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Industry Trends, News Analysis, Market Intelligence and Opportunities

Satellite Broadcast Market Trends

by Elisabeth Tweedie, Associate Editor

One thing that is absolutely clear, is that the video landscape is constantly evolving. This is not news, it started years ago, with the introduction of digital standard definition (SD) TV. This was followed by High Definition (HD) and then briefly by 3D; something the industry prefers to forget, at least for the moment. Hot on the heels of 3D came 4K or ultra-high definition (UHD); and now, just as the early adopters have bought their 4K TV sets, we have high-dynamic range (HDR).

Falling prices are propelling the growth of 4K TV sets. IHS Market forecasts that worldwide sales of 4K sets will reach over 100 million in 2019, up from 55 million in 2016. HDR, which dramatically increases the brilliance and range of colors displayed is generally agreed to be the "added value" that was needed to complement 4K. In the US Vizio has just announced its 2017 range of smart TVs. This includes a 55 inch 4K, HDR set with a recommended retail price of US$ 599.99. IHS Market is predicting that worldwide sales of HDR sets will reach 30 million in 2020 from a base of 4 million in 2016. With those prices from Vizio, this could prove to be a low forecast.

This year's NAB 2017 in Las Vegas will be showcasing the latest video innovations that will impact the satellite industry.

As with almost everything to do with video, there are competing standards for HDR. The two major ones are HDR10 and DolbyVision. Both meet the standards agreed by the UHD Alliance, but HDR10 is an open standard, whereas DolbyVision is proprietary. Technically it is also better. It uses 12-bit color depth as opposed to the 10-bit used by HDR10. (Standard dynamic range (SDR) uses 8-bit color depth.) DolbyVision produces 4,000 nits of brightness whereas HDR10 only produces 1,000. (SDR screens are 3-500 nits.) Another difference between the two formats is whilst both formats use metadata to tell the TV how to display the video, HDR10 only sends that data once at the beginning of a program, whereas DolbyVision sends it on a frame-by-frame basis, which at least in theory provides for more creativity by the content producers. Right now HDR10 is more widely available. Until last month whilst it was possible to display HDR10 content on a DolbyVision TV the reverse was not true. However, DolbyVision has now announced that it will be

Continued on page 4

What's Inside

From the Editor.....3

VSAT Market Trends
by B. Schneiderman.9

Intelsat/OneWeb Merger
by A. Musey.....17

Products and Services MarketPlace: NAB 2017.....20

CABSAT Report.....26

Astrapi, Startup Space. and Swiss Executiions
by L. Zacharilla.....25

Executive Moves....30

Better Satellite World
Satellite Rescue.....33

MarketBriefs.....35

Stock Index.....36

Advertisers' Index..38

Vision Awards at the NAB

At the NAB 2017 in Las Vegas this month, over 100,000 attendees from over 60 countries will be bedazzled with the latest gizmos and technological innovations. Our Associate Editor, Elisabeth Tweedie in this month's cover story, surveys the changing broadcast landscape and how it will impact the satellite industry.

As you know, Satellite Markets and Research is celebrating its 10th anniversary this year. We think there is no better place to celebrate this important milestone as the NAB. The NAB has been traditionally the launching pad for many cutting edge technologies.

We also will be holding the fifth Annual Vision Awards at the NAB. This year we are honoring The Spaceconnection, a satellite services and solution provider based in Los Angeles, California, which is coincidentally celebrating its 30th anniversary this year. The Spaceconnection has not just managed to survived many dramatic changes in the very competitive segment of the industry it's in, but thrive and prosper. The company is well-poised to face the coming challenges and changes in the industry and for this, the Board of Judges of the Vision Awards, are honoring the company with its "Most Promising Company of the Year" award.

Join us at the NAB to celebrate our 10th anniversary and innovation in the industry. Drop by our booth at the South Hall Upper level booth # SU 10224. We look forward to seeing you all there.

Virgil Labrador, **Editor-in-Chief**

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Satellite Broadcast Trends...From page 1

available as a software solution, meaning that hardware manufacturers could theoretically upgrade to it in the future.

At the same time as the broadcast industry was developing these technologies, the telecommunications industry was rolling out ever increasing broadband speeds to the home. Meanwhile the wireless industry evolved from 3G to 4G and WiFi became ubiquitous in public spaces.

Increased broadband speeds (coupled with improved compression technologies) enabled the delivery of video over broadband and wireless. Consumers, led by millennials, latched on to this and over the top (OTT) video began to take off. Alongside traditional linear TV, video is viewed on smartphones, watches and tablets at the viewers' behest.

Although we're still a long way away from the day when all video will be 4K HDR and viewed on a smartphone or tablet whenever and wherever the viewer requests it; the pace of change has definitely accelerated in the last few years. According to the Ericsson Media Survey, last year live or linear TV, only accounted for 46% of Millennials' viewing time. Perhaps more surprisingly, it now only represents 64% of the viewing time of adults over 35.

However, all is not lost, video as a whole is growing. Since 2012, globally the average consumer has increased viewing on mobile devices by four hours a week, while fixed screen viewing has only declined by two and a half hours per week. Meaning an overall increase in video consumption of one and half hours of video per week.

Interestingly, it is proving more difficult to find content on OTT, with viewers spending 30% of their viewing time, searching for something to watch. The corresponding statistic for linear TV is 19%, leading Ericsson to deduce that in the US the average

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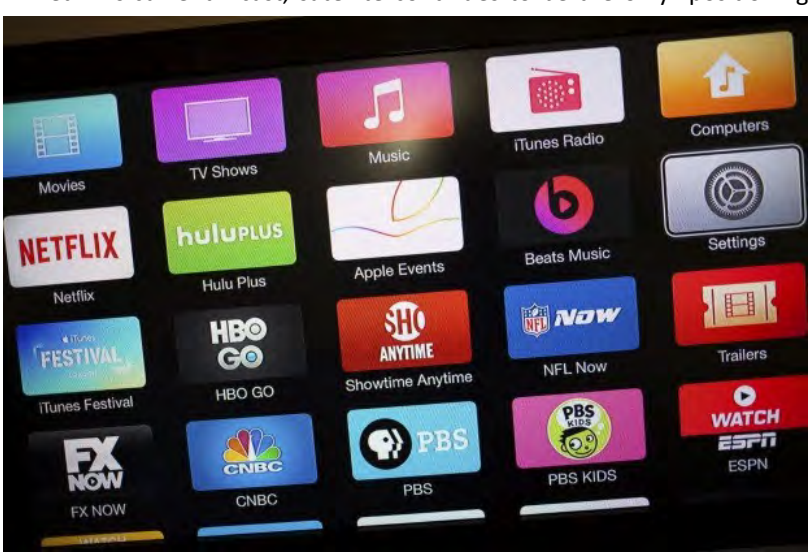
viewer will spend 1.3 years of their life looking for something to watch!

When we think of OTT players, we think of the 'big four:' Netflix, Amazon Prime, Hulu and YouTube, and these are certainly the ones that have shaped the market and provide the greatest challenge to the traditional content creators and distributors. However, according to SNL Kagan, there are now 978 OTT services in operation worldwide, 182 of which are from North America. In the US, Netflix at 47 million, now has more subscribers than HBO with 32 million. Netflix is currently available in 130 countries compared to 50 for HBO. Netflix is also taking lead in original programming. This year it plans to spend US$ 6 Billion with the intention that by the end of the year over half of its content will be owned or produced by the company. Needless to say, the traditional content providers are not taking this lying down and have introduced their own OTT services. The BBC has even gone as far as to release certain series online before broadcasting them.



Not only are the OTT players changing the way we consume video, they are also leading the way in introducing new technology. Netflix and Amazon took the lead in 4K content – even though the majority of the subscribers had neither the bandwidth to receive 4K content, nor the equipment to view it on. Now, Netflix, Amazon and YouTube are all introducing HDR content whilst the traditional program makers lag behind. Netflix already has 12 shows or movies available and plans to produce an additional 150 hours by the end of the year. Amazon currently has over 30 titles available. There are also numerous HDR Blu-ray disks available

"...Not only are the OTT players changing the way we consume video, they are also leading the way in introducing new technology…"

So, what does all this mean for the satellite industry? Well, as discussed in previous articles, even with high efficiency video coding (HEVC), 4K requires more bandwidth than HD. So that continues to be good news for the industry. Whether for OTT or linear broadcast, satellite continues to be the only game in town when it comes to providing content to planes and ships. As passengers and crew alike, have come to expect to have access to the same content when traveling, that they do at home, or in the office, this segment a growth area for the industry. However, that could change, if the current ban on larger electronic devices being used on planes on certain routes, is expanded to other regions. Nevertheless, the demand from cruise ships could more than compensate for this at least in terms of bandwidth consumption.

In order to stay relevant in the OTT world, many companies are repositioning themselves as media centers and becoming hybrid networks utilizing satellite, fiber, wireless and internet as delivery mechanisims. For example, last year SES bought RR Media, to merge it with its SES-PS unit creating MX1. MX1 provides a complete service to over 900 customers including Netflix, Amazon and Hulu. Similarly, Globecast has repositioned itself to be a media center, not a teleport. As well as providing the more traditional playout and content delivery services, it also offers a video-on-demand (VoD) packaging and a modular solution to launch and operate an OTT service.

That's the past and the present. Lurking in the wings we have 8K, ATSC 3.0, and of course Virtual Reality. Watch this space.

