service from STN, that enables viewers to watch live and on-demand channels from the entire Middle East region, including news, entertainment, religious, children’s programming and radio, via the free app available for Apple and Android devices. MENAFLIX is also available through Roku and Amazon.**

# Asia Satellite Business Week

## Highlight Key Trends in APAC Market

by **Blaine Curcio**

The Asia Satellite Business Week (ASBW), part of the larger Asia Tech X Singapore (ATxSG, formerly known as CommuicAsia), took place from 7-8 June at the Singapore EXPO. Organized by Euroconsult, the conference brought together leaders from across the Asia-Pacific space and satcom industry, and featured two days packed full of panels, networking, and fireside chats with local space agencies and other stakeholders.

An impressively varied list of topics was fit into two jam-packed days, but three stood out as particularly interesting or poignant:

- Local players had a bigger presence this year, as the space sector is becoming more prevalent in the Asia-Pacific region.
- NGSO constellations are becoming more widely accepted as necessary by GEO operators, while at the same time remaining uncertain as to market impact, and
- The space and launch segment is becoming more flexible, which is likely to enable further growth in the sector.



### Local Players Turned Out in Force

Previous editions of AtxSG and ASBW had included a strong local contingent, but 2023 was different. Most obviously, this was the first year since pre-Covid with mainstream Chinese attendance. Given the difference between Chinese commercial space today and Chinese commercial space in 2019 (today is vastly larger), it's not surprising that we saw several new blue chip Chinese commercial space companies in attendance, including MinoSpace and PIESat.

Given the re-opening of China in late 2022, it's also not surprising that we saw the return of several usual suspects of Chinese space including China Satcom and China SpaceSat (aka Beijing Dongfanghong). Beyond Chinese attendance, we also saw the inaugural participation of the Satcom Association of India as a panelist, and the Geo-Informatics and Space Technology Development Agency (GISTDA) of Thailand in a fireside chat. Local participants were keen on leveraging space for both industrial development and practical benefits. We learned from GISTDA ways that they are using space to benefit average Thai people, notably through the creation of the Dust Check

([เช็คฝุ่น](#)) app.

Finally, several satcom panels featured local participants who brought new perspectives to the discussion. Notably, we heard pessimistic forecasts about site deployments for BAKTI in Indonesia (as few as 50,000 compared to the 150,000 conceptualized by KOMINFO), but this partly for lack of supply (the ~3 Mbps allocation per site initially planned was vastly insufficient). In particular, West Papua Province is apparently behind on expected deployments, with the other major factor being logistics (it's expensive and time-consuming to deploy VSATs to the field).

### NGSO Constellations were the Biggest Talking Point, and it wasn't just Starlink

One of the biggest talking points throughout the satcom part of the conference was the impact of Starlink, and other NGSO constellations. In the case of Starlink, the constellation appears to be winning some market share in maritime, with multiple maritime satcom service providers reiterating previous positive sentiment about performance



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and customer demand (Speedcast), and with more recent adopters providing more measured, but still undeniably positive feedback on their Starlink usage (Tototheo Maritime Group of Cyprus).

Other NGSO constellations made their presence known at the conference. KTSAT showcased a multi-orbit strategy, the centerpiece of which is the company's investment into Mangata Networks (part of the company's January 2022 funding round). During the conference in Singapore, KTSAT announced a contract to purchase MEO capacity from Mangata, allowing KTSAT to "meet the diverse needs of customers with multi-orbit networks, including their own GEO capacity."

OneWeb's presence in the region remains limited due to only having recently completed coverage, but markets seem primed to take on more capacity, even at prices that are not seen as rock-bottom. The long-awaited entry of OneWeb into India is expected to meet a well-primed market via local partner Hughes India, and other markets including Indonesia also seeming ready to take on capacity.

Overall, the clear conclusion during the week is that most satellite operators are starting to look at NGSO in some context, and quite a few of them are starting to make fairly substantial moves into multi-orbit solutions: even the regional ones. In the future, the biggest question, as has been the case for some time, is elasticity of demand. As hundreds of Gbps or Tbps become the standard for space-based communications networks, how much more demand will exist at pricing that will by definition be orders of magnitude lower than today.

### Vastly More Flexible Space and Launch Segment

One of the key enablers of a more varied space industry will be an increase in flexibility on the space segment, occurring in several ways. First, satellite manufacturers are building modular, software-defined satellites, and leveraging technologies and capabilities integrated from experience in building NGSO constellations. During the conference, we heard from Boeing about leveraging capabilities developed from building batches of O3b mPOWER satellites and incorporating them on their GEO platforms. This is consistent with lessons learned by other manufacturers, including Airbus (leveraging capabilities developed from building OneWeb satellites).

This flexibility is partly being enabled by a new gen-

eration of in-orbit servicing. Around the time of the conference, Northrop Grumman subsidiary SpaceLogistics announced multiple in-orbit servicing contracts with Intelsat, and the company noted that demand for life extension of existing GEO satellites in Asia-Pacific was strong in an uncertain GEO satcom environment. At the same time, companies such as Astroscale are enabling satellite operators to be responsible actors in space, giving them more flexibility in launching experimental payloads that might result in space debris (which could be cleaned up by Astroscale).

Moving forward, as the space sector becomes more mainstream, it seems inevitable that flexibility would only increase.

### Conclusion

ASBW was a great showcase of all things satcom and space in the Asia-Pacific region. Highlighting a regional dynamism that is starting to fire on all cylinders, the conference was the clearest indication yet of the growing interest in space in APAC. On the satcom side, the most apparent trend was the impact of NGSOs, and the broadening acceptance by satcom operators on the importance thereof.

In the conference more broadly, we saw emerging space nations playing a bigger role, with several first-time speakers from the region in attendance. This is being enabled by, and also creating support for, increased flexibility of space-based services, including life extension and debris mitigation. Looking on to next year, we may have some clarity on the impact of NGSOs on satcom demand at lower price points, and we are sure to see a few new faces. Either way, looking forward to seeing you then in Singapore!



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# Artificial Intelligence is Here to Stay

by Roxana Dunnette

The International Telecommunications Union (ITU) hosted another edition of the Artificial Intelligence (AI) for Good Global Summit from July 6-7, 2023 in Geneva, Switzerland, this time completely different as robots were also in attendance. Nine humanoid robots and more than 40 general-purpose robots were at work at the summit.

More than 3000 delegates from governments, businesses, academia, civil society, ambassadors and UN

sister organizations were present to listen and debate AI issues presented by a large number of inventors, scientists and visionaries on the benefits and risks of AI unchecked.

The summit featured a series of inspired AI performances, interesting presentations, drinks and food prepared and served by robots, humanoid robots talking and doing things and the company of incredible people.

Doreen Bogdan, Secretary General of the ITU set the tone: "Let's show the world what an inclusive, a safe and a responsible AI can do for humanity," she declared. She focused the discussions on how AI could help the implementation of the 17th United Nations Sustainable Development Goals for an inclusive society and what can be achieved by 2030.

"AI can be as good or as bad as humans can be," said Sundar Pichai, CEO of Google. The possibilities are



or destabilizing financial markets.

If AI were to become capable of making plans and act upon them –

especially if they are not based on human values, who knows if deciding humans are not becoming obstacles?

At this Summit, there were a numerous presentations on the benefits of AI in health care, education, agriculture, climate control, space and earth, architecture, arts, among others.

There was a strong call for regulations at the global level and countries level to ensure societal protection. Among the questions asked were: Should we have a Global Observatory on how AI should work, empower existing ones? Companies,



The summit featured life-like robots to showcase the capabilities of AI for various applications such as health, space, earth sciences, among other, and how it will transform how we work and play.

huge, the risks great but it is not too late for policy makers to establish rules to mitigate the dangers and have AI only for Good. In the wrong hands AI tools could cause many problems from creating fake content to cyberattacks

governments who should regulate? Who is responsible for AI devices?

At the country level there are concerns about lack of debate, knowledge of AI by regulators, lack of sectoral agencies, the complexity and speed of AI innovation that will make almost impossible a central supervision. Databases in languages other than English is a problem so are countries regulatory traditions. The Summit provided a platform to debate all those problems having a risk-based approach in using AI. Meanwhile, the US Senate announced plans to legislate AI, UK PM calls for a Global Summit on AI safety, EU the same. The concern is there.

Regulatory and Ethics go hand in hand. Human rights, inclusivity, diversity should be taken into consideration.

The European Union AI ACT gave a wide range of rules designed to govern the use of AI. The AI ACT bans for example AI that tracks citizens based on their behavior and the facial recognition in public places. Predicting all potential risks of AI would be impossible and will stop innovation.

