Satellite Executive BRIEFING

Vol. 11 No. 5 June 2018

SATELLITE Markets & Research

Industry Trends, News Analysis, Market Intelligence and Opportunities

Asia's Rising Space Ambitions

by Blaine Curcio

Asia-Pacific is a big, diverse region. More or less regardless of one's geographic definition, Asia-Pacific covers over four billion people and around 50 countries. The past several decades have seen rapid growth throughout much of the region, however until more recently, many of the region's largest countries by population, and in some instances by GDP, were punching below their weight in terms of space programs. This has started to change, and moving forward, Asia will play an increasingly important role in the space and satcom industry, with several countries leading the charge.

China

The Chinese space program has developed an increasing appetite for exports over the past several years. Since the first foreign sale of a Chinese communications satellite (Nigeria's NigComSat in 2007), China has expanded its capabilities to sell and export satellites, while also developing a suite of associated services to help propel its export machine. This includes financing, launch services, and in some instances turnkey technical support (for instance, in the case of LaoSat).

As the chart on page 4 shows, China's turnkey strategy is yielding results, with the country's state-owned aerospace companies having finalized deals for 7 satellites being exported to foreign countries since the start of 2016. While some of these deals are not entirely well-defined (for example, there has been relatively little news about the high throughput satellite (HTS) that China sold to Thaicom in late 2016, and rumors that the program has not gotten off the ground due to political uncertainty), but in general, the trend is undeniably upward.

Beyond the country's increased emphasis on exporting satellites, China has been focusing on improving its domestic market, with this seen as a different way of enhancing the country's turnkey competitiveness. To elaborate, in mid-2017, China launched its first HTS, and this was brought into service earlier this year, and the country has since placed continuously increasing emphasis on developing new applications for HTS. This started with a deal signed with Gilat in 2015 calling for a broad variety of VSAT solutions to be developed, including distance education, mobility, and other applications that will "improve the quality of life for citizens in the country's remote locations". Moving forward, if China finds a way to create scalable connectivity for improvement of quality of life in remote parts of the country, this solution would very likely be scalable as a turnkey product in other parts of the developing world. Given that infrastructure is a key compo-

Continued on page 4...

What's Inside

Scale to New Heights

Our Heights™ Networking Platform combines unparalleled horsepower, efficiency and intelligence, and was designed with the service provider and its multi-user environments in mind. The globally accepted platform has been adopted by service providers scaling to new heights by providing elevated Quality of Experience across demanding applications, including:

- Increasing transaction volumes of corporate banking & mining customers using High Throughput Satellites
- Aiding global connectivity for embassies
- Powering high-speed railway communications
- Enabling Mobile Network Operators to expand 3G/4G LTE services & reach remote areas using High Throughput Satellites
- Facilitating secure communications for international government entities

All of this has been made possible with the Heights Networking Platform.

Contact us today. We are ready to evaluate how our unique feature set can provide you with the industry's highest user throughput, highest availability, and most optimal resource utilization.

COMTECH EF DATA™

+1.480.333.2200
sales@comtechefdata.com
www.comtechefdata.com

From the Editor

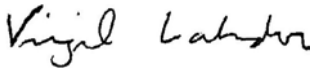
The Asian Satellite Market

This year, the new owners of CommunicAsia in Singapore has rebranded the show at "ConnecTech Asia" incorporating CommunicAsia and Broadcast Asia which has been going on for the last forty years. "As Asia pursues digital transformation at an accelerated pace, it is critical that the event evolves alongside the dramatic shifts happening in the spaces we serve," said Victor Wong, Project Director, UBM, the organizer of ConnecTechAsia. "The new event reflects the pulse of Asia today, and is the only business platform covering the converging ecosystems of communications, broadcasting and emerging technologies connecting the physical and digital worlds," he added.

For more information on ConnecTech 2018, see the feature event article on page 41 of this issue.

I started my career in the satellite industry in Singapore twenty years ago and I have been attending CommunicAsia ever since. It will be interesting to see how the show will continue to keep up with the trends in the industry and navigate us through the inevitable changes. For now, the satellite industry is going very well in the Asia-Pacific region and has weathered the winds of change so far very well.

We look forward to seeing you in Singapore. Drop by our booth at the Marina Bay Sand ,level 1, booth # 1 N5-01.



Virgil Labrador
Editor-in-Chief

Satellite Executive BRIEFING
Industry Trends, News Analysis, Market Intelligence and Opportunities

EDITORIAL

Virgil Labrador
Editor-in-Chief
virgil@satellitemarkets.com

Elisabeth Tweedie
Associate Editor
elisabeth@satellitemarkets.com

Contributing Editors:

North America: Robert Bell, Bruce Elbert, Dan Freyer, Lou Zacharilla

Latin America: B. H. Schneiderman

Europe: Martin Jarrold, *London*
Hub Urlings, *Amsterdam*
Roxana Dunnette, *Geneva*

Asia-Pacific: Peter Galace, *Manila*,
Naoakira Kamiya, *Tokyo*
Riaz Lamak, *India*

Editorial Assistant: Niko Rodriguez

ADVERTISING

For Advertising enquiries send an e-mail to:

sales@satellitemarkets.com

Satellite Executive Briefing
is published monthly by
Synthesis Publications LLC
and is available for free at
www.satellitemarkets.com

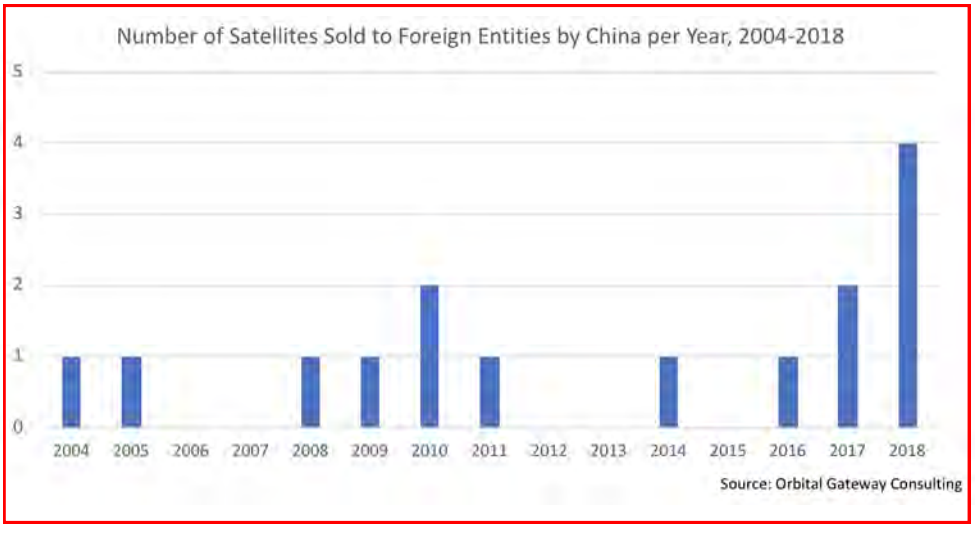
SYNTHESIS PUBLICATIONS LLC
1418 South Azusa Ave. Suite # 4174
West Covina CA 91791 USA
Phone: +1-626-931-6395
Fax +1-425-969-2654
E-mail: info@satellitemarkets.com

Asia's Space Ambitions ..From page 1

-nent of China's Belt and Road Initiative, and given that satellites serving rural broadband/connecting schools and hospitals are "infrastructure", it is not a far leap to say that China will put more emphasis on exporting these types of turnkey programs in the future.

Overall, China has seen significant development in the size and complexity of its space and satellite program over the past several years, and this is expected to continue moving forward. With that said, China is far from the only developing space power in Asia-Pacific.

"...Asia will play an increasingly important role in the space and satcom industry, with several countries leading the charge..."



India

The Indian space program has developed in a rather different way than China's. India has focused markedly less on selling turnkey products to developing countries, with the country's space agency focusing instead on launch, among a few other areas. India's GSLV/PSLV launch vehicles have been established as reliable, relatively low-cost, and flexible in its ability to carry both small and large satellites. Last year saw India launch GSAT-19 on a GSLV Mark 3 rocket, with this marking the country's first such launch, and with said rocket capable of putting a satellite of up to 4,000 kilograms into geostationary transfer orbit.

Other areas that India has sought to develop as it pertains to satcom include the launch of high throughput satellites as part of the country's *Digital India* initiative. This initiative has not been without its hiccups, with GSAT-11, slated for launch earlier this year from Kourou, having to be shipped back to India for further testing. However, this should not obscure the greater ambitions of India's various HTS programs, with this including the GSAT-20 HTS, which is expected to bring 70 Gbps of capacity over the subcontinent later this decade or in the early 2020s.

Others

Being two of the region's fastest-growing economies, and the two most populous countries, China and India have made arguably the most noteworthy gains among national space programs in Asia over the past several years. However, other countries have large space ambitions as well, and have shown this in different ways. Japan announced earlier this year a government fund with US$940 million earmarked for space startups. Likewise, Australia has recently announced the creation of its own space agency, as well as earmarking tens of millions of dollars for companies in the space. Countries such as Indonesia, which have long possessed their own domestic satellites, are seeing rapid growth in their domestic fleet. Examples include Bank Rakyat Indonesia (BRI) having launched its own satellite around 2 years ago, which the bank notes has been a success in bringing village Wi-Fi hotspots to rural banking branches, and thus increasing turnover. This is in addition to a deal between two Indonesian telcos (PSN and PT Telkom) and China Great Wall Industry Corp (CGWIC) for at least one satellite, inked in 2017. Bangladesh has also recently launched its first domestic satellite, with this having occurred only several years after Laos did the same.

Reasoning, and Conclusions

Why have so many countries been putting more resources into their space programs, sometimes into projects that seem totally detached from economic reality? For starters, the space industry is expected to grow faster than most industries moving forward. As noted in a recent article discussing prospects for the Australian space industry, the global space industry is expected to grow at a rate of 10% per year to 2030, with the government panel conducting the study noting that "every $1 million spent on satellites can drive up to $5 million in economic benefits back on earth". So, there is a real economic argument to try to cap-

SECURING A LEGACY

BY UNVEILING THE FUTURE

Introducing M-Series – The Industry's Lightest Wideband Ka Carry-On-Compliant 90cm Antenna

Incorporating over a quarter-century of modularity and precision engineering, DataPath's M-Series is the world's most portable 90cm terminal - capable of fitting in an airline's standard overhead compartment or ship's berth.

In addition to industry leading service and support, DataPath's powerful MaxView® Enterprise™ network monitor and control software comes standard. When bundled with your choice of network, professional or our award-winning Cyber Security services, the M-Series outweighs anything in its class.

DATAPATH

Terminals to Teleports and All the Tools In Between™

ATLANTA GA | ABERDEEN MD | WASHINGTON DC | DUBAI | NEW DELHI | SINGAPORE | STOCKHOLM

866.855.3800 | datapath.com

ture a bigger piece of the global space market, for the nations that are able to export their own satellite technologies.

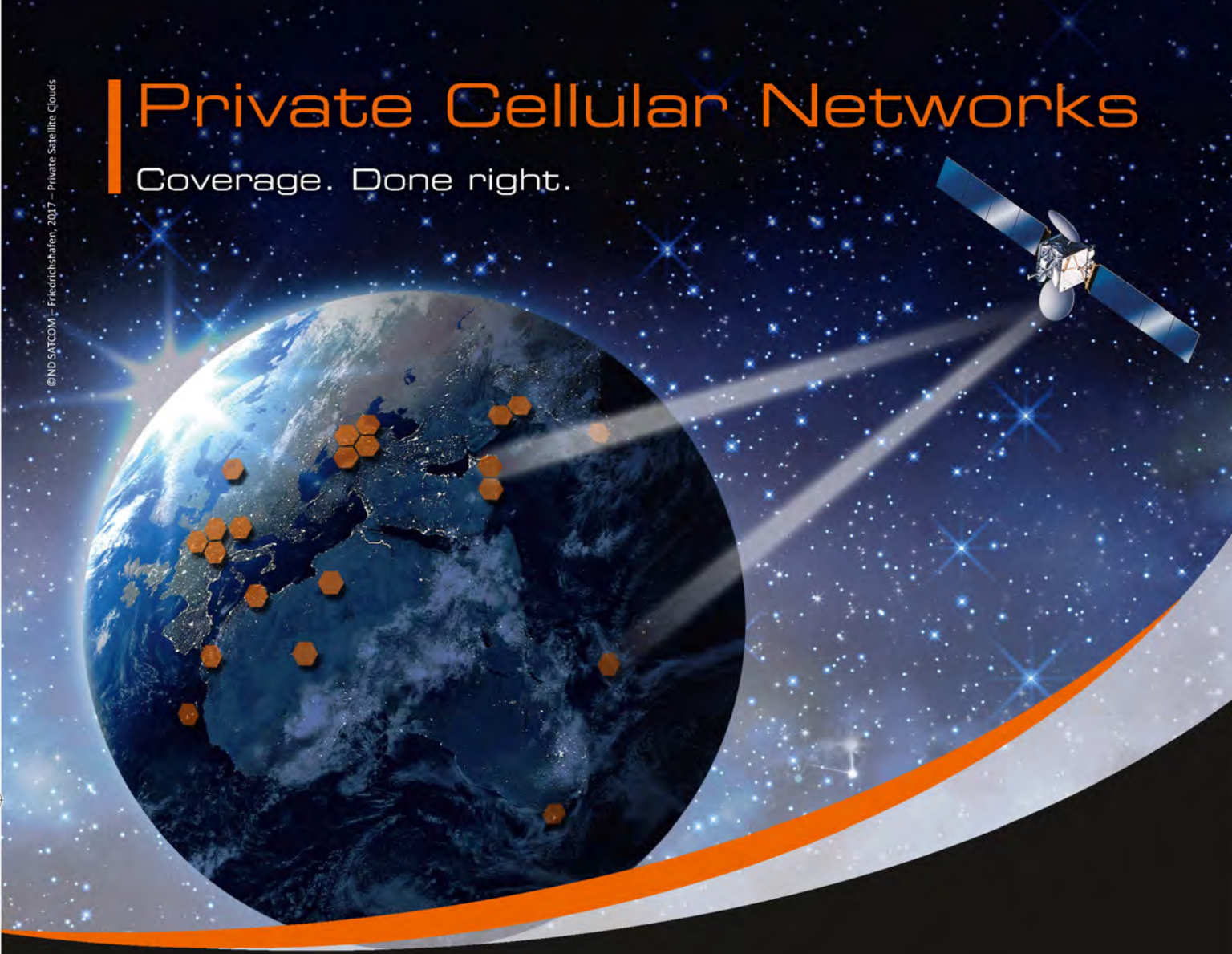
For those nations in Asia aiming to import satellite technology (i.e. buy satellites), the motivation moving forward will be a greater ability for satellites to operate as digital infrastructure. As noted above, HTS will bring about potential for (relatively) cost-effective rural broadband, school connectivity, telemedicine, and others. Countries that are trying to close the business cases for these new verticals—i.e. China and to some extent India, among others—are putting themselves in a position to be able to export a turnkey product, which is expected to be a powerful value proposition.

