

Satellite Executive BRIEFING

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Industry Trends, News Analysis, Market Intelligence and Opportunities

The Impact on the Satellite Industry of the War in Ukraine

by Elisabeth Tweedie

Whether by design or circumstances, the space industry has become inextricably involved in the war in Ukraine, and/or the repercussions from it. The launch industry is suffering from major supply issues, joint ventures and partnerships have been canceled. Both of these will have a long-term impact, changing the structure of the industry. In complete contrast, satellites are making a major contribution not only to our understanding of what is happening, but also by providing much needed help to Ukrainian refugees.

Probably, the first thing that springs to mind when thinking of space in the context of Ukraine, would be the images that we are all seeing on a daily basis from Maxar, Capella Space, Planet and other Earth Observation (EO) companies. These

before and after images have certainly played a significant role in alerting the world to the devastation on the ground. While the news media is sharing relatively high-level images, EO satellites now have the resolution to hone in to 30 centimeters or less, giving far greater detail to those who need to know. Maxar and Capella Space also use synthetic aperture radar (SAR) to capture images



through cloud cover, something that was particularly important at the beginning of the war, as Ukraine is frequently covered by clouds in winter. As well as imagery, other satellites provide advanced geospatial capabilities. Hawkeye for example collects and geo-locates radio signals from 50MHz to 18GHz. As Tony Frazier,

Continued on page 4

What's Inside

From the Editor3



Company Spotlight: Satellite Mediaport Services.....9
by Mody Schreiber

Kacific: Bringing its Successful Business Model to SouthAsia and Beyond.....14
by Virgil Labrador

Steering Clear of Digital Dinosaurs18
by Robert Bell

Products and Services Market-Place Guide to CABSAT22

Sustaining the Final Frontier..27
by Martin Jarrold

Mergers & Acquisitions.....32

Executive Moves35

Market Trends.....37

Advertisers Index.....40

Vital Stats40

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Satellite MarketCasts



The great thing about the industry shows coming back live is meeting old and new friends face to face again. To us who cover the industry, it also means being able to do in-person interviews. Our Satellite Marketcasts channel has been active again with interviews with key industry executives (<http://www.satellitemarkets.com/satellite-marketcast>)

View our most recent interviews at the Satellite 2022 show in Washington D.C. including: **Kevin Steen**, CEO-ST Engineering iDirect; **Miguel Angel Panduro**, CEO-Hispasat; Thomas Fröhlich, CEO of **WORK Microwave**; **Mitja Lovsin**, General Manager of **STN**; **Eric Schmidt**-VP-Sales, **Comtech Satellite Network Technologies**; **Brian Billman**, Chief Marketing Officer-**Isotropic Systems**; and Steve Bjornaas, Director of Software Development-**Trisept Corporation**.

We have full slate of shows in the next coming months with Satellite Asia in Singapore and IBC in Amsterdam, among others. So stay tuned!

Virgil Labrador

View video interview with key executives from the Satellite show in Washington, D.C. at:

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Office: +1 512 9430454
Mobile: +1 310 9181728
Fax: +1 512 9430455
Web: www.applicationstrategy.com
E-mail: bruce@applicationstrategy.com



EDITORIAL

Virgil Labrador
Editor-in-Chief

virgil@satellitemarkets.com

Peter I. Galace
Elisabeth Tweedie
Associate Editors

Contributing Editors:

North America:

Robert Bell,
Bruce Elbert, Dan Freyer,
Lou Zacharilla

Latin America:

Bernardo Schneiderman
Europe:

Martin Jarrold (London)
Omkar Nikam (Strassbourg)
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Roxana Dunnette (Geneva)

Asia-Pacific:

Blaine Curcio (Hong Kong),
Naoakira Kamiya (Tokyo),
Riaz Lamak (India)

ADVERTISING

For Advertising enquiries send an e-mail to:
info@satellitemarkets.com

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SYNTHESIS PUBLICATIONS LLC
1418 South Azusa Ave.
Suite # 4174
West Covina CA 91791 USA
Phone: +1-626-931-6395
Fax +1-425-969-2654
E-mail:
info@satellitemarkets.com
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The war in Ukraine...

from page 1

EVP Global Field Operations, Maxar Technologies said during Satellite 2022 in Washington DC in March of this year: “The crisis in Ukraine has really been a catalyst for bringing together our industry...for how commercial remote sensing and more advanced geospatial intelligence can be applied to a trending event, where you're having the ability to see, understand and interpret activity from space, to really deliver insights to those in need.”

On a more negative note the war is having serious and far reaching consequences for international cooperation, as evidenced by the number of agreements that have been canceled since the war began. The space industry has generally considered itself to be independent of conflicts on the ground, nowhere is this more clearly evidenced than in the International Space Station (ISS) a cooperative venture between 15 countries, including Russia and the US. Cooperation that was tested, but survived the Russian annexation of Crimea in 2014. So far, it has survived the war in Ukraine, but not without significant bluster coming from Dmitry Rogozin, head of Roscosmos, who at times has implied amongst other things, that if sanctions continue, Russia may let the ISS “fall to the ground.” However, whilst Russian propulsion systems do keep the ISS in orbit, this would hardly be in Russia’s best interest given that it also has cosmonauts aboard. SpaceX has indicated that its Dragon capsule that already docks with the ISS could provide the necessary thrust if need be. NASA, meanwhile has remained calm and indicated that everything is proceeding as normal. And indeed, this seems to be the case. In spite of the blustering, there is still a multi-national crew on board and a NASA as-



Pre-war Ukraine had a thriving space industry. The Yuzhnoye State Design office is considered one of the best design bureaus in the world, and Yuzmash another state enterprise produces launch vehicles and spacecraft. Its Zenit (pictured above) and Cyclone booster rockets are used by many western companies.

tronaut, along with two Russian cosmonauts, was returned to earth by the Russian Soyuz spacecraft at the end of March.

However, other joint ventures have not fared so well. ExoMars, a joint European Space Agency (ESA)/ Russian venture to launch a Mars rover that would look for extraterrestrial life has been canceled. Germany has turned off its eROSITA telescope which is part of Spektr-RG, a joint space observatory with Roscosmos. Luna-25 a Russian spacecraft due to launch later this year, was to have carried a navigation camera (PILOT-D) from ESA to collect images during

...On a more negative note the war is having serious and far reaching consequences for international cooperation, as evidenced by the number of agreements that have been canceled since the war began....

the landing which would have been used to support ESA’s work developing a precision lunar landing system. ESA has requested that the camera be removed and put in safe storage until it can be returned. ESA was also due to supply a payload for a later launch of Luna-27. This payload (a drill and an instrument to study lunar volatiles) has now been transferred to NASA.

The launch industry, has long been a showcase of international cooperation; many international launches take place at Roscosmos’ launch facility in Baikonur, Kazakhstan, and many European launches use Russian rockets. Going forwards, this cooperation is unlikely to continue. In response to sanctions, Roscosmos refused to launch 36 of OneWeb’s satellites unless the British government withdrew its investment in the constellation. In a surprising show of industry cooperation, these are now being launched by SpaceX, owners of Starlink, a competing broadband LEO constellation. Additional launches will be provided by India. Roscosmos also canceled all Soyuz launches that were scheduled to take place in the European Spaceport op-

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erated by Arainospace in French Guyana. The western launch industry has suffered further setbacks, as Russia has refused to deliver rocket engines used by both Northrop Grumman and United Launch Alliance (ULA).

Pre-war Ukraine had a thriving space industry. The Yuzhnoye State Design office is considered one of the best design bureaus in the world, and Yuzmash another state enterprise produces launch vehicles and spacecraft. Its Zenit and Cyclone booster rockets are used by many western companies. It also produces the thruster for the fourth stage of the Vega and has a contract to produce 20 of these. Orbital ATK developed the Antares booster with help from Ukraine. Yuzhnoye designed it and Yuzmash manufactured it. Since 1991 more than 162 rockets and over 370 spacecraft have been produced with either design help and/or components from Ukraine. Unfortunately, the current situation in the country means that it is now impossible to rely on Ukraine being able to fulfil its contracts, so companies are searching for alternative solutions. As Josef Aschbacher, Director General ESA which relies heavily on Vega, said "We now have sufficient engines for 2022 and 2023. We are working on options for 2024 and onwards based on different technologies." Obviously, this is a sound commercial strategy, but will be a double blow down the line for industries emerging from the war, to find that they have lost key customers.

At the end of 2019, Ukraine changed the law to allow commercial companies to enter the space business. In the nearly three years since this happened, a number of interesting startups have sprung up. These include Promin Aerospace, which is developing a "self-devouring" rocket engine for launch vehicles. Essential-

...satellites are making a major contribution to our understanding of what is happening on the ground in Ukraine, but the contribution goes far further than photography and electronic eavesdropping. Satellites continue to supply communications to the country, most particularly in areas where terrestrial communications have been rendered inoperable...

ly the rocket's hull is made of solid fuel, such that the rocket consumes itself as it launches. Other startups include Kurs Orbital aiming to develop in-orbit servicing and Orbit Boy, which is developing a microsatellite air-launch system for European customers.

