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TECHNOLOGY INTELLIGENCE FOR THE SATCOM MARKET

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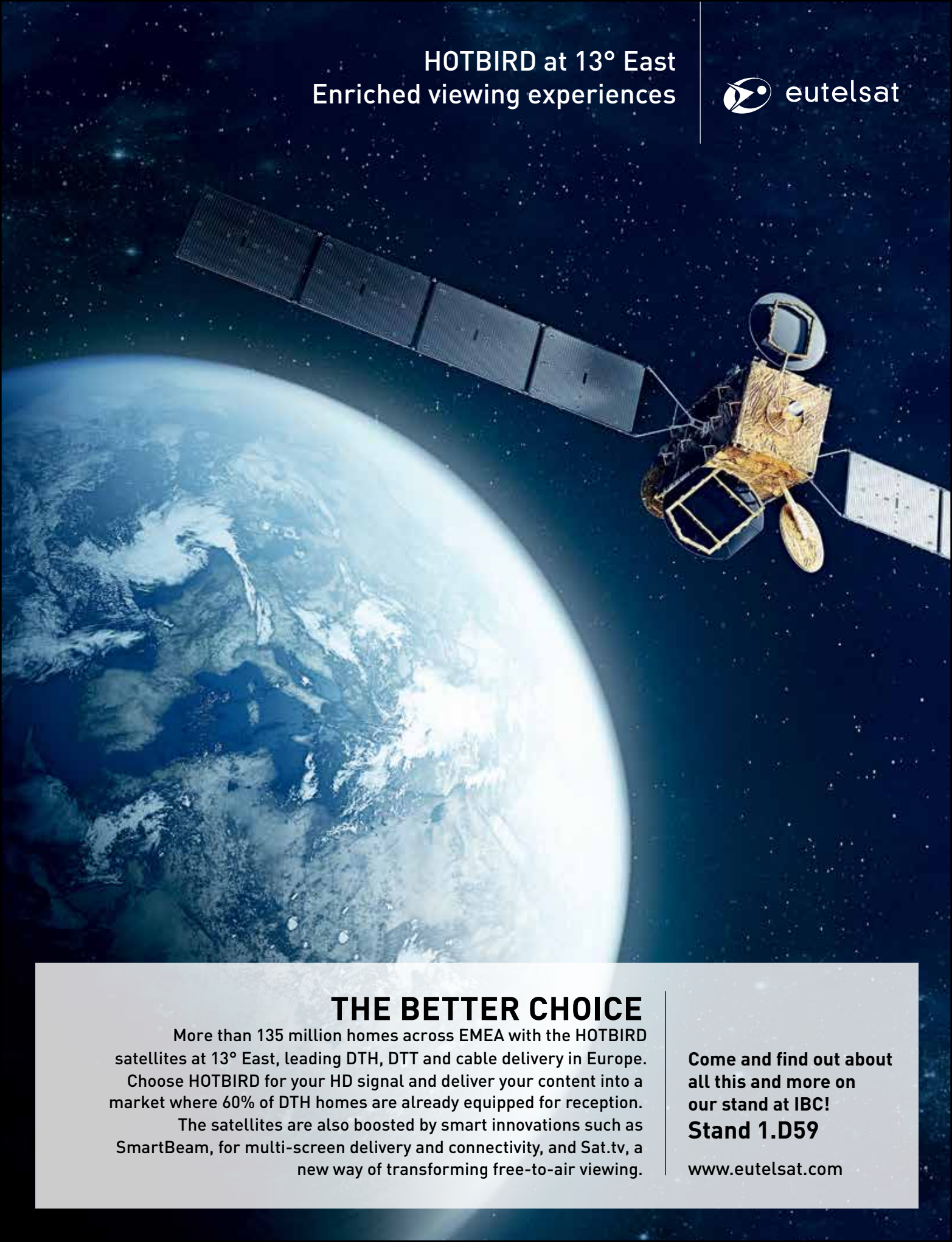
READY

IBC 2016

FOR 4K?

A look at whether satellite operators and equipment manufacturers are ready for the impending shift to 4K



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TECHNOLOGY INTELLIGENCE FOR THE SATCOM MARKET
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Are you ready for IBC?

Welcome to the September edition of *SatellitePro ME*. I'm sure you will enjoy reading this issue, as it is filled with exciting features. To start with, the 4K feature really sheds light on how satellite operators and equipment manufacturers have been preparing themselves to make 4K broadcasts a reality.

UHD TVs and set-top boxes have already reached market, with everyone eagerly awaiting 4K broadcasts in the region. Some sources even say that the Middle East will be able to watch its first 4K channel by the end of the year, although most pundits think the onus will fall on sports programming and live concerts first, before the leap to complete 4K programming across all genres.

It's once again that time of the year when broadcasters, satellite operators and equipment manufactures gather together to witness Europe's biggest broadcast show, IBC. The show is taking place 8-13 September at the RAI in Amsterdam, and will host more than 55,000 professionals from all over the world.

Our entire team will be present in full force, and I suggest that if you haven't made bookings with us yet, please get in touch to fix a time suitable for you. I look forward to meeting all of my friends in the industry and perhaps even making some new ones, walking the packed halls of the show.

I wish you a wonderful September. As always, I'd love to hear your feedback and comments on this issue of the magazine. Please send me an email or call the number in the panel on the left.

Clayton Vallabhan
Editor

In this edition:

"Not all HTS platforms are the same. Differences in system architecture and frequency band have an impact on performance"
Thomas Wrede, Vice President, Reception Systems, SES
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"Intelsat Epic^{NG} was designed with the ability to adapt, modify and improve this infrastructure as the market demands"
Shahrokh Amiri, Director of Sales, MENA, Intelsat
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"The duration for which the debris remain in orbit varies depending on the orbit. Debris in orbits below 600km usually falls within a few years"
Omar Hussain, MBRSC
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"More recently, airlines have introduced the telephone and Wi-Fi on aircrafts and the car industry is currently developing its own systems"
Mitja Lovsin, CCO, STN
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NORTH TELECOM

Broadband internet

ON AIR
Broadcasting

Teleport service

Oil and Gas

Maritime VSAT

Teleco / ISP

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JCSAT-16 performs post-launch manoeuvres

SSL announced that a satellite designed and built for SKY Perfect JSAT Corporation, a leading satellite operator based in Japan, was launched on August 14, and successfully performed post-launch manoeuvres according to plan. The satellite, JCSAT-16, deployed its solar arrays on schedule following the SpaceX Falcon 9 launch from Cape Canaveral Air Force Station in Florida. JCSAT-16, which will provide service for video distribution and data transfer communications, began firing its main thruster early last month, to navigate toward its final geostationary orbit.

JCSAT-16 is an 8.5kW multi-mission satellite designed to function as an in-orbit back-up for multiple orbital locations that will ensure stability for existing services and further strengthen SKY Perfect JSAT Corporation's business. The satellite, which has both Ku- and Ka-band capabilities, will serve the Japanese market from multiple orbital locations.

+ www.sslmda.com

JCSAT-16 was built by SSL for SKY Perfect JSAT Corporation.

GBI ANNOUNCES NEW VP OF OPERATIONS

GBI announced the appointment of Mohamed Abdel Bassit as Vice President – Operations. On the occasion of the appointment, Amr Eid, Acting CEO and CCO of GBI, said: "Mohamed's appointment comes after GBI's successful transition into a global service provider. His proven industry track record and operational leadership will build on our core business plans."

Abdel Bassit has 19 years of experience in the ICT industry, spanning sales, business operation and product development.

+ www.gbiinc.com

ADVANTECH WIRELESS SIGNS MULTI-MILLION DOLLAR ORDER

Advantech Wireless announced it has received a multi-million dollar order for its AMT-83L advanced satellite modem from a NATO country member. The modem adds a number of advanced features to the AMT-73L modem series, the first worldwide satellite modem to be certified with MIL-STD-188-165A by DISA.

"These modems have been designed to fulfil advanced two-way satellite gateway communication requirements in defence satellite communications systems," said Cristi Damian, VP Business Development at Advantech Wireless.

"Based on the success of the AMT-73L line of DISA-certified modems, with thousands of units deployed and field tested throughout the world, the new AMT-83L class adds powerful modulations and error correcting codes. The AMT-83L also has much higher data rate, full-fledged IP traffic with built-in router, and GSE encapsulation."

+ www.advantechwireless.com

UAESA LAUNCHES DEVELOPMENT PROGRAMME

Lockheed Martin, the UAE Space Agency and Mubadala have launched a space-based workforce training programme to develop emerging leaders in the UAE space industry. Generation Space: The Space Fundamentals Training Programme for early career professionals across the UAE aerospace industry will run for the next four months and includes training in the UAE and the US. The programme begins in the UAE with training in space foundations and moves on to more technical topics, covering more than 200 hours of course work. Participants will also complete mentor-guided research.

+ www.space.gov.ae

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Information

15 November 2016 | Habtoor Grand, Dubai, UAE
Summit: 10am - 4pm | Awards: 7pm – 10pm
broadcastpromeawards.com

SES sees uptake for capacity at Olympics

SES announced record uptake of its satellite capacity for the Olympics, compared to previous Games.

A total of 23,000 hours of capacity was booked on four SES satellites – NSS-806, SES-4, NSS-7 and SES-3 – to enable transmission of the Games to broadcasters in the Americas, Europe, Asia and Africa. SES serves 10 leading broadcasters in the US, the UK, Switzerland, Italy, Brazil and Japan, including Eurovision, CNN/Turner and Nippon Television Network.

"SES has provided capacity for the Olympics since 2000, and we are pleased that the capacity demand for Rio Olympics far exceeded the previous editions. For the first time ever, we are using more capacity on more satellites to broadcast more hours of sporting events and news coverage of the Games to a truly global audience," said Richard Lamb, GM of Occasional Use Services at SES.

"This record demand illustrates how broadcasters continue to view satellite as an ideal and cost-effective way to broadcast excellent image quality of sporting events live to millions of viewers around the world."

+ www.ses.com

YAHLIVE RENEWS CONTRACT WITH BBC WORLD SERVICE

Yahlive announced that it has signed a contract renewal with the BBC World Service. As part of the ongoing agreement, the BBC will continue the broadcast of its Persian and Arabic television channels, as well as radio programming from its Arabic and Afghan services, to audiences across Yahlive's wide and culturally diverse footprint.

Commenting on the strength of the partnership, Sami Boustany, CEO, Yahlive, said: "Yahlive is one of the fastest-growing regional satellite broadcasters in the region. Working closely with partners such as the BBC is core to our mission to bring viewers a mix of culturally relevant programming. The continuation of our partnership with the BBC is reflective of this and is a significant component of our growing channel portfolio."

Nigel Fry, Head of Distribution, BBC World Service, said: "Since our first signed agreement in July 2014, the continued partnership with Yahlive has given us an opportunity to share our world-class content with more viewers and listeners across the region."

+ www.yahlive.com

MBRSC ANNOUNCES SECOND EMM SCIENCE WORKSHOP

MBRSC has announced the second annual EMM Science Workshop, which targets students, graduates and educational entities from various UAE universities. The workshop, which will be held on October 3 will address the science of the Martian atmosphere, as well as various topics about the Red Planet.

Engineer Salem Humaid Al Marri, Assistant Director General for Scientific and Technical Affairs at MBRSC, said: "Being delegated to design, implement and supervise all the phases of the project, under the supervision of the UAE Space Agency, MBRSC is committed to the development of national capacity in Martian science and outer space exploration technology."

+ www.mbrsc.ae

EUTELSAT APPOINTS BOCQUET AS DIRECTOR OF SPECTRUM

Eutelsat Communications announced the appointment of Wladimir Bocquet in the new post of Director of Spectrum Management Policy. He joined Eutelsat on 1 August from the GSM Association in the UK, where he served most recently as Senior Director, Head of Policy, Planning and Regulatory Affairs.

Commenting on his arrival, Rodolphe Belmer, CEO, Eutelsat said: "At a time when significant initiatives are underway in ultra-fast broadband, 5G, hybrid networks, new frequency bands, satellite constellations and connected objects and vehicles, Wladimir's skills and unmatched experience in spectrum management will make an essential contribution to our strategic choices and development. He will steer our spectrum strategy on these new challenges."

+ www.eutelsat.com

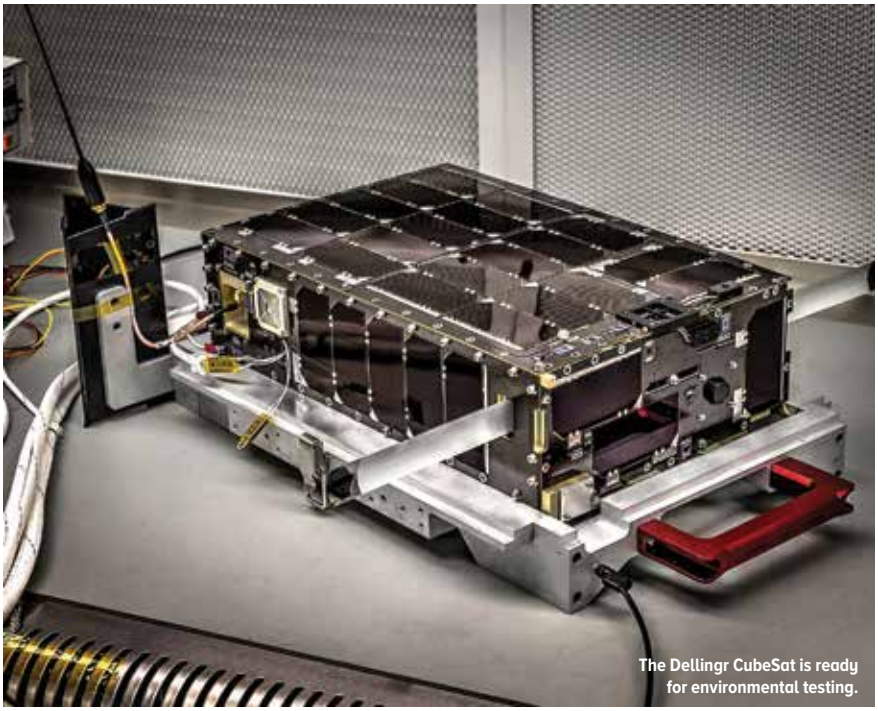
NASA's Cubesat readies for environmental testing

NASA scientists have successfully completed the construction of miniature satellite Dellingr CubeSat, and the low-cost satellite is now ready for its first environmental testing. The satellite will be launched using the most powerful rocket space launch system (SLS) in 2018.

Environmental testing is a key step after any satellite has been built, to make sure it can withstand intense vibrations, the extremes of hot and cold, and even the magnetic fields of space – all the rigorous conditions the CubeSat will encounter during launch and spaceflight.

Dellingr will study the ionosphere – the outer region of Earth's atmosphere populated by charged particles, ionised by incoming solar radiation and magnetospheric particle precipitation. The magnetosphere is Earth's magnetic environment, and charged particles in this region are sometimes deposited into the atmosphere below.

+ www.nasa.gov



The Dellingr CubeSat is ready for environmental testing.

THURAYA AND VINAPHONE LAUNCH MSS IN VIETNAM

Thuraya Telecommunications has signed an agreement with VNPT VinaPhone making its land and maritime handsets available to the Vietnam Posts and Telecommunications Group (VNPT). Thuraya's first service agreement in Vietnam is helping VNPT VinaPhone establish satellite services, which was marked by a ceremony attended by Vietnamese Prime Minister Nguyen Xuan Phuc in Hanoi on 4 August.

This agreement will extend VNPT VinaPhone's coverage to two thirds of the world, using Thuraya's robust and reliable network. It will also give VNPT VinaPhone 100% coverage over Vietnam's territory, including its islands.

+ www.thuraya.com

YAHSAT AND PANASONIC AVIONICS SIGN MOU

Yahsat and Panasonic Avionics have announced the signing of a MoU to explore new ways to offer a broadband connectivity solution serving several mobility markets in the Middle East within the next three to five years.

The companies will explore a wide range of factors including the type of frequency to be used, the coverage and capacity needed to serve flight routes in this region.

+ www.yahsat.ae

+ www.panasonic.aero

SPEEDCAST ACQUIRES WINS LIMITED

SpeedCast International Limited has announced the acquisition of WINS Limited (WINS), a European provider of broadband satellite communications and IT solutions for the maritime sector.

WINS provides services to over 100 passenger-carrying vessels, such as cruise liners and ferries, and more than 2,000 merchant shipping vessels with a portfolio of VSAT, L-band, Accounting Authority services and International Maritime GSM services.

SpeedCast CEO Pierre-Jean Beylier commented. "This acquisition is further affirmation of SpeedCast's growth strategies, and is a significant milestone for us. WINS brings a strong local presence in Germany, a major maritime market, as well as expertise in the cruise industry in Europe, a fast-growing user of satellite communications."

+ www.winssystems.com

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Mitsubishi Electric to open new facility

Mitsubishi Electric Corporation announced that it has started constructing a facility that will double the satellite component production capacity of its Kamakura Works, Sagami Factory in Sagamihara, Japan. The factory is Mitsubishi Electric's core production and testing site for solar array panels, structural panels and other satellite components. The new facility, which will commence production in October 2017, is expected to help the company continue growing its share of the global satellite market.

Mitsubishi Electric is one of the world's leading manufacturers of satellite components, most notably structures made with advanced composite materials for the global market. The company has a rich history of providing global satellite manufacturers with solar array panels, structural panels and antennas produced at its Kamakura Works. Over the years, Mitsubishi Electric has developed a substantial share of this market.

The new facility will introduce a number of advanced manufacturing machines, such as high-precision machining equipment and automated welding machines, which will help the factory to double its production capacity.

+ www.mitsubishielectric.com

An artist's impression of a Mitsubishi Electric built satellite.

IEC TELECOM GROUP EXPANDS TO TURKEY

With a strong presence in Europe on one side and in the Middle East and Central Asia on the other side, IEC Telecom Group found it necessary to fill the gap in between in order to get closer to its customers in the region and support them with its well-known proximity service.

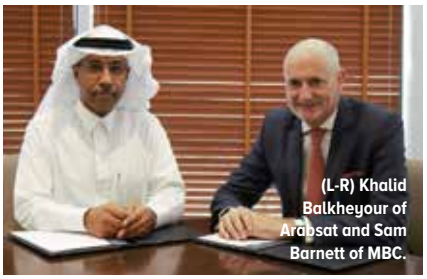
After due consideration, the Group chose to establish in Turkey. The IEC Telecom Turkey headquarters are in Istanbul, and will have the same core activities as all other subsidiaries. Its main targets will be both land and maritime markets. Its offer for L-band mobile services is based on the Group's comprehensive portfolio – Thuraya, Iridium and Inmarsat, of which the Group is a distribution partner.

The company's offer for VSAT mobile and fixed services is based on Inmarsat GX and FX, the Group being Global Xpress VAR. Yahsat KA and Eutelsat KA are equally part of the portfolio.

