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SATELLITE Markets & Research

Industry Trends, News Analysis, Market Intelligence and Opportunities

The Changing Video Market

by Elisabeth Tweedie, Associate Editor

Advances in technology: are they good news or bad news for the satellite industry? The satellite industry is powered by some of the best engineers in the world. Working together, and sometimes with their colleagues from the broadcast and telecommunications industries, tremendous advances in technology have been made over the years. While no one would dispute the technological brilliance of some of these advances, have they always benefited the industry? This article focuses on some of the more recent developments in video.

The rapid spread of Netflix, Amazon Prime and other Over-the-Top (OTT) video services, fueled by the rollout of broadband to the home, has long been quoted as sounding the death knell for Direct to Home (DTH) satellite television and linear TV in general. But, although Netflix launched its streaming service over ten years ago, and now has over 117 million subscribers in 190 countries, the impact on the satellite industry, so far has been negligible. According to Dataxis, globally, DTH added seven million subscribers last year. NSR, in its 2017 report on Linear TV via satellite, forecast an additional 12,200 satellite TV channels in the ten years between 2016 and 2026. Granted some teleports have lost channels to the OTT industry, but in many cases, they have also gained new business, as the OTT service providers, recognize the operators' expertise in content distribution. MX1 for example distributes content to Amazon Prime.

Satellite technology still remains the most efficient method of distributing content to a large number of viewers. And as the world moves from Standard Definition (SD) to High Definition (HD) to Ultra High Definition (UHD), also known as 4K, satellite gains another advantage. Namely that of higher bandwidth. The OTT players are definitely leading the way, when it comes to the making and distributing 4K content. However, around the world, the number of subscribers that are able to view 4K content, is limited. Netflix recommends that in order to view an HD movie, a viewer needs a connection of at least 5Mbps, for UHD the figure is 25Mbps. Even in well-developed markets, outside of urban conurbations, this bandwidth is rarely found.

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The Video Market

Broadcast video has been a staple of the satellite industry. In its heyday, video revenues from broadcasters comprise up to 70% of revenues from satellite operators. But the video market is changing, which more Over-the –Top (OTT) and other non-linear services gaining popularity especially among the younger demographics. Cor-cutting, or cancellation of cable and satellite subscription are the norm.

To navigate the changes in this important market, our Associate Editor, Elisabeth Tweedie covers this topic in our lead story this month. As she reports, the rapid spread of Netflix, Amazon Prime and other OTT video services, fueled by the rollout of broadband to the home, has long been quoted as sounding the death knell for Direct to Home (DTH) satellite television and linear TV in general. But, although Netflix launched its streaming service over ten years ago, and now has over 117 million subscribers in 190 countries, the impact on the satellite industry, so far has been negligible.

Most likely, we will learn more developments in this important segment of the market at this month's Satellite show in Washington, D.C. and at the NAB in Las Vegas next month. Rest assured that we will be at both shows to report on the key updates and highlights. We look forward to seeing you at both these important industry events.

Virgil Labrador
Editor-in-Chief

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

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Netflix publishes monthly speed indexes. These show the average best primetime streaming speed from individual ISPs, averaged by country. For 2017, Switzerland was consistently the top-ranking country, with an average monthly primetime streaming speed that varied between 4.11 and 4.32Mbps. Far below that required for UHD.

"...Satellite technology still remains the most efficient method of distributing content to a large number of viewers...."

Satellite on the other hand, with the right set top box can deliver HD and UHD directly to the home. And for the last several years, the move to HD has been responsible for an uptick in transponder usage, as broadcasters not only introduced HD channels, but in many instances also continued to broadcast the same channel in SD. By definition, higher quality video, basically requires more bandwidth. Improved compression (H.264) helped to offset this, but not totally. An HD channel still requires more transponder capacity than an SD channel.

Satellite technology has one advantage over Over-the-Top (OTT) services—it can deliver Ultra HD directly to the home.

UHD was first announced by the Consumer Electronics Association, as a display standard in 2012. Less than three months later, in January 2013, HEVC was ratified as a standard. HEVC (also known as H.265) is the successor to H.264. However, even with this improved compression, UHD still requires around 20Mbps. i.e. four times more bandwidth than HD. At first glance, this seems like good news for the satellite industry. But, that would assume that the broadcasters are price insensitive and willing to pay four times the price to transmit a program in UHD.

However, earlier in 2012, Newtec, along with SES and other members of the DVB Project (an alliance of about 200 companies) took the lead, in pressing for an update to the DVB-S2 transmission standard. As a first step, that year, Newtec launched Clean Channel Technology™ as a software update. This improved efficiency for broadcast contribution by up to 15% compared to DVB-S2. The updated DVB-S2X standard, was officially introduced in 2014, and resulted in an efficiency gain of between 15 and 30% in a typical distribution network. In a contribution network, the saving is even more impressive with gains of up to 51%.

According to Newtec, for content contribution and primary distribution to cable headends, etc., the satellite operational savings (OPEX), gained by using DVB-S2X far outweigh the capital expenditure (CAPEX) of installing new modems. In order to upgrade to DVB-S2X an operator needs one new modem, per remote site. The existing Integrated Receiver Decoders (IRDs) need not be replaced, so upgrading to DVB-S2X can be independent of upgrading to HEVC.

However, this is not an either/or situation. HEVC can be combined with DVB-S2X for even great efficiencies. For DTH subscribers, since a new Set Top Box (STB) will be needed for 4K anyway, it makes sense to incorporate DVB-S2X chips into the same STB.

Modems incorporating DVB-S2X are available from all the major manufacturers: iDirect, Comtech EF Data, Newtec, Gilat, Hughes etc. Newtec, however, has gone one step further in the drive for efficient use of transponder capacity. It has introduced DVB-S2X Channel Bonding. Combining HEVC and DVB-S2X, it is possible to transmit three (20Mbps) UHD channels on a 36MHz

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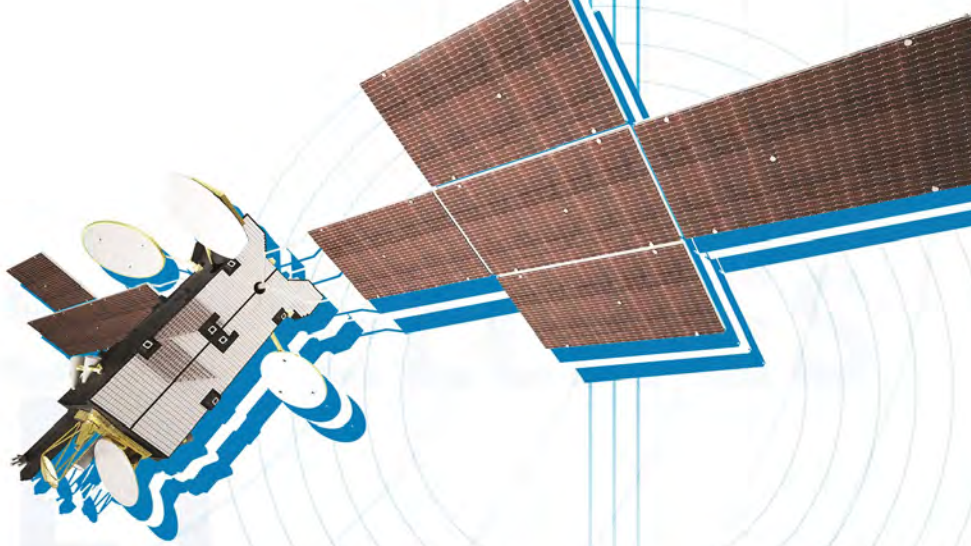
transponder, so three transponders would carry nine channels. Channel bonding, uses statistical multiplexing to create a single high bitrate transport stream for multiple UHD channels. This stream is distributed over three transponders, treating them as a single entity. As a result, 11 UHD channels can be transmitted from 3x36 MHz transponders, instead of nine.

On the contribution side of the video business, Satellite Newsgathering (SNG) has seen tremendous competition in recent years. This has come from new service providers, such as LiveU, who introduced cellular channel bonding, to enable broadcasters on location, to use cellular networks instead of satellite, to transmit breaking news stories and minor events. This works well up to a point. It is cheaper, but the quality is rarely as good, as that which can be delivered from a dedicated satellite link, but in many cases, it is adequate for the purpose. The main issue, is that of crowded cellular circuits. The first news crews to arrive at a breaking news site, will probably get good connections, but as more crews arrive; as well as the general public, all of whom are using their cell phones; the circuits become congested and the quality of service deteriorates. Nevertheless, it is undoubtedly true, that the use of bonded cellular, has enabled news crews to cover many events that would not have made economic sense had satellite been the only means of transmission.

One solution to to the congestion and quality issues, has been developed by Dejero and Intelsat. The service is known as CellSat. Cellsat, blends up to six cellular signals (from multiple providers) with Ku-band IP connectivity from Intelsat. The overflow IP packets that the cellular networks can't handle are automatically routed to satellite. This gives broadcasters the assurance that they will have access to high quality transmission, regardless of how congested the cellular networks become. For the broadcaster, it is an easy "one stop shop" that doesn't require them to pre-book satellite time. The software uses complex algorithms powered by a Dejero Encoder and a Newtec Modem to manage the fluctuating bandwidth of individual cellular connections and to dynamically allocate satellite bandwidth as needed for optimal performance.