Another startup, Lunar Research Service was about to ship its first batch of nanosatellites to its backers, when the war started. Priorities were changed and instead of going to the customers, the satellites were disassembled and the components given to the military. In total the company donated nearly 17,000 satellite batteries to power flashlights and radio transmitters, and GPS equipped long-range communication models. The company's 3D printers are now being used to make parts for periscopes and guns. Lunar Research Service only had 12 employees and several of these volunteered for the Ukrainian defense forces.

At the time of writing the current state of Ukrainian facilities is unknown. Reports from a month ago, indicated that work was continuing in the state-run industries despite the war. All four of the commercial companies mentioned here, have recent social media posts. Compared to other countries the Ukrainian state-run space industry, was already underfunded, so it is questionable as to how it will fare after the war. Even if the all the facilities of both state-run and commercial enterprises sur-

vive intact, sadly, it is unlikely that all the staff will, given the vast numbers of Ukrainians that are now directly involved in defending the country. Loss of personnel would be a particularly hard blow for the startups, which typically depend on just a few key individuals.

As mentioned earlier, satellites are making a major contribution to our understanding of what is happening on the ground in Ukraine, but the contribution goes far further than photography and electronic eavesdropping. Satellites continue to supply communications to the country, most particularly in areas where terrestrial communications have been rendered inoperable. Starlink, is the most well publicized service provider, having donated 5,000 terminals, initially solely for government use, but now for private use as well. USAAID funded some of these, although the precise nature of the agreement with Starlink is unclear. Many other satellite companies have footprints that cover Ukraine and were providing service there before the war. It is safe to assume that wherever possible, they have continued to do so.

One of the most heartwarming examples of the impact that satellites are having on the current situation, is the role that they are playing in helping refugees. The N50 Project, which is managed by Geeks without Frontiers, is in the process of installing Portable Connectivity Centers (PCC) for refugees fleeing Ukraine. Initially



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ten PCCs will be installed in border countries where there are large concentrations of refugees, along transit routes and co-located with community centers serving refugees. But in the future, PCCs will also be located in Ukraine, to provide services where the infrastructure has been destroyed.

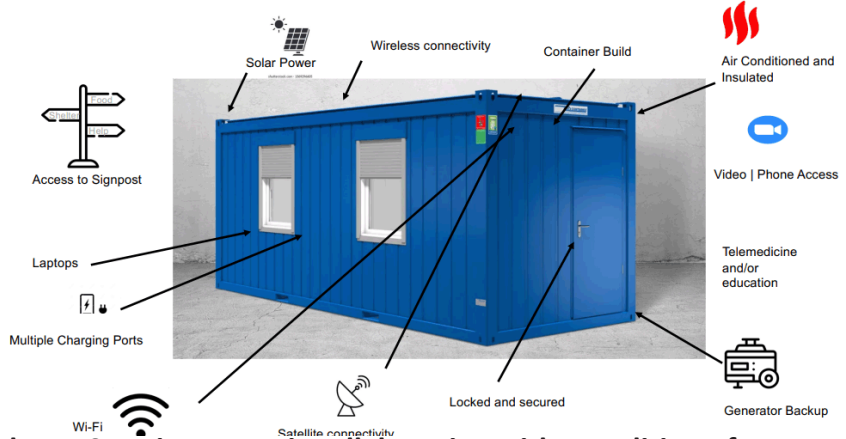
The PCCs, which are essentially converted shipping containers, are being produced in Krakow at a cost of ~ US\$100,000, and shipped to the final destination by truck or train. The whole process takes between four and six weeks. The PCCs provide power, WiFi connectivity, charging stations and laptops so that refugees can contact friends and family left behind and find out about locally available resources for shelter, food and water. In addition, telehealth services will be available for anyone that needs medical assistance. In the second phase the PCCs will be customized to meet local needs, providing distance learning for example.

Unsurprisingly, connectivity to the PCCs is provided by satellite. Not only does that mean that the PCCs can be installed anywhere, regardless of the local infrastructure, it makes them resilient to any future disruption of terrestrial service, and portable so that they can be moved in sync with demand. The equipment and airtime for the PCCs are being funded by generous donations from the industry.

In the last few days Viasat, has announced that it has partnered with the Košice region in Slovakia, to provide community internet service for refugees.

In addition, a group of industry players including: HawkEye 360, National Security Space Association, Capella Space, Maxar, Rocket Lab and Viasat have come together to form the Space Industry for

PORTABLE CONNECTIVITY CENTRE COMPONENTS



The N50 Project team is collaborating with a coalition of partners to develop and implement Portable Connectivity Centers (PCC). These PCCs are designed to help provide essential power and connectivity for refugees, fleeing the Ukraine to neighboring countries.

Ukraine (SIFU). This is designed to be a short-term initiative to provide immediate humanitarian aid to the people of Ukraine. To date SIFU has raised nearly US\$1 million. Companies joining the initiative make a one-time pledge of US\$50,000. Initial projects include, acquisition and delivery of medical and food supplies to Ukraine and Poland, Communication hardware and funding of operating costs to help NGOs working in the region, construction and operation of mobile medical facilities and general support for the evacuation of Ukrainian refugees.

It is too soon to know what the ultimate impact of the war will be for the space industry. Inevitably, joint ventures and international partnerships, once considered to be a good thing, will be reconsidered. It is however, heartening to know, that as always, when there is a major disaster, whether natural or man-made, satellites will always be the first means of providing much needed communications.



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



Satellite Mediaport Services: Gateway to the Future

by Mody Schreiber

Over the past decade the global telecom industry has been in the grip of massive transformation, propelled by unstoppable growth in data navigated by software across a growing open network system with an ever-increasing appetite for delivering localizing scalable cloud-compute capabilities to the cloud edge as the shared means for optimizing and transacting our aggregated needs.

This frenzy is driving major changes in the satellite industry. To form a part of this dynamic reorganization, satellite services need to become cloud-enabled i.e. fully integrate into this expanding ecosystem over compatible digital standards that extend network orchestration to targeted edge points.

satellite and ground segment operators offering a proliferation of new applications to industry verticals for connecting a host of end points within large geographical footprints over new technologies and proprietary non-terrestrial platforms.

Today's global telecom landscape has also formed a 'monolith', one in which digital technologies produce dynamic network connections across a cloud merging terrestrial and non-terrestrial networks. This requires satellite services to transition from reliance on proprietary technologies to a digitalized IF standard that over a community of cloud-resident of dials interfaces and manages both ends of QoS preference-driven networks.



5G has already initiated important software routing standards that seamlessly combine 'new generation' (or NGSO) network segments with terrestrial networks, and thus create a unique opportunity for satellite networks to drive this open orchestration.

There are parallels between the trends and transformations visible today with the first introduction of satellite services in 1965 that transformed the global telecom system. These introduced 'bent pipe' telecom services distributed across the globe through a politically manufactured monolith made up of national telecoms, each bound by common rules; standardized earth stations and operations. In the 1980's, fed by private equity, this monolith exploded into a multitude of independent

This technological re-organization is accompanied by closer collaborations across the satellite industry in the provision of services and also between government and private enterprise in the design, manufacturing and operation of satellites and of space launch vehicles and transmission systems. In a rearguard action, a number of 'legacy' service satellite operators are seeking to shore up their revenue decline, resulting from the loss of their non-terrestrial services to cloud-enabled networks, by extending their ownership share over non-terrestrial service supply chains and its revenue segments as far down as the physical network connection with the end-customer (e.g. Hispasat with Axess and Intelsat with Gogo).

Satellite Mediaport Services' ground segment proposition

Going forward, it is a safe bet to assume that satellites will retain their "specialist" telecom positioning, one that rests on their unique advantages in wide geographies; in mobility and increasingly in the delivery of high-speed and low-latency service wherever it may be needed.

Multi-orbit service orchestration leverages these unique advantages by allowing QoS preference stacking for aggregated non-terrestrial network services, at costs reduced by higher levels of infrastructure or gateway utilization – sometimes referred to as the 'common denominator' effect.

Optimal 'new generation' satellite deployment will require agile dynamic analysis and allocation of their power resources between inter-satellite links; gateway landings and limitations imposed by capacity bottlenecks over selected geographies and shifting frequency coordination limitations. Ground segment deployment and its value assessment forms a part of that dynamic complexity.

Like all teleports, the SMS Teleport is a highly-managed 'real-estate' complex. It is strategically positioned for uplinking to satellites in a 'clean' RF environment and is protected by perimeter fencing and other security systems.

