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SATELLITE Markets & Research

Industry Trends, News Analysis, Market Intelligence and Opportunities

# Middle East Satellite Market Update

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

According to most analysts, this is a great time for satellite broadcasters and service providers in the Middle East and North Africa. International broadcasters are committed to the future of satellite technology, providers are increasing capacity and reinvigorated conditional access systems are ensuring profitability.

The most recent research from Eutelsat suggests that consumers prefer satellite. While pay television services in the MENA region grew by 15.3% in 2016, virtually all of this growth came from direct to home satellite.

Northern Sky Research adds that the satellite capacity leasing market has been growing at an annual rate of 4.2% globally, and the MENA region is predicted to see the largest FSS Ka-band demand in the world over the next two years.

The recent announcement by OSN of a set-top box swap-out, to an "unhackable" device, is designed to bring in revenues from at least some of the estimated five million illegal connections in the Middle East. OSN predictions are that at least 20% – one million homes – will convert to a paid subscription.

Greater confidence around content protection is one of the reasons that international broadcasters are showing greater commitment to the region, with BSkyB now offering a regional news service, and channels from MTV and Turner being added to bouquets.

When considered in conjuction with the strong growth in ethnic programming predicted by the Eutelsat survey, it is clear that there will be a strong demand for satellite transponders in the coming years.

Middle East & North Africa OTT TV episodes and movies will generate revenues of $1.75 billion by 2022; more than quadruple the $428 million recorded in 2016.

According to the Middle East and North Africa OTT TV & Video Forecasts report by Digital TV research, SVOD's dominance of the sector will grow. SVOD revenues will reach $1.23 billion by 2022 (or 70% of the OTT total); nearly $1 billion more than the 2016 total (56% of OTT revenues). Digital TV Research forecasts 17.27 million SVOD homes by 2022, up from 3.74 million recorded by end-2016. Turkey will remain the leader by some distance,

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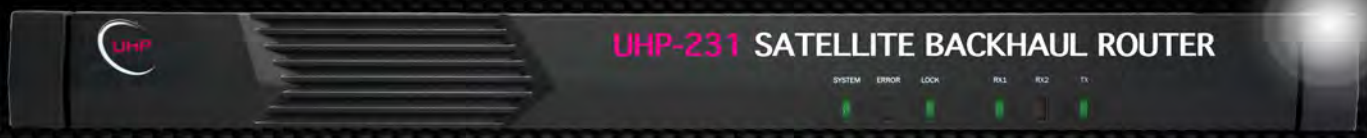



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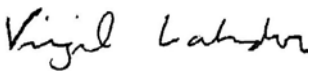
# The Middle East Satellite Market

We begin 2018 with CABSAT in Dubai, UAE being held two months earlier than usual bringing the Middle East satellite market to the fore in the year's agenda. This is a welcome development as it avoids any conflict with other trade shows in the past. By all indicators it is also a good time for the middle east satellite market.

Northern Sky Research that the satellite capacity leasing market has been growing at an annual rate of 4.2% globally, and the MENA region is predicted to see the largest FSS Ka-band demand in the world over the next two years. Demand will be driven by many diverse applications such as broadband, telecoms, M2M, IoT, maritime, among others.

Ali Al Kuwari, Preisident and CEO of satellite operator Es'hailsat, summed it up best with his observation of the trend for channel owners and broadcasters to start broadcasting their content in higher quality via satellites, i.e. from standard definition to high definition and even to 4K ultra high definition. "From a technology perspective, both broadcast and telecommunication services are looking at bandwidth efficiency with higher compression and latest modulation schemes being explored and implemented. Satellite capacity demand for inflight connectivity for entertainment and flight data management is set to increase over the next few years. Demand for satellite capacity for maritime services is also set to increase over the next few years. Not only in terms of mission critical data or services, but also in the entertainment segment, with high volume on-demand content and internet traffic requiring substantial amount of satellite capacity," said Al Kuwari.

We look forward to seeing you at CABSAT in Dubai, UAE from January 14-16, 2018.



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



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having established a major local player as far back as 2011. The top six regional platforms (Netflix, Amazon Prime Video, Icflix, Starz Play, Iflix and Shahid Plus) will account for 39% of the region's SVOD subscribers by end- 2022, up from 34% in 2016. Extracting Israel and Turkey, these six platforms will account for 78% of SVOD subscribers by 2022 – down from 88% in 2016.

Netflix will be the largest pan-regional SVOD platform by 2022, with an expected 3.26 million paying subscribers. This is more than quintuple the 2016 total. Longerestablished Icflix will cross 2 million subscribers by 2022 – quadruple its 2016 total. Starz Play will add a further 1.60 million. Our forecasts of 695,000 subs for Iflix by 2022 only cover six of its eight current countries in the region. Simon Murray, Principal Analyst at Digital TV Research, said: "A handful of mobile operators such as Orange, Zain, Ooredoo, Etisalat and Vodafone have assets across several countries. SVOD platforms can gain considerable economies of scale by signing distribution deals with mobile operators. Deals between mobile operators and SVOD platforms are already prevalent in the Middle East and North Africa – offering an example for the rest of the world to follow."

## M2M Market

The Middle East and Africa M2M Satellite Communication market is expected to grow from US$ 329.4 million in 2014 to US$ 572.6 million in 2019 at a CAGR of 11.69% during the period 2014-2019. The market is primarily driven by the growing digital broadcasting in Africa's and digital television transition is under way in most of Africans countries.

M2M Satellite Communication is an emerging technique for communication and it involves sharing and transferring of data across the regions and that data is used by the organization for decision making at various strategic level.

***"...The Middle East and Africa M2M Satellite Communication market is expected to grow from US$ 329.4 million in 2014 to US$ 572.6 million in 2019 at a CAGR of 11.69% ..."***

M2M Satellite Communication market has a great potential because of its capability to connect with smart devices and inactive objects. Moreover, M2M satellite communication provide with best connectivity for data transferring through various satellite equipments like Amplifiers, Dish TV, Power Suppliers, and Antennas.

There is a huge untapped market in the MEA region creating a huge market potential for new entrants in M2M satellite communication market. These M2M satellite communication market will generate huge revenues for the players entering into these markets as compared to the other growing markets. Moreover it is seen there is Increase in the shipment of M2M modules large number of M2M modules being shipped to the MEA region are being used for telematics, mostly for tracking of vehicles and truck-borne assets.

## Key Trends

Khalid Balkheyour, CEO of Arabsat, sees opportunities in the services and telecom sectors. "In terms of services we see this derive toward Video service providers like NetFlix and similar products, however, it will continue to be hampered by the FTA nature of the video market although this will have, and it did, have positive effect on reducing PAyTV subscriptions. Sport continues to be the major driver to grow PayTV customer database with attempts from different players to acquire major events rights," said Balkheyour.

"Due to the Political events over the past five years, we have witnessed different projects by governments in the telcom domain for military and civil applications that will continue to exist over the coming few years and will be considered as a major driver for the industry growth, " added Balkheyour.

Marwan Al Tal, VP, Sales and Marketing of Eutelsat MENA said: "One clear trend we are witnessing is increasing consumer appetite for improved image quality. More and more channels from the region are catching the HD train that will soon be followed by Ultra HD. As a satellite operator, we want to help channels and pay TV platforms in MENA manage a transition to HD and to Ultra HD that will take the viewing experience into a whole new dimension. With its strong focus on MENA, our satellite fleet is ideally suited for this. In the MENA market, the 7/8° West position we jointly operate with Nilesat is key as it enables 52.3 million homes, up from 49.7 million in 2014, in a vast region from Morocco to the Gulf to receive over a thousand channels with a single small satellite dish.

Broadband is also an important opportunity. This is the application in the satellite market that will grow the most over the coming ten years. Demand is absolutely huge as every human being wants to be connected and billions are still waiting. Satellite won't serve all this growth, but it will have a share, combined with other technologies. It is vital for ensuring that we can build inclusive digital societies," said Al Tal.

Ali Al Kuwari, President & CEO of Es'hailsat said "the digital media sector in the MENA region is dynamic and is expected to grow annually by 7% over the next 3 years. This growth is fuelled by both, demand for local Arabic content as well as expansion of premium channels. We see the DTH market in

MENA region growing driven by the demand for premium content in High Definition (HD) and the launch of new channels. Progressively broadcasters are making the transition to HD driven by consumer demand for compelling new HD content that can be viewed on larger screen. We expect to see HD and new transmission technology providing opportunities for us to expand the service offerings to the consumers. In terms of other verticals, we see the demand for satellite capacity increasing in the near future for maritime and aerospace services."

## Satellite Operator Plans

Arabsat's Balkheyour said that its 6th generation plan encompassed 5 satellites. The first of them, Badr-7, manufactured by Airbus and launched by Ariane, was launched in 2016 with major coverage over MEA in Ku and Ka bands. Hellas-sat-3, manufactured by THALES and launched by Ariane, has been just launched last month with focus on EMEA markets in Ku and Ka-bands also. There are 2 other satellites under manufacturing currently; 6A by Lockheed Martin and is contracted to be launched by SpaceX in Q2, 2018 with focus on MENA in Ku-band and different hosted payloads in Ka-band and Hellas-sat-4 by Lockheed Martin also and is contracted to be launched by Ariane in Q2,2018 with EMEA coverage. Arabsat 6D is currently in procurement phase and is planned to be in orbit in 2020/2021 time frame.

Eutelsat meanwhile is planning to launch four satellites within in the coming years, three of them being well-suited for the MENA region. Both satellites scheduled for 2018- EUTELSAT 7C and EUTELSAT 5 West B - will provide coverage over MENA region, serving mainly video markets. They will be followed by the first Eutelsat Quantum-class satellite, slated to be located at 12.5° West. This satellite can reshape the coverage and power level of its beams, including the Middle East and North Africa region within its reach. Its customer-controlled flexible resource allocation is a unique feature in the commercial satellite sector that matches the most demanding needs from VVIP mobility and MoDs.