IEC Telecom Turkey will provide the Group's satcom solutions and applications that have been either developed in-house or by the Group's specialised companies.

+ www.iec-telecom.com

MBC TRANSITIONS CHANNELS TO ARABSAT'S 26-DEGREE POSITION



(L-R) Khalid Balkheyour of Arabsat and Sam Barnett of MBC.

MBC Group channels announced the transition of its Gulf channels and MBC Pro Sports channels to Arabsat through a strategic partnership signed with Arabsat earlier last month. Previously, MBC shared its portfolio of channels between Arabsat's BADR satellites situated at the 26-degrees hotspot and Nilesat at 7-degrees West.

The cooperation aims to establish a new era of family TV entertainment, while the transition of some channels will be exclusive to Arabsat.

Khalid Bin Ahmed Balkheyour, CEO, Arabsat, stated: "It is proof that the media industry is progressing in the right direction."

+ www.arabsat.com

+ www.mbc.net

NORTHTELECOM APPOINTS SENIOR SALES DIRECTOR FOR APAC

NorthTelecom announced that Richard Alwani has joined its team as Senior Sales Director for the APAC region.

Alwani has over 20 years' sales experience in information and technology, as well as 16 years in the satellite field.

He has worked in companies such as ABS, SpeedCast, iDirect and C2SAT, and recently was a Senior Consultant for customers in the oil & gas industries, supplying them with VSAT communications, below-deck network equipment and entertainment packages. In his previous roles, he opened up new markets for the companies that he worked for and strengthened his network to all parts of the world in this field.

NorthTelecom has invested in a new facility in Singapore to serve the APAC region.

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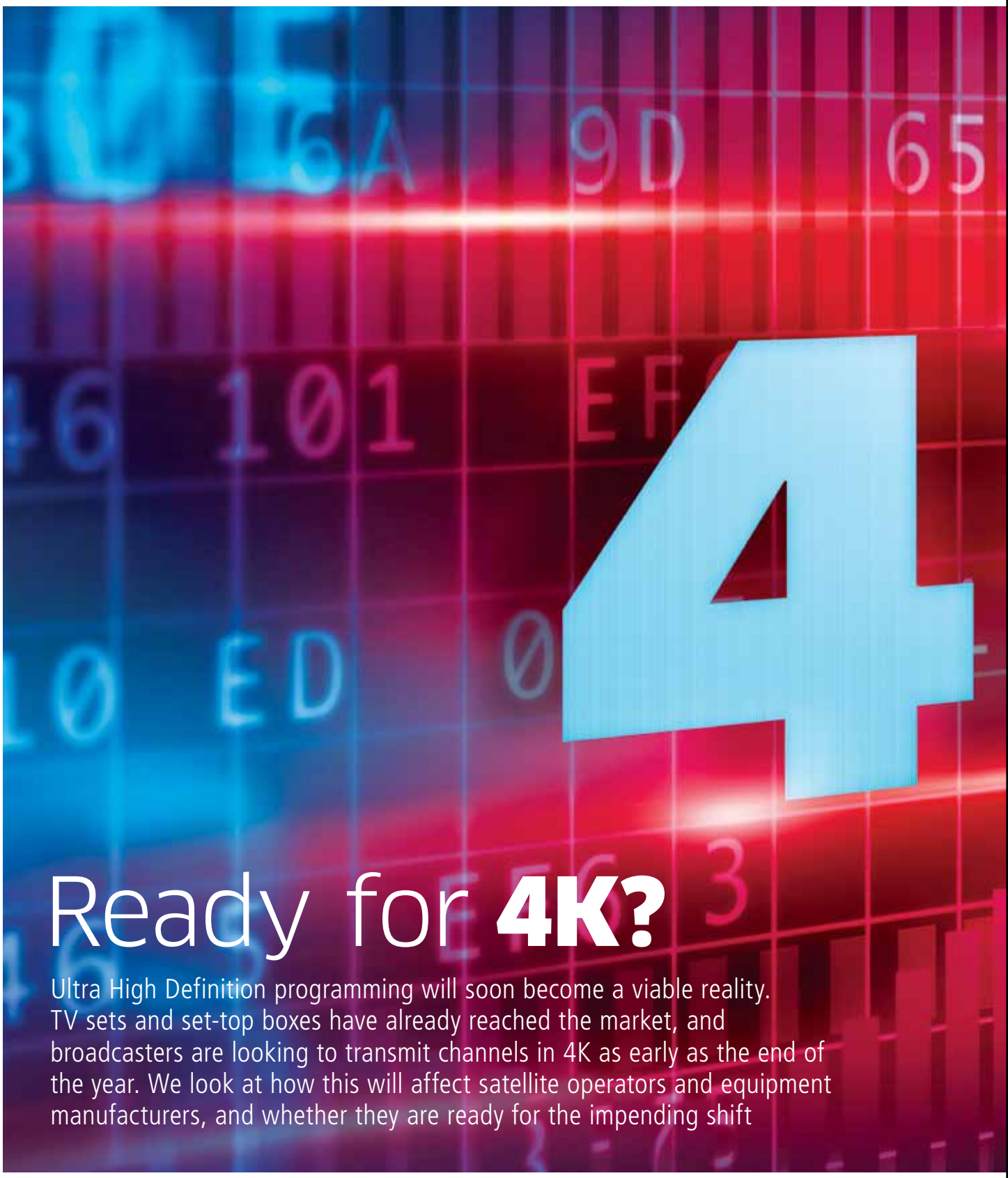
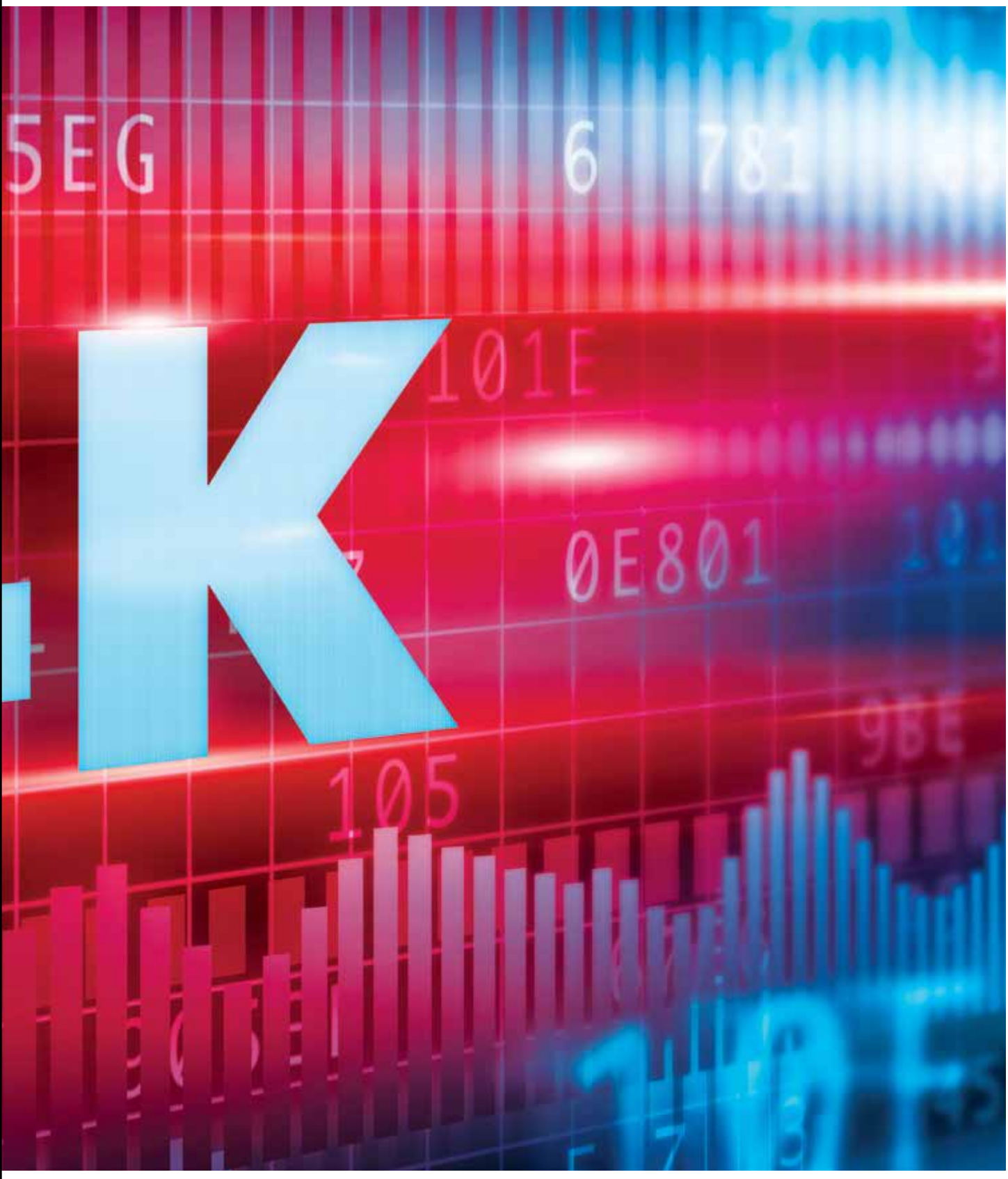


Ready for **4K?**

Ultra High Definition programming will soon become a viable reality. TV sets and set-top boxes have already reached the market, and broadcasters are looking to transmit channels in 4K as early as the end of the year. We look at how this will affect satellite operators and equipment manufacturers, and whether they are ready for the impending shift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For the satellite industry, 4K and 8K means the industry will be able to deliver state-of-the-art picture quality into homes. Due to the bandwidth and reliability requirements to transmit 4K content, satellite operators will be able to deliver this high quality standard while other infrastructure providers, particularly in emerging markets, will struggle for many years to come. This is clearly the competitive edge for satellite operators.

Regardless what device content is watched on, whether big-screen TV or multimedia devices such as tablets and smartphones, broadcasters are under increased pressure to deliver the best content in the highest possible resolution. This demand in turn pushes the satellite industry to keep up with the pace of change and deliver what is required.

Thomas Wrede, Vice President, Reception Systems at SES, says: "For the broadcasting industry, I think in a nutshell it means two things. One is that the broadcasting industry can make available for viewing live events like soccer, other sports and live concerts in a much higher quality. So it will be more enjoyable to consumers. Second, it will create additional business opportunities to provide managed services, different satellite capacity, also for occasional use Ultra HD transmissions during major sports events."

"Broadcasters will not go to 8K directly, even in Japan they will start with 4K. 8K in our view, for SES core markets is still several years away. That's very clear. It is a logical step to move from 4K to 8K but at this point in time it's still quite a while away because there's hardly any equipment available in the market."

THOMAS WREDE, Vice President, Reception Systems, SES

"There is, of course, also the question how does it impact the industry? It impacts the industry because it will stimulate competition, also it will stimulate technology upgrades. Hence in the next investment cycle, the broadcasters will have to prepare the studio infrastructure and production infrastructure to upgrade to 4K or even 8K."

According to Peter Ostapiuk, Head of Media Product Services and Management at Intelsat, 4K and 8K will have a positive impact on the satellite sector, as it continues to be the only way to distribute high-quality content in a cost-efficient way.

Based on a 2014 Intelsat survey, 4K adoption is expected to first gain

4K TVs and set-top boxes are already on sale in the market.

momentum in Asia and then the United States. However, the availability of 4K and 8K content, and further advancements in compression technology and final transmission standards, all play a role in the actual timing of widespread adoption. The survey revealed an increase in production of 4K content, advancements in HEVC compression, sales of UHD TVs and advancements in modulation that drive greater spectrum efficiency.

Ostapiuk, however, thinks it will take a couple more years before a critical mass of content from major media companies of 4K UHD programming becomes available.

Hans Massart, Market Director, Broadcast at Newtec adds: "Until recently the UHD market was driven by TV manufacturers, but as it expands it provides opportunities for the whole value chain, from content suppliers through to service providers and equipment manufacturers. The timescale for UHD mass deployment varies – some analysts think it will happen imminently, others say that it may take five or six more years. However, it is commonly acknowledged that UHD is becoming the new normal."

"The timescale for UHD mass deployment vary – some analysts think it will happen imminently, others say that it may take five or six more years. However, it is commonly acknowledged that UHD is becoming the new normal"

HANS MASSART, Market Director, Broadcast at Newtec

Speaking about the fact that many broadcasts are still stuck in SD, Cristiano Benzi, Director of Special Projects at Eutelsat Italy, says the broadcast industry has to manage different calendars at the same time and address transition needs according to market specifics.

"We have been the first to launch an Ultra HD demo channel, HOTBIRD 4K1, on our key position HOTBIRD back in 2014, and we now carry three commercial channels on our fleet, not to mention major broadcasters in the Middle East, such as OSN, planning to introduce Ultra HD services on our satellites. This shows 4K deployment is now leaving the experimentation phase and is accelerating. Within a context where Ultra HD TV sets are entering households worldwide at a very fast pace, we can predict that Ultra HD could become really mainstream within two to three years."

Wrede of SES says the satellite operator broadcasts 2,352 HD channels and 24 UHD

Cristiano Benzi, Director of Special Projects, Eutelsat Italy.

Andrew Bond, Sales Director, ETL Systems.

channels. Due to advances in compression technology, UHD quality is now possible. The latest compression codec, High Efficiency Video Coding (HEVC), is even more powerful than its predecessor, H.264. HEVC reduces bandwidth by half and therefore allows UHD quality, which is four times the size of HD, to be broadcast affordably. Sales of HEVC set-top boxes are predicted to increase to five million in 2016, further spreading access to this new and improved video experience.

"Disrupters to the traditional broadcasting industry have added more impetus to 4K's virtuous circle. Netflix and Amazon have thrown their respective hats into the ring by producing their own wildly successful, award-winning 4K content like *House of Cards* and *Transparent*. In the wake of this big bang, the Ultra HD content universe can only get bigger," says Wrede.

So how are equipment manufacturers and satellite operators making 4K more mainstream?

Our experts all feel now is the time for the satellite industry to ensure it is prepared for the growing popularity of 4K UHDTV, by investing in technologies which support the latest standards and go hand-in-hand with 4K UHDTV.

"Satellite, like any other broadcast platform, is 'transparent' to the content delivered and can immediately accommodate 4K broadcasting; that is why our current satellites already present all the technological requirements to support the higher bitrates demanded by broadcasters for this type of transmission"

CRISTIANO BENZI, Director of Special Projects, Eutelsat Italy

Massart says: "In Newtec's case, we see new transmission standards such as DVB-S2X and HEVC as examples of technologies which the satellite industry needs to consider investing in. In comparison with DVB-S2, DVB-S2X results in an efficiency gain of between 15% and 30% in a typical distribution network (including DTH), which will be vital as 4K becomes mainstream."

Ostapiuk says the satellite industry has demonstrated that it is ready to support 4K delivery when the time is right for media organisations. Intelsat and its ecosystem partners have conducted 4K UHDTV transmissions demonstrations of various applications and standards since 2013, proving that the satellites currently in orbit are able to cost-efficiently deliver high-quality 4K UHDTV content for contribution and distribution purposes.

As 4K UHDTV moves closer to becoming mainstream, there is an increased likelihood that both UHD and HDR technologies will be

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combined to provide an optimal immersive viewing experience, with the ability to easily handle transmission of multiple viewing formats across a globalised network.

Andrew Bond, Sales Director, ETL Systems, says: "Broadcasters such as Sky, BT and Netflix are now offering hardware to provide 4K content to consumers. Satellite ground station equipment manufacturers like us are designing RF equipment, such as larger switch matrix systems to handle more RF feeds which operate over extended L-band for use in Ka-band applications. This will make it easier for broadcasters to implement 4K."

"In the sports broadcasting world, BT are already offering 4K transmissions with Europe's first 4K sports channel. Japan's public channel, NHK, has recently tested the world's first broadcast using 8K TV technology to broadcast parts of the Rio 2016 Olympic Games, which are being filmed in 8K by special NHK cameras. However, equipment to receive and display the 8K signal is not yet commercially available."

While many may think that 4K means future satellites will need to be bigger and have more transponders, improved codecs like HEVC will create significant added efficiency, allowing more 4K streams to be fitted within a single transponder.

Massart says: "Launching 4K channels will require much more bandwidth than with SD or HD, as the efficiencies introduced by even more efficient coding such as HEVC are outweighed by the significantly higher resolution and frame rates. Where an HD channel may require an average of up to 5Mbps, the same channel in UHD may require up to 20Mbps. This is a challenge which broadcasters, satellite operators and satellite service providers need to address as the uptake of 4K UHD begins to gather pace."

Benzi says similar statements were made when the broadcast industry shifted from SD to HD, but the change of format had no impact on the availability of bandwidth or the signal quality delivered by Eutelsat's fleet.

"Satellite, like any other broadcast platform, is transparent to the content

"There is, of course also the question how does it impact the industry? It impacts the industry because it will stimulate competition, also it will stimulate technology upgrades. Hence in the next investment cycle, the broadcasters will have to prepare the studio infrastructure and production infrastructure to upgrade to 4K or even 8K"

THOMAS WREDE, Vice President, Reception Systems, SES

Peter Ostapiuk, Head of Media Product Services and Management, Intelsat.

Thomas Wrede, Vice President, Reception Systems, SES.

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Hans Massart, Market Director, Broadcast, Newtec.

"Where an HD channel may require an average of up to 5Mbps, the same channel in UHD may require up to 20Mbps. This is a challenge which broadcasters, satellite operators and satellite service providers need to address as the uptake of 4K UHD begins to gather pace"

HANS MASSART, Market Director, Broadcast, Newtec

delivered and can immediately accommodate 4K broadcasting; that is why our current satellites already present all the technological requirements to support the higher bitrates demanded by broadcasters for this type of transmission. Plus, the continuous improvement of compression standards and rates allows an ongoing optimisation of bandwidth and increases available capacity," says Benzi.

Wrede too says the SES fleet is completely 4K ready, and that with the rise of modern video encoding technology like HEVC, SES can put three 4K programmes per transponder together with new modulation and coding technologies like DVB-S2X. This capacity can be bundled to allow statistic multiplexing and bandwidth gains. He says 4K will drive demand for transponders, which will increase by 28% by 2025, per Northern Sky Research (NSR).

In addition, future SES satellites will be more powerful, more agile, more flexible and have various technological advancements, according to Wrede.

Since NHK and some other broadcasters are testing 8K playouts, it will be interesting to see if broadcasters decide to skip the 4K bandwagon altogether and instead jump straight to 8K.

Industry gurus, however, don't see this happening.

According to Wrede: "Broadcasters will not go to 8K directly; even in Japan, they will start with 4K. 8K in our view, for SES core markets, is still several years away. That's very clear. It is a logical step to move from 4K to 8K, but at this point in time it's still quite a while away because there's hardly any equipment available in the market. And then I think some broadcasters these days may consider – when moving from SD to HD – to move to the optimal HD quality, which is the 1080 lines progressive format rather than 4K or 8K. So broadcasters will definitively not go to 8K directly but rather take a step-by-step approach."