Moving forward, this could make life difficult for existing operators. With various countries launching their own satellites, it is possible that demand will be migrated from private operators to nationally owned "pride-sats" (satellites launched for national pride as well as economic reasoning). While this is expected to open the door to some opportunities for collaboration, technology transfer, or even demand elasticity due to lower pricing, the overall effect will undeniably more capacity coming into markets that already have a lot of capacity. At a time when the world's economic center of gravity is increasingly shifting from west to east, it appears that the center of gravity of the space industry is likewise creeping in that direction.

Blaine Curcio is the Founder of Orbital Gateway Consulting. He's an expert on the commercial space and satellite industries with a focus on the Asia-Pacific region.. He can be reached at: blaine@orbitalgatewayconsulting.com

Private Cellular Networks

Coverage. Done right.



Deploy our mobile terminals to rapidly and flexibly serve your customers on demand.

Our solutions offer:

- Portable cells for LTE over SKYWAN
- Meshed cells over terrestrial and SKYWAN links
- OPEX-optimized LTE over HTS satellite
- Voice and data services for closed enterprise networks

SKYWAN – Expand your horizons.

For detailed information use the QR code or visit our website:

www.ndsatcom.com

Star Full Mesh Multi-Star Hybrid DVB S2X

ND SATCOM

Meet us at CommunicAsia 2018, Booth 1L3-11

FIND SATELLITE WITH THE TOUCH OF A BUTTON

www.c-comsat.com

C-COM SATELLITE SYSTEMS INC.

Leading Designer & Manufacturer of Auto-Acquire Satellite Antennas (SOTP & SOTM)

BROADCAST EVENTS & STREAM VIDEO FROM ANY LOCATION

Trusted Worldwide

- Broadcasting & DSNG
- Government Services
- Mobile Office
- Emergency Communication
- Telemedicine
- Oil & Gas
- Cellular Backhaul
- Military Operations

Works Anywhere, Deployed Everywhere

iNetVu® by C-COM

ANTENNA MODELS OFFERED IN

Ka Ku C X

Visit our booth @ CommunicAsia USA Pavilion 1Q4-12

Japan Ultra HD 4K8K Update

by Naoakira Kamiya

Japan is trying to take a big leap as practical Ultra HD 4K8K broadcasting services are scheduled to start from December 1 this year and full-scale commercial services are targeted in 2020.

Currently Broadcasting Satellite System Corp (B-SAT) is providing one transponder of BSAT-4a satellite for 4K8K test broadcasting. Program providers are NHK and Association for Promotion of Advanced Broadcasting Services (A-PAB). They are broadcasting from 10:00 A.M. to 17:00 P.M. on time-share basis. NHK's program is a mixture of 8K and 4K. A-PAB is acquiring mostly 4K and a few 8K programs from about 10 productions and contributing to permeate such advanced broadcasting programs to Japanese households. In case of 8K broadcasting, one transponder is fully used. At the time of 4K broadcasting, two or three channels are allocated to one transponder.

At present SKY Perfect JSAT (JSAT) is broadcasting two 4K channels on commercial basis via JCSAT-3A/JCSAT-4B satellites. In addition JSAT is providing one left-hand polarized transponder of JSAT-110A to A-PAB for their test broadcasting.

From December 1 this year B-SAT intends to commence ten 4K and one 8K broadcasting services via BSAT-4a. It is interesting to know that five out of eleven channels will be broadcasted via left-hand polarized transponders carried by BSAT-4a for the first time in Japanese satellite broadcasting history.

At the same time JSAT is supposed to start eight 4K broadcasting services based on left-hand polarized transponders of JCSAT-110A. Actual program providers have not been disclosed as of this writing but it is assumed that JSAT's subsidiary company, SKY Perfect Entertainment, will

take up one or two channels.

In view of the above-mentioned landscape, NHK and A-PAB are devoting themselves to 4K & 8K production and fighting with their back to the wall in promoting new receiving antenna, advanced conditional access system, and newly-built tuner with particular reference to left-hand polarized broadcasting. As of now such manufacturers as Pixela Corp and Toshiba have committed to make and sell necessary tuners or tuner-installed TV sets by September this year.

"...Japanese satellite market will deeply lead into 2018 with more satellite launches and additional 4K/8K channels..."

Since the beginning of this year NHK demonstrated its 8K content at two occasions. One occasion was Pyeongchang Winter Olympics. NHK set up public viewing places at major cities in Japan and showed selected games live in 8K.

Another occasion was 2018 National Association of Broadcasters Show in Las Vegas, Nevada. NHK set up 8K theater and screened three HDR programs using 350 inch screen and four Panasonic 4K projectors. NHK also set up three types of 8K reception rooms to familiarize family's viewing circumstances. 70-inch, 85-inch, and 98-inch LCD TVs were installed at each room respectively. Three kinds of sound systems, two-loud speaker type, 22.2 channel frontal array speaker type, and discreet 22.2 multi-channel surround sound type were built at each room respectively so that the listeners can recognize the difference.

Meanwhile A-PAB has two very important rolls. One is to make Japanese citizen familiar with advanced 4K and 8K TV services during remaining seven months until December 1. Another is to notify each household on the need of new receiving antenna for left-hand polarized services and new tuner with advanced CAS to watch newly created 4K8K programs.

It took four years since Ministry of Internal Affairs and Communications announced its advanced broadcasting roadmap. At last a year 2018 is going to mark a new year for Ultra HD 4K & 8K broadcasting in Japan.

To get back to Japanese satellite market, it shows active evolution in line with new technologies, new services, and new strategic partners. Top ten interesting trends from 2017 to the end of April 2018 can be summarized as follows.

First: B-SAT launched BSAT-4a in September 2017 aboard Ariane-5 rocket. The spacecraft was handed over from SS/Loral to B-SAT on November 16. Accordingly B-SAT owns and operates four satellites, BSAT-3a, -3b, -3c and -4a at 110 degrees east. Unique feature of BSAT-4a satellite is that it carries 12 left-hand circularly polarized Ku-band transponders in addition to 12 right-hand versions.

In March 2018 B-SAT placed an order of BSAT-4b satellite with SS/Loral. It seems NHK strongly pressed B-SAT to backup BSAT-4a satellite during critical period of 2020 Tokyo Olympic and Paralympic Games, which is the greatest opportunity for full-scale spread of 4K and 8K broadcasting.

Second: JSAT launched JCSAT-15 towards the end of 2016 and started operation under the new name of JCSAT-110A from February 2017. This satellite also carries new 12 left-hand circularly polarized transponders and JSAT is set to use for additional 4K Ultra HD broadcasting.

At the end of April 2018 JSAT owns and operates a large fleet of 14 satellites. These satellites are located at 110 degrees east (JCSAT-110 and 110A), 124 (JCSAT-4B), 128 (JCSAT-3A), 132 (JCSAT-5A), 136 (N-Star-c, JCSAT-8), 144 (Superbird-C2), 150 (JCSAT-6), 154 (JCSAT-2B), and 162 (Supebird-B2). In addition JSAT maintains three backup-satellites called JCSAT-110R, JCSAT-RA, and JCSAT16. Furthermore JSAT and Intelsat jointly own and operate Horizons-1 at 127 degrees west and Horizons-2 at 85 degrees east. The latest addition is Superbird-8, which was launched on April 4 this year. JSAT plans to operate this satellite under the name of Superbird-B3 at 162 degrees east.

Third: JSAT is constructing JCSAT-17 at Lockheed Martin Space Systems and placed launch service order with Arianespace in January 2017. This satellite carries S-band and C-band payload and intended for high throughput services in Japan. Actual operator of S-band services is NTT DoCoMo.

Fourth JSAT ordered JCSAT-18 satellite from Boeing in February 2017 and launch service from Space-X in September 2017. JCSAT-18 is a condominium satellite with Kacific Satellite. In addition JSAT and Intelsat are constructing a joint satellite named Horizons-3e at Boeing, which is scheduled for launch in the latter half of 2018.

Fifth: Brand new left-hand circularly polarized transponders of BSAT-4a and N-SAT-110A have been officially allocated by Ministry of Internal Affairs and Communications (MIC) for 4K and 8K broadcasting as mentioned in Ultra HD update. Users of BSAT-4a were announced to be NHK for 8K、SC Satellite, QVC Japan, WOWOW, and Tohokushinsya Media Services for 4K. Meanwhile JSAT received eight 4K broadcasting licenses from MIC for left-hand polarized transponders. A-PAB together with JSAT started test broadcasting in advance from April 1 2017 by using such transponder of N-SAT-110A (JCSAT-15).

Sixth: JSAT's subsidiary company DSN launched DSN-2 (Kirameki-2) aboard H-2A rocket in January 2017 and DSN-1 (Kirameki-1) aboard Ariane-5 in April 2018. The launch for DSN-1 was delayed due to spacecraft damages found on the

way from Mitsubishi Electric Company's factory to Arianespace's launch site in June 2016.

Seventh: Globalstar and IPmotion established Globalstar Japan in Tokyo on September 1 2017. According to them their first job is to apply for the certificate of conformity on their GPS-1700 satellite mobile phone and SPOT Gen3 location-based tracking and life-saving device. After getting approval from national certification body they hope to start selling in Japanese market. As is known Inmarsat, Iridium, Thuraya, and Orbcom are already selling satellite mobile phones and IoT services in japan. It is interesting to know how Globalstar Japan will permeate into the market.

Eight: Mitsubishi Heavy Industries (MHI) and Japan Aerospace Exploration Agency (JAXA) accomplished six launches successfully in 2017. Historically it is the first time for MHI and JAXA to launch six times per year. These satellites were DSN-2 in January, IGS-R5 in March, QZSS-2 in June, QZSS-3 in August, QZSS-4 in October and GCOM-C & SLATS in December. As regards future commercial launch, Inmarsat placed an order of Inmarsat-6 F1 with MHI in September 2017. The satellite is under construction at Airbus Defense and Space and will be launched aboard H-2A rocket in 2020.

Ninth: SoftBank and JSAT acted very aggressively in partnership agreement and investment. SoftBank invested in OneWeb in March 2017. JSAT invested in Kymeta in March and LeoSat in May 2017.

Tenth: As to new projects in Japan, JAXA placed an order of ETS-9 with MELCO in May 2017. According to the announcement ETS-9 will be all electric satellite with digital processors and optical link system. BridgeSat in the US and AstroTerrace were selected to develop optical communications solution for this project.

In view of the above-mentioned recent trends, Japanese satellite market will deeply lead into 2018 with more satellite launches and additional 4K8K channels.

Naoakira Kamiya is Managing Director, **Satellite System Research Institute** and Director of the **Japan Satellite Business Association** based in Tokyo, Japan. He is a frequent contributor to various satellite and broadcasting trade publications. He can be reached at: ZUM05241@nifty.ne.jp

ENABLING COMMUNICATIONS IN ANY SITUATION

AvL'S FAMILY OF INTEGRATED TERMINALS (FIT)

- Ultra lightweight - meets IATA requirements for carry-on or checked baggage
- One person set-up in less than 10 minutes
- Carbon fiber reflectors - sizes range from 45cm to 1.35M
- All-in-one positioner system & switchable manual or motorized operation
- Quick change tri-band feed and RF kits
- AvL AAQ computer-assisted pointing and acquisition
- Beacon receiver, ODU/modem integration and BUC/LNB integration
- Watch the video at avltech.com/media

The Connected Aircraft Market

by Bernardo Schneiderman

This article focuses on what the major players of satellite operators are implementing and planning for the Aviation market for the short and long term. The growth trends are based in requirement of Internet connectivity on commercial and private flights for passengers in addition to the Government and Defense market and in the long term the requirement for the operations of the commercial fleets that need connectivity for their overall security and operations and improve the overall logistics of the airlines.

Another key issues we are addressing in the market are the trends for the Ku and Ka-band that some operators are more focus and what kind of satellite will be more efficient for the Aeronautical market among Geostationary, Low and Medium orbit satellites;

Based in recent NSR forecasts in-flight connectivity (IFC) to be installed on 2 out of every 3 commercial passenger aircraft by the end of 2026. Driven by higher demand for broadband connectivity, this installed base will generate over US $32 billion in revenue over the next decade, as air travel continues its rise around the world. The imminent start of service by highly-touted HTS will help meet the tall expectations of passengers for quality inflight connectivity (IFC) experience at the right price.

Euroconsult in another market report is saying that the launch of HTS satellites in both Ku-band and Ka-band is expected to be a game-changer for the IFC market. These new satellites will offer significantly greater HTS capacity in the coming years. The total HTS capacity dedicated to inflight connectivity will increase from 4 Gbps YE2016 to 21 Gbps YE2018. The total HTS capacity dedicated to IFC is expected to reach almost 300 Gbps by YE2026.

Four our virtual roundtable discussion, we have invited the main satellite operators to participate, including: **Jean-François Fenech**, Executive VP Global Mobility Business Line-**Eutelsat**; **Frederik Van Essen**, SVP-**Inmarsat Aviation**; **Aditya Chatterjee**, SVP, Aero Segment Market Solutions-**SES Networks**; **Don Buchman**, Vice-President & General Manager-**Viasat Commercial Aviation Business**. Excerpts of the discussion follows:

Satellite Markets (SM): How much capacity do you have today for the aeronautical market ?

Eutelsat: We are currently leveraging our global fleet's multiple frequency bands to serve the in-flight connectivity and live TV markets across the Americas, Europe, the Middle East, Africa and Asia-Pacific through seven satellites across our spanning from 117° West to 172° East: EUTELSAT 115 West B, EUTELSAT 117 West A, EUTELSAT 3B, KA-SAT, EUTELSAT 10A, EUTELSAT 70B and EUTELSAT 172B.