Es'hailsat's Al Kuwari said that: " Since commercial launch of our first satellite Es?hail-1 in 2013, we have been very much focused on providing Qatari customers and stakeholders high quality and reliable services along with satellite capacity. Over the past year we have been expanding our services beyond Qatar and in to the MENA region, broadcasting a number of regional Arabic channels, supporting off-shore voice and data connectivity and

mobile backhaul services. With Es'hail-1 almost full, our immediate focus is to successfully bring in to service our second satellite Es'hail-2. In addition we will be completing our new state of the art teleport and bringing it in to service to support our customers with teleport services such as turnaround, playout, studio, editing, multiplexing, etc. and telecommunication services such as hub services, VSAT, disaster recovery, etc. Beyond this, we are in talks with a few partners for JV or condo satellites in new orbital positions covering regions outside of our current coverage area. HTS is an area that we see having great potential and something we are considering for our 3rd or 4th satellite."

Yahsat plans to to drive satellite applications that can address the availability and affordability of broadband connections. Broadband as the end application is going to continue to be key, however, we are continuously expanding how we, via our satellites, are able to serve this need, both in terms of business model (e.g. direct to home, VNO, backhaul) and in terms of advances in technology.

For the remaining population, who are already connected, the trend is moving towards internet ubiquity i.e. significantly more capacity and coerage. Yahsat will be selective here, directly entering areas where we have a clear advantage (e.g. in-flight connectivity) while collaborating with terrestrial and digital services providers to be an enabler for others (e.g. OTT, video multicast, terrestrial-satellite converged solutions), according to Yahsat.

In addition, IoT is opening up a host of very exciting applications e.g. critical/non-critical monitoring, smart homes, smart appliances, identity services, telesurgery, autonomous cars etc. Satellite has a very distinctive and unique ability to serve some of these applications en masse at a very affordable price point. However, these markets are still in a state of flux and we will be identifying the right partners & business model as we enter these applications, according to Yahsat.

**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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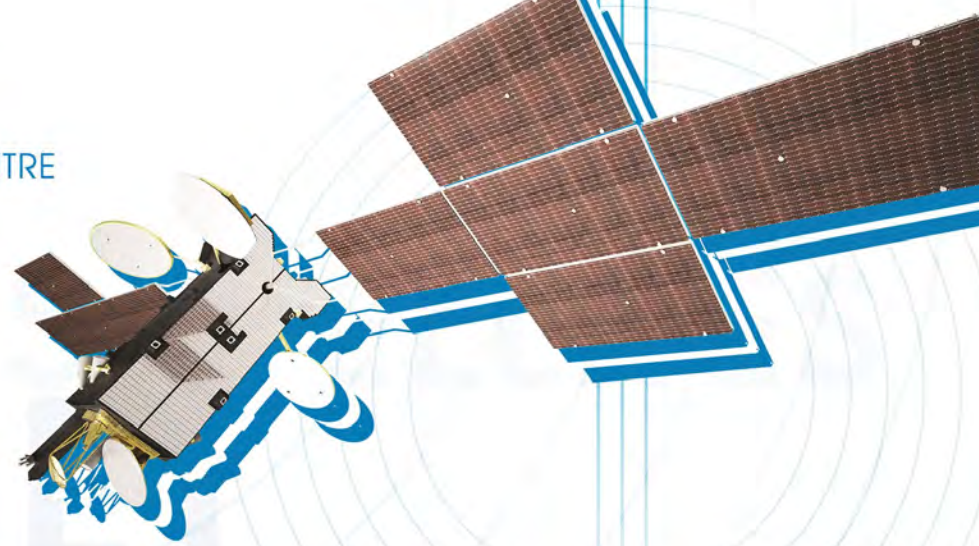

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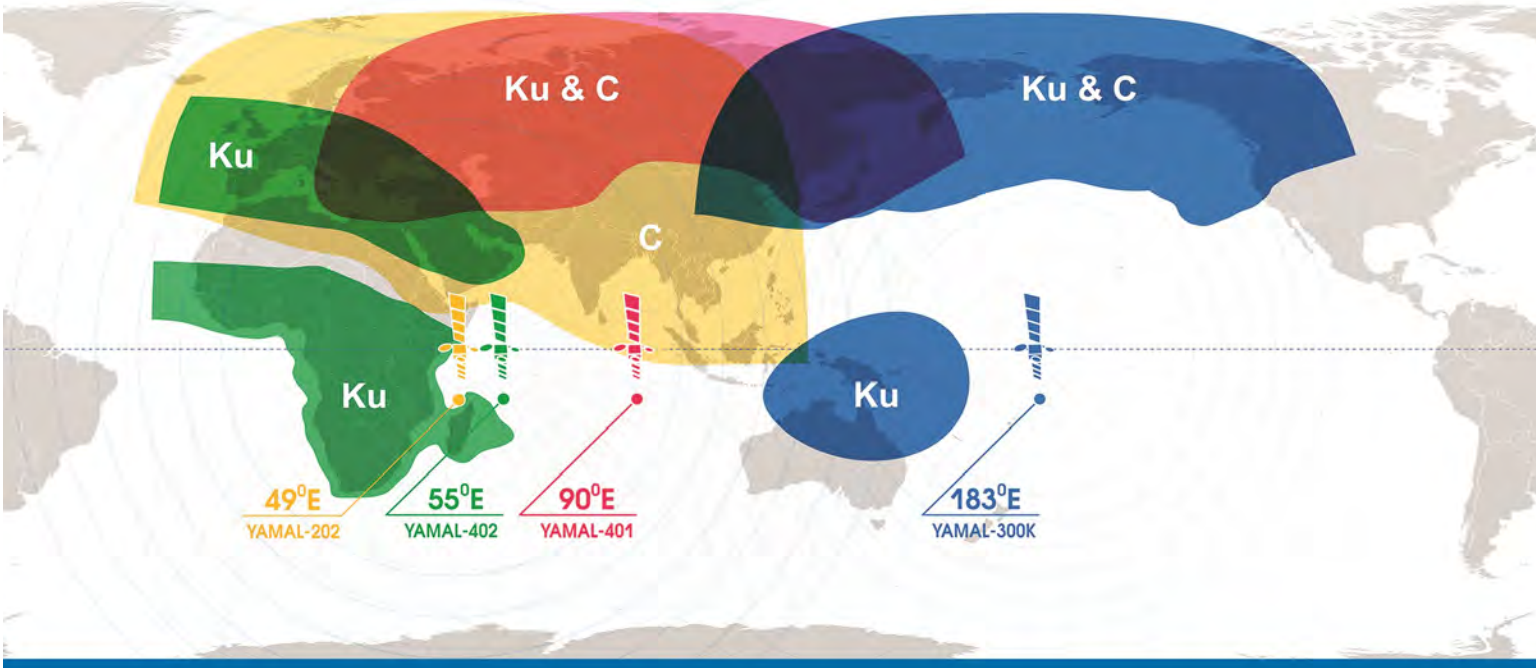


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# 8K Ultra HD Making Inroads in the Japanese Broadcast Market

by Naoakira Kamiya
Tokyo Correspondent

8K Ultra HD TV is gaining serious ground in Japan. This was evident in the recently held Interbee show. The Japan Electronics and Information Technology Industries Association (JEITA) held the 53rd International Broadcast Equipment Exhibition (InterBEE2017) at Makuhari Messe Convention Center located at Chiba City, near Tokyo, from November 15-17, 2017.

Looking ahead to 2020 Olympic and Paralympic Games in Tokyo, a record number of 1,139 companies and organizations including 643 from 33 countries and regions overseas, exhibited at 1,983 booth spaces this year. At the end of the show JEITA proudly announced that the total attendees marked a record breaking 38,083.


**NHK collaborated with Broadcasting Satellite System to demonstrate 8K UHD video featuring Grand Prix of Figure Skating 2017 at the InterBEE show in Chiba City, Japan held last November.**

The highlight of InterBEE2017 was an expansion of 4K and 8K Ultra HD (UHD) landscape. There were hundreds of different equipment and video content on display at the show floor. UHD is undoubtedly the next logical step in TV evolution since 4K theoretically offers four times the resolution of full HD and 8K supports four times more of 4K UHD.

NHK set up one of the largest booths together with JEITA and engaged visitors by showing fascinating 8K UHD video featuring Grand Prix of Figure Skating 2017 (NHK Trophy), which was held at Osaka Municipal Central Gymnasium from 10 to 12 November. The ice skating pair of Tessa Virtue and Scott Moir of Canada with large 98 inch 8K monitor was really worth seeing. Interestingly enough the 8K monitor was not made-in-Japan but made-in-China by BOE Technology. According to NHK staff, eight Sony 8K camera were used for shooting and Astrodesign's 8K SSD recorder was selected for non-compressed recording. As regards the slow motion novelty video, NHK adopted Sony HDC-4800 4K ultra high frame rate camera system which is able to capture up to 480fps.

8K UHD video of U.S. President Donald Trump's three day stay in Tokyo was also shown at a special living room style corner of the booth, where a Sharp's brand-new 70 inch 8K TV was set for viewing.

In addition to 8K UHD video, NHK showcased 8K OB Van named SCH-1, which caters to the live production. At present they own two of such vehicle, one made by Ikegami Tsushinki and another by Sony. NHK says one more is under construction.

Sharp and Astrodesign jointly arranged stunning 8K World, where a world's first 8K 60p, 4:2:2, 10bit Camcorder was unveiled. Such 8C-B60A Camcorder integrates capabilities for shooting, recording, playback, and line output. The attendant said that 40 minutes continuous recording can be accomplished with 2TB SSD pack.

At 8K World, visitors were also ushered to the theater, where Insight Laser 8K Projector and large 300 inch screen were installed. The 25,000 lumens digital projector has been developed by Delta Projector in Taiwan and powered by Astrodesign. The 8K content presented in the theater was 2017 Japan Motocross.

Sharp prepared a stage for professionals to compare


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quality of their 85 inch 8K LCD monitor and the world's first 70 inch 8K compatible TV. Then they announced that such AQUOS 8K TV set will be on sale from December 1 at major electric appliance shops in Japan.