Elisabeth Tweedie is the Associate Editor of the *Satellite Executive Briefing*. She 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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VSAT Market Trends

by Bernardo Schneiderman, Contributing Editor

VSAT (Very Small Aperture Terminal) technology is now a mature satellite communications ground system technology with major players in the global market providing Internet connectivity for small and large corporate networks & ISP operators and backbones and cellular backhaul for telecom operators in the terrestrial segment providing services for consumers. In Maritime and Aeronautical segment VSAT technology penetration is growing in a large scale for both the consumer market (Cruise Ships) and Commercial Airlines and business operation.

This article will cover the following key points of VSAT technology: historic and current trends, the major players in the global market, How the market is evolving and segmentation now and beyond 2017

Historic and Current Trends

The first commercial VSATs were C-band receive-only systems using spread spectrum technology. More than 30,000 units of 60 cm antenna systems were sold in the early 1980s. C -and two-way system was developed during 1984-1985 and sold about 10,000 units using Star Topology.

In the early 80s the worlds' first Ku-band VSAT for oil field drilling and exploration units was developed. Following development of Ku-band VSATs for enterprise customers were implemented. These enterprise terminals made up the vast majority of sites for the next 20 years for two-way data or telephony applications reaching network with 100,000 terminals using Start topology and other using mesh topology.

In 2005 VSAT networks deploying Ka-band was implemented for consumers. Since 2005 millions of consumers in the USA and Europe are using Ka-Band VSAT technology for Internet connectivity using IP protocol.

Today we have VSAT platforms with C-Band, Ku-Band and Ka-Band in the commercial sector with X-Band for Defense.

C-Band VSAT are being used in the majority of segments where the availability of the link is critical for the applications because not impact with rain fade but required large antennas (1.8 meter or more)

Ku-Band is being used for the majority of enterprises worldwide and ISP and Telco Backhaul (requiring 1.2 meter antennas or more)

Ka-Band is being used for Consumer terminal in the majority of application but now is being implemented in some special project for enterprises too. (requiring 60 cm antennas or more).

During the last 20 years the price of the IDU (VSAT modem) went from a few thousand dollars to US$ 300.00 or less but the market is targeting lower price for mass market.

The VSAT terminal today is composed of Antenna, BUC and LNB (Usually Integrated for consumer market) and Modem (IDU – Indoor Unit)

The technology currently for all VSAT network is IP (Internet Protocol) but still have proprietary modem being used from each major VSAT vendor in the market. This means that a modem from vendor A will not talk with modem of vendor B, C or D. This issue never been resolved by the VSAT industry until now beside some efforts, like DVB-RCS was done in the past but only in regards of TX/RX.

The trends in speed of the link now depend more of Satellite Communications capacity used in the network. Ku-Band satellites with High Throughput Capacity and Ka-Band High Focus Beam could support Download of more them 150 Mbps and upload of 20 Mbps but the trends is reach higher data rate during the next 2-3 years with new satellites coming in the global market from existing carriers and new operators like Oneweb and others.

Currently among the main players in the VSAT market are in alphabetic order Advantech, Gilat, Hughes, Idirect and Newtec, among others. Follows are a profile of each company with the main VSAT platforms available with information supplied by each vendor.

Advantech Wireless

Advantech Wireless is a company based in Canada and was founded in 1988 and is a manufacturer of VSAT and Wireless Broadband Communication for Commercial, Critical Infrastructure, Government and Defense Clients. During the period of operations Advantech have deployed equipment over 150 countries.

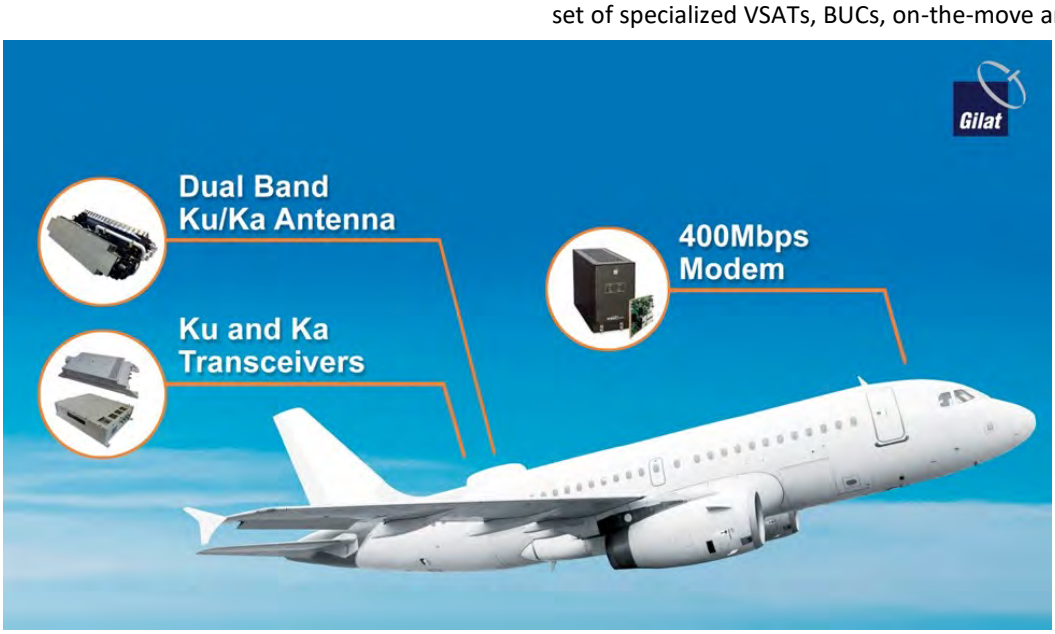
Advantech Wireless believes service and satellite operators today face, more than ever before, a mass of new applications and vertical market opportunities. To expand these new markets in the face of new economic forces, operators can't rely on traditional diverged and separate satellite network solutions. With that in mind Advantech Wireless released its ASAT II™ System - a true multi-service and multi-application satellite network platform. Driven by demand for broadband consumer, industrial IoT/M2M,

enterprise, trunk backhaul and mobile services for always higher throughputs with optimum efficiency, the ASAT II™ System from Advantech Wireless has been designed as a

U9000 VSAT Router with embedded Single Board Computer

scalable multi-service platform configurable to support tens to hundreds of thousands broadband terminals.

Satellites and VSAT platforms nowadays demand higher spectral efficiencies, on the other hand network-wide utilization is the next challenge. Satellite service providers struggle between spectrum-efficient SCPC platforms and the agility provided by MF-TDMA systems. With the ASAT II™ System there is no need to compromise. Using Advantech Wireless WaveSwitch™ technology, ASAT II™ manages 3 Return Link waveforms – RCS2 MF-TDMA, ASCPC – near-SCPC MF-TDMA, and SCPC – simultaneously and seamlessly all on shared Return Link resources. ASAT II™ bandwidth on demand radio resource manager automatically adapts each terminal's waveform to match the terminal application and traffic density. ASAT II™ is a true multi-service ready platform offering a range of VSAT Routers and terminals to meet market needs, all running and sharing same network resources and satellite space segment. This real-time on the fly waveform adaptation allows optimizing network utilization and providing true multi-service operation in today's versatile markets landscape.



ASAT II™ features VSAT Routers and terminals ranging from compact terminals designed for Industrial IoT / M2M and broadband consumer, to enterprise VSAT Routers and high-end terminals designed for trunk and cellular backhaul applications. ASAT II™ terminals go beyond optimizing waveform and the PHY layer (with traffic optimization capabilities such as caching and compression) and opening new possibilities with Multi-access Edge Computing (MEC) capable terminals allowing exciting localized value added services as well as drastically off-loading satellite traffic.

Advantech Wireless expects the same network utilization challenge to manifest in many aspects of modern satellite systems, as the case for beam hopping architecture demonstrates. Advantech Wireless already works with our partners to advance and materialize such new technologies to bring true multi-service and multi-application solutions to the market.

Gilat Satellite Networks

Gilat is a global company operating in ninety countries to provide satellite-based broadband communication since1987. Gilat delivers the ground segment equipment, comprehensive solutions and end-to-end services for both mobility and fixed applications, with a special focus and achievements for in-flight connectivity, consumer broadband and cellular backhaul.

To address the abundance of HTS capacity and the wealth of new satellite communication opportunities, Gilat has brought to market a scalable single platform, SkyEdge II-c, to serve multiple commercial and government applications. The platform is supported by Gilat's distributed X-Architecture based on Software Defined Networking (SDN) and Network Functions Virtualization (NFV) and includes a set of specialized VSATs, BUCs, on-the-move antennas and a centralized network management system.

To meet the demanding market needs of high throughput, enhanced and continuous user experience, bandwidth efficiency, operational advantages, and affordable consumer broadband, Gilat has brought to market several pioneering technologies to address broadband connectivity on land, sea and air.

- The SkyEdge II-c platform is being enhanced with the latest generation wideband DVB-S2X outbound stand-

ard. Gilat is introducing unique true real-time resilient adaptive LDPC inbound TDMA waveform, which enables significant savings of satellite bandwidth costs while delivering highest service availability. Gilat's innovative implementation delivers exceptional spread-spectrum transmission performance, enabling high on-the-move service availability even in the most extreme conditions.