Massart adds that most operators, service providers and equipment vendors are still strongly focused on fully implementing 4K services. Strong commercial arguments will be required for skipping straight to 8K, even if widespread 4K implementation takes longer than expected. He doesn't see a lot of evidence at this stage that 8K can be commercially successful. It would require significant financial outlay in terms of production equipment as well.

Bond thinks that as 4K has not become totally mainstream, the decision to jump straight to 8K will not be taken lightly by broadcasters and will only be made if it is realistically achievable and viable on a large scale.

"4K technology is now gradually becoming more affordable, and the high costs associated with 8K, as it is at the moment, are not very attractive for consumers. At ETL, we understand that technology continues to advance, so standing still is not an option. Our products evolve as the industry changes, and we pride ourselves on that flexibility and ability to respond quickly. 70% of our largest orders in 2015 were bespoke engineered to meet specific customer requirements, so we are always up for the challenge to design new products for shifting industry needs," concludes Bond. PRO

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Vox Pop

How is the Internet of Things (IoT) affecting the satellite industry? What data is being collected in particular, and how is it useful to your clients?

Greg Ewert, President, Inmarsat Enterprise

IoT is integral to the direction we're taking. Inmarsat recently partnered with Drayson Technologies and the bike courier company Gophr to provide connectivity to CleanSpace Tags (portable air pollution sensors) which will map pollution levels during Gophr cyclists' journeys across London. This initiative will collect data that will help to build a real-time map of London's air pollution as they carry out their same-day deliveries. Obviously, air pollution affects everyone who lives in the capital, so that's an example of important work.

Ronald van der Breggen, Chief Commercial Officer, LeoSat Enterprises

As much as from a networking perspective the IoT means a huge increase in bandwidth requirements, and not so much the requirement for alternative infrastructure, the typical satellite strongpoints remain strong – also with IoT. So for satellite, its ability to reach destinations far and away from terrestrial infrastructure, as well as its ability to set up connections within minutes, will play very well into certain applications for IoT – the personal safety area as well as SCADA applications in the industrial sector. LeoSat will add to this its ability to take 'ubiquity' to its next level, as it also covers the Arctic areas up to poles, and in doing so brings latency down to well below the performance of fibre when deployed over longer distances. As LeoSat is all about full duplex connectivity, it also is a better fit to IoT, given that all its devices are more reliant on two-way communication than traditional applications that make use of satellite.

Shahrokh Amiri, Director of Sales, MENA, Intelsat

Businesses across multiple verticals – maritime, oil & gas, ConnectCar – are increasingly relying on IoT applications to enhance operations. For example, ships have been carrying a multitude of data-collecting sensors for decades, but this data has not been fully utilised to optimise operations because current delivery channels are not capable of moving the data cost-efficiently. The improved throughput delivered by HTS will lead to better tracking of containers, and this could improve utilisation by 10-25%, potentially reducing annual spending by nearly $13 billion per year in 2025. These techniques could also enable operators to raise average ship speeds by 11-13%, resulting in an economic impact of $4.5 billion to $9.3 billion in 2025.

Roger Franklin, CEO, Crystal

The biggest impact we are seeing is in the oil & gas and mining & exploration sector. Any place where connectivity is only available by satellite and companies want to collect more data, like pipeline monitoring, ocean rigs, geological data, then satellite continues to be a critical communication link. Very recently, some new data correlation technology has been able to save drilling companies weeks or months of time and tens of thousands of dollars by quickly analysing the vast amounts of data associated with drilling operations. Being able to extract useful analyses from available data makes the business case for IoT and the satellite links necessary for connectivity.

There is a lot of talk about video being streamed to multiple devices. What role does satellite play in this scenario, and how effective will it be for consumers?

Jacques Dutronc, Chief Innovation and Development Officer, Eutelsat

Satellite technology is already the backbone of video distribution networks to fixed displays for pay-TV platforms and broadcasters around the world. Our fleet is able to deliver a universal and immediate signal to wide regions. More importantly, our satellites can guarantee the transmission of high-quality stream with no saturation effects, commonly observed with terrestrial or mobile networks.

We are in a good position to start broadcasting free-to-air and rights protected content to multiple mobile devices. SmartBeam, our innovative IP-native multi-screen content delivery solution, is thus a milestone in our roadmap to reach millions of additional viewers on their smartphones or tablets wherever they are, independently of terrestrial and mobile networks. For TV operators, SmartBeam enables them to reach new audiences, as well as to enhance the viewing experience for their customers. The adoption of this technology by leading Russian pay-TV Tricolor TV acts as a solid demonstration of the strategic role satellite can play in the multi-devices streaming and OTT landscape.

Greg Ewert, President, Inmarsat Enterprise

Inmarsat is an industry leader when it comes to streaming video via satellite. Streaming video has many applications, from crew welfare aboard oil rigs to e-health video conferencing solutions for remote medical treatment. Global Xpress is the first globally available, high-speed broadband connectivity provided by a single operator, and it can easily deliver the bandwidth needed to stream high-quality video. We've also been providing BGAN (L-band) solutions to major international broadcasters for live reports from remote locations for a long time now too.

Our bonded BGAN HDR can stream live footage that is easily as good as VSAT in quality, but the terminals are no bigger than a pair of laptops. We're proud of that.

Deepak Mathur, Senior Vice President, Commercial, Middle East and Asia-Pacific, SES

Beyond the typical broadcasting, we see travellers wanting to enjoy video streaming services on board planes and ships, and smartphone users consuming huge amount of content on our devices on their social media accounts. The increasing amount of data consumption is not possible over terrestrial infrastructure alone, and here is where satellite can play a leading role. Satellites are ideal for connecting communities and businesses in under-served and unconnected places, and notably high throughput satellites which deliver cost-effective bandwidth. Wi-Fi, cellular data and SAT>IP technology is used to connect end users' devices directly. Such a hybrid solution will ensure content is optimally and cost-effectively delivered to consumers.

Ronald van der Breggen, Chief Commercial Officer, LeoSat Enterprises

Ultimately consumer do not care how their content is being delivered,

Vox Pop

they just want it done fast and in a reliable way. Typically satellite is part of that infrastructure, as a very robust way to deliver content to television sets. With the onset of digitisation and mobile devices, satellite has not been able to play as dominant a role there; while still carrying video, it is often used as a last resort type technology as opposed to being the primary carrier that it was for linear television. LeoSat has the opportunity to regain some ground for satellite. With its low latency and ability to deliver video content to any corner of the world seamlessly, there are great areas for deployment in the off-shore and mobile markets as well as for remote and rural areas.

Shahrokh Amiri, Director of Sales, MENA, Intelsat

In order to distribute multiple formats to multiple platforms at the same time, media customers are starting to use fully automated, managed IP-based work flows that eventually will enable them to transmit their content via a single platform. This will include live video, file transfer, VoIP, internet access and data exchange. Satellite offers an alternative cost-effective solution that provides the high-quality viewing experience viewers demand and broadcasters and advertisers expect. The technology will continue to provide solutions for traditional and new ways of viewing content while delivering large-scale transmissions that are high quality, reliable and secure – regardless of the screen.

Roger Franklin, CEO, Crystal

Using fibre and cellular terrestrial networks, which are optimised for low-latency two-way data flow, to deliver one-way high-bandwidth video streams is a poor use of those terrestrial networks. Imagine a Wi-Fi hotspot in a café or your car that used to provide the last few metres of connectivity to mobile devices. That hotspot has multiple trunk links to the internet: wired ADSL or cable modem; cellular LTE; and satellite via a VSAT, phase array antenna or flat panel antenna. The type of data being accessed by connected Wi-Fi devices dictates the delivery path. Voice calls and video chat travel over the lowest latency path, while video streaming or email downloads travel over a path with better capacity and mobile connectivity, like satellite. To be viable, however, the data flow switching has to be seamless to the consumer, and the billing has to be predictable and easy to understand.

HTS satellites are here and affecting every form of satellite delivery. Are there any disadvantages to the technology, or any creases that have to be ironed out? What comes after HTS?

Ronald van der Breggen, Chief Commercial Officer, LeoSat Enterprises

HTS is here to stay as a means to address the increasing demand for data connectivity via satellite. With frequency re-use and spot-beams, there is an opportunity to offer more capacity to more

customers. While the technology does not have too many disadvantages beyond the limitations that narrow spot-beams will bring when compares to the wide-beam solutions typically offered, there is one issue becomes more critical: latency. HTS is geared towards data applications more than ever, and it is these data applications that are more sensitive to latency than any other application. So while additional capacity is being offered, the high latency of satellite has now increased the need for additional smart boxes to offset the negative effects of this high latency, complicating the network architecture and increasing the operational costs.

Not so with LeoSat – while offering the same capacity and ubiquity as traditional HTS, the technology has latencies comparable and often better than fibre, and the architecture allows point-to-point connections that are simply impossible using regular HTS. As there is no dependency on any ground infrastructure whatsoever, it adds a level of security that is totally unique to anything satellite to date.

Hussein Oteifa, General Manager, Sales, Middle East, SES

HTS does not affect every form of satellite delivery. At present, we see that HTS possesses the potential to better serve the data markets, but even this is dependent on the end application. For example, a customer who requires connectivity for voice-only applications over Sub-Saharan Africa will not require a huge amount of bandwidth in a concentrated spot beam but instead require the connectivity to be available through various countries. In this instance, traditional widebeam capacity is better suited. The era of HTS has compelled satellite operators such as SES to examine our two basic end users – consumers and enterprise – and redefined our value proposition to each. By emphasising value-added services, we will be able to provide and ensure the applications that matter to the user.

Shahrokh Amiri, Director of Sales, MENA, Intelsat

Not all HTS platforms are the same. Differences in system architecture and frequency band have an impact on a platform's performance. Intelsat EpicNG was designed with the ability to adapt, modify and improve this infrastructure as the market demands, and with each new satellite we will introduce more innovations, evolving the technology with new flexibility features that will take this new generation towards fully software-defined satellite missions. At this point, every characteristic of the spacecraft performance will be adaptable and modified by simple commands sent to the spacecraft from the ground. So we are offering to our current and future customers not only the most powerful and the most consistent space infrastructure ever built, but also an ability to adapt, modify and improve this infrastructure.

Roger Franklin, CEO, Crystal

Monitoring hundreds of spot beams is still challenging for HTS operators. The key is to learn from the cable and wireless industries. Use data that is easily available in regular consumer terminals to determine the integrity and quality of each satellite spot beam. This involves some better logic in the terminals and a way to report summary data to hubs, as well as a way for a hub to collect more detailed data from specific terminals. The alternative of deploying hundreds of spectrum analysers and other test equipment doesn't seem practical. The next big thing after HTS will be LEO systems made of small satellites. These systems will provide connectivity for IoT sensors and also contain a number of sensors themselves. The amount of information that will be available from a bird's eye view, in many different frequency ranges (visible light, RF, UV, Infrared, etc.) will provide us with insight into things happening in our world that we never could have known before. Simple data samples, like the number of cars in a retailer's parking lot over a given period time, or allocation of water reserves throughout a region, country or continent, provide us with immediately useful information. But there will be so much more that we'll learn as we find ways to process and correlate data samples in new ways. PRO

A New **Avenue**

SatellitePro ME speaks with Zulfikar Khan, CEO of EMS, about how SaaS is changing the way telco carriers can monetise their platforms to maximise profits

EMS started in 2006, and it was entrusted at that time with starting the Blackberry offering in the region. Blackberry didn't have a partner in the region, and were looking at avenues to enter the market. Although they had been trying, Blackberry couldn't really manage the business from Canada.

It was at this time that EMS worked on the business with them, and Etisalat joined as the first carrier. EMS started the Blackberry plans in the UAE, and then grew to more markets around the Middle East, Asia and some parts of Central and Eastern Europe.

"We worked with over 2,000 enterprises just in the UAE. We work with every sector and every vertical you can imagine"

ZULFIKAR KHAN, CEO, EMS

Zulfikar Khan, CEO, EMS, says: "We grew rapidly with them to over 100 carriers, which translated to a billion-dollar

business. We did more and more things for them, which included device distribution at the enterprise level. We worked with over 2,000 enterprises just in the UAE. We work with every sector and every vertical you can imagine. We work with Dubai government, Dubai municipality, with almost every major bank in the UAE."

"As you know, Blackberry used to give a control which is used to control the IT policies on the field workforce. Today it's prevalent in everything that we do. Blackberry was the only one at the time, the first smartphone that used this technology. This is how we built our reputation, through carriers, enterprises and the mobility space."

Nowadays, smartphones have evolved. It's much more than Blackberry these days, with mobile, cloud and other platforms. EMS has evolved its relationships to much more agnostic organisations that deal in Android- and Apple-based platforms. The company now has a presence in 65 countries and works with more than 100 carriers. It works directly with these carriers and provides them with all sort of services related to monthly activations and plans. It also works in the enterprise sector, with a focus on security, mobility management and device management tools among other things.

EMS' model with carriers is built on having a bouquet of SaaS services. There are agnostic parts like mobile IM and VMware. Sometimes telcos use EMS' professional services to engage with enterprise and government. EMS works with both Etisalat and du, and it's all bespoke. It's whatever their requirement is. From bringing SaaS service to having people on the ground, as well as people doing TekOne in Pakistan. EMS has 50 people working at the carrier one level support.

"The carrier part is very central to EMS. It is something that differentiates us from any other IT company or distributor out there. Even looking at large multinational companies like Nokia Siemens, Ericsson and Huawei, nobody actually does what we do. We still have the Blackberry plans, and now with the introduction of SOCIFI, which promises to be a game changer for us, we can help telcos pull in extra revenue. Carriers at the moment haven't looked into mobile advertising and monetising their Wi-Fi coverage as well as their data, 3G and 4G customers. Facebook and other social media websites are referred to as OTT players.

They enjoy the fact that they are leveraged on the carrier paying for all this expensive infrastructure, and the customers are using it while the OTT player isn't paying for anything related to that. The carrier covers all the cost, and with competition it's become a commodity, while voice and data costs are coming down.

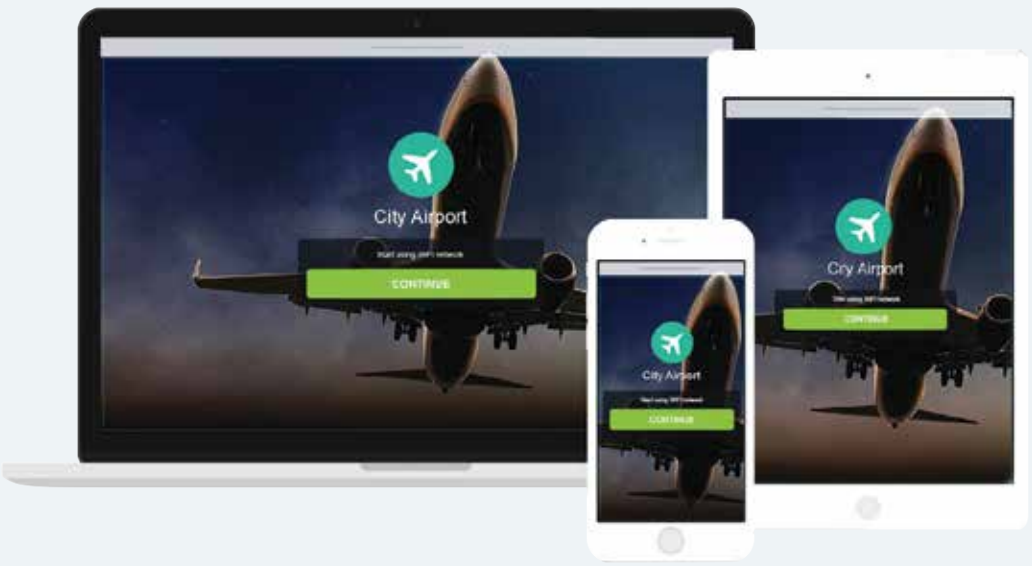
"With SOCIFI, mobile advertising is a way that carriers can monetise their networks. For example, if we take into account the masses, they don't have too much money each month to spend on their plans. This can be subsidised if for instance they view ads in the month, and based on the ads the carriers can give a certain reward to them. This could be something like 10MB or 100MB of data. Each carrier would be different. It could be voice, or maybe a $5 subsidy on their plan, based on the ads that have been seen," says Khan.

"The carrier part is very central to EMS. It is something that differentiates us from any other IT company or distributor out there"

ZULFIKAR KHAN, CEO, EMS

The consumers can pinpoint their areas of interest, such as sports, fashion, electronics, etc. Based on their profile and interest areas, they would only see the ads based on these interest areas. This serves the advertiser's needs as well as the consumer's needs.

For markets like Pakistan and Nigeria, some carriers would have about 70 million subscribers. A certain percentage of them would like to see the advertisements to benefit from free data or a subsidy on their plan. There is always a limited budget that the masses have for their mobile bills. This is significant revenue that the customer will get back, something they previously never had. This is why EMS



SOCIFI can be used on a variety of media consumption devices, across various operating systems.

sees SOCIFI as a major game changer.

"The other major shift is that the carriers have the opportunity to turn the tables on the OTT players. For example, if Facebook says to the carrier, we would like to make a zero data rate for anyone accessing Facebook for this month in the UAE. In this case, Facebook would pay the carrier. For Facebook, it might work out to benefit them much more with their monetisation and their ecosystem. This is a shift in revenue that the carriers could make, and for the first time earn from the OTT players.

"This is a completely untapped area that is in its infancy, a blue ocean if you will. For this reason, we are exclusive partners with SOCIFI and work with them in 70 countries on an exclusive basis. We are very strong on the carrier side, and there isn't really any other company like EMS that covers carriers. We've already started SOCIFI with Wi-Fi in 20 countries, and as for carriers, we've selected three carriers to start trials with for the Middle East and African markets," says Khan.

For the future, it's not just SOCIFI that EMS is looking forward to. It is also looking at other SaaS services as well. The company is beginning a project called Virtual SIM, which gives a consumer access to multiple numbers on a single phone. This too works on a software level and is OS agnostic.