Other 8K products on display at 8K World were SSD recorder for 60fps and 120fps, 55 inch 120fps LCD monitor, 85 inch 60fps LCD monitor, 8K U-SDI to 12G-SDI converter, 8K cross converter, and 8K IP transmission equipment.

Besides the dedicated booth on the show floor, NHK, as a content creator, welcomed visitors at the entrance hall of Makuhari Messe Convention Center and introduced more 8K programs such as Mount Fuji, Louvre Museum, and Toshiko Akiyoshi's Jazz Orchestra. These contents were actually uplinked from NHK Shibuya Broadcast Center by Broadcasting Satellite System (B-SAT) and downlinked at Makuhari Messe. According to B-SAT, Ku-band transponder of BSAT-3b satellite is used and broadcast specification is ISDB-S3, 16APSK, 100Mbps. Video format is based on 4:2:0, 10bit, 60fps. Prototype 8K receiver and new 70 inch 8K TV set are provided by Sharp for this particular occasion.

It was also interesting to know that the most popular pay TV operator in Japan, WOWOW Corp, joined forces with NHK by providing their new 8K HDR documentary titled "The Great Below, Son Doong Cave." WOWOW said this footage of the world's largest cave was captured in Vietnam in March 2017. To be honest it was really one of the most immersive documentaries I have ever seen.

At the entrance hall, SKY Perfect JSAT (SPJ) and Association for Promotion of Advanced Broadcasting Services (A-PAB) captivated visitors by demon-strating 4K UHD HDR video. A unique feature of this year's demonstration was that SPJ facilitated one of newly allocated left-hand circularly polarized Ku-band transponders, ND23. As is known Japan has been using only right-hand circularly polarized Ku-band transponders for more than 20 years.

***In preparation towards the commencement of practical broadcasting services in December 2018 and full commercial services by the time of the 2020 Tokyo Olympic and Paralympic Games, the Japanese public broadcaster, NHK, is getting ready for 8K TV broadcast.***

According to SPJ, this year's 4K UHD HDR video signal is transmitted over JCSAT-110A satellite made by SS/Loral and launched in December 2016. Its basic format is 4:2:0, 10bit, 60fps, and the transmission speed set at 35Mbps.

I asked A-PAB staff who made new 4K tuner for left-hand circularly polarized broadcasting services. The answer was Pixela Corp in Osaka, Japan. The tuner was connected to 70 inch 4K AQUOS TV provided by Sharp. The video shown this year featured Colors of Life by Nicholai Bergmann, Tokyo Archives, Deep Water Solo and Flower Carpet.

It was obvious that in preparation towards the commencement of practical broadcasting services in December 2018 and full commercial services by the time of the 2020 Tokyo Olympic and Paralympic Games, the Japanese public broadcaster, NHK, is getting ready for 8K TV broadcast. At the same time other commercial broadcasters are gearing up to broadcast 4K UHD and 4K HDR TV not only over right-hand polarized transponders but also via left-hand polarized transponders.

Setting aside 4K and 8K video content experience, the InterBEE2017 put the spotlight on the leading broadcasting equipment manufacturers such as Sony, Panasonic, Canon, Ikegami Tsushinki, Hitachi Kokusai Electric, FOR.A , Socionext among others at the show.

Sony unveiled the latest version of camera such as UHC-8300 8K portable, VENICE 4K Cine Alta, and HDC4800 4K slow motion. The company also exhibited Crystal LED Display System, multi-format switcher XVS-6000, HDR production converter HDRC-4000, live IP system manager and other state-of-the-art products around its core capabilities in image and IP technologies.

Panasonic launched AJ-ZS0580 8K recorder this year even though there was no sign of Panasonic-made 8K camera. It seems that their sales strategy is to connect their 8K capable studio switcher AV-HS8300 to this recorder to start with and keep up with market changes.

As to 4K product they exhibited AU-EVA1 compact cinema camera. The attendant in charge of this camera emphasized "It is actually 5.7K."

Canon set up a special 8K solution corner and introduced a prototype 8K camera and 30 inch 8K HDR display for visitor's information. As regards 4K product they highlighted EOS C200 and C200B camera this year.

Pride of place at Ikegami Tsushinki was SHK-810 8K camera and CCU-810H camera control unit. This system is based on dual green SDI interface.

Hitachi Kokusai Electric also proudly showed SK-UHD8060B 8K camera in addition to SK-UHD4000 4K camera and SK-HD1500 high speed camera. 8K camera has been jointly developed with NHK.

Another company that is proud of Made-in-Japan lineage was FOR.A. The company spearheaded the live sports coverage with next generation high speed FT-ONE-LS-12G camera. With this camera, you can shoot up to 500 fps 4K image.


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Socionext is known in Japan as a developer of 8K HEVC decoder chip and ISDB-S3 demodulation LSI. This year they exhibited for the first time s8 media player with 8K HEVC decoder chip inside. This media player will be on sale from March 2018.

In the satellite communications and broadcasting equipment sector, a number of leading players such as AT Communications, Moubic, Kato Denki/ Tokyo Keiki, Japan Radio, Matsuura Kikai Seisakusyo, and Rikei showcased their latest products and services.

AT Communications unveiled two brand new SNG vehicles this year. One of them was made for Asahi Broadcasting Corp in Osaka. It is equipped with 1.2 meter CCT120DA antenna on the roof, and 10 meter pole with FPU and IP camera on the top. In this 4WD car, NTT's 4K encoder HC11000E and Paradise Datacom's Q-Flex DVB-S2 satellite modem are installed.

Another SNG vehicle was intended for Sun Television Company in Kobe. Unique feature of this vehicle is that the back seat is facing backward so that camera men on the seat can capture marathon runners or race walkers who are following the car.

Other notable products at the AT Communications booth were portable Ku-band flat antenna, CCT series flyaway system, and low power consumption SSPA. Very small flat antenna (445mm x 280mm x 58mm) was made by SATCUBE in Sweden and it weighs only 6kg. CCT series flyaway system is offered in the antenna diameter of 75cm, 120cm, and 200cm. SSPA was developed by Mission Microwave in the U.S. and two kinds of product, 100W and 200W, were exhibited.

Moubic owns SNG vehicle named Moubic-M01 and is very active in video contribution services. Makoto Ozawa, President, proudly said "We sent our digital SNG vehicle to Suzuka and Motegi during October and uplinked video to Intelsat-19 satellite. At Suzuka we contributed video of Formula One Japanese Gran Prix 2017 and at Motegi we transmitted MotoGP Japan 2017 race."


**SKY Perfect JSAT unveiled Kymeta's flat-panel antenna for the first time at InterBEE2017.**

Besides contribution business, Moubic sells video-related products from such companies as Ericson, Vislink, and Newtech At this year's In-terBEE2017, they introduced Ericson's contribution encoder AVP2000, Vislink's Mantis MSAT and UltraCoder, and Newtec's MCX7000 DVB-S2X multi-carrier satellite gateway.

Kato Denki and Tokyo Keiki jointly offered 1.2 meter parabolic antenna on -the-move and tried to sell to broad-casters for SNG operation. The attendant at the booth proudly added that National Institute of Information and Communications Technology in Tokyo uses 9 meter parabolic antenna they have built.

Attracting much attention at Japan Radio Company was two kinds of flat antenna. One antenna is intended for flyaway service, which they say SKY Perfect JSAT is already using for daily operation. Another high-end antenna is designated SNG vehicle usage.

Last but not least SKY Perfect JSAT (SPJ) unveiled Kymeta's flat-panel an-tenna for the first time at InterBEE show floor. SPJ signed partnership agreement with Kymeta in February and invested in the company. Since then satellite industry specialists have been wondering when the road test will start. SPJ people at the booth said 70cm mTenna (metamaterial surface antenna) was installed on the roof of Toyota car and road test has been per-formed. HD video was captured by GoPro camera in the car and trans-mitted to JCSAT-5A Ku-band satellite. As regards the test result, it was disclosed that the maximum uplink transmission speed attained was 3Mbps and downlink 6Mbps.SPJ concluded that automotive application tests were successful.

**Naoakira Kamiya** is Managing Director, **Satellite System Research Institute** and Director of the **Japan Satellite Business Ass**ociation.
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# Where are Satellite Service Providers Investing Today?

**by Robert Bell**

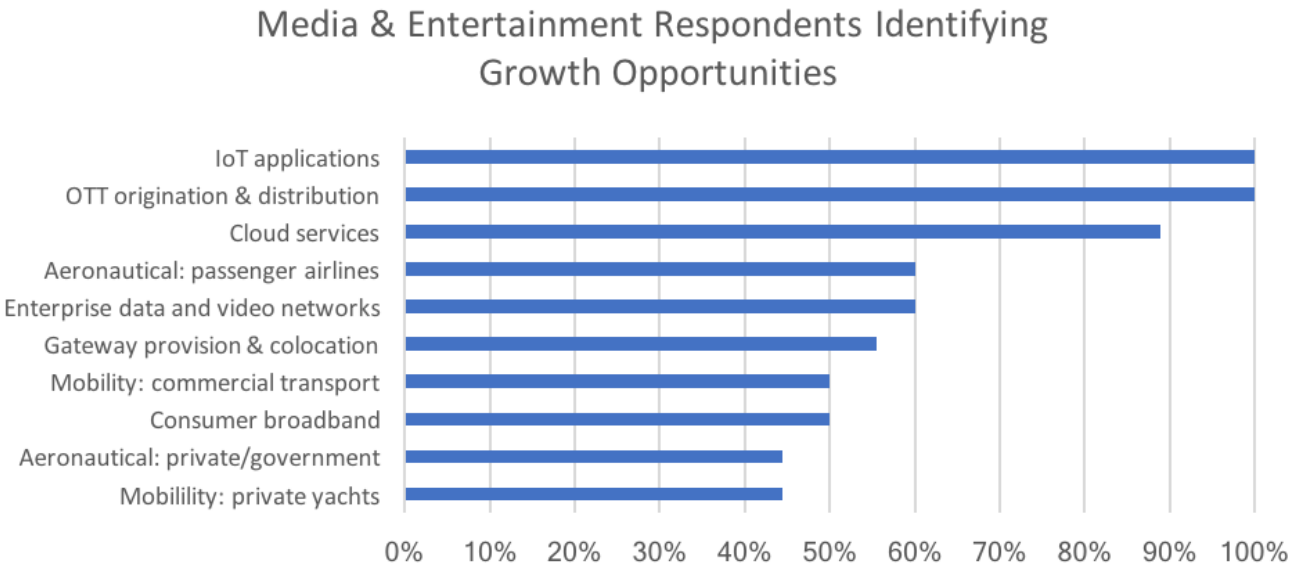
The amount of investment capital flooding into the satellite business today is nearly unbelievable. Sometimes it seems that anybody with a great PowerPoint and some decent engineers on the team can pick up a few million dollars at the investment counter and get to work. Of course, fundraising is never really like that – but these times do put me in mind of a great book. If you haven't read it, you should.