- Patented embedded acceleration techniques that allow mobile network operators to achieve true LTE speeds while overcoming the inherent delay in satellite communications. (Capricorn)
- All outdoor, self-installable, VSAT-in-a-box technology, to reduce barriers to entry enabling affordable broadband to all. (Scorpio)
- Unprecedented throughput reaching up to 400Mbs while enabling transmission at supersonic speeds with Doppler timing compensation. (Taurus)
- Open platform dual-band (Ku/Ka) airborne satellite antenna for in-flight connectivity applications. This unique high bit-rate panel antenna is interoperable with any aero modem. (ER6000-A)

All-in-one terminal for small boats open an untapped market, making affordable connectivity at sea now possible for this underserved maritime segment. Service is now available in a joint offering with SES in the Caribbean. (MarineRay 60P)

Operational benefits are provided via Gilat's network management system, which includes a comprehensive set of mapping tools delivering mobility services to a configurable geographic service area, with automatic beam switching. Gilat's innovative Cloud Quality of Service (QoS) supports global bandwidth management, enabling service providers to provision and manage bandwidth across multiple teleports, satellites and user beams from a central NMS. (TotalNMS)

Hughes Network Systems

Hughes is a company based in the USA and was founded in 1971. Hughes is the world's leading provider of VSAT broadband for home and office, delivering innovative network technologies, managed services, and solutions for enterprises and governments globally. Hughes has manufactured and shipped more than 4 million terminals to customers in over 100 countries, and has consistently maintained a global market share of over 50 percent.

DVB-S2X is a key technology that enables service providers to realize significant improvements on bandwidth efficiency and promises to be rapidly adapted around the world. Hughes actually started shipping DVB-S2X systems in 2016 and to date we have shipped over 70,000 DVB-S2X remote terminals globally. These remote terminals include one important component, the Hughes JUPITER System on a chip, our own in-house designed ASIC (application specific integrated circuit). This innovative and powerful technology not only enables DVB-S2X but also powers all of our processing for the remote terminal and makes every Hughes remote capable of 200 Mbps of throughput. DVB-S2X will continue to play a critical role in satellite network efficiency, but not all DVB-S2X implementations deliver the same capabilities. In particular, the Hughes implementation uses a single stream which means any remote can receive the entire forward channel versus other implementations which require multiple streams or partitions. The DVB-S2X technology supports the trend of delivering higher speeds, and for this, the implementation is critical. The single stream DVB-S2X enables better statistical multiplexing performance and delivers a better end-user experience.

HughesNet Terminal

Airlines around the world are implementing inflight broadband for their passengers and these services are best delivered by VSAT based systems. For Hughes, enabling powerful and flexible aeronautical mobility is a key element of our service and product strategy. The recently announced JUPITER Aero solution offers one of the industry's fastest in-flight Internet connectivity, capable of supporting speeds in excess of 400 Mbps and operates on both Ka- and Ku-band frequencies. These technological strengths make it the ideal solution for commercial air routes throughout the world. The dual-band JUPITER aeronautical terminal is based on ARINC 791 and incorporates a highly advanced Modem Manager (MODMAN) along with an option for a dual Ka- and Ku-band antenna. The terminal is fully compatible with both wide-beam and spot-beam satellites, and supports rapid switching between beams and satellites without loss of session while aircraft traverse the coverage area. Passengers benefit from this flexible technology, enjoying uninterrupted high-speed connectivity around the globe.

In developing parts of the world, we are seeing the development of "community VSATs" or VSATs that are shared amongst many people. This trend is growing as not every consumer in these regions can afford to have a VSAT at their house. A great example of this concept is the deployment of 4G/LTE cell sites which provide high-speed data to

many user terminals. To effectively support this, Hughes has introduced the JUPITER System HT2500 terminal, a next-generation satellite terminal that has native support for accelerating LTE protocols and enabling community VSATs. With support for over 7,500 simultaneous TCP sessions, the terminal is able to deliver accelerated performance for many devices connected simultaneously to the LTE eNodeB. Speeds of 200 Mbps enable the HT2500 to deliver the LTE performance required by mobile operators around the world. The HT2500 with LTE acceleration enables MNOs and governments to bridge the digital divide in a cost-effective way

Idirect EVOLUTION X7 Satellite Remote Router Modem

IDirect

VT iDirect, a subsidiary of VT Systems, is a global leader in IP-based satellite communications providing technology and solutions that enable iDirect partners worldwide to optimize their networks, differentiate their services and profitably expand their businesses. For more than 20 years, the VT iDirect organization has focused on meeting the economic and technology challenges across the satellite industry.

VT iDirect iDirect serves +1600 networks worldwide and +400 Beams of HTS and has sold over 3,500 Hubs and 350,000 Remotes to over 350 network operators remaining to be the world's largest TDMA enterprise VSAT manufacturer. In addition, it is the leader in key industries including mobility, military/government and cellular backhaul.

iDirect's technology provides one of the most scalable, flexible and bandwidth-efficient products in the industry, while also providing iDirect partners with the lowest total cost of ownership for a complete broadband VSAT solution. iDirect's technology will allow to customers to create and implement multiple service plans, each with their own requirements, at the lowest cost of operation, while still meeting their Service Level Agreements (SLAs).

With iDirect's solution, customer will benefit from innovative development culminating in a carrier-class infrastructure platform based on iDirect's Commercial off the Shelf (COTS) technology. This offering leverages industry-leading technology in the key areas of DVB-S2/S2X ACM, Group Quality of Service (GQoS), and Management Systems. The combination of these technologies is critical to executing customer's overall vision for their projects.

Thanks to iDirect long experience in commercial, military and government projects, customers can benefit of the following key features of iDirect Intelligent Platforms:

- Extreme flexibility of the Hub platform: star, SCPC Return, and mesh topologies can be supported from the same hub, addressing up to 5 satellites or 5 different satellite networks from the same hub chassis
- High system efficiency enabled by DVB-S2, DVB-S2X, ACM and Adaptive TDMA, 2D 16-state coding and PCMA combined technologies.
- Superior Group QoS features in order to satisfy even the most complex bandwidth management scenarios
- Tight coupling between ACM / Adaptive TDMA and Group QoS
- Advanced security features such as Link Encryption, FIPS 140-2 Level 3 and TRANSEC
- Native support of mobility and Comms On the Move (COTM) through advanced features such as Global NMS, Automatic Beam Switching, Spread Spectrum, Doppler compensation, Fast Beam Switch, and Fast Re-acquisition
- Leading Network Management System, based on iDirect iVantage software suite, IDirect Pulse Web Management System and complements by SatManage tools.

This year, iDirect is launching DVB-S2X Hub and Remotes designed to unlock the power of High Throughput Satellites (HTS).

To gain the greatest advantage from DVB-S2X, customers need ground infrastructure that supports the full scope of the standard. With iDirect's next-generation DVB-S2X product suite, iDirect is delivering just that – everything from best-in-class remote performance, to a new cost model, to scale infrastructure to support for coming industry advances like intelligent payloads.

The product lineup features powerful Universal Line Cards, a next-generation S2/S2X remote series that integrates a DVB-S2X ASIC chipset that can achieve higher level modcods, aggregate throughputs of 500 Mbps (forecast to increase to 1 Gbps in the future) and greater processing capabilities; And higher hub density and processing capabilities.

With iDirect new product suite, customers can manage migrations from DVB-S2 to DVB-S2X with minimal interruption to business operations, while gaining rapid access to continual technology innovation.

Newtec

Newtec is a company based in Belgium and was founded

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in 1985. Newtec has developed satellite communication equipment and technologies for broadcast, government and defense, IP trunking, mobility and consumer and enterprise VSAT.

Newtec's portfolio of satcom products and technologies meet the highest operational requirements for professional reliability and service availability. They can be applied in a wide range of markets such as Broadcast, IP Trunking & Backhauling, Consumer & Enterprise VSAT, Government & Defense, Mobility and their respective applications.

Newtec Dialog supports multiple satellites, multiple frequency bands, regular and spot beam satellites. Scalable from 5 to +100.000s of terminals. With highly efficient DVB-S2X ACM in the forward link, choice between SCPC, MF-TDMA and patented Newtec Mx-DMA® as return link technology a unique range of markets and applications can be covered.

Newtec VSAT terminals are able to transmit 4CPM (Quarternary Continuous Phase Modulation) with TDMA, HRC (High Resolution Coding) with Mx-DMA, DVB-S2X with SCPC and receive a common DVB-S2X ACM waveform. The terminals can be mixed and matched with the application requirements.

Newtec Dialog Release 2.1 gets the most out of High Throughput Satellite capacity, unleashing the power of DVB-S2X and provinding return rates upto 75 Mbps using shared capacity.

Main advantages are: Supporting wide range of applications and services on a single platform. 30% forward efficiency improvement using DVB-S2X, 50% bandwidth saving with Newtec Mx-DMA return link technology and easy OSS/BSS integration using extensive open API.

Conclusion

Trends are to have hubs flexible that can cover all the market segments (backhaul, broadband, mobility etc..) just adding specific software or simple hardware modules. All the remote terminals will be small and cheap due to the new chipsets with SDR (Software Defined Radio) to implement via satellite link all the upgrades.

All the technologies will implement DVB S2X for increasing the throughput in the available transponder bandwidth and will be easy expendable adapting the Hub to the number of transponders to be used in each HTS satellite.

Another major trend in the VSAT market is the antennas that are coming Flat instead of typical Parabolic Antennas for both terrestrial, maritime and aeronautical market.

Base in the last study of NSR below we can see the market share among the main vsat vendor and market segments.