"We've already started SOCIFI with WiFi in 20 countries, and as for carriers, we've selected three carriers to start trials with"

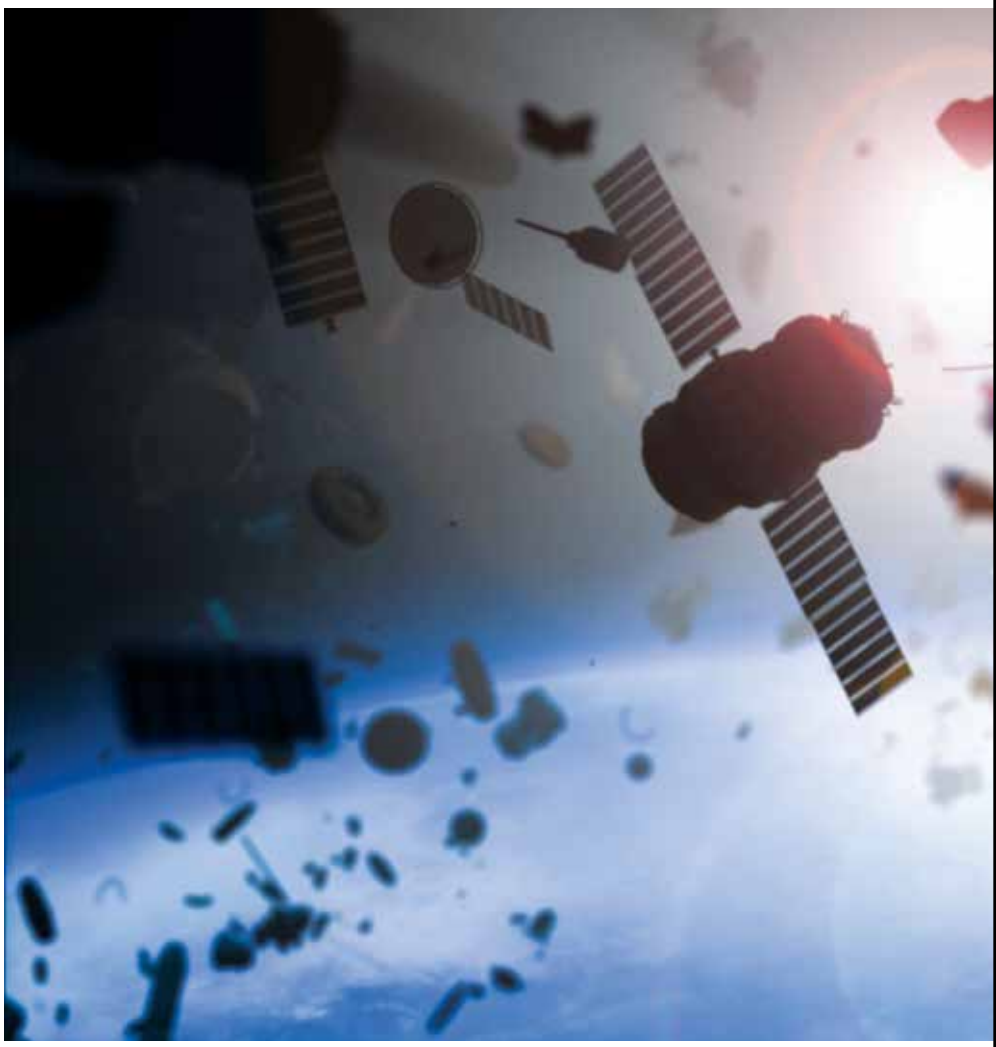
ZULFIKAR KHAN, CEO, EMS

"If you are a consumer who doesn't like to carry two or three phones to carry three different numbers, Virtual SIM is exactly what you need. We are starting this service with a Middle East carrier in the next few months. It's at a software level. All that's needed is for an app to be downloaded that can allow you to have access to multiple numbers. For instance, one number could be used for data, while another for voice. There could be a personal number, as well as one for business use. Another example is if you are selling your car, you can have a special number just for a month or two months in order to receive calls on. Once the car is sold, you can disconnect that number.

"There is another carrier in Asia where we are starting a web building service. It too is SaaS related. Through a few clicks you can choose your domain, load your images and text, and within 10-15 minutes your website is live on the domain that you want. It is intended for SOHO and SME organisations where they don't have the budget to spend $10,000-15,000 to set up a website. They won't mind spending $8-9 per month for having such a service. There is also an e-commerce engine built within as well," concludes Khan. PRO

Space **Debris**

SatellitePro ME speaks exclusively with Omar Abdelrahman Hussain Mohamed Hussain, Software Engineer at MBRSC, about orbital debris, its dangers, and what space agencies are doing to clean up the mess



There are approximately 171 million pieces of space debris in orbit around the Earth.

SatellitePro ME: What is orbital debris?
Omar Hussain: Orbital debris is waste in space that is produced from previous space missions. Those consist of old satellites, rocket stages, smaller fragments from disintegration, erosion and collisions, and also lost equipment! Space debris actually creates more debris from collisions by itself and other space crafts.

SatellitePro ME: What are some examples of orbital debris?
Omar Hussain: Vanguard I, which was launched in 1958 by the United States, is expected to remain in orbit for 240 years and is considered space junk until it burns up in the atmosphere. A funny example of space debris is a glove lost by Ed White on the first American spacewalk! Also a toothbrush which was jettisoned by Mir's cosmonauts!

SatellitePro ME: How much orbital debris is currently in Earth's orbit?
Omar Hussain: It is hard to get exact values for the amount of debris currently orbiting the Earth. However, latest estimates show that the total amount of space debris is somewhere around 171 million pieces. Of those, around 170 million are smaller than 1cm in size, while around 670,000 are between 1cm and 10cm, and around 29,000 are larger than 10cm.

SatellitePro ME: How fast does orbital debris travel?
Omar Hussain: Much like spacecraft, depending on the orbit, the velocity on which the debris travels varies. For instance, in a low Earth orbit the debris travel at around 8km/s; however, collision speeds can reach double that if the objects are orbiting in opposite directions.

"Spacecraft use passive shielding to protect from space debris. The shielding used is called a Whipple shield. Whipple shields were first invented by Fred Whipple to protect against micro meteoroids"

OMAR ABDELRAHMAN HUSSAIN MOHAMED HUSSAIN, Software Engineer at MBRSC

SatellitePro ME: How can launch vehicles be protected during launch?
Omar Hussain: Launch vehicles usually protect themselves from space debris by performing mission analysis to look for objects that might be along the trajectory. NORAD data and other tracking data is used for tracking any object in space. Also, a CAM (Collision Avoidance Manoeuvre) will take place to avoid spacecraft and launcher collision with other objects.

SatellitePro ME: How are the satellites

"Launch vehicles usually protect themselves from space debris by performing mission analysis to look for objects that might be along the trajectory NORAD data and other tracking data is used for tracking any object in space"

OMAR ABDELRAHMAN HUSSAIN MOHAMED HUSSAIN, Software Engineer at MBRSC

protected from orbital debris?
Omar Hussain: Spacecraft use passive shielding to protect from space debris. The shielding used is called a Whipple shield. Whipple shields were first invented by Fred Whipple to protect against micro meteoroids. There are many variations of this shielding; however, the way it works is by placing a thin layer of aluminium at a distance from the spacecraft walls. This sacrificial layer breaks in a collision, vaporising the object and reducing the impact on the spacecraft walls.

SatellitePro ME: How long will orbital debris remain in Earth orbit?
Omar Hussain: The duration for which the debris remain in orbit varies depending on the orbit. For instance, debris in orbits below 600km usually falls within a few years, while debris in 1000km or higher orbits will remain in orbit for centuries.

SatellitePro ME: Are any efforts being made to clean up this debris?
Omar Hussain: Effort is focused on reducing the amount of debris growth. For instance, in orbits like GEO (geostationary orbit), it is required for a spacecraft to move to a graveyard orbit in decommissioning, due to the importance and high desirability for achieving this orbit. However, there are some external efforts to remove debris, like the mission e.Deorbit. This mission is commissioned by the ESA in order to remove a large amount of debris.

SatellitePro ME: Is re-entering debris a risk to people and property on Earth?
Omar Hussain: Smaller pieces of space debris disintegrate on entry; however, larger pieces might survive. There is always a risk of damage to people or property; however, those are extremely rare. Heiner Klinkrad, head of the ESA's Orbital Debris Office, stated that during your lifespan the chance of being struck by space debris is less than one in a billion.

SatellitePro ME: Do countries have guidelines on orbital debris?
Omar Hussain: Yes, the US, China, Russia, Japan, France and the ESA have all issued orbital mitigation guidelines. PRO

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Space pioneer and MARS ONE CEO, *Bas Lansdorp,* will reveal the human colonization plans and investments at 2nd Global Satshow on 29 Nov,2016

Space Pioneer and Mars One CEO, Bas Lansdorp has never been one to let bold ventures intimidate him. A born entrepreneur, he sees potential and opportunity where others shy away. Gifted with an articulate vision and genuine enthusiasm, he moves people with his passion for science and the human mission to Mars.

Mr. Bas Lansdorp, will reveal the human colonization plans and investments at 2nd Global Satshow.

In order to listen the revealed plan for human colony on how and why we will colonize in Mars, your address is the session 'Address: Colony Street, No: 2025, Mars'. Definitely a "not to miss" session!

Don't miss the future maker session "Address: Colony Street, No: 2025, Mars"

Mars is the focus of much speculation and scientific study about possible human colonization. Its surface conditions and the presence of water on Mars make it arguably the most hospitable of the planets in the Solar System, other than Earth.

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The antenna farm at STN's teleport facility.

Heralding **Change**

Mitja Lovsin, CCO of STN, speaks exclusively with *SatellitePro ME* about how the evolution of 4K transmission and HTS is changing the way teleports operate

Mitja Lovsin, CCO, STN.

In such a fast-changing and developing technical industry, there is no surprise that every year we can sit down and review many innovative advancements. This year is no different, and there are many conversation pieces. However, two topics – 4K UHD and HTS – though not new to the arena, are currently being heavily discussed.

4K UHD is something that is not new to the market, or for the future, but has been slowly creeping onto our screens and into our lives for the past few years. Many major brands have already added 4K UHD to their portfolios and today there are 4K TVs, tablets, laptops, projectors and even smartphones available to the general public everywhere. The question is whether the mainstream consumer is ready to use this technology, as it seems that we've just recently got used to the 'Full HD' term and along comes 4K Ultra HD as the next-generation step in the world of TVs, offering more lines, pixels and ultimately detail.

Experts in the field predict that ultra-high-definition television – 4K, UHD, 160p, Ultra HD television, Ultra HD, UHDTV, whatever you call it – is here to stay for a while in one form or another (4K or 8K). Industry analysts expect 140 million homes to be watching Ultra HD by 2020.

However, these numbers are way too ambitious! This technology raises quite a few technical questions for service providers, play-out centres and teleports such as STN.

The first and most basic one is simple: how will we transport the signal from the entry point, including all the signal processing, to the end compression system? Will we hold on to the good-old SDI interface? Will we use fibre instead? Or will we use pure IP-based infrastructure?

All are feasible. 6G-SDI can carry 2160p30, and 12G-SDI is able to carry 2160p60 (alternatively, 4K can be split between four 3G signals, also known as quad link). Let us take a simple play-out (without any further processing) as an example. There are video cards on the market that can output these resolutions with the respected frame rates, so play-out in 4K is not a problem; neither is routing, which takes care of the redundancy.

We also need to look at pure IP-based solutions; I think IP-based solutions are simpler and easier to implement. If we look at the same scenario as before, we either output 4K via IP out of the play-out server or use a 3G (quad-link)/6G-SDI/12G-SDI, use an SDI/IP gateway and apply TICO 4K over a single 3G-SDI cable with lossless 4:1 compression, or purely uncompressed 4K over IP using SMPTE 2022-6 for distribution over 10 GigE. There

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STN's datacentre at the teleport facility in Dob, Slovenia.

are IP-based routers on the market which take care of the redundancy, and then we finally feed the IP signal into an HEVC real-time video and audio encoding device.

At STN, we have decided to take the latter approach for 4K and have already demonstrated our capability to offer 4K linear TV broadcasts over satellite and live stream to new media platforms to several clients. 4K over any platform, be it satellite or any other media platform, is currently a matter of prestige. The technology is new, and as with all new technologies it will take time to establish a larger audience.

The investments are huge, as 4K also requires more bitrate than standard HD, but new technologies such as H.265 (HEVC) compression standard and DVB-S2X modulation schemes will drive the price down. I am confident that future HEVC encoders will become more efficient, resulting in lower and lower bitrates required for 4K. It happened with SD, it happened with HD, and it seems set to continue with UHD/4K. The future is bright (especially with HDR) and clear (with 4K).

Although there is a huge push from production teams and DTH providers for the general public to buy into this technology, there is still a serious lack of programming available and costs are still not in any way compatible with HD. The main driving force behind 4K UHD implementation seems to be major sports events such as the Olympics, the World Cup, rugby and golf. The introduction of 4K DVD players and discs may possibly entice many more users, but for now the user count is relatively small – measured in decimals, not yet percentages.

From STN's perspective, there is still a considerable amount of new development required in relation to more powerful encoders and pre-processors to use less space and drive down the costs of bandwidth used for transmission of 4K UHD. As most prices, especially for prime satellites, are still holding their level, 4K and 8K are not likely to take off to any considerable level until the overall costs become more compatible for all areas of the market involved.

But we must also consider the possibility that 4K could be surpassed by 8K in the future. With 3D completely disappearing from the market, what will be the next big thing for viewers? Will 4K and 8K suffer the same fate as their predecessors? Or will viewer demand rise for this type of broadcasting? Only time will tell!

A second item of much discussion this year are HTS, primarily deployed to provide broadband internet access service (point-to-point or point-to-multipoint) to regions unserved or under-served by terrestrial technologies, where they can deliver services comparable to terrestrial services in terms of pricing and bandwidth, offering services to government and enterprise markets.

There is clearly a growing market for broadband and cellular backhaul. Public demand for 24/7 connectivity, no matter where people are, where they are going and however they have travelled there, is increasing.

In the same way as terrestrial and mobile operators reorganised demand for 4G/LTE services without hitting users with a high roaming cost, satellite operators are ready to address this type of service with HTS satellites.

For many years we have availed of these services in hotels, major cities, cruise liners and public buildings free of charge or at a very low cost. More recently, airlines have introduced the telephone and Wi-Fi on aircraft and the car industry is currently developing its own systems to bring high-speed internet or Wi-Fi to the road.

Demand for these services is growing much faster than predicted, and it looks pretty certain that satellites will continue to play a large role in the world of connectivity in the future. However, terrestrial infrastructure continuing to grow at such a fast pace will without doubt take away a significant piece of the pie, but I feel growing demand will provide sufficient business for both players.

The question that must be asked when talking about HTS and teleports is: what will HTS mean for us in the teleport sector? Here the future might not be as promising as it seems at first glance, with demand increasing and new opportunities such as the already mentioned offshore, maritime and especially airline industries.

This is because satellite operators are trying to move further and further up the traditional industry chain and are inadvertently getting into direct competition with traditional teleports. Simply put, there will not be as many direct opportunities for traditional teleports to offer their services, as satellite operators will offer megabits (as opposed to MHz) directly to the customers using their own ground infrastructure.

One thing is for sure: our industry will continue to be as dynamic in the future as it has been in the past, and STN will be there to play a significant role. PRO

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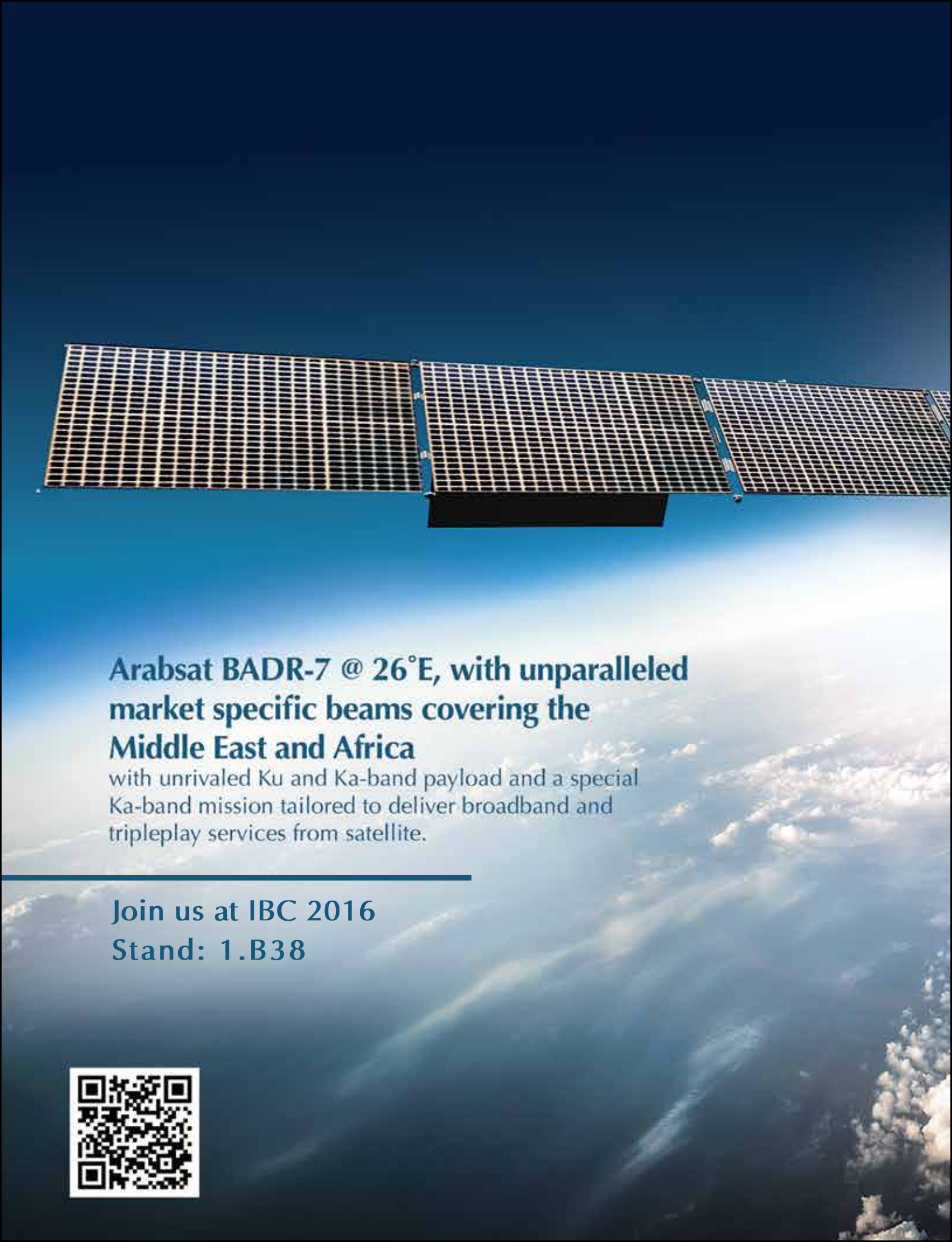
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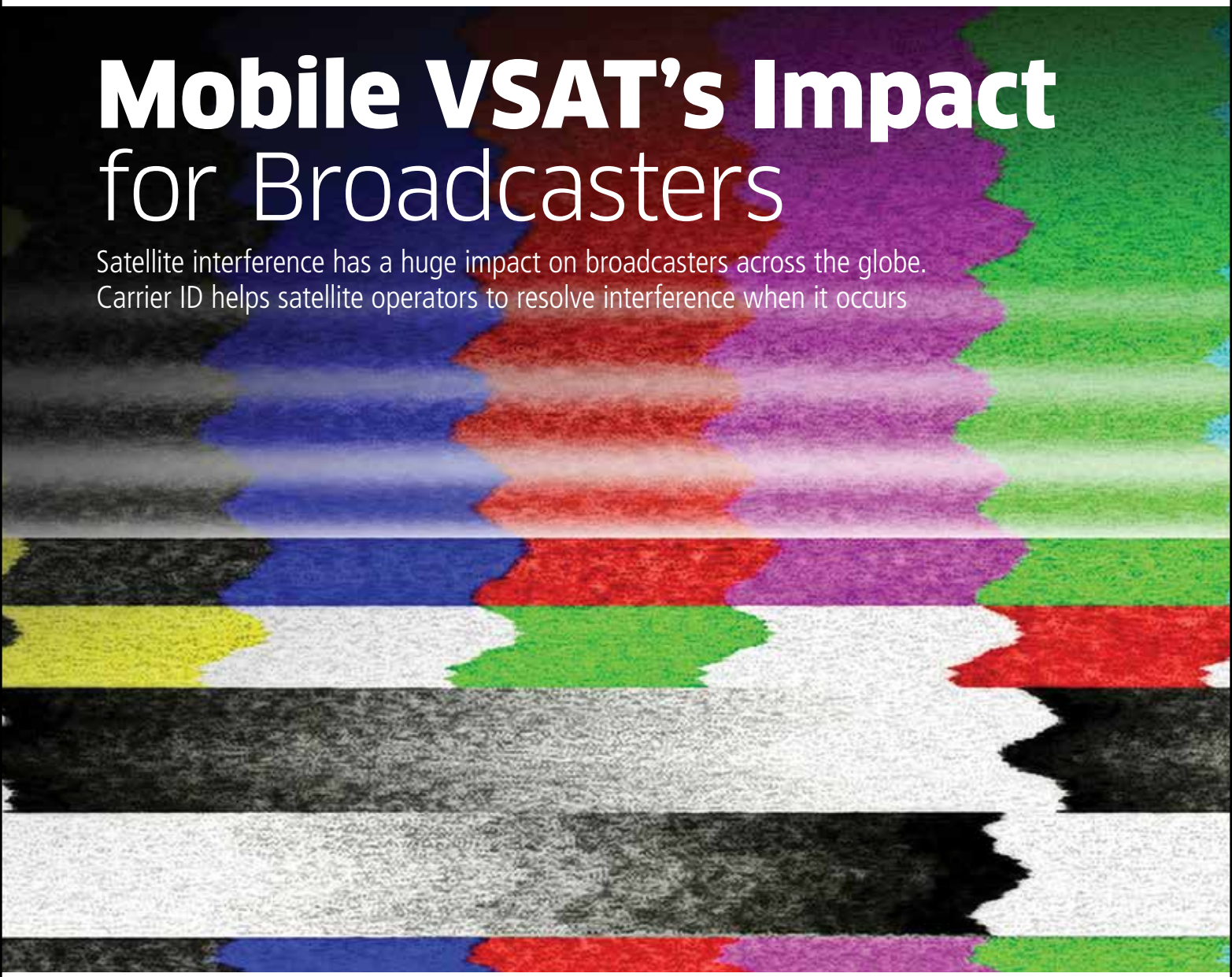
Mobile VSAT's Impact for Broadcasters