*Eccentric Orbits* by Joe Bob Briggs is the amazing story of Iridium, from a sketch on a cocktail napkin to a $6 billion bankruptcy and its remarkable return from the dead to put Iridium NEXT into orbit. Briggs writes with the wit and verve of Michael Lewis (author of *The Big Short*) and if I hadn't lived through a bit of the story myself, I wouldn't believe it was true. It was the most expensive start-up in history and it made satellites incredibly sexy for a while, with everyone from Craig McCaw to Bill Gates raising money on promises of massive constellations whipping around the globe.

## Smart Money

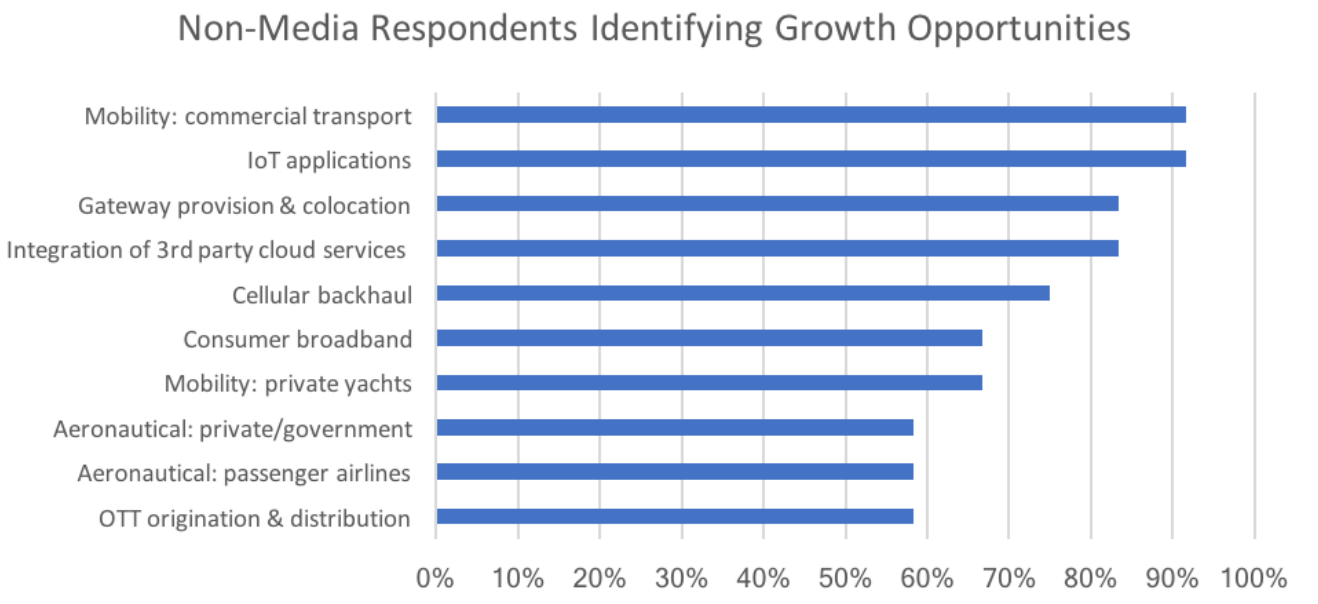
It is way beyond my pay grade to predict whether this time will be different. I certainly hope and pray that markets will absorb the mind-boggling capabilities of the coming generation of commercial satellites, and that business models are smart and strong enough to make it through the inevitable rough patches. But I'm a bit old-fashioned where money is concerned. I like to see where my return is coming from. And in that way, I'm a lot like the teleport-based, satellite-centric service providers who have to make technology produce a profit in the near term.

The World Teleport Association polled teleport executives across multiple countries, running companies both large and small, about where they saw opportunities to make technology produce that profit over the next few years. We also asked them what they were investing in today to make that happen – and the answers diverged in interesting ways.




## Media-Centric and Not

The differences lie in what business teleport operators consider themselves to be in. There is a fairly sharp divide between companies that gener-




ate most revenue from media and entertainment companies, and those for whom media and entertainment income is minor to non-existent. Media-centric operators believe that the five biggest opportunities of the future are, in order: OTT distribution, aeronautical service for passenger airlines, providing gateways for HTS and other new satellite operators, consumer broadband and maritime service to private yachts.

Non-media operators differ. Their top five opportunities are mobility for commercial transport (ships, trains, trucks), the Internet of Things, gateways, the integration of third party cloud services (e.g., AWS) into their offerings, and cellular backhaul.

What's interesting about the lists is that only one of the five growth opportunities identified by media-centric operator is in media & entertainment. Everything else is about data – except for the opportunity to provide gateways, which is clearly on everybody's mind with the expected explosion of MEO and LEO capacity.

## Investment Priorities

WTA also asked what technologies the operators expected to invest in over the next three years. There, the realities of today's business held more sway. The top five investments by media-centric companies will be in OTT distribution, private cloud services as well as the integration of third-party clouds (AWS, for example) into their services, the Internet of Things and, at the bottom, in terrestrial and cable TV distribution.

For non-media operators, the top five investments of the next three years will be in gateways, mobility for commercial transport, the Internet of Things, maritime service to private yachts and cellular backhaul.

The takeaway here is that the investment priorities of the non-media operators align more closely with their views of future opportunities. For media-centric companies, four of the five investment priorities are related to media & entertainment. No one would argue with those priorities, given their business model. But their responses suggest that, for executives working in the media and entertainment market, the grass looks much greener on the data side.

**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

# Alexander Müller-Gastell
# CEO and Managing Director-ND Satcom

***You just started in your new position in September 2017, how has it been so far?***

I knew coming into the new role that the company had successfully mastered some tough times and was now on the upturn again and that it would be my job to work closely with the management team in define and implement the strategic direction of the company to ensure the future success of the business. The first 90 days have provided me with a great opportunity to spend valuable time inside the organization to get a comprehensive picture on how the people see their own company and meet a number of people in the industry to learn on how they see ND SatCom as a partner in the future. This has been a tremendous experience and has made me even more confident that ND SatCom can play an important role in the future in this industry.

***How do you see ND Satcom's position in the industry in general and in the market segments that you serve?***

It is important to know your position in the market and even more importantly to work on the areas that can expand and strengthen it. Over the years, ND SatCom has successfully established itself as a premium supplier of modem technology being the world market leader in the ATC business and the provisioning of services to highly demanding customers in the defence and governmental sector.

This is the basis that we build on – ND SatCom is more than just a modem supplier- we are a solution provider that has the ability to expand its current portfolio in adjacent markets and regions to diversify our offering.

***What are your targets for 2018?***

2017 has been a success story for ND SatCom. All the hard work that has been invested has now shown its positive results in the performance of the business. We are focused on continuing the positive development in 2018 using the momentum to grow in all our verticals through our existing customer base and generating new leads. We will look to expand our business into new regions and markets that are well suited for our business model – always remembering our core competencies and the value add they bring to the market. In summary, we want to take ND SatCom to the next level.

***How do you see ND SATCOM in the next few years? What key trends are you following in the industry and how will those impact your company?***

Alexander Müller-Gastell

We witness every day how quickly the world is evolving and changing and the same holds true for our industry.

There are many trends in the industry that we are following on technology such as HTS, MEO/LEO/GEO constellations and investigating how our Mesh technology plays out in this and impacts our next developments.

Everybody is longing for the next great technical development or invention and I want to make sure that we are close to the pulse on any of them and be in a lead position to bring new solutions to the market. Having our own in-house R&D department gives us a competitive advantage in being able to react quickly and customize our offering with any new features.

***Anything else you would like to add?***

This industry will continue to play a key role in how people and machines communicate with each other and the flow of information for years to come. I´m excited to be part of this industry watching it evolve in the future and support our customers in providing the best solution for them.

# Private Cellular Networks

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

www.ndsatcom.com

Star Full Mesh Multi-Star Hybrid DVB S2X

ND SATCOM

**Meet us at CABSAT 2018 in Dubai, Booth ZB1-D20**

# Products and Services MarketPlace

A guide to key products and services to be showcased at CABSAT in Dubai, UAE from January 14-16, 2018.

## ABS
**Booth # ZB2-C40**
**www.absatellite.com**

**ABS** is one of the fastest growing global satellite operators in the world. ABS offers a complete range of tailored solutions including broadcasting, data and telecommunication services to broadcasters, service providers, enterprises and government organizations.

ABS operates a fleet of satellites: ABS-2, ABS-2A, ABS-3A, ABS-4/Mobisat-1, ABS-6, and ABS-7. The satellite fleet covers over 93% of the world's population across the Americas, Africa, Asia Pacific, Europe, the Middle East, CIS and Russia.

Headquartered in Bermuda, ABS has offices in the United States, United Arab Emirates, South Africa and Asia. ABS is majority owned by funds managed by the European Private Equity firm Permira.