NSR's VSAT and Broadband Satellite Markets 15th Edition forecasts the global installed base for fixed VSATs to increase by 12.2 million by 2025, generating over US$ 133.7 billion in cumulative Service Revenues over the 2015-25 period. Despite near term challenges, insatiable data demand and HTS capacity will ignite long term growth.

The Fixed Enterprise VSAT market also had another challenging year. Developed regions continue to face strong competition from ground networks and market saturation. Additionally, poor macroeconomic factors like currency exchange rates or commodity prices limited growth in emerging economies.

However, NSR sees some positive signs of a turnaround. Cheaper capacity prices are unlocking new markets like Mobile Backhaul, which will become the major driver for growth in the coming years generating over a Tbps of demand by 2025. Despite not returning to the number of shipments pre-slow down, most VSAT ground vendors are now back on a growth track. NSR forecasts the installed base for Fixed Enterprise VSATs to incorporate more than 1 million new sites generating US$ 4.5 billion in net growth for annual service revenues.

This article was written in collaboration with Claudio Mastroianni – Senior Consultant of Telematics Business Consultants, specializing in the VSAT ground segment. He can be reached at cmaistroianni@gmail.com

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Intelsat + OneWeb= True Love or Shotgun Mariage?

By Armand Musey

It's well known that Intelsat and OneWeb announced plans to merge, backed by a US$ 1.7 billion investment from SoftBank. This adds to SoftBank's investment in the satellite sector, following it's the December 2016 announcement of a US$ 1 billion investment in OneWeb. What's not well understood is why this deal is happening? What's in it for each party? This post explores the possibility that the transaction was essentially forced upon OneWeb by SoftBank, its largest shareholder. To be clear, this post is a speculative interpretation of the limited public information currently available.

The Intelsat/OneWeb Transaction Makes Obvious Sense for Intelsat

Intelsat's current capital structure combined with rapidly falling prices for satellite capacity is unsustainable. It's now fairly clear that Intelsat EPIC won't provide the promised sustained revenue lift needed. As is, an Intelsat restructuring almost inevitable – probably around the end of the decade when large debt tranches come due. SoftBank's US$ 1.7 billion investment will allow Intelsat to modestly de-lever its balance sheet. Satellite capacity from OneWeb may allow Intelsat to reduce future satellite capX by moving some of its network services customers to OneWeb instead of replacement Intelsat satellites. Additionally, OneWeb revenue could also help service Intelsat debt in addition to its own. The cumulative effect of these factors might help Intelsat convince its creditors to refinance and avoid a restructuring. If SoftBank is sufficiently impressed with Intelsat/OneWeb's progress, they might even extend their own financing as they have done with Sprint. Frankly, this deal is probably Intelsat's only shot of avoiding restructuring.

No Apparent Benefit for OneWeb

But what's in it for OneWeb? It had SoftBank's previously provided financing and capacity purchase agreement for most or all of OneWeb's capacity (the terms of the agreement are vague in public documents). With this in hand, OneWeb was likely in a position to get debt financing for most of the rest of their remaining capital needs. Moreover, the capacity agreement left OneWeb with minimal marketing concerns, at least for a few years. Given this background, there appears no benefit for this dynamic new entrant to want to partner with an over-levered company whose revenue is in a long-term secular decline.

SoftBank's Moivation is Clear

The key to understanding the proposed merger appears to be that the transaction seems highly beneficial to SoftBank. The deal could allow SoftBank to effectively offload a large portion of the risk from its commitment to buy OneWeb capacity. SoftBank is not a satellite capacity distributor and does not appear to have the resources to resell the OneWeb capacity it committed to buying. Intelsat has a global distribution network, much of it focused on network services traffic and disproportionately in developing countries with the greatest need for OneWeb's services. Of course, Intelsat isn't going to just move traffic to OneWeb and essentially give-up a large portion of its Network Services business. That would be signing its own death certificate. But if Intelsat is part of OneWeb, and benefits from OneWeb's growth, the equation changes allowing Intelsat to justify aggressively move customers to OneWeb. As a 43% shareholder and critical customer it would have significant influence over OneWeb. We suggest SoftBank might have used this influence to pressure One-

Web into the merger with Intelsat.

If OneWeb succeeds in the market, this may be enough to convince Intelsat creditors refinance debt coming due around the end of the decade. Should this happen, SoftBank will be in position to make an enormous profit from its junior position in Intelsat's capital structure. Offloading risk from its capacity purchase agreement with OneWeb is icing on the cake.

….If OneWeb succeeds in the market, this may be enough to convince Intelsat creditors refinance debt coming due around the end of the decade. Should this happen, SoftBank will be in position to make an enormous profit from its junior position in Intelsat's capital structure.…

Not Closed Yet

The proposed merger is contingent on, among other things, current Intelsat bondholders agreeing to an exchange offer. Based on trading prices, bondholders are poised to reject SoftBank's offer and are expecting SoftBank to sweeten it. It's not clear that will happen. There were few rumors until the day before the deal was announced, suggesting SoftBank may have not yet done deep due diligence on Intelsat. We suspect deep analysis of Intelsat's market position and declining market prices will make the deal look worse rather than better over time. We would not bet on SoftBank raising its offer.

J. Armand Musey is the president and founder of Summit Ridge Group LLC (www.summitridgegroup.com). Armand specializes in the satellite, media and telecommunications industries. He has a unique blend of 16 years of equity research, investment banking and consulting experience. He can be reached at: amusey@summitridgegroup.com

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A guide to key products and services to be showcased at the NAB 2017 in Las Vegas, Nevada, USA 2017 from April 24-27, 2017.

Advantech Wireless
booth # SU 3821 and OE 828
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. 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.

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AvL Technologies
booth # C 7248 and OE 504
www.avltech.com

At NAB 2017, **AvL Technologies** will feature The Family of Integrated Terminals (FIT), AvL's newest line-up of flyaway antenna systems. These antennas are designed to accommodate current and future modem, RF and satellite frequency options. On display in our Central Hall booth, C7248, will be a 1.35m FIT antenna, and our outdoor booth, OE504, will have a 0.98m antenna. This new line of user-configurable, IATA checkable and carry-on satellite terminals are ultra-compact, ultra-lightweight, ultra-high performance fully integrated systems, upgradeable from the baseline manual-point configuration to a motorized, auto-acquisition platform.

Our Central Hall booth also will feature a 1.2m O3b MEO tracking Ka-Band antenna. The antenna offers the power of O3b's high throughput, low latency connectivity in a compact, easily transportable and rapidly deployable design. The antennas operate in tandem pairs (same size) with make-before-break communications.

An 85cm auto-deploy flyaway fully-integrated solution that packs into two airline checkable bags, loaded with features including multiple modem choices, mission-configurable weatherproof electronics enclosure with the latest power efficiency technology and a 1.2m SNG vehicle-mount antenna with a motorized selectable dual-feed system will be displayed in our Central Hall booth.

On display in our outdoor booth will be a 1.2m SNG motorized vehicle-mount Ka-Band antenna with swappable feeds.

C-COM Satellite Systems Inc.
booth # 711
www.c-comsat.com

C-COM Satellite Systems Inc. is a pioneer in the manufacture and design of mobile, auto-deploy antenna systems. The iNetVu® brand, available in vehicle mount, flyaway, and fixed motorized format, is sold in over 100 countries, and is considered the most reliable and advanced product in the market today. More than 8,000 C-COM antenna systems have sold into the military, oil and gas, SNG, disaster management, mobile banking and telecom verticals, among others. C-COM is also engaging in the design and manufacture of next generation, 'Comm-on-the-Move' antenna systems, including a land-based, Ka-band COTM antenna, as well as a phased array, electronically steerable solution.

At the NAB, C-COM will be showcasing its Ka-98H/JUP , a 98cm, auto-deploy antenna approved for operation on Hughes Jupiter System. It comes with the one-button, auto-pointing 7710 controller system to acquire satellite in under

two minutes. The system can be converted in the field to operate on other available approved Ka-band services, including Eutelsat KASAT, Yahsat YAHCLICK, and Avanti (iDirect/Gilat service), and also to Ku-band.

COMTECH EF Data
booth # SU 3308
www.comtechefdata.com

Comtech EF Data Corp. is the global leader in satellite bandwidth efficiency and link optimization. Our integrated SatCom infrastructure solutions encompass Advanced VSAT Solutions, Satellite Modems, RAN & WAN Optimization, Network & Bandwidth Management and RF Products. The offerings feature groundbreaking efficiency (industry-leading coding, modulation, compression and physical layer operation), robust intelligence (traffic shaping, dynamic bandwidth allocation and integrated network management) and unparalleled horsepower (processing power for your pps and Mbps transmission requirements).

COMTECH Xicom Technology
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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 will be showcasing its SuperCoolTM family of amplifiers which has many practical advantages over traditional air-cooled amplifiers including: ambient noise reduction, ease of service and maintenance, higher reliability, reduced heat load in hubs, flexible and compact installation and gain stability over ambient temperature. The Comtech Xicom design incorporates integrated cooling channels in the amplifier baseplate, external to the high voltage and RF circuitry and drip-free connections. Liquid cooling is available across the high-power end of the product-line, including: the new SuperPower 2000W, and 1500W products; the 1250W, 750W, 500Ka and 250Ka family of amplifiers.

