

Satellite Executive BRIEFING

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Industry Trends, News Analysis, Market Intelligence and Opportunities

The Small- and Medium-size Satellite Market

by **Bernardo Schneiderman**

The market for the manufacturing of small- and medium-size satellites is growing exponentially with the launch of Low-Earth (LEO) and Medium-Earth (MEO) Orbit constellations globally. Now we have more than 100 companies manufacturing nano satellite up to medium size satellites beside the larger manufacture of Geo Satellites that are providing some medium satellites to the market.

Small satellite manufacturers that have successfully designed & developed small/micro satellites that are launched into space are considering by the mass of the satellites Microsat weight=10-100kg, Smallsat weight = 100-500kg.

During a panel in the Satellite 2023 Conference last March NSR analyst mentioned that the GEO orders have gone as a result, satellite manufacturers have expanded their businesses to supplying small and medium-size satellites to commercial and government customers using existing small satellite manufacturers. During the panel a representative of Lockheed Martin

mentioned that now produces more small satellites annually than large satellites. One of the companies Lockheed Martin is investing is Terrain Orbital the company that won a US\$ 2.4 billion contract to supply 300 satellites for Rivada Space Networks. Terrain Orbital's ability to scale up small satellite manufacturing will help Lockheed Martin supply customers with satellites at "a radically reduced price point," was mentioned during the panel.



Small satellites are proving profitable for Airbus largely due to standardization and forecast potential sales of 500 to 1,000 in the next five years," said Airbus Defense and Space VP of space systems. Airbus is selling its Arrow 450 produced by Airbus OneWeb Satellites to various customers including Northrop Grumman.

Another main GEO manufacturer Thales Alenia supplies small satellites through its joint venture with BlackSky. "This market is driven by telecommunications, but also by Earth observation," said Thales Alenia Space CEO.

Globally there are more than 116

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Small satellite manufacturers companies, but we decide in this article focus in few ones that are more active in the global Market place with some of them with interest or investment for major defense contractors.

Just 10 years ago, the space industry seemed like it was going nowhere. Today it's buzzing with an exponentially growing number of satellites, creating opportunities for new businesses to service and support the thousands

Continued on page 4

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The Year that LEO Constellations may have Come of Age



This decade was projected to be the decade for Low Earth Orbit (LEO) constellations. And for the most part it has lived up to expectations. Over 5,000 LEO satellites have been launched since 2020, more than doubling the number of satellites currently in orbit. While the pace and number of LEO satellites being launched are truly amazing, many question the long-term financial viability of LEO constellations.

Most of the LEO satellites launched so far are from the industry-leading Starlink started by Billionaire Elon Musk. Last month, Starlink announced that it has reached break even in terms of cash flow--a key milestone. With over 5,000 satellites, which comprise the majority of satellites in orbit, and having made inroads in key markets globally, Starlink may have assured its future.

In this issue, we look at the small and medium-size satellite manufacturing market in our cover story. There is also a report by our Associate Editor, Elisabeth Tweedie on the Satellite Innovation conference held in Silicon Valley, where LEOs and other Non-Geostationary Orbit constellations were one of the hot topics.

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Small and Medium-size Satellites, from page 1...

of small and medium satellites orbiting the planet in Constellation application for Imaging, Communications, Internet of Things (IoT) Radar and etc.

The companies profiled in this article have been selected based on the stage they are in the market such as product portfolios, market penetration, research and development initiatives in the Global Small & Medium manufacture of Satellite. We invited key companies to share their views on the market and among those, Kongsberg Nano Avionics, Žilvinas Kvedaravičius, Chief Sales Officer and Carol Craig, Founder & CEO of Sidus Space provided us some insight which are featured in the executive spotlights following this article.

Small satellites are low-cost alternatives that have enabled commercial enterprises, non-profit groups, and educational institutions to execute low-Earth orbit missions.

Bryce Tech report 2,304 Smallsats are launched in 2022 (see Graphic from Bryce tech presentation attached second page). Smaller satellites have broken records and are transforming in-space architectures,


According to another research report published by Spherical Insights

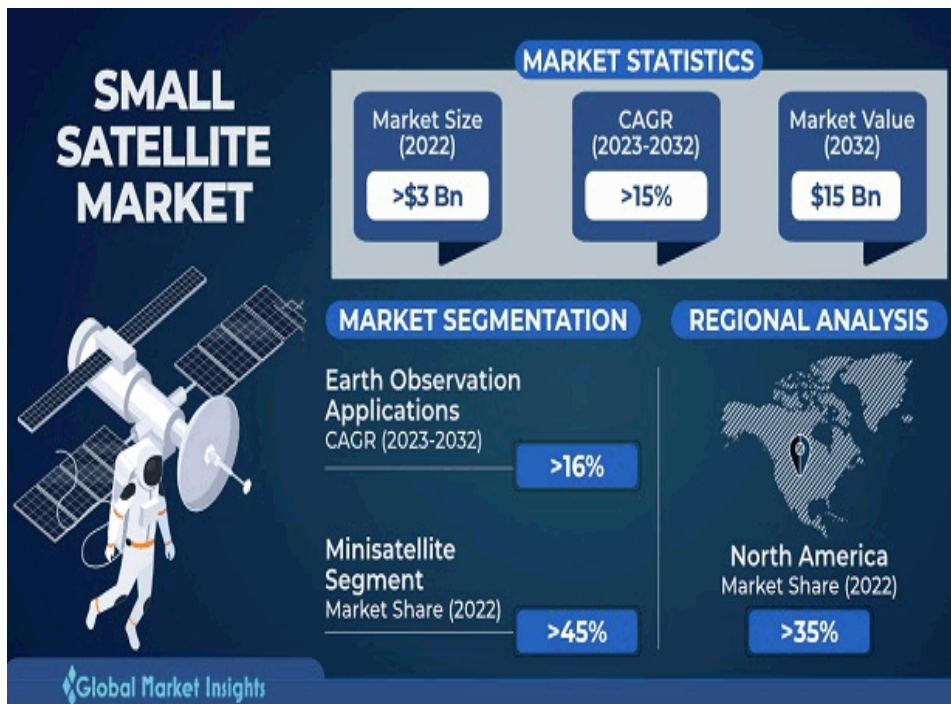
"...The Small Satellite Market size is expected to reach US\$ 13.2 Billion globally by 2032...."