Satellite interference has a huge impact on broadcasters across the globe. Carrier ID helps satellite operators to resolve interference when it occurs



As we head to IBC, interference will likely not be a headline discussion topic. However, satellite interference does have a large impact on broadcasters across the globe and clearly needs resolving. In the broadcast world, at IRG, we have been spearheading the Carrier ID (CID) initiative, and working to encourage broadcasters across the world to implement CID in order to be easily identifiable helping the satellite operators resolve interference when it occurs.

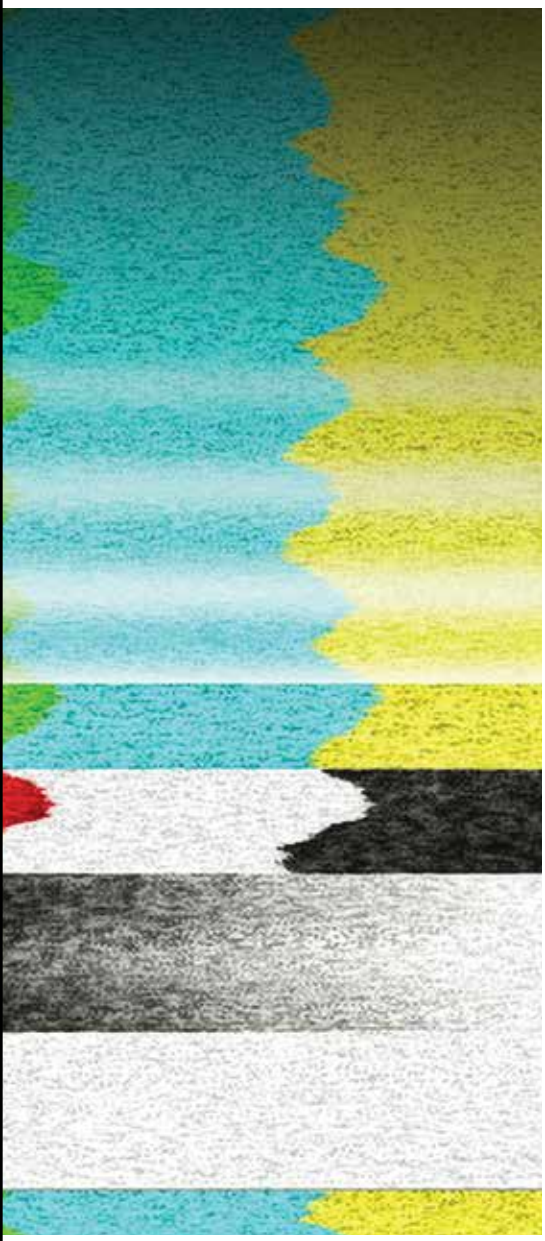
There are of course a number of deadlines approaching to help that happen, the next being September 2017 for the FCC deadline CID. CID really helps to solve technical human errors faster, such as mis-pointing and causing ASI; high power causing noise, and cross polarisation causing rogue carriers appearing in the opposite segment. All these types of interference are the highest proportion of cases observed, around 50% to 75% per month.

So if broadcasters and occasional use providers across our industry implemented CID, then the impact of interference would be greatly reduced as operators would be able to identify the interfering carrier and resolve the interference quickly.

Simply put the more users with CID the easier for satellite operators to resolve interference when it occurs.

Mobile VSATs

One group where CID is meeting a great



"CID is important and will make a massive difference to resolution of interference instances when they occur"

MARTIN COLEMAN, Executive Director, The Satellite Interference Reduction Group

deal of resistance is the VSAT world. However, it has been widely reported that VSAT is the biggest single cause of satellite interference, responsible for around 40% of interference. At the same time, it is also the hardest to solve, hence responsible for the largest amount of downtime.

The problem is of course that when these systems cause interference, it doesn't only affect the VSAT world, it affects other satellite users across the globe, including broadcasters. For broadcasters operating from Satellite News Gathering (SNG) trucks, an issue with antenna alignment can not only cause satellite interference for others, but can also cause a serious impact in service quality for that broadcaster. We are seeing evidence from our satellite operator members, which have spotted a trend. As soon as there are mobile VSATs in any given area, wherever it is in the world the amount of cross-polar interference and Adjacent Satellite Interference greatly increases.

This is obviously not a coincidence, however nor is it a surprise. Operating a mobile VSAT without causing interference is not simple. The very nature of these systems being mobile means that they are constantly changing position, and therefore keeping an antenna aligned can be tricky. Add to that the fact that they are very often operated by untrained users and therefore the risk of misalignment is greatly increased. This isn't helped by the fact that often these systems are badly installed in the first place, which immediately starts off on a bad footing. And installation can only be successful if the equipment is up to spec! Where the equipment is constantly on the move, it is more imperative than ever that all equipment used is of the best quality possible and smart enough to deal with the constantly changing position. Unfortunately, this is often not the case, with poor quality, often out-dated equipment or just badly conceived software designs (especially with antenna controllers) being used. This only continues to exacerbate the problem.

Why should the broadcasters care?

Of course, the broadcast world is a big user of mobile VSAT itself and as demand for immediate coverage of breaking news or live sports increases, the need for these systems is also increasing. The rise of Over-The-Top (OTT) delivery and the trend for TV everywhere is making the broadcast landscape much more competitive and consumers expect news and events as it happens, regardless of when or where it is happening in the world. Therefore this reliance on mobile VSAT for breaking stories is likely to get more significant.

Ensuring any mobile VSAT can operate without causing interference should be a key concern for all satellite users, not only for those actually operating the systems and ensuring their feed gets to the right place at the right time and with the right level of quality, but also show respect to all other users who may otherwise experience interference from one of these systems.

As mentioned above, CID is important and will make a massive difference to resolution of interference instances when they occur. The only way it can be truly effective is of course if enough users start using it, which is why I'm really pleased that there are a few deadlines coming up that will encourage that implementation to begin in earnest. So CID is an integral part of satellite operators "tool-box", along with other tools such as Antenna and System Approval, Training, VSAT auto detection systems such as SatGuard, etc. With this in mind, I would like to see a concerted drive to get CID adopted across the entire spectrum of satellite users. However, wouldn't it be great if we actually never had to use it? What if interference didn't occur in the first place? That is what we, as an industry, should be striving for. Of course, we can never eliminate every single case of interference and therefore being able to identify carriers quickly and easily will always have its place.

The Difficulty with VSAT resolution

The biggest challenge with solving any VSAT interference comes down to low cost and huge numbers of terminals. Add mobility to this mix, it will naturally make it harder to locate the source. In

addition, the likelihood of intermittent issues will increase, making it much more difficult and time-consuming to locate this new breed of interference case.

Jan Hetland of Telenor Satellite discussed how satellite industry trends will impact satellite interference at the last IRG Workshop at Telenor's Headquarters, and in his article in the latest issue of *SatellitePro ME*. One of the topics he discussed was VSAT moving to high frequency bands. As he pointed out, high frequency bands bring with them a number of advantages in terms of amount of bandwidth for cost and we are seeing more and more VSAT users move to Ku or Ka-Band. However, as Jan mentioned, this move means we have moved from circular polarisation to linear and now we are back at circular polarisation. And this is associated with poorer cross-pol performance, may make the problem even worse.

Getting the right tools

So thinking back to our "Tool-Box", when engineers are faced with a problem this important, there are often numerous people working on solutions! As Jan Hetland pointed out, whilst higher frequency bands means the potential for poorer cross-pol performance, it also means you no longer need to adjust the polarisation manually, thus getting rid of another human error element.

Indeed, there are a number of solutions emerging to make resolution of VSAT interference quicker and more efficient. For example, one of our members, Integrasys, has tools to make installation quick, easy, and perhaps more importantly, extremely accurate. It has already proven to greatly reduce installation time and errors. The company has also launched a tool for automating the checks and corrections remotely, from the NOC, particularly valuable for those terminals in hard-to-reach locations.

Another member developing cutting-edge technology for VSAT interference resolution is VeriSat. Its tool, SatGuard, has greatly reduced time to resolve VSAT interference down to a matter of minutes, which could previously have taken hours, days, weeks, or even years! It also now has a tool to determine GSM base station location by decoding the GSM interference and extracting the country, network and unique cell ID.

"There are a number of solutions emerging to make resolution of VSAT interference quicker and more efficient. For example, one of our members, Integrasys, has tools to make installation quick, easy, and perhaps more importantly, extremely accurate. It has already proven to greatly reduce installation time and errors"

MARTIN COLEMAN, Executive Director, The Satellite Interference Reduction Group

Prevention better than cure

These tools are available and already making a difference and the more VSAT users and satellite operators that adopt these tools the lesser the impact of satellite interference. However, we should also be looking at ways to prevent interference occurring in the first place. Ensuring everyone operating a mobile VSAT has appropriate training is trickier than it sounds, especially when you consider the military environment where personnel changes are frequent. However, we should be striving to do something there and reduce human error with better education and automation. There are numerous, very good, training courses available but the challenge is getting people to take them. In addition, the drive for automated terminal provision and operation is the true way forward. Maybe the answer is to make these a requirement for all VSAT operators and suppliers.

Remember the two biggest causes are human error and equipment failure and that is our focus. If users could only use equipment that had passed stringent hardware and software product testing, such as the type approval carried out by Inmarsat, Eutelsat or the Global VSAT Forum (GVF), then we would immediately see a dramatic drop in interference cases. And guess what, I bet we would also see a significant rise in product quality standards for all new equipment offerings being manufactured!

Making the equipment not only better, but smarter, along with well trained staff, would make a massive difference to our industry operations. And that, to me, has always been the key: the more we automate and use intelligent systems, the less possibility of people making mistakes and the less instances of interference we will encounter. Ultimately, it is just common sense! PRO

Martin Coleman, Executive Director, The Satellite Interference Reduction Group.

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THE 2ND GLOBAL SATSHOW

SMART CONNECTIONS

Hosted by ESOA
EMEA SATELLITE OPERATORS ASSOCIATION

THE MOST REMARKABLE SATELLITE EVENT OF THE YEAR: *2ND GLOBAL SATSHOW*

2nd Global Satshow will be hosted by **ESOA (EMEA Satellite Operators Association)** at Istanbul's Haliç Congress Center on November 29-30, 2016. With its demographic position, the event is being prepared to become the greatest and most remarkable satellite event in the region. Being hosted by a roof organization that proves to be the voice of satellite operators in Europe and EMEA, the event further multiplies its impact. Another major factor contributing to the exhibition's race to the top is the dynamism in the satellite-space industry within Eurasia and the Middle East. Medyacity's CEO Hakan Kurt has his signature on the event.

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GLOBAL SATSHOW = *BUSINESS DEVELOPMENT*

For two days, the Haliç Congress Center will convene satellite operators, manufacturers, and suppliers; network providers; satellite equipment providers; Broadband Solutions for VSAT Services, F.T.T.H (fiber to the home); broadcasting and broadcasting equipment providers as well as the production equipment providers from the broadcasting industry; TV channels, TV platforms and telecommunication operators; 5G technology suppliers; and talented professionals in the IoT technology. The Global Satshow provides an opportunity for every participating company to establish direct contact with a considerably very broad network. The Global Satshow will once again provide a great opportunity for the leading companies of the industry to have a glimpse of new business and trade opportunities, target and market-oriented analyses of labor markets and business potentials in all the aforementioned industries thanks to the contributions of the industry steering participants. For this reason, the exhibitors are offered Platinum, Gold and Bronze cards. The participants can receive more information by visiting the website www.globalsatshow.com, but in a nutshell, it can be said that exhibitors can get the maximum benefit from the events by selecting the right card in accordance with their needs.

SATELLITE INDUSTRY

SPACE TECHNOLOGIES

MOBILITY

BROADCAST

SATELLITE OPERATORS

IOT

29-30 NOV 2016
ISTANBUL / TURKEY

SMART CONNECTIONS

JOURNEY TO MARS STARTS WITH *MARS ONE*

Another session titled "Address: Colony Street, No: 2025, Mars" is expected to draw great attention and interest on November 29 --the first day of the event -- where **CEO Bas Lansdorp** of Mars One, a non-profit foundation, will deliver a presentation. Lansdorp will illustrate Mars One's aspiration to establish a colony on Mars, the only planet in the solar system with seemingly the best livable alternative to the earth for humanity- at least for now - with its surface conditions and the existence of water, and will further elaborate on the reasons why and how they will do this.

The event has been set up on the pillars of satellite operators, satellite industry, space technologies, live broadcast, mobility and 5G, as well as the Internet of Things (IoT). The event's programme includes CEO Summit of Global Satellite Operators, various sessions with the participation of worldwide future-makers and C-Level round table meetings. It is expected to have more than 200 exhibitors from over 50 countries and more than 10,000 business professionals and visitors from the industry at the two-day Global Satshow events. We could name the following to briefly introduce the exhibitor profile: C-Level global satellite operators, C-Level satellite industry market, decision-makers/decision-making mechanisms in satellite markets, future makers in space industry, global C-Level telecommunication operators, leading C-Level broadcasting companies, business development directors, mobility and 5G experts, as well as young talents operating in the field of IoT.

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KEY TO SATELLITE OPERATORS: *CEO SUMMIT*

The CEO Summit, which will feature CEOs of global satellite operators from around the world, is the session expected to create the most tremendous impression this year. Eight CEOs will share their predictions with regard to the future of the satellite industry during the summit, organized under the title of future cooperation among regional and global satellite operators. With a total market value exceeding USD 100 billion, the CEOs will steer the global satellite markets from Istanbul.

Advertorial

THE 2ND GLOBAL SATSHOW

SMART CONNECTIONS

Hosted by ESOA

EMEA SATELLITE OPERATORS ASSOCIATION

GLOBAL SATELLITE OPERATORS *CEO SUMMIT SPEAKERS*

Khalid BALKHEYOUR
ARABSAT PRESIDENT & CEO
Founded: 1976
Head Quarter: Saudi Arabia

"Global Satshow is an efficient business development platform for the Satellite Market, to discuss future plans and technological developments."

Christodoulos PROTOPAPPAS
HELLAS SAT CEO
Founded: 2001
Head Quarter: Greece

"The cooperation between Global and regional satellite operators under this high competitive environment must take place for mutual benefit, without changing the character of the regional satellite operators."

Cenk ŞEN
TÜRKSAT CEO
Founded: 1990
Head Quarter: Turkey

"The Global Satshow event, which started last year under the 'Satellite, Space and Technology Days' and was powered by TURKSAT, is set to provide an international platform where the industry's leading companies will come together in Istanbul to discuss the present and the future of the industry."

Ali Ahmed AL KUWARI
ES'HAILSAT PRESIDENT & CEO
Founded: 2010
Head Quarter: Qatar

"Global Satshow has become an important event in the annual calendar for global satellite industry, where CEOs and key decisions makers exchange ideas and explore cooperation and partnership opportunities. We are happy to support this event and wish every-one a successful show."

Rupert PEARCE
INMARSAT CEO
Founded: 1979
Head Quarter: UK

"At a time when our industry is undergoing unpresented change and demand for satellite communication services is reaching into every geography and every sphere of life, events such as this are vital in catalysing our industry to set a path for future growth."

Samer HALAWI
THURAYA CEO
Founded: 1997
Head Quarter: UAE

"The Global Satshow is an excellent opportunity to improve collaboration and synergies amongst all the satellite operators, and in the ESOA it has excellent hosts. Thuraya is pleased to play its part in making the event a great success."