Crystal
booth # SU 11017
www.crystalcc.com

Crystal provides advanced monitoring and control software for video distribution over satellite, cable or the Internet. It makes any combination of hardware and software, from practically any manufacturer, operate reliably as a single seamless system. Its software is also on the leading edge of new OTT applications, with frame-accurate precision that enables everything from dynamic ad insertion and content replacement to live-to-VOD and live clipping without adding infrastructure or manual processing. That is why, over the past 30 years, the world's leading broadcast and cable networks have trusted Crystal to support hundreds of billions in revenue. Founded in 1986, Crystal is headquartered in Greater Atlanta, GA

Crystal Control enables multi-site NMS & Control, Metadata applications for Linear to OTT, Streaming with DRM & DAI. Serving satellite, broadcast and video for 30 years: *Spectrum Monitoring & Recording, * Metadata applications, * Ad Insertion Verification & Reconciliation, * Site Diversity Switching, * Network Management Systems.

Hispasat/Hispamar
booth # SU 9813
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 communications bridge between Europe and the Americas.

With more than 25 years of experience, the HISPASAT Group maintains an important presence on the Iberian Pen-

insula and in Latin America, where it is now the fourth satellite operator. HISPASAT has solidly positioned itself in high growth markets and has a stable strategic client base.

HISPASAT distributes more than 1,250 television and radio channels through its powerful fleet of satellites and is a key driver for the Spanish aerospace industry.

Newtec
booth # 2802
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.

Here's what to expect from Newtec at NAB 2017:

Boosting SNG: Find out how next-generation IP satellite links boost connectivity for IP newsgathering.

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- Newtec DVB-S2X, DVB-S2, DVB-DSNG and DVB-S broadcast modulator – **M6100 Broadcast Satellite Modulator**
- Newtec MCX7000, a dense Multi-Carrier Satellite Gateway for broadcast, video contribution, exchange & distribution, up to four modulators & three demodulators – **MCX7000 Multi-Carrier Satellite Gateway**
- Newtec DVB-S2X, DVB-S2, DVB-DSNG and DVB-S broadcast modulator–**M6100 Broadcast Satellite Modulator**

RSCC
booth # SU 12710
www.rscc.ru

The Russian Satellite Communication Company (RSCC) is the national state satellite operator whose spacecraft provide a global coverage. RSCC belongs to the ten largest world satellite operators and owns five teleports and its own optical fiber infrastructure. The company possesses the largest satellite constellation in Russia located in the geostationary orbital arc from 14 West to 140 East and cover the whole territory of Russia, the CIS, Europe, the Middle East, Africa, the Asia Pacific region, North and South America, and Australia.

RSCC offers a full range of telecommunications services such as TV and radio broadcasting, data transmission, telephony, multimedia and others using its own terrestrial engineering facilities and satellite constellation.

Walton De-Ice
booth # OE 907
www.de-ice.com

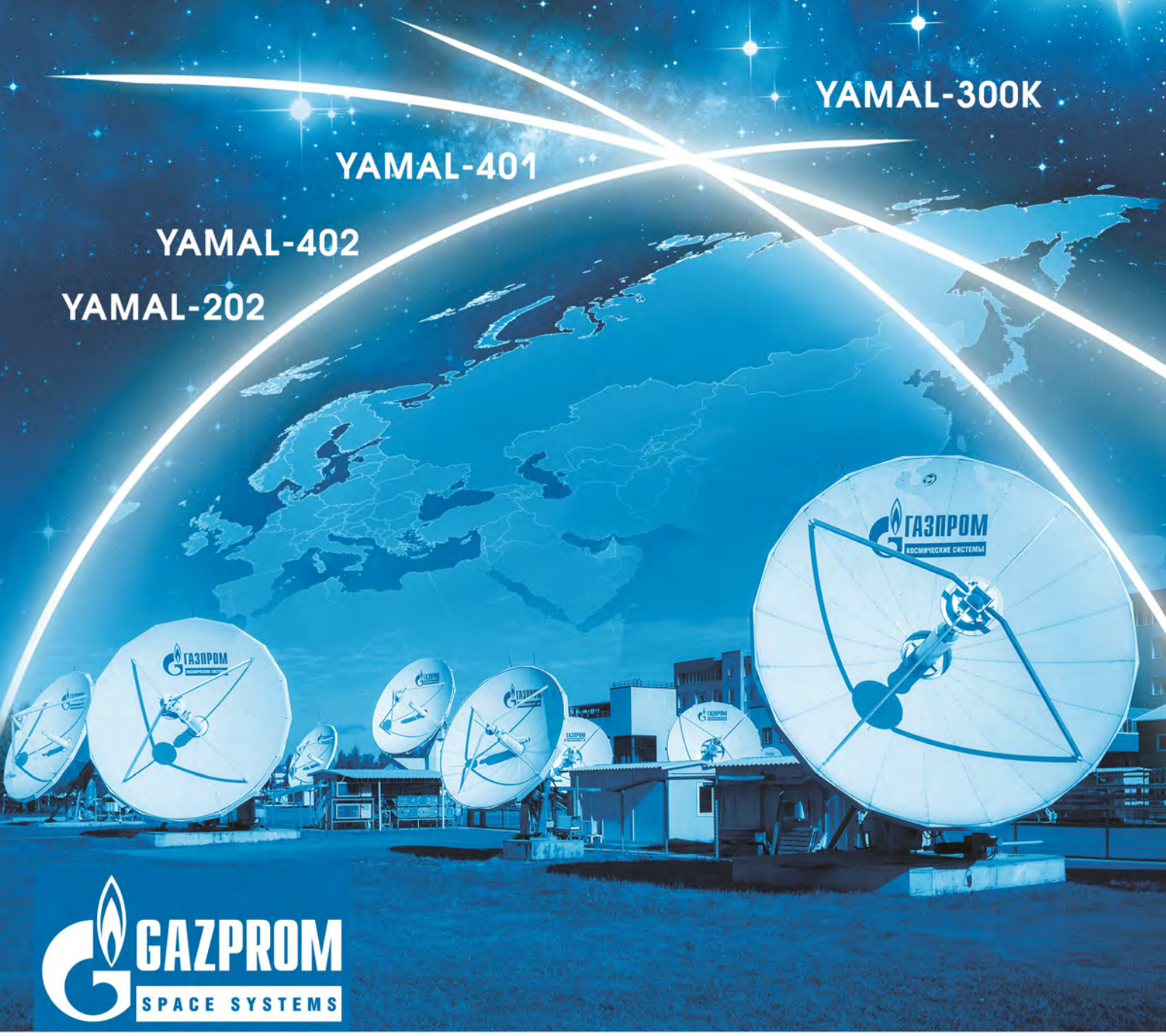
Walton De-Ice, the world's leading designer and manufacturer of satellite earth station antenna (ESA) weather protection solutions, Walton will showcase its latest Ka-Band satellite ESA weather protection solutions, **Ice Quake, Rain Quake**, and **Snow Shield** at the NAB.

Learn how satellite facilities are ***reducing their energy consumption and costs***, while protecting their antennas from outages due to snow, ice, rain and weather.

Walton De-Ice will announce a the NAB in Las Vegas that one of the world's most successful pay TV services has updated its satellite earth station with the latest Walton Hot-Air Plenum De-Ice systems.

The Ice Quake (U.S. patent) enhances the reliability of a passive Snow Shield cover by shaking off snow before ice forms, and melting ice with heating options. Enjoy huge – up to 100x utility bill savings compared to conventional systems. No need for high-power conduit, trenching, or switch gear costs. Automatic moisture and temperature monitoring and control system.

Minimize signal loss due to Rain Fade with Walton De-Ice's Rain Quake. Reduce data loss - by 20X or more - compared to antennas without protection. Prevent water from sheeting on your antenna surface - causing Ka-Band or Ku-Band rain fade - from VSATs to large antennas.



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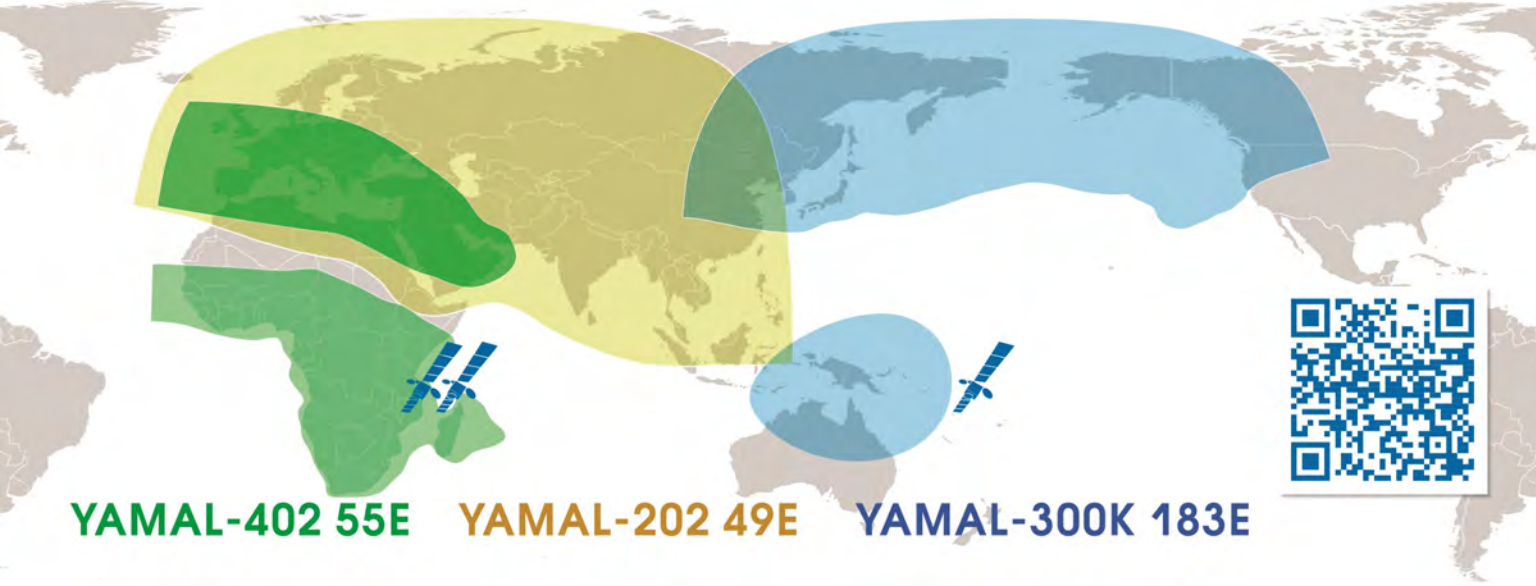