& Consulting. Global Small Satellite Market Size to Grow USD 13.2 Billion By 2032 | CAGR of 15.9%. The Global Small Satellite Market Size was valued at US\$ 3 Billion in 2022 and the Worldwide Small Satellite Market size

satellites in low-Earth orbit (LEO) and increased demand for satellite-based communication services. Both of these factors lead to its growth. As technology has improved, small satellite manufacturing and launch have be-

come more efficient. As a result, launching small satellites into orbit is now much easier and less expensive. Furthermore, there has been an increase in the need for data connected to earth observation and remote sensing, increas-

ing the demand for small satellites in a variety of industries. 



is expected to reach US\$ 13.2 Billion by 2032.

The small satellite sector is expected to grow drastically. This development is being driven by several factors, including rising demand for small



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Žilvinas Kvedaravičius, Chief Sales Officer Kongsberg NanoAvionics and Carol Craig, Founder & CEO of Sidus Space

To get their insights on the growing small and medium satellite market, Satellite Executive Briefing invited several companies to participate in a virtual roundtable. Žilvinas Kvedaravičius, Chief Sales Officer of Kongsberg Nano Avionics, and Carol Craig, Founder and CEO of Sidus Space shared their views on this important segment of the industry. Excerpts of their responses are follows:

Please provide a brief profile of your company and the current status of your offerings?

Kongsberg NanoAvionics: Founded in 2014, Kongsberg NanoAvionics is a small satellite mission integrator and bus manufacturer focused on delivering a new generation small satellite buses for the satellite applications and services market. NanoAvionics has customers in more than 40 countries across Asia, Europe and the Americas ranging from national space agencies such as NASA and ESA to fundamental research institutions such as Los Alamos National Laboratory and the MIT, as well as companies such as Thales Alenia Space, Aurora Insight, the Dubai Electricity & Water Authority, SEN and OQ Technology. It has dedicated manufacturing facilities in Lithuania, the United States and the United Kingdom.

Through its expert team of 300 international professionals and extensive flight heritage, NanoAvionics continues to reshape the space economy with its standardized small satellite platforms. The company offers efficient, cost-effective satellite products and services, including mission design, production, launch brokering, ground segment and satellite operations that help organizations to swiftly launch their space missions, providing higher return on their satellite investment.

As part of Kongsberg Defense and Aerospace since 2022, when Kongsberg acquired a majority stake in NanoAvionics, the company has further strengthened its commitment to robust, innovative, secure and reliable space solutions. The company's aim is to become a

prime supplier for small satellite constellations.

SIDUS Space: Sidus Space is a multi-faceted Space and Defense-as-a-Service satellite company. With its AI driven hybrid 3D printed LizzieSat satellite scheduled for launch at the end of this year, and eight additional missions manifested with SpaceX, Sidus is building a unique constellation of satellites to provide earth observation and remote sensing solutions for its customers. Additionally, we provide the manufacturing, design, development, and commercialization of new and innovative space technologies and services through aerospace, defense partnerships, and collaboration.

Which applications i.e., Communications, Imaging, Radar, etc. are you focusing on if any?

Kongsberg NanoAvionics: We are payload agnostic. Satellite buses manufactured by NanoAvionics are primarily used for integrating various types of telecommunications, Earth observation, remote sensing, signal intelligence, maritime surveillance as well as applications that need high data throughput such as complex and emergency communications missions, and fundamental research. We have a vast experience of integrating and launching commercially available small satellite Earth Observation (EO) and communications payloads, thus we can also offer end-to-end satellite solutions.

To cater for increasingly sophisticated mission requests, the company's developed its microsat bus range in 2021. NanoAvionics's MP42 bus for micro-



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sats is capable of accommodating payloads in the range of up to 150 kg. The microsat bus range offers larger volume in a flexible payload envelope with more powerful onboard resources, and opens more possibilities of accommodating a wide array of more demanding missions and satellite applications.

SIDUS Space: We plan to establish one of the industry's leading LEO small satellite constellations, with a focus on earth observation and remote sensing. Our strategy is to enhance the capabilities of our satellite constellation continuously, expand our international and domestic partnerships, and broaden our analytics offerings to increase the value we deliver to our customers. Our satellite constellation and hardware manufacturing capability are mutually reinforcing operating assets, resulting from years of heritage and innovation.

What vertical markets will the satellites you will be manufacturing be used for (ie. Enterprise, Government or Defense)?

Kongsberg NanoAvionics: NanoAvionics is already providing its manufactured satellites to commercial, governmental, research, security and defense customers. Working with customers from different verticals allow us to understand their needs and cater for the best possible technical solutions for their missions.

SIDUS Space: Sidus Space's satellites will have broad application in Enterprise, Government and/or Defense. A few of the business verticals include: Supply chain/transport; Construction/land use; Telecommunication; Education; Marine/Maritime; Agriculture; Forestry, among others.

What differentiates your company and your offerings from your competitors?

Kongsberg NanoAvionics: NanoAvionics's successful and cost-efficient approach for nano- and microsatellite bus design, manufacturing, and integration has allowed companies to reduce their cost and time to market, receive rapid integration and deploy their spacecraft much quicker compared to other existing solutions



Artist rendering of SIDUS Space's AI driven hybrid 3D printed LizzieSat satellite. (images courtesy of SIDUS Space)

in the market without compromising on quality and reliability. It enabled the access to space previously prevented by barriers such as cost, lack of modularity, mechanical restraints and suitable mission operations.