29-30 NOV 2016
ISTANBUL / TURKEY

SMART CONNECTIONS

MOBILITY VIA SATELLITES, *29 NOVEMBER 2016*

The future for mobility is bright and lightning fast. The "Mobility via Satellites" session features speakers from global mobility leaders, 5G Technologies, M2M Communications in order to discuss upcoming satellite mobility solutions including those focused on tele-communications, navigation and more based on the current and future requirements by globe, region and verticals. Learn about next generation mobility technologies and IoT directly from the sectoral leaders.

2nd GLOBAL SATSHOW PROGRAMME

29 NOV 2016

- Platinum Lounge Breakfast
- Exhibition Floor
- Opening Ceremony
- Royal Tour
- CEO-CXO Roundtable Lunch
- Session 1 **"Future Cooperations in Satellite Industry"**
- Session 2 **"Mobility Via Satellites"**
- Session 3 **"Address: Colony Street, No:2025, Mars"**
- Networking Reception

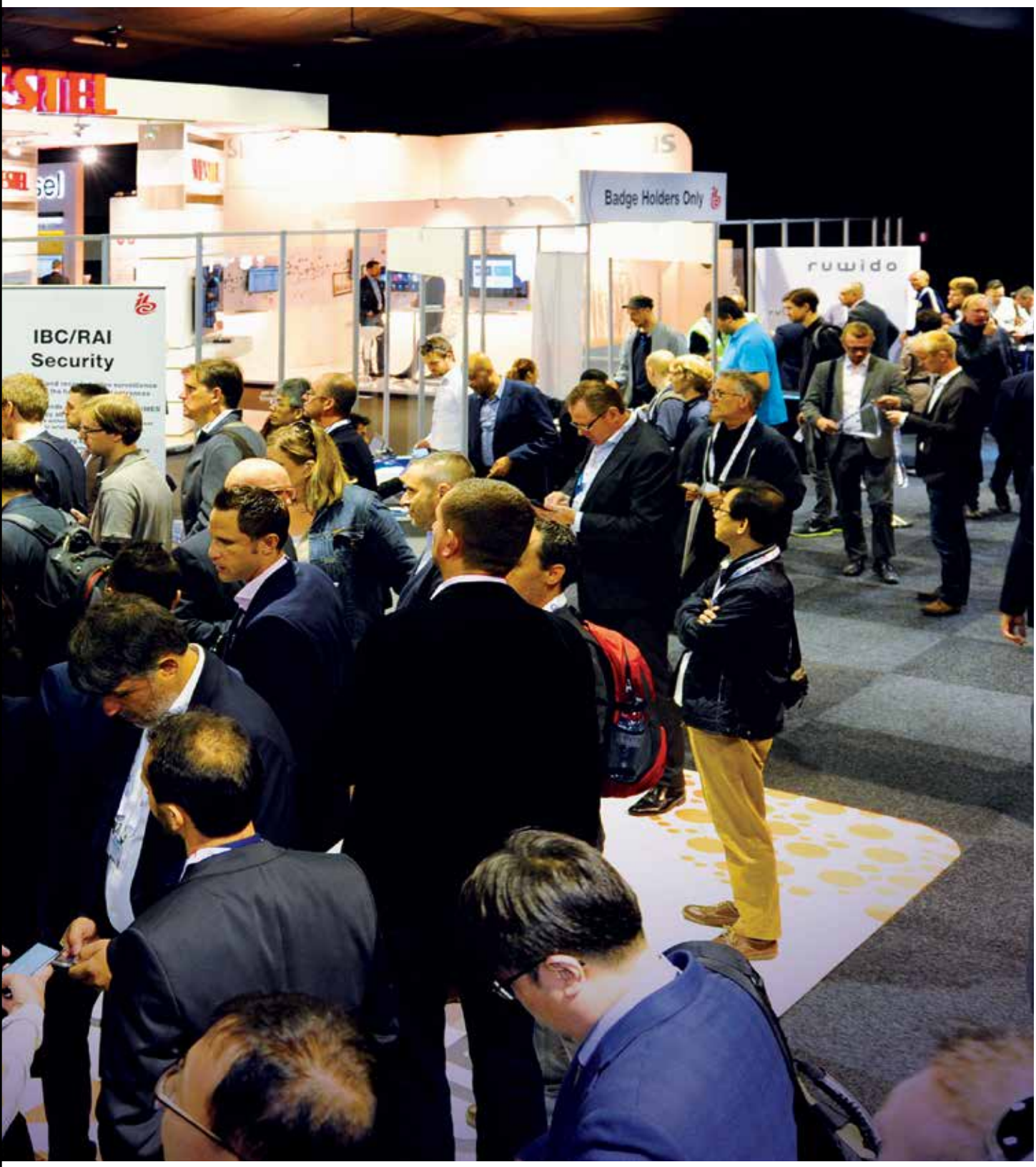
30 NOV 2016

- Exhibition Floor
- CEO-CXO Roundtable Breakfast
- Session 4 **"Energy via Satellite and Space Tehcnologies"**
- Session 5 **"Worldwide Satellite TV Expansion"**
- CEO-CXO Roundtable Lunch
- Session 6 **"Connected Transportation"**
- CEO SUMMIT **"Future Coopertions Between Global and Regional Satellite Operators"**

www.globalsatshow.com **REGISTER**

Amsterdam **Beckons**

IBC2016 will run from 8-13 September at the RAI Exhibition Centre in Amsterdam. The show is expected to draw more than 55,000 professionals, who will have a chance to witness new technologies and learn from industry leaders. We've put together a short preview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WORK Microwave to debut **A-Series modems**

At IBC2016, WORK Microwave will demonstrate the latest innovations in analogue and digital satcom solutions, increasing flexibility, bandwidth and margins for satellite operators while reducing their operational costs. Key highlights at the show will include the company's new A-Series IP-based DVB-S2X family of modems, demodulators and modulators, along with the debut of greater design options for frequency converters based on market demand.

WORK Microwave devices have been 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 and governmental.

WORK Microwave will showcase three new products from its A-Series FPGA-based family of modem, modulator, and demodulator platforms at IBC2016. On display will be the AX-60 IP modem, AR-60 IP demodulator and AT-60 IP modulator high-performance platforms for IP trunking and IP network infrastructure applications.

Customisable and scalable, the A-Series can be adapted to any throughput, data analysis method and other waveforms beyond DVB-S2X, making it perfect for telecommunication companies, internet service providers, teleport operators, government and intelligence agencies and operators of low orbit (LEO) satellite constellations.

Using the A-Series, operators can transmit and receive DVB-S2X signals with the utmost efficiency and ease of operation. Optimal use cases include high-speed network links (100, 200 or 300Mbps) over satellite, IP-based satellite newsgathering, IP-based contribution and distribution links, connection to and from LEO for Earth observation, and reception and analysis of satellite communication. By providing operators with a future-proof, flexible platform for both standardised DVB-S2X and customised satellite communication.

Newtec to demonstrate **Dialog 1.3**

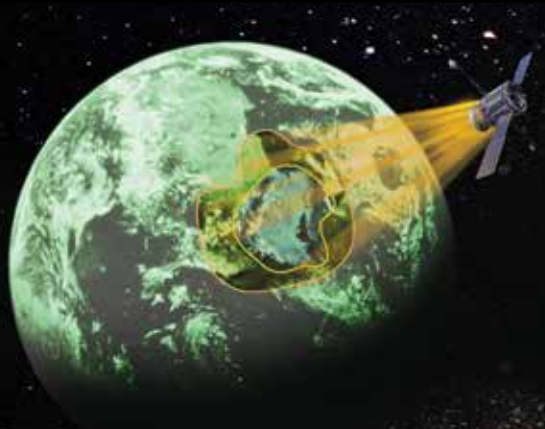
With over 30 years of experience in the broadcast sector, Newtec will return to IBC2016 to display its latest range of Satcom applications, designed to improve efficiency. Its technologies can be applied in a wide range of single and multi-service applications from DTH broadcasting, video contribution and distribution, disaster recovery and backbones for cellular backhauling, to small and medium enterprises, SCADA and oil & gas networks, aircraft and vessels.

This year's products will focus on getting the most out of the ever growing number of HTS. The latest version of Newtec Dialog release 1.3 will make its IBC debut. A scalable, flexible and highly efficient platform, Newtec

Dialog allows operators to build and adapt their business as the market changes by enabling multiple services over a single all IP-based platform.

New features of release 1.3 include DVB-S2X on the forward link, support for the new MDM5000 satellite modem, Layer 2 bridging and mobility support. It's also equipped with Newtec's unique technology, Mx-DMA, which enables MF-TDMA flexibility and on-demand variable bandwidth allocation at SCPC efficiencies. From release 1.3 onwards, Mx-DMA rates up to 75Mbps in the return are supported using shared capacity.

The MDM5000 – the industry's first DVB-S2X high-throughput VSAT modem – is designed for mid- and high-speed applications like connectivity for medium-sized enterprise networks, government applications, oil & gas, maritime and cellular backhaul. This latest edition completes Newtec's modem portfolio for low- up to high-speed applications, ensuring the optimal solution for every application and price point.



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SPECIAL GUEST ADDRESS:
His Excellency Dr Mohammed Al Ahbabi, Director-General, **UAE Space Agency**

* Subject to final confirmation

KEYNOTE ADDRESSES:

Clare Grason, Programme Manager, Enhanced Mobile Satellite Services, **DISA**

Lieutenant Colonel Abde Bellahnid, Directorate of Joint Capability, SATCOMS & SAR Requirements, **Department of National Defence Canada**

MILITARY AND GOVERNMENT SPEAKERS ALSO INCLUDE:

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Colonel Leonardo Musmanno, Head of Navigation, Surveillance and SatCom Division, **Italian Ministry of Defence**

Colonel Christophe Debaert, Head of French SATCOM Programs, **DGA France**

Lieutenant Colonel Kenneth Sandler, Assistant Chief of Staff G6, **U.S Marine Corps Forces for Europe and Africa**

Wing Commander Rhys Taylor, Joint Communication and Information Systems (J6), **New Zealand Defence Force**

Lieutenant Colonel Frank Valentin Nielsen, CIS Operations Support Department, **Danish Defence Command**

Major Attila Horvath, SatCom Specialist, **Hungarian Defence Forces**

Major Nicolas Stassin, Defense Staff/ Strategy Department/ Defense Development Division/ Capabilities Section/ Enabling Space, **Belgian Defense**

Major Luciene da Silva Demenicis, Head of the Geostationary Satellite of Defense and Strategic Communications Training Section, Space Operations Center, **Brazilian Air Force**

Dr Gregory Edwards, Director of Infrastructure Services, **NATO NCIA**

Magali Vaissiere, Director of Telecommunications and Integrated Applications, **European Space Agency**

Dean Olson, Senior SatCom Policy Analyst, DoD CIO, **U.S Department of Defense**

Senior Representative, J6, **NATO Joint Forces Command Brunssum**

PRE-CONFERENCE WORKSHOPS | 7TH NOVEMBER 2016

A: Architecting Space Systems
Hosted by: **Rachel Morford, Project Leader, Future & International Programs, MILSATCOM Division, The Aerospace Corporation | 8.30 - 11.45**

B: The Low Earth Orbit Small Satellite Constellation Revolution
Hosted by: **Alex da Silva Curiel, Business Development Manager, Surrey Satellite Technology Ltd | 12.30 - 16.30**

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2wcom to showcase **AoIP and Satellite Integration**

At IBC2016, 2wcom will be focusing on new technology that takes transport one step further by letting broadcasters easily integrate AoIP and satellite technologies and switch from one stream to another, depending on their immediate needs.

Designed for versatility, the MM01 is suitable for studio-to-transmitter link applications and studio-to-studio transmissions, as well as broadcast and post production purposes. It is compatible with Session Description Protocol (SDP), Session Initiation Protocol (SIP), Session Announcement Protocol (SAP), Real Time Streaming Protocol (RTSP) and Precision Time Protocol (PTPv2). The MM01, which is able to handle a sampling rate up to 192kHz and provides a delayed firmware update so users can upload a firmware file and activate it later on demand, includes GPIO forwarding, AAC and enhanced aptX compatibility, an FM tuner option for FM transmission monitoring and back-up, advanced VLAN configuration and an Icecast server.

MM01 is a 19" 1HE unit prepared for a rack installation with display, jogwheel and remote control audio inputs and outputs, serial inputs and outputs, GPIOs, redundant IP interfaces and dual redundant power supplies. 2wcom's FlexDSR STL technology allows operators to receive audio streams via satellite or IP, depending on their requirements and the best quality source available. Particularly suited for dual-stream applications, FlexDSR is a satellite receiver that also serves as a complete AoIP system. The multi-faceted solution, ideal for mixed environments, automatically detects and switches to the best quality source – satellite or IP. The system, which cleverly combines transport technologies, facilitates the reception of transport streams or elementary audio streams via IP with Pro-MPEG FEC and DualStreaming protection against IP packet losses.

FlexDSR can receive and decode audio from a wide range of sources. It is capable of transporting streams via satellite (DVB-S/S2), ASI input and IP, and can also manage elementary audio streams and Icecast streams via IP. Able to support audio codecs such as MPEG 1 Layer 2, MP3, AAC LC, HE-AACv1 and HE-AACv2 and Enhanced aptX, FlexDSR also offers quality uncompressed audio PCM at 48kHz/24bits. The FlexDSR system allows operators to benefit from a wide range of audio quality and offers a complete, efficient solution able to meet the rigorous needs of broadcasters, allowing them to quickly adapt to various transport scenarios.

Bridge Technologies **to introduce Omega**

In addition to unveiling a number of new products that set unique standards of scalability, ease of use and portability in the monitoring, management and optimisation of IP networks, Bridge Technologies will continue to showcase its ability to help its customers ensure high-quality, profitable digital media service delivery in broadcast, cable, satellite, OTT and telecoms applications.

"At IBC, we'll be demonstrating several exciting new products as well as our award-winning range of solutions that are compatible with all major industry standards, ruggedised for reliability in challenging environments, and built for low-energy operation," said Simen K. Frostad, Chairman, Bridge Technologies. "We're looking forward to showing visitors how we can help them to manage complexity, to achieve greater efficiency and to improve service quality."

"Our development team has created unprecedented new technology achievements this past 12 months that give the industry a complete, coherent system solution for any media need from the broadcast studio to the user's home," continued Frostad. "We are very excited to be showing this at IBC."

One product demonstrated at the show will be Timeline. Timeline is a data analysis system which stores all the data collected through the monitoring system (and other sources if connected) for up to two years of operation, and allows engineers to review historical data in detail at any time in a multi-track timeline display similar to a non-linear editing system.

The ability to play through data recorded over a period of several months or years allows users to see recurring patterns that may be invisible over a shorter timescale. After an 'acute' event such as a service failure, for example, the engineering team can use Timeline to review all the data gathered by the entire monitoring system to analyse the chain of events that led up to the failure and generate reports for remedial action or the fulfilment of SLA obligations.

Another service being introduced at IBC is Omega, which aims to provide customers with a number of key opportunities. These include remote hands-on technical support, in-depth education, automated off-site data backup, system-wide automated software updates, and a planning and provisioning consultancy package.

For each customer, Omega provides a direct connection with a dedicated Bridge Technologies expert who is fully knowledgeable about the customer's configuration and can intervene remotely to resolve problems.

Omega also provides customer engineers with the opportunity to receive in-depth education that supports improved strategic decision-making.

Domo Broadcast **brings SDR to IBC2016**

DTC, Domo Broadcast will demonstrate the latest advances for its new concept in electronic newsgathering and live production at IBC 2016.

After recently launching the SOLO7 OBTX modular camera back transmitter, Domo is now developing a module to interface directly within it, which will transform the already feature-rich radio into a class-leading ENG transmitter based on the company's SOLO8 software defined radio platform.

The new functionality this radio will afford news broadcasters is second to none and will boast full SD and HD, including 1080p50/60 formats, IP encoding and streaming capabilities, traditional ASI COFDM, bi-directional IP over RF (Mesh), return IFB and 3G and 4G dongle support. The new technology has already been successfully trialled in real-world applications, with ongoing deployments planned right up to, and during, IBC.

At IBC, Domo will also feature its acclaimed SOLO7 OBTX, which boasts 1080p60 and 4:2:2 compression with integrated camera control. It includes swappable RF (340MHz-8.6GHz) modules and H.264/MPEG-4 AVC video encoding. The transmitter's latency can range from 1s to an exceptionally low 10ms. Extended field performance is also possible, due to the unit's low power requirements.

Broadcast Sales Director JP Delport said: "Our established SOLO7 OBTX and SOLO8 SDR products are major steps forward in wireless communication, but they are only the beginning of a major new development initiative."

NorthTelecom **showcases MVSAT at IBC**

NorthTelecom has been providing MVSAT communication for many years, but now the company has solutions that will meet the requirements of all boat and ships owners and operators, with 24/7 communication support including video on demand, GSM, fax, VoIP, SIP phone and more. Its MVSAT services will be on display at the show. The company plans to meet the needs of all users who require satellite services all the time.

"NorthTelecom works out plans with fixed monthly charges to our customers," said Mahdi N. Mehrabi CTO and MD Asia Pacific. "Our MVSAT services provide significant savings on communication cost and keeps our clients connected in the sea all the time, even in the most extreme conditions."

NorthTelecom's MVSAT services deliver regional coverage over the Arabian Gulf, Oman Sea, Aden Gulf and Red Sea. It also provides continental coverage over the Mediterranean Sea and the North Sea, as well as intercontinental coverage over Asia and Pacific all the way to South Korea.

SIS LIVE brings **Anylive+ to the show**

At IBC 2016, SIS LIVE will announce the further expansion of its AnyliveT fibre network. This powerful, rapidly expanding fibre network has been operating for a number of years and has strengthened SIS LIVE's mission.

SIS LIVE will also announce details of Anylive+, a new range of services that will extend the capabilities of the Anylive network.

SIS LIVE Managing Director David Meynell said: "The need for high production values for live events continues to rise, and with them the costs. That's why the advent of high-quality, low latency connectivity over IP like that offered by our Anylive network is an attractive proposition for those who need the power and flexibility of IP-based production for multiplatform delivery."

The established national and international Anylive fibre network already connects key broadcasters, major switching centres and channel aggregators, and more than 70 major sports stadia and venues.

Two teleports and 24/7 network operations centres at MediaCityUK and SIS LIVE's head office in Milton Keynes are backed by

extensive, permanently leased satellite capacity to supplement the fibre-based connectivity. The network has been successfully trialled for the production of major national sporting events, which has led to the official launch of the network, and additions to the rapidly expanding network are expected to be announced at IBC.

The addition of highly adaptable Anytime+ services enables production operations such as gallery functions, vision engineering and camera operations to be moved back to the comfort and familiarity of a broadcaster's base. The reach of SIS LIVE's growing fibre-based infrastructure offers the triple benefit of exceptional production flexibility, high resilience and, ultimately, significant cost savings.