CEOs of large investment funds praised AI but seek rules on its ethical use. While waiting for governments to speed up regulations of AI, they set Guidelines for how companies in which they invest should use "AI ETHICALLY"--a set of standards to be unveiled in August this year. A responsible investment framework will be the norm.

The ITU is responsible for AI Standardization (see the chat with Seizo Onoe, Director of ITU's Telecommunications Standardization Bureau), policy and digital transformation in countries with fewer infrastructures.

Putting human values at the core

of this work is a priority. The new ITU-T Focus Group on AI Ethics will issues a report by the next summit in May 2024, same for the ITU and UN-HCR report on AI and Human Rights.

### AI for Health

No other subject attracted more attention on AI ethics than **AI for Health (AI4H)**. Automated medicine benefits from a massive amount of biological data for today's computer algorithms to quickly find patterns that would take humans years to discover.

AI could be used to accelerate discovery time for new medicine, do clinical evaluation, predict pandemics, evaluate the use of robots, recreate medical ethics, solve mystery about genetic disorders and identify potential treatments, educate.

WHO already published two guidelines on:

- Ethics and Governance--Accelerating evidence for AI based medical devices, a frame work for training, validation and evaluation.
- ITU -T Focus Group on AI for Health issued in March: Clinical evaluation on AI4H.

At the Summit, WHO, ITU and WIPO signed the "GLOBAL INITIATIVE on AI4H" which will:

- Enable (standards, policies, governance, guidelines)
- Facilitate (investments, global countries experts)
- Implement (sustainable models of AI programs at country level)

Ethics will evolve too, as based AGI programs with updated inputs

will decide which ethical norms are necessary.

Visionaries and authors like Noah Hariri and Ray Kurzweil entertained the debate benefits vs. risks of AI, reaffirming that by 2029 computers could reach human intelligence and in the next 20 years AI will change what human means.

Let's wait and see ....

### AI for Space and Earth Science

The applications of AI for space and earth science are endless: from machine-based detection and monitoring of satellite operations to cleaning the space from debris, to missions to Mars. More than 60,000 objects are in space and satellites are not protected. Accidentally objects fall on earth and add to the pollution. AI algorithms can track them, destroy them or bring them back.

AI is key in this age of planetary transition. We can use the information provided to improve the social behavior, have less pollution and better planetary design. Mapping water resources, carbon print, bio diversity, agriculture fields, people, it is easier and we could use LLM integration for predictive analysis, to establish trends, climate patterns for research or measurements.

You can't manage what you can't measure.

AI outputs are useful in viewing alerts (deforestation for example), drive action, detect dangers in real time and if plugged into Chat GPT get an answer without going to the field.

AI Robotics can retrieve satellites from orbit or prolong their life and help with operational and financial planning. All AI Robots have on-board





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### AI and the Workforce

AI will alter work for most knowl-

edge workers, shifting skills they need and changing the staffing, but it is not so bad as new jobs like AI Personal Assistant to fix AI for every device, will emerge.

AI will empower humans not replace them, do jobs and tasks too difficult or dangerous for them.

The immediate effect could be unemployment but if the demand is

there this technology creates jobs.

If we choose applications not technologies that address "huge markets unexpressed needs, for example: deliver education and health care in poor countries" (as one distinguished speaker said) it will be good for people.

Humans have emotional intelligence and will retain their role and in many situations have the advantage.

## Chat with Seizo Onoe, Director of ITU's Telecommunication Standardization Bureau

There was a lot of talk at this Summit about the urgent need for AI Governance, Regulations and Standardization. At ITU-Telecommunications Standardization Bureau (ITU-T), Artificial Intelligence and Machine Learning are getting a larger share of ITU-T's standardization work in areas like AI and 5G future networks, networks management, coding and multimedia applications, digital health, environmental efficiency, autonomous networks and more. We asked *Seizo Onoe* Director of ITU-T, about the status of standardization work in enabling the safe use of AI in the future.

### What is the AI standardization process and what is the progress so far?

ITU-T Study Groups develop recommendations on technical specifications, in some cases on guidelines that are published. In Study Groups only ITU members governments, private sector, academia participate. We created more than 10 years ago Focus Groups open to all, everybody outside ITU can join even if they are not members. Machine Learning for 5G future Networks--it describes the frame work and the active chart to implement AI in 5G networks.

In St. G. 13, Future Networks and ST.G.16 Coding, we have inputs from Focus Groups for "AI and ML for multimedia coding and multimedia applications." They are currently under evaluation.

### What can be standardized in regard with AI and ML ?

Standardization is not only for technical specifications there are other phases, it is important to clarify terms and definitions which could become standards.

### What is the time line from Focus Group Work to standard?

It is not fixed it depends on the theme. If we get a consensus it can go quickly, in some cases if there is no result the process is finished. We have new activities in Focus Groups about Autonomous Networks, AI and Ethics for Health.

### How are the AI standards going to be implemented in this virtual world?

Implementation of AI is not so physical like telecommunication systems but even in telecom we have activities in software interface and some outside organizations define applications. In either cases we need to implement such specifications, We also have activities in open sources and we expanded our areas of standardization in collaboration with other organizations that have their own technical activities. At this Summit ITU signed with WHO and WIPO a "Global Initiative AI for Health." This Summit just became to a platform to discuss AI Governance, it just happened thanks to Chat GPT . Focus Groups create some input and paper work but it is not a recommendation. In some cases after Focus Groups successful discussions results move to Study Groups then if members agree it will become recommendation, then standard. I can give you an example: I attended just before the Summit Study Group 5 meetings. We had a Focus Group on 5G Networks and their input went to Study Group, then we had a good outcome and became a Recommendation T.3172.



**Seizo Onoe**



## SHOW REPORT

Men create the data used by algorithms. Using Generative AI could speed up many tasks and increase productivity, but how do you get AI to do only things you want, make sure is aligned with human intentions and is a service to humanity? As more interdisciplinary experts join the teams, AI will not endanger confidentiality or security.

NO changes NO progress, there is not one solution but many choices!

### Creativity and Robots for Good

Is AI an opportunity to humanity?

AI just reinvents the human creativity. AI can create, work, comment on changes, understand the world perform with humans and engage you in many different ways.

The summit featured a FESTIVAL of ROBOTS, 40 + general-purpose robots and 9 humanoids and it was so nice to watch some robots "create" and display "artistic intelligence."

The all-purpose robots on display were for manufacturing, maintenance and repairs (accelerator at CERN), for dangerous operations, (rescue, police, nuclear facilities). We had autonomous robots for disaster management, robots that assist autistic children, help with learning or socially assistive robots for older adults or for recovery stimulating patients with cognitive disorders, robots for medical rehabilitation or that work in restaurants and bars.

There were performances on stage by artist playing music created by AI (what about the copyrights?) and jam sessions with real musicians and humanoid robots.

Why humanoid robots are creat-

ed? – Because they can have a better connection with us and have multiple functions in the society. Avatars could be used in kindergartens, supermarkets, amusement parks and hotels as guides or information points, can be public speakers and presenters or play games with us.

Among the robots include the following:

GEMINOID (Hiroshi Ishiguro's avatar) good at gestures can sell bread in a bakery; NADINE (Nadia Thalman's avatar) uses Chat

GPT to understand the environment and issue comments.

DESDEMONA, the rock star delighted us with a live performance with a jazz band on stage.

GRACE, the medical care robot provides advices to nurses, informs patients on their rights and medical ethics.

SOPHIA is the first robot Innovation Ambassador to UNDP.

AI- DA, my favorite robot artist is painting, does portraits, and makes us think differently about robotic artwork.

When asked at the press conference "What do you feel when you paint?" the robot answered, "I don't



have feelings, I like to experience and be around people but I can't experience what you do. I can't suffer."

Yes, we had the first press conference with all 9 humanoid robots and their creators but only the robots answered our questions.