This is a result of keeping about 80% of the flight-proven architecture consistent for each mission and by using modular subsystem manufactured in advance and in larger quantities. These measures and results have significantly lowered the entry barriers for companies.

Our commercial customers, having tested their technologies in orbit, are moving towards their constellation development and deployment phase. This demands higher production and operational capacity from our side. That is why NanoAvionics has grown its mass manufacturing capabilities. By enabling an annual output of several hundred identical satellites a year the company is ready for these constellation orders. For example, we have tripled our current production capacity at our MAIT facility in Vilnius, Lithuania, and we are in the process of preparing to increase production at all of our global facilities.

And it is not just commercial customers, we observe a global interest in small satellite constellations from

governmental institutions that regard small satellites as a viable tool to ensure critical activities such as communications and remote sensing.

SIDUS SPACE: We offer Space-as-a-Service instead of simply space-based hardware manufacturing/components. Our emerging Data-as-a-Service offering is expected to provide near-real-time data transmission from our LEO satellites as we build our constellation. This is an exciting time for Sidus Space, with LizzieSat expected to launch later this year.

Additionally, we provide end-to-end or full stack solution support and carve outs everywhere in between. Our products and services are vertically-integrated and our decade plus of space manufacturing heritage means we're supporting missions for all destinations in space, not just Leo, but the Moon, Mars and beyond. This type of model allows for greater efficiency, cost savings, and access to expertise, and enables other companies and organizations to access and utilize space-related technologies without having to develop these technologies in-house.

Anything else you would like to add?


Kongsberg NanoAvionics The NewSpace industry has seen a phenomenal growth over the last decade. However, to continue with the cost efficiencies, which enabled the rise of NewSpace, for the arrival of more constellations and their commercial success, small satellites need to be standardized for serial production, and processes automated. In the long term, hardly anyone will benefit from customization anymore. Instead, standardization is the only way to accelerate the industry. This will require a change of the current industry mindset of building a satellite platform around a payload. A process that would have to be inverted.

What the industry needs is a “satellite-as-a-product” approach that would see future constellation operators choosing a modular satellite platform as an off-the-shelf vehicle and tailoring their payloads to fit platform’s standard requirements. This changed approach will lead to much shorter lead times due to



Kongsberg NanoAvionics engineers performing tests for nanosats (images courtesy of SIDUS Space)

component stocking, streamlined production, automated testing campaigns, lower cost, and improved reliability of satellites.

SIDUS Space: At 100kg, the size of LizzieSat satellites allows us to include propulsion and provide precision pointing and maneuvering otherwise not available to smaller satellites. Propulsion provides a longer life in orbit which means continued data transfer and revenue opportunity, and as the structure of the satellite is lightweight, the cost is reduced and there exists more space for customer and data-generating technologies. As our world advances rapidly, we’re committed to doing our part – which includes providing opportunities to easily monitor climate variables via LizzieSat such as deforestation, pollution, rising sea levels and greenhouse gas concentrations. 

Is Regulation the Answer to Achieving Better Space Situational Awareness?

by Joe Chan

Chairman, Space Data Association

With the rapid increase in space traffic anticipated over coming years, and the growing problem of space debris, improving Space Situational Awareness (SSA) is becoming increasingly important. The long-term sustainability of space is dependent on being able to effectively predict and prevent collisions, and for this we need better SSA systems.

Although there are accepted norms of behaviour and a number of international committees and agencies that have produced guidelines to ensure the safe and continued use of space, such as United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), United Nations Working Group on the Long-Term Sustainability (LTS) of Outer Space Activities, Inter-Agency of Debris Coordination Committee (IADC), and European Space Agency (ESA), there is currently little explicit legal obligations requiring space players to engage in and carry out SSA. Consequently, there are many different approaches to space safety and SSA seen around the world, and some of them are likely questionable.

How can we achieve SSA that meets current and future needs? For effective SSA, you need to identify objects in space, know where they are, and predict where they will be in the near future. Doing this with a level of acceptable accuracy is incredibly complex and requires aggregation of data from many sources. It also demands all space actors to actively engage in SSA efforts. Is new prescriptive regulation needed to achieve SSA that is fit for purpose now, and in the future, or would regulation struggle to accommodate the different approaches that the various different actors

around the globe have taken? Before we can begin to consider whether more regulation will improve the situation, we first need to examine existing approaches.

Existing Approaches and Barriers

Although over 100 countries have now signed up to the UN COPUOS, the way that countries and organisations implement and adhere to the treaties and agreements that the COPUOS oversees, can and does vary. In the absence of any independent, effective, central SSA system, govern-

ments, intergovernmental organisations such as the ESA, and private companies have either developed their own SSA systems or have come together to share operational data in a controlled way to enable SSA and improve flight safety.

Although some public office led Space Traffic Management (STM) services do exist, (such as Space-Track), many consider the SSA systems that power these services do not always be accurate enough to provide the level of safety that operators require. This concern about the value of such systems combined with challenges around transparency and data sharing have discouraged many organisations from signing up to these services. International security and political complexities are also feeding into the reluctance to share data and work collaboratively on a global basis.

The many different systems out there use data from separate sources, and the methodology, modelling and algorithms used to generate predictions not only about where space objects are, but where they will be, can vary



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enormously. Understandably, this can cause huge problems when it comes to operators acting on the information and planning collision avoidance manoeuvres.


What's needed is a much more collaborative approach. Fusing multi-source data, pooled from governments, commercial entities, and satellite operators, and combining with advanced data processing techniques can considerably improve predictive positional accuracy.