So have these advances in technology been good for the industry? In the case of the move to HD, undoubtedly. It led to greater demand for bandwidth to transmit the existing channels, and also to the development of new channels to take advantage of improved



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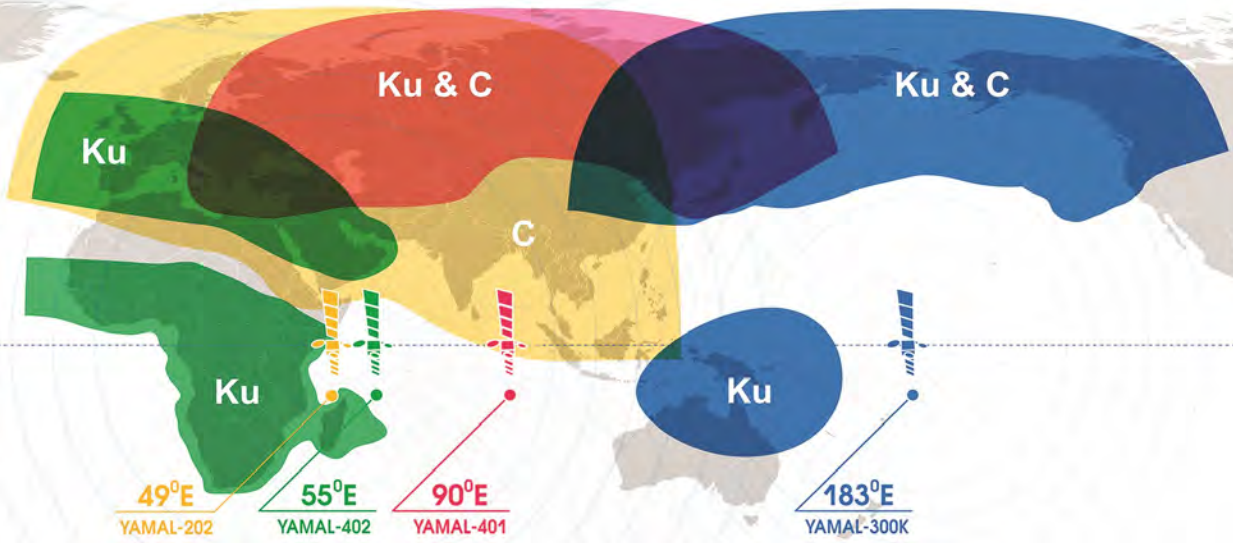

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picture quality it brought. Many industry "experts" expected UHD to follow the same uptake as HD and therefore provide significant additional business. Whilst the number of channels is increasing, the overall numbers are still relatively low. SES, with 30 channels on its North American UHD platform, has the largest concentration of UHD channels in the world. Many reasons have been cited for this, and I have discussed them in previous articles. One of the most compelling ones, being that of cost. It costs significantly more to make a program in 4K, but advertisers generally don't pay any more to have their advertisement shown on a 4K channel. The additional cost, comes both from the equipment needed, and from the cost for additional transponder capacity. HEVC, DVB-S2X and channel bonding, do a great deal to mitigate the latter. Whether, ultimately this is good news or bad news for the satellite industry as a whole, remains to be seen. It certainly allows the operators to make more efficient use of their assets. If this greater efficiency is passed onto the customers in the form of lower lease prices, it may well help drive demand, for UHD capacity, so it will be a good thing. If, on the other hand, UHD fails to reach a critical mass, and the technology is used for existing HD channels, it will significantly decrease the capacity needed, and one would assume the revenue of the operators. Ericsson, is already pushing HEVC with DVB-S2X as a way of saving transponder leasing costs for the broadcasters. So, good news for the ground service providers, potentially less so for the satellite operators.

Combining cellular and satellite for SNG, is both a defensive move and a means of getting new customers. As already mentioned, bonded cellular, led to an increase in the number of news events covered by broadcasters, as well as taking away existing SNG customers from the satellite service providers. The combined service will bring some of those new customers to the industry, as well as help bring back, albeit on a smaller scale, some of those lost to bonded cellular. So definitely a good thing.

So, in spite of the gloomy voices predicting the demise of satellite TV due to the rise in OTT services. Satellite's inherent advantage of one to many distribution, coupled with the recent technology advances in compression, transmission and channel bonding, mean that satellite is still very well placed to deliver HD and UHD and will remain so, for many years yet.

Elisabeth Tweedie has over 20 years experience at the cutting edge of new communication and entertainment technologies. She is the founder and President of Definitive Direction a consultancy that focuses on researching and evaluating the long term potential for new ventures, initiating their development and identifying and developing appropriate alliances. During her 10 years at Hughes Electronics she worked on every acquisition and new business that the company considered during her time there. www.definitivedirection.com
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Key Considerations in Choosing BUCs and SSPAs

by Virgil Labrador
Editor-in-Chief

Block Upconverters (BUCs) and Solid State Power Amplifiers (SSPAs) are important elements in a satellite ground system as they are used in satellite uplink transmissions and are a key component in determining potential data rates.

The increasing demand for connectivity has prompted users of satellite services to demand capable satellite network infrastructure. With new High Throughput Satellite Systems (HTS) coming online in the market, it is essential for the satellite ground station equipment providers to work closely with satellite operators to provide the necessary hardware suitable for a broad range of services.

With so many choices of BUC and SSPA manufacturers available, price competition is often seen in the marketplace, especially with manufacturers overseas. However, satellite service providers and users of satellite ground equipment should base their selections on a variety of factors and not solely on price. Factors to consider are company reputation, financial stability, past customers, testimonials, and warranties. When choosing a BUC or SSPA manufacturer, one should look at the track records of companies and see if they are able to make delivery commitments and deliver on what they promise. Finally, companies with decades of industry experience and financial stability, offer after-sales support which is critical in the satellite communications sector.

"..With so many choices of BUC and SSPA manufacturers available, price competition is often seen in the marketplace...However, satellite service providers and users of satellite ground equipment should base their selections on a variety of factors and not solely on price. ...."

One company that has been in the market for a long time is Norsat International. In a recent interview with Norsat's Brian Donnelly, Vice President of Sales and Marketing, he states: "Norsat celebrated our 40th anniversary in 2017 and we're proud that a large part of our success is due to long term loyal customers, many of which have been procuring satellite technology from us for decades." Norsat has been in the satellite communications industry since 1978 and is known globally for delivering high quality, high performance products including portable satellite terminals, satellite components, and satellite networks. Donnelly reinforced this notion saying, "Some of our customers have moved to Norsat because they were frustrated by false performance or incorrect technical specifications of products such as output power or noise. Norsat products meet the specifications we advertise, we deliver on-time, and we support our products and customers for the life of the product. In short, we take care of our customers."

Design Considerations - SWaP

Applications are becoming more complex and design engineers are constrained by requirements such as limited size, weight restrictions, and power requirements; these constraints lead to more custom products. When designing for BUCs and SSPAs, the term, SWaP, which stands for size, weight, and power, is commonly heard throughout the design stages. Depending on the requirements, it is up to the engineering team to design the best BUC or SSPA for the customer's needs.

SWaP plays a major part in the design process. For example, BUCs and SSPAs create a lot of thermal energy based on their comparatively high-power consumption requirements. At various power levels, a BUC or SSPA draws more power than output power due to heat-related and other power wastage. This measure is defined as the BUCs/SSPAs power efficiency. Longer RF runs inside or outside the BUC can also lead to signal loss or a reduction in efficiency. How the heat is physically dissipated varies by output power, design, and application. Heat sinks versus fans, or a combination of the two, are often used to cool the BUC or SSPA so that operation in extreme heat (e.g. 70^{o}C) can be achieved. At lower powers, cooling fins, and heat sinks usu-

ally suffice. As the power outputs and sizes increase, the resulting higher thermal load requires cooling fans, spreaders, and heat pipes. Fans have limitations as they yield very concentrated heat densities and are disproportionately large. They also do not work well at altitude where there is little air to move. When customizing products and designing for SWaP, heat dissipation is an important factor.

"...One of the key differentiators that make our products stand out from the competition is our ability to customize. We can tailor our products in many ways such as shifting the frequency, changing the form factor, and meeting complex technical specifications such as MIL-STD requirements..."

-Brian Donnelly, VP-Sales & Marketing, Norsat

In further discussions with Norsat's Brian Donnelly, he expressed, "One of the key differentiators that make our products stand out from the competition is our ability to customize. We can tailor our products in many ways such as shifting the frequency, changing the form factor, and meeting complex technical specifications such as MIL-STD requirements. Certain military and airborne projects require stringent specifications including vibration, shock, and extended temperature operation. Norsat has many of these products off-the-shelf, but if not, we can customize an existing product or design a new product to meet the customers exact needs."

Designing for the Application

Depending on the application, a custom BUC or SSPA may be the best solution. For example, in airborne applications, space and weight is constrained and fuel consumption margins need to be considered. Off-the-shelf products cannot meet these needs so therefore customization is required. As for maritime applications, weight is somewhat less important than space which expands the product range available. However, when the radome is considered in the design, this enforces extremely compact form factor requirements. The radome creates thermal issues and could potentially overheat the unit so custom products may be necessary. As for land-based vehicular Communications on the Move (COTM), space is limited, and weight also imposes penalties on performance. Some form of customization may be needed for the BUC or SSPA to work properly in the application it is being used in.

When looking for a manufacturer to customize the BUC or SSPA, look for a manufacturer with a broad range of products, such as Norsat. Donnelly adds, "Another key differentiator for Norsat is our broad product portfolio. We cover all the key bands such as C-, Ku-, Ka-, and X-Band-and have a large array of output powers from 2W to 200W. When purchasing from Norsat, customers can have a one-stop shop for satellite components including BUCs, SSPAs, LNBs, LNAs, BDCs and more. If our portfolio doesn't have the exact product a customer is looking for, we likely can customize a product to meet their exact needs. Added to this we also have redundant switch capability and extensive certifications for airborne, maritime and military and comms-on-the-move applications,"

Application Note: Norsat Customizes a BUC Design for a Military Communications-on-the-Move (COTM) Application

An example of meeting specific client requirements was the case of a North American military organization

Norsat's ATOM BUCs and SSPAs

The ATOM series of Ku and Ka-band Block Upconverters (BUCs) and Solid State Power Amplifiers (SSPAs) are small, light, and extremely powerful. With industry best size, weight, power and efficiency, ATOM series BUCs are easily integrated into a variety of systems, making them ideal for applications such as: COTM/COTP, Portable VSAT, CDL, Airborne, RADAR and TWTA replacement.

requiring an extremely low-profile BUC for a Communications-on-the-Move (COTM) application. The BUC had strict specifications on size and weight as the application required a lightweight, small, and inconspicuous design. The design needed to be low profile and discreet as radomes of communications equipment have become a target to military enemies. Norsat International, the chosen vendor, worked together with the military organization to ensure the finished project would be designed exactly as the customer envisioned. Communications commenced early even before the project officially started with technical specifications and initial proof of concepts.

The specified dimensions were flat, and the design would be based on Norsat's 40-Watt ATOM Ku-band BUC. The ATOM BUC was reconfigured and redesigned to fit the customer's specifications by taking the vertically stacked board layout and separating them, lying them side by side. This layout took a breadbox form factor (approximately 6.7 inches height) and flattened it to be shorter and wider like a pizza box form factor (approximately 2 inches height). With the change in size, heat dissipation needed to be addressed. Norsat overcame this design challenge and was able to manufacture a BUC that fit the specified dimensions and worked effectively. Norsat and the military organization cooperated to ensure that the product completed was what was expected, including re-validating the environmental certifications. Having clear requirements and open communication resulted in project success with the first two units shipped to the customer ahead of schedule. The customer tested the product and provided feedback to Norsat's engineering team. Norsat then worked with the customer to modify the design for the final product, which included a high temperature range option beyond the typical 60^0C. The customer was thrilled with the end-product and the project moved into production.