Inmarsat: Inmarsat is the only provider that has global networks serving all three domains of connected aviation; safety services, airline operations and passenger connectivity. We use a combination of high resilience L band and high capacity S- and Ka-band capacity to serve these markets. All these networks have been specifically designed for mobility and because we own and operate our own networks, we're able to add capacity seamlessly and in step with growing market demand.

For global passenger connectivity, Inmarsat operates its Global Xpress network, which is the only global High-Throughput Satellite (HTS) network in the world that is live today. Coverage is global, except for poles where very few aircraft fly. GX Aviation has been designed to provide a seamless and reliable quality of service of up to 50 Mbps per aircraft around the world. GX Aviation launched in 2016 and both capacity and performance are set to further increase from 2019.

In Europe, we've just completed the roll-out of the European Aviation Network (EAN). This is the world's first combined satellite & ground network and dedicated to the aeronautical market. It is a regional network with an initial capacity of 90Gbps, covering the EU28 and Norway & Switzerland. It has been designed to provide over 75Mbps per aircraft using very light and small blade antennas which can be fitted even on small aircraft.

SES: SES' aero optimized global coverage platform is designed to meet the current and future demands of an increasingly mobile world. Inflight connectivity is booming and fast becoming a must have for passengers and airlines around the world.

We are on the verge of entering a whole new age of IFC as the number of flights and passengers are expected to skyrocket over the next decade and beyond. In fact, IATA projects 7.8 billion people will travel by air in 2036, nearly double the 4 billion air travelers expected to fly this year, with Asia becoming the biggest driver of that unprecedented growth in air travel.

SES is building a truly global multi-band, multi-orbit network aimed at providing ubiquitous coverage. We not only have over 50 GEO traditional wide beam satellites, but we also have three GEO satellites that have high throughput payloads. Additionally, we have 16 Medium Earth Orbit (MEO) satellites up and operational today. One of the amazing features of the system SES is building is its ability to flexibly move capacity to meet the dynamic demands of the aero market. In this way, SES is going beyond questions about how much capacity can be put in one location or another.

VIASAT: Today we have the most Ka-band network capacity than any other in-flight connectivity provider. We have over 400 Gbps of total network capacity over North America—with our ViaSat -2, ViaSat-1, WildBlue-1 and Anik F-2 satellites; in Europe, we can tap into about 90 Gbps of total network capacity using our JV's jointly-owned European satellite, KA-SAT; in Australia, we work closely with nbn to leverage their Ka-band capacity on the Sky Muster™ satellite system—which has about 135 Gbps of total network capacity, and in the rest of the world, we have the ability to use our best available Ku-band satellite system.

SM: Considering the aeronautical market is divided in three main segments: Commercial, Business Jet and Goverment/Defense, how are you aapproaching these various markets?

Eutelsat: Eutelsat has been working hand in hand with the world's leading IFC specialists as they progressively scale up across our fleet to serve the growing demand from customer airlines. We are a key capacity provider in Ku-band and Ka-band to the market-leading service providers such as Panasonic Avionics, GEE, GoGo, ViaSat, UnicomAirNet (part of China Unicom) and Saudi Arabia's Taqnia that all include Eutelsat capacity in their networks. We believe that partnerships, technology innovation and investment in infrastructure optimized for this vertical are key to unlock the potential of this market.

Inmarsat: For the commercial market, we have a large ecosystem of partners to provide GX Aviation to airlines around the world. They also provide the equipment airlines need to use the service onboard their aircraft. In some cases, we're also directly providing services to airlines.

Although GX Aviation only launched end of 2016, it is the IFC choice of well-known brands such as Lufthansa, Austrian, Germanwings, Singapore Airlines, Qatar Airways, Air Asia and Norwegian. GX Aviation offers passengers a living-room-quality Wi-Fi experience, allowing passengers to browse the internet, stream videos, check social media and more during flights. Great progress is being made with GX Aviation installations this year - more than 200 have been completed with our launch customer, Lufthansa Group, alone.

EAN has been built in partnership with Deutsche Telekom and is exclu-

sively available from Inmarsat directly. It benefits from the mass coverage of a satellite and the performance, low latency and flexibility of a ground-based system. EAN's robust, cost effective and ultra-compact technology makes it uniquely qualified for European airspace.

We're also leading in connectivity for business aviation with Jet ConneX, the only global, high-speed inflight Wi-Fi option available for business jets today. Using our advanced Ka-band satellite network, Jet ConneX offers data plans up to 15Mbps and consistent global coverage across 100% of major flight paths and islands off the beaten path. All four major business jet OEMs (Gulfstream, Bombardier, Dassault and Embraer) offer Jet ConneX as a preferred line-fit option, and its popularity is booming in the business aviation community with more than 200 aircraft now flying with the technology.

Government & defense markets are served through specialized business units in Inmarsat.

SES: SES works closely with leading IFEC service providers such as Gogo, Global Eagle, Panasonic and Thales Inflyt to meet the evolving inflight connectivity and entertainment demands of global airlines and passengers, and governments and institutions worldwide. We are tailoring much of our global fleet to deliver the high-powered coverage required by the inflight connectivity market where it's needed today and in the future.

For example, our SES-14 satellite, which is set to initiate service in September, will enable IFEC service providers to bring connectivity that is 5 to 10 times faster to the airlines and passengers in the Americas. That is a game changer.

Under a recent agreement, Sputnik Telecommunications Entertainment Company (STECCOM), Russia's major satellite communications operator and leading developer of VSAT-based communication systems, will leverage our global mobility solution to customize and efficiently distribute bandwidth to commercial passenger aircraft and business jets operating on their network, opening up opportunities for enhanced connectivity across Europe, Russia and Central Asia.

"...Each segment has its own requirements; however, the opportunity rests in bringing highly-productive, high-capacity satellites to market. Our purpose-built satellites are configured to serve multiple markets, each with their unique needs—but all with the interest to scale and target demand, as needed..."

-Don Buchman, Vice-President & General Manager-**Viasat Commercial Aviation Business**.

VIASAT: Each segment has its own requirements; however, the opportunity rests in bringing highly-productive, high-capacity satellites to market. Our purpose-built satellites are configured to serve multiple markets, each with their unique needs—but all with the interest to scale and target demand, as needed. As a vertically-integrated company, we can quickly and affordably bring satellite services that are reliable and scale to meet end-user demand.

SM: For you medium and long-term plan what capacity in Ku and Ka-Band are you planning for the next 2-5 years for the aeronautical market?

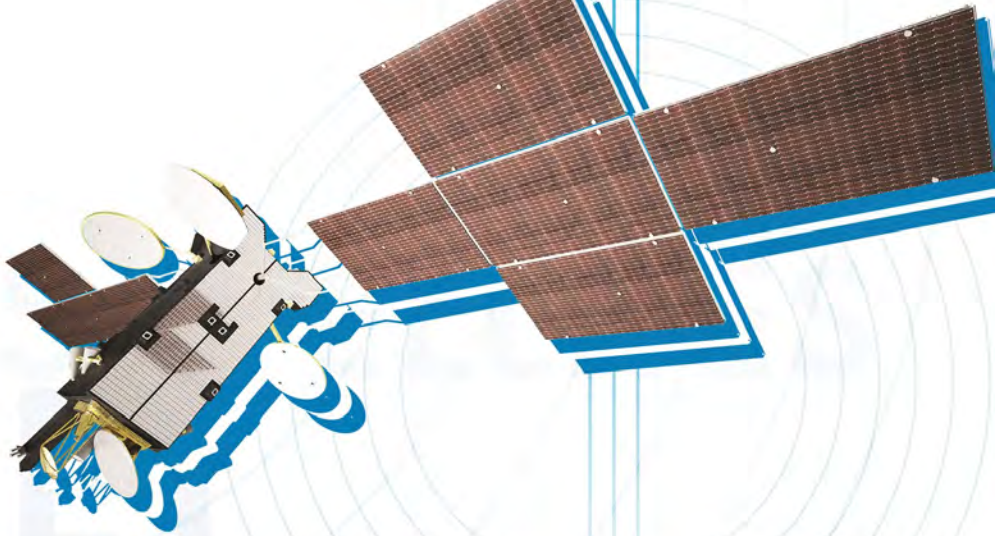
Eutelsat: We believe the most significant growth will come from the broadband and mobility sectors and are starting to design satellites that address both of these markets. These satellites are larger than if they were exclusively dedicated to in-flight connectivity and thus benefit from much better economies of scale, allowing our solutions to be the most competitive in terms of bandwidth cost.

This configuration applies to our recently announced KONNECT VHTS satellite, which will enter into service by 2021. This satellite will provide a Ka-band capacity of 500 Gbps, allowing passengers flying over Europe to enjoy high-speed Internet services, with the same level of quality as European households located beyond terrestrial networks.

Inmarsat: In 2017, we awarded the contract for the construction of a VHTS Ka-band Global Xpress satellite to Thales Alenia Space. Scheduled to launch next year, this will be a seamless addition to the GX network. This reflects Inmarsat's strategy to continue adding capacity to our already established, unique, high-speed global broadband network in areas of high customer demand. Two more Ka-band satellites, combining Global Xpress and safety services, are on order from Airbus for launch in the early 2020s.

SES: SES continues its investment programme with a strong satellite fleet roadmap built on an advanced multi-orbit strategy. The HTS payloads of the recently-launched SES-14, SES-15 and the upcoming SES-12 are designed to complement each other to provide comprehensive HTS Ku-band coverage. Together with SES-17, a fully Ka HTS satellite, which will be launched in 2021, these satellites will offer a global, multi-frequency system for aeronautical, maritime, government and enterprise customers.

This GEO HTS coverage will complement the existing O3b's MEO constel-

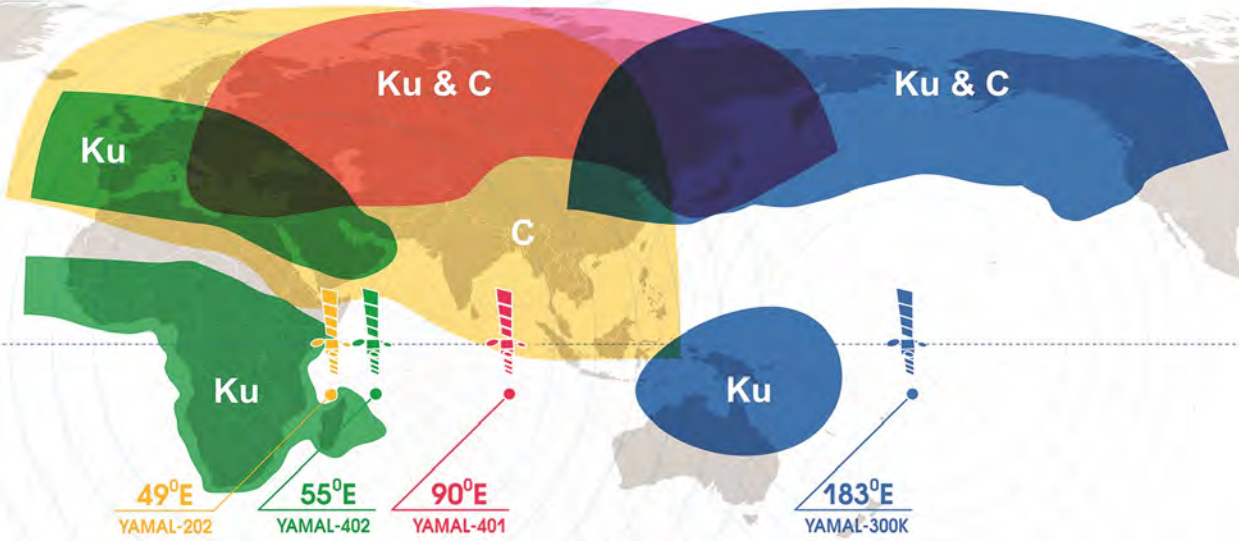


YAMAL SATELLITES FLEET

GAZPROM SPACE SYSTEMS

Our Strengths

- four reliable satellites: Yamal-202, Yamal-401, Yamal-402, Yamal-300K
- wide C and Ku bands service zones
- 24/7 customer support
- above 250 company customer base



www.gazprom-spacesystems.ru

GAZPROM
SPACE SYSTEMS

lation. We continue to grow our MEO constellation, by adding more O3b satellites and investing in an upgrade to our next-generation, super-powered O3b mPOWER technology. The unique integrated offering combination of SES traditional satellites, SES' GEO HTS and O3b's MEO HTS will deliver comprehensive coverage, massive throughput and low latency fibre-like services to meet the needs of IFC.

VIASAT: Viasat announced its ultra-high capacity satellite constellation—known as ViaSat-3. This constellation consists of three GEO satellites—each with visible-earth coverage—to provide high-speed, high-quality, high-performance internet to the world. Each satellite will deliver over 1,000 Gbps—or over 1 Tbps—of total network capacity—enabling Viasat to bring more than 3.5 Tbps of total network capacity to the global market.

SM: In the long term are you considering the use of the upcoming LEO and MEO constellations for the aviation market?

Inmarsat: Our roadmap is focused on adding flexible capacity to the GX network, which provides our airline partners with the high quality of service they require and the inflight experience their passengers demand. We continue to push the boundaries of innovation; we don't rule anything out and keep a close eye on new technologies and other advances that could be beneficial for our customers.

SES: SES has been delivering MEO connectivity since 2014. It is definitely on our roadmap to make sure the aero segment can reap the benefits of MEO fibre-like connectivity, just in the same way it's being done by the cruise industry.

Satellite-enabled connectivity solutions with gigabit speeds and low latency already exist and are used today by our customers globally. In the future, the next-generation, market-leading capabilities of our O3b mPOWER constellation will be enabling our customers with even higher speed and more flexibility to concentrate capacity where is needed immediately.

SES is not considering LEO constellations to deliver massive throughputs across the globe. SES believes its combination of MEO and GEO constellations are the most cost-effective technology to provide the high data rates required by airlines, along with the low latency required by certain applications.

SM: Any other key solutions you are providing to the market that make you more competitive for the aeronautical market?

Eutelsat: Eutelsat's new KONNECT VHTS satellite will embark the most powerful on-board digital processor ever put in orbit, offering capacity allocation flexibility, optimal spectrum use, and progressive ground network deployment. Its exceptional 500 Gbps Ka-band capacity will set us apart in the European market.

Inmarsat: In April, Inmarsat introduced SB-S into commercial service with Hawaiian Airlines - the first and only global, secure, broadband platform for operations and safety communications. SB-S is also in-flight evaluations with United Airlines and Shenzhen Airlines, and has been selected by Airbus as a Light Cockpit Satcom solution on its A320 and A330 families.