Regulatory Considerations

With so many different approaches to SSA around the globe, how can space actors, who all have very different interests, be encouraged to engage in collaborative SSA efforts? A regulatory approach that enforces engagement in a very prescriptive way may have the opposite effect than is desired, resulting in key players withdrawing from agreements entirely. Given the current political uncertainties that the world faces, this is perhaps even more of a concern than it was a few years ago.

With this in mind, a lighter, more

flexible approach that focuses more on encouraging cooperation, and developing guidelines that work to standardise practice and address emerging challenges seems preferable. Any regulation around SSA would need to aim to strike a balance between flexibility and standardization, allowing for variations based on specific circumstances, while ensuring a baseline level of safety and responsible behaviour. Collaboration among nations, industry players, and regulatory bodies is essential to establish effective regulations that consider the diverse interests and capabilities of all stakeholders.

Ultimately, regulation alone cannot solve all challenges related to SSA, but it can provide an essential foundation for improving space safety and mitigating the risks associated with the growing number of space activities. 



Joe Chan is the Chairman of the **Space Data Association (SDA)**. The SDA is an international organization that brings together satellite operators to support the controlled, reliable and efficient sharing of data critical to the safety and integrity of the space environment. The SDA membership includes the world's major satellite communications companies.

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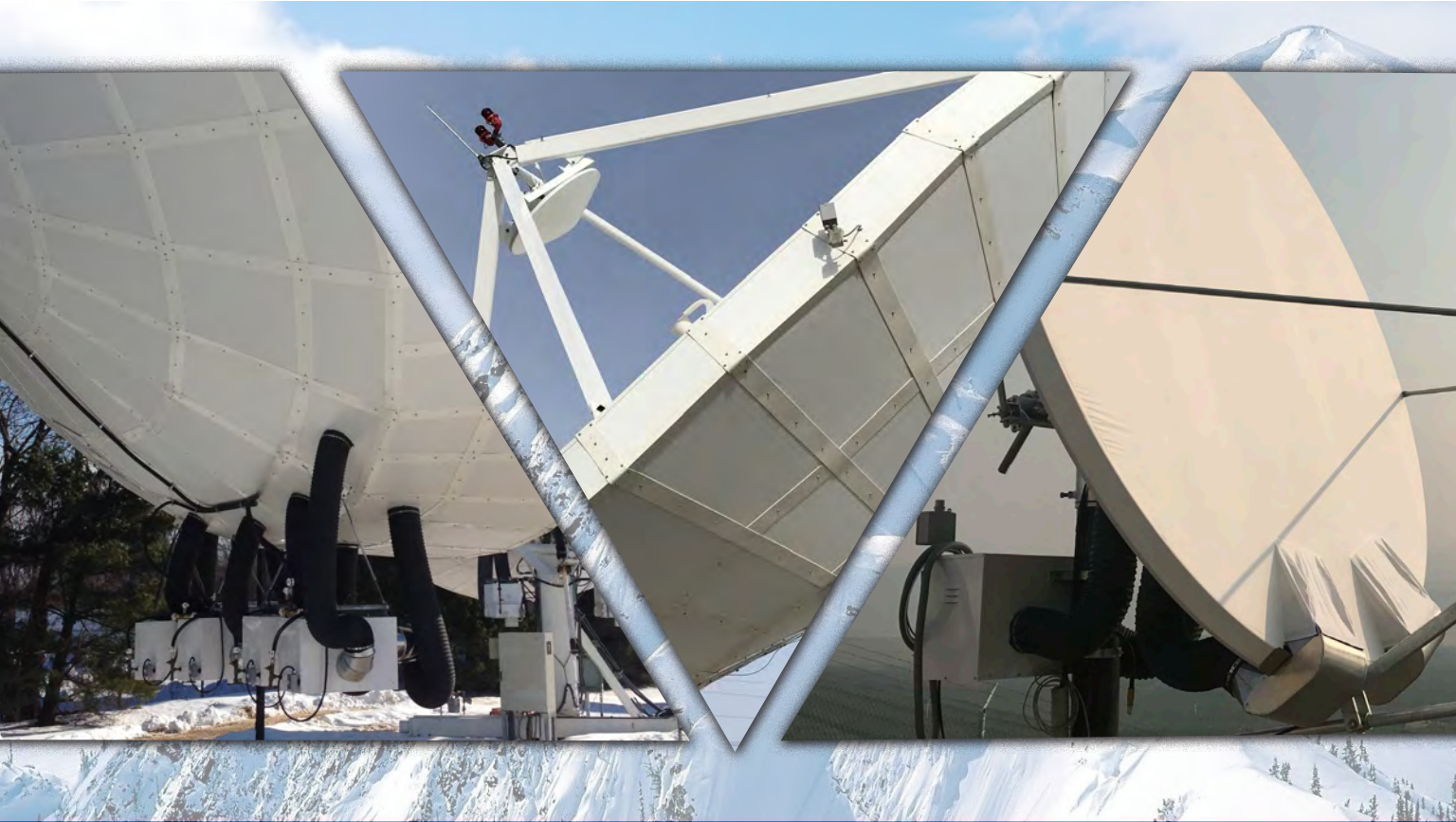
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The Year in Review: ST Engineering iDirect

by Julie Bettinger

2023 has been full of important developments, with technological advancements and innovation driving our industry's transformation at a pace not seen before in satcom.

We've seen significant changes as providers respond to constant demands for bandwidth, greater speeds, and more network flexibility.

The continued influx of capacity is changing on-orbit economics with falling prices driving the emergence of new use cases. Software-defined satellites are bringing new and dynamic capabilities that are highly flexible and reconfigure themselves on demand.

Next-generation ground networks must reflect the space segment in terms of high flexibility with capabilities that allow operators to rapidly change where capacity is required, enabling seamless integration, and roaming across networks. And ground segment providers must become software-defined, cloud-based and virtualized to unlock the potential of new space.