Conclusion

Choosing the correct BUC or SSPA provider depends on many factors, including, but not limited to: company reputation, application expertise, production capability, customization ability, quality programs (e.g. ISO 9000) and third-party certifications, among others. Though most manufacturers

say they can customize your product, many of them do not have the capability to do so for small quantities at a reasonable price point. It is important to thoroughly research the manufacturer and ensure that they have a track record of delivering on what they promise. Choosing the right manufacturer is essential in meeting the many challenges and complex requirements of the new satellite systems coming in the next few years and the key applications driving these systems.

Virgil Labrador is the Editor-in-Chief of ***Satellite Market and Research*** based in Los Angeles, California. He is the author of two books on the satellite industry and has been covering the industry for various publications since 1998. Before that he worked in various capacities in the industry, including a stint as marketing director for the Asia Broadcast Center, a full-service teleport based in Singapore. He can be reached at: *virgil@satellitemarkets.com*

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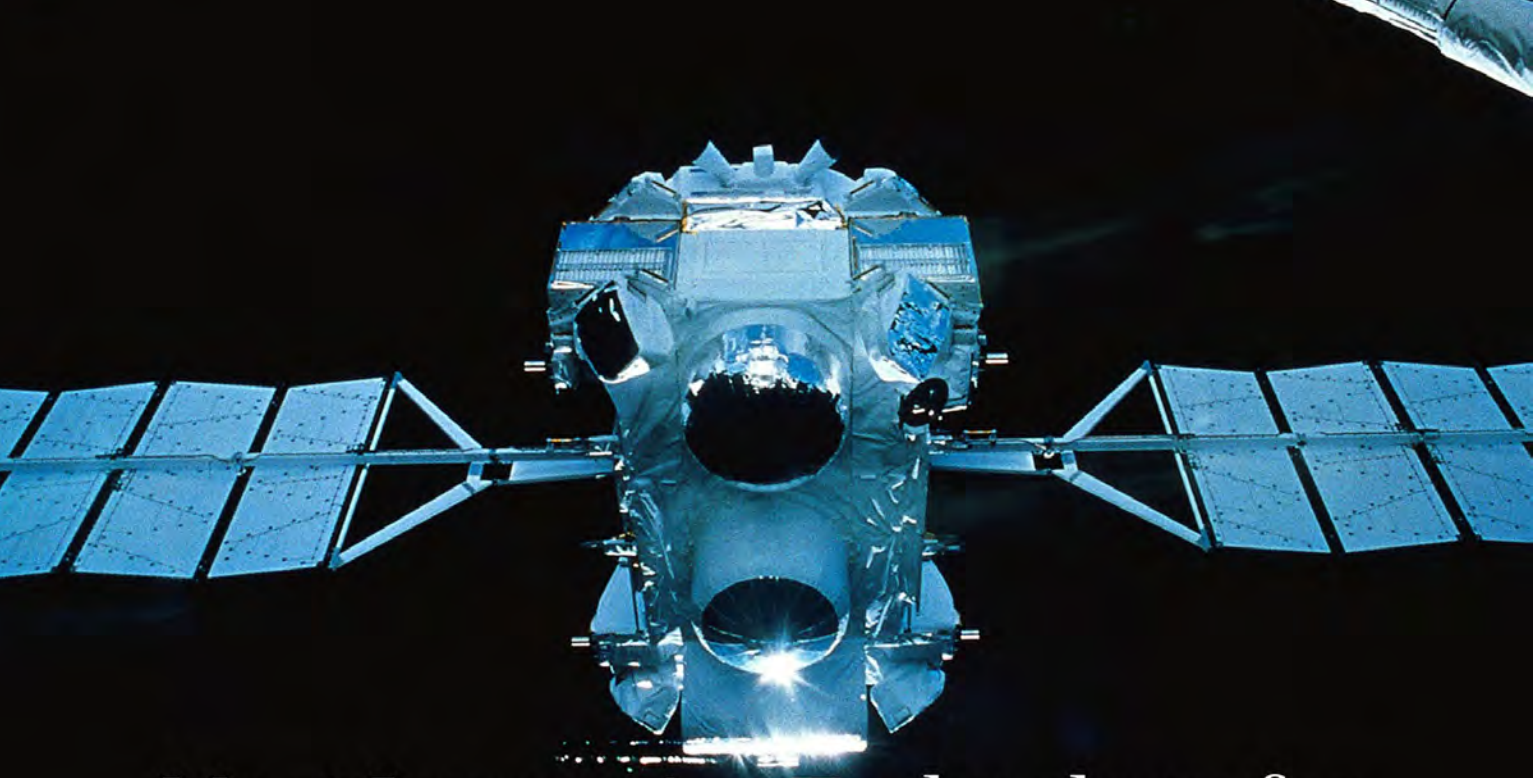

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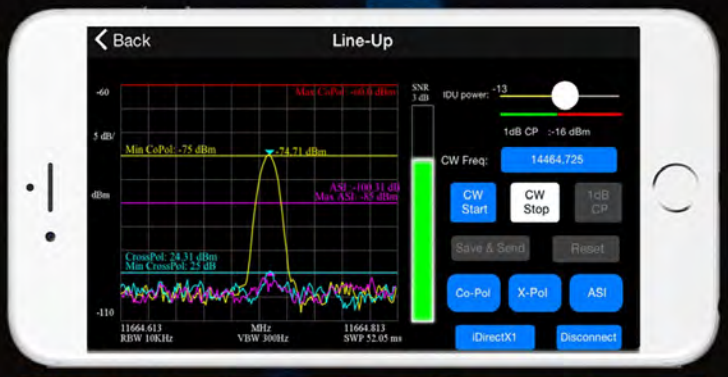

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How Teleport Operators Respond to Market Disruption Will Determine Their Future

by Robert Bell

The business environment in which teleport operators work is being disrupted by technology and market change. Their established businesses face disruption from new models of connectivity (HTS, MEO and LEO), by the rising domination of software over hardware, and customer demands for seamless global service. They are disrupting their own operations by innovating up the value chain to meet new customer needs, which requires a new depth of technology knowledge and strong management skills.

The CEO of one company summed it up: "Everybody desperately wants to know where things are headed right now – and nobody knows."

At the end of last year, WTA set to find out – or at least to survey the collected wisdom of the executives who have to make decisions today that will shape the success of their companies tomorrow. Our upcoming Teleport Opportunity Report explores how service providers in different market segments are adapting. What market opportunities are they targeting and where are they investing their capital? What are their biggest obstacles to growth and the biggest threats to their survival?

Here are some of the more interesting findings:

- Of the top five growth opportunities cited by executives whose companies principally serve media & entertainment customers, only two are in media & entertainment. That may reflect a dim view of their core business's future: nearly half expect decline in DTH, terrestrial and cable origination and distribution.

- Media-focused companies are betting on developing their own private cloud services as a winning strategy. Because TV content owners continue to hesitate on adopting public cloud services like AWS, they see opportunity in providing a "safer pair of hands" for their customer's precious content. Data-focused operators, however, are investing in integrating public cloud services into their offerings, apparently reasoning that they are never going to beat Amazon at its own game.

- Despite the rising value of data and analytics, teleport operators' top three investment priorities continue to be in satcom infrastructure at their teleports, encode/decode and modem technology, and network management systems. Data center and IP infrastructure, OTT technology and security encryption are lower priorities – but rise in importance when we asked executives what they would be investing in three years from now.

WTA member companies get free access to the report when it is published on January 25. It is also available to non-member companies for a price. Hint: it pays to be a member!

Robert Bell is Executive Director of the World Teleport Association, which represents the world's most innovative teleport operators, carriers and technology providers in 46 nations. He can be reached at: rbell@worldteleport.org

Satellite Agenda "Access New Areas": Major Trade Shows in New Partnership with GVF-EMP 2018 Programs

by Martin Jarrold

The GVF agenda of conference program engagements, as it continues to encompass a broader and broader remit, will, in the week following my preparation of this column, lead me to the city of Copenhagen and to panel discussion of the present and future of autonomous shipping and its implications for the maritime satcoms environment. Autonomous Shipping is an innovation that generates much controversy and one that stimulates intense debate including such varied perspectives as "It's all a lot of hype" through to "Exciting times for next generations COTM". The outcomes of this dialog will be something I shall be introducing to the agenda future meetings/teleconferences of the GVF Maritime SatCom Forum (MSF), which I co-chair with Roger Adamson of Futurenautics.

More broadly, on the question of innovation. This is also coming in 2018 to a number of the events programs of the partnership between GVF and UK Event Management Partners (EMP), most particularly in June and July, in engaging with **5G World** in London and the **Farnborough International Air Show**.

GVF-EMP has announced details of the series of programs taking place in March, May, June and July 2018, beginning with **Connectivity 2018: Evolving the "New" New Verticals – Air – Sea – Surface - Rail**, to be held in London's Canary Wharf district on 21st March 2018. The latest iteration of the annual **Connectivity** program to address the growth of satellite communications verticals encompassing the mobile aeronautical, maritime, land, and rail environments will feature four principal panel-based discussion themes focusing on **[1]** Space & Ground Segment, **[2]** The Varied Connectivity Ecosystem, **[3]** Mobile Connectivity, the Cloud & IoT, and **[4]** Building User-Vertical Applications – Development & Deployment Environments.

On 10th May the city of Aberdeen will once again be the host location for **Oilfield Connectivity 2018: The Next Generation Digital Oilfield**. This conference will be the 11th program in the series dedicated to communications in Europe's

oil & gas ecosystem, bringing to the market an ICT-oriented dialog at the crucial interface of demand for ICT solutions by the energy vertical and the supply of those solutions from the satellite connectivity industry.

"...The dynamics of oil market supply and demand are set against the backdrop of the always dangerous, harsh, and emote environments where exploration and production take place, and against the constant demands of the industry's commercial and operational centers for cost and efficiency..."

The dynamics of oil market supply and demand are set against the backdrop of the always dangerous, harsh, and remote environments where exploration and production (E&P) take place, and against the constant demands of the industry's commercial and operational centers for cost and efficiency innovation enabling communication with E&P rigs and platforms. Robust communication is a Digital Oilfield imperative, and in this context the conference will discuss issues surrounding mobility, M2M/IoT & Big Data, the Cloud, HTS satellite capacity and capability, cyber security and hybrid technology connectivity solutions. This event will focus on the evolving challenges.