SB-S is bringing safety and operations into the digital age, transforming the role of satcom from a safety utility to a strategic asset that airlines can use to access real-time data. This data is being used to drive decision-making, improve operational efficiency and ensure that airlines can deliver the highest levels of safety.

There are lots of ways in which the technology aids airlines and the wider industry. Firstly, it reduces fuel costs and CO_2 emissions through Electronic Flight Bag applications, including real-time weather reports, optimized profile descent and trajectory-based operations. It assures safety with real-time flight data streaming (Black Box in the Cloud) and interaction with rescue coordination centers. It improves maintenance by delivering aircraft health and performance information in real time, improving predictive maintenance and reducing turnaround on-the-ground. For the industry, SB-S will be a driver of digitization, unlocking the value of connected apps for airline operations. Our Certified Application (CAP) program takes away innovation risk for airlines by testing, optimizing and certifying new aero applications that take advantage of the digital benefits of SB-S.

Now that SB-S is in commercial service, we're looking forward to seeing the real-world impact that the technology will have on aviation efficiency and safety in the months and years to come.

SES: What makes us more competitive for this market is our approach and attitude towards customers. They aren't customers. They are partners whose presence is essential at the satellite design table so that we can build what will enable them to drive an enhanced passenger experience. We see great value in working closely with our inflight connectivity partners and we ask for a seat at their table so we understand end-user requirements.

SES is building a global ubiquitous network, much like the cellular networks on the ground that offer up seamless connectivity virtually anywhere around the world. SES has launched multiple HTS satellites in recent years, offering multi-band solutions much of that capacity tailored to meet the growing passenger IFC demands as well as the airlines' increasing efforts to operate more efficiently

on a global basis.

And this is how through our partnerships with the four leading IFEC service providers, SES provides satellite capacity to more than 50% of all satellite-enabled connected aircraft flying today.

VIASAT: In addition to the best communications spacecraft with more capacity than any other in-flight connectivity provider, Viasat also launched its latest generation in-flight connectivity (IFC) equipment for its advanced satellite platforms: Viasat-2 and Viasat-3 class satellites. The equipment is optimized to take full advantage of the highly-anticipated massive capacity increases from the Viasat satellites, offering airlines even faster and higher-quality in-flight internet performance.

What we're bringing to the in-flight internet market is so drastically different than anything else coming on the market. We're delivering a vertically-integrated system - from the satellite to the terminal and the access points on the aircraft - that is optimized to keep pace with the most powerful communications satellites in the world - Viasat-2 and Viasat-3. As a result, our latest IFC equipment extracts greater productivity, performance and higher throughput levels from the integrated system, and raises the standard for delivering best performing in-flight internet and streaming experiences at scale."

The new equipment is capable of supporting throughput levels of up to 1 Gbps; offers forward and backward compatibility to give airlines a future-proofed method to take advantage of Viasat's more than 3.5 Tbps expected capacity.

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

Imagine That?

by Lou Zacharilla

After he heard something incredulous or which blew him totally away, my uncle Pasquale would say, "Imagine *that*?" One of his favorite stories was of how the magnificent Imperial Japanese battleship, Yamato, which could fire projectiles weighing two tons a distance of 26 miles at a rate of 7.5 per minute met the future. The Yamato had a crew of 3,000 men and it was seemingly unconquerable on the seas. But the imagination of the moment belonged to those who could control the skies. It took 180 minutes for 386 American airplanes to sink this majestic Shinto shrine of a collapsing Empire.

"Imagine *that*?" said Pasquale. "The old days were over in three hours."

The space and satellite industry is in one of those periods now. The old days are way over. If seven years ago *Satellite Executive Briefing* had published this lead paragraph, which appeared in another industry magazine this past March, would anyone have believed it?

"Over the next several months four Falcon 9 rockets will lift off from California, starting with a launch scheduled for March 29. They will place into orbit the remaining 35 satellites of the Iridium Next constellation…..These satellites will join the 40 satellites launched last year, completing the constellation."

Imagine *that*?

SpaceX announced in 2011, nine years after it was founded, that it was beginning a funded, reusable launch system technology development program. That was an act of imagination (some used another word at the time!), since the finish line for its vision is a place on Mars where you can drink a "Falcon Mule" with your best friends after a day's work!

It seemed improbable in 2010, but today, SpaceX's accomplishments need no additional publicity. They are a fact. Industry Hall of Fame inductee Gwynne Shotwell, President and COO of SpaceX, noted that the 18 launches in 2017 will improve to as many as 30 flights this year because of the "flight-proven vehicles" now in use. That's some jump in cadence.

Imagine.

And if in 2000 I had told you that a company that had not yet been founded would launch a bunch of L-band birds for a company which *Time* magazine (using rhetoric seemingly reserved for the Oval Office in 2018), called "one of the ten biggest tech failures of the last decade," you would have told me to find a job in another industry. But the Motorola-backed global satellite PHONE company, Iridium, which filed for bankruptcy in 1999 after famously spending US$5 billion to build and launch a satellite-based infrastructure for a global wireless phone service, is today about to become the backup system of choice for VSAT networks in many key industries.

These are just two high-profile examples.

Before SSPI launched its *Better Satellite World* campaign in 2015 - specifically to counter the claim that the industry lacked vision and imagination - there seemed to be a dearth of both. We discovered that the baby our Chairman Emeritus, Sir Arthur C. Clarke, brought forth was beginning to kick, holler and wail. It was a rediscovery of the age of excitement.

Since then, we have seen our industry help break up slave rings on the high seas, map fields for better yields of corn in America's "Badlands," and give farmers in Manitoba, Canada a level playing field using data from satellites to empower them in a tough marketplace.

We have seen disasters become less disastrous and I have lost my job as the unofficial Tourist Helper of New York, as smart phones give visitors directions to not just Bloomingdales, but obscure restaurants and sake bars that I don't even know exist!

Since the new players entered, the worlds of big and open data have emerged as tools to shape new business models. The Better Satellite World campaign www.bettersatelliteworld.com has come into prominence and identified organizations and companies where satellites were a trigger for their imaginations.

Go ahead and make a list. We did. It is a long, long list. SpaceX and Iridium are on it for sure. Blue Origin, ViaSat

and Planet too. Kymeta and Phasor. Each has a compelling imagination disguised as a business plan. The new age of satellite excitement has impacted ("infected?") the original great innovators too. Today Boeing has its foot pressed to the innovation pedal.

And these are only the companies you have heard about. There are dozens inside incubators like Starburst and the New York Space Alliance bootcamp.

Inside the massive hulk of New York's Intrepid Museum last week ULA's Bernard Kutter held an audience of people under 35 (present company and Steve Wolfe of SpaceCom excluded!) rapt by sharing his company's vision of CIS Lunar 1000, and how his launch company will help enable a space-based economy that will transform our global economy over the next three decades.

None of this will be unfamiliar to you. What you may not know is the degree to which the world is hungry to help, transform us and open their doors. I was invited to attend a meeting at Hogan Lovells law firm office last month where the Kingdom of Saudi Arabia invited us to consider becoming the anchor "cluster" of a new city in the western part of the country. Yes, our potential is incredibly appealing.

As SSPI proved with the launch of the industry's *Better Satellite World* campaign, there is not only endless vision and passion in the industry, there is the potential to do what our founders always knew was possible: to become indispensable to human endeavors. One that is always shaping the future – where imagination never needs to rest.

Imagine *that*!?

For more information about SSPI go to:
www.sspi.org

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

Interview with Dr. Thomas Fröhlich, CEO Work Microwave

Can you give a brief summary of your two and a half-year stint at WORK Microwave so far?

We posted our third record growth year in a row in 2017. It was a real good year last year and a fantastic step forward with more than 50% turnover increase. We had a very good result for the year and this is primarily due to the development of the US market. The growth is mainly coming from the US market, however, there are some potential challenges if under the current US administration a "Buy American" policy is instituted especially in the Department of Defense procurement. We are, however, very thankful to our US customers, and especially to Harris who entrusted us with one of the biggest orders WORK Microwave has ever signed. Overall, the main businesses of WORK Microwave are stable and our bread and butter converter business is developing very well.

Dr. Thomas Fröhlich

What challenges are you facing currently in the market?

The main challenges we will be facing this year are as follows:

We have V- and Q-Band activities coming especially here in the US and it is our intention to position WORK Microwave as *the* leading V- and Q-Band provider in the world. We have invested a lot in the pre-development of V-Band upconversion and also in the test and production facilities we need for that.

For our modem business, it's clear that wideband is the application to be developed. That is where we have the AT-80/AR-80 DVB-S2X wideband modulator/demodulator which can support up to 500 megasymbols per sec (Msps) on a single carrier for future wideband multimedia and network applications. The E2E product solution offering 500 Msps at full 256APSK modulation allowing to transfer up to 3Gbit/s in each direction will be exhibited at CommunicAsia in Singapore this year.

And from the practical side of the business, as a result of the company's tremendous growth in the last three years, we have decided to expand and invest in people and facilities. We will double in size in terms of facilities. We will move to a new larger building still in Holzkirchen near Munich most likely during the fourth quarter this year.

The CommunicAsia trade show in Singapore is coming up, can you talk about the Asian market for WORK Microwave?

We expect more growth from the Asian market. It's a market where we think we can do more and do better. In September 2017, we opened our Singapore office. We hired a new Sales Director for Asia, Eric Lossouarn, who knows the business and is very experienced in the region. He is now currently very busy opening up new markets for us in the region such as in Korea. We have a big project coming up

in India and we are also making a big push for the Japanese market. We have very high hopes for our business in the Asian market in the coming years and I would expect our Asian business grow by a 100 percent.

If you would rate the regions you are active in, where do see the best potential for growth?

We have had several years of doubling of our US business. Obviously this growth rate cannot be sustained in the long term. But I believe that we still have room for expansion in the US market. We are facing a globally stagnating European market, which we need to serve well. On the customer service side, there is still room for improvement in Europe. We will develop our service business for the European market and other markets, but especially in Europe. In terms of relative growth as a percentage of actual business, there is great potential in the Asian market. The Japanese and Chinese markets are very promising for us.

During its 30th anniversary celebrations in 2016, WORK Microwave held a Technology Workshop at a Customer Experience Day event at their facilities in Holzkirchen, Germany.

Finally, you've given us a good overview of your plans for various region. I'm sure you are aware that you will be facing competition in these markets. What differentiates you from your competitors?

It is well known in the business that WORK Microwave stands for high performance, high reliability and high quality. We are one of the top, if not the number one provider in the converter market in the world today. The key difference between us and our competitors is the level of customer service and support we provide to our clients. It starts from the tender phase where we provide unparalleled access to our engineering staff to ensure that we meet the client's specifications and find the best solution. This level of service runs through the delivery phase when we make any adjustments necessary and find pragmatic solutions to ensure the proper installation. This creativity in finding solutions has helped us in developing long-term relationships with our clients and help convince new clients to try us out and stay with us.

Another key differentiator is our ability to combine strong RF competence with digital signal processing capability. Many of our competitors are either active in one field of competence or the other. Our company has in-depth knowledge and experience in both areas of RF and digital signal processing which has helped us in the satcom business and beyond. As you know, we are also involved in other businesses, which require the combination of these two core competencies. This is what makes WORK microwave unique and puts us in a position where we can offer products and features that others are unable to provide.

WORK MICROWAVE

Over 30 Years Experience

Leading Global Satellite Communications

Bandwidth Beyond Ka-Band

4 Channel V-Band Upconverter

Q/V-Band available to order today!

Full range of Frequency Converters designed to support the next generation of HTS/UHTS systems.

Maximum Capacity for HTS/UHTS

A-Series AX-80 Modem

All-IP Platform designed to support ultra-wideband transponders up to 500 Msps.

First end-to-end transmit and receive solution on the market!

WORK Microwave devices are deployed by operators worldwide to support a range of broadcast and data applications in satellite communications markets, including HTS/UHTS, SNG/contribution, direct-to-home, IP networking, government and defence, and more.

Learn more at **www.work-microwave.com**

DVB S2X

Visit us at CommunicAsia 2018
Booth: #1V2-07

Products and Services MarketPlace

A guide to key products and services to be showcased at CommunicAsia 2018 at the Marina Bay Sands in Singapore from June 26-28, 2018.

Advantech Wireless Technologies
Level 1 booth # 1 V1-12
www.advantechwireless. com

Advantech Wireless supports the critical need for High Throughput Satellite communications in a rapidly expanding digital environment. Our proven low-cost and highly reliable system solutions are meeting the ever-increasing need for high-bandwidth communications essential to broadcasters. We integrate award-winning research and development engineering into our designs. Learn more about our World Leading SATCOM GaN based SSPAs/BUCs, pulse amplifiers for radar systems, frequency converters, Broadcasting Datalink Solution, Fixed & Mobile Antennas and Microwave Radios.

Alga Microwave
Level 1 booth # 1 R5-01
www.alga. ca

Alga Microwave is a leading supplier of Radio Frequency (RF) and Microwave Solid State Power Amplifier, Pulsed Amplifier for Radar Applications, Transmitter and Transceiver products as well as RF Passive Components and systems.

The current product offering covers all major frequency standards, specifically: for Active Components L, S, C, X, Ku and Ka with frequencies that range from 2.0 to 31.0 GHz and within power spectrum of 5 to 16000 watts and for Passive Components - 500 MHz to 110 GHz.

Alga is one of the few companies in the world offering products across this radio frequency and power spectrum. We specialize in products that are designed for each customer individually.

AQYR
Level 1 booth # 1 Q3-08
www.aqyrtech com

AQYR designs and manufactures highly portable GBS and 2-way Ku/Ka/X-band full auto-acquisition, single-case, portable ground terminals. These intuitive, patented, auto-acquire terminals are used by Defense, NGOs, Public Sector, Foreign Governments, Commercial & Enterprise markets. An expanding product line of antenna terminals include COTM, manual point and turnkey solutions. AQYR is THE land terminal provider for SATCOM Solutions.

AVL Technologies
Level 1 booth # 1 N1-01
www.avltech.com

At CommunicAsia 2018, **AvL Technologies** will display the newest addition to its flyaway family – a 2.0m ultra-lightweight manually operated axi-symmetric antenna. The RF components are located behind the hub which makes it highly configurable. The antenna features a 14-piece carbon fiber reflector and packs into two checkable transit cases each weighing <100 lbs. This ultra-lightweight flyaway antenna is the most compact 2.0m on the market and offers performance specifications comparable to competing 2.4m lightweight antennas with small pack-up.