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Astrapi, Startup Space and Swis Executions

by Lou Zacharilla

Being hyperbolic is a symptom of my enthusiasm for the satellite industry. Where else but in our industry will you find this level of technological diversity, an incredibly satisfying global community of colleagues and a higher purpose tied together in the private sector? (Or in the public sector, for that matter?)

SSPI has articulated the global urge of our industry and its craftsmen and women: to make a better world through satellites. (We call it a "Better Satellite World" www.bettersatelliteworld.com) This can only be accomplished if more of our entrepreneurial energies are unlocked. To unlock them, we need to make sure that we find the next gen of people as hyperbolic, collegial and driven toward the creation of wealth and the higher purpose as those of us peaking at our career summits. This is the ethos of our tribe. To hand the flame over and keep the birds flying – and much more.

Based on what I saw from a chair at the back of the Exhibition Hall in the bottom floor of 801 Mount Vernon Place on 7 March (the Walter E. Washington Convention Center), I would say that not only has the flame begun to be handed over, it is becoming a big ole' helium ball!

Enter the Space Frontier Foundation. These guys are on par with SSPI when it comes to articulating a great mission statement. Theirs reads*: the purpose of the Space Frontier Foundation is to unleash the power of free enterprise and lead a united humanity permanently into the Solar System*.

"Where do I sign up?" I asked.

Turns out *they signed me* up. I was asked by Jeff Smith, the Investor Relations Manager of Space Frontier and Jeff Hill, the Chairman of Satellite 2017, to be a part of this year's Startup Space Entrepreneur Pitch Contest at the Satellite show. What a blast – an opportunity to judge young startups in the early phase.

The format was clean and simple – kind of like a Swiss execution. (Well, I've never seen a Swiss execution but I assume they are like a Swiss watch with guns and blindfolds.) Each contestant was placed in one of four groups and given a 10-minute time slot: five to pitch their product and five for judges to probe and ask questions. We scored each presentation in our group and, in the end, a winner was given an award at the end of the conference at the Carnegie Library. The prize was an opportunity to present to Will Porteous (RRE Ventures) and Space Angels guru Chad Anderson. We were the second round of the playoffs, so to speak.

Said Smith, "We chose 20 contestants for this first go-around. I wanted to include contestants and companies from a variety of categories within the space industry, all of them along the full spectrum of development, from the student with a great business idea to an established company looking for an additional round of funding. Also there was no cost for contestants to participate."

He added that among the types of disruptive technologies that should keep a traditional industry CEO up at night was the continued development and application of additive manufacturing and 3D printing, which I also saw in large numbers from among the presenters in my group. The groups had great names such as Aterio, Optisys and Ursa Space Systems (run by SSPI former Promise Awards Winner, Adam Maher.) I am proud to say that I was among the judges who picked Astrapi, which became the overall winner. The company's co-founder, David Shaw, did a terrific job. With 40 patents, Astrapi was established to develop and license spiral modulation, which would open an unexplored area for innovation and take care of a lot of our industry's capacity and power constraints. It is currently working with an American National Space Foundation (NSF) grant.

Like mining platinum on an asteroid, an endeavor valued to be worth as much as US$20 trillion, according to Planetary Resources, wild dreams harnessed and finally tamed for reality, can solve problems which seem eternal. What seem like intractable paradigms for the satellite community will prove to be simply the legacy software of an industry that is not only rebooting, but doing it in a way that will continue to put it into a new orbit and financially in a good place. I call that place the "middle mile" – the sweet spot between our venture out to the New Frontier and the expanded service to the one we call home - where our mission calls for us to make it better.

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

From CABSAT to Aberdeen's Oilfield Connectivity

by Martin Jarrold

GVF collaboration with **Dubai World Trade Center** again brought a program of strategic debate on key issues for the current satellite industry technology and service marketplace to the **CABSAT** show a week or so ago, but this year with two programs covering all three days of the exhibit, with Day 1 featuring the **SATEXPO** conference, and Days 2 & 3 featuring the **GVF Satellite Hub Summit**.

Pictures are a good way to tell a story so you may what to take a look here to get the flavor of the conference from 21st March http://clients.tcb-studio.com/gallery/CABSAT/album/2961614. The event was keynote and panel discussion oriented – the keynotes being from the **UAE Space Agency** and **Virgin Galactic** – so there isn't really any post-show slide-set material to share.

However, the photo record of the **Satellite Hub Summit** of 22nd and 23rd March (http://clients.tcb-studio.com/gallery/CABSAT/album/2958056) does come with the opportunity to see the slide-sets that panelists used to illustrate their opening/introductory remarks. Click on the **Satellite Hub GVF** logo link at www.gvf.org for free access to this invaluable resource.

Behind this link you will find brief presentations from most of the following final line-up of **Satellite Hub Summit** speakers: Riyadh Al Adely, Managing Director, **SkyStream**; Tom Loi, Sales Director, **AsiaSat**; Khalid Al-Awadhi, Manager Space & Broadcasting Services, **TRA, UAE**; Dongsik (Thomas) Kim, Senior Engineer, Space Systems Coordination Division, Space Services Department, Radiocommunication Bureau, **ITU**; Patrick van Niftrik, Vice President, Spectrum Development, EMEA, **SES**; Kumar Singarajah, Director, Regulatory Affairs & Business Development, **Avanti Communications**; Laith Hamad, Director, Middle East & North Africa, **Access Partnership**; Guido Baraglia, Director, Business Development EMEA, **Kratos Networks**; Ammar Hamadien, Head of Strategic Engagement, MENA, **GSMA**; Nile Suwansiri, CCO, **Thaicom**; Dr. Mohaned Juwad, Senior Manager, Spectrum Policy, **Intelsat**; Soheil Mehrabanzad, Vice President, **Hughes**; Freddie Caldwell, Sales Manager, **Paradigm Communication Systems**; Majdi Atout, Vice President of Sales, Middle East, **iDirect**; Alessandro Caranci, Vice President Sales & Business Development Networks & Connectivity, **Telespazio**; Paul Febvre, CTO, **Satellite Applications Catapult**; Julian Kell, Director, Sales, EMEA, **Telesat**; Martin Coleman, Executive Director, **sIRG**; Zahid Zaheer, Senior Director of GMPCS Affairs, **Thuraya**; Abdul Aziz Al-Feel, Regional Director MENA, Enterprise Business Unit, **Inmarsat**; Anthony Baker, CEO, **Global Satellite Vu**; Koen Willems, Market Director for Government & Defence, **Newtec**; Andrew Bur-

dall, Executive Vice President, Enterprise & Emerging Markets, **SpeedCast**; Mostafa Fathi Abdalazem Alazab Elkhouly, Research Fellow, **Fraunhofer IIS**; Gez Draycott, Vice President Mobility Solutions, **SES**; Neale Faulkner, Manager, Strategy & Marketing Operations, MEA, **SITAOnAir**; Michele Scotto, Senior Vice President, **Globecomm**; Drew Klein, Director of International Business Development, **C-COM Satellite Systems**; Andreas Voigt, Communications Systems Manager, **Eutelsat**; Mazen Nassar, Managing Director, **MenaNets** & GVF Master Trainer; Yasir Hassan, Director, Transmission Operations, **ArabSat**; Ibrahim Nassar, Manager of Teleport, Teleport Department, Global Technology Services Directorate, Technology & Network Operations Division, **Al Jazeera Networks**; Erwin Greilinger, Product Line & Sales Manager for Satellite Monitoring Solutions, **Siemens Convergence Creators**; Christian Bergan, Vice President, Sales & Marketing, **TSAT**; Jack Buechler, Vice President, Business Development, **Talia**; Thierry Balanche, Sales & Marketing Manager, SDR Products, **Zodiac**; and, Akshat Jain, Sales Director, MENA & India, **ND SatCom**.