The second and third quarters of 2018 will bring our key innovations to two further, and established, GVF-EMP programs – **Cellular Backhaul** and **AeroConnect**. **Cellular Backhaul 2018: Smartphones & Tablets - To the Satellite Network & the World**, a regular feature of the GVF -EMP calendar for the last three years, changes venue, context, and format this year and will be held on 14th June during, and in association with, **KNect365's 5G World | IoT World Europe | Digital CX World | Smart Transportation & Mobility**, which runs over 12th to 14th June.

The KNect365 event – held at the Excel Exhibition Centre in London's Docklands and which has the 3GPP as a Strategic Partner – attracts the participation of 2000+ telecoms professionals representing around 100 Telcos and MNOs and the GVF-EMP program will feature alongside such other elements as Executive Keynotes, a 5G Standards & Spectrum Workshop, a Demo Zone & Content Theatre, a Network Security Focus Day, and an Antenna Evolution Focus Day.

The format, as well as the venue, will be different, in that the program will take place embedded within the event's exhibition space and will therefore bring added value for exhibition attendees. Moreover, it will give key focus to the imperatives of the role of satellite in a 5G networking future – because that future is a global communications ecosystem which will integrate satellite and 5G in unified networks – as recognized by the 3GPP and 5GPPP, and as represented by the European Space Agency Satellite for 5G Initiative (S45G) to which GVF is signatory.

Farnborough International Air Show (FIA), which takes place 16th to 22nd July, this year opens its new multifunctional Exhibition & Conference Center and during Farnborough week the center will be the venue for **AeroConnect2018@Farnborough** (19th July). The Air Show, one of the most important events in the global aerospace calendar, occurs every two years and in 2016 it brought the participation of 82 of the top 100 aerospace companies in the world with 71 per cent of the 1500 exhibitors from outside the UK and representing 52 countries.

The significant pairing of these two events as **AeroConnect@Farnborough** recognizes this major innovation. Today the aerospace market, the scale and scope of which is nowhere better illustrated than at this most prestigious of industry shows, is as much about communications connectivity as it is about airframe design, engine efficiencies, aircraft performance, etc. So many of these (and many other) parameters, as the objects of inflight measurement, generate mega-data that is gathered in real-time over satellite connectivity.

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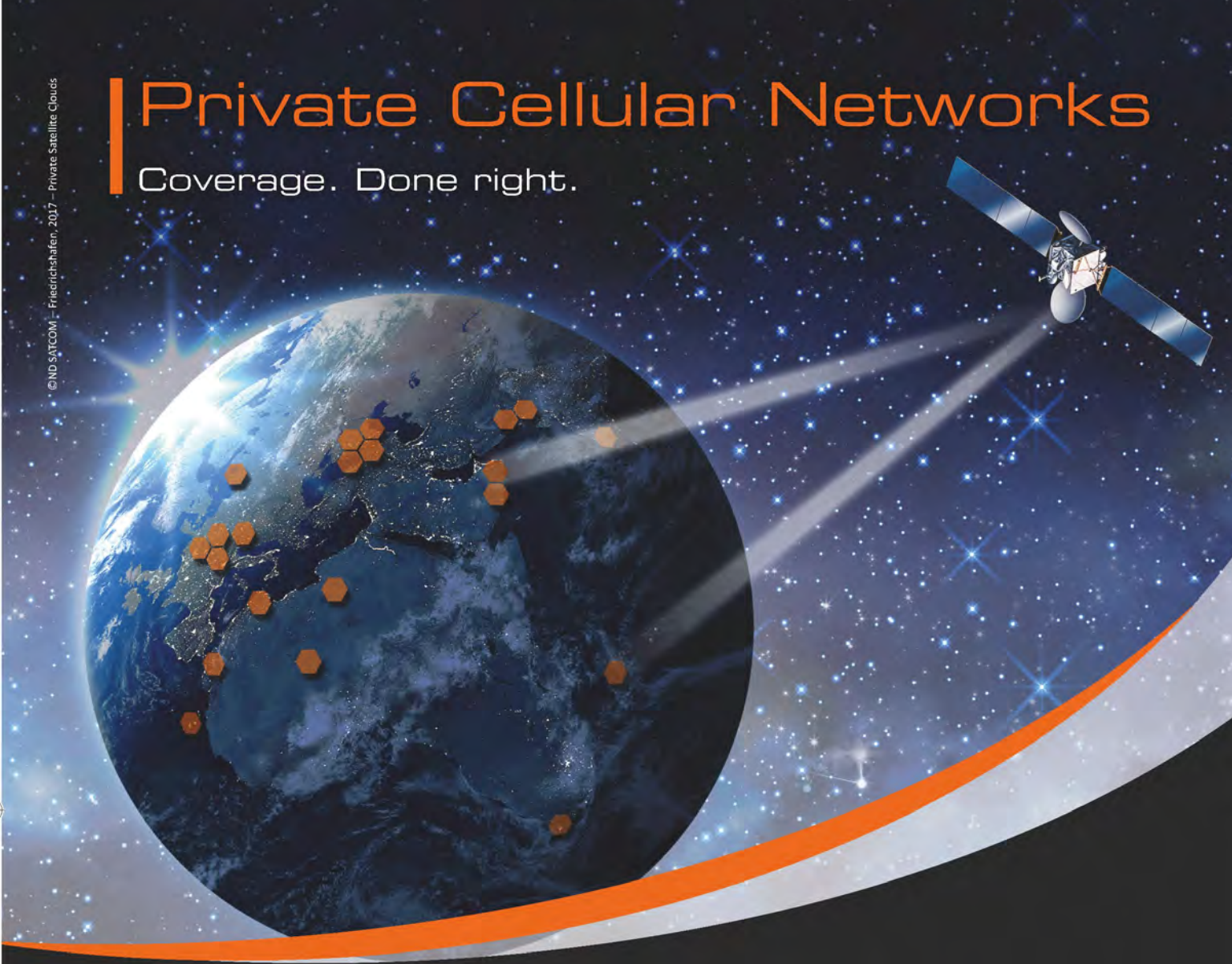

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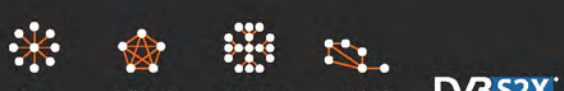

ND SATCOM

Meet us at SATELLITE 2018, Booth #2319

Connectivity 2018: Evolving the "New" New Verticals - Air - Sea - Surface - Rail, the first of 2018's GVF-EMP events, takes place at **De Vere, No. 1 Westferry Circus, Canary Wharf, E14 4HD**. The program will examine some of the key themes, technological developments, and market trends that feature on the path to a universal via-satellite connectivity ecosystem. The program will analyze continuing developments in the satellite communications marketplace, with high throughput satellite (HTS) payloads – in geostationary orbit, in medium and in planned low earth orbit constellations – serving multiple new and emerging vertical markets. The program will reference such varied topics as: Future of Mobile Backhaul; Satellite & MNOs; Communications-on-the-Move; Mining & Remote Resources; Hospitality & Mobile Connectivity; Networks & Cyber Security; M2M & IoT; Vehicle Telematics & Smart Cities; Intelligent Highways; Connected Rail Services; The Cloud Interface; Satellite + Terrestrial Wireless Synergies.

As at 23rd February the program has attracted registrations from more than 60 companies and other organizations, including: Access Partnership; Aetheric Engineering; AKD Sat-Com; Anver Ltd; APT Mobile Satcom Limited; Avanti Communications; Beaconseek; CETel; China Satellite Communications; Comtech EF Data; CVL; European Space Agency; Europasat; Eutelsat; FBS UK Ltd; Futurenautics; General Dynamics Satcom; Global Eagle; GoMedia; GTS Ltd; Hispasat; Honeywell; Hughes Network Systems; Inmarsat; Innovate UK; Inster; Integrasys S.A; Intelsat; IP Access; IRG; Isotropic Systems Ltd; Karlsen Associates; Kratos; M&J Communications; Navarino UK; ND Satcom; Neuco; NWNS; PA Consulting; Paradigm; PHASOR; Pico Services; PTC/ThingWorx; Razor Secure Ltd; RDP Media; RigNet; Satellite Applications Catapult; Satellite Evolution; Satellite Mobility World; Sematron; SES; Soracom; Talia; Talk Satellite; Telenor Satellite Broadcasting; Thales Alenia Space UK Ltd; Thorn SDS; UR Group; ViaSat; VT iDirect; Yonet Ltd; Zuckert Scoutt & Rasenberger, with more companies registering daily.

Also as at 23rd February, the panelist line-up will include as moderators **Anver Anderson**, Director, Anver Ltd and **Kevin French**, Publisher, Talk Satellite, as well as myself. The event will feature a "Back-Drop" presentation from **Maria Kalama**, Lead, Satellite Communications, Innovate UK, to set the connectivity context and present the results of market research sponsored by Innovate UK and coordinated by the UK's Satellite Applications Catapult.

Panel Session 1: Space & Ground Segment will include contributions from **Greg Quiggle**, Vice President, Emerging Technologies & Business Development, VT iDirect; **Anver Anderson**, Director, Anver Ltd; **Mark Lambert**, Vice President, Business Development, Kratos Communications Ltd; **Andy Lucas**, Senior Vice President (Satellite Operators), Comtech EF Data; and, **Deepukrishnan Pillai**, Senior Analyst - Strategy & Market Intelligence, SES.

Panel Session 2: the Varied Connectivity Ecosystem will be addressed by **Robert Novak**, Expert for Cellular Backhaul Solutions, ND SatCom; **John Finney**, Founder, Isotropic Systems Ltd; **Miguel Angel Díaz Sánchez**, CEO/ Director General, Inster; **Andrew Sikorski**, Policy Analyst, Access Partnership; and, **Jorge Rodríguez López**, Gerente de Marketing (Head of Marketing), Hispasat.

Contributing to **Panel Session 3: Mobile Connectivity, the Cloud & IoT** will be **John Chambers**, Regional Director OEM Partner Sales, EMEA-India, Thingworx; **Velipekka Kuoppala**, Vice President, Sales & Business Development, Soracom; **David Garrood**, CSO, PHASOR Inc; **Alvaro Sanchez**, Director, Sales & Marketing, Integrasys; and, **Robert Brown**, Executive Chairman, RazorSecure.