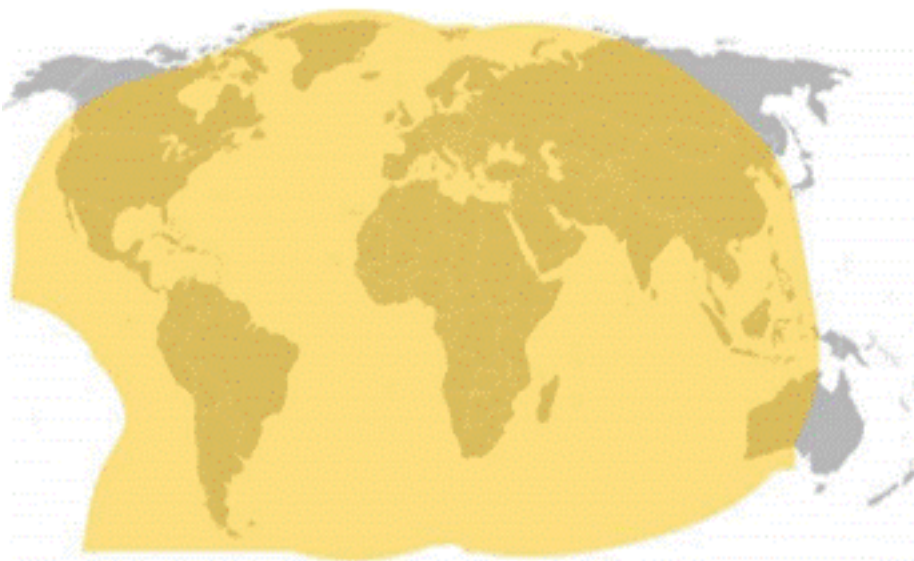
We maintain and plan new on-site connectivity across all teleport sub-systems, both colocated as well as fully owned and managed; the availability and distribution

...To form a part of this dynamic reorganization, satellite services need to become cloud-enabled i.e. fully integrate into this expanding ecosystem over compatible digital standards that extend network orchestration to targeted edge points...

of power, with automated switching for uninterrupted service protection; the communication between all operating systems tied to automated IT software management and control reaching active service components, including qualified Earth Stations and their associated electronics- all carefully backed-up in automated design to ensure highest QoS performance levels.

Our customers depend on satellite networks for their business

The SMS Teleport and its service is designed for global service providers, whose businesses require gateway operations and for whom satellite networks form a key part of their operation.



Satellite Mediaport Services' combined C-Ku- and Ka-band service footprint from Rugby, UK.



Defining the siting for one of our 3 additional remotely operated uplink locations of SMS's 360° global satellite monitoring service.

Twelve years ago, Satellite Mediaport Services embarked on a brave and ambitious building plan that aimed to provide uplink capability, in high capacity, to every potentially relevant satellite slot within our orbital arch extending from 600E to 600W, thus creating an aggregated ground segment infrastructure with solid common denominator economic value. We believed then - and experience has borne this out - that our infrastructure growth would strengthen our position as the teleport of choice for our existing customers.

Over those 12 years, whilst the ground segment part of the satellite industry was under pressure to contract and consolidate its activities, the SMS Teleport grew by 30% in each successive year. It is now nearing its targeted uplink capacity. In the process we have attracted major global service operators and TV broadcast embracing over 350 television channels.

Our infrastructure has expanded and renewed, but our range of services has not materially changed over that period. It includes:

- Transmission and reception;
- RF uplink and downlink;
- IP connectivity & backhaul;
- VSAT / multi-site link operations
- One-way or two-way Internet backbone connectivity via satellite;
- Network / Hub Hosting;
- Hosting / maintenance of customer furnished equipment (CFE);
- Satellite capacity;
- Worldwide lease line interconnection;
- DVBS2 + SCPC services;

- Data Storage and backup;
- Colocation.

In 2021, using our management's considerable experience in the implementation and operation of global uplink / turnaround projects and solutions and responding to a requirement initiated by one of the top international news agency customer, the SMS Teleport designed and began to implement a remotely uplinked 360° global satellite monitoring solution extending our core service footprint across the globe from four additional sites in the Middle East; SE Asia and the USA.

The Future

Ground segment 'real estate' is all about highly-managed infrastructure aggregation and operation as a service.

As digitalization shapes and alters the global network hues, we expect to see higher granularity focus on data management and QoS grading with greater involvement by the large data players, for whom control of network operation is central to their business.

SMS Teleport's accumulated know-how in service provisioning combined with relentless dedication to Ground Segment QoS; wide infrastructure base for uplink activities and highly responsive customer focus will remain essential ingredients for effective satellite communication services gateway. Even our larger customers will find it hard to compete with our real-estate capabilities. Our prime attraction as a service provider with these advantages is the fact our business does not compete with our customers. Our business is devised as an indivisible part of their operation, focused on a service bottleneck whose \$ cost to our customers is very low in relation to the potential inconvenience and expense resulting from having to divide their operation between smaller sites, and more importantly, the potential cost of any system failure that is not avoided or mitigated by our singular dedication to



Satellite Mediaport Services readying for LEO gateway services

perform service at a highest level of QoS.

Our incessant teleport physical infrastructure build-out has proved a well-founded strategy, attracting leading global operators who seek a solid basis for their ground segment operation.

Down the road, for the end customer, QoS is increasingly measured in scalability and speed across virtualized end points and not in real geographies. Looking into the future, there will be a need for more investment to elevate Satellite Mediaport Services gateway 'real estate' into higher reaches as an 'edge presence' for end customer QoS. In practice this will leverage our aggregated real estate advantages by enhancement of additional network value chain capabilities. The strategic proximity to England's industrial heartland and its major cities makes our teleport exceptionally well positioned take this next step to realise its edge presence potential.



Mody Schreiber is a creative entrepreneur with extensive leadership track-record in B2B markets with global operations and Senior Advisor to businesses in the satellite telecom industry. In 2000 co-founded and led SkyVision, one of the leading telecom services company delivering IP services over satellite to fast-growth markets over a geographic footprint covering over 80 countries. He can be reached at: mschreiber@sms-teleport.com

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Kacific: Bringing its Successful Business Model of Connecting the Unconnected to South Asia and Beyond

by Virgil Labrador

The South Asian market, comprising the countries belonging to the South Asian Association for Regional Cooperation (SAARC) that include Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka, is one of the world's most underserved markets for telecommunications services. Internet penetration in the region according to the International Telecommunications Union (ITU) is only 39 percent of the population of nearly two Billion as of 2020. That's nearly 1.2 billion unconnected people without access to broadband services.

One satellite company with a proven track record of success is hoping to bridge the digital divide in South Asia and neighboring regions that have large number of unconnected



Kacific is bringing its successful business model of connecting the unconnected to South Asia and beyond with its forthcoming Kacific-2 satellite.

populations. Kacific, a satellite operator based in Singapore has made it its mission to connect the unconnected. Its first satellite, Kacific-1, launched in 2019 has achieved in a relatively short time providing broadband access to over 120 million people previously unconnected in the remote areas of South East Asia and the Pacific. The state-of-the-art Geosynchronous satellite with 60 Gbps of bandwidth capacity has 56 high power spot beams providing coverage to an area populated by over 470 million people. The company is now the largest provider of Ka-band satellite services in East Asia and the Pacific.

More than just providing broadband access, Kacific has a unique business model that is making a substantial impact on the lives of the people and communities that it serves. Kacific's business model aims not just to achieve profitability and a reasonable return on its investment for its various

stakeholders, but also to achieve Environmental and Social Goals (ESG) in line with sustainable development goals set by the United Nations. By bringing broadband access to remote communities, the impact is beyond simply accessing the Internet - the business model empowers more and more people through supporting local businesses and contributing to job creation; promoting gender equality through connecting schools by making education even more accessible; improving quality of life by connecting health facilities and bringing

health care to local clinics in isolated communities, among others.

Kacific is planning to expand their unique business model of providing affordable satellite broadband internet to the underserved South Asia, the rest of South East Asia and

neighbouring regions with its upcoming Kacific-2 satellite scheduled for launch in 2025.

Kacific's agile business model and innovative technology which has worked very well in East Asia and the Pacific promises to make a substantial impact on the South Asian region. For its Kacific-1 broadband satellite service offering, it has added a franchise retail model to complement its wholesale model distributing bandwidth primarily through large (Internet Service Providers (ISPs) and telecom operators. The new model was created partly in response to businesses finding it difficult to commit to long-term contracts. Kacific's innovative franchise retail model, Gigstarter, is a pre-packaged, prepaid, monthly broadband service, which allows channel partners to resell broadband plans easily to end users plan-by-plan, site-by-site through small, light, and easy-to-install VSAT termi-



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nals. This offers many practical advantages for distributors or ISPs alike, including the hassle-free deployment of pre-packaged broadband plans with turnkey fair use policies and quality of service settings.