## Arabsat
**Booth # ZB2-A20**
**www.arabsat.com**

Founded in 1976 by the 21 member-states of the Arab League, **Arabsat** has been serving the growing needs of the Arab world for over 40 years, operating from its headquarter in Riyadh-KSA and two Satellite control stations in Riyadh and Tunis. Now one of the world's top satellite operators and by far the leading satellite services provider in the Arab world, it carries over 500 TV channels, 200 radio stations, pay-tv networks and wide variety of HD channels reaching tens of millions of homes in more than 80 countries across the Middle East, Africa and Europe—including an audience of over 170 million viewers in the Middle East and North Africa (MENA) region alone tuned into Arabsat's video "hotspot" at 26°E.

## C-COM Satellite Systems Inc.
**Booth # Z1-109**
**www.c-comsat.com**

At CABSAT, **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 Xicom Technology
**Booth # ZB1-C35**
**www.xicomtech.com**

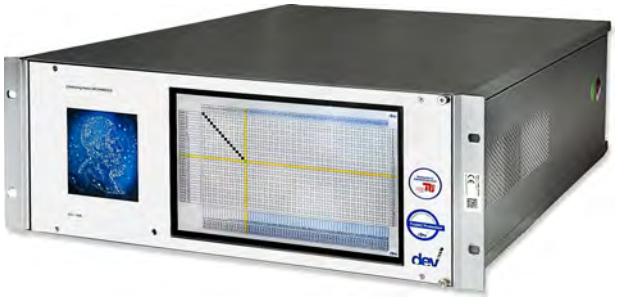
**Comtech Xicom Technology** provides a broad product line of KPAs, TWTAs, SSPAs and BUCs for worldwide satellite uplink covering C-, X-, Ku-, DBS-, Ka-, Q-band, Tri- and Multiband with power levels from 8 to 3,550 watts and available in rack-mount and antenna-mount ODU packages.

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 Up-converters (BUCs) for in-cabin ARINC-type and out-of-skin hermetic

configurations support DO-160 requirements from category A1 to F2. Xicom Gallium Nitride (GaN) SSPAs enable high-speed satellite connectivity for both airlines and travelers around the world. For more information go to: http://xicomtech.com/applications-airborne

**DEV Systemtechnik**
**Booth # ZB1-D10**
**www.dev-systemtechnik.com**

At CABSAT, **DEV Systemtechnik** presents its flagship distributing matrix ARCHIMEDES. DEV has continued to evolve it, resulting in a smaller size and lower product price without losing functionality. This enables customers to benefit from less rack space and significant lower power consumption. DEV's matrices are highly customizable due to modular design and support up to



2048 input and output channels. Optional optical inputs are available, as well as LNB powering on all input channels, several redundancy options and a full-color multi-touch display. The DEV ARCHIMEDES is 'Made in Germany' and characterized by an extremely high availability, reliability and manageability. Combined with their unique TripleC Protection Service, DEV Systemtechnik can truly claim to have set a benchmark in the RF matrix business.

DEV's products are designed for operation in multiple frequency bands and impedances to meet a wide spectrum of unique customer needs. This makes them equally suitable for:

- Teleports and Broadcasters
- Satellite Operators
- Satellite Ground Stations
- Cable and IPTV Headends

**Gazprom Space Systems**
**Booth # ZB1-C40**
**www.gazprom-spacesystems.ru**

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

**Integrasys S.A.**
**Booth # ZB2-B11**
**www.integrsys-space.com**

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

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

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

**Newtec**
**Booth # ZB1-B30**
**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.

**ND Satcom**
**Booth # ZB1-D20**
**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.


## RF-Design
## www.rf-design-online.de

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

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

Mr. Oliver Vogel will be attending CABSAT from 14-16 January. To Arrange a meeting send an e-mail to: o.vogel@rf-design-online.de

## RSCC
## Booth # ZB2-D21
## 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 # Z1-101
## www.terrasatinc.com

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

New to Cabsat 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 # ZB2-C11
## www.uhp.net

**UHP Networks Inc.** is engaged in the development, manufacturing and marketing of satellite networking equipment. Its core products include universal satellite routers UHP and advanced Network Management System. UHP is the industry's first fully software-defined, high-throughput VSAT router, which can be used in a network of any size and any topology either as remote or a building block of a VSAT hub. UHP-powered solutions are efficient and reliable, with industry-best total cost of ownership. These solutions have been deployed in over 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 ZB1-D23**
**www.work-microwave.com**

At CABSAT, **WORK Microwave** will demonstrate the latest enhancements to its satellite technologies portfolio, including a new high-performance DVB-S2X demodulator for transport stream applications. Using WORK Microwave's analog and satcom solutions, operators can dramatically increase their flexibility, bandwidth, and margins while reducing operational costs.

WORK Microwave devices are deployed by operators worldwide to support a range of applications within the satellite broadcast and satellite communications markets, including SNG/contribution, direct-to-home, IP networking, teleport management, governmental, and more.

**Key Products and Technology Demos:**

**NEW AR-61 Demodulator.** WORK Microwave is expanding its A-Series IP modem, demodulator, and modulator family at IBC2017 with the introduction of the all-new AR-61 demodulator for transport stream applications.

The AR-61 provides the best DVB-S2X performance on the market for high-quality video transmission with minimal satellite bandwidth occupation. It is ideal for professional video contribution and distribution use cases. Offering compliance with DVB-S2X, DVB-S2, and DVB-S, the platform is entirely future-proof, enabling seamless migration to next-gen infrastructures and evolution to advanced functionalities for operators relying on legacy standards. Upgrades are made easy via software licensing.

For operators looking to transition to all-IP, WORK Microwave also offers the AX-60 IP modem, AR-60 IP demodulator, and AT-60 IP modulator high-performance platforms for IP trunking and network infrastructure applications.

**NEW Integration Between AT-60 IP/AT-80 Wideband Modulator and Encapsulator .**Operators now have the option to integrate WORK Microwave's AT-60 IP modulator and AT-80 wideband modulator with an encapsulator and IP routing system for large-scale VSAT systems. This integrated solution scales to every type of satellite network, from small networks with five remotes, up to the largest networks encompassing tens of thousands of remotes. Designed with flexibility in mind, WORK Microwave's solution is based on a pay-as-you-grow business model, can scale up or down to support any operator's requirements, and is completely customizable in terms of adapting to existing infrastructures. Embedded Adaptive Coding and Modulation (ACM) enables each remote to operate at its most efficient coding and modulation scheme.

**Compact Satellite Up- and Downconverter Enhanced With C- and X-Band Support.** Based on customer feedback, WORK Microwave has added C- and X-Band support to its integrated, compact, and cost-effective frequency converter. Ideal for satellite operators, integrators, and teleports working in classical bands, WORK Microwave's compact converter is operational in C-, X-, and IF frequency bands, allowing users to support multiple simultaneous channels in one unit to save significant rack space and costs.


# How Satellites Brings You a Better Flight

Satellite technology is getting ready to make your next airplane flight a whole lot better. Once a luxury experience for the well-heeled, airplane travel has become a regular part of life for most of us, at least in the affluent parts of the world. In 2015, people took 3.4 billion airplane trips, up 700% from only 432 million in 1975. People in high-income countries accounted for two out of every three trips.

Affordable air travel is good. Not so good are long, boring flights packed too tight with too little to do. Infuriating delays that ripple through the overburdened system like a bad case of the flu. And occasionally, the terrifying moment when a flight disappears, never to be seen again.

The world's airlines and air traffic managers have a solution to all these problems – and the solution is satellite.

## Staving Off Boredom – and Saving Billions

For better or worse, being connected is central to modern life. The screen rules, whether it is the phone in your pocket or purse, the tablet in your hand or the laptop in your bag.

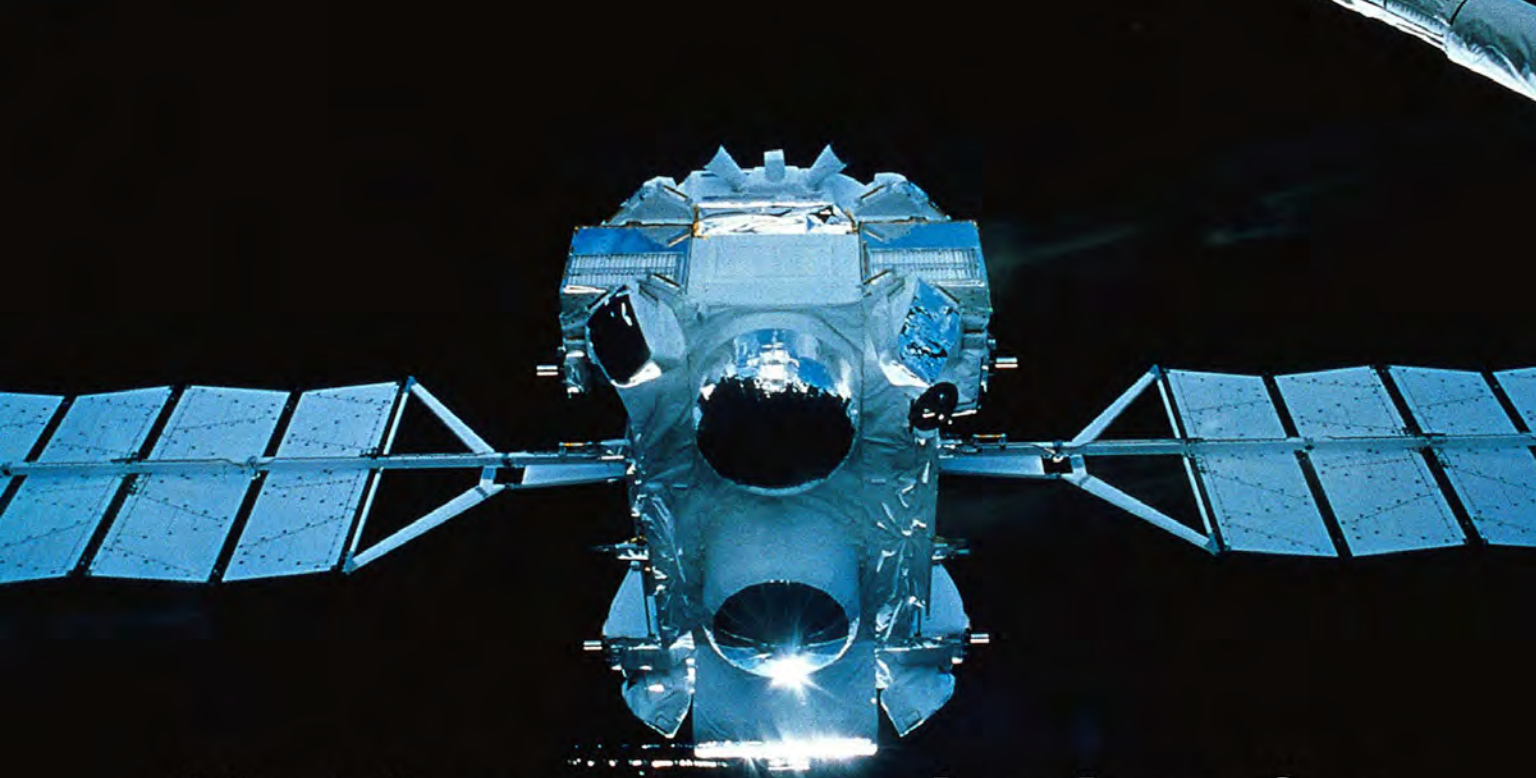
Not so long ago, however, the screen's domain ended at the aircraft door. Phones and laptops were switched off for takeoff and landing, and once airborne, there wasn't much to do with them but play games or catch up on work. But starting in 2009, airlines began installing Wi-Fi aboard their aircraft.