In the end DESDEMONA the rock star robot told us:

*"Use AI for GOOD, let's get wild and make the world the background."* 🚀

**Note: This article was not written by ChatGPT or a robot.**



**Roxana Dunnette** is a correspondent of Satellite Executive Briefing based in Geneva, Switzerland. She is Executive Director, R&D MEDIA, Switzerland. She has had an extensive career in broadcasting and media including senior management positions at Worldspace, CBS and PBS in New York and international telecommunications regulatory work at the UN in New York and ITU in Geneva as US government representative. She accomplished many development projects in Africa based on satellite technologies, broadcasting, Internet and accessibility. She can be reached at: [rdmedia@bluewin.ch](mailto:rdmedia@bluewin.ch)

## Phoebe Wang VP-Asia, Thuraya

*At Satellite Asia 2023 held in Singapore, Satellite Executive Briefing caught up with mobile operator Thuraya's Vice-President for Asia, Phoebe Wang, who expounded on Thuraya's presence in the Asia-Pacific market and the latest developments on their company. Excerpts of the interview follows:*

*Why are you here at Satellite Asia, and what are the most interesting solutions or products you are showcasing at this exhibition?*

We are happy to be at Satellite Asia, which is part of ATxSG, commonly referred to as CommunicAsia, the premier ICT event in the Asia Pacific region. Thuraya is participating as the mobility arm of the UAE's flagship satellite solutions provider, Yahsat. It is happening in the midst of the 'Yahsat Asia Week' we are hosting in Singapore, which opened with our Asia Partner Conference on 5 June. As Thuraya transitions to next-generation connectivity with the expected launch of the Thuraya 4-NGS satellite next year and a next-generation broadband portfolio, we regard events like CommunicAsia as great platforms to network with our partners, explore new market opportunities and give customers first-hand experience for our next generation broadband portfolio developed in collaboration with industry leader, Cobham SATCOM. This is fundamental to our strategy to drive growth.

Thuraya has a lot of goodwill in the market and the response we are receiving is tremendous. In addition to our next-generation broadband portfolio, we are showcasing our latest solutions, including the award-winning and immensely popular Thuraya MarineStar and Push-To-Talk solutions.

*How important is the Asia-Pacific market for Thuraya?*

The Asia-Pacific region has always been vital for our mobility business. Thuraya has been active in the market for more than 15 years and our customers in the region are familiar with our technology. Other various solutions and products are among the most popular and most selling products in this part of the world.



**Phoebe Wang**

Our recent spike in maritime service revenues is driven largely by Asia. As regional economies develop, there is a corresponding surge in demand for satellite services in the region. We see great opportunities for growth especially in the IoT and maritime sectors. Fisheries, utilities and agriculture hold a lot of promise. So, yes this is a very important region for us and central to our expansion plans.



*How many countries you are actively servicing in this region right now? Please shed light on your expansion plans.*

Today, we cover all countries in the region and are licensed to service most of them. Our Asia Partner conference was attended by more than 25 entities from the region, representing key markets including Vietnam, Philippines, Malaysia, Singapore, South Korea, China, Indonesia, and Australia. We have big plans to expand in the IoT and maritime sectors, and are aiming for a big push in Southeast Asia.

*In your opinion, what are the key strengths that make Thuraya stand out among the crowd as an outstanding SATCOM provider?*

I would say our resilient satellite network and strong and enduring partnerships. Innovation is in our DNA and our next-generation broadband portfolio addresses diversified market requirements. It is bound to be a game-changer when launched. Our pricing model is extremely flexible and the pay-per-use subscription packages are ideal for value-conscious customers. Rather than a satcom provider, we see ourselves as a solution provider and technology enabler, providing customized capabilities to meet diversified needs.

*When are you launching your Next Generation mobility broadband portfolio?*

We will be launching it next year soon after the expected launch of our sixth satellite-Thuraya 4-NGS-in the first half of 2024.

*What are your immediate priorities, say for the next 6 months?*

We are preparing for the launch of Thuraya 4-NGS satellite system in the first half of 2024, which is a key driver of our next-generation transformational program. In parallel, we will be launching our next generation mobility broadband portfolio.

Those are our top two priorities, which will allow us to venture into segments needing advanced satcom capabilities. At the same time, we are exploring new opportunities and strengthening existing partnerships to fortify our distribution channels.



**The Thuraya 4-NGS satellite, scheduled for launch in the first half of 2024, is part of Thuraya's transformational program to build a new and comprehensive ecosystem by upgrading all three segments, namely space; ground; products and solutions.**

**(Artist rendition of the satellite courtesy of Thuraya).**

*Thuraya is the mobility arm of the UAE's Yahsat, where the space economy is thriving. How is Thuraya positioning itself within this rapidly growing sector?*

A top-10 satellite operator (in terms of revenue) reaching 80% of the global population, Yahsat is one of the key drivers of the UAE's space economy. Last year, Yahsat's revenue grew by 6%, and Thuraya's share was 19% or 1/5th of the total revenue.

This will give you an indication of how important the mobility business is for us. The new satellite and the next-generation broadband portfolio allow us flexibility to tap into new market segments and opportunities, ensuring further growth and expansion. 

## In Memoriam: Zvi Golod



***A Visionary and trailblazer in satellite communications, who reshaped the telecommunications landscape in Israel and left an indelible mark on the global communications arena***

**Zvi Golod** (1943-2023), a leading luminary in the realm of satellite communications, embarked on a transformative journey that spanned tumultuous decades and reshaped the landscape of modern communications technology. Educated amid the backdrop of the vibrant 60s, Zvi's indomitable spirit led him to pursue a path of innovation and discovery that has left an indelible mark in the telecommunications industry.

As an accomplished electrical engineer, he found himself intrigued by satellites in the mid-1970s, when the technology was just starting to take shape. Understanding their significant potential, he became one of the pioneers who brought used satellite antennas to Israel. Assembling one in his parents' backyard, he overcame the intricate challenges that defined the technology of that era.

Zvi's breakthrough moment arrived when he witnessed the transformation of mere snowflakes on a monitor into vivid images, achieving high-quality video reception. This accomplishment unveiled new horizons, propelling him into the forefront of satellite communication innovation.

During the Iran-Iraq war, Zvi's visionary approach shone brightly. Operating from his makeshift backyard "studio," he offered American television networks cassette recordings of combat footage gleaned from various satellites. This pioneering endeavor not only revolutionized media coverage but also spared the lives of correspondents in perilous war zones. Zvi's leadership and visionary prowess set a standard that many eagerly followed, establishing him as a beacon of inspiration in Israel's technology landscape.

As the internet emerged, Zvi's astute insights and understanding of satellite technology propelled him to new heights. He recognized the potential for multipoint content distribution and spearheaded pioneering methods to transmit large volumes of data between Israel and distant continents. This foresight culminated in the creation of Satlink, a satellite-based venture situated on the outskirts of Jerusalem. Satlink served as a conduit for global news and content distribution, solidifying Zvi's position as a leading luminary in the field of satellite communication.

Zvi's relentless drive led him to establish Skyvision, a visionary enterprise dedicated to providing internet services across Africa, the Middle East, and Eastern Europe. These groundbreaking services heralded a new era, shaping the digital landscape of the developing world on a grand scale.

In the mid-2000s, Zvi's unwavering passion and pioneering spirit once again manifested. He stumbled upon a dormant satellite facility in northern London, housing a mere five antennas. Recognizing the opportunity amidst the challenges, Zvi acquired the facility and embarked on a transformative journey. Over nearly two decades, the site blossomed, growing to encompass an impressive 65 antennas (originally 5) and expanding by eight acres (originally 4). Zvi's visionary leadership transformed this location into an unparalleled communications hub, setting new standards for the industry.

Today, Satellite Mediaport Services ([www.sms-teleport.com](http://www.sms-teleport.com)) stands as a testament to Zvi's enduring legacy. The facility's allure extends beyond its function, encompassing charming Japanese gardens, meandering streams,



## REMEMBRANCE




**One of Zvi's most enduring legacies is the state-of-the-art Satellite Mediaport Services (SMS) teleport near Rugby, England which he painstakingly built with exacting technical standards and punctuated it with his artistic touches such as the well designed landscaping and classical statues as pictured in the inset above.**

and an annual spectacle of North American and African bird migrations. Zvi's dream of hosting social events on-site, inspired by the captivating beauty, continues to thrive.

Under Zvi's astute guidance, Satellite Mediaport Services evolved into an expansive teleport, with a trajectory of growth and innovation spanning decades. Beginning with a modest five antennas, the company burgeoned into a powerhouse boasting

over 70 antennas today. Zvi's resolute commitment led to the acquisition of four additional acres, ushering in a new era of expansion. This strategic evolution broadened the company's horizons, enabling it to cater to diverse international organizations.

Zvi's indelible impact extended the company's reach to pivotal regions, solidifying its role as a premier global satellite teleport hub. The name Zvi Golod became synonymous with sat-

ellite communications, a testament to his visionary leadership and unwavering drive that elevated the company's stature. With an unwavering focus on discerning high-profile clients and global reach providers, the company embodies Zvi's exceptional vision and enduring contributions to the realm of satellite communication. Zvi Golod's legacy shall continue to shine brightly, inspiring generations to come in the ever-evolving world of technology and communications. 