Another innovation to its service offering was in its distribution channel. Kacific developed a network of Authorised Distributors (KADs) in which local entrepreneurs can participate and get licensed to resell Kacific's broadband services in remote regions. The KAD channel has created avenues and opportunities for rural economic development, further increasing Kacific's reach and impact in the remote and isolated regions in South East Asia and the Pacific.

In the price-sensitive South East Asian and Pacific markets, Kacific has managed to reduce the total price of satellite broadband for customers with the introduction of a terminal kit consisting of low power, high throughput ST Engineering iDirect MDM2010 IP Satellite modem, its paired iLNB 3210 transceiver, and the 1.2m VSAT antenna. The MDM2010 is a 2-way, high throughput modem supporting a wide range of IP services like Internet/intranet access, VoIP and multi-casting services. Its easy point-and-play installation and high-performance modulation techniques allow Kacific to offer fast broadband services more cost-effectively over its Ka-band network.

The compact, lightweight modem is more affordable, easier to set up than existing modems, and can be configured from a web browser. It has a small profile, low power consumption and is suitable for all weather conditions. Its introduction will reduce installation time and bring down the cost of the terminal kit by up to 50 percent, with entry prices starting around US\$ 400 FOB (Free on Board). The new modem will easily connect 5 to 10 average users simultaneously, making it suitable for farms, households, and small or medium businesses.

"The underlying principle of Kacific's business is providing fast affordable broadband to under-served areas. The MDM2010, is a step forward in delivering that. Along with its paired iLNB transceiver, it is an entry level product that will significantly lower the price of Kacific's consumer-oriented terminals without compromising performance. It is capable of speeds of up to 50Mbps down and 10Mbps up, further reinforcing the total cost-effectiveness of the Kacific broadband plans for consumer and Small/Medium Enterprise (SME) end-users," said Christian Patouraux, Kacific's Founder and Chief Executive Officer.

"There is nothing more satisfying for us at Kacific than to see videos of smiling users accessing rich online content for the first time via a Kacific VSAT terminal. Every life that we touch with internet connectivity represents a chance for a child, a family, a community, to have higher quality educa-



Virgil Labrador is the Editor-in-Chief of Los Angeles, California-based Satellite Markets and Research. Virgil is one of the few trade journalists who has a proven track record working in the commercial satellite industry. He worked as a senior executive for a teleport in Singapore, the Asia Broadcast Center, then-owned by the US broadcasting company CBS. He has co-authored two books on the history of satellite communications and satellite technology. He can be reached at virgil@satellitemarkets.com



Kacific's terminal kit consisting of low power, high throughput ST Engineering iDirect MDM2010 IP Satellite modem, its paired iLNB 3210 transceiver, and the 1.2m VSAT antenna.

tion and healthcare and be better integrated in a fast, connected world," Patouraux added.

The upcoming satellite Kacific-2 will bring more of the innovations and best practices that its first satellite has successfully implemented in the East Asian and Pacific regions. "We are confident that the unique business model that we have implemented in East Asia and the Pacific with our first satellite, Kacific-1, will work just as well in the underserved markets of South Asia and neighboring regions. Specifically, our franchise retail model where we essentially partner with ISPs and Telco operators and sell them not bandwidth, but broadband plans that provides them the flexibility in their business. In addition, we developed a network of distributors who are incentivized to sell our broadband plans to their customers. These innovative practices which has worked very well for us, our partners and various stakeholders. It has enabled us to reach profitability in a relative short-time and provide broadband access to those unconnected and help developing communities reach key social development goals," said Patouraux.

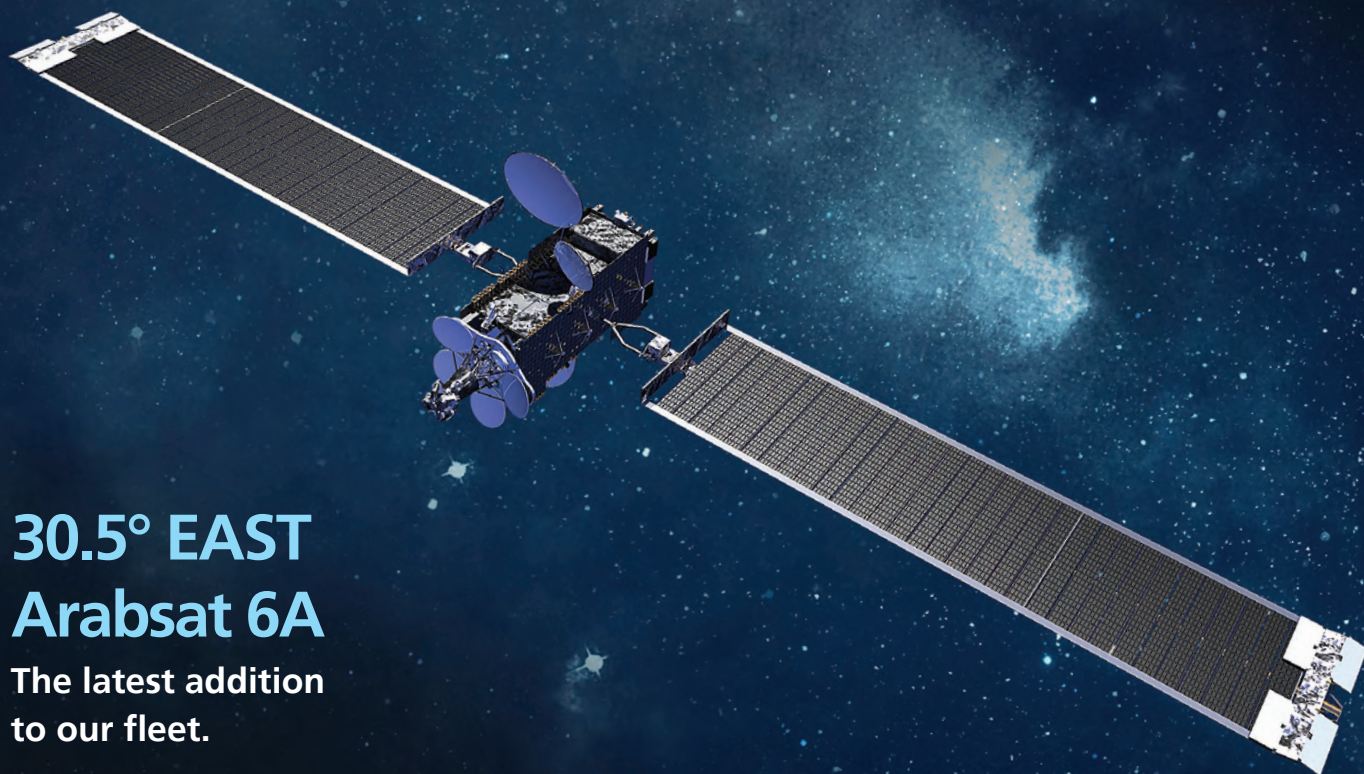
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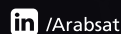
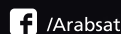
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Steering Clear of the Digital Dinosaurs

By Robet Bell

Everybody knows what “digital transformation” is, right? It’s that thing where you put on the VR goggles, drop into the metaverse and turn into a dinosaur with pink earmuffs.

Maybe not. It’s certainly not what CapGemini and MIT meant when they coined the term in 2011. It is, or is supposed to be, a foundational change in how an organization uses digital technology to deliver value to its customers.

Digital Transformation is Hard

If the words no longer appear in everyday business news stories, it may be because digital transformation is hard. Really hard. A 2020 study by Boston Consulting Group found that a staggering 70% of digital transformation projects fall short of goals. There are many other scary statistics out there, but they generally add up to one thing. It is much harder to deliver new value to customers through digital transformation than you might ever expect.

That’s why the World Teleport Association published a report late last year, *How to Profit from Customers’ Digital Transformation*. Nobody would expect the teleport or satellite sectors to be on the leading edge of digital transformation – heck, we are just getting around to thinking that adopting terrestrial telecom standards might be a good idea. But both sectors are embracing digital transformation, driven in no small part by the major changes that the pandemic forced on companies both internally and externally. Once location and work were unlinked, it became far easier to envision a digital foundation for much of what your company does. And the need to sell and serve customers remotely made a necessity out of what might once have been only an aspiration.

Plan? What Plan?

For most of the teleport and technology executives we interviewed for the report, digital transformation is less a detailed plan than an opportunistic evolution. Given the high rate of disappointment with big projects, that sounds like a lesson well learned. Transformation is driven, not by a clear end goal, but by the rollout of technologies that deliver operating efficiencies. As one executive put it, “The journey started and we subsequently identified it as a digital transformation journey.” So persuasive are these innovations that even skeptics of digital transformation are moving forward for fear of being left behind.