Passengers loved it – until they gave it a try. Those early systems connected to the ground directly, so they only worked over land. The high costs, slow speeds and spotty coverage made it less like surfing and more like standing still.

Then satellite got into the game, and things changed fast. A new generation of satellites brought multi-megabit speeds into the cabin for everything from email and social media to online shopping.

## Wonders from a Magic Box

Delivering high-quality broadband on a fast-moving plane isn't easy. Satellite-powered Wi-Fi systems did not get rave reviews at first, because connections remained slow and spotty. But innovators like Panasonic Avionics, which has been installing in-flight entertainment technology for decades, also pioneered systems to deliver high-speed Internet access and live television. Panasonic's 3rd generation platform uses a state-of-the art satellite modem



# Most Innovative Technology for Carrier Monitoring VSAT Autocommissioning Virtual Network Maintenance

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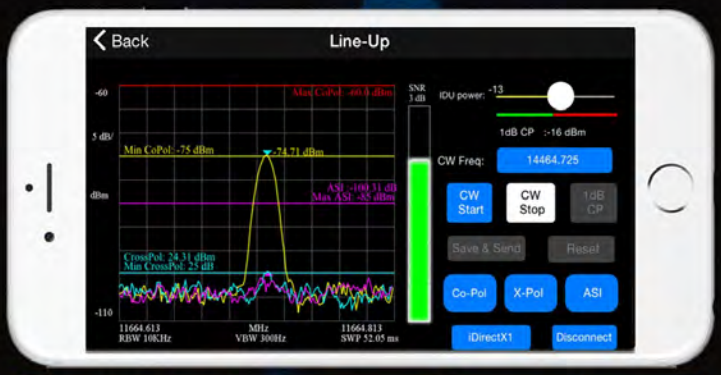



VSAT INDUSTRY AWARDS 2015
WINNER
VSAT Technology Innovation of the Year

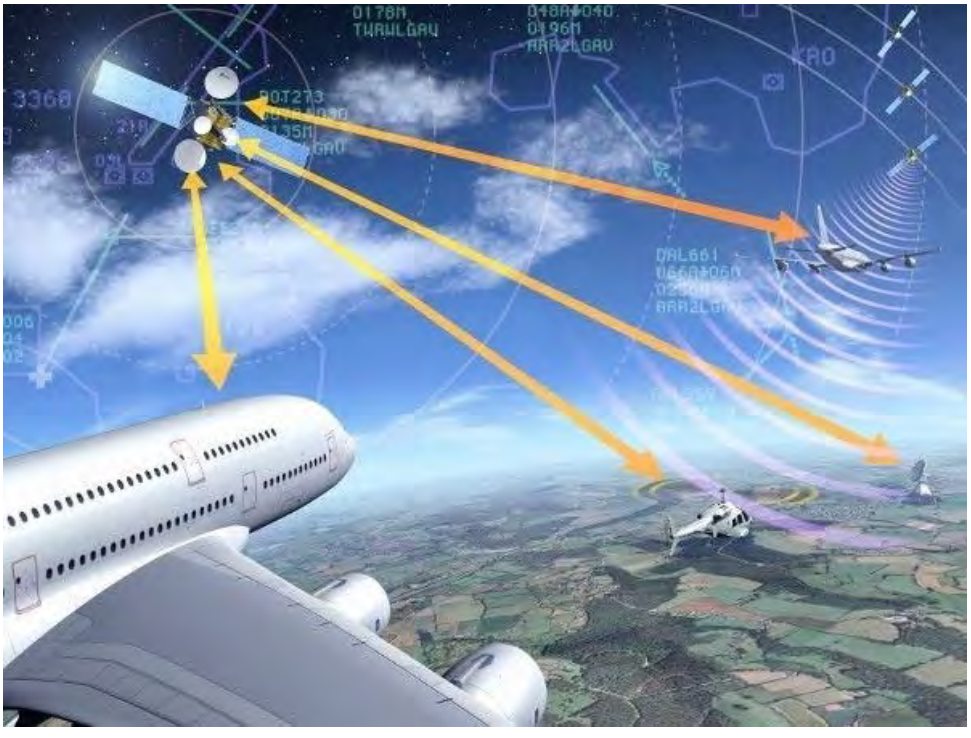
VSAT Stellar AWARDS
WINNER

# INTEGRASYS

**At Cabsat visit us at our Booth ZB2-B11**
**info.sales@integrasys-sa.com**
**www.integrasys-space.com**

from a Belgian company called Newtec.

Raw speed is one improvement. Clever engineering, as part of a product called Newtec Dialog, doubles the amount of data that can go over a satellite connection. The Newtec modem also fixes a problem unique to aircraft. Planes travel so fast, moving either toward or away from a satellite, that the signal experiences the Doppler effect, rising in frequency as the aircraft flies toward the satellite and dropping in frequency as it flies away. The Doppler effect can corrupt the data it carries. To counteract it, Newtec's modem tracks, predicts and compensates for the Doppler shift every second, so your data keeps flowing



But that is not the last of its tricks. Early satellite service was spotty for a reason. A fast-moving plane crosses from the beam of one satellite to another in its flight. When that happens, older modems were forced to reset themselves, which interrupted service. The Newtec modem, custom-designed for Panasonic, operates three receivers at once. It uses two receivers to establish a connection with a new satellite beam before breaking the connection with the old one, so that users never notice the switch. The third receiver is used for simultaneous live TV reception on Panasonic's global satellite network.

A 2016 research report projects that providing connectivity to passengers will generate nearly $5.4 billion in sales by 2025, up from $700 million in 2015. Whether anybody makes money on that service, however, is another matter. Airlines passengers want broadband at an affordable price. Service providers like Panasonic need to keep passengers happy without losing their shirts. It is technology like Newtec Dialog, and advances from dozens of other companies, that will gradually close the gap and make sure onboard Wi-Fi is here to stay.

## Lost in Space

Satellites do much more for airline passengers than make flying more fun. When airlines fly over land, air traffic controllers track them using ground-based radar. But two-thirds of our planet is covered with water, and once aircraft head out over the deep blue sea, they pass out of radar range. Regulations require flight crews to radio their location to air traffic control centers they pass. It all works extremely well most of the time – but flights do sometimes vanish. The most recent and infamous case was Malaysia Airlines flight 370, which disappeared in 2014 while carrying 239 passengers over the Indian Ocean. Fight 370 was equipped with a tracking technology called ADS-B, which reports position, altitude and speed every 6-12 seconds. The trouble is that ADS-B only talks to ground-based control centers and other ADS-B equipped aircraft. Once beyond range of land, its signals are lost. New satellite technology, however, is changing all that. Inmarsat, the company founded to bring communication to ships at sea, announced upgrades to its network to support global aircraft tracking, and Qatar Airlines became its first customer in 2017. A new company called Aireon, partnering with the satellite phone company Iridium, will begin offering satellite detection of ADS-B in 2018.

Every flight begins with a briefing about the things keeping you safe, from seat belts and life preservers to inflatable rafts. Today, more and more of those things are digital services delivered by satellite, and you can thank those orbiting assets for keeping you safe, entertained and informed on the way to your destination.

**Produced for *Satellite Executive Briefing* by the Society of Satellite Professionals International (SSPI). See more stories and videos of satellite making a better world at: www.bettersatelliteworld.com.**


# EXCELLENCE IN RF EQUIPMENT

- Unique - Innovative - Clever Switch Matrix systems
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- RF Line-Amplifiers (single, dual, quad, 1:1 redundant)
- RF Switches & Redundancy switches
- Low-cost and professional type Splitters & Combiners
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NEW

## „FiberLink*plus*“ RF-over-Fiber

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

NEW

## „FlexLink“ Switch Matrix series

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

# First VSAT Congress Highlight Issues Facing Satellite Industry

**by Elisabeth Tweedie, Associate Editor**

The first VSAT Congress, took place in Washington, DC from November 14-15, 2017. The conference was organized by Comsys and the Global VSAT Forum (GVF) and chaired by Susan Bull and David Hartshorn. True to the format of previous conferences run by Comsys, there was a lot of very frank and spirited discussion about the industry and the issues facing it today.

Susan Bull officially opened the congress, with a plea to the industry to take its collective head out of the sand and not allow VSAT to become a commodity. Pointing out, that by doing so, it makes it easy for others, namely the satellite operators, to undercut them and move into their market. To make this point, she referenced data, showing that overall, in the last three years, there had been a 0.8% CAGR in total number of VSATs shipped, but a negative 0.9% CAGR in revenue over the same period. This trend is particularly noticeable in mobility, where a 4% CAGR in number of VSAT sites, has been accompanied by a 1% CAGR in revenue.