DVB to showcase **DVB to IP and DVB-S2X**

At this year's IBC Conference and Exhibition, DVB will showcase the work it is undertaking to standardise the provision of high-quality content via satellite more efficiently to all in-home IP devices. It will also demonstrate the market preparation of consumer technology for its groundbreaking DVB-S2X technology.

With new devices such as tablets and sWith new devices such as tablets and smartphones gaining popularity for the consumption of live broadcast TV, DVB is set to offer a technical solution to reach these devices. In a live demo, a DVB-T2 signal will be converted into Internet Protocol using a server integrated in the TV. The signal will then be streamed to IP client devices.

Building on the SAT>IP communications protocol for taking live satellite broadcast onto IP networks, DVB broadcast signals can be encapsulated into IP at the point of reception in an IP server. Effectively these IP servers add an IP transport layer and inform the clients about the available services. The principle can be applied to the entire family of first and second-generation DVB transmission platforms (DVB-T/T2, DVB-S/S2/S2X, DVB-C/C2) and managed IPTV transmissions. The SAT>IP Alliance and DVB Project are working closely together to make broadcast delivery to handhelds as easy as possible and will look at adding new features.

A critical step for the introduction of DVB-S2X for DTH is the availability of cost-efficient DVBV-S2X receiver chipsets. The industry has been working at full speed on the development of the necessary consumer technology. DVB-S2X chipsets and consumer products are now in the prototype phase and are expected to hit the market soon. This will allow operators to use DVB-S2X also for DTH, and most probably for delivery of UHD services. This demo will show the progress the industry has made.

The DVB stand will be manned by DVB representatives and technology experts, available to answer queries and provide information on DVB's wide ranging family of open, interoperable, market-driven standards.

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TUESDAY 18
FINANCE & INTELLIGENT CITIES

James Baresse
Former CTO, **PAYPAL**

One of the leading minds behind the biggest fintech disruptor

Jonathan Reichental
CIO, **CITY OF PAOLO ALTO**

How to transform into a number one digital city in the world

WEDNESDAY 19
RETAIL & EDUCATION

Paul Clarke
Chief Technology Officer, **OCADO**

Becoming the world's largest online grocery store using AI & robotics

Assine George
CIO, **UNIVERSITY OF WESTERN AUSTRALIA**

Mapping a path to the most connected campus & pioneering the future of learning

THURSDAY 20
ENERGY

Keith Kaplan
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The Connected Car

Intelsat, in partnership with Kymeta, is building and testing antennas that will be used in connected cars for over-the-air (OTA) updates

We launched our first Epic satellite, IS-29e, and it went operational over the Americas and across the Atlantic to Europe. It is performing above spec, and we're getting about two and a half times the efficiency compared to a normal Ku-band satellite. Our customers are very happy. It is also backward compatible with existing ground infrastructure. It also has the most advanced digital payload, which means you can go from one beam to another in small frequency bands, which is something that has never been done in the past. There are also great interference mitigation capabilities, which are extremely crucial for our government and media customers.

We are a big believer of innovating the whole ecosystem, and by that I mean finding new applications for satellite that weren't possible before. Intelsat is investing in two antenna manufacturers that are creating a phased array, flat panel antenna for the business jet market, which we consider a large market. Another innovation is with Kymeta for the connected car as well as maritime services. Kymeta is owned by Bill Gates, and is very involved in this, using nanotechnology, electronic beam forming and holographic technology to basically track a satellite with something that is on the move. The initial run of production is being done and it will be low-cost because of volume.

What's driving car manufacturers to the connected future is the complexity of the vehicles. A car today has 100 million lines of coding. In comparison, a 787 Dreamliner has only six million lines of coding. The average car has 30 ECUs that used to be operated by pneumatics and mechanics; they are now operated by software. Most car manufacturers quote that 60-75% of all recalls or all services done on their car are software upgrades. The mechanic doesn't really do anything. He simply has to plug in the car, and after a software upgrade everything is fixed.

"For a mobile phone network, every added user has to be paid for. They figured out that by 2020 the manufacturer would need to deliver about 1TB to the car every month. Imagine if you were paying for that with your GSM connectivity. So they found satellite to be much more cost-effective"

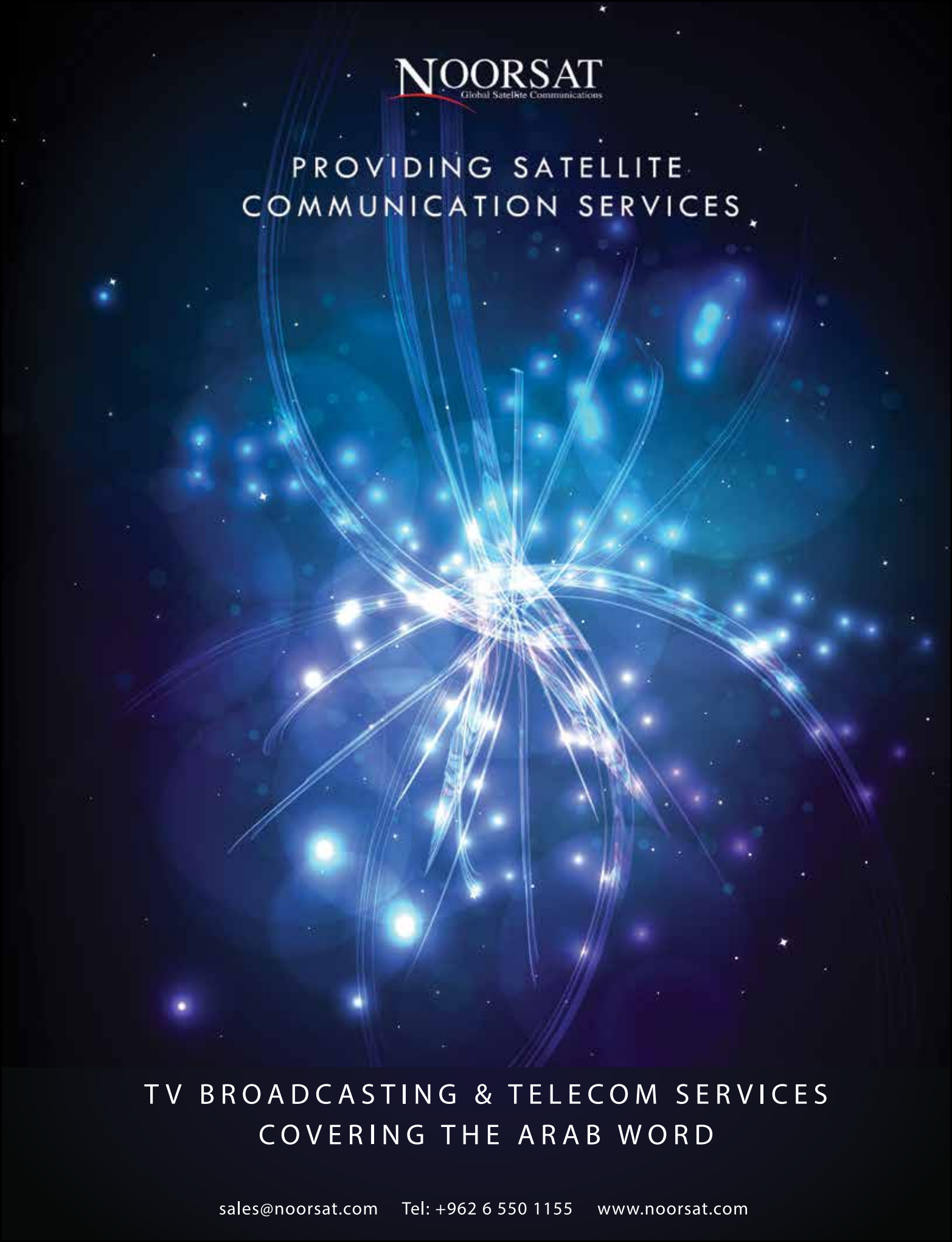
TERRY BLEAKLEY, Regional VP Asia-Pacific, Intelsat

Car manufacturers have looked at how they can do OTA upgrades with communication technology today. They looked at mobile phone networks and they looked at satellite, and for mobile phone networks they needed a global network. For satellite they saw it as being a lot more cost-effective, because at the end of the day it is one file that is going to millions of cars, and every car you add doesn't cost anything extra. It's like broadcasting television.

For a mobile phone network, every added user has to be paid for. They figured out that by 2020 the manufacturer would need to deliver about 1TB to the car every month. Imagine if you were paying for that with your GSM connectivity. So they found satellite to be much more cost-effective because of the broadcast nature of the need to upgrade, and also much more secure. If you look at the global network of GSM operators worldwide, you have millions of entry points where the file may be corrupted. With satellite there are only three entry points in the global solution, and that's at the uplink, so it's a lot more secure. Thus car manufacturers chose satellite to facilitate OTA upgrades.

There is also the added benefit where you can deliver TV to your car, internet, and that's added value for the car when it goes out in the market.

Trialling is going on at the moment. There was a trial across the US where cars manufactured by Toyota travelled 8,000 miles, with a Kymeta antenna looking at a traditional Intelsat satellite. There is still testing going on, and the technology is in the alpha stage. Production rollouts are expected for 2020. Other car manufacturers will follow, I believe, maybe at first with the high-end models and then later to cover entire fleets. PRO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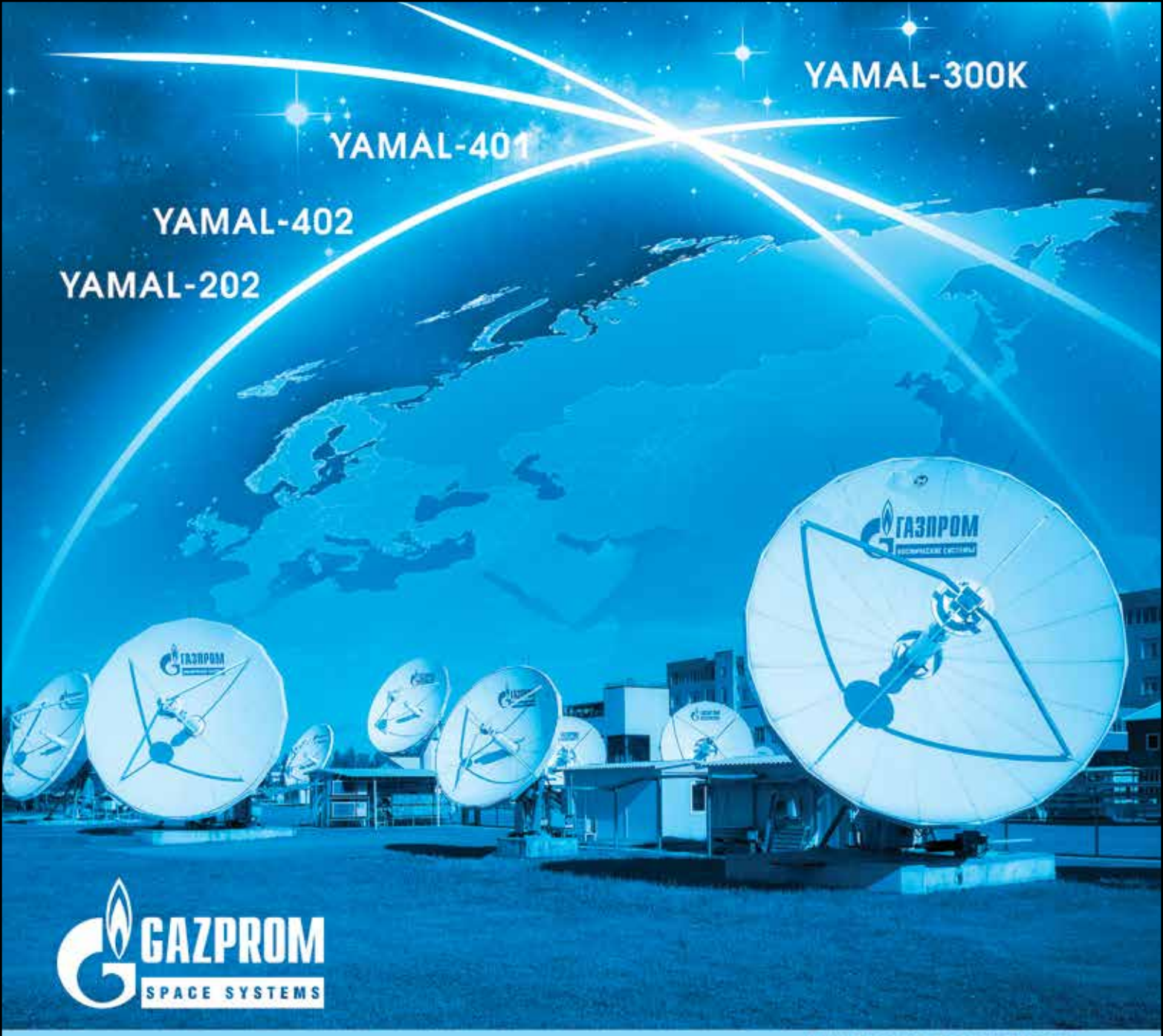

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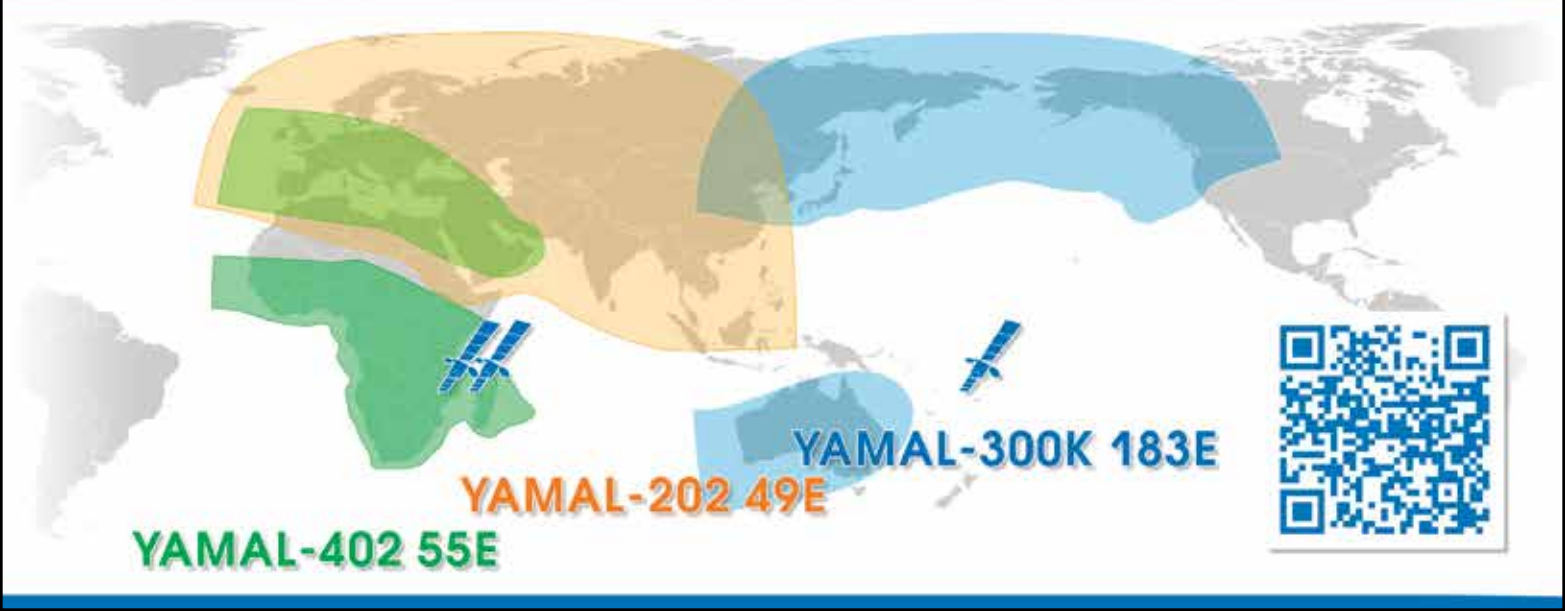

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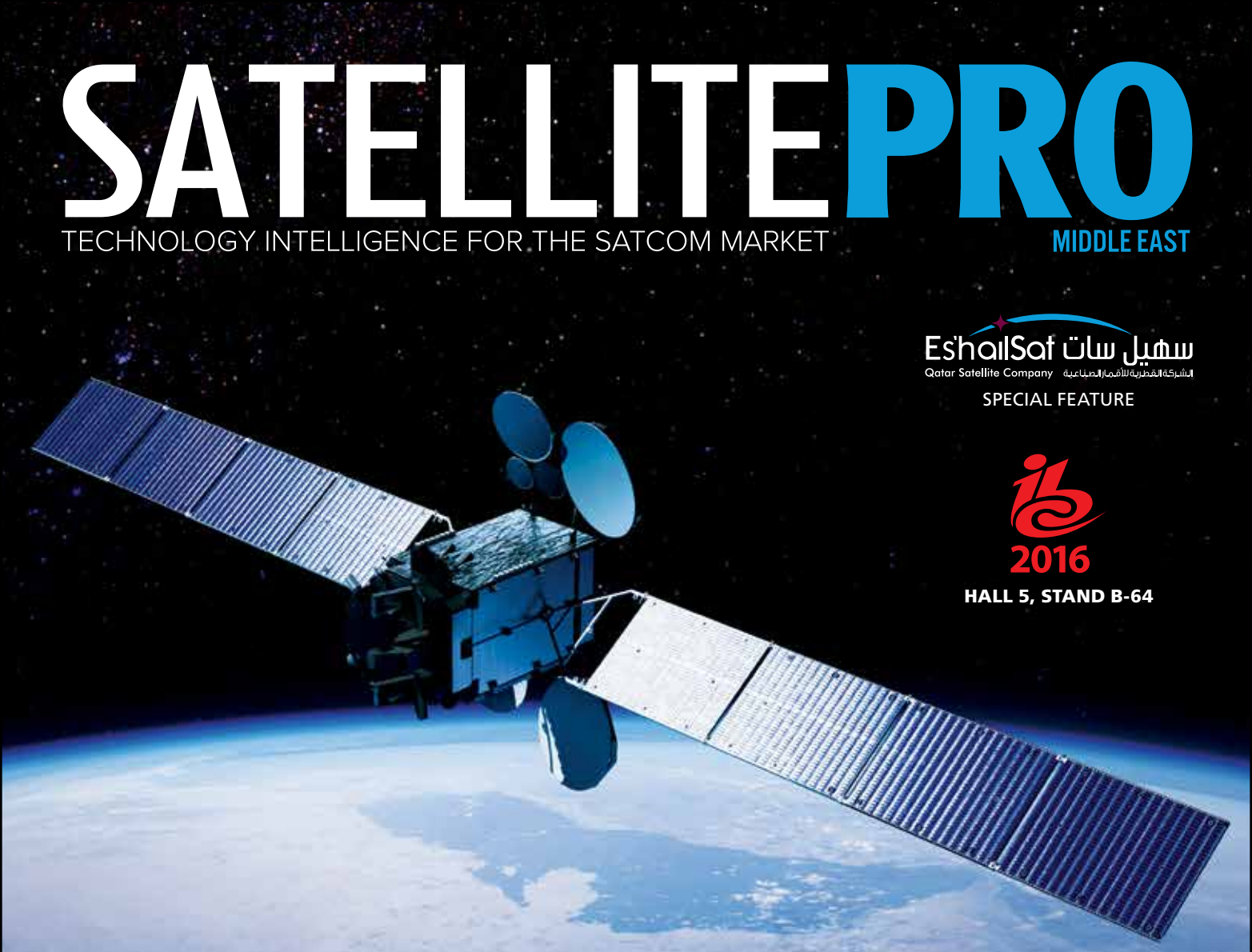