In **Panel Session 4: Building User-Vertical Applications - Deployment Environments** delegates will hear from **Kieran Arnold**, Head of Networks & Systems, Satellite Applications Catapult; **Jack Buechler**, Vice President, Business & Product Development, Talia Group; and, **Roger Adamson**, CEO, Futurenautics, among others.

Continued on page 32...

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SATELLITE COMMUNICATIONS

Products and Services MarketPlace

A guide to key products and services to be showcased at Satellite 2018 in Washington, D.C. from March 13-15, 2018.

ACORDE
booth # 434
www.acorde.com

ACORDE manufactures reliable and field proven solutions such as compact and lightweight BUCs (X/Ka) and LNBs/LNAs, introducing new and efficient technologies such as GaN, and versatile approaches such as dual and quad sub-bands integrations. ACORDE offers built-to-spec up to Q/V-band under MIL-STD -810G/461E for ground, naval and airborne platforms.

Advantech Wireless
booth # 1500
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, cellular network providers, military and government requirements, robust corporate networks, and security. We integrate award-winning research and development engineering into our designs. The result: custom solutions with lowest overall capital and operating costs, together with an unparalleled commitment to lead the industry in materials, design and reliability.

Learn more about our World Leading Second Generation SATCOM GaN based SSPAs/BUCs, New AMT-83L Advanced Military Grade SOTM Satellite Modem, New A-SAT-II™ – 2nd Generation HTS Multiservice VSAT Hub Platform, New VSAT Hub 3D BoD WaveSwitch™ technology, Broadcasting Datalink Solution, Antennas and Microwave Radios.

Amos Spacecom
booth # 1011
www.amos-spacecom.com

More Coverage. More Throughput. More Services. Across the Middle East, Europe, Africa and Asia. **Spacecom's** AMOS satellite constellation, consisting of AMOS-3 & AMOS-7 co-located at 4°W and AMOS-4 at 65°E, provides high-quality broadcast and communications services across Europe, Africa, Asia and the Middle East. With AMOS-17 planned for launch to 17°E in 2019, Spacecom will further expand its reach, reinforcing its position as a leading satellite operator.

AQYR
booth # 1939
www.aqyrtech.com

AQYR is a land terminal provider for Tactical SATCOM Solutions, used by Military & Defense, Public Sector, Foreign Governments, Commercial & Enterprise markets; designing and manufacturing highly portable GBS and 2-way Ku/Ka-band full auto-acquisition ground terminals. Our designs were born from our 10 years as Windmill Tactical SATCOM Solutions.

AVL Technologies
booth # 417
www.avltech.com

At SATELLITE 2018, **AVL Technologies** will showcase the latest addition to our flyaway family – a 2.0m ultra-lightweight easy to point axi-symmetric antenna. The antenna features a 12-piece carbon fiber reflector and an RF package with a 55W Ku-band BUC located behind the hub, which makes it highly configurable. The antenna can be assembled and on-network in <25 minutes, and it packs into two checkable transit cases with each weighing <100 lbs. The AvL 2.0m ultra lightweight flyaway antenna is the most compact 2.0m antenna 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

Also on display will be our Family of Integrated Terminals (FIT) with aperture sizes of 0.75m, 0.98m & 1.35m. This line of user-configurable and IATA checkable and carry-on satellite terminals are ultra-compact, ultra-lightweight, ultra-high performance fully integrated systems, which can be upgraded from the 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 Re-

trace 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.

AVCOM of Virginia
booth # 214
www.avcomofva.com

Avcom will be highlighting its EVO Series of high performance RF spectrum analyzers at Satellite 2018. The analyzers are the next generation of proven products from Avcom serving the satellite industry for over 35 years.

The EVO Series products are based on digital swept FTT technology and will be available in a convenient 1RU enclosure. The analyzers provide reliable performance over a wider frequency range than previous products. With models available in frequency bands, ranging from 70 MHz to 6 GHz, the EVO series acquire an accurate measurement of signals with higher resolution bandwidth and faster sweep rates. A web-based GUI provides the user with a clear, intuitive and multi-function display. Remote control of all settings and functions, such as data logging, stream recording, and shape alarms are easily accessed via the standard GUI.

C-COM Satellite Systems Inc.
booth # 409
www.c-comsat.com

At Satellite, **C-COM Satellite Systems** will be exhibiting its fully motorized iNetVu® FLY-981 (Ku-band Flyaway) and iNetVu® Ka-98H/Jup (Ka-band Driveaway) at CABSAT booth Z1-109. Robust and highly advanced, these auto-deploy antennas allow the user to transmit and receive Broadband Internet via satellite with just the press of a button.

The iNetVu® systems are used worldwide in many critical applications like broadcasting, oil & gas exploration, emergency response & disaster recovery.

This year marks C-COM's 20th Anniversary!

C-COM Satellite Systems is a world leading designer and manufacturer of Comm-on-the-Pause (COTP) mobile antennas (iNetVu®). With 8,000 systems sold in over 100 countries, the company is considered a world leader and pioneer. C-COM is also currently nearing production of mechanically steerable, Ka-band Comm-on-the-Move (COTM) mobile antennas. The company is also in early stage development of a unique, electronically steerable Ka-band flat panel antenna system that is modular, conforming and low cost.

COMTECH EF Data
booth # 313
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.

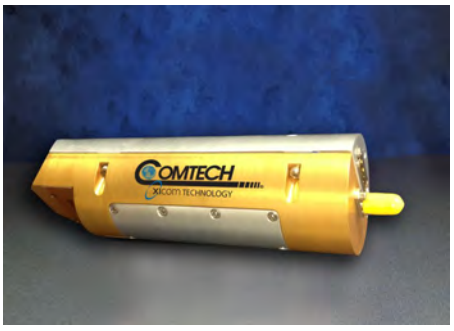
COMTECH Xicom Technology
booth # 313
www.xicomtech.com

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



DataPath
booth # 1725
www.datapath.com

DataPath leverages over 25 years of experience across 40 countries to bring best practices to everything "From Terminals to Teleports and all the Tools In Between™." We focus on remote, distributed or at-risk environments, where reliable communications are a must. This includes government, broadcast, emergency response, and industrial markets.

Hispasat/Hispamar
booth # 431
www.hispasat.com

The **HISPASAT Group** is composed of companies with a foothold in Spain as well as in Latin America, where its Brazilian affiliate HISPAMAR, sells its services. The Group is a leading Spanish- and Portuguese-language content broadcaster and distributor, including over important direct-to-home television (DTH) and high-definition television (HDTV) digital platforms. HISPASAT is one of the world's largest satellite companies in terms of revenue in its sector, and the main

Integrasys S.A.
booth # 2400
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**.

LP Technologies
booth # 1243
www.lptechnologies.net

LP Technologies is a leader for spectrum analyzers, monitoring and interference detection solutions. LPT offers powerful systems that include hardware software solutions. Combining customer recommendations, constant innovation and 20 years of experience help to create powerful solutions while keeping the cost down. LPT is redefining spectrum monitoring and interference detection.

ND Satcom
booth # 2319
www.ndsatcom.com

With over three decades of experience, **ND SatCom** is the premier supplier of and integrator for innovative satellite communication equipment systems and solutions to support customers with critical operations anywhere in the world. Customers in more than 130 countries have chosen ND SatCom as a trusted and reliable source of high-quality and secure turnkey and custom system-engineered communication solutions. ND SatCom's flagship product, the SKYWAN platform, enables international users to communicate securely, effectively and quickly over satellite.

Newtec
booth # 2001
www.newtec.eu

Newtec, a specialist in designing, developing and manufacturing equipment and technologies for satellite communications, will be showcasing at the NAB 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.

Norsat International
booth # 1332
www.norsat.com

Norsat's Redundant Switches for LNBs and BUCs automatically detect signal faults and switch to an alternate LNB or BUC - providing maximum satellite service availability. Receive-side signal continuity is maintained via continuous power detection, and upon detecting a fault, signal is automatically switched to the reserve LNB/BUC. Available for either 1:1 or 1:2 redundancy applications, and in either IDU or headless configurations, Norsat's Redundant Switch solutions combine the reliability and performance pedigree of down conversion products with the ultimate system safeguarding solution for remote and challenging satellite terminal installations. Key features include

- C, X, Ku, and Ka-Band systems available
- Current-sensing fault detection
- Fully automatic or manually-commanded redundancy
- 1RU high indoor unit or headless outdoor unit for ultimate flexibility

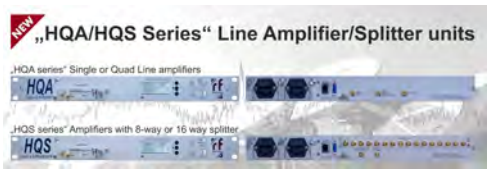
Optional remote M&C available.

RF-Design
booth # 2329
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 communications market. Our product range includes a wide range of **Switch Matrix systems, RF-over-Fiber solutions, Splitters Combiners, Switches/Redundancy Switches, Line Amplifiers, 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 SATELLITE 2018 we will demonstrate our new and unique amplifier unit "HQA" available with various amplifier modules with gain control of max. 40dB, the innovative and clever Switch Matrix system "FlexLink-K7-Pro", our new RF-over-Fiber system "FiberLink*plus*" as well as our "LSEL/LCEL EcoLine" low-cost type Splitters/Combiners.



RSCC
booth # 933
www.rscc.ru

The **Russian Satellite Communications Company** (RSCC) is Russia's satellite communications operator, whose spacecraft ensure global coverage. he RSCC satellites are positioned along the geostationary orbital arc from 14 ° W up to 145 ° E, covering the entire territory of Russia, CIS, Europe, Middle East, Africa, Asian-Pacific region, North and South America, and Australia.

Terrasat Communications, Inc.
booth # 1536
www.terrasatinc.com

Terrasat Communications designs and manufactures innovative RF solutions for Satellite Communications systems. Our groundbreaking 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 Satellite 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
booth # 2109
www.uhp.net

UHP Networks Inc. is engaged in the development, manu-

facturing 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 efficiet and reliable, with industry-best total cost of ownership. These solutions have been deployed in over 200 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
booth # 2009
www.work-microwave.com

Headquartered in Holzkirchen (near Munich), Germany, and comprised of four operating divisions -Satellite Communication, Navigation Simulators, Defence Electronics, and Sensors and Measurement — **WORK Microwave** leverages over 30 years of experience to anticipate market needs and apply an innovative and creative approach to the development of frequency converters, DVB-S2/S2X equipment, and other digital signal processing technologies while maintaining the highest standards for quality, reliability, and performance.