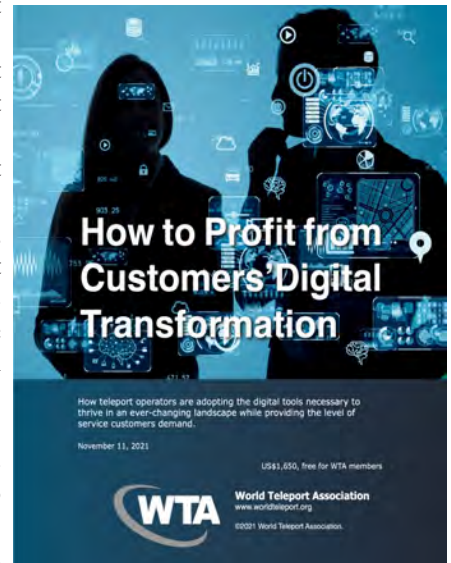
A different kind of technology rollout is also at work. As teleport operators look toward multi-orbit and software-defined satellites, they realize that ground networks also need to be software-defined and highly flexible. One interviewee put it this way: “We have to build an environment that follows the world of satellite. If we don’t go digital, we won’t be able to scale.”

Coming to the industry’s rescue is cloud computing, the single biggest technology innovation enabling digital transformation. (See our report on 2021 Cloud Forecast for Teleport Operators.) Cloud providers have achieved enormous adoption across business and government with their combination of pay-as-you-go economics, effectively unlimited compute capacity and a vast range of ready-to-run applications. By de-risking digital experimentation, the cloud has let teleport operators innovate faster, scale up the things that work and abandon ones that don’t at minimal cost.

Internal vs. External Focus

The title of our report assumed that most companies would focus their investments on network applications that serve their customers. Some have done so, but most have been quicker to migrate to cloud-based technologies for internal business operations. The journey has tended to begin with internal business support services like accounting and human resources management before moving on to customer-facing operations.

Some companies have limited their use of these tools to date to internal applications like auditing and tracking. One executive with a large teleport operator said the implementation of ServiceNow for incident reporting is among one of the company’s biggest accomplishments to date.



Another area where teleport operators have made tangible progress is network management and resource allocation. In this case, they are leveraging cloud based-software tools specifically developed to support communications networks – satellite, terrestrial or both. These products provide visibility into network performance and automate the process of ingesting and disseminating data throughout the network. Some of the larger, more sophisticated teleport operators are using software to orchestrate programming for broadcast customers.

Virtualization of hardware-based functions is widely viewed as a major area of digital transformation. Examples of purpose-built teleport hardware that interviewees said are ripe for virtualization include modems, switches and encoders, which typically require dedicated computing equipment.

Where's the Money?

Most of the operators and technology providers we spoke with said their ongoing digital transformation has yet to translate into new revenue streams. They clearly see the potential, however, either by reducing prices to levels that attract new customers or by allowing operators to easily bundle in value-added services such as information security and data compression.

Ground stations serving operators of non-geostationary and HTS satellite systems, however, are ahead of the pack, being relatively new and for reasons of orbital geometry. LEO and MEO constellations typically require global ground infrastructure able to deal with multiple satellites passing overhead, and virtualization is key to operating and utilizing these systems without going broke.

The digital transformation journey of the teleport industry will not be as thrilling as a visit to the metaverse. But by patiently testing technologies and adopting solutions, teleport operators will steer clear of turning into digital dinosaurs, earmuffed or not.



Robert Bell is the executive director of the World Teleport Association (www.worldteleport.org), which conducts research into the teleport and satellite industry and offers Quality Assessment and Teleport Certification programs

to service providers. He can be reached at rbell@worldteleport.org

How to Profit from Customers' Digital Transformation is available for free to members and for sale to non-members at <https://www.worldteleport.org/store/viewproduct.aspx?id=19289475>. A webinar based on the report is available free on demand at <https://www.worldteleport.org/general/custom.asp?page=Webinars>.



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The teleport was fully-functioning just few months ago, when it had to cease operations at the end of 2021 due to circumstances beyond the owners' control with regards to site of the teleport. There were no operational issues with any of the equipment or the business itself. It was in fact a very successful venture providing VSAT services for various verticals like enterprises, oil and gas, among others, for critical and essential connectivity applications.

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ND SATCOM continues to distinguish itself through its commitment to innovation and customer satisfaction. The coming launch of the ND SATCOM FLYAWAY terminal underscores the company's competitive advantage.

One advancement that sets this new terminal apart is its operational wind resiliency: it can withstand and function in very high wind speeds and during severe storms.

ND SATCOM incorporated another clear advantage: the latest version of the premier SKYWAN 5G technology. Customers value the proven high reliability and security that SKYWAN represents. The bar was raised here, too, by integrating the pioneering innovation of Adaptive Coding and Modulation (ACM) for TDMA, thus permitting transmission during heavy rains with adaptive bandwidth control. For the motorized FLYAWAY version, engineers integrated the ACU into the 5G modem, thus minimizing equipment and enabling pointing on SKYWAN or DVB signals.

ND SATCOM pushed the engineering boundaries further by optimizing portability and product longevity for this new FLYAWAY. Carbon was used wherever possible to reduce weight, enhance durability, and provide the extreme stiffness required for Ka-band in high wind conditions. Both the unique 180° azimuth range and integrated feed-booms for various bands expedite setup and use. For an extremely fast setup -, this terminal was designed for easy deployment and dismantling - time and again - while maintaining structural integrity throughout.

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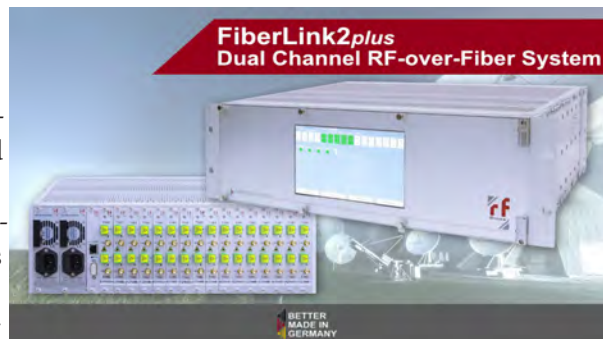


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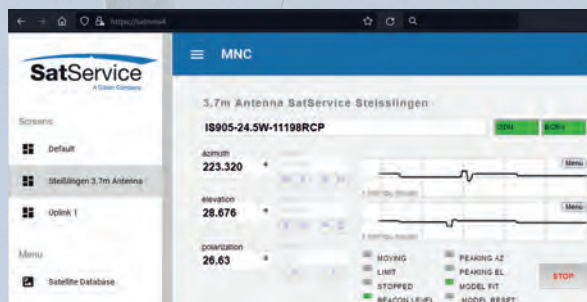
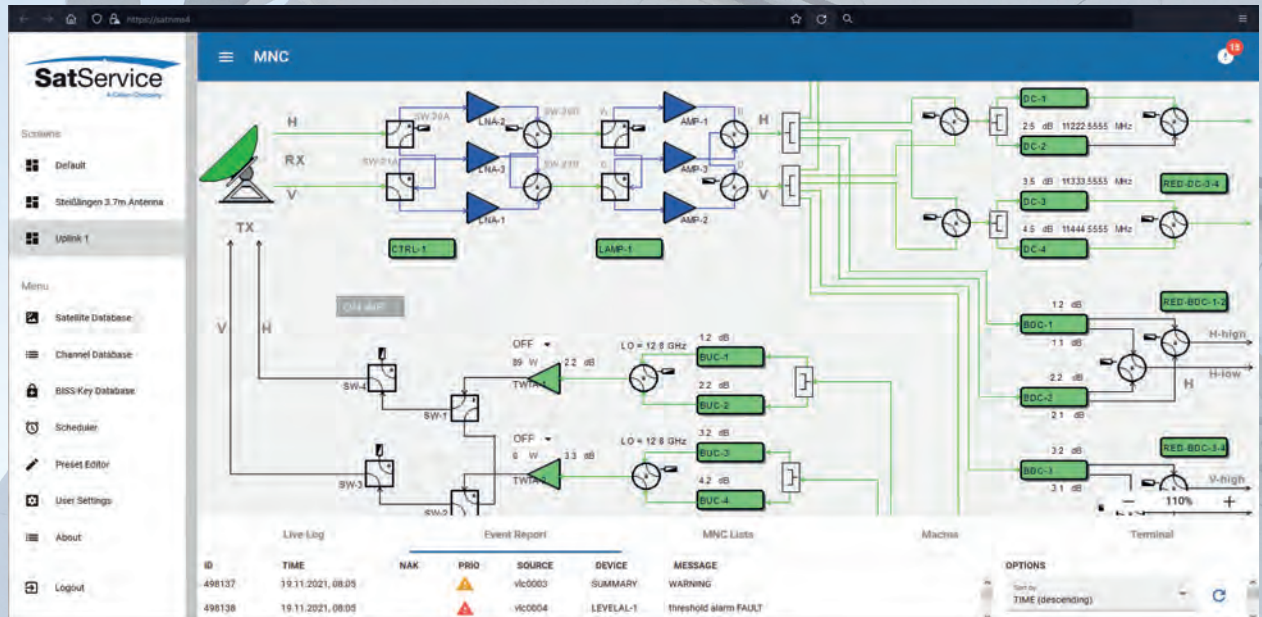
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Sustaining the 'Final Frontier': Managing Orbital Space as a Global Commons?

by Martin Jarrold

“Space...The final frontier.” When we first heard these words spoken by the ‘Star Trek’ actor William Shatner as Captain James Tiberius Kirk of USS Enterprise on television in 1966, space was indeed thought of as humankind’s final frontier. Several years before, the USSR had taken humanity’s radio technology into this frontier with Sputnik-1. In 1965, the first commercial communications satellite had been launched, and a few years later American scientists, technicians, and astronauts pushed humanity’s frontier by landing on the surface of the Moon.