**There was a lot of very frank and spirited discussion about the industry and the issues facing it today at the very first edition of the VSAT Congress held in Washington , D.C. last November.**

While others were not as openly opposed to the satellite operators, there was a considerable amount of discussion, as to whether they were trying to undercut the service providers. Some of the delegates, agreed that this is a threat, whilst others felt that it was not a significant issue, as the satellite operators really didn't have the ground staff to provide the service needed. PJ Beylier, CEO of Speedcast, pointed out that bandwidth represented only 20% of what the customer is charged, so if that gets eroded "it's not the end of the world." However, he also emphasized that whilst SpeedCast is happy to work with satellite operators who have a partnership attitude, such as AsiaSat and Telesat, it has no interest in working with operators who are trying to eat its lunch.

One point, that everyone agreed about, was the fact that the business is no longer about bandwidth, it is about Quality of Experience (QoE). One service provider who exemplified QoE is IsoTropic Networks. IsoTropic is a family owned business, founded 25 years ago and based in Lake Geneva, WI. According to Hank Zbierski, the Chief Catalyst, the company is not customer focused, it's customer obsessed. Isotropic owns three planes, so the staff can be with any customer in a matter of hours. There are no written contracts, a handshake e is still all that is needed and offered.

Other topics that provoked a lot of discussion were: the upcoming WARC-19 and the surprising announcement by Intelsat and Intel, proposing sharing C-band spectrum with terrestrial 5G operators; high altitude platforms – and Google's Loon in particular. SES is currently providing backhaul to five Loons in Puerto Rico, which have replaced 4,300 cell towers.

Unsurprisingly, following the devastation in parts of the US and Caribbean by hurricanes this year, the role of satellites, in disasters was also a hot topic. Jose Luis Rodriguez, CEO of Campo Rico Group (CRG), explained what CRG was doing to help restore telecommunications in Puerto Rico. CRG, owns a teleport there, which survived the hurricane and is now providing limited service using a generator for power. Working with the Foundation for a Better Puerto Rico, CRG developed a model which was used in Celebra, PR to provide cellular coverage to an area, using satellite connectivity. There, is however much work still to be done to replicate this in other areas. Jose Luis, would welcome volunteers to work with him.

This was a very stimulating conference, and many of the delegates commented on how much they appreciated the open discussion about the many issues facing the industry.

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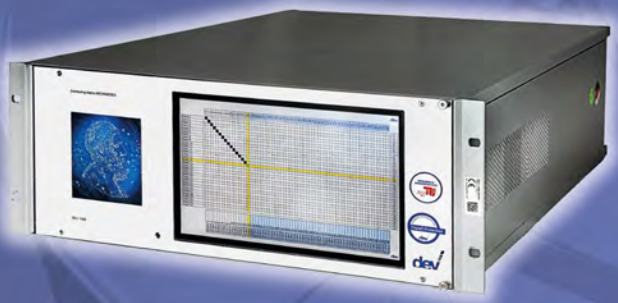

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THE ART OF ENGINEERING

# 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 32...*

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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 30…*

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."

## Jim Simpson Appointed ABS CEO

**Washington, DC, December 21, 2017**—Satellite operator, **ABS** announced the appointment of **Jim Simpson** as Chief Executive Officer (CEO). Jim, reporting to the Board of Directors, will lead the management

Jim Simpson

team to drive changes to enhance shareholder value and continue to partner with ABS customers and vendors to deliver unparalleled business results.

Jim Frownfelter, Chairman of ABS said, "We are very excited to welcome Jim to the ABS family! His extensive experience, leadership, and knowledge of the business will create significant value for the company as ABS transitions to the next phase of our long term growth strategy. The board and I are delighted that Jim Simpson as the new Chief Executive Officer will lead the executive team to effect the company's continuing expansion."

Prior to joining ABS, Jim Simpson spent 35 years at The Boeing Company in various leadership positions in the Satellite and Launch Business. After retirement from Boeing, he served 2 years as the Senior Vice President for Strategy and Business Development and was an Officer of Aerojet Rocketdyne focused on propulsion and power systems for satellites, rockets and defense productions. Jim holds B.S. and M.S. degrees from the University of California, Los Angeles, an M.B.A. from the University of Southern California and a graduate certificate in Program Management from California Institute of Technology.

## CEO Transition at Imagine Communications

**Dallas, Tex., December 5, 2017** – **Imagine Communications,** a portfolio company of The Gores Group, announced that **Tom Cotney** has been named CEO of the company, effective immediately. Current CEO Charlie Vogt is joining The Gores Group as a Senior Advisor to continue to drive M&A and business development activities at Imagine. The two executives will work closely to continue the momentum and growth at Imagine Communications while also ensuring a seamless leadership transition.

"Over the past four years, Imagine has transformed the media industry by becoming the first company to deliver on its vision of an all IP/cloud network for playout and master control," said Alec Gores, founder, Chairman and CEO of The Gores Group. "I want to acknowledge and personally thank Charlie for his leadership in driving this massive transformation and placing Imagine's technology at the forefront of the industry. Sharing our vision of where the industry is heading, Tom is uniquely qualified to build on this momentum and I welcome him in his new role."

"I am excited about the opportunity to lead Imagine to the next level," said Mr. Cotney. "Business models in transformation have become the norm in almost every company today. I can't thank Charlie and the team enough for building Imagine into one of the market leading, long-term players in this industry."

Cotney has spent 20 of his 30-year career partnering, selling to and competing in the telecommunications and mobile technology industries. He served as General Manager of the Communications Sector at IBM Global Services and has been a CEO and board member for a number of privately held companies. Cotney will also join the board of directors of Imagine.

Tom Cotney

"Imagine Communications could not be better positioned than we are today to take market-share across the ad management, playout, networking and distribution markets, particularly as we continue to guide the industry transition to IP and the cloud," said Vogt. "We are pacing to have our best quarter of the year, and Friday we signed a strategic Advertising Management System contract to accelerate the emerging ATSC 3.0 multi-services market."

Vogt has been a CEO and strategic leader across the telecommunications, broadcast and media sectors for 30 years – 16 years as a CEO. During that time, he has overseen the acquisition and integration of 15 companies.

"This transition underpins our long-term commitment to Imagine, and to the media and entertainment sector in general, as well as the confidence we have in Imagine to continue leading the industry in the transition to IP and cloud services from monetization to content distribution," said Gores.

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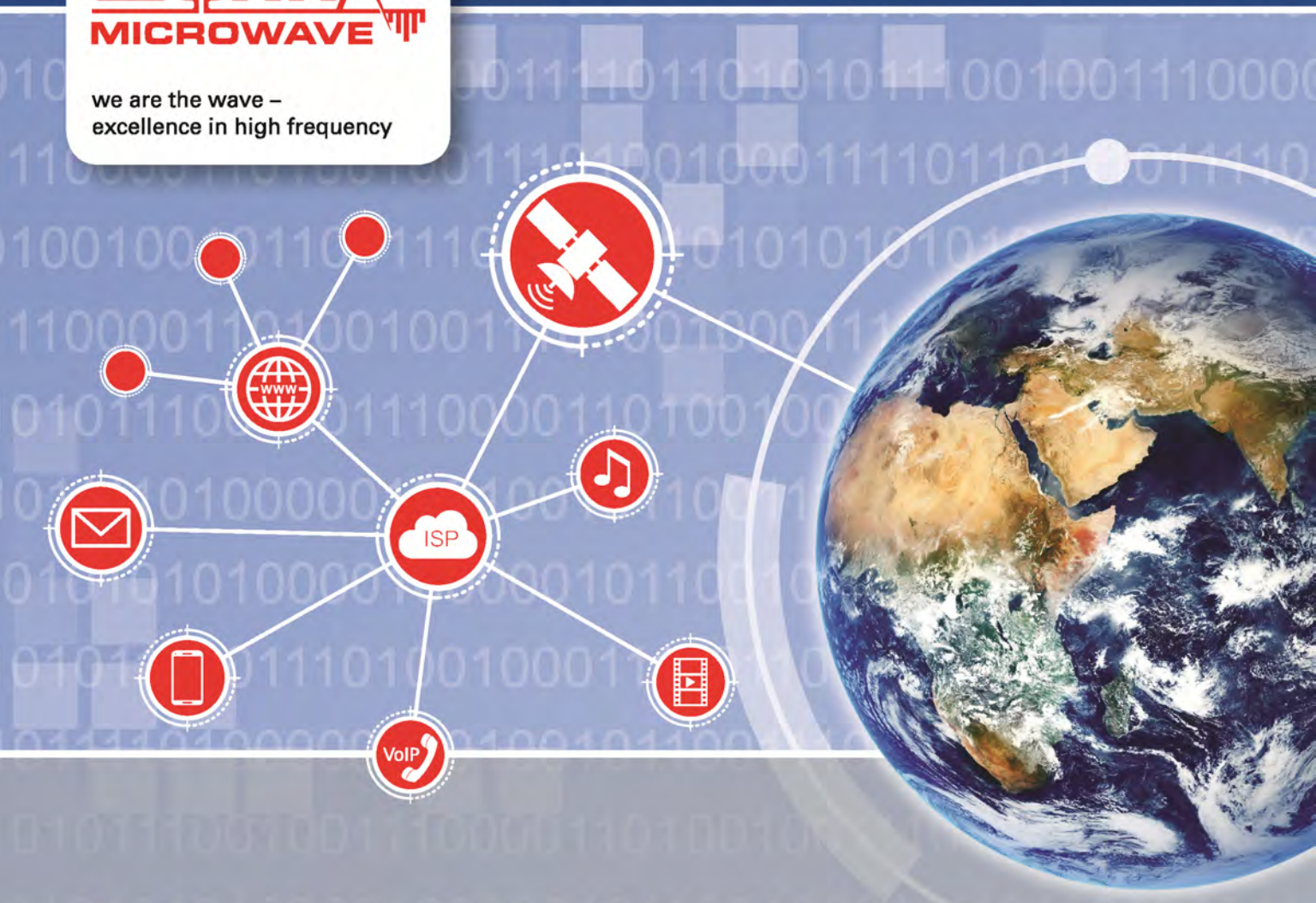


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# Work Microwave

**Dr. Thomas Fröhlich, CEO of Germany-based equipment manufacturer, Work Microwave, shared his thoughts on his company and his vision for the next few years.**

***How was your year 2017?***

2017 was the third record year in a row for WORK Microwave. And it was by far the most successful one in the company's 31 year history, with a turnover increase of more than 50% compared to 2016. This tremendous increase and step forward was made possible thanks to new customers in the US market, and a global confirmation of our customer's trust in WORK Microwave products and services.