# Jonsa Technologies

**T**aiwan-based antenna manufacturer **Jonsa Technologies** has been in business since 1989 and has carved a unique niche in the satellite antenna manufacturing sector with its reputation for high quality products and exceptional customer service. From its sprawling 28,000 square-meter facility in Nantou City, Taiwan, the company has a monthly production capacity of over one million units in a variety of antenna products. Their comprehensive portfolio of antenna systems includes Satellite TV (TVROs), VSAT, WISP, and VAST mounting bracket solutions, among others.

With its patented RF, object-oriented design and stable raw materials, J O N S A can manufacture high-quality parabolic dish that are extensively applied to the commercial, maritime, Internet service, emergency communications, weather data analysis, among others.

Even though the company has a capacity for high-volume orders, it can accommodate even small orders for samples. The company does not discriminate between its larger clients and smaller companies with limited production runs. The company not only manufactures its own products but can also do Original Equipment Manufacturing

(OEM) and Original Design for third-parties. "We are a one-stop-shop. We work from concept to the designing, manufacturing and testing of OEM/ODM products and even customize them to meet our clients' requirements," said Johnson Lin, Product Manager of Jonsa.

With over 30 years OEM/ODM experience in the antenna market, JONSA prides itself in adherence to quality assurance and best industry practices. Over the years, JONSA has achieved various quality certifications including TW AEO, ISO 14001, ISO9001, and ISO45001.

The company is committed to a strong R&D department. Its team of highly-skilled technicians and engineers are capable of delivering DTH antenna first trial run within 60~70 days and VSAT antennas within 90 days.

Jonsa is ready to help you meet your antenna design and manufacturing needs.

For more information, go to: [www.jonsa.com.tw](http://www.jonsa.com.tw)



From its sprawling 28,000 square-meter facility in Nantou City, Taiwan, the company has a monthly production capacity of over one million units in a variety of antenna products.



View an interview with Jonsa Technologies Product Manager Johnson Lin at: <https://satellitemarkets.com/people/interview-johnson-lin-product-manager-jonsa-technologies>



## Flyaway and Maritime Antennas from JONSA Technologies

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

**Our best-selling product in Jonsa includes:**

### 0.6M/0.9M Auto and Manual Flyaway

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

### VSAT (E74/97/120) antenna

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

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

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

For more information, please visit [www.jonsa.com.tw](http://www.jonsa.com.tw) or email [saccount@jonsa.com.tw](mailto:saccount@jonsa.com.tw)



Spotlight on key products and services to be showcased at IBC 2023  
Amsterdam, September 15-18, 2023

## AvL Technologies

@ IBC visit AvL at Hall 1 booth # 1.C64



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

For more information go to: [www.avltech.com](http://www.avltech.com)

## Comtech

@ IBC, visit Comtech at Hall 1 booth # 1.D71

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



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

For more information go to: [www.comtech.com](http://www.comtech.com)

## Es'hailSat Qatar Satellite Company

@IBC visit Es'hailSat at Hall 1 booth # 1.F68

Es'hailSat, the Qatar Satellite Company, is a communications satellite operator headquartered in Doha, Qatar. Established in 2010, Es'hailSat delivers services to broadcasters, enterprises and governments in the MENA (Middle East and North Africa) region and beyond. With the goal to become a world class satellite operator and the foremost satellite services provider in the MENA region, Having both Ku-band and Ka-band payload on satellites co-located at 25.5°E / 26°E broadcast hotspot enables Es'hailSat to provide the region with the most advanced and sophisticated services including broadcast, telecommunications and broadband.



For more information go to: [www.eshailsat.qa](http://www.eshailsat.qa)



## ND SATCOM: The future is Now. The Future is SKYWAN 5G

@IBC visit ND Satcom at Hall 1 booth # 1.C48



INSTALLING  
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With over three decades of experience, ND SATCOM, headquartered in Germany, is the premier supplier and integrator of innovative satellite communication systems and solutions to support customers with critical operations around the world. Customers in more than 130 countries have chosen ND SATCOM as a trusted and reliable source of high-quality, secure turnkey and custom system-engineered communication solutions.

The company's products and solutions are used in more than 200 transnational networks in government, military, telecommunications and broadcasting sectors. The flagship of ND SATCOM, the SKYWAN platform, enables international users to communicate securely, effectively and quickly over satellite. ND SATCOM's core technologies and diverse applications are:

- SKYWAN, an advanced MF-TDMA VSAT system for establishing wide area networks for military, governments and enterprises.
- FlyAway antennas for various commercial and military uses.
- Tactical Communication-On-The-Move (COTM) for high-security missions on land and sea, enabling mobile command and control.
- Tailored communication solutions for embassy networks, disaster relief and emergency operations, oil and gas explorations, and maritime locations.
- Leading supplier of ATC networks across the globe.
- Specialized solutions for military and defence operations such as mobile and transportable satellite ground terminals.



Dive into a new dimension of satellite communication with SKYWAN 5G. Just when you thought you heard it all – from reliability to flexibility to scalability – ND SATCOM breaks the barrier with new engineering features that anticipate your business needs and further optimise the performance of your business. We listen, we innovate, we lead. This is why our standards of excellence, proven track record and 5th generation SKYWAN keep customers coming back for more. We are the only trusted solution provider in Europe for demanding market sectors such as aviation and the military, where the concept of reliability has far-reaching impact.

For more information, go to: [www.ndsatcom.com](http://www.ndsatcom.com)

## Mission Microwave

@IBC visit Mission Microwave at Hall 1 booth # 1.F64

Mission Microwave Technologies was founded in 2014 to create the next generation of Solid-State Power Amplifiers (SSPAs) and Block Upconverters (BUCs). We use advanced GaN transistors, unique power combining technology, and novel full-system designs to create the industry's most efficient, lightweight, and compact high-reliability SSPAs for mobile



communications applications.

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



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

For more information, go to: [www.missionmicrowave.com](http://www.missionmicrowave.com)

## K-NET

**@IBC visit K-NET at Hall 8 both # 8.A46**



K-NET is a technology company registered and operates from Ghana and has tremendous experience and knowledge in telecommunication solutions, with many landmark deployments within West and Central Africa. Our Services include: - Teleport Services - HNO & VNO VSAT Services - Content Distribution Networks - Satellite Uplink Services.

For more information, go to: [www.knetgh.com](http://www.knetgh.com)

## Revgo Global

**@IBC visit Revgo Global at Hall 1 booth # 1.C43**



RevGo Global Inc. was founded by senior satcom executives from US and Canada with more than 100 years of combined experience at Satcom RF system design. We combine the new generation GaN technology with unique power combining capabilities, designed for high volume production with strict reliability and quality control to create the most compact, cost-effective, field-proven, reliable BUCs, LNBS and Transceivers. Manufactured to the stringent quality standards of ISO9001:2015. All at the highest value available and the shortest lead times.



For more information go to: <http://www.revgotech.com/>

## RF-Design

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Since 25 years RF-Design is developing, manufacturing and providing technology leading satellite ground segment products and solutions offering a wide range of premium class RF distribution, RF-over-Fiber, RF amplifying and RF monitoring systems. High quality products, long expertise, flexibility and the ability to customize products for individual customer requirements along with a unique customer oriented service approach have made us a reputable partner within this sophisticated industry around the globe.

Celebrate our 25 years anniversary with us in Amsterdam at IBC 2023 (booth #1.F46) and see some of our new products we will have on display at the show. We look forward to meeting with you soon in Amsterdam.

Celebrate our 25 years anniversary with us in Amsterdam at IBC 2023 (booth #1.F46) and see some of our new products we will have on display at the show. We look forward to meeting with you soon in Amsterdam.

For more information, go to: [www.rf-design-online.de](http://www.rf-design-online.de)





## Satservice GmbH

**@IBC visit Sateservice at Hall 1 booth # 5 1.F47**

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



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

SatService is your reliable and innovative Partner in the field of satellite communications. For more information, go to: [www.satservice.gmbh.de](http://www.satservice.gmbh.de)

## Walton Enterprises

**@IBC visit Walton Enterprises at Hall 1 booth # 1.A44**



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

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

## WORK Microwave

**@IBC visit WORK Microwave at Hall 1 booth # 1.A46**



Headquartered in Holzkirchen, Germany (near Munich), and comprised of four operating product lines —Satellite Communication, Navigation Simulators, Defence Electronics, and Sensors and Measurement — **WORK Microwave** leverages over 35 years of experience to anticipate market needs and apply an innovative and creative approach to the development of its technologies while maintaining the highest standards for quality, reliability, and performance. WORK Microwave's

Satellite Communication product line develops and manufactures high-performance, advanced satellite communications RF- and optical ground segment hardware and software for earth observation, N GEO constellations, direct-to-home broadcast, IP networks, teleport management, government communications, and many more applications.