Final Frontiers!

Now a days, thanks to incredible satellite technologies, and orbiting and deep space instrument-based findings and observations supporting equally incredible theoretical advances, we know more about the outer space that is very far away from us than we do about the inner space of Earth’s deep oceans. It is the deep oceans that are today’s real “final frontier”. Interestingly, and central to the thoughts presented here, space and the oceans, as frontiers, unfortunately have something in common... Human activity is compromising them both, in different ways, of course, but potentially with parallel, or equivalent, catastrophic

results.

As the oceans of the CO₂-emission and methane-emission saturated anthropocene epoch get warmer, become increasingly acidified, and are filled with plastic waste, we observe just one facet of the human-vectored threat to Earth’s interconnected ecosystems. Of course it is by using space, at least that



From 17-18 May for The Satexpo Summit at CABSAT in Dubai will be tackling the issues discussed in this article in panels such as ‘Stakes and Solutions in Responsibly Managing Space’ and for ‘Disruptive Evolution in the Satellite Ground Segment’ and ‘Driving a New Space Innovation Paradigm with Artificial Intelligence and Machine Learning’.

part of it that lies within the low earth orbit (LEO) range of the planet’s overall useful orbital assets – between the Karmen line (altitude approx 100km) and the geostationary arc (altitude approx 36,000km) – that we are able to most effectively measure the magnitude of these threats with remote sensing satellites. It would be extremely damaging to the potential of our efforts to monitor the various inputs and outputs of Earth’s shifting climate trends if we lost the ability to do so from orbit; and yet our anthropocene activities are extending and impacting beyond the limits of Earth’s immediate ecosphere. There is a deep synergy between ensuring humanity’s continuing climate security on the surface of the planet, and ensuring that Earth’s LEO is kept safe and secure – is kept for ongoing sustainable use.

Our Orbital Space

Of course, it is not only LEO – whether used for the remote sensing noted above, or used increasingly for



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broadband communications – that is vitally important to us here on Earth. GEO has long been, and remains, vital too. The potential of geostationary orbit was, of course, first identified as important by a man who (as I have previously written) is synonymous with humankind’s exploration of the extreme frontiers of space, albeit usually within the realms of science fiction. Arthur C. Clarke’s ‘Wireless World’ article prompted the following decades-long journey of using the geostationary arc above the Earth’s equator to locate communications satellites which throughout these decades have become increasingly powerful and capable. GEOs are a technological resource without which the planet’s communications networks would simply not function. As the satellite population of the geostationary arc has grown, there have been problems to be resolved... but development of solutions has followed.

For example, there is a legal obligation on bodies like the US Federal Communications Commission at the national level, and the International Telecommunication Union internationally, to ensure that the activities of satellite operators do not interfere with each other. In another example, good practice in the installation of satellite ground terminals to avoid adjacent satellite interference (ASI) has been encouraged and facilitated through accessible (i.e., online) training such as that developed by GVF Training which has successfully reached over 20,000 students worldwide. In yet another example, GEO satellites at end-of-life after 15, or perhaps, 17 years, must have a sufficient remaining station-keeping fuel supply to be maneuvered to a graveyard orbit. The GEO orbital arc is very busy with just two degree spacing between slots, but good husbandry of this orbit ensures that navigation to a graveyard slot means it will take many many thousands of years for the planet’s gravitational attraction to decay their orbit to a plasma-engulfed end in the atmosphere.

Most recently, we have gone further to enhance the good management of GEO space. The Mission Extension Vehicle (MEV-1) successfully performed an automated rendezvous with a non-transmitting satellite which required an in-orbit service check and re-fueling in February 2020. Later, MEV-2 successfully docked with and refueled a still fully functional satellite but which was running low on propellant.

How Many is a Crowd?

Our usable orbital space is getting more and more crowded: [a] In the commercial sphere (i.e., in satellite communications and Earth observation); [b] In the government sphere (e.g., in activity by increasing numbers of national space agencies); [c] In the military sphere (e.g., including the increased potential for various types

of anti-satellite – A-sat – technology); [d] In the research and technology sphere (e.g., in satellite future technology demonstrator projects, orbit-based industrial product development and manufacturing in pharmaceuticals and other sectors); [e] In the space resources management sphere (e.g., orbital debris removal and other debris mitigations, mission extension missions and automated satellite repair, orbital tow trucking); and not forgetting, [f] In the entertainment sphere (e.g., multi-million-dollar-ticket sub-orbital joyrides and space hotels).

With [a] satellite communications in all orbital planes will continue to get busier and more competitive as even more powerful examples of high-throughput GEOs are launched, as a new generation of MEOs are orbited, as existing LEO constellations grow, and the building of more LEO constellations begins; in Earth observation, particularly with satellites scaled as multi-unit cubesats. With [b] more and more countries, including some in the low GDP range, have founded a national space agency as both a mechanism to promote bilateral or multilateral cooperation with other countries’ agencies and to promote national space-related capabilities in aspects of satcoms (e.g., Internet of Things – IoT) and Earth observation/remote sensing (e.g., deforestation monitoring, agricultural monitoring, climate change monitoring, ocean monitoring). With [c] A-sat technology can include missile systems, kinetic anti-satellite weapons, etc. With [d] space and satellite technology development which may be the means to other ends, such as S.T.E.M. development. With [e] the consequences of increased volumes of orbital activity and numbers of spacecraft requiring servicing, as per [a], means that further satellite-based technology will be needed to manage an increasingly populated orbital environment.

Good Practice in Our Orbital Space Management

The international policy discussion and regulatory environment is likely to become more “heated” during the next years as nations, international agencies and organizations, and commercial entities become further embroiled in dialogue about not only long-standing issues concerning spectrum access rights and radio frequency interference issues, but also regulation on orbital debris and mitigating the potential of the “Kessler Syndrome”, as well as attempts to prevent A-sat activity.

An orbiting population of 100,000 or more satellites is likely by the end of this decade, and already an estimated 170 million man-made objects are in space. These objects comprise active satellites, derelict satellites, launcher stages, and ‘debris’ resulting from fragmentations, explosions and collisions which, when more

than 10cm in size, can be tracked (there are over 22,000 objects in ‘The General Catalog of Artificial Space Objects’), with anything smaller being untrackable.

This density of “junk”, however it arises, and even when objects are quite small (but traveling at high velocity), threatens humanity’s essential access to useful space, potentially rendering impractical many space activities and the use of satellites in LEO for generations to come.

More and more satellites being launched means having effective measures to deal with de-orbiting them at the end of their useful life, otherwise even more debris will be a natural consequence of such measures being inadequate and of the consequential likelihood of collisions. Various debris mitigation mission demonstrators have already been tested but need large-scale commercial development. The need for such missions in tackling increasing volumes of debris should be offset as LEO constellation operators are building-in de-orbiting protocols and technologies to their spacecraft. Hopefully, this means that LEO will be a resource that is well-managed with long-term good husbandry in mind, albeit that with the LEO satellite lifespan being about five years constellation operators will continuously need to replace satellites, requiring frequent launches and deliberate de-orbiting, leading to a constant turnover within LEO, and the risk of more derelicts from failed satellites.

Rules of the Road

There are non-binding guidelines which try to minimize the proliferation of debris:

- The Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines
- The UN Committee on the Peaceful Uses of Outer Space (COPUOS)/UN Office for Outer Space Affairs (OOSA) Long-Term Sustainability guidelines
- NASA guidelines

Broadly, these state that during the active life of satellites, operators should manoeuvre them to avoid collision, and at the end of spacecraft life, it is expected that a spacecraft will either be moved to a graveyard orbit (see above), or left in a lower orbit where it will decay due to atmospheric drag within 25 years. The open question regarding the latter provision is, “Is this sufficient?”