As a result, the industry's focus has turned to exploring how to approach virtualization, standardization and interoperability, and the unification of technologies to make one

cohesive connectivity landscape.

ST Engineering iDirect's Transformation

Parallel to these changes in the wider industry, it has also been a significant year for us at ST Engineering iDirect, as we usher in an innovative era of growth under the new leadership of our CEO, Don Claussen. Today, we embrace an even more ambitious focus: to establish the new

major advances in satcom but it can be a topic few want to bring up. With many in the industry used to working in silos and a bespoke network mindset, we need to actively drive and implement standardization, with the telecom sector serving as a compelling example of embracing this direction.

At ST Engineering iDirect, we've been busy steering our next-generation technology towards standardization and look forward to showcasing its viability through practical execution over the next year.



Partnerships and Milestones

Without collaboration, the industry will not be able to achieve its goal of interoperability and multi-orbit, seamless connectivity. We've worked with many partners this year, maximizing our collective knowledge

We continued our work as part of the DIFI Consortium that has developed the DIFI v1.1 standard, supporting the digitization of the interface between modem and RF components.

We collaborated with Microsoft Azure, showcasing the demodulation and modulation capability of an iDirect-virtualized high-speed SCPC modem running as containerized software on a COTS server located on Azure.

norm where satellite-based networks seamlessly integrate multi-orbit solutions with terrestrial-based wireless communications.

Realizing this vision requires an unwavering commitment to three core operating principles: standards-based innovation, industry-wide collaboration to ensure interoperability, and an operator focused mindset to ensure their success.

Standardization holds the key to

Next, we plan to migrate our network processing functions to the cloud. We want to prove that satellite network architectures can be built with commercial off-the-shelf components that leverage cloud computing to its fullest potential.

We formed a strategic partnership with Airbus to enable tighter space-to-ground integration, while we also took the lead on the European Protected Waveform project, where consortium members will develop and productize the waveform for use by European nations. The project will see the collaboration of EU Member States to establish agile, secure, economical, and interoperable satellite communications suitable for all European nations and joint EU operations.

What's next for 2024


Those who have, like us, focused

"...In 2024, we can expect more discussion around the adoption of standards, which must happen if we are to succeed with our seamless multi-orbit future..."

on adapting to operators' needs this year, showing proof of concepts, will enter 2024 ready to adjust to any changes in the market.

In 2024, we can expect more discussion around the adoption of standards, which must happen if we are to succeed with our seamless multi-orbit future. We'll see more collaboration and build upon relationships both inside and outside the industry to achieve this.

The lessons we learn from ex-

isting and future proof-of-concepts will guide our next-generation technologies and enable a future-proof platform for our customers. We'll continue to collaborate with others in the industry to deliver a stronger ecosystem to meet end-user requirements over the coming years. The excitement and momentum in 2023 are only the start of great things to come. 



Julie Bettinger is the Chief Marketing Officer of **ST Engineering iDirect**. She can be reached at: jbettinger@idirect.net

ST Engineering iDirect has partnered with Satellite Markets and Research in the publication of several TECHBrief and MarketBrief reports on various technological innovations and market studies. The reports highlight case studies of some of ST Engineering iDirect's key accomplishments in various sectors of the industry.



To access the free reports go to: www.satellitemarkets.com/Market-Brief

Highlights from Satellite Innovation 2023

by Elisabeth Tweedie

As would be expected a broad range of topics were discussed at the Satellite Innovation held this October in Mountain View, California. These included Direct-to-Device (D2D), low earth orbit constellations (LEOs), supply chains, orbital debris, in-space servicing and manufacturing (ISAM) and big data. A couple of key topics that cropped up in several panels, and stood out for me, were D2D and ISAM. The former because opinion was sharply divided and the latter because it is a relatively new segment. In addition, two keynotes, one from Jessica Rosenworcel, FCC Chairwoman and the other from Katherine Gizinski, CEO, River Advisers (formerly known as ManSat) were particularly interesting.

D2D was first mentioned in the opening session “Review of 2023 and Outlook for 2024.” One of the poll questions was “In the upcoming year (2023-4) which innovation will drive the most growth in the space economy. 49% of the audience chose “Space-based telecom.” Don Claussen, CEO, ST Engineering iDirect, vehemently disagreed, saying, “it (space-based telecom) shouldn’t be up there.... if we’re talking about driving growth. There is a place for it, but we don’t know what the number is.” In a similar vein during a later panel Dr. Anton Monk, VP & CTO Wireless Initiatives, Viasat commented that estimates of the size of the D2D market varied from US\$3-40 Billion “Camping needs are not going to fill that market, just how much do people want to connect when they are out of coverage?”

Joseph Anderson, VP Space Logistics, Northrop Grumman has probably been in the ISAM market the longest. Northrop Grumman’s Mission Extension Vehicle (MEV) was first discussed in this magazine in 2011, when, several mergers ago, it was known as Vivisat MEV. Anderson reported that there are now two MEVs in orbit, these have

extended the life of two Intelsat satellites by a total of six years, now Northrop Grumman is working on a second generation vehicle that will be able to install augmentation devices onto satellites that were not designed to be serviced, do basic repairs and satellite relocations. This will launch in 2025. On the manufacturing side Orbital Composites, a startup, is planning to manufacture antennas, very large antennas, “kilometer sized antennas” in space. JPL are also planning manufacturing in space, so that a hosted payload could be added post launch. As for the size of the market, panelists expect it to be very large, particularly if deorbiting LEOs is considered part of the ISAM market.