WORK Microwave's Satellite Communication division develops and manufactures high-performance, advanced satellite communications equipment for telecommunications companies, broadcasters, integrators, and government organizations that are operating satellite earth stations, satellite news gathering vehicles, fly-aways, and other mobile or portable satellite communication solutions.

Work's A-Series AX-80 Wideband All-IP Platform

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 SATELLITE 2018, 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.

Walton De-Ice
booth # 425
www.de-ice.com

Walton De-Ice the world's leading designer and manufacturer of satellite earth station antenna (ESA) weather protection solutions, will unveil its all-new Walton ***ADC-4000 Antenna De-Icing Control System*** for the first time in Europe at the IBC. The ***Walton ADC-4000*** makes the operation of Walton hot-air de-icing systems more accurate and efficient than ever, offering potential savings in management and labor overhead for satellite broadcast and head end facilities.

The ***ADC-4000 Antenna De-Icing Control System*** adds a new method to actively control the heat within an antenna de-icing enclosure thus allowing for improved control of the antenna surface temperature. "Our new ***ADC-4000*** features now give users control of the actual temperature on their dish," adds Walton.

The system provides rain and snow detection, basic monitoring and control functions and control of heaters and blowers in order to maintain ice-free conditions on an antenna reflector, feed, and sub reflector without assistance from site personnel. The **ADC-4000** uses ambient temperature monitoring, and senses both within De-Ice enclosure (Plenum) and outside near the reflector's surface. Local units (**DS-18**) on or near the antenna and remote units (**DP-10 Remote Control/Status Unit**) work in unison with temperature probes and other components to provide the most up to date and cost effective Antenna De-ice Control System in the industry. Temperatures are displayed via the remote digital rack mounted monitor (DP-10), and the system can communicate with external earth station and broadcast M&C systems via RS-232, 4 wire RS-485, IP

through Ethernet or Fiber Optics. The all-new DS-18 and DP-10 units are EMI/RFI rated for Defense applications. The **ADC-4000** provides four control functions: Snow Detection, Rain Detection, Heater Operating Point Control, and Main Reflector Temperature Balance Control. The Temperature Balance Control function reads and stores "temperature span" settings in order to ensure that the surface temperature of a main antenna reflector is uniformly distributed, thereby preventing or minimizing reflector distortion losses. Broadcasters can designate "Trigger Temperature" thresholds for auto activating/de-activating antenna heaters, with optional adjustable time delay settings. Existing installations of legacy ADC-3000 or ADC-2000 De-Icing Control systems can add Temperature Control features similar to the ADC-4000's built-in feature by ordering an easy-to-install **TCS-2** upgrade option.

Xiplink
Satellite booth # 2014
www.xiplink.com

XipLink is the leading global technology provider for Wireless Link Optimization (WLO) utilizing SCPS TCP-IP protocol acceleration, streaming data compression and Internet optimizations for better user experience over stressed communication links. At booth 2014, XipLink will provide information on new capabilities for HTS, IPv6, Intelligent Link Balancing and other features.

Xiplink's XA-Appliances deliver the most advanced satellite and wireless optimization in easy to install appliances, assuring proper throughput at a reasonable capital cost. For small and medium sized sites with access speeds from a few Kbps to 16 Mbps, desktop style appliances are user installed via logical GUI templates thus minimizing impact to the operations staff. For high speed links or central aggregation sites, fully redundant appliances will optimize links with aggregate capacities from 30 Mbps to 300 Mbps, supporting thousands of simultaneous TCP sessions and dramatically increasing effective throughput to the customer.

"Satellite Agenda," From page 22

Latest details of the panelist/speaker line-up can be viewed at www.uk-emp.co.uk/current-events/connectivity-2018/programme/.

For further information on all GVF-EMP programs please regularly visit www.uk-emp.co.uk/current-events, or alternatively contact me at GVF (martin.jarrold@gvf.org) or Paul Stahl at EMP. Links to the 2018 events noted in this column are as follows:

Connectivity 2018: Evolving the "New" New Verticals – Air – Sea – Surface - Rail
www.uk-emp.co.uk/current-events/connectivity-2018/

Oilfield Connectivity 2018: The Next Generation Digital Oilfield
www.uk-emp.co.uk/current-events/oilfield-connectivity-2018/

Cellular Backhaul 2018: Smartphones & Tablets - To the Satellite Network & the World
www.uk-emp.co.uk/current-events/cellular-backhaul-2018/

AeroConnect2018@Farnborough
www.uk-emp.co.uk/current-events/aeroconnect-farnborough/

We look forward to seeing at these events .

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

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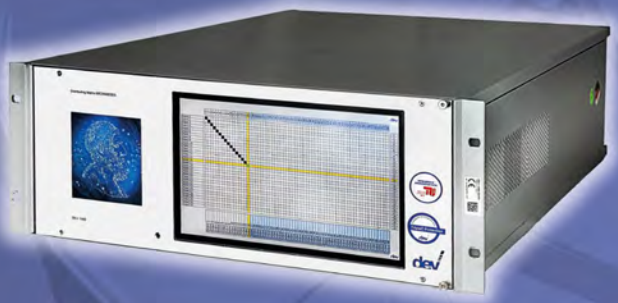

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THE ART OF ENGINEERING

WDTC Highlight ICT and Satellites for Sustainable Development Goals

by Roxana Dunnette, Correspondent

More then 1000 representatives from the public and private sector from 140 countries gathered in Argentina to debate, discuss and define the next phase of telecommunication sector for sustainable development. They participated in the World Telecommunications Development Conference (WDTC) in Buenos Aires, Argentina from October 9-12, 2017.

This year's WDTC theme was "Information Communication Technology (ICT) for Sustainable Development Goals." The Prime Minister of Argentina Marcos Pena, Andres Ibarra, Argentina's Minister of Modernization, Houilin Zhao, Secretary General of the International Telecommunications Union (ITU) and Brahima Sanou, Director of ITU-D inaugurated the conference on 9 October.

Messages have been received from Pope Francis, a native Argentinian, who stated the importance of technologies for social and economical development and invited delegates to build forms of communications that promote unity, and Antonio Guterres, Secretary General of the UN.

"A better world is a connected world. Digital inclusion represents more freedom, more democracy and more transparency" said Argentina's Prime Minister Pena.

Quality services provide citizens with capability not only to receive information but also to generate and share," Pena added.

The program included:

-Plenary sessions in which ministers and vice ministers exchanged viewpoints on emerging tendencies and strategies related with the development of ICT and

- Parallel sessions where experiences and best practices on subjects like satellites for sustainable development, making a difference, cyber security, digital finances, gender, youth and employment, digital economy transformation, disaster management were discussed.

The main theme of the conference was ICT and its contribution in achieving United Nations Sustainable Development Goals (SDG).

The WDTC conference held in Buenos Aires, Argentina in October 2017 emphasized the role of satellite technology in reaching the United Nations' sustainable development goals.

Chairman elect of the conference Oscar Martin Gonzales from Argentina's Ministry of Communications conducted the high level segment meetings dedicated to the importance of ICT in helping implement SDGs. One key issue discussed was the need for policy regulations based on sustainable development perspective.

Three of the SDGs, namely: no. 13-Climate Change, no. 14-Life below water and no. 15 Life on Land, emphasized the importance of satellites in realizing those objectives.

It is interesting to note that developing countries are considering the possibility of moving terrestrial broadcast services to satellite for economic and security reasons.

Countries like Bangladesh, for example , are launchings their own satellite project with the launch of the GEO **Bangabandhu Satellite**–1 in Ku band for broadcasting.

KonnectAfrica (Eutelsat) decided to remodel the broadband industry in Africa using satellites as the best solution for Internet access across the continent including rural and remote areas.

Argentina announced a new "Satellite Policy"-"politica satelital," to be defined right after the parliamentary elections end of October.

The construction of ARSAT 3 satellite in Ka band will bring connectivity to rural Argentina the mountains area and solve the last mile problem.

The Federal Internet Plan using ARSAT 3 satellite will connect 1,300 cities, 306 small communities and will add 34,000 km fiber optic in 2018. President Mauricio Macri committed himself personally to link 2,800 rural schools to Internet using the existing ARSAT 1 and 2 satellites.

The conference side event on "Satellites and SDG" set a clear vision for the future contribution of satellite operators to many of 2030 objectives for a better inclusive digital world.

On 13 October, which is also the

Continued on page 37...

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The International Telecommunications Union (ITU) has been deploying satellite equipment to affected areas for a long time. To understand better the role of ITU and the logistics involved Satellite Executive Briefing correspondent Roxana Dunnette spoke to **Cosmas Zavazava**, **Chief of the Projects and Knowledge Management (PKM) Department of ITU**. Excerpts of the interview follows:

***Roxama Dunnette (RD)**: Almost 20 years have passed since Tampere convention. Where are we now?*

Cosmas Zavazava (C): In the constitution of the ITU it is said that we have to prioritize human lives use telecommunications to save lives on land, on sea, on sky, so in 1998 ITU and OCHA coordinated a conference which was looking at establishing a global legal framework for disaster communications, which resulted in the adoption of the Tampere Convention.

The treaty's aim was to break cross border barriers to facilitate moving telecommunications equipment before and during disasters.

In implementing the TC we involved organizations dealing with human movement, immigration, custom, telecommunication regulatory authorities, military.

Since then ITU moved forward, I negotiated myself the first agreement with Inmarsat for 150'000$, to buy satellite terminals and we deployed them for the first time in December 2004 during Tsunami for search and rescue operations.

We have 46 counties that ratified the agreement and we work very hard to encourage all countries that signed the agreement to ratify. We organized the first Forum on Emergency Telecommunications in 2007 in Geneva and the second one in 2015 in Kuwait and we push for the implementation of Tampere Convention on regulatory and legal aspects.

At the pick of EBOLA we implemented the fist " big data" project based on " call data records " in Sierra Leon, Liberia and Guinee and minute-by-minute we were able to track the movement of people with mobile phone, visualization only, in order to protect their privacy. It was also used for cross border traffic from infected areas.

We added an E-Health component where a closed users group could exchange information based on official sources. We could trace a " road record planning " for those movements but it serves also other needs like promoting businesses.

The system was designed and deployed by ITU.