### What's your Mission?

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

For more information, go to: [www.work-microwave.com](http://www.work-microwave.com)

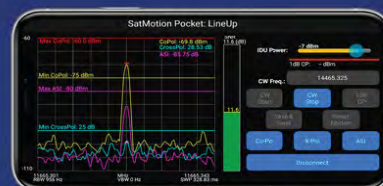




# Smart Tools for End-to-End Technologies with AI for SatCom, and Defense



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# India's Road Less Travelled

by Lou Zacharilla

Think of it.

We have a fourth nation within our swelling species that has engineered with typical industry excellence (always a requirement!) a device which with the thin fingers of a profound creator has touched the surface of the Moon. “Our Moon,” as we call it.

Our imaginations always felt the lunar landscape and now we are able to touch it – literally. Science and data compound and push us forward. We have learned that we can even touch it with our bare hand. Based on measurements of the lunar soil we know we probably could press a bare hand against the hottest lunar soil without feeling uncomfortably warm. (If your hand hit a rock, however, it might not be so nice.)

India’s new national lunar flagship, Chandrayaan, had no human hand with which to reach out to test the proposition. However human hands and brains engineered its landing approximately 69 degrees south latitude at a landing site called “Shiva Shakti,” words that symbolize the strength of the women who contributed to this mission, according to its Prime Minister.

The landing was closer to the lunar South Pole than any craft before. As the current resident of the USA White House would say, “That’s a big deal.”

And a great adventure. Great adventures are lubricants that trigger the imagination and the memory.

India’s great adventure landed me back to July 1969 and the American lunar mission. It transfixed the world. As a young boy in Upstate New York it did what I am sure India’s majestic moment is doing to young boys and girls in Chennai, Pune and Delhi.

Swollen with national pride I recall that mind-altering night. As luck – or divine intervention – would have hit, three Catholic priests showed up at our home for dinner to watch Neil and Buzz.

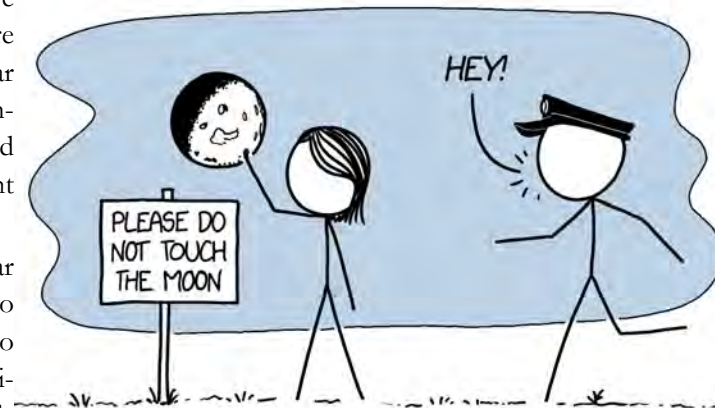
The three were very different. A mix of saintliness, brilliant intellectual skepticism and petty nastiness.

Father Neil (coincidentally) was a saint. A 1960’s style guy with a heart wide as space and with an almost unearthly sense of compassion. He ran a house of mercy for the most down-trodden addicts and impoverished in the City of Rochester. Forever gentle, his wish was that this unifying moment would usher in real peace among people.

Father Jim was a bright guy. Intellectually brilliant, well read and maybe too keen a social observer for his own good as he looked over the landscape of that troubled era. He soon after had a crisis of belief. He watched the Moon landing and could not come to any other conclusion than this was the beginning of the end for the mythologies and cultures he knew. He left the priesthood and became a successful CFO of a company in New York. Ironically, he married an ex-nun! You can take the boy out of the country, but...

Father Richard was a jerk. Pure and simple. He was a cynical, petty human being who was suspect on many levels. It would have been best to have him sent beyond the Moon, I thought. He was sarcastic and caustic about the entire episode and wanted only to gossip about his own parish’s most notable people.

I was enthralled by the TV. I was wondering all kinds of things. What the Moon smelled like for instance. Later on, the Apollo astronauts were quite specific. Moondust



smells like burnt gunpowder.

It didn't end my string of questions. Maybe that was the start of my podcasting career. [www.sspi.org/podcast](http://www.sspi.org/podcast)

I turned to Father Neil near the end of the night for some wisdom. The man who would marry me and bury my father in later years as my family's spiritual advisor said in his quiet way, "We are going to need to change if we are going to live peacefully there."

I was more like Father Jim on that one. I didn't see much hope but I know more now. I remain optimistic. What I do know is that through the SSPI India chapter and the great effort by Jay Gullish of the USA/India Business Council we have seen an explosion of entrepreneurial activity and policy development in India. It is that nation's time. That is clear. We are pleased that the India Space Association and others are part of our regular monthly working group.

This is a new moment for a nation where many of the world's great creative technical minds and genuine saints

were born, taught and wander in their necessary way. I wonder if that ancient DNA and the new one launched on the back of ISRO will balance its progress with Father Neil's and Neil Armstrong's single great aspiration: a giant leap.



**Lou Zacharilla** is the Director of Innovation and Development of the Space and Satellite Professionals International (SSPI) and the host of the "Better Satellite World" podcast. He can be reached at: [LZacharilla@sspi.org](mailto:LZacharilla@sspi.org)

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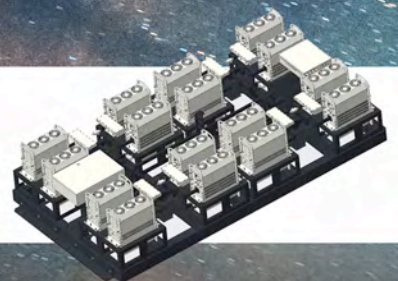
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## MARKET INTELLIGENCE

# By 2027, Starlink's Multi-regional Approach Could Generate \$16 Bil. Annual Revenues

by Carlos Blanco  
Senior Analyst-Dataxis

Starlink expanded rapidly: at the end of 2022, SpaceX' company had reached 1.07 million satellite broadband subscribers. Although the figure remains modest globally, it shows that in just a few months the company achieved a third of what the entire satellite broadband industry had accumulated in its entire history, at a different scale.

A noteworthy fact is that the company practically did not steal customers from other satellite companies, which indicates that it is targeting users with less specific needs, an aspect of the demand

that usually constitutes the ceiling for this technological segment. The company offers competitive speeds, and during 2022, its price level fell sharply, making it a viable alternative to certain terrestrial technologies. Price adjustments were tailored to the competitive environment of each region. Dataxis estimates that by 2027, the company could accumulate almost 31 million active subscriptions.

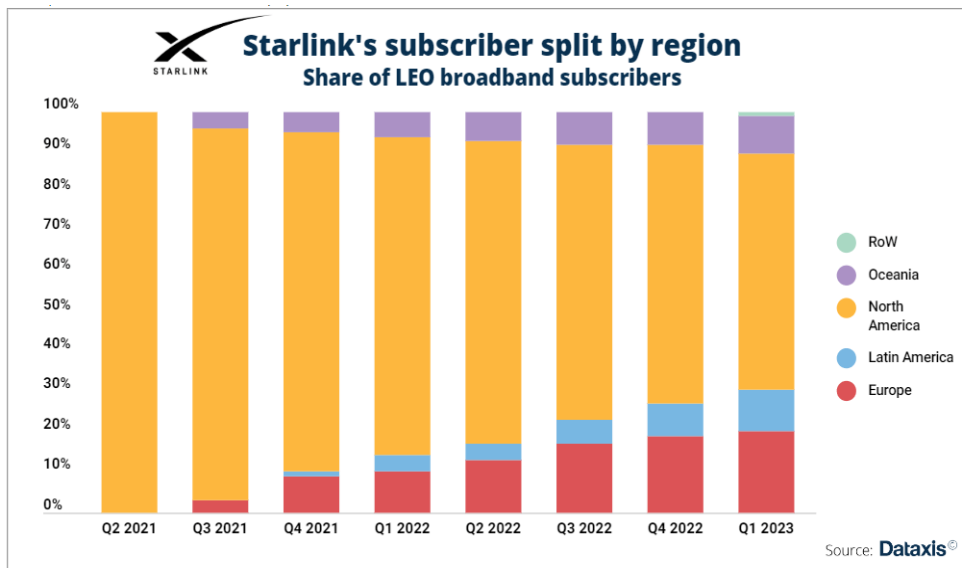
By 2022, the fleet expanded to 3,000 low Earth orbit satellites, plus

another 500 that were not yet operational. In commercial terms, it already had a presence in more than 40 markets, giving it potential coverage for over 35% of the world's population. North America, its area of origin, still accounted for 64% of its customers at the time. Europe was its second-most important market.