Most of us realize that the US is a leading player when it comes to space. Jessica Rosenworcel, Chairwoman FCC, really put this into context when she pointed out that the US investment in space now exceeds that of all other governments combined. In addition, the US has ten times more space focused companies than any other country. Space is now the fastest growing segment of communications technology and right now there are filings for 56,000 new satellites with the Commission, double the number of applications filed just four years ago. There are also many applications for novel space services, including lunar landers, space tugs and antenna farms.

In order to deal with this onslaught, a new Space Bureau, led by Julie Kearney has recently been created. This bureau is designed to support US leadership in the space economy. One of the key achievements of the Space Bureau, has been to streamline the rules for the application process, and kick-off a transparency initiative which includes publishing rules, and videos online, in order to make it easier for new companies to enter the market. Another initiative is investigating what it can do to mitigate orbital debris. This is a





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- DAB - Digital Audio Broadcasting
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particularly important subject not only for our industry, but for the world. In poll taken during another session, 71% if the audience believed that “orbital incidents are likely to radically change the ability to use space in our lifetime.” To this end, the rules for deorbiting an end-of-life LEO have been changed to five years from 25 years and action has already been taken against a company that failed to meet its deorbit commitments.


The World Radiocommunications Conference (WRC), will take place from November to December in Dubai, so this was a perfect time to hear insights from Katherine Gizinski. River Advisers, are the leading experts in spectrum policy and allocation for our industry. She opened her talk by referencing back to the points made by the FCC Chairwoman about the size of US investment in space. Then pointed out that nevertheless, when it comes to spectrum allocation, the US gets only one vote, in common with the other 192 countries that will participate in WRC-23. She went on to discuss how spectrum influences everything and everyone involved in satellite communications. Whether a company is making ground equipment, operating a satellite or providing a service, the frequencies that can be utilized will impact where best to spend the R&D budget, which markets can be addressed and long-range business plans.

Every country participating in the WRC has two objectives: protect the spectrum they have and increase it if possible. Spectrum is a finite resource and the competition is not just other satellite operators, it is also mobile network operators (MNOs) and fixed wireless operators. Almost by definition, satellite is not a national business, so it is particularly important for the industry to gain the support of other countries, regionally or globally when defending or requesting spectrum. The WRC only meets once every four years, so the time between conferences is the time for working groups and behind the scenes discussions and negotiations to arrive at a cohesive strategy for the next WRC. Items on the agenda for WRC-2023 that impact the satellite industry include: new applications in existing satellite bands, improving satellite procedures and additional spectrum in Region 2 (the ITU divides the world into three regions. Region 2 primarily covers the Americas and Greenland).

An important part of Space week, is the Society of Satellite Professionals

“...Estimates of the size of the Direct to Device (D2D) market varied from US\$3-40 Billion...”

International (SSPI) Future Leaders’ Celebration, where the “20 under 35” honorees are recognized. These are employees or entrepreneurs who have demonstrated initiative, creativity and problem-solving skills that created new capabilities, overcame major challenges, and ensured excellence in technology and service. It was interesting to note that this year, 12 of the 20 were ladies. The three top-ranking Future Leaders, on the list were also ladies, and these were honored with a Promise Award, recognizing their status as leaders of the 2023 cohort. These were: Bhavi Jagatia, an Astrodynamics Engineer at Planet; Onyinye Nwankwo, a scientist in the field of upper atmospheric and space sciences, currently pursuing her PhD in Climate and Space Sciences and Engineering at the University of Michigan. Previously, Nwankwo was a Scientific Officer with the Center for Atmospheric Research, National Space Research and Development Agency (CAR-NASRDA) in Anyibga, Kogi State, Nigeria; and Julie Newman, Program Chief Engineer for Satelit Nusantara Lima N5 (SNL), a major geostationary communications satellite program, at Boeing. At the same ceremony Debra Facktor, Head of US Space Systems, Airbus US Space and Defense, was honored as “Mentor of the Year.”

Times are definitely changing. Three female Promise Award winners, more ladies than men recognized as future leaders. The first female Chairwoman of the FCC (there has been a previous Acting Chairwoman). It’s worthwhile mentioning whilst on this subject, that the current Secretary General of the ITU is Doreen Bogdan-Martin. This marks the first time that the ITU has been led by a woman since its formation in 1869. Hopefully, in a few years’ time, none of this will be remarkable. Leadership of our industry will be equally divided between the sexes. 



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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Do Renaissance Persons Work in Satellite?

by Lou Zacharilla

How does someone get a job like mine in this great industry? Running two great trade associations and advising a range of great companies – and being able to tell my story in places like this publication every other month?

In my case, it was poetry.

1980: There was no way I was going to get that job as an advertising copywriter at the big agency in New York City. I had gone through several interviews, showed them all my terrific writing from my Summer jobs reporting for local newspapers, being a Sports Information Director at my college and my quirky enthusiasms in print, submitted to every magazine in North America.

It wasn't enough. The HR Director liked me. I knew she wanted to find a place for me but this stuff wasn't doing it for them.

"Do you have anything else?"

"I have some poetry. I've been published in a few magazines and journals. But that's it. You've seen everything else."

"Bring it in."

Three days later I was hired as a copywriter for one of the largest ad agencies in New York, working on the US Army's "Be All You Can Be Campaign." The rest is long history. I eventually founded a company and ended up, through seized opportunities, with a business serving the satellite industry.

It is an unusual path for this industry. Or it was.

Today? When I do my "Better Satellite World" Podcast, I speak with people in all different disciplines because the industry needs them.

Geoffrey Craig, for example. The Senior Product Strategist for Ursa Space was a journalist in the commodities industry and had a few other careers before landing a job with a space data analytics company that is on fire. You'll hear my Podcast with him in a few weeks at www.sspi.org/podcast

The point is that with the range of companies and jobs in need, compa-

...Perhaps this is the real requirement for today's commercial space and satellite worker. They need to be more broadly educated and never think that what they have - and have not shown - will not find its way to the HR office.."

panies like Ithaca-New York based Ursa are literally hiring economists, journalists, data analysts and, yeah, artists.