Our work at ITU is to establish:

- A legal framework based on sound pro disaster- risk reduction and disaster management policy,

Cosmas Zavazava

- To establish institutions to deal with this problem
- To train people to make sure that those responsible design redundant and resilient telecom networks able to sustain extra traffic when a disaster strike.
- To develop standard operation procedures OPP, which institution does what and when.

***RD**: What is the practical procedure for the deployment of equipment to affected areas ?*

CZ: We can deploy satellite equipment within 12 hours .There are two ways of doing this: -

- We monitor what happen and we ask the respective country if it needs assistance and we deploy before the disaster, or the country contacts us.

From page 34…

International Day for Disaster Reduction a very interesting debate took place on disaster management during recent hurricanes in the Caribe, US and the earthquake in Mexico.

Early warning and monitoring systems using satellites and new technological tools where key in reducing the potential damage and helped the restoration of networks.

Christopher Curribias from Iridium, emphasized the importance of satellites during hurricane Harvey, the fire s in California, Mexico's earthquake or to repair Maria's damages.

"ICT is not a solution, he said, but it can predict events, enable rapid response and enhance recovery.

Satellites have the advantages of high reliability, autonomy, geographic coverage, are cost effective and interoperable.

Still, regulations do not facilitate early response; there are situations that do not fit existing regulations. We need a regulatory review to facilitate not inhibit the disaster management like simplifying licensing procedures in emergency situations, no custom/ import restrictions, reduce license fees, relax local gateway requirements," said Iridium's Curribias.

In Buenos Aires ITU-D celebrated its 25th Anniversary and its contribution to the rapid growth and expansion of ICT networks and services.

Two ministerial roundtables discussions for this occasion focused on of the importance of digital economy, affordability of connectivity, use and benefits.

The last plenary session adopted the "Buenos Aires Plan of Action" and the "Strategic Action Plan," documents that mark the agreement of member countries to continue the efforts in finding new methods to achieve SDG and have a clear vision of the development of a digital society.

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

The equipment is stored in the basement of ITU, it is returned from the field after 3 months , it is checked, repaired, software are updated and it is ready to go again.

We use the same satellite equipment for health purposes like in Haiti for example .

In 2010 the major problem there was the number of organizations, NGOs, military, government, private entities using telecom equipment without applying for frequency first and the result was an incredible congestion and interference. This is the reason our priority is to train people *before* a disaster.

RD: How do you use the satellite infrastructure?

CZ.: Satellite communication is key,

We believe in neutrality of technology when a disaster strikes, terrestrial infrastructure is destroyed so we rely on satellites.

We use them to monitor the climate changes, the environment, for remote sensing, for geographical information system, satellite maps –(it helps to have a picture before and after the disaster to help with the reconstruction), and we use satellite communications networks for broadcasting, data transmission, Internet, satellite telephony and much more.

RD. Moving forward… at this conference what was relevant and new in regard with this issue?

C.Z. WTDC adopted Resolution 34 on" Emergency telecommunications for saving lives" and

" Regional Initiatives " on emergency telecommunications. Each region has 5 initiatives including VSAT and mobile satellite solutions.

We will continue to work closely with our regional partners PITA in the Pacific Islands, CITEL in Americas, Broadcasting Unions.

We are grateful to our partners, member states for financing this project (we just signed an agreement with Australia), to our private sector members who donate the equipment.

My credo is "ICT for better life" what technology can do for us."

DEV Systemtechnik Appoints New MD

Friedberg, Germany, February 1, 2018-**DEV Systemtechnik,** supplier of RF signal transmission solutions for satellite, cable and broadcast applications, has appointed **Manfred Mettendorff** to the role of Managing Director. With more

Manfred Mettendorff

than 22 years of experience in the global communications and IT industry at Fujitsu Semiconductors and Socionext, Manfred Mettendorff brings unique qualifications to the role.

Based in Germany and temporarily in Silicon Valley, CA, USA Mettendorff has held various managing positions in marketing, sales, business development and engineering, and has directed entire business units. Before joining DEV Systemtechnik, he was instrumental in Fujitsu's and Socionext's communications business, introducing the industry's first coherent transceivers for optical networks. Mettendorff holds an engineering degree (Dipl. Ing.) in electronics with a major in communications.

The addition of Manfred Mettendorff to DEV Systemtechnik's management team strengthens the company's expertise as it continues to expand into world markets. To assure a smooth transition of DEV's top management Jörg Schmidt, current Managing Director, founder and shareholder, will continue to lead the sales and marketing department.

CEO Transition at Datapath

Atlanta, GA, Feb. 1, 2018—**DataPath, Inc.,** a leading provider of remote communications and information technology solutions to the aerospace, broadcast, government and critical infrastructure markets, announced that its Chairman of the Board, Chris Melton, will step in as interim CEO, after its current President & CEO, David Myers, announced his plans to step down in February. The announcement follows the successful completion of a three-year transformation from a public-company spin-out to an independent, private equity owned business, and on the heels of a record year for DataPath, which grew over 70 percent in 2017.

DataPath had previously operated as a division of public company Rockwell Collins until its acquisition by a private investment group led by The White Oak Group in July of 2014. Over the past three and half years, DataPath has reinvented itself, launching several new products, including class-defining satellite ground systems for the military and unmanned aerial vehicle (UAV) markets, as well as a new managed cybersecurity service for both commercial and government clients. The company has also significantly expanded its international presence, providing services in nearly 20 countries.

In addition to serving as Chairman of the Board and interim CEO for DataPath, Inc., Chris Melton is the Chairman and CEO of The White Oak Group, an Atlanta-based private investment firm. Melton also previously led the growth of DataPath as Co-Chairman from 2004 until its public offering in 2006.

DataPath also recently announced the appointment of its first Chief Operating Officer, Brad Majeres, as well as a new Chief Financial Official, Carter Johnson, both of whom started at the beginning of January. DataPath's board is in the process of selecting the new permanent CEO and plans to announce an appointment in the near future.

Steve Collar Appointed CEO of SES

Steve Collar

Luxembourg, February 12, 2018 – The Board of Directors of **SES** announced the appointment of a new President & CEO and CFO of SES with effect from April 5, 2018.

Steve Collar, who is currently CEO of SES Networks, has been appointed as the next President & CEO of SES, becoming CEO Designate with immediate effect. **Andrew Browne**, who was until recently CFO of O3b Networks and CFO of SES between 2010 and 2013, has been appointed as the next CFO of SES, becoming CFO Designate with immediate effect.

The Board accepted the decision of Karim Michel Sabbagh to step down from his role of President & CEO, with effect from the next Annual General Meeting (AGM) of SES on April 5, 2018, in order to spend time with his family and to pursue new interests.

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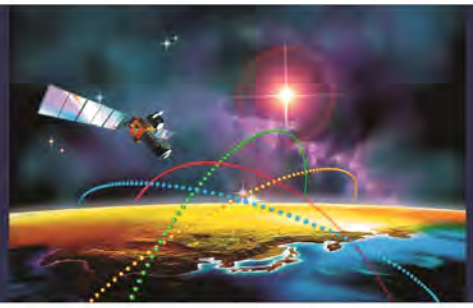

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Andrey Kirillovich
Director of Integration Services and Projects, Russian Satellite Communications Company

What coverage do you have for the Latin American region and what services can RSCC provide?

RSCC provides full coverage over Andean Region, Brazil, The Caribbean, and partial coverage over Central America and Southern Cone in C and Ku bands. Our services are typical for the satellite operators already working in the region: Lease of satellite bandwidth, TV Distribution/Contribution, Occasional Use, Enterprise VSAT networks, IP Trunking and Cellular Backhaul.

What differentiates your company from the others serving the Latin American market?

Our company is the second oldest satellite operator in the industry. We have been doing satellite communications and broadcasting staring from 1967. We have got a vast experience in delivering various satellite based applications to businesses and individuals all over the world. The orbital position of our Express-AM8 satellite in 14 West gives Latin American customers an opportunity to serve their networks and assets in their domestic region, as well as across the Atlantic in Europe, Africa and Middle East. Besides that we have got a number of a turnkey solutions for local broadcasters, content providers, mobile network operators and satellite service providers, enabling them to receive great savings in the initial investments required to start a satellite network or broadcast a TV channel via satellite.

How do you see the Latin American satellite market in the next few years?

Latin America market is becoming a tough place for satcom service providers as the competition is becoming very fierce. But this will result in the benefits for customers, who will get the most cost effective solution, and will be able to compete with other terrestrial and wireless technologies. I see a lot of potential here for satellite in broadcasting, broadband and cellular backhaul.

What are RSCC's plans for the region?

Like in other regions of the world RSCC is developing the market with strong assistance of local partners and distributors. Each subregion in Latin America needs specific approach, so we are working with a number of partners, who are at the forefront of our presence in the region. Some regions like Brazil require a completely different approach , mainly from regulatory prospective. Besides that we also see a demand from our existing customers developing their networks on RSCC satellites in EMEA region. Express-AM8 satellite give them an opportunity to extend the reach of their service offering to almost entire Latin America.

Anything else you want to add?

Yes sure. Football is a real passion in Latin America. It is in the DNA of the local people. I am sure almost everybody in the region is waiting for the Summer, when 2018 World Cup is going to start. And this time it will take place in Russia. Since RSCC is the Russian national satellite communications and broadcasting operator, holding 75% of the domestic market, we are ready to provide broadcasters from Latin America a full package of satellite transmissions and live satellite broadcasts from World Cup 2018 venues in Russia via our Express-AM8 satellite launched a couple of years ago. Satellite location at 14 West above Atlantic makes this satellite an ideal tool for delivering live content from Russia to Latin America.