Dynamics & forecasts for near- and medium-term evolution across the Middle East and North African telecommunications sector and analysis of the ongoing major and expanding role of the satellite solution was discussed by contributors to the opening session, and this was followed by sessions entitled: ***Spectrum: Satellite & the Next ITU World Radiocommunication Conference; Leveraging Advancing Technologies & Scaling Innovative Services to Evolve Larger & Emergent Markets; Constellations for Connectivity: The Low Earth Orbit Solution Re-born? Mission Criticality: The Satellite Solution & the Humanitarian Crisis***; ***Into the Mainstream: VSAT Communications-on-the-Move & the New Strategic Marketplace***; ***Ensuring an Interference-Free World of Satellite Services***; ***Integrating & Securing Our Digital World: Cyber Security for Satellite in a World of Big Data, the IoT & the Cloud;*** and, ***Perspectives & Strategic Take-Aways: The Satcoms Dynamics of a Connected World.***

Next Agenda Items

The next near-term events in GVF's own conferences portfolio are **Oilfield Connectivity 2017**) when, on May 10th, the GVF-EMP Conference Partnership returns to Aberdeen for the 10th successive year, and **High Throughput Satellites-The DC Roundtable** returns on May 24th with the title *Show Me the Margin, and the Spectrum, and the Value Chain, and the Hardware, and the Investors, and…?* More details of the latter event will be made available in my next monthly column; here I focus on the Aberdeen program.

The Brent crude price per barrel is hovering around the US$52 as I write, and the overall crude price forecast trend varies widely, with one of the more optimistic from the World Bank indicating US$66 a barrel by 2022, and US$80 by 2030. If this trend forecast proves to be anywhere near accurate then the upward crawl to a price where oil companies are yielding more than their per-barrel recovery price will be a very slow one indeed.

Oilfield investment conditions are still far from encouraging, and even with a few tentative signs that employment recruitment is picking-up, tens of thousands of jobs have disappeared across the oil and gas sector and its ancillary industries in the Aberdeen region, and, of course, the preliminary phases of Brent Oilfield decommissioning are already underway.

Though problematic, the ongoing price crisis – albeit somewhat alleviated by OECD production decisions – is still only one consideration in a market that is also affected by ongoing geopolitical tensions, diminished, or even non-existent, exploration budgets, environmental permit delays, postponement or cancellation of information and communications technology (ICT) and other infrastructure spending.

Oilfield Connectivity 2017 will be set against this backdrop, and will continue the Series' focus on future potential hydrocarbon exploration and production (E&P) geographies and the latest communications technologies required for support of the energy industry's future and renewed efforts to locate and exploit remaining energy reserves.

About one-third of the known recoverable resources below the United Kingdom Continental Shelf (UKCS) remain to be exploited. This is no longer 'easy oil', but marginal oil, requiring an even more robust ICT-oriented dialog at the crucial interface of demand for ICT solutions by the energy vertical and the supply of those solutions from the communications industry. Some of the themes at this interface are:

Big Oil means Big Data | The storage, management, protection and analysis of information extracted from the large volume of data generated by the oil industry, much of which increasingly generated out of the rapidly expanding satellite communications/Machine-2-Machine (M2M) interface, and increasingly generated out of a universal Internet of Things (IoT), will be a major thread in the conference dialogue.

Robust Communication is an Imperative | The oil & gas sector faces many challenges which arise from operations in dangerous, harsh, and remote environments. The industry's commercial and operational centers require a range of means to communicate with E&P rigs and platforms, and to draw information from computer applications, mission-critical equipment, and other in-field infrastructure.**Mobility |** Oil & gas companies are aligning their upstream business processes with mobile technology, applying mobile applications to aid communication and workflow and fostering enhanced workforce productivity. The conference will investigate the implications for satellite communications with particular reference to HTS advances.

Internet of Things (IoT) | As noted elsewhere here, key issues in today's

oil & gas sector are Big Data, as well as M2M communications, and the arena of the Internet of Things (IoT). The relationship of these issues to the regional E&P communications and applications networking agenda will be prioritized in the program, together with a range of other topic areas arising from the international energy environment and the wider global economy.

"...Oilfield investment conditions are still far from encouraging, and even with a few tentative signs that employment recruitment is picking-up, tens of thousands of jobs have disappeared across the oil and gas sector and its ancillary industries..."

Machine-2-Machine | M2M communications is now a key connectivity focus in oil & gas, and the interface and synergy of M2M communications and satellite communications will comprise part of the conference subject-matter. Naturally, this dialog must begin with reference to future-history – IPv6 will bring on the full potential of the Internet of Things, and it is the IoT which will be the ultimate realization of a future universal M2M environment which will far exceed the potential boundaries and limited scope of even the greatest reach of a legacy supervisory control and data acquisition (SCADA) systems environment in the oil & gas sector.

The Cloud – Applications & Connectivity Imperatives for the Digital Oilfield | The list of applications and connectivity imperatives to be discussed at this event will include ICT aspects of: safety systems provision on oil & gas installations at sea; the enhanced application of satellite-based security provisions related to the use of "Cloud"-based data traffic networking; and, of great significance to the growth of "Big Oil" and "Big Data" in the region, the impact of HTS on the communications solutions vital to hydrocarbons E&P, including, potentially, video streams from unmanned aerial vehicles (UAVs) on security patrol around isolated offshore installations. The definition of the Digital Oilfield brings together Cloud server applications which facilitate the transfer of oil/gasfield IT infrastructure, and IT personnel expertise, away from multiple offshore, or other remote locations, to centrally located headquarters/regional offices in support of fully integrated operations for real-time well-head/drilling measurements and data networking/sharing, along with video-based equipment and instrument monitoring, video-based remote surveillance for safety and security, and video conferencing.

HTS – High Throughput Satellites & a New LEO Dawn | In all of this, HTS has been more than a game-changer for the oil and gas sector. The technology brings to the end user requirement multiple advantages, including lower space segment costs per megabyte, higher throughput rates, and greatly improved capacity availability. Amidst this HTS transformation, the satellite industry is looking ahead to the orbiting of the "mega-LEOs" with numbers of launches to low earth rather than geosynchronous orbit on an unprecedented scale. The accelerating growth of satellite-based traffic and of the demand for bandwidth and throughput capacity has also heightened the importance for oil and gas of other satellite technologies, particularly bandwidth, throughput and traffic optimization techniques.

Satellite-Terrestrial Hybrid Communications | The Aberdeen event will examine the full range of satellite-based communications, and integrated satellite-terrestrial hybrid communications solutions, to which the oil & gas industry turns to play a vital role in providing the essential connectivity and access to vital applications. Mission critical operational success in the upstream E&P environment is dependent on access to the most efficient ICTs, and to the wealth of sophisticated applications these technologies bring to the disposal of the teams of geologists, geophysicists, drilling engineers, seismic data analysts. etc., etc., who locate new oil & gas reserves and get them out of the ground and from beneath the ocean floor through the collection of massive amounts of disparate data in multiple formats.

Cyber Security – Networking & the SCADA Threat | It is now increasingly important to assess and respond to the new cyber landscape which threatens all secure critical information infrastructures. Cyber threats and exploitation of data vulnerability is advancing, and the ability and proliferation of sophisticated efforts to steal and monetize corporate data or leverage it to assert power, track trends/behavior etc. or even cause physical disruption in operations is a growing concern in the oil & energy industry. Denial-of-Service (DoS) attacks involve malicious attempts to disrupt the operation of a computer system or network that is connected to the Internet, disrupting system or network operations by consuming the bandwidth of the victim network or overloading the resources of computer systems. Almost all critical industrial infrastructures and processes are managed remotely from central control rooms, one example is the flow of gas and oil through pipes, using forms of process control and SCADA.

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

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Thuraya Appoints Acting CEO

Dubai, UAE, April 1, 2017--Thuraya Telecommunications Company announced that Mr. Ahmed Al Shamsi,

Ahmed Al Shamsi

Chief Technology Officer has been appointed as temporary Acting Chief Executive Officer of the company, assuming the role immediately.

Al Shamsi has been a key member of Thuraya's leadership team since its inception in 1997. He was directly involved in all phases of its development, from concept initiation to complete deployment, operation and evolution.

AvL Technologies Announces Strategic Hires on its Engineering Team

Asheville, N.C., March 3, 2017–AvL Technologies announces three new strategic hires on its Engineering team. Ian Timmins, Ph.D., has joined AvL as Principal RF Engineer and is responsible for key research and development efforts, Rich Tarpley as Director of Strategic Product Development and Wayne Holt recentlyas a Senior Mechanical Engineer.

Dr. Timmins previously served as VP of Engineering for Optical Cable Corporation in Asheville, and held a research role at Memorial University of Newfoundland where he obtained his Ph.D. He also has worked for DELL Computer Corp. and Cisco Systems. Ian has extensive electromagnetics and RF antenna experience.

Rich Tarpley has joined AvL as Director of Strategic Product Development. Rich is leading AvL's integration efforts for customer-requested systems integration and for AvL-developed antenna systems integration. Prior to joining AvL, Rich was President and CEO of PathFinder Digital where he managed all technical operations for the company and large government projects. Rich also has served in management positions for Wegener Communications, BitCentral, General Instrument Corporation, COMSAT RSI and Scientific Atlanta.

Tarpleyhas an Associates of Applied Science Degree in Electronics Engineering Technology from DeVry Institute of Technology and has held Top Secret Clearance for the U.S. Department of Defense.

Wayne Holt recently joined AvL as a Senior Mechanical Engineer with extensive structural analysis, thermal analysis and design expertise. Wayne holds a B.S. in Mechanical Engineering from Texas Tech University and has significant engineering design experience at other satellite antenna manufacturers including ViaSat, ASC Signal (formerly Andrew) and General Dynamics Satcom (formerly VertexRSI). Wayne also worked for Lockheed Martin.