AvL 2.0m Ultra-Lightweight Flyaway Antenna

Additionally, there will be a 0.98m ultra-compact, ultra-lightweight, ultra-high performance fully integrated antenna which is part of AvL's Family of Integrated Terminals (FIT) available in aperture sizes 0.75m & 1.35m. This line of user-configurable IATA checkable and carry-on satellite terminals can be upgraded from a baseline manual-point configuration to a motorized auto-acquisition platform.

Additionally, we will have in our booth the newest addition to the O3b family – the 0.70m MEO network Rapid Retrace Terminal featuring a single antenna with a <7 second retrace enabling re-sync without disruption. This rapid retrace satellite tracking terminal offers the power of O3b Network's high throughput, low latency connectivity. The terminal packs into two cases each weighing <40 lbs., allowing ease of transport and deployment. The antenna can be deployed and operational in minutes.

C-COM Satellite Systems Inc.
Level 1, USA Pavillion booth # 1 Q4-12
www.c-comsat.com

Please visit **C-COM's** booth # 1Q4-12 at the USA Pavilion, to discuss the latest in COTP and COTM antenna innovation. On display will be the iNetVu® Ka-98G Driveaway, and MP-100 ManPack.

C-COM Satellite Systems Inc. is a leader in the development of commercial grade mobile satellite-based technology for the delivery of two-way high-speed Internet, VoIP and Video services into vehicles. The iNetVu® antennas that deliver broadband over satellite in remote areas while stationary, virtually anywhere where one can drive. More than 8000 C-COM antennas have been deployed in 103 countries around the world in vertical markets such as Oil & Gas Exploration, Military/Disaster/Emergency Communications, SNG, Cellular Backhaul, Telemedicine, Mobile Banking, and others.

COMTECH EF Data
Level 1 booth # 1 T2-07
www.comtechefdata.com

Comtech EF Data's Heights Networking Platform is engineered to elevate your services with unparalleled horsepower, efficiency and intelligence. The platform's features were designed with the service provider and its multiuser environments in mind. It combines efficient waveforms, Heights Dynamic Network Access (H-DNA), header and payload compression engines, WAN & GTP optimization, multi-tier QoS, proven dynamic bandwidth and power management along with bi-directional ACM capability to provide the highest user throughput, highest availability, and most optimal resource utilization available in the industry.

COMTECH Xicom Technology
Level 1 booth # 1 T2-07
www.xicomtech.com

Comtech Xicom Technology provides a broad product line of KPAs, TWTAs, SSPAs and BUCs for worldwide satellite uplink covering C-, X-, Ku-, DBS-, Ka-, Q-band, Tri- and Multiband with power levels from 8 to 3,550 watts and available in rack-mount and antenna-mount ODU packages.

Comtech Xicom Technology offers state-of-the-art Gallium Nitride (GaN) solid-state amplifiers for the fast-growing In-Flight Connectivity market. We have DO-160 in-cabin certified and cabin exterior certified designs. The high efficiency technology and advanced packaging techniques used enable industry-leading power density products that meet the tough environments of airborne applications.

Xicom SSPAs and Block Upconverters (BUCs) for in-cabin ARINC-type and out-of-skin hermetic configurations support DO-160 requirements from category A1 to F2. Xicom Gallium Nitride (GaN) SSPAs enable high-speed satellite connectivity for both airlines and travelers around the world. For more information go to: http://xicomtech.com/applications-airborne

DEV Systemtechnik
Level 1 booth # 1 K4-01
www.dev-systemtechnik.com

DEV Systemtechnik develops and manufactures a complete range of products and systems for the optical and electrical transmission of Radio Frequency (RF) signals via coaxial cable or fiber. For over 20 years DEV has designed, engineered, and manufactured RF transmission equipment for satellite, broadcast, and cable applications. All products are built to meet the highest standards of system availability, reliability and manageability.

At CommunicAsia, DEV is showcasing the first 16x16 L-Band Distributing Matrix with 20 outputs – DEV os introducing a new L-Band Distribution Matrix in its product portfolio. The Matrix can be ordered with up to 16 input and 20 output channels and fits in a compact 2RU chassis. The 16x16 (DEV 1985) provides a high degree of flexibility: The number of input and output channels can be changed; connectors and impedances can be configured even after purchase. In addition to electrical and optical inputs, the DEV 1985 supports variable gain and slope as well as several redundancy options. It comes with a local user interface and provides many more helpful features.

Gazprom Space Systems
Level 1 booth # 1 U2-01
www.gazprom-spacesystems.ru

Russian satellite operator **Gazprom Space Systems** (GSS) presents the opportunities of its constellation, consisting of Yamal-202 (49E), Yamal-300K (183E), Yamal-401 (90E), Yamal-402 (55E) satellites. GSS's customer base includes over 250 companies. Yamal satellites capacity is used for telecommunication services provision in more than 100 countries worldwide.

Integrasys S.A.
Level 1 booth # 1 U14-12
www.integrasys-space.com

Integrasys is a privately owned company specialized on engineering and manufacturing **Satellite Spectrum Monitoring** systems in the telecommunication and broadcasting markets.

Integrasys was founded in 1990 by a group of Hewlett-Packard engineers experts on Automated RF & Microwaves Test Systems and Software. Since then Integrasys has evolved towards today's company, offering a wide range of signal monitoring products for different telecom services.

At Integrasys our mission is to provide the industry the best quality and fastest technology available in carrier monitoring systems, with the customer service and care that our customer's deserve. We want to add value to our customers in quality of service, technology, speed and cost efficiency, by innovating; therefore satellite industry recognizes Integrasys as the **leader** for innovation in **satellite signal carrier monitoring systems**.

Newtec
Booth # 1 P2-01
www.newtec.eu

Newtec, a specialist in designing, developing and manufacturing equipment and technologies for satellite communications,. As a pioneer in the industry, Newtec is dedicated to creating new possibilities for the broadcast, consumer and enterprise VSAT, government and defense, cellular backhaul and trunking and mobility including maritime markets. Their products and technologies can be applied in a wide range of single and multiservice applications. They are looking forward to discuss future projects with potential customers.

Newtec will be showcasing at CommunicAsia its most advanced VSAT modem to date – the first on the market to support wideband DVB-S2X , the Newtec MDM5000 Satellite Modem. The MDM5000 is capable of receiving forward carriers of up to 140 MHz, and processing over 200 Mbps of throughput. On the return channel, it supports SCPC, TDMA and Newtec's unique Mx-DMA™, up to 75 Mbps.

ND Satcom
Level 1 booth # 1 L3–11
www.ndsatcom.com

At CommunicAsia, ND satcom will be highlighting its SKYWAN **5G** satellite router, a reliable, flexible and versatile satellite communication platform for customer centric networks. It is a bi-directional MF-TDMA plus DVB-S2X system that supports voice, video and data applications in the most bandwidth efficient manner combined with unrivalled real-time performance.

SKYWAN **5G** unlocks new business opportunities for service providers e.g.in enterprise networks. Total cost of ownership is significantly reduced thanks to the fact that only one type of device is needed for all roles in the network. Each SKYWAN **5G** has the full functionality on board and specific features are unlocked by a license key. One small hardware for all network roles simplifies logistics and unprecedented scalability enables the growth of your network in a very cost efficient manner. This saves costs in terms of logistics, certifications, network configuration and maintenance. Measuring in at only 1 RU the SKYWAN **5G** is the smallest hub device on the market.

Norsat International
Level 1 booth # 1 T4-01
www.norsat.com

Versatile and reliable, **Norsat** provides the broadest selection of Ka-band BUCs and LNBs! ATOM BUCs are up to 20% smaller, 50% lighter, and 50% more powerful than industry alternatives. When paired with one of Norsat's Ka-band LNBs, this complete Ka-band package is easily integrated into a variety of sys-

tems. Looking to buy these products separately? No problem! Norsat offers a wide range of satellite components for the Ka-band. For more info go to : www.norsat.com/ka-band

RF-Design
Level 1, German Pavillion, booth # 1 L3-14
www.rf-design-online.de

RF-Design specializes in developing, manufacturing and marketing high quality RF distribution solutions for the international Satellite-, Broadcast- and Broadband commu- nications market. Our product range includes a wide range of **Switch Matrix systems, RF-over-Fiber solutions, Splitters Combiners, Switches/Redundancy Switches, Line Amplif ers, RF/DVB Signal Quality Analyzers** and **LNB-supply control systems**...perfectly suited for applications in Teleports, Satellite Earth-Stations as well as Broadcast- and Broadband RF distribution infrastructures.

We also have strong capabilities to design and to manufacture custom-made RF distribution solutions for your individual needs. All our products are developed, manufactured, tested and approved in our own facilities in Lorsch, Germany and characterized by high quality, reliability and superior RF performance.

At CommunicAsia 2018 we will demonstrate the new single, quad or 1:1 redundant amplifier systems "HQ series" allowing variable gain control of max. 43dB, our innovative and clever Switch Matrix system "FlexLink-K7-Pro" and our RF-over-Fiber system "FiberLink*plus*". Join us at our booth (#1L3-14 German Pavilion), we look forward to welcoming you and to talking about your individual RF equipment requirements.

Terrasat Communications, Inc.
Level booth # 1 Q2-12
www.terrasatinc.com

Terrasat Communications designs and manufactures innovative RF solutions for Satellite Communications systems. Our ground-breaking **IBUC**, the Intelligent Block Upconverter, brings advanced features and performance to C-band, X-band, Ku-band, DBS-band and Ka-band satellite earth terminals and VSAT's.

New to CommunicAsia 2018, we now have 300W and 400W Ku-band **IBUCG** models featuring minimal backoff to P_{Linear} usable power. We have made recent developments that bring significant 2 -3 dB improvements to GaN technology amplifier linear output power. Through conservative engineering, Terrasat products have gained a reputation for enduring over the long term in extreme operating conditions.

UHP Networks
Level 1 booth # 1 R1-01
www.uhp.net

UHP Networks is engaged in the development, manufacturing and marketing of satellite networking equipment. Its core products include universal satellite routers UHP and advanced Network Management System. UHP is the industry's first fully software-defined, high-throughput VSAT router, which can be used in a network of any size and any topology either as remote or a building block of a VSAT hub. UHP-powered solutions are efficient and reliable, with industry-best total cost of ownership. These solutions have been deployed in over 300 networks by Tier 1 telecom service providers, broadcasters and government agencies.

UHP Networks is a market leader in high-availability HTS -ready VSAT equipment. Star, Mesh, MF-TDMA or SCPC supported in a single device which consumes 9W, processes 450 Mbps, initializes in 5 seconds. Hub scales up to support tens of thousands of remotes.

WORK Microwave
Level 1 booth # 1 V2-07
www.work-microwave.com

WORK Microwave's Satcom Technologies division is a leading provider of high-performance, advanced satellite communications equipment. This equipment is designed for use by telecommunications companies, broadcasters, integrators, and government organizations operating satellite earth stations, satellite newsgathering vehicles, flyaways, and other mobile or portable applications.

As one of the only satellite technologies providers offering an end-to-end solution for wideband applications, including an advanced modem, modulator, and demodulator, WORK Microwave enables operators to adapt to future requirements, including the next-generation DVB-S2X standard, with ease and affordability. At CommunicAsia, WORK Microwave will demonstrate its all-IP platform, which provides operators with increased flexibility, scalability, and a future-proof solution. WORK Microwave supports a wide range of use cases, such as outbound carrier for the HTS/UHTS/UHDS VSAT system, IP trunking, cable/fiber restoration, and HD image downloading in earth observation.

Serving Your World for Over 15 Years with Quality Engineered IBUCs

Available in GaN and GaAs

C-Band Ku-Band Ka-Band X-Band

Up to 400W

CommunicAsia
Marina Bay Sands Singapore June 26th-28th
Visit us at Booth 1Q2-05

ENGINEERED TO ENDURE

Contact us:
+1 408.782.5911
www.terrasatinc.com

Follow us:
@TerrasatCom

TERRASAT
Communications, Inc.

From Cellular… to Aerospace… to New Space

by Martin Jarrold

June-July is another busy period in GVF's international schedule of event engagement – with our own ***Cellular Backhaul*** program in London in the middle of the month, and both the ***CommunicAsia*** SatCom Track (a collaboration between APSCC and GVF) and the ***CASBAA Satellite Industry Forum*** in Singapore at the end. In July, if you will forgive the pun, things really take off again with our ***AeroConnect@Farnborough*** one-day conference.

Before continuing, it would be wholly remiss of me not to reference **the** most major of recent developments at GVF – the forthcoming departure of David Hartshorn, Secretary General of the association since its creation a little over 20 years ago. David is, as very many readers will already know, moving from GVF to GWF, taking the position of Chief Executive of Geeks without Frontiers. I have worked directly for Dave for 17 years and from now on it will be pleasure, as one member of the GVF team, to look into all the ways in which GVF and GWF can potentially collaborate in driving to secure the widely shared objective of bridging the Digital Divide in support of achieving the UN Sustainable Development Goals.

The GVF-EMP Partnership has run a cellular backhaul program in London for several years, but 2018 is different. ***Cellular Backhaul 2018: Satellite + 3G, 4G, LTE & 5G Leveraging the Now! & The Sometime Soon*** (www.uk-emp.co.uk/current-events/cellular-backhaul-2018/) moves to London's ExCeL Centre on 14th June 2018, embedded within the **KNect365** ***5G World/IoT World/Smart Transportation/Mobility*** event, which runs from 12th to 14th June. GVF is delighted to be working within a context that directly facilitates the mobile network operator (MNO) and teleco community's engagement in current dialogs that encompass analyses and perspectives on 5G, and on the Internet of Things, of the 3GPP, the 5GPPP, the ITU, the European Union, ESA, and other stakeholder actors.

One example of this dialog being the 3GPP's specification of a series of *Use Cases* where satellite will be essential and integral to 5G networks service offerings, namely in respect of Multimedia Delivery; Mobile Broadband to Users & Vehicles; Machine Type Communication; Critical Communication; and, Vehicular Communication. Another being the NetWorld 2020 European Technology Platform analysis that satellite will contribute to augment 5G service capabilities and address some of the major challenges in relation to the support of multimedia traffic growth, ubiquitous coverage, machine-to-machine (M2M) communications and critical telecom missions whilst optimizing the value for money to the end-users." In 5G, satellite will feature not merely as an 'interfacing' technology and service, with a secondary role in the 'network', but an 'integrated' technology and service, fully part of an evolving and complex 'network of networks'.