## Starlink Adjusted Prices with Differences by region

Dataxis estimates that in 2022, Starlink generated US\$ 607.3 million in service revenue. As the company gained customer volume, its average monthly revenue per subscriber (ARPU) evolved downward.

Although the total ARPU for Q4 2022 reached \$95, this indicator did not share the same fate in all regions. North America is the only territory where the average revenue level has been rising. In the other markets, Starlink



However, half of its European accesses were in Ukraine and Poland, where the operator positioned itself as a communication alternative in the war. In 2022, Oceania and Latin America had similar shares and, as a whole, represented around 17% of the subscribers. The entry into Asia and Africa only began to take shape in Q1 2023. In that quarter, Starlink already had a commercial presence in more than 50 countries, the equivalent of 50% of the world's population.

adjusted its pricing aggressively to match the competitive environment and gain volume. Between Q4 2021 and Q4 2022, Oceania's ARPU fell by 11%, while the decrease reached 41.5% in Europe and 52.3% in Latin America. In Q2 2023, the company announced another drastic price reduction, but although ARPUs keep going down rapidly, Starlink's service should remain far from becoming a mass market offer. The LEO broadband access could become an attractive option to compete against





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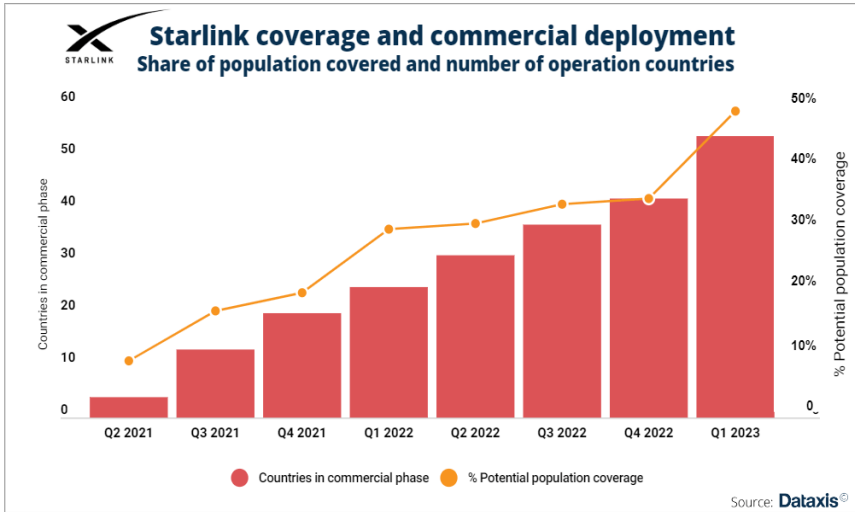
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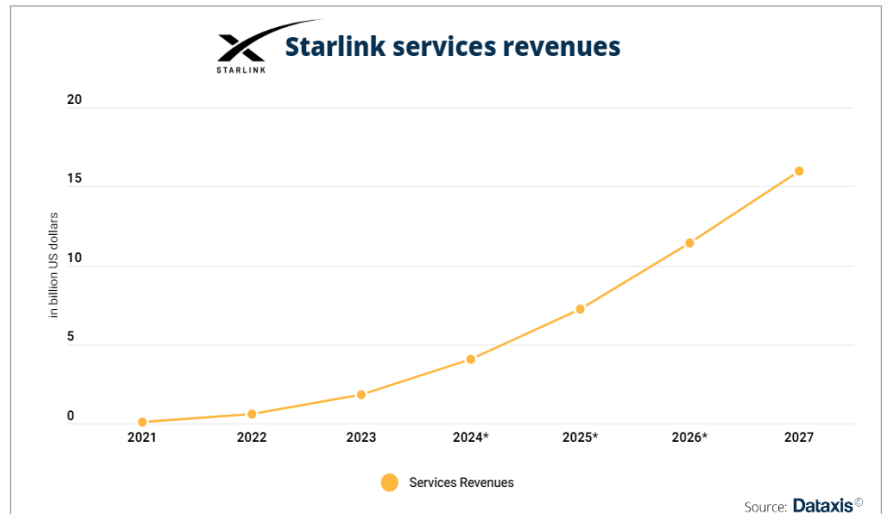


old-fashioned terrestrial options in rural and suburban areas, as it did not only bring additional coverage but also more competitive download speeds. So, it found markets in zones lacking efficient internet access as well as in areas with alternative but flawed options to access broadband.

This research highlight is based on our data coverage of Satellite infrastructure and Infrastructures worldwide. Please contact us to get a demo and see the depth of our service. This topic will also be addressed during the 8th edition of Nextv Series Europe, the most exclusive conference about TV, Media and Entertainment in Europe.

**Starlink is Forecasted as a Strong Global Player**

In 2027, Databis projects that Starlink could have 31 million customers and service revenues of \$16 billion. Such number of subscriptions would represent almost 1.5% of the total broadband access globally. Starlink has a vertically integrated business model and a direct reach to end-consumers. This trajectory could be adjusted through alliances with strategic operators, as it seems to be the way forward in Africa and Asia, and the signing



of agreements for subsidized social connectivity programs with governments. Although the company does not yet have an equivalent competitor, satellite alternatives will begin to emerge in 2023 to also try to capture parts of its market. OneWeb is another LEO system that will move forward through alliances with major players. O3B, SES's MEO fleet, has already started launching its satellites and should emerge as a very strong competitor in the equatori-

al belt. In addition, GEO systems will gain competitiveness with HTS units like Eutelsat Konnect in Europe or the future Viasat 3 in the Americas, among others. These offers have the potential to bring a surgical approach to the market with more capacity for small surfaces, elements that can also make them serious contestants in the race for widespread, efficient and affordable broadband satellite access.

This research highlight is based on Databis' data coverage of satellite and telecom infrastructures worldwide. Contact Databis at <https://databis.com/contact-us/> to get a demo or for more information. This topic and other satellite-related issues are also be addressed in Databis' Nextv Series of conferences worldwide, the most exclusive conferences about TV, Media and Entertainment globally (<https://events.nextvseries.com/events>).





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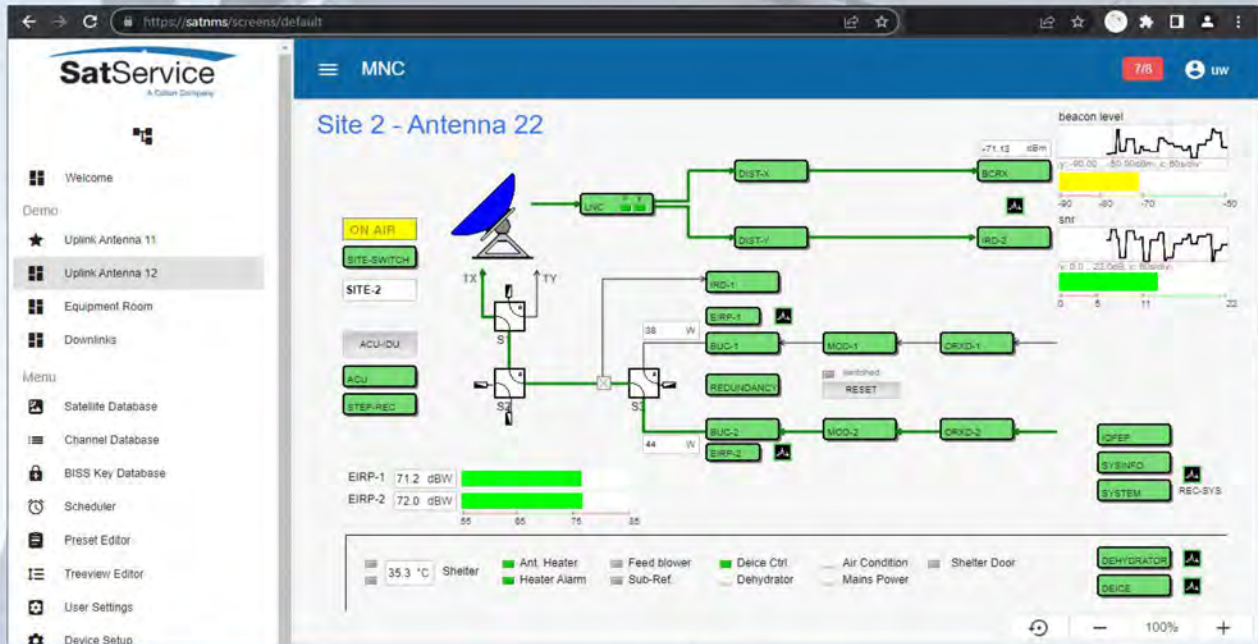


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# Finding Energy in Ocean Waves

The Earth is embraced by its oceans and seas. And so are we. We depend on them for more than half of the oxygen we breathe. Ocean currents shape the slow march of climate and the daily changes of our weather. Scientists estimate that waves washing up on America's coastline contain enough to meet the power needs of two-thirds of its homes and businesses.