Globecast appoints Ken Fuller as CTO in the US

Los Angeles, March 28th, 2017 — Globecast, the global solutions provider for media, has announced the appointment of Ken Fuller to the post of Chief Technology Officer (CTO) of Globecast Americas, effective immediately. Ken will lead all aspects of the company's technical development and will work closely with the executive management team to establish a clear

Ken Fulller

and strategic technical vision.

In his new role, he will oversee key vendor relationships and investigate, purchase, and implement new technologies. On top of this, Fuller will manage a team of 30 in the US. He reports to Globecast COO Philippe Fort who is based in Paris.

Prior to joining Globecast, Fuller held the post of Senior Vice President of Operations at Deluxe Entertainment Services Group in Burbank, CA, where he was responsible for several integration groups that focused on ingest, QC, metadata management of packaging and delivery of SVOD, TVOD, and streaming content.

Before then, he spent several years as Senior VP and General Manager at Encompass Digital Media, Inc., where he was responsible for the company's metro Los Angeles operations, production, engineering and facilities services. Fuller is also a Past President of the Society of Motion Picture and Television Engineers as well as an SMPTE Fellow. In addition, he was Director of Broadcast and Network Operations NBC New York. While there, he received five Technical Emmy Awards for his work on NBC's Olympic broadcasts.

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Staging Rescues from Low Earth Orbit

. Joe Hiscock and his son look forward each year to hunting on the south coast of Newfoundland, Canada. Their cabin is 35 miles from the nearest road and accessible only by private helicopter or snowmobile. One September, they were dropped off at the cabin, where they planned to spend the week. Instead, Joe began suffering abdominal pains that worsened as day turned into night. Finally, he pulled out a gadget he carried called SPOT and pushed a button on it labeled "S.O.S." Within 20 minutes, the local RCMP detachment was on the phone with Joe's wife, confirming his location. Shortly after that, a helicopter was dispatched to Joe's GPS coordinates but could not land due to heavy fog. It was in the early morning hours, as visibility improved, that Joe was airlifted to the nearest hospital, where he would spend two weeks being treated for an abdominal infection complicated by kidney stones. In his view, "Anybody who goes into the woods should have one of these devices."

SPOT is an example of personal tracking technology. The device, which fits in the palm of your hand, communicates your exact GPS location to a satellite network. A web portal lets users create pre-set messages that go out by email or text to people they designate. Each message is associated with a button on the unit. Press one button and you send a friendly "Guess where I am?" message with a link to a Google map showing your location. Press the S.O.S. button and the nearest emergency responders start racing to the rescue. Since the technology's launch in 2007, SPOT has initiated more than 4,500 rescues around the globe.

Wi-Fi from Space

Sometimes it is machines, not people, who need help. The logging industry operates heavy machinery in remote places far from roads or cellular coverage. When that equipment needs maintenance or repair, it tends to mean high costs and long delays.

Black Diamond Mechanical & Welding sells and services logging equipment from its headquarters in British Columbia. "There is a shortage of skilled heavy-duty mechanics in our industry," says Black Diamond's owner, David Pope. "In fact, half of the people on our job sites are apprentices. Often, they have to check out a problem and then drive back to the nearest internet connection an hour away to communicate with our master mechanic. Then they go back and forth, trying different solutions and reporting on results. It wastes hours and days."

A long-time user of sat phones, the company has now added another satellite technology: a Wi-Fi hub called Globalstar Sat-Fi. Users can now use their existing smartphone and tablet devices to communicate beyond cellular, with up to 8 individual users having the ability to connect to one Sat-Fi hotspot device. Switch it on anywhere with a view of the sky, and it provides internet access to devices within a 100-foot radius.

With satellite-based Wi-Fi, workers with a smartphone can take pictures of the equipment problem and text or email it, along with their questions, to the master mechanic. It can also handle voice calls and provide internet access. "We have seen a significant improvement in productivity," says Pope. "With Globalstar Sat-Fi, it's like having the master mechanic standing right beside the apprentice in the field."

Rescue for the Heart

When migrants began flooding into Europe in 2015 from the war-torn Middle East, Disaster Tech Lab was there. This nonprofit grassroots organization provides rapid response communication networks for disaster relief and humanitarian aid. On the Greek island of Lesbos, Disaster Tech Lab staff used Globalstar sat phones to keep its teams connected and to call for medical help and supplies as they moved from place to place. But the impact of the phones went far beyond the practical, according to the Lab's founder, Evert Bopp.

"On several days, he says, "we used the satellite phones to let refugees make a quick call to family back home to let them know they were safe. From a humanitarian point of view, this had the biggest impact. We had people foregoing medical treatment to wait in line to use the phone. Many were overcome when talking to their families and burst into tears. It was absolutely fantastic to be able to pull out the satellite phone, hand it to someone and let them make a call there and then."

Satellites circle the Earth hundreds or thousands of miles above the surface. That may make them an odd choice of rescuer for people in distress. But the invisible web of communications they weave keeps body, spirit and the occasional machine together, day after day, from one corner of the globe to another.

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Satellite Operators' Financials in Transition

Cambridge, Mass., April 10, 2017 – NSR's Satellite Operator Financial Analysis, 7th Edition, finds in an industry fraught with falling prices and indebted behemoths, satellite operators are playing a more aggressive game to find growth. A shift in emphasis, away from the broadcast-dominated days, into a brave new world of HTS, LEOs and MEOs, with radical and sometimes risky changes that are expected to move operator financials forward.

In 2016, top-line operator revenues declined in USD terms by just under 3%, as the Euro-Dollar exchange rate stabilized and emerging market currencies, such as the Brazilian Real, rebounded. (The latter event lead to Star One posting a sizzling 46% USD-denominated revenue growth rate.) A continued downward momentum of revenues per transponder continued as data markets suffered and several operators saw their cash piles wind down due to acquisition or paying down debt.

To counter the stagnation of traditional capacity business, operators are making big, potentially risky plays. These moves have been prominent last year and so far in 2017. This shows most clearly in SES's financials—the company's EBITDA margin dropped from 74.2% to 70.2% (though 73.7% using same scope)", notes Blaine Curcio, Principal Analyst at NSR and report co-author. "Other noteworthy examples of operators upping the ante include Intelsat and OneWeb's proposed merger, Telesat's potential LEO-HTS play, and the proposed GEO-HTS mobility constellation spearheaded by Hong Kong-based APT Satellite through a Mainland Chinese Joint Venture. Conspicuously absent from the table is Eutelsat, with the company sticking to its guns of high-margin video hotspots and broadband, with the strategic implications of all the above developments and more discussed within the study.

"2016 also saw operators becoming more competitive in their respective international data/mobility markets, with heavy discounts on bulk contracts for customer acquisition. This was well complemented with an emphasis on curbing CAPEX and OPEX to offset pressure on top line revenues, and, more importantly, checking their debt profiles with majority of them undertaking partial or full debt refinancing," notes Gagan Agrawal, Analyst at NSR and a report co-author.

The Satellite Markets 20 Index™

Company Name	Symbol	Price (Apr 07)	% Change from (Mar 01)	52-wk Range	
Satellite Operators					
Asia Satellite Telecommunications Holdings Limited	1135.HK	9.58	0.00	9.30	12.00
Eutelsat Communications S.A.	ETL.PA	21.36	0.13	15.19	28.80
APT Satellite Holdings Limited	1045.HK	4.10	0.00	3.64	6.73
Inmarsat Plc	ISAT.L	837.50	0.20	594.50	1024.00
SES S.A.	SES.F	21.70	0.12	17.90	26.10
Satellite Manufacturers					
The Boeing Company	BA	178.85	-0.03	118.25	184.80
MacDonald, Dettwiler and Associates Ltd.	MDA.TO	69.18	0.03	63.52	92.92
Lockheed Martin Corporation	LMT	270.23	0.01	210.90	270.00
Orbital ATK, Inc.	OA	98.59	0.04	67.04	94.79
Honeywell International Inc.	HON	124.27	-0.02	105.25	127.41
Equipment Manufacturers					
C-Com Satellite Systems Inc.	CMI.V	1.03	0.01	0.90	1.29
Comtech Telecommunications Corp.	CMTL	13.31	0.16	9.52	25.09
Harris Corporation	HRS	110.17	-0.01	73.32	111.67
ViaSat Inc.	VSAT	63.28	-0.08	63.00	82.19
Gilat Satellite Networks Ltd.	GILT	5.47	0.05	3.84	6.19
Service Providers					
DISH Network Corporation	DISH	62.55	0.01	43.29	64.74
Globalstar Inc.	GSAT	1.62	0.13	0.63	3.00
Orbcomm Inc.	ORBC	9.45	0.06	7.15	10.98
Sirius XM Holdings Inc.	SIRI	5.16	0.00	3.74	5.22
Sky plc	SKY.L	969.00	-0.03	560.00	1069.00

The Satellite Markets 20 Index™ is a composite of 20 publicly-traded satellite companies worldwide with five companies representing each major market segment of the industry: satellite operators; satellite manufacturers; equipment manufacturers; and service providers. The base data for the Satellite Markets Index is January 2, 2008 - the first day of operation for Satellite Markets and Research. The Index equals 1,000. The Satellite Markets Index™ provides an investment benchmark to gauge the overall health of the satellite industry.

INDEX	Index Value (Apr 07)	% Change from (Mar 01)
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