The program for ***Cellular Backhaul 2018: Satellite + 3G, 4G, LTE & 5G Leveraging the Now! & The Sometime Soon***, as at 24th May, will feature speakers from (in alphabetical order): AsiaSat; Comtech EF Data; Gilat Satellite Networks; Globecomm; Hispasat; Hughes; Inster; Intelsat; Kratos Communications Ltd; LeoSat; ND Satcom; Newtec; Satellite Applications Catapult; SES Networks; Vodafone; VT iDirect. The draft program webpage is www.uk-emp.co.uk/current-events/cellular-backhaul-2018/programme/.

If you are reading this column whilst in Singapore as a visitor, exhibitor, or conference participant at ***CommunicAsia*** and also attending the ***CASBAA Satellite Industry Forum***, and you have travelled from overseas, the chances are that, depending on your airline carrier, you will either have been able to email, browse, tweet, and try for a seat upgrade on your return flight, through access to cutting-edge inflight connectivity (IFC) technology, or you will have been frustrated by either (a) the inadequate performance of a slow or unreliable connection, or (b) by the total absence of any IFC.

GVF once again takes-up the analysis of the inflight connectivity market at ***AeroConnect@Farnborough*** in mid-July during the Farnborough International Air Show, but aside from a recommendation to examine the introduction to the event at www.uk-emp.co.uk/current-events/aeroconnect-farnborough/, I will leave this facet of our global program to my next column, and return to the subject of Singapore.

Within the 26th June Satcom Track at ***CommunicAsia 2018*** (www.connectechasia.com/the-summit/summit-programme/) – located at Orchid 4302, Level 4, Marina

Bays Sands – which features the five themes of *The State of APAC's Satellite Industry; Shaking-Up the Value Chain; China Satcom Technology Panel; LEOs, MEOS, GEOs… and Everything In Between; and, IoT, 5G & ROI* GVF will be moderating discussion on the *LEOs, MEOS, GEOs*, focusing on trends towards consolidation between MEO in compliment to the GEO portfolio with others preparing for LEO constellation rollout, and planned realignments for next-generation services. Questions to be addressed under David Hartshorn's moderation include: "What do these plans look like and how will they resonate with enterprise clients and consumers?"

The panelists exploring this theme will be: **Mark Rigolle**, Chief Executive Officer, LeoSat; **Barrie Woolston**, Chief Commercial Officer, AsiaSat; **Patompob (Nile) Suwansiri**, Chief Commercial Officer, Thaicom; **Imran Malik**, Vice President Fixed Data Asia-Pacific, SES Networks; **Steven Soenens**, Vice President Product Marketing, Skyline Communications; and, **Ken Betaharon**, Executive Vice President & Chief Technology Officer, ABS.

On the day before the ***CommunicAsia*** track, 25th June, David Hartshorn will contribute to the ***CASBAA Satellite Industry Forum*** on the subject of *Sustainability of Space Operations: Emerging New Space & Orbital Debris* and a GVF-led initiative to establish a global, industry-consensus-based guideline on best practices to help improve on-orbit conditions.

GVF has been engaged with a growing range of stakeholders and other subject-matter experts in developing the guideline which focuses on preserving sustainability for the various commercial, and other peaceful, uses of space. Contributing to the ongoing dialog is the European Space Agency Space Debris Office, focusing on recent trends and the potential further development of space sustainability guidelines developed to prevent and mitigate orbital debris with a focus on international coordination, space surveillance and risk models.

Space applications – commercially-based or scientifically-orientated, but peaceful in objectives – serve to protect and enhance people's lives all over the world as they contribute to communications, navigation, weather forecasting, natural resource management, environmental monitoring, climate modelling, and disaster mitigation early warning systems, etc.

As the commercial space industry embarks on the New Space age of innovative low Earth orbit business serving enhanced communications, advanced Earth observation, global navigation, cutting-edge exploration, accelerated economic development, and creative security applications – using satellites of widely varying scale, typically of much lower mass than today's typical GEO communications satellite, and often in planned constellations comprising tens, hundreds, even thousands of spacecraft – there has been a resurgence of concern about orbital debris as a specific phenomenon affecting current space applications. This concern results from the potential for physical and electromagnetic interference and is related to the potentially negative impact of orbital debris on the development of new technologies – technologies which require a secure space environment to ensure sustainability over the long term.

"...Space applications– commercially-based or scientifically-orientated, but peaceful in objectives – serve to protect and enhance people's lives all over the world as they contribute to communications, navigation, weather forecasting, natural resource management, environmental monitoring, climate modelling, and disaster mitigation early warning systems, etc..."

Without space sustainability, the cost of using space will increase, potentially rendering it too expensive to continue to use at the very time when new technologies – in satellite manufacture, in launcher design, etc. – are reducing costs and making access to orbit open to more potential space stakeholders.

Currently more than 21,000 pieces of debris larger than around 10 cm are being tracked in orbit around the Earth, and there are reportedly as many as 500,000 other, untracked, pieces larger than 1 cm. Debris colliding with any operational satellite will likely result in damage or destruction of the spacecraft. As these numbers continue to increase. So does the threat to space sustainability.

In response to this, various space agencies have identified a set of mitigation guidelines aimed at enabling space users to reduce the creation of space debris by, for example, limiting the orbital lifetime of spacecraft and launch vehicle stages after the end of their mission.

Over a number of years the United Nations Committee on the Peaceful Uses of Outer space (UN COPUOS) has evaluated various aspects of the long-term sustainability of outer space activities, and has addressed themes that include sustainable space utilization supporting sustainable development on Earth, space debris, space operations and tools to support collaborative space situational awareness, space weather, and regulatory regimes and guidance for actors in the space arena.

A first set of 12 COPUOS guidelines were agreed in mid-2016 and February 2018 saw agreement on a further nine guidelines specifically intended to reduce the risk of collisions in space, as well as other harmful space activities. Though voluntary and non-binding, the guidelines were agreed by 87 UN member states, and whilst all counties are encouraged to incorporate them into their laws and regulations the 87 members are now supposed to include them in future national space-related legislation.

The nine guidelines most recently approved by the COPUOS working group cover a range of issues, including improved registration of space objects and sharing of information about them, performing conjunction assessments for all objects that have the ability to control their trajectories, addressing risks associated with the uncontrolled re-entry of space objects, and observing precautions when using lasers in outer space.

One of the guidelines, informally known as the 'small satellite guideline', calls on countries to take measures to increase the "trackability" of space objects, including small-size space objects, and calls on satellite operators to follow orbital debris mitigation guidelines to limit their long-term presence in "protected regions" of space after the end of their mission.

Seven more guidelines are in the pipeline though their future is unclear as the COPUOS working group's activities are coming to an end. Continuation of that work will be discussed at the next full meeting of COPUOS in mid-June 2018 – during UNISPACE+50 in Vienna – where the report on the nine new guidelines completed by the working group in February 2018 will be approved to send on to the UN General Assembly. In Singapore GVF will provide the latest update.

Martin Jarrold is Director of International Programs of the GVF. He can be reached at martin.jarrold@gvf.org

Moving, But Always Connected

by Alvaro Sanchez

The rising demand from a constantly connected people means that comms on the move will be in higher demand than ever before. However, maintaining satellite communications whilst on the move is notoriously difficult. Maintaining signal whilst ensuring continuous links is as crucial as it is problematic, with even the slightest mispoint causing the signal to be out of range. Furthermore, if the equipment is not up to standard, then it won't align properly, which whilst on the move can cause numerous complications. How can the satellite industry ensure that continual connection and minimise errors?

Demanding a Constant Connection

Comms on the move has always been crucial for a number of applications. For example, in the cruise industry it enables passengers to access their Social Media applications and OTT content, on any device (nowadays mostly smart devices); this is the world in which we live today, with trends governed by the millennials and followed by every generation. Satellite provides the best and unique communication method where no other communication network will reach. Hundreds of Mbs are being delivered per second in a reliable way to hundreds of cruises today. In a very similar manner, other maritime vessels are also connected, such as traditional shipping vessels and even yachts, a market that is currently booming.

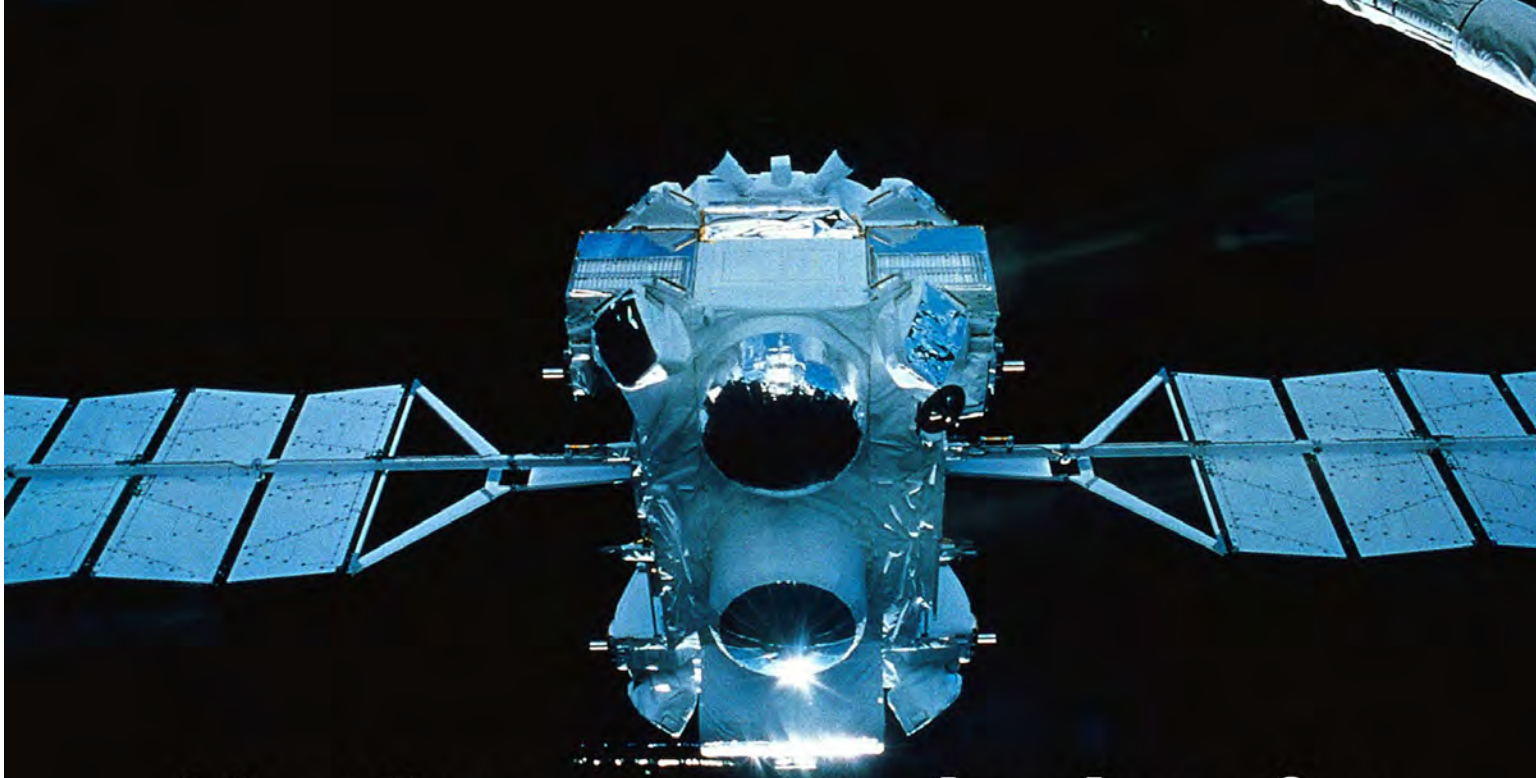
The aero industry has for some time been another big user of comms on the move, both for commercial and cargo planes. Again, no other communication method could keep a plane connected throughout its journey. This has always been important, keeping the crew connected for important information, relating to weather or cockpit updates, etc. However the constantly connected consumer is making it even more crucial for commercial aircrafts to also supply a connection for customers. Consumers are used to always being online and rely on broadband connections for pretty much everything in their daily life. For a consumer on board a plane, whether that be an international or regional flight, whether that be a low cost or a flagship airline, today it has become a must have. There is an expectation that will continue on board, with very little consideration for the technical challenges of ensuring that.

This demand is set to continue at a fast pace over the coming months and years and will extend beyond just those areas. For example, we will see an increasing appetite for connected cars will begin to emerge into the market. Of course keeping a car connected presents all the same challenges of other comms on the move applications, with the added complication that a consumer will simply not want to, or know how to, troubleshoot any connection errors. Comms on the move will simply have to work, all the time, and be able to self-diagnose when there is a problem, without the need for any human intervention. Just imagine for a minute, that you bought the connected car of your dreams, and after couple of months you take it for a drive on a nice road, when a light on the dashboard shows it needs to go to the garage to repair and update the vsat unit. Could you imagine the mechanic doing an update or troubleshooting the IDU or ODU or any IP? Most likely this would be a disaster. Therefore, we need to take all measures to make it as robust as it could be, ensuring 99,99% availability and being able to maintain & test remotely.

Challenges on the Move

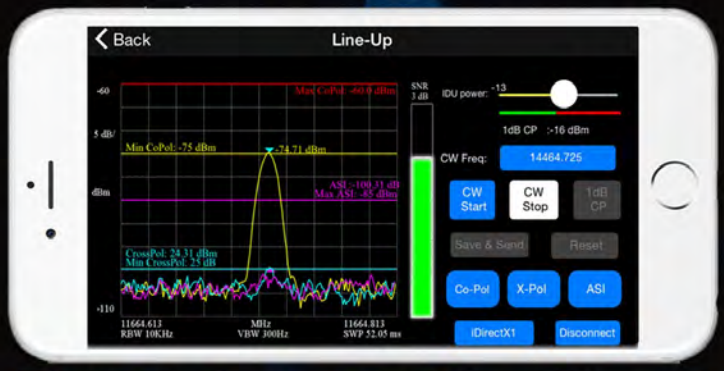
The technical challenges of ensuring constant communications on the move are not insignificant. The very nature of constantly moving makes maintaining a fix on the satellite challenging. It is all too easy to lose that alignment, or calibration, point to the wrong satellite, or lose the return link completely. Add to that the possibility of very changeable weather conditions and temperature on a journey, which can of course affect the satellite connection, and customer satisfaction, without forgetting of our beloved SLAs.