The ‘Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies’ (the “Outer Space Treaty”) recognizes that the activities of each satellite operator have potential consequences for other operators. It also provides that “States shall be responsible for national space activities whether carried out by governmental or non-governmental entities.” Indeed,

there is a growing momentum behind the view that we should be explicitly considering orbital space as an “environment” just as we recognize the “environment” of the planet’s surface and in the ocean depths. This momentum is evidenced in the G7 Summit statement on space sustainability in 2021; the World Economic Forum, European Space Agency, Massachusetts Institute of Technology, University of Texas, and the analytics consultancy, BryceTech, development of a ‘Space Sustainability Rating’.

Concrete and Coordinated Action

Space activity subject to environmental law is proposed as a necessary key step in translating international good intentions into concrete action, with each sovereign state recognizing its global responsibility just as with other environmental issues such as climate change and plastics in the ocean. Naturally, it is better for the satellite industry if the LEO satellite operators, in acting upon the recognition that their operations have potential consequences for other operators, maintain the usable orbital environment in good order based on rational commercial self-interest, as has been evident in the historical good husbandry of GEO.

The presence of more, and seemingly ever-larger, LEO constellations will put extreme pressure on conjunction threat assessment good practice, and place under increasingly severe stress collision avoidance maneuvering systems. Orbital space has a finite traffic-carrying capacity, an upper limit which will guarantee our usable orbital resource for the safe conduct of our satellite operations. The question is one of exactly when may we expect to see a universally acknowledged definition of this limit, and even if and when recognized, we have a jointly managed system for the long-term strategic prevention of the “Kessler Syndrome”.

This lengthy article has been prompted by one of GVF’s panel sessions during the forthcoming CABSAT SatExpo Summit. I introduced all three of the GVF sessions in my column here last month, so please join us over 17-18 May for ‘Stakes and Solutions in Responsibly Managing Space’ and for ‘Disruptive Evolution in the Satellite Ground Segment’ and ‘Driving a New Space Innovation Paradigm with Artificial Intelligence and Machine Learning’.

Martin Jarrold is Vice-President of International Program Development of GVF. He can be reached at: martin.jarrold@gvf.org



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Thomson Broadcast Signs Agreement to Acquire GatesAir

Cincinnati, OH, April 23, 2022

— GatesAir a provider of wireless, over-the-air content delivery solutions for radio and TV, announced that Thomson Broadcast has signed a definitive agreement to acquire GatesAir from an affiliate of The Gores Group. The transaction is subject to certain regulatory filings and is expected to close in the second half of 2022. Details of the transaction were not disclosed.

GatesAir is a renowned company in the Broadcast industry with a history of powering over-the-air networks worldwide with unparalleled reliability over the past 100 years. GatesAir has recently seen strong growth, coming off a very successful participation in the North America Spectrum Repack program. GatesAir worked with Bowen Inc. on a robust process which involved interest from several strategic and financial parties, with Thomson Broadcast prevailing due to its highly complementary fit. The combination of GatesAir with Thomson Broadcast will create a scaled, comprehensive platform with greater capabilities in innovation, design and product efficiency and an expanded portfolio of holistic, turnkey broadcast solutions.

“GatesAir is already an undisputed leader in the broadcast industry, and our combination with Thomson Broadcast will create a

combined company of larger scale even better suited to meet the ever-evolving needs of our customers all over the globe,” said Bruce D. Swail, CEO of GatesAir. “I am very proud of the GatesAir team for its stewardship of and innovation in this industry over the past century and look forward to entering the next 100 years as an even stronger business leveraging the strengths of two

legendary broadcast brands. On behalf of everyone at GatesAir, I’d like to thank Gores for



their strategic guidance which was invaluable in growing our business and driving innovation.”


“Over the course of our successful partnership with Bruce and the management team, GatesAir has driven tremendous growth and transformation through organic and inorganic initiatives, establishing itself as a premier, independent broadcast company with market leading technology and service,” said Edward Johnson, Senior Managing Director at The Gores Group. “We have no doubt GatesAir will

continue on its successful trajectory and strengthen its market leadership alongside Thomson Broadcast.”

For more than 100 years, Thomson Broadcast has forged extensive experience in the fields of Digital Terrestrial Transmission (DTV) and AM Radio, including DRM. Thomson Broadcast is an international French company well known in the broadcast sector. Over the past two years, Thomson Broadcast has received awards for providing exceptional DTT turnkey solutions to large-scale digital migration projects in Africa.

“In 2018, we have set the goal to establish ourselves in the US Market. With Thomson Broadcast and GatesAir now united, these two companies will make us stronger in America and globally as well,” says Ylias Akbaraly, Chairman of Thomson Broadcast.

“Thomson Broadcast and GatesAir together can bring innovative and revolutionary products to the broadcast industry in the centuries to come,” says Aby Alexander, President of Thomson Broadcast USA.

“We are delighted to have reached this point,” says Amine Oubid, CEO of Thomson Broadcast. “From the start we were excited to work with the GatesAir team and saw the obvious fit of the two companies. The transaction closing can’t come fast enough for us. We’re very proud to participate in the rallying of two century-old companies and excited to start working together.” 



17 - 19
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How Norway Makes Sure Its Climate Investments Pay Off

The vast forests of the tropics are givers of life. Eighty percent of the Earth's land animals and plants live there. And more than 250 million of the world's poorest people make their livings from the forest.

Forests matter. The trees of the Amazon produce one-fifth of the oxygen we breathe. All the world's forests keep more than 200 billion tons of carbon out of the atmosphere.

But every year, fire, bulldozers and lumber crews clear millions of hectares of forests – an area bigger than New Zealand. In just the last 40 years, the world has lost a forest area equal in size to all of Europe.

How to Stop Deforestation

Stopping deforestation is hard. The poor people most affected by it have little power to change things. Much of it breaks national laws, but overstretched governments struggle to stop it.

One nation, however, stands out. The government of Norway is the first to fund programs that help tropical nations rein in deforestation. A grant to Brazil in 2008 helped preserve enough forest to keep 3 billion tons of carbon out of the air. A 2010 agreement with Indonesia offered incentive payments for reducing emissions – and that nation's carbon output dropped by half in just a few years.

In 2020, Norway took another step. It announced a first-of-its-kind public-private partnership with Planet, Airbus and KSAT. Together, they would provide access to detailed satellite imagery covering 64 countries – all for free.

Satellite Industry Partnership

Planet operates a vast fleet of small satellites called Doves. They take pictures of all the Earth's landmass ev-

ery day. Those pictures are detailed enough to reveal individual trees.

Airbus is adding an archive of images captured by its Spot satellites since 2002. These allow today's forests to be compared to those from years ago. The Norwegian company KSAT is pulling together all this data and providing technical support to users, who can view and download the files from Global Forest Watch or Planet.

With daily updates from space, the images offer the first chance to see deforestation while it is happening. Logging and land-clearing operations deep in the forest can no longer hide. Governments and international organizations can identify illegal actors and pressure them to change. And all this value come free of charge, because the Norwegian government is paying for the service.

For the founders of Planet, this effort is the realization of a dream. When CEO Will Marshall, Chief Strategy officer Robbie Schingler, and Chris Boshuizen left NASA to found the company, their goal was to provide actionable data on the whole planet at the speed of change.

This lets governments, businesses, and researchers make smarter, more informed decisions to better protect our world's ecosystems.

For Norway, the images show its forest funding at work. As the country's Minister of Climate and Environment told the BBC, "We decided to foot the bill for the world."

So, the next time you take a deep breath, thank Norway – and the images and technology that come from companies like Planet, Airbus and KSAT. Together, they are helping keep the life-giving forests of the world alive.



Comtech Appoints Robert Samuels as VP-Investor Relations and Corp. Communications

Melville, N.Y., April 11, 2022--
Comtech Telecommunications Corp. (NASDAQ: CMTL), a leading global provider of next-generation 911 emergency systems and secure wireless communications technologies, today announced that it has named investment and financial analysis expert **Robert Samuels** as its Vice President of Investor Relations and



Robert Samuels

and Corporate Communications. This newly created position will significantly enhance Comtech's commitment to shareholder engagement and transparency.

Samuels brings over 20 years of Wall Street experience from working at leading financial institutions, including UBS Global Wealth Management, where he served in the Chief Investment Office, producing company-specific and thematic research, as well as marketing collateral for the firm's financial advisors and private clients. While at UBS, Samuels drove investment performance of tens of billions worth of assets, outperforming the sector benchmark and S&P 500 for five consecutive years.

"As we turn Comtech into becoming the most trusted provider of Failsafe Communications, we want to increase engagement around our

transformation with the entire financial community," said Michael Porcelain, President and CEO of Comtech. "Having a seasoned investment professional like Robert on our team strengthens our ability to tell Comtech's compelling story and elevate our brand. Robert will assist Comtech's leadership in its ongoing evaluation of potential new segment reporting and non-GAAP financial measures, and the roll out of our new social media initiatives. I am confident that with his expertise and fresh insights, Robert will make a strong contribution to Comtech."