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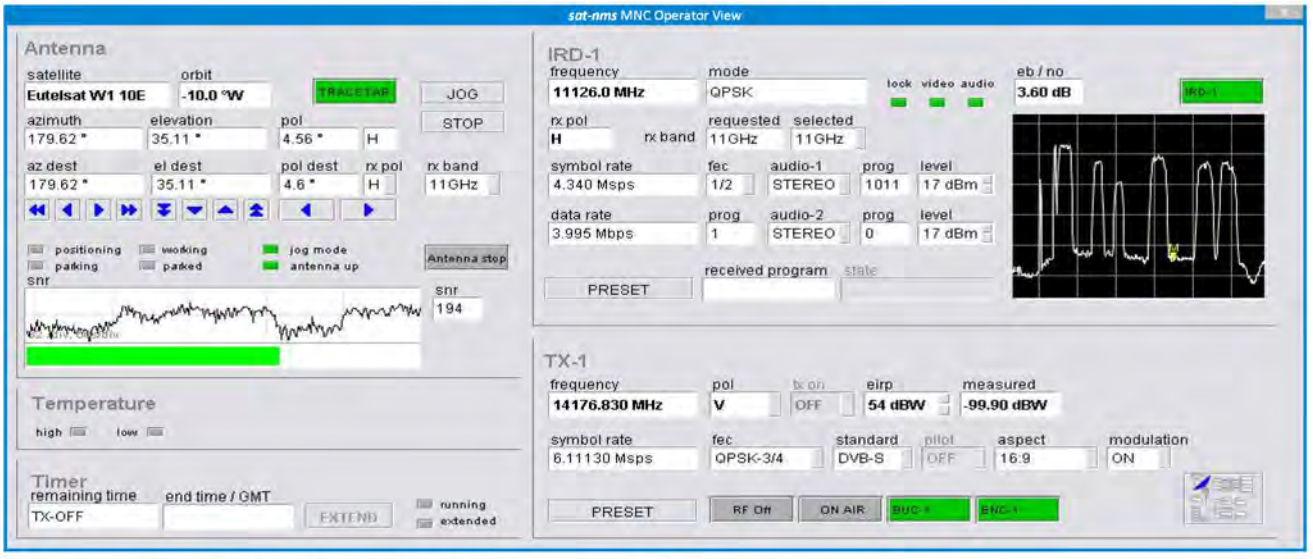

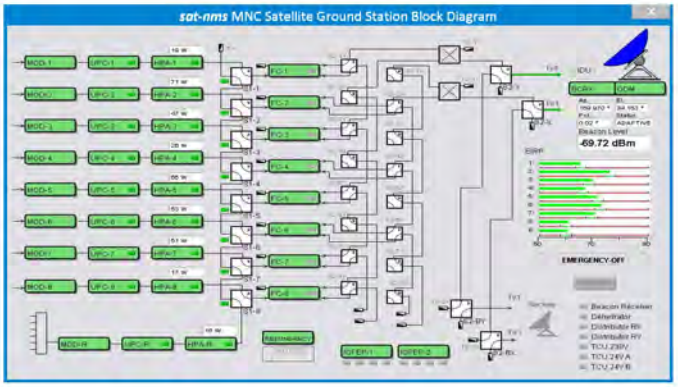

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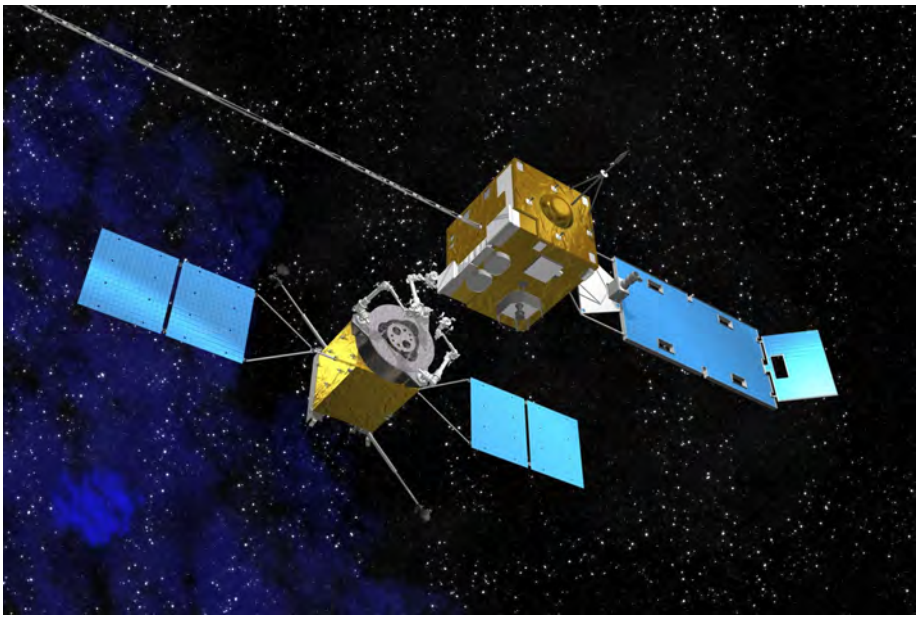
In-Orbit Servicing Market Opportunity Exceeds US$ 3 Billion

Satellite Servicing Market Set for Lift-off Given Operator Dynamics and Development of Key Offerings

Cambridge, Mass., February 1, 2018 – NSR's industry-first *In-Orbit Servicing Markets* (IoSM) report finds the nascent in-orbit servicing market poised for growth, and forecasts a total market of over US$ 3 Billion in the next 10 years. Life extension services drive most of this revenue, as many in-orbit service providers plan to enter the market in the next five years servicing commercial and government customers with additional solutions to fleet management.



"In-orbit servicing is an entirely new market, ripe for growth, providing the satellite industry with an attractive value proposition in an environment of falling capacity prices, rapid technology changes, and uncertainty in CAPEX," noted Carolyn Belle, NSR Senior Analyst and report co-author. Affordability has long been a major barrier for IoS players, but as the technology advances, the business case evolves.

Until a few initial in-orbit demonstrations prove the technology works *as a system,* there will be a reasonable level of apprehension amongst stakeholders. But the potential of In-Orbit Servicing is vast and varied: from life extension, de-orbiting, and salvage operations that lead early revenue opportunities, to satellite repair and alteration on the mid-term roadmap, while diverse emerging applications support is a long-term objective.

"In-Orbit Servicing (IoS) is seen as an additional tool in the operator's array of options for fleet management, and operators are more eager than ever before to use it to optimize their investments in space assets," explained Shagun Sachdeva, NSR Analyst and report co-author. She added: "After years of demonstration and tests, recent contracts and upcoming missions show signs of a solidifying business case for IOS".

Still, the future success of the industry has obstacles to overcome and will also depend on government support and legal and regulatory requirements coming together to facilitate market growth.

With the first commercial servicing spacecraft slated to launch in 2018, NSR's In-Orbit Servicing Markets (IoSM) dives into the market trends and subsequent challenges that impact the industry's future. This report evaluates the main IoS applications for different customer types and provides a global market revenue and addressable market demand forecast for each application for a 10-year period, 2017-2027.

For additional information on this report, including a full table of contents, list of exhibits and executive summary, please visit www.nsr.com or call NSR at +1-617-674-7743.

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Flat Panel Antennas Ready for Takeoff

NSR's Flat Panel Satellite Antennas, 3rd Edition (FPA3) report forecasts cumulative FPA equipment sales to reach US$ 7.9 billion by 2027. As the only multi-client report on the FPA market today, NSR's FPA3 finds aeronautical equipment will drive revenue growth for manufacturers, while fixed broadband applications on non-GEO satellites will be the main, long-term volume market.

While flat panel antenna technology, more specifically phased array antennas, have been deployed for many years, cost and performance have been major obstacles inhibiting the wide acceptance of this technology. "The growing demand for in-flight connectivity, plus the necessity of using a low profile for air-drag concerns, justifies the development of complex phased array antennas in the commercial aeronautical market. This development has allowed the tide of technology to rise across other verticals, allowing for the entrance of FPA manufacturers targeting the land-mobile and maritime sectors," stated Dallas Kasaboski, NSR Analyst and report lead author. "Concerning satellite broadband, every day brings us closer to the potential deployment of non-GEO satellite constellations. Yet, the fast beam-steering and pointing required to connect with these satellites will necessitate improvement on ground equipment technology, and only once prices drop to better compete with parabolic antennas will we see a large take-up of FPAs for fixed applications."

Given increasing in-flight connectivity (IFC) take-up by airlines, growing demands from the maritime passenger segment, and the established land government vertical, NSR expects FPA equipment revenues from mobile applications to dominate the forecast, responsible for 92% of the market share by 2027. Currently, at least twenty manufacturers are in various stages of development and deployment of FPA solutions. NSR's FPA3 details the progress of each and the growing maturity and partnership seen in the industry value chain, which will drive cost and performance improvements, allowing for more successful business models and greater access to satellite communications worldwide.

NSR's Flat Panel Satellite Antennas, 3rd Edition report provides a 360-degree overview of the FPA market, forecasts the global industry growth in terms of shipped units, in-service units, and equipment revenues across nine regions.

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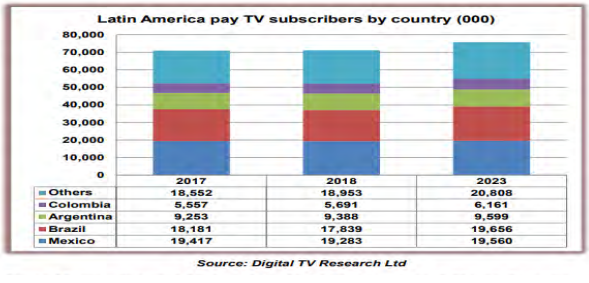
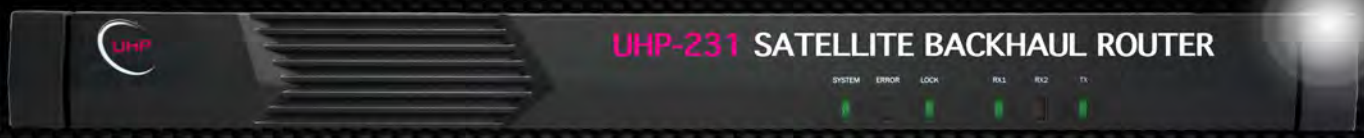


Although the economic recession waned somewhat in 2017, the Latin American pay TV sector was still affected. According to the eighth edition of the Latin America Pay TV Forecasts report by Digital TV Research, the number of pay TV subscribers was flat year-on-year.

DISRUPTIVE INNOVATION IN CELLULAR BACKHAUL OVER SATELLITE



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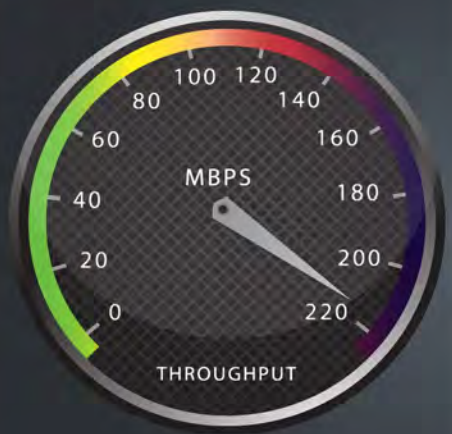

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