At the same time, in the comms on the move environment, the terminal has to be as small as possible. Nowadays we are talking about few inches and cm, as the smaller the unit, the cheaper to manufacture, transport and deploy. With consumer applications such as connected cars, space will be even more limited. Meaning ever smaller terminals have to achieve what bigger terminals even have challenges with. Therefore for our industry to survive, we need to ensure the very best performance from the smallest of terminals. We already have the situation in existing applications where the people tasked with looking after the satellite equipment are often not trained in satellite technology, imagine if the Tx beam is even wider. As we see consumer applications emerge, many people won't even realise it is satellite technology, so we need to automate



Most Innovative Technology for Carrier Monitoring VSAT Autocommissioning Virtual Network Maintenance

2014 Vision Awards Winner
Most Innovative Product of the Year Award



VSAT INDUSTRY AWARDS 2015
WINNER
VSAT Technology Innovation of the Year

VSAT Stellar AWARDS
WINNER

INTEGRASYS

At CommunicAsia visit us at Booth 1U14-12
info.sales@integrasys-sa.com
www.integrasys-space.com

even faster and further for these markets.

So that we are one the move, let´s bring the moving satellites into play.

The Promise of LEO

Over the coming months and years, there are predicted to be a massive array of LEO and MEO constellations launching to tap into this demand for constant connectivity. I am a strong believer in the success of LEO constellations, which will find the much-needed investment and come to the market. With these constellations will come massive capacity, more than we will need in the foreseeable future. This means that capacity won't be a problem, but it also means that there will be huge competition from LEO providers vying for customers. This year there are 25 serious LEO constellations, so that competition will mean reduced costs on the capacity but it will also mean that those providers, more than ever, will need to ensure quality and consistency of service to retain the customer and that means they should be investing in the right technology to solve the LEO challenges in a seamless way to the customer.

These new constellations will come with their own set of challenges of course. One of the major concerns for the industry is the pure volume of constellations, which many fear will cause massive interferences with GEO. In our view, it does not need to be that way, we just need to ensure the right tools are used. The other problem is that the nature of these means the process of connecting to the satellite is not as simple as in GEO where you lock onto the satellite and it doesn't move (correlated to earth coordinates), but with LEO the movement of the satellites with respect of the earth makes this all the more complicated.

Integrasys' Alusat product won the "Teleport Technology of the Year Award" in 2018 presented by the World Teleport Association.

How do we keep comms, *on the move?*

Given the plethora of challenges, it is very easy to conclude that comms-on-the-move will become impossible to manage, but the truth is that tools just need to get better, and more clever and this is done by innovating faster.

Firstly, knowing that antennas are already not often operated by satellite engineers, and with the rise of connected cars and other consumer applications, there is a clear need for automation. The more automated the processes are, the less chance of error and the less knowledge needed by the user. There will therefore be a growing need for both automated tools to ensure initial alignment is accurate, as well as being quick and efficient, at the same time as using automated tools to ensure a connection is maintained even on the move with new satellites. This also means the systems need to be able to self-diagnose as much as possible, flagging up any errors and even potentially fixing them remotely.

Flat panel antennas will be absolutely critical to these new developments, especially for environments such as connected car, where space will be at a premium. Eventually these will need to be flexible enough to be used as plug and play, like smartphones are. The easier it is to operate, the better. Without these types of antennas, we can have neither the predicted growth of HTS nor new satellite constellations.

The other important factor is monitoring. This will become even more critical as we see the launch of numerous LEO and MEO constellations. Being able to constantly monitor an entire network easily and effectively will make a massive difference to ensuring errors are spotted before they occur and thus keeping the network online, being proactive instead of reactive with old fashion tools.

Alvaro Sanchez is General Manager of **Integrasys.** Alvaro prior to join Integrasys was signal analysis expert at CERN European Organization for Nuclear Research. He can be reached at: alvaro.sanchez@integrasys-sa.com

The First 16x16 RF Matrix with up to 20 Outputs

dev

Part of the axing Group

- Flexible Choice of Connectors & Impedances
- Electrical and Optical Inputs in One Chassis
- Different Sizes, up to 16x20, in 2 RU
- Built-in Spectrum Analyzer
- LNB Powering

Visit Us
CommunicAsia
Booth 1K4-01

dev-systemtechnik.com

Geeks Without Frontiers Appoint Hartshorn as CEO

Washington, D.C. May 2, 2018 – Geeks Without Frontiers (GEEKS), an award-winning Non Governmental Organization (NGO) focused on addressing global connectivity challenges with a view to closing the Digital Divide and facilitating the implementation of the United Nations Sustainable Development Goals (SDGs), announce the appointment of **David Hartshorn** as Chief Executive Officer with effect from July 1, 2018. Hartshorn, who will be supported by Angie Mar in her new role as GEEKS' International Program Director, brings more than 25 years of experience tackling global communications issues including through helping to build and lead the Global VSAT Forum (GVF), an international association focused on all aspects of improving access to satellite-based connectivity.

David Hartshorn

GEEKS co-founder Michael Potter said: "GEEKS has achieved a lot in the last three years with the launch of its Model Law on DigOnce!, the success of its Community Connect initiative and GEEKS' appointment to a working group of the Federal Communications Commission's 'Broadband Deployment Advisory Committee' (a new body focused on accelerating the deployment of broadband Internet access in the USA). We have ambitious plans for the future, and David and Angie's skills and experience will enable us to accelerate our connectivity programs."

"Since GEEKS' inception, I have admired the Founders' vision and the strategic approach of the team and their advisors," Hartshorn said. "I'm honored to have the opportunity, at this moment in history, to pursue the organization's goal of positively impacting the lives of a billion people through the innovative use of technology, connectivity and sustainable social enterprise models. In addition to helping to expand and accelerate the rollout of GEEKS' current initiatives, I look forward to establishing a global community and platform to help close the digital divide by bringing communications-enabled health, education, security and other solutions to unserved and underserved global communities."

Datapath Appoints New CEO

Duluth, Georgia, May 11, 2018-- DataPath announced the appointment of Dr. **Sherin Kamal** as the company's new President and CEO. He will officially assume the position June 11. Kamal is an international business executive with extensive experience in driving revenue and profitable growth.

Sherin Kamal

Kamal most recently served as Chief Engineer and Senior Director of Technical Services at SAIC. Prior to his 10-plus years at SAIC, Kamal served as Founder and CEO, Senior Vice President and General Manager, and Vice President of Engineering at advanced networking technology companies. He has led businesses to strong growth in both domestic and international markets. Kamal is a frequent contributor to major conferences and white papers and is recognized as a thought leader in the areas of advanced military networks and emerging wireless and satellite communication technologies.

"This is the perfect time for Sherin to become DataPath's next CEO as we continue to scale to better meet the needs of our customers," said Chris Melton, Chairman of the Board. "Today, our customers—be they military, civilian government or commercial enterprises—have set a frenzied pace for modernizing their operating capabilities. They have trusted DataPath to provide innovative wireless and satellite solutions and on-site technical field services globally. Sherin's business and technology expertise will ensure DataPath continues to be a trusted partner."

Mike Guthrie to Lead KVH in Asia-Pacific

Singapore, May 10, 2018-- **KVH Industries** announced that **Mark Guthrie** has been named KVH's vice president for the Asia-Pacific region.M

Guthrie will oversee all KVH activities in this area, which is of vital importance in the mobile connectivity market. Mobile tech innovator KVH provides connectivity solutions for the maritime market, including global mini-VSAT Broadbandsm services used by thousands of vessels worldwide.

Mike Guthrie

Guthrie joined KVH in 2013, and has held a variety of roles, most recently serving as vice president for global channel management. Mark's extensive experience in the satellite communications and telecom industries includes roles held prior to joining KVH – at SES, BT (British Telecom), Europe Star, and Verestar.

Guthrie will work out of KVH's Asia-Pacific headquarters, located in Singapore; KVH also has a presence in Tokyo and in Hong Kong.

EXCELLENCE IN RF EQUIPMENT

- Unique - Innovative - Clever Switch Matrix systems
- RF-over-Fiber solutions for indoor & outdoor applications
- Multi input Signal Quality Analyzers for RF & DVB monitoring
- RF Line-Amplifiers (single, dual, quad, 1:1 redundant)
- RF Switches & Redundancy switches
- Low-cost and professional type Splitters & Combiners
- Stand alone & modular LNB supply/control systems
- Custom-Made products and solutions tailored to your needs
- Perfectly suited for applications in Teleports, Satellite Earth Stations, Broadcast- and Broadband facilities...

NEW

„FiberLink*plus*“ RF-over-Fiber

- Versatile & scalable RF-over-Fiber systems
- Supports various redundant configurations
- Suited for indoor & outdoor applications
- Gain control & RF-power monitoring
- Switchable LNB-supply
- Excellent quality and performance

NEW

„FlexLink“ Switch Matrix series

- Unique - Innovative - Clever
- 1RU/19" in sizes 8:16 to 16:16 & 8:24
- 6RU/19" scalable from 8:8...64:64 to 256:256
- Also available with optical inputs
- Switchable LNB supply
- Variable gain control, slope equalization...

RF-Design/GERMANY • contact@rf-design-online.de • www.rf-design-online.de

24i Media Acquires Mautilus

Amsterdam, May 9, 2018 - 24i Media, the leading internet TV app technology provider for the world's top media companies, today announces the acquisition of Mautilus, the Czech TV app agency specializing in HbbTV and applications for multiple devices. The acquisition strengthens 24i's technology framework with new products and features, and increases its production capacity with Mautilus' highly-skilled engineers. The acquisition of Mautilus is the next step in 24i's ambition to deliver the most innovative, modular, flexible and scalable video streaming application technology.

"Mautilus shares our vision and recognizes the importance of delivering flawless and immersive experiences for our clients and their end-users. Its solutions strongly complement the broader 24i portfolio, and allows us to continue building a global internet TV app powerhouse with the best talent in the industry," said Martijn van Horssen, CEO and Co-Founder of 24i. "We are excited to be adding a tremendously talented team to contribute to our competitive edge. Sharing our values, our culture and our ongoing commitment to bringing state-of-the-art solutions to the new TV industry will allow 24i to bring even more powerful solutions to market. As one company, we will provide customers with truly innovative solutions enabled by cutting-edge technologies." he added.

Martijn van Horssen, CEO and Co-Founder of 24i and Rehor Vykoupil, CEO of Mautilus.

24i continues to grow and expand its position in today's evolving video landscape according to the company.. While 2017 was a year of record growth, this trend is continuing into 2018. In fact, Mautilus is 24i's second acquisition in 2018; the company acquired multiscreen video platform provider Vigour in March.

"Innovation, agility and the ability to scale are crucial ingredients to surf the impressive waves caused by the TV industry's fundamental changes. We've been able to accelerate our growth by picking partners that strengthen our strategic positioning. We always strive to attract great media professionals, whether individually or by teaming up with highly valued peers like Mautilus. Based on our successful integration with the former Siemens CVC front-end team in 2016, we are convinced of the value creation and cross-pollination of our teams in Brno," added 24i's Co-Founder and Chief Strategy Officer Hans Disch.

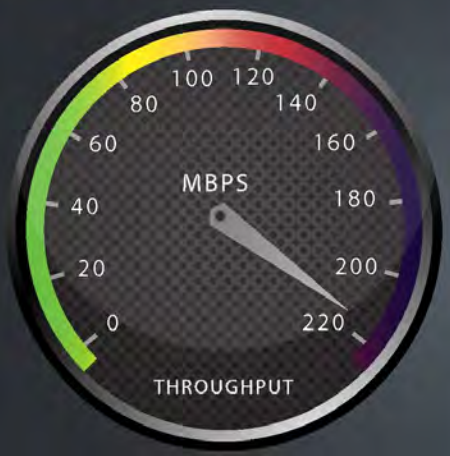
Mautilus develops TV apps for multiple platforms, including smart TVs, mobile, HbbTV, as well as for games consoles, set-top-boxes, and much more. Its customers include HBO, T-Mobile, iFlix and Showmax.

"Joining forces with 24i will allow us to better serve our customers by offering an innovative approach to streaming video technology," said Rehor Vykoupil, CEO of Mautilus. "The combination will allow us to provide the best solutions to our customers, and will be a great home for our technology and team. With our unique blend of multi-platform experience, specific HbbTV expertise and knowledge of addressable TV, we can strengthen and accelerate 24i?s ambition of becoming the most recognized technology provider for developing cutting-edge video applications across all devices. Petr Mazanec, Ivan Bradac and myself, as founders of Mautilus, are really proud to marry our team into the 24i family," he added.

Having experienced rapid growth in 2018, as well as announcing the launch of the Tennis Channel app for Sinclair Broadcasting Group last month, 24i will continue to expand its market position in the coming months according to the company.

DISRUPTIVE INNOVATION IN CELLULAR BACKHAUL OVER SATELLITE

PING 570 ms VIA SATELLITE



7 ms MF-TDMA JITTER

LTE

3G

2G

MAX TX/RX THROUGHPUT MBPS 225

ROUTER PERFORMANCE KPPS 200

2G/3G/LTE GTP DECODING ACCELERATION OPTIMIZATION

SPECTRAL EFFICIENCY BIT/HZ 4.2

TDM EFFICIENCY % 99

TDMA EFFICIENCY % 96

UHP NETWORKS

WWW.UHP.NET
INFO@UHP.NET

COMMUNICASIA 2018
JUNE 26-28
BOOTH 1R1-01
SINGAPORE

IBC 2018
SEPTEMBER 13-18
BOOTH 1.A91
AMSTERDAM

casbaa
REPRESENT INFORM CONNECT

Satellite Industry Forum 2018

25 June 2018, Four Seasons Hotel Singapore #casbaasif

The Satellite Industry Forum brings together a wide range of world-class speakers from the industry to deal with crucial issues in a full day of keynote presentations and panel discussions.

Register now for this Not-to-be-Missed event!

http://casbaaevent.com/events/casbaa-satellite-industry-forum-2018/

SCAN ME

Scan me

Sponsors

APSTAR by APT Satellite · AsiaSat · Boeing · Effective Space · eutelsat · Integrasys · JSAT

MARSH · measat · Newtec · NorthTelecom · SES beyond frontiers · SpaceX · SSL

New Mega Technology Event ConnecTechAsia Addresses Role of Accelerated Digital Change in Asia's Growing Economy

ConnecTechAsia, combining the strengths of industry stalwarts CommunicAsia, BroadcastAsia, and newly launched NXTAsia, is the region's latest Mega Technology event, and will stage its inaugural edition from 26-28 June 2018, in Singapore.