The world needs that power. Experts believe the world will need 50 percent more energy by 2050 than it does today. To protect our planet, much more of that energy needs to come from renewable sources.

## A Long Road to Wave Power

Capturing that power from the sea is hard. Inventors and engineers have been trying to generate electricity from the waves for more than 200 years – and no solution has even gone beyond testing or small-scale projects.

Why is it so hard? Salt water corrodes metal. The up-and-down, back-and-forth motion of waves breaks moving parts. And stormy seas can wreck any but the strongest structures.

## The Promise of PacWave

ReTo speed progress, Oregon State University used funding from the US Energy Department to build two unique testing platforms for wave and tidal energy systems. Called PacWave, they provide test beds connected by undersea cables to the onshore electrical grid. Dozens of undersea energy converters can be tested at the same time. It is the world's first low-cost, high-performance facility for testing ocean energy.

But to test systems, you need to know what the ocean is up to hour by hour – the temperatures, winds, wave

patterns, tidal flows and ocean currents. By matching that information to the test data, engineers gain invaluable data on each system being tested, so they can diagnose problems and find solutions. That flow of data turns guesswork into ever-growing knowledge.



## Tracking by Satellite

The vital data for PacWave comes from the sea by way of the sky. The university has placed buoys across the region where its platforms operate. Each is equipped with temperature, motion and other sensors. They are also equipped

with Globalstar's SmartOne Solar devices – small, rugged satellite transmitters that are charged by sunlight and can operate for up to 10 years. Using an online system called SPOT My Globalstar, PacWave researchers can find the location of each buoy, import data and receive alerts if buoy's drift away.

Off the Oregon coast, the waves roll in and the tides rise and fall. The stream of data, beamed up to Globalstar satellites and back to Earth, is helping innovators test their ideas faster than ever before to learn what fails and why, and what might work tomorrow. Two centuries after the first attempts, they are discovering how ocean energy may, at long last, start contributing to our sustainable energy future..





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## MDA Acquires SatixFy Space Systems UK

**Rehovot, Israel, September 1, 2023**--SatixFy Communications Ltd. ("SatixFy") (NYSE AMERICAN: SATX) announced a US\$ 60 million transaction with MDA Ltd. (TSX: MDA), selling SatixFy's holdings in its SatixFy Space Systems UK Ltd, one of SatixFy's UK based subsidiaries, to MDA as well as an additional US\$ 20 million in advanced payments under new commercial agreements which includes the previous US\$ 10 million advanced payment made in June to be applied to future orders of space grade chips.

The strategic transaction establishes cooperation between the companies, to utilize SatixFy's revolutionary digital payload chip based technology to advanced digital satellite payloads, which the parties believe to be unparalleled in today's market, and is expected to open up SatixFy's solutions to broader markets as well as new customers. SatixFy has decided strategically to focus its space business on being a technology provider to satellite payload design companies offering its unique digital multi beam forming and beam-hopping on-board-processing radiation hardening chipsets.

The transaction is a combination of a US\$ 40 million share purchase agreement, selling SatixFy's holdings in its SatixFy Space Systems UK Ltd, one of SatixFy's UK based subsidiaries, to MDA as well as an additional US\$ 20 million in advanced payments under new commercial agreements which includes the previous \$10 million advanced payment made in June to be applied to future orders of space grade chips. SatixFy Space Systems is

SatixFy's satellite payload subsidiary expert in the development of digital satellite payloads systems and subsystems, including digital beam forming antennas and on-board processing. SatixFy will continue to retain all its related ASIC intellectual property and new chips' development to support the growing market and customers building satellite digital payloads.

The transaction is subject to customary closing conditions, including regulatory, lender and other third party and shareholder approvals and is expected to occur in the fourth quarter of 2023.


Nir Barkan, Acting CEO of SatixFy, commented, "This landmark agreement for SatixFy with MDA, a leading provider of advanced satellite technology, is a major achievement for SatixFy. We recently took the strategic decision to focus our satellite business on our core competencies of development of groundbreaking chipsets supporting multi beam digital antennas and on board processing for the space industry and advanced ground terminals. Today's announcement is an integral part of that strategy and brings SatixFy's cutting-edge space chipsets into MDA's digital payloads, representing a strong step forward in the commercialization of our technology. It demonstrates our market leadership in providing space-grade chips technologies for next-generation satellites and positions SatixFy as a leading innovator in the satellite communications industry and strengthens our competitive positioning. Furthermore, we expect that this transaction will increase our chipset sale into

satellite digital payloads and will lead to increased collaboration between MDA and SatixFy in new areas. MDA has been a steadfast SatixFy customer, and we are thrilled to fortify this relationship further. In addition, we will continue to expand our ground terminals and chipset offering to the satellite communication markets."

"The acquisition of SatixFy's digital payload division advances MDA's satellite systems strategy as we continue to invest and expand in next generation satellite technology and talent to meet growing customer demand," said Mike Greenley, CEO of MDA.

"MDA and SatixFy have worked together to advance our digital satellite technology solutions and our teams are well acquainted, highly complementary and collaborative. This acquisition is a natural next step in solidifying and strengthening our market position and addressing customer demand as we continue to capitalize on the growth in the Low Earth Orbit (LEO) satellite communication market," he added.

SatixFy develops end-to-end next-generation satellite communications systems, including satellite payloads, user terminals and modems, based on powerful chipsets that it develops in house. SatixFy's products include modems that feature Software Defined Radio (SDR) and Fully Electronically Steered Multi Beam Antennas (ESMA) that support the advanced communications standard DVB-S2X.

SatixFy is headquartered in Rehovot, Israel with additional offices in the UK, US and Bulgaria. 

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## Imagine Communications Names Frank Deo as CTO of its Ad Tech Business

Denver, CO, September 5, 2023

- **Imagine Communications** has appointed seasoned media industry executive **Frank Deo** to the position of chief technology officer of its ad tech business. In this role, Deo will leverage his proven track record and unique insights into emerging technologies to drive the product development, operations and long-term technology strategy for Imagine's market-leading ad tech portfolio.



**Frank Deo**

Deo brings to Imagine a decades-long career leading product and engineering teams in the media industry, along with extensive experience in addressable advertising, telecommunications, OTT streaming and data analytics systems. Prior to joining Imagine, Deo held executive-level positions at multiple ad tech companies, including 605, Comcast, Cadent and ACTV, where he conceptualized, designed and implemented state-of-the-art Advanced TV advertising solutions.

"Frank's visionary approach to technology and exceptional leadership skills make him an invaluable addition to our team," said Rob Malcolm, general manager of ad tech at Imagine Communications. "As the media and advertising landscapes continue to rapidly evolve, we are confident that Frank's expertise will drive the development of cutting-edge ad tech solutions that

set new industry standards and help our customers pursue emerging opportunities for growth and success."

Deo has established a reputation across the industry as an accomplished, innovative leader and mentor with a proven track record of building high-performing teams, reducing time to market of new features, and redefining roadmaps to align with companies' strategic objectives. His career highlights include 31 U.S. and international patents and a Technical Emmy® Award, demonstrating his innovative spirit and commitment to pushing the boundaries of technology.

## USEI Appoints Paul Kaminski, Mike Antonovich and John Stopher to Top Positions

**Brewster, Wash., September 5, 2023--US Electrodynamics, Inc. (USEI)**, which recently added over US \$100 million in assets to expand its teleport facilities, announced that it is enhancing its senior leadership to build on this recent growth and address the emerging needs of the traditional and "New Space" satellite opportunities – in both the defense and commercial markets.

Under the new leadership of Chairman **Dr. Paul Kaminski** (former Undersecretary of Defense for Acquisition & Technology, who has chaired the Defense Science Board, the NRO Advisory Board and several industry boards) two new senior executives have been appointed:

CEO Commercial **Mike Antonovich**, former CEO of Eutelsat Americas, Genesis Networks,



**John Stopher and Mike Antonovich**

Spaceconnection and a former senior executive with PanAmSat.

CEO Government, **Dr. John Stopher**, former Assistant to the Secretary of the Air Force for Space and on the staff of the House Intelligence Committee.

**Jim Veeder**, founder and owner of USEI, was WTA Executive of the year in 2022 and USEI was the WTA teleport of the year in 2023. USEI owns teleports in Brewster, WA and Vernon Valley, NJ and also operates satellite services from Mexico, Chile, South Korea, Australia, the UAE, South Africa and Germany. The combined assets include more than 150 antennas that support GEO, MEO, LEO, CIS-LUNAR and other specialty satellite markets.