Continued global expansion: Following on from the success of the US office opening in late 2015, WORK Microwave has recently appointed Eric Lossouarn as local representative in APAC, reinforcing our commitment to helping customer's worldwide realize their full business potential.

***How do you see WORK Microwave's position in the industry in general and in the market segments that you serve?***

WORK Microwave has established as a strong benchmark especially in the frequency converter business of the Satcom industry. In addition, WORK Microwave has built a long term reputation for quality and customer service.
Our position in the Modulator / Modem business is still to be further developed, but we offer here very competitive solutions for niche markets like intelligence services or wideband applications up to 500 Msps / 3 Gbps.
We are globally very satisfied with the evolution of our market position over the last couple of years.

***What are your targets for 2018?***

The primary target for our Satcom business is to be recognized as the benchmark player for:

Q/V band converters -WORK Microwave's frequency converter portfolio is Q/V band ready and has already been requested by global satellite operators to support the ever increasing demand for high-bandwidth telecommunication and broadcast services.

Wideband —Wideband is a groundbreaking technology that enables operators to support future high-throughput satellite transponders, running links with less back off and higher power, increasing multiplex efficiencies, and maximizing throughput.

While there are multiple wideband modulators available on the market today, there's an absence of demodulators.

Always at the forefront of Satcom innovation, WORK Microwave has developed one of the industry's first end-to-end solutions for S2-X wideband transmission and reception up to 500Msps / 3Gbps.

Dr. Thomas Fröhlich

**How do you see WORK Microwave in the next few years?**

We expect WORK Microwave to further develop its position in all sectors of activity, which are Satcom, Defence Electronics, Navigation Simulators, and Sensors & Measurement technology.

In the Satcom business, we want to become a reference for modulators and modems, at least in certain niche markets with specialized, flexible equipment, and obviously we intend to maintain and expand our benchmark position for converters.

***What key trends are you following in the industry and how will those impact your company?***

Trends that will drive the Satcom market in the next years and therefore deserve our full attention are:

"LEO / MEO rise vs. GEO (decline)" : follow up the impact of OneWeb and potential other constellations

"5G vs. and Satcom" : will it be more collaboration (complementary) systems or a clash? What are the implications on frequency filing, system architectures, and business plans – hence the commercial pressure on Satcom?

The demand for higher frequencies and fully integrated solutions: it started with Ka, but will become increasingly more important as we climb towards Q and V Band, or even beyond.

The impact of those technology trends, technology challenges and competition of system architectures is yet not clearly predictable. For a medium sized enterprise like WORK Microwave, it is of the essence to very closely monitor the market trends and anticipate product evolutions and innovation at the right point in time.

# The Satellite Markets 20 Index™

| Company Name | Symbol | Price Jan. 8 | 52-wk Range | |
|---|---|---|---|---|
| **Satellite Operators** | | | | |
| Asia Satellite Telecommunications Holdings Limited | 1135.HK | 7.00 | 7.24 | 10.80 |
| Eutelsat Communications S.A. | ETL.PA | 18.55 | 15.25 | 25.35 |
| APT Satellite Holdings Limited | 1045.HK | 3.78 | 3.58 | 5.71 |
| Inmarsat Plc | ISAT.L | 490.30 | 594.50 | 865.00 |
| SES S.A. | SES.F | 13.02 | 17.90 | 23.11 |
| **Satellite Manufacturers** | | | | |
| The Boeing Company | BA | 318.43 | 131.39 | 259.30 |
| MacDonald, Dettwiler and Associates Ltd. | MDA.TO | 66.60 | 61.80 | 80.28 |
| Lockheed Martin Corporation | LMT | 330.51 | 228.50 | 311.38 |
| Orbital ATK, Inc. | OA | 132.6 | 71.52 | 133.68 |
| Honeywell International Inc. | HON | 156.01 | 105.25 | 142.67 |
| **Equipment Manufacturers** | | | | |
| C-Com Satellite Systems Inc. | CMI.V | 1.24 | 0.92 | 1.15 |
| Comtech Telecommunications Corp. | CMTL | 21.43 | 9.52 | 21.40 |
| Harris Corporation | HRS | 145.62 | 88.89 | 132.83 |
| ViaSat Inc. | VSAT | 75.71 | 57.75 | 82.19 |
| Gilat Satellite Networks Ltd. | GILT | 8.33 | 4.12 | 6.20 |
| **Service Providers** | | | | |
| DISH Network Corporation | DISH | 48.57 | 52.09 | 66.50 |
| Globalstar Inc. | GSAT | 1.24 | 0.73 | 2.59 |
| Orbcomm Inc. | ORBC | 10.74 | 7.15 | 11.99 |
| Sirius XM Holdings Inc. | SIRI | 5.31 | 4.05 | 5.89 |
| Sky plc | SKY.L | 1017.00 | 747.50 | 1050.00 |

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 (Jan. 8) |
|---|---|
| Satellite Markets 20 Index™ | 2,871.99 |
| S & P 500 | 2,751.29 |

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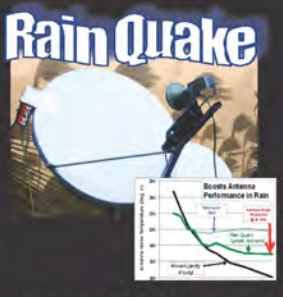


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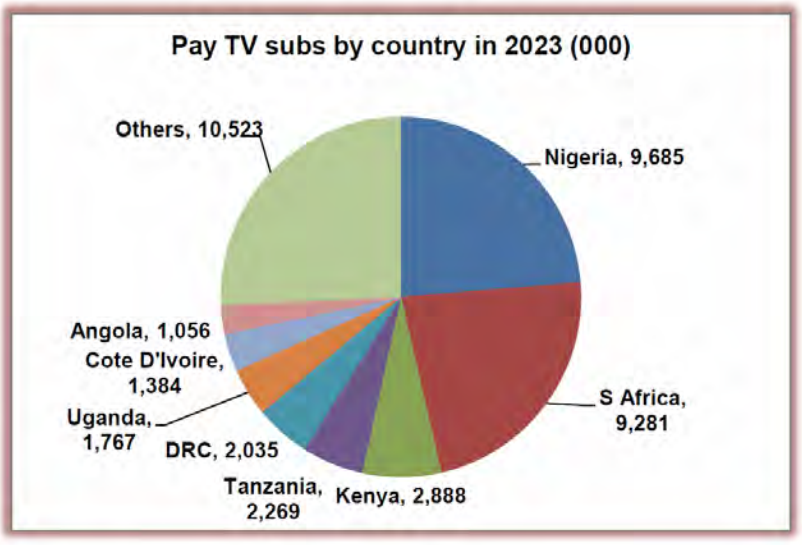
# Constellations To Drive Smallsats Market

**Cambridge, Mass., January 2, 2018** – NSR's newly released *Small Satellite Markets, 4th Edition* (SSM4) report identifies growth across the 1-500 kg smallsat market with 5,000 satellites launching within the next decade, generating cumulative revenues of US$ 25 Billion in manufacturing and launch services. Constellations remain the strongest driver of market growth; 70% of satellites to launch will be part of such a group of 5 or more satellites with the same mission. North America and Asia present the largest near-term opportunities, building on well-developed satellite ecosystems and leveraging the growth prospects in Earth Observation, Communications, and Science applications.

2017 was a strong year for the smallsat market, making up for declining launch rates in 2015 and 2016 with over 300 satellites launched and several new systems commencing deployment. "More and more players across the value chain are looking to engage in the smallsat market, seeing an opportunity to leverage their existing business and capabilities in this rapidly evolving segment," comments report author and NSR Senior Analyst Carolyn Belle. "As these players cement their offerings and look to build market share, competition will heighten, and today's young market will begin to mature. The key question now facing the industry is, *how many players can the market support*, and *how will M&A activity make its mark?*"

Through this market maturation, a robust industry based on one-time projects and individual satellites will sustain activity through the ups and downs of constellation deployment and replenishment cycles. Siddharth Shihora, NSR Analyst and report co-author, noted "emerging constellations will be challenged to balance CAPEX, investment, and revenue generation, particularly for systems designed with rapid replenishment rates that generate constant CAPEX requirements." NSR does not anticipate all systems currently in development to launch, with a forecasted success rate of less than 50% as operators seek the right response to myriad challenges.


*Source: Digital TV Research*

**The number of pay TV subscribers in Sub-Saharan Africa will increase by 74% between 2017 and 2023 to reach 40.89 million. However, the Sub-Saharan Africa Pay TV Forecasts report by Digital TV Research estimates that subscriber growth will outstrip revenue progress. Pay TV revenues will climb by 41% to $6.64 billion by 2023, up by $2 billion on 2017.**

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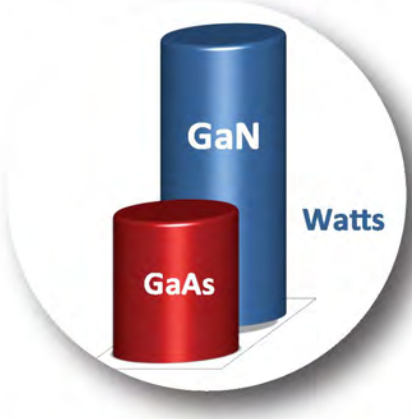


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