With legacy events CommunicAsia and BroadcastAsia having served the telecommunications and broadcast media sectors respectively for nearly 40 years, the new NXTAsia builds upon this to bring new technologies that are shaping Asia's increasingly innovation-driven economy. With the advent of the Industry 4.0, ConnecTechAsia will present a holistic ecosystem of infrastructure, technology, and services that businesses and governments in Asia need to thrive in this new era.

"As Asia pursues digital transformation at an accelerated pace, it is critical that the event evolves alongside the dramatic shifts happening in the spaces we serve," said Mr Victor Wong, Project Director, UBM, organiser of ConnecTechAsia. "The new event reflects the pulse of Asia today, and is the only business platform covering the converging ecosystems of communications, broadcasting and emerging technologies connecting the physical and digital worlds."

At NXTAsia, industry professionals will catch the newest innovations and thought-leadership in areas such as Artificial Intelligence (AI), Augmented and Virtual Reality (AR/VR), Cyber Security, IoT, Robotics, Cloud and Data among others. NXTAsia will host promising start-ups, and the Singapore-leg of renowned start-up competition SeedStars, at tech showcase Disrupt+.

CommunicAsia, Asia's most established international industry event for the telecommunications sector, will focus on Network Infrastructure/FTTx, satellite communications and telecom software and services – the latest technologies to help companies and governments in Asia prepare for the coming of 5G and maintain a competitive edge in the communications and digital world.

With on-demand and streaming services surging in popularity, BroadcastAsia will shine a spotlight on the future of broadcasting, exploring how we have consumed news and entertainment over the past decade, and the challenges and opportunities this creates for traditional broadcasters and OTT players. BroadcastAsia will highlight technologies that are reshaping the value chain, such as the latest innovations in UHD/HDR, IP Broadcasting, Live Production, Content Media Security, OTT and Alternative Content Platforms.

ConnecTechAsia Summit – Digital Business Transformation

The ConnecTechAsia Summit this year centres on Digital Business Transformation, covering the hottest trends across ICT, broadcasting industries and enterprises to enable a digitalised future. The three-day summit comprises three tracks – NetworkComms, BroadcastMedia and EmergingTech – that will drive business growth and sustainability.

5G, Network Virtualisation, Satellite Communications and Network Slicing will be the main topics in the NetworkComms track, while The Future of Television, Monetisation Strategies, Social Video, IP Broadcasting, 4K, AI and Immersive technologies for broadcasting will feature in the BroadcastMedia track. Topics of the EmergingTech track will include: Artificial Intelligence/Machine Learning, Blockchain Technology, Cybersecurity, IoT, Data Analytics, Seamless Commerce/Digital Payments, Connected Industries, IoT, Augmented, Virtual and Mixed Reality, and Smart Cities.

"Presenting a holistic ecosystem of digital convergence and a platform for the discovery and understanding of new frontiers of innovation to elevate the global standing of Asian business and governments sits at the heart of what ConnecTechAsia stands for," adds Mr Wong. "Continuing the 40 year legacy of CommunicAsia and BroadcastAsia, the new ConnecTechAsia will continue to serve Asia as we embark on the journey of the Fourth Industrial Revolution."

For more information on ConnecTechAsia, please visit www.connectechasia.com.

Following the Signal

AVCOM

Of Virginia Inc.

Unique Monitoring System Solutions and Spectrum Analyzers

SBS2
Embedded Spectrum Analyzer
and Beacon Receiver

RSA Series
Rackmount Spectrum Analyzer

PSA Series
Portable Spectrum Analyzer

www.AvcomOfVA.com 804.794.2500

MADE IN USA

Satellite Manufacturing and Launch Markets Find a New Normal in US$ 250 mil. Opportunity

Cambridge, Mass., May 16, 2018–NSR's Satellite Manufacturing and Launch Services, 8th Edition report, released today, finds that despite a slow 2017, across the board, the global satellite manufacturing and launch market is poised to generate in excess of $250B in the next decade. As both commercial and government players begin deploying constellations, turning to smallsats to provide more flexibility across a system, and leveraging more advanced flexible and exquisite payloads, the requirements placed on manufacturers and launch service providers enabling these next generation systems will change.

"Communications remains the global market driver, though it is diversifying from GEO-only to a blend of GEO and non-GEO as operators deploy new assets and seek to create more integrated systems capable of seamlessly addressing customer demand," commented Carolyn Belle, NSR Senior Analyst and report author. "Yet commercial hesitancy to commit to new communications assets and new CAPEX, compounded by a natural lull in government system development, made 2017 a challenging year for satellite manufacturers. The market will improve in 2018 and 2019 before adjusting to a level of annual GEO orders lower than historic averages, plus additional non-GEO contracts," noted Belle. Situational awareness and technology development have received a renewed focus and will play an increasingly vital role in the market moving forward, built on escalating government activity and commercial players emerging for the first time.

North America led the market in 2017 and is expected to continue as the global hub of activity, due to both ongoing government demand for high value satellites as well as a robust commercial market. Activity across Asia is closing this gap, however, with China, India, and Japan placing a greater emphasis on competition and capabilities in the space domain. Alongside heightened geopolitical tensions and the perception of new threats to space assets, defense and intelligence spending on space is set to increase around the globe. In a world more reliant than ever on ubiquitous connectivity and data big and small, demand for satellites is not going away – but manufacturers and launch service providers must creatively address requirements to capture the opportunity.

As both military and commercial satellite operators broaden their concept of operations to include multiple payloads, orbits, and service models, manufacturers and launch service providers are challenged to deliver compelling, innovative solutions that address and anticipate operator requirements.

The *Satellite Manufacturing and Launch Services, 8th Edition* report provides must-have information for the backbone of the satellite industry, providing a critical view into historic trends, evolving requirements, and upcoming demand and revenue for satellite manufacturing and launch services across all user types, applications, and regions.

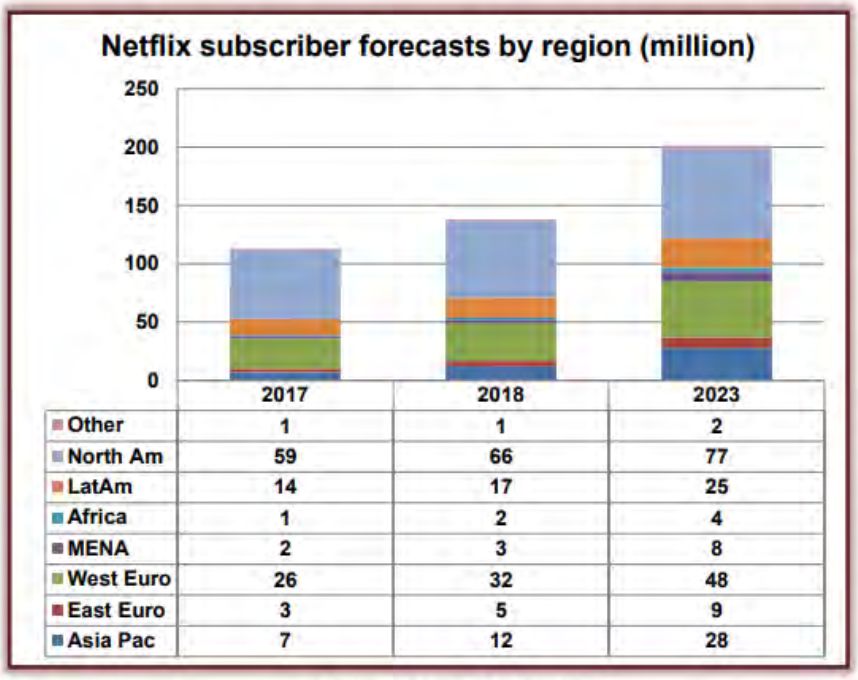
Netflix to reach 201 million subscribers by 2023

London, UK, May 16, 2018—Digital TV Research forecasts that Netflix will have 201 million streaming subscribers by 2023, up by 82% from 111 million at end-2017.

About 28 million subscribers will be added in 2018 – making it the largest growth year ever. Lower growth is expected after 2018, according to the Netflix Forecasts report.

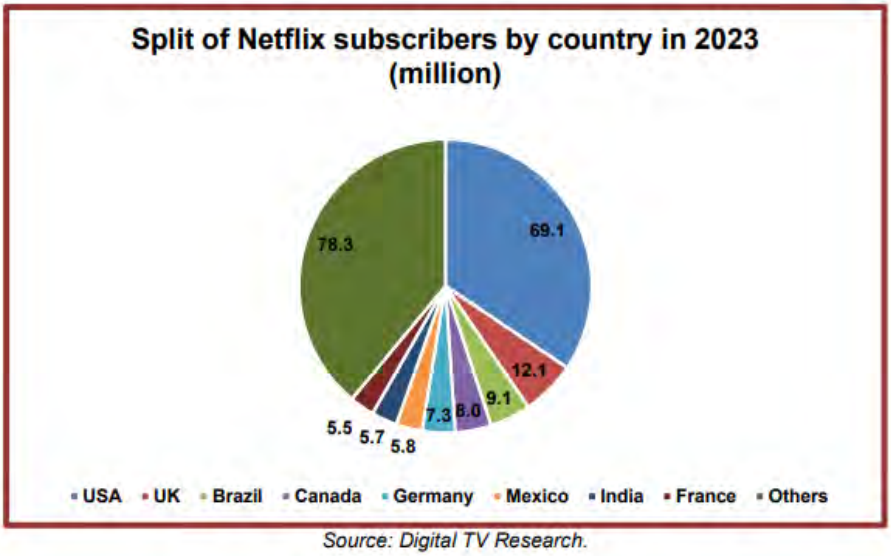
North America and Western Europe will together supply 62% of Netflix's total subscriber base by 2023 – still dominant, but down from 76% in 2017. Asia Pacific will boast fast growth by taking 14% of the 2023 total. This represents 28 million subs; quadruple the 2017 figure.

Simon Murray, Principal Analyst at Digital TV Research, said: "These forecasts are a lot higher than the last edition of this report. Similar to many other analysts, we underestimated the fast take-up in international markets."



	2017	2018	2023
Other	1	1	2
North Am	59	66	77
LatAm	14	17	25
Africa	1	2	4
MENA	2	3	8
West Euro	26	32	48
East Euro	3	5	9
Asia Pac	7	12	28

Source: Digital TV Research.

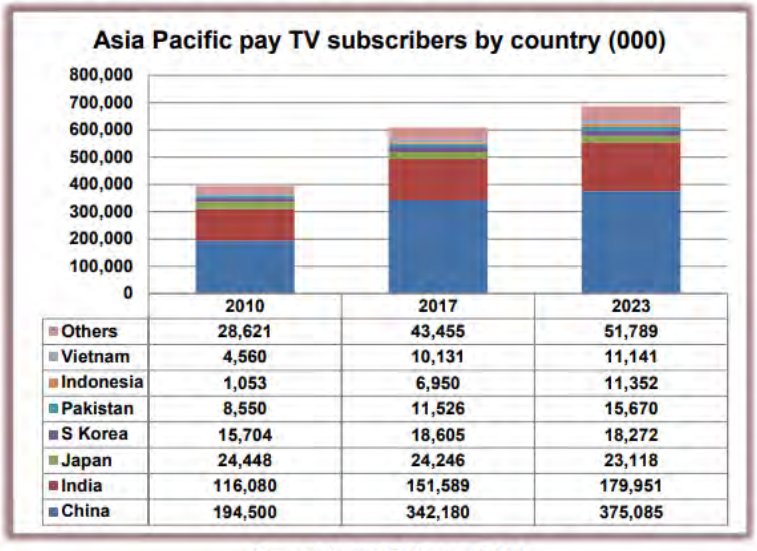


Source: Digital TV Research.

The top five countries will supply 53% of Netflix's subs by 2023; down from 69% in 2017. Although the number of international subs overtook US ones in 2017, the US will still contribute 44% of subscribers by 2023 – and will add 16 million subs between 2017 and 2023.

Streaming subscription revenues for Netflix will climb by 155% from $11.3 billion in 2017 to $28.8 billion in 2023. The top five countries will generate revenues of $16 billion in 2023 – or 56% of Netflix's global subscription revenues. The US will contribute $11.2 billion, with four other countries above $1 billion.

Advertisers' Index



	2010	2017	2023
Others	28,621	43,455	51,789
Vietnam	4,560	10,131	11,141
Indonesia	1,053	6,950	11,352
Pakistan	8,550	11,526	15,670
S Korea	15,704	18,605	18,272
Japan	24,448	24,246	23,118
India	116,080	151,589	179,951
China	194,500	342,180	375,085

Source: Digital TV Research Ltd

The Asia Pacific Pay-TV sector is bucking the downward trends in much of the rest of the world. Subscribers will grow by 78 million and revenues by $2.73 billion between 2017 and 2023, according to the *Asia Pacific Pay TV Forecasts* report by Digital TV Research.

MEET NEWTEC DIALOG THE PLATFORM THAT EMBRACES CHANGE

FLEXIBILITY • SCALABILITY • EFFICIENCY

NEW RELEASE 2.1
HUB PORTFOLIO FOR
SMALL TO MULTI-SERVICE
HTS & GLOBAL NETWORKS

NEW COMPLETE
DVB-S2X WIDEBAND
MODEM PORTFOLIO

VISIT US AT

COMMUNICASIA
JUNE 26 - 28, 2018
BOOTH 1 P2-01
SINGAPORE

BROADCASTASIA
JUNE 26 - 28, 2018
BOOTH 4 U3-01
SINGAPORE

#NewtecDialog
www.newtec.eu
Follow Newtec Satcom on

Newtec Dialog®

ADVANTECH
WIRELESS

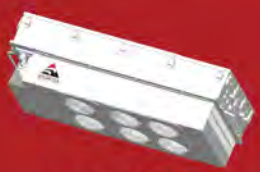
Second Generation GaN based SSPAs/BUCs in C, X, Ku and Ka-Band

250W C-Band
2nd Generation GaN SSPA/BUC

400W C-Band
2nd Generation GaN SSPA/BUC

300W-400W C-Band Rackmount
2nd Generation GaN SSPA/BUC

400W Ku-Band
2nd Generation GaN SSPA/BUC



1,250W Ku-Band
2nd Generation GaN SSPA/BUC

Visit us at **CommunicAsia 2018** Booth 1V1-12

www.advantechwireless.com