This is the New Renaissance. We are leading it.

Over in England, we had the Right Honorable Lord David Willets speak at the annual SSPI UK Chapter awards dinner. Called by the Guardian the "last public intellectual in politics," he is a thinker on education, boomer economics (see his book *The Pinch* if you are



baby boomer and want to take an honest, hard look at what you've contributed – and taken – in your long years!) and of course Space. Lord Willets is Chairman of the UK Space Agency and served as Minister for Universities and Science. His mind is expansive and he is among the best and the brightest in many different areas.

Perhaps this is the real requirement for today's commercial space and satellite worker. It is something I see more and more. They need to be more broadly educated and never think that what they have - and have not shown - will not find its way to the HR office. Butcher, baker, candlestick maker? Who knows?

Rub-a-dub-dub. Don't forget to keep writing that poetry either! 📧



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

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Gilat Completes Acquisition of DataPath

Petah Tikva, Israel, November 16, 2023—Gilat Satellite Networks Ltd. (Nasdaq: GILT, TASE: GILT), a provider of networking technology, solutions and services, announced that it has completed the acquisition of DataPath, Inc., a provider of trusted communications for the US DoD Military and Government sectors.

The transaction was approved by the Gilat Board of Directors and by

kets, DataPath is the pillar we have been seeking to rapidly realize Gilat's strategy. With annual revenues in the defense sector forecasted to increase by approximately \$50 million, we are building upon the new, strong synergies enabled by the acquisition, as Gilat's international presence will present DataPath with new opportunities for its advanced solutions, and DataPath's valued presence in the US will create

DataPath's ability to develop solutions for the rapidly evolving satellite communication market. As the SATCOM market enters a new space age, our combined resources and technologies further enhance Gilat's strategy in the global defense sector."

Needham & Company LLC and Quilty Analytics LLC are serving as financial advisors to Gilat. Naschitz Brandes Amir & Co. and Foley and



DataPath's Board of Directors and stockholders earlier this year, and it has received regulatory approvals, including the receipt of clearance from the Committee on Foreign Investment in the United States (CFIUS).

"This acquisition is a strong step ahead in Gilat's strategy to increase its presence in the growing defense market," said Adi Sfadia, Gilat's CEO. "With more than 25 years of experience in serving the US DoD and government sectors, as well as other government and defense mar-

new opportunities for Gilat's advanced communication technologies in this sector."

"Together with Gilat, we are well positioned to offer all of our customers comprehensive integrated solutions built with best of breed components and technologies," said David McDonald, DataPath's President. "DataPath, now as part of Gilat, will continue to offer superior solutions, not just within the U.S. DoD market, but throughout the world. This acquisition's synergies enhance Gilat's and

Lardner LLP are acting as Gilat's legal counsel. RCBG, headquartered in Chicago, Illinois, served as exclusive strategic advisor to DataPath, Inc. DLA Piper LLP and Greenberg Traurig are acting as DataPath's legal counsel.

DataPath provides advanced and secure communications solutions tailored to the unique requirements of defense, aerospace, broadcast, government, and critical infrastructure clients.

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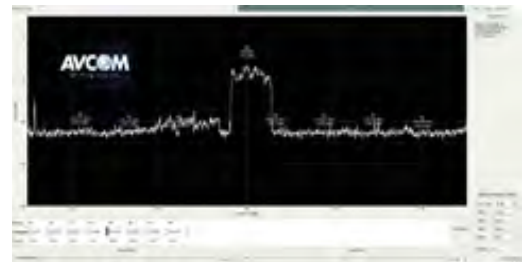
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Comtech Names John Ratigan as Chief Corporate Development Officer

Denver, Melville, N.Y., December 6, 2023— **Comtech** (NASDAQ: CMTL), announced the appointment of satellite communications and defense technology industry leader **John Ratigan** as the company's first Chief Corporate Development Officer (CCDO).

With differentiated expertise across the global satellite technology sector, Ratigan brings over three decades of leadership experience to his position as **John Ratigan** Comtech's CCDO.

Ratigan's experience is uniquely well aligned with Comtech's strategic business priorities and continued expansion into new growth markets. Prior to joining Comtech, Ratigan served as CEO and President of iDirect Government as well as holding a position as an Executive Committee Member of ST Engineering iDirect. As its first employee, Ratigan established iDirect Government and grew the company to over US\$ 100 million in annual revenue. During his tenure as CEO and President, Ratigan assembled a team of over 200 outstanding professionals and was responsible for taking iDirect Government from a startup to a well-known technology leader that deployed thousands of innovative modem solutions and satellite technologies supporting U.S. government and Department of Defense (DoD) customers



across the globe. Ratigan was also responsible for acquiring GlowLink and its unique interference mitigation technology (CSIR) and fused it with iDirect's own Evolution technology, which helped the company become the largest provider of Time Division Multiple Access (TDMA) SATCOM capabilities for the U.S. DoD.

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

Asheville, N.C., December 8, 2023 – **AvL Technologies** has appointed **Jerry Ivester** as Chief Commercial Officer, effective immediately. Ivester succeeds Tony Wilkey who is retiring from AvL after 15 years with the company.

Ivester brings to AvL over 22 years of military experience and 12 years of business development and strategy experience in the satellite communications industry, most recently as the Director of Government Business Development at Communication & Power Industries (CPI). Prior to CPI, Mr. Ivester served as the Director of Sales and Business Development for General Dynamics Satcom Technologies. His military experience includes serving as the Director of Communications Planning and Senior Communications and Intelligence Analyst for U.S. Special Operations Command, and as an Officer for the U.S. Army. Mr. Ivester holds a Bachelor of Science degree in Business Administration from the University of Tennessee at Chattanooga.