"I've focused my work on industries that impact people in their daily lives," said Robert Samuels. "What Comtech does is undeniably critical, as it provides Failsafe Communications that people, businesses, and governments know they can rely on, no matter where they are – on land, at sea, or in the air – and no matter what's going on outside – from armed conflict to a natural disaster. I look forward to amplifying that exciting story and helping to convey the strong investment opportunity it represents."

SatixFy CEO Yoel Gat Passes Away

Rehovot, Israel , April 10, 2022 –
SatixFy Communications Ltd. a



Yoel Gat

provider next-generation satellite communication systems based on in-house developed chipsets, announced that the com-

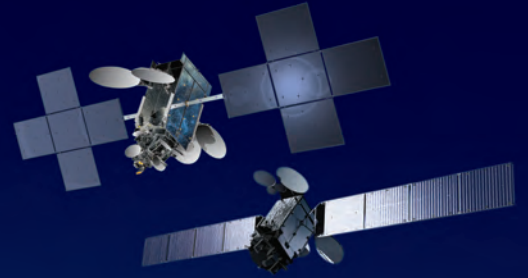
pany's Co-Founder, Co-Chairman and CEO **Yoel Gat** passed away on April 8, 2022.

Yoav Leibovitch, Co-Founder, Co-Chairman and Chief Financial Officer, issued the following statement on behalf of himself and SatixFy's Board: "We are deeply saddened by the passing of Yoel. He was a tremendous visionary and the driving force behind growing SatixFy to where it is today. I personally have partnered with Yoel for over 30 years and will miss both his personal friendship and business partnership. He was a true entrepreneur, a creator of new companies, technologies and markets. We will continue to follow his vision as we take SatixFy to its next stage of growth. We also extend our heartfelt condolences to his wife Simona, and his two children. Our thoughts and prayers are with them at this difficult time."

Mr. Leibovitch has been named Interim CEO and will assume Mr. Gat's leadership duties for the time being as well as continuing his duties as CFO. SatixFy had previously announced that its new CEO has been hired to begin on June 26, 2022, the culmination of a transition plan that began in the Fall of 2021. SatixFy expects to announce the name of the new CEO in the coming weeks, as soon as he is free to do so in his current position.

On March 8, 2022, SatixFy announced that it had entered into a definitive business combination agreement with Endurance Acquisition Corp. (NASDAQ: EDNC), a publicly traded special purpose acquisition company formed by an affiliate of Antarctica Capital, an international private equity firm. 🇺🇸

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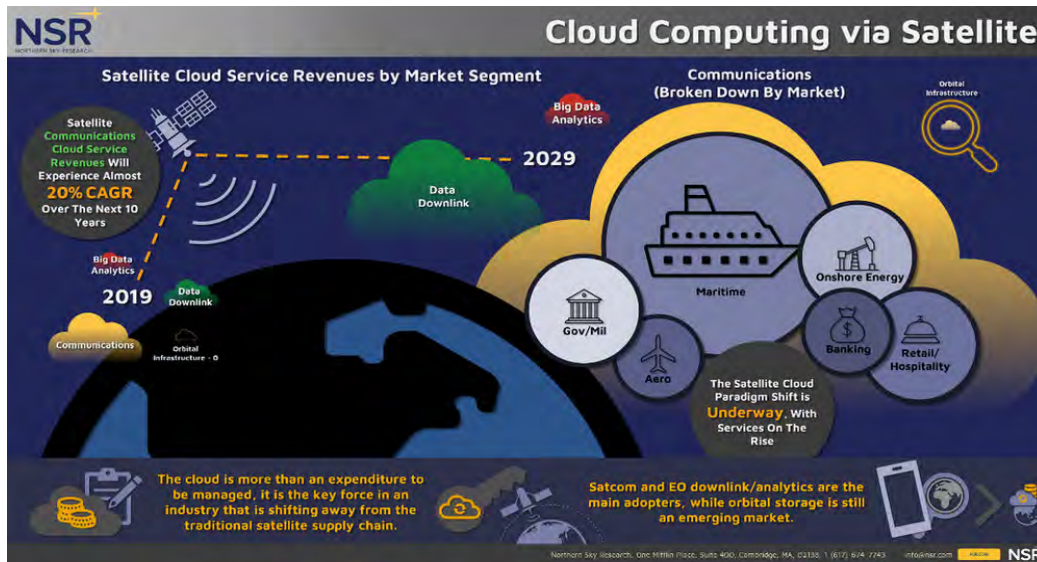
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Cloud Service Delivery via Satellite to Generate US \$ 32 Bil. by 2031

Cambridge, Mass., April 27, 2022- NSR's newly released Cloud Computing via Satellite, 3rd Edition sees Cloud Service Delivery via Satellite positioned to generate US\$ 32 Billion, with 240+ Exabytes of Traffic, by 2031. The im-

pending wave of LEO, MEO, GEO-satcom and data services is set to boost long-term cloud adoption, significantly enhancing market engagement opportunities.

formation driving toward higher volumes, particularly with HR and VHR data, be it SAR, hyperspectral or sub-meter resolution optical imagery, opportunity is set to broaden.”



While 98% of data traffic come from satcom cloud services, volume is growing for Earth Observation, Situational Awareness and science applications as large cloud and IT players make further in-roads into traditional satellite industry, shaking up the market ecosystem.

Going forward, Cloud will play a key role in bridging gaps between traditional upstream aerospace/satellite players focused on manufacturing spacecraft and launching into orbit, and downstream end users and middle layer organizations, where demand resides.

Muruganandham concludes, "Cloud adoption is lowering the barriers to entry for space-derived data services, especially on the downstream side of the market. With greater opportunities available to them than in the past, today's start-ups born in the cloud are shaping the future of the satellite industry."

"With the need to address user-specific requirements across verticals, Cloud solutions adoption is expected to increase," states report co-author Shivaprakash Muruganandham. "Cloud-hosted applications, cloud storage/processing by geospatial analytics providers, and direct cloud connectivity for satcom will all further growth in this market, evolving business models development."

New partnerships and service roll out offer market capture and growth potential, as satellite players vie to capture the untapped addressable markets across verticals, from communications to data downlink and geospatial analytics.

"The market for data downlink onto cloud servers towards EO applications is growing significantly," notes report co-author Prachi Kawade. "Driven by an increasing number of constellations and increasingly rich in-

formation driving toward higher volumes, particularly with HR and VHR data, be it SAR, hyperspectral or sub-meter resolution optical imagery, opportunity is set to broaden.”

While 98% of data traffic come from satcom cloud services, volume is growing for Earth Observation, Situational Awareness and science applications as large cloud and IT players make further in-roads into traditional satellite industry, shaking up the market ecosystem.



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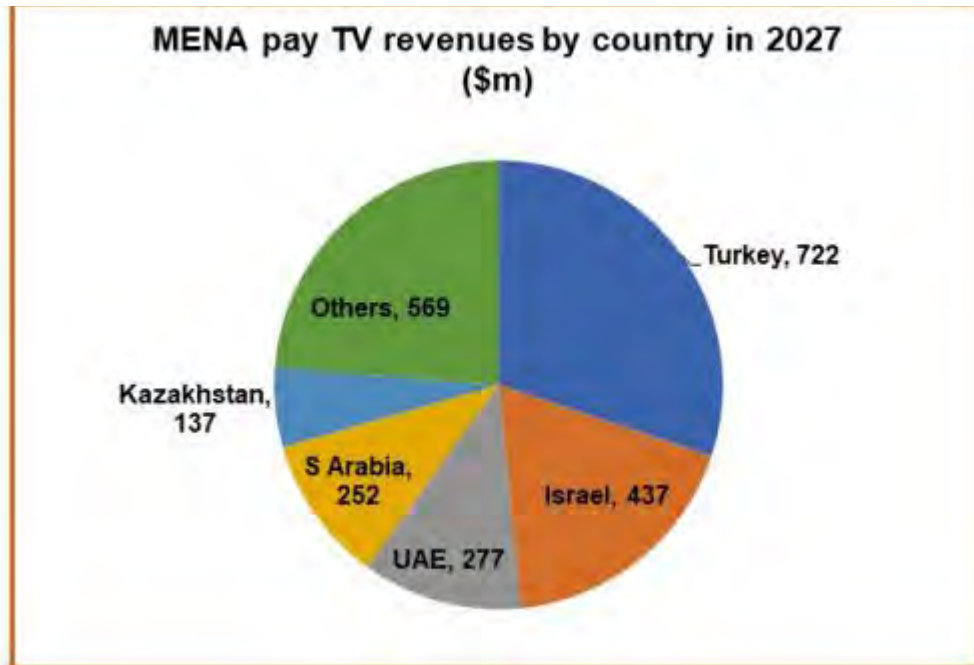
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