USEI has recently been selected by INTELSAT and SES for their key US West Coast TT&C and Gateway Services provider of the C-band spectrum services as frequency protection is provided at the Brewster Earth Station to satellite operators after the FCC's opening of most of the CONUS C-Band to 5G services.

In addition, USEI is playing an increasingly important role in "New Space" supporting companies such as BlackSky, Microsoft Azure and Omnispace. 🌍

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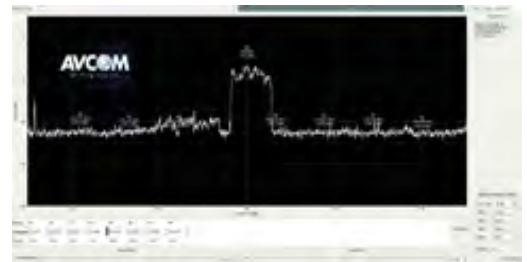
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# The Global Satellite IoT Subscriber Base to Reach 23.9 million by 2027

**Gothenburg, Sweden, September 1, 2023**--According to a new research report from specialist IoT analyst firm Berg Insight, the global satellite IoT communications market is growing at a good steady pace. The global satellite IoT subscriber base grew to surpass 4.5 million in 2022. The number of satellite IoT subscribers will increase at a compound annual growth rate (CAGR) of 39.6 percent to reach 23.9 million units in 2027.

Only about 10 percent of the Earth's surface has access to terrestrial connectivity services which leaves a massive opportunity for satellite IoT communications. Satellite connectivity provides a complement to terrestrial cellular and non-cellular networks in remote locations, especially useful for applications in agriculture, asset tracking, maritime and intermodal transportation, oil and gas industry exploration, utilities, construction and governments. Both incumbent satellite operators and more than two dozen new initiatives are now betting on the IoT connectivity market. This new study covers a total of 44 satellite IoT operators.

"Iridium, Orbcomm, Inmarsat and Globalstar are the largest satellite IoT network operators today", says Johan

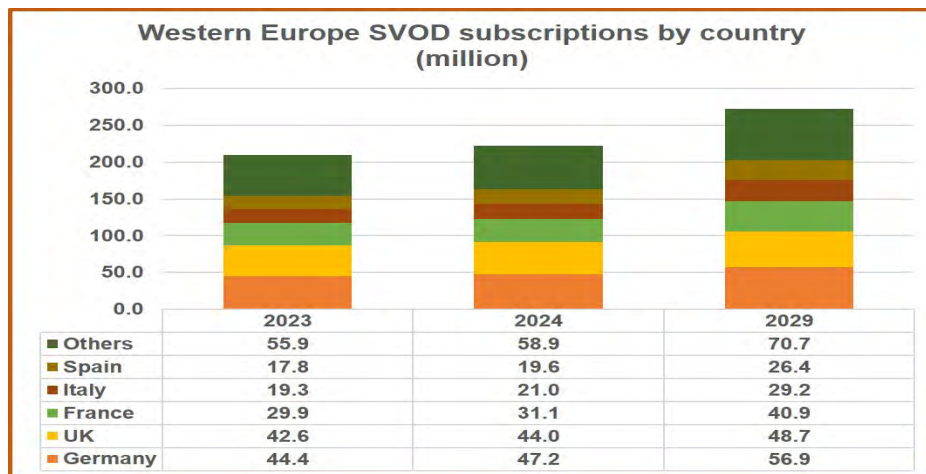
Fagerberg, Principal Analyst at Berg Insight. Iridium grew its subscriber base by 20 percent in the last year and reached the number one spot serving 1.5 million subscribers.

Originally a dedicated satellite operator, Orbcomm has transitioned into an end-to-end solution provider, delivering services on its own satellite network as well as being a reseller partner of Inmarsat and others. At the end of Q4-2022, the company had 1.1 million satellite IoT subscribers on its own and Inmarsat's networks. At the same time Globalstar reached 0.44 million subscribers. Other players with connections in the tens of thousands include for instance Myriota in Australia, Kineis in France and Thuraya in the UAE.

"Collaborations between satellite operators and mobile operators that explore new hybrid satellite-terrestrial connectivity opportunities will become common in the next years and recent examples include Telefónica & Sateliot, Deutsche Telekom & Intelsat/Skylo and Soracom & Astrocast", concludes Fagerberg.



## VITAL STATS



Western Europe is forecast to have 273 million SVOD subscriptions by 2029, up from 210 million by end-2023. From the 63 million additions, the UK will contribute 6 million, Germany 12 million, Spain 9 million, Italy 10 million and France 11 million according to new research from Digital TV Research.



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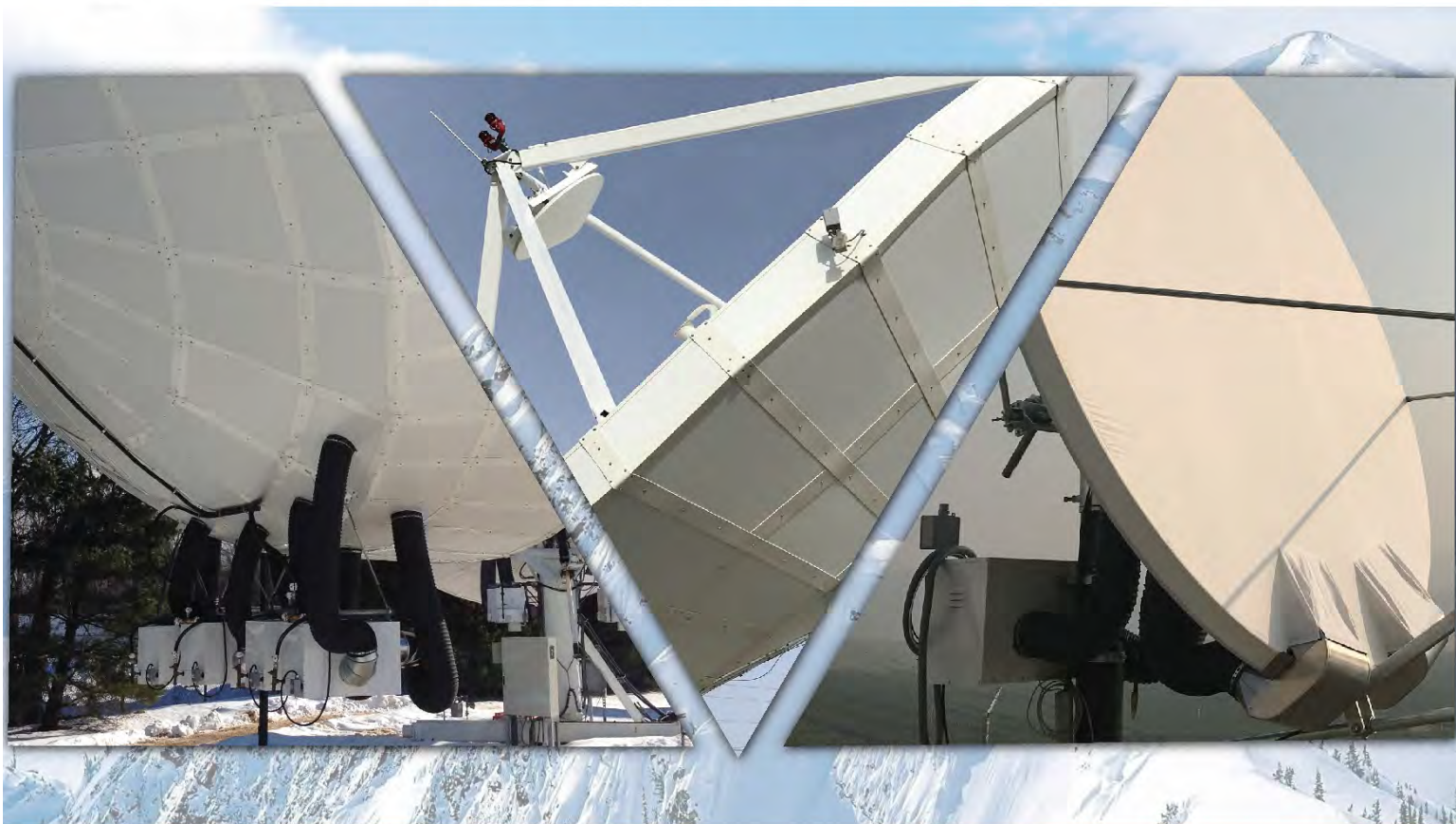
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