"AvL is grateful for Tony Wilkey's



Jerry Ivester and Larry Watts

15 years of leadership; he will be missed by AvL team members and customers alike," said David Bowne, President and COO of AvL Technologies. "We're excited for Jerry Ivester to step into the CCO role and continue to grow the business. His military service and deep SATCOM and MILCOM industry experience uniquely positions him to lead AvL's strategic sales and business development."

Several other key leaders at AvL have moved into new roles. **Larry Watts** has moved into the newly created role of Chief Supply Chain Officer and is streamlining and improving AvL's vendor relationships and supply chain. Zach Akridge is now Director of Operations, and Richard Rader is now Sales Accounts Director with responsibilities for eastern U.S. and international sales.

AvL Technologies, Inc. (AvL) specializes in the design, development and production of mobile satellite communication antenna systems and terminals. AvL's visionary approach to mobile satellite antennas and positioners has established the company as a global leader in innovation and reliability. The industry leading AvL product line features a full range of rugged, rapidly deployable, mobile antenna systems and terminals, including multi-band and multi-orbit configurations. For more information go to: www.avltech.com

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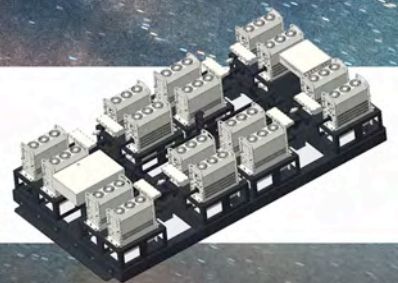
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The Global Market for Earth Observation to Reach US\$ 7.6 Bil. by 2032

Paris, France, November 30, 2023--As global economic landscapes continue to navigate challenges posed by inflation, geopolitical tensions, and the residual effects of pandemic-related disruptions, the Earth Observation (EO) market is undergoing a transformative phase, reflecting both setbacks and opportunities for industry players worldwide.

Commercial operators are restructuring, reducing costs, and optimizing resources with a focus on execution. In the current year, Maxar, BlackSky, Planet, Satellogic and now Airbus have adapted their organizations to reflect slower market dynamics and an increasingly competitive landscape.

The alignment of Security, Sustainability, and Digitization becomes a pivotal support system driving market dynamics. Defense sector investments, notably exemplified by the Electro-Optical Commercial Layer (EOCL) increased budgets via the U.S. National Reconnaissance Office (NRO), spearhead market momentum. This impetus is further reinforced by European recovery plans and public policies fostering EO ecosystems, such as Japan Aerospace Exploration Agency's (JAXA) mechanisms for investing in private enterprises.

According to Alexis Conte, Earth Observation Managing Consultant, and Chief Editor: "underlying drivers remain supportive, there is a realignment from Private equity investment falling year-on-year for the first time in the last 10 years, toward rising public investment." The latter supports the idea of recognizing the pressing concerns of Security, Global Warming, natural disasters, and the global shift toward sustainability, investments in EO technologies increasingly prioritize eco-friendly practices.

However, amidst short-term challenges, the long-term outlook for the EO market remains optimistic, bolstered by technological advancements across the value chain. These innovations catalyze the evolution of higher-value premium

products, enhancing operational decision-making and facilitating timely monitoring across diverse applications.

The data market landscape currently stands at US\$ 1.78 billion (2022), growing at a 5-year CAGR of 6%. Forecasts project an upward trajectory, anticipating a valuation surpassing US\$ 2.7 billion by 2032, growing at a 4% CAGR throughout the decade, primarily fueled by submetric resolution usage.

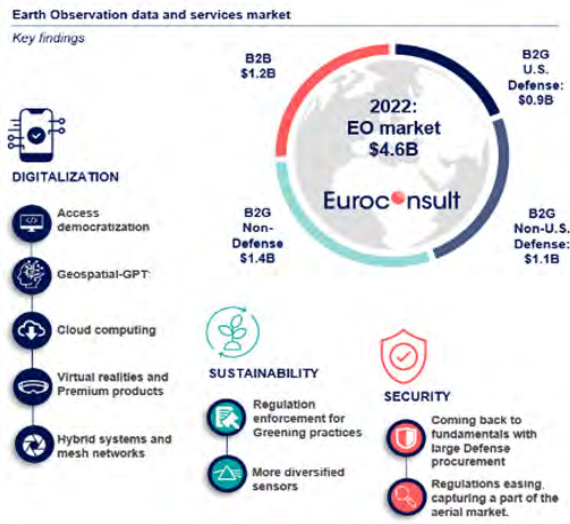
In parallel, the service market, currently valued at US\$ 2.86 billion (2022), demonstrates a 5-year CAGR of 9%. Predictions envision an escalation to US\$ 4.9 billion by 2032, growing at a 6% CAGR. The commercial

Value-Added Services (VAS) sector, by its nature, remains fragmented, with the top two players contributing approximately 26% of revenues (28% in 2021).

The Business-to-Government (B2G) sector remains foundational, with Defense continuing to be the most significant, valued at US\$ 2 billion in 2022. Despite moderate growth rates, the Defense market is expected to witness a substantial net addition of \$910 million between 2022 and 2032, primarily attributed to the U.S. defense sector's projected 4% CAGR.

North America retains its position as the primary market, constituting nearly 45% of revenue while Europe, accounting for 22% of the market share, witnesses a shift in demand from data to information services based on cost-efficient supply. Meanwhile, Asian markets, led by China, Japan and South Korea, are poised for robust growth, driven by domestic usage and burgeoning export potential.

The Earth Observation market's evolution continues to be shaped by a delicate interplay between economic realities, geopolitical dynamics, technological breakthroughs, and shifting consumer demands. Amidst these fluctuations, industry leaders are positioned to leverage emerging opportunities and drive the EO sector toward sustained growth and innovation.



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