Es'hailSat سهيل سات
Qatar Satellite Company الشركة القطرية للأقمار الصناعية

SPECIAL FEATURE

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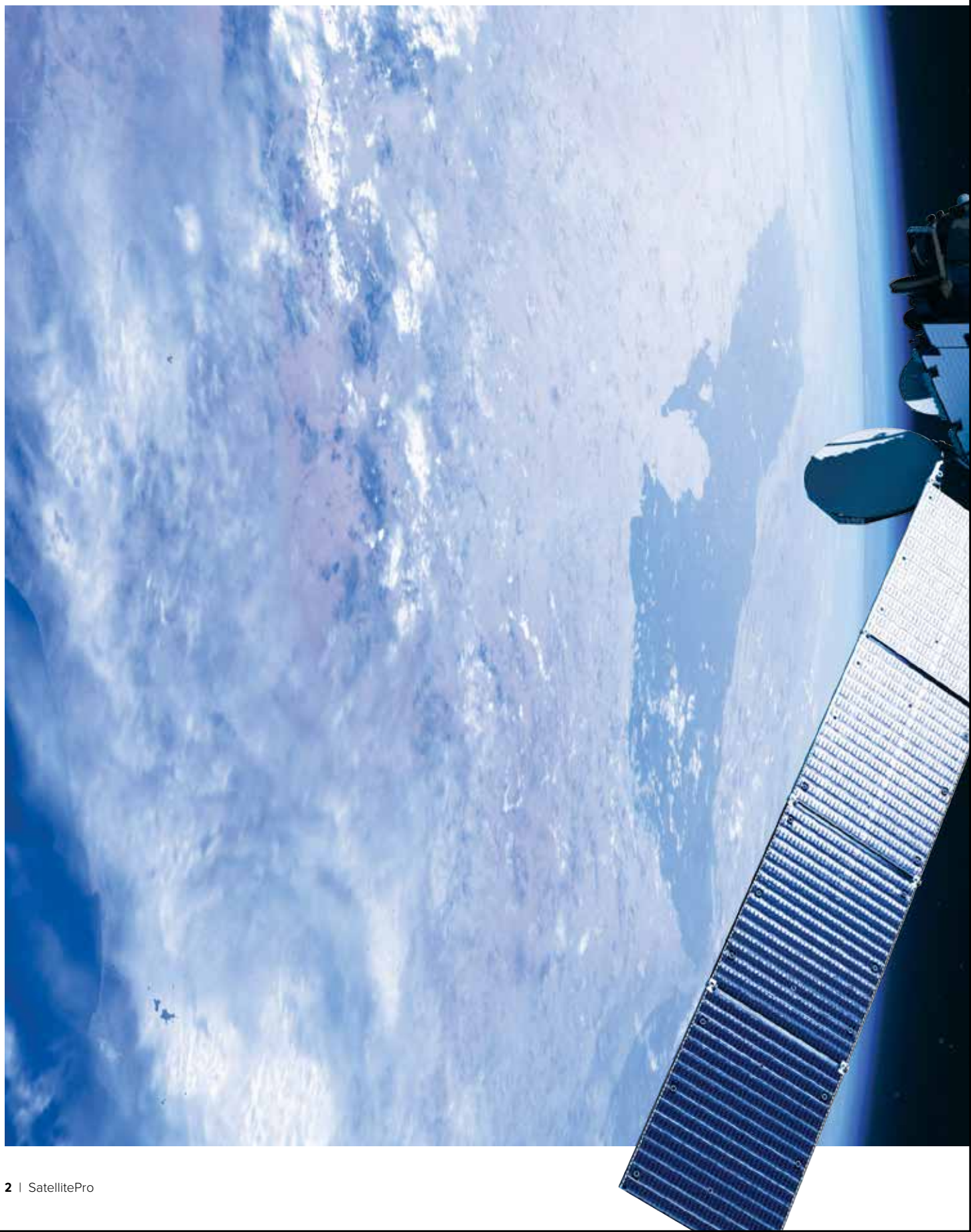
SPACE TO DELIVER YOUR VISION

Es'hailSat goes from strength to strength with a new satellite, a new teleport and new VSAT services in the pipeline



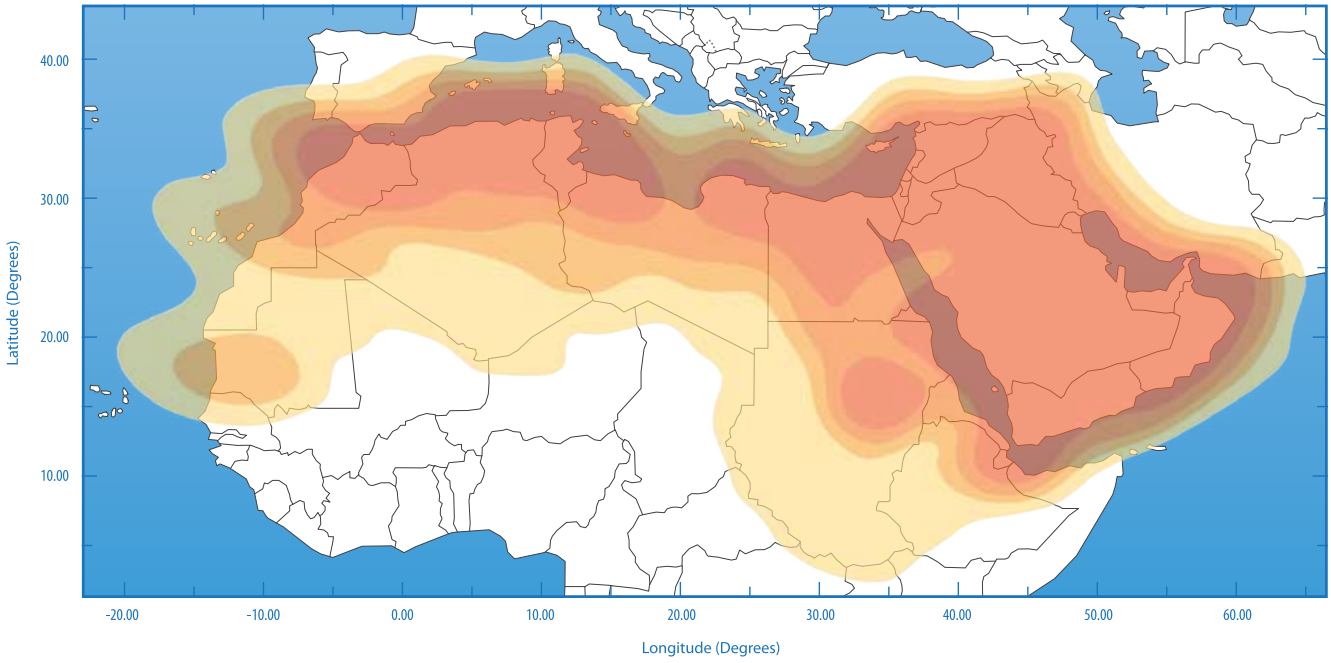
Es'hail-2

- Es'hail-2 is a Mitsubishi Electric satellite
- Scheduled for launch in Q3 2017
- Ku-band and Ka-band capacity
- Leading hotspot for TV Broadcasting and SNG applications
- Located at 26°E covering whole of Middle East and North Africa

SPACE TO DELIVER **YOUR VISION**

With one satellite in operation, a second due for launch soon and the opening of its own teleport, 2017 promises to be a stellar year for Es'hailSat. SatellitePro Middle East catches up with the Qatari satellite operator to find out more about how it is increasing broadcasting and communications capabilities in the MENA region as well as developing a sustainable national satellite communications sector as part of Qatar's 2030 Vision.

Es'hail-2 Ku-Band Downlink Coverage Over MENA



Es'hailSat, The Qatar Satellite Company was established in 2010 as an independent company to manage and develop Qatar's presence in space. Since the launch of Es'hail-1 - Qatar's first satellite - in August 2013, Es'hailSat has grown to become a highly professional, key player for satellite communications in the MENA region. And the company is currently on target to fulfil the requirements of its key stakeholders by boosting broadband delivery, broadcasting and global connectivity.

Es'hail-1 is successfully supporting the strong demand for broadcasting services, internet and critical data distribution in the region. Having started service on Qatar National Day, 18th December 2013, with Al Jazeera Media Network and beIN SPORTS, it has gone from strength to strength with coverage of the Rio Olympics 2016, UEFA Euro 2016, FIFA World Cup 2014 and the launch of new niche Arabic channels over the last few years.

Looking to the future, Es'hailSat is also expanding the network to drive growth in the years ahead. They are on schedule with the manufacture of Es'hail-2, which is scheduled for launch in Q3 2017. The second high-powered, advanced satellite will provide high quality, premium DTH content and critical communications services across the Middle East and North Africa from the 26 °East TV hotspot. And currently consulting with stakeholders for expansion requirements for an additional satellite, Es'hail-3.

"Having both Ku-band and Ka-band capacity at the 25.5° / 26°E hotspot locations enables us to provide the region with the most advanced and sophisticated services including broadcast, telecommunications and broadband. In terms of geographic markets, our core focus continues to be the MENA region, but our intention has always been and will be to be a global player in the satellite arena"

ALI AL KUWARI, President & CEO of Es'hailSat

Es'hailSat aims to bring a new dimension to Qatar's diversifying economy by building a world-class company and center of excellence in the region. As well as developing satellite system in space, they are also investing in local infrastructure and talent, ensuring that they nurture and grow satellite technology for Qatar and key to providing a secure, independent communications network to meet the needs of stakeholders, customers and citizens now and in the future.

Premium Content on Es'hail-1

Es'hail-1, the first satellite continues to go from strength to strength, demonstrating the value of Es'hailSat's offering in terms of technical capabilities and performance, and also in terms of independence and security of content they broadcast. In addition to providing transmission for established news, sports and entertainment channels, a growing number of new Arabic channels are choosing Es'hailSat to launch in the

MENA region. Qatari cultural channel Al Rayyan 2 and Al Araby Television Network, a London-based platform for Arab youth, talent, energy and aspirations, both recently launched HD channels exclusively on Es'hail-1. And with an increased subscriber growth of 34% since starting transmission on Es'hail-1, beIN Sports recently launched new HD entertainment channels, seeking to diversify and expand its audience with new content including film, entertainment and TV series such as travel, lifestyle, kids and documentary programming. In addition, Al Jazeera commenced transmission of a new bouquet of HD channels on Es'hail-1, making 25.5°E a truly hotspot for quality high definition channels.

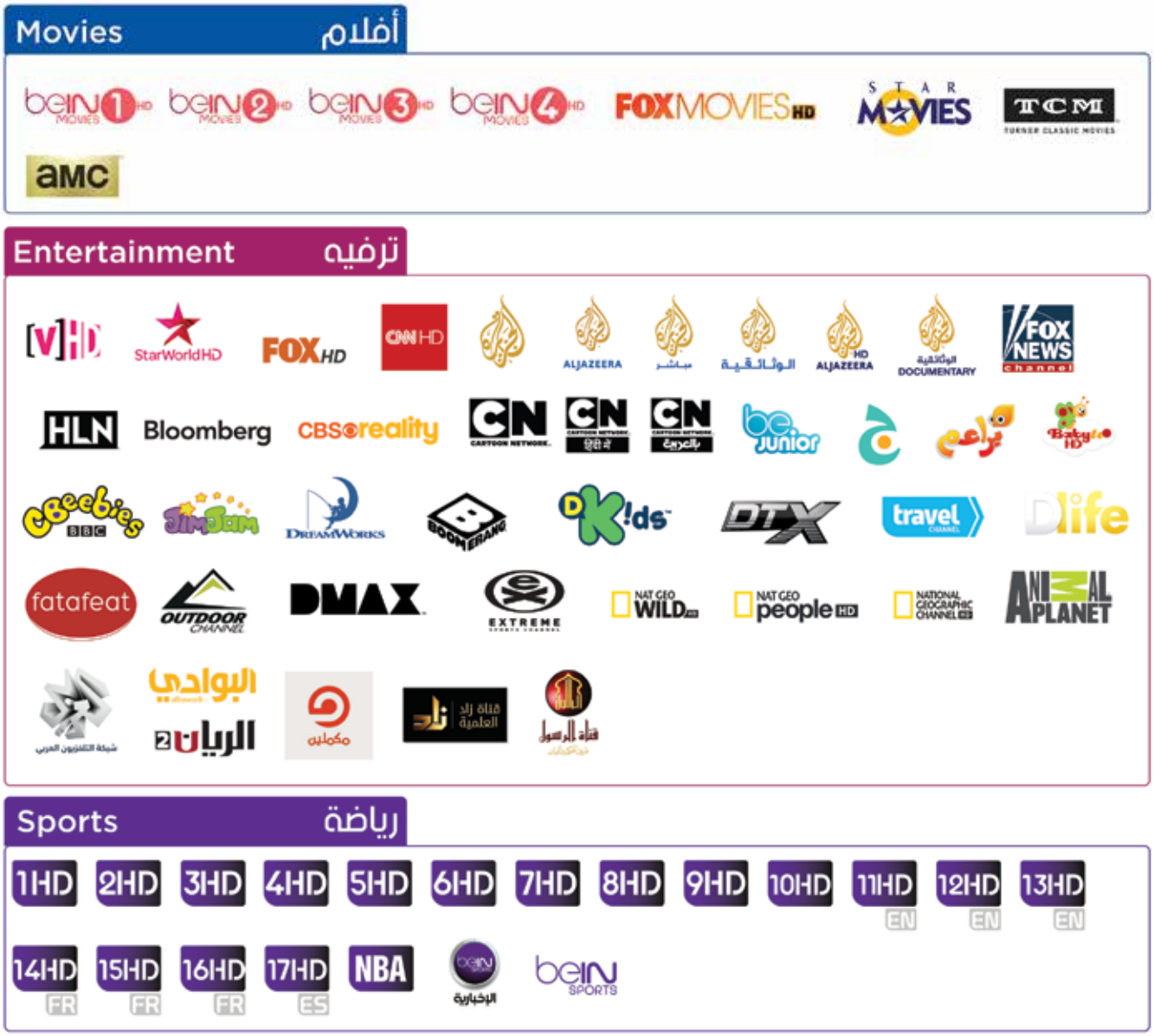
New VSAT Services

They announced a major development and collaboration agreement with Ooredoo that allows both companies to work together on a range of new satellite and world-class communications services for Qatar. Demand for VSAT services has risen sharply in recent years, particularly in remote locations such as deserts and coastal areas. Partnership with Ooredoo helps drive home grown innovation and stimulate the development of a full portfolio of solutions to support VSAT business.

Growing Demand For Ka-band

With a growing demand for Ka-band services across the MENA region, especially in hub based solutions and mobility services, Es'hailSat developed a Ka-band hub located in Doha, which provides

Premium Content at 25.5°E/26°E



Es'hailSat New Teleport in Doha

"At Es'hailSat we aim to bring a new dimension to Qatar by building a world-class satellite company and center of excellence in the region. As well as providing the Es'hail-1 and Es'hail-2 satellites, we are training the young people of Qatar in satellite technology so that we have a solid foundation for the future"

ALI AL KUWARI, President & CEO of Es'hailSat

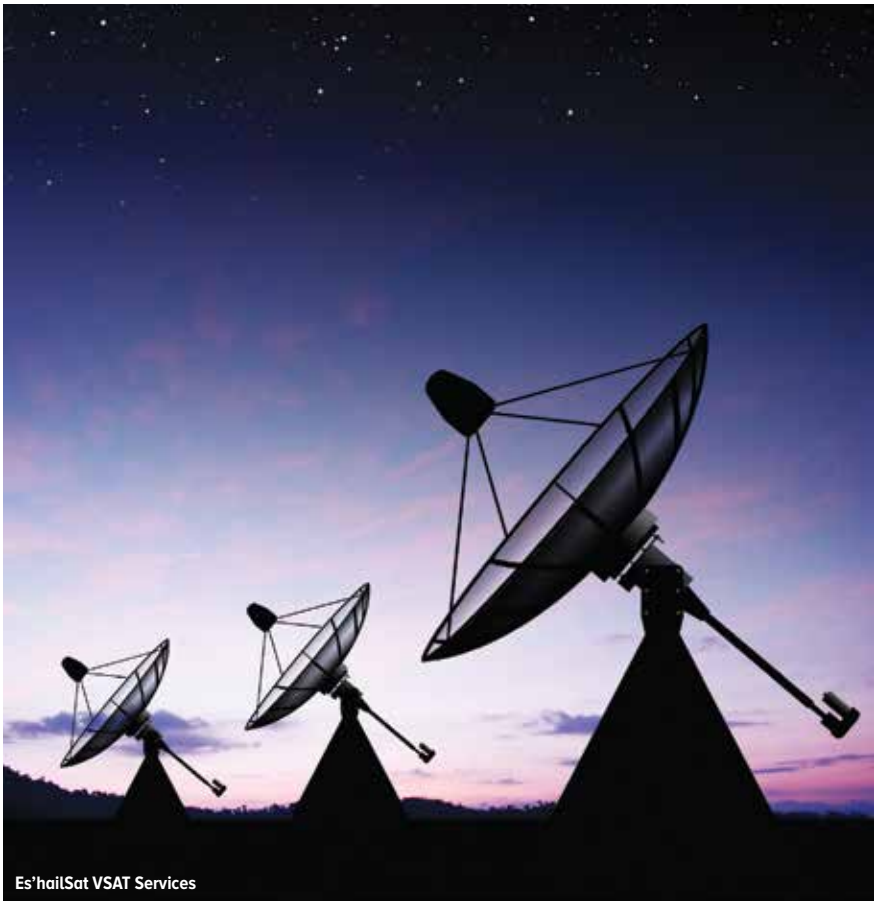
flexibility to service providers, allowing them to choose a style of engagement and commitment to suit their business needs. Through the hub's high-tech infrastructure, Managed Service Providers (MSPs) can provide telecom solutions that support a range of satellite-based data communications applications, ensuring their customers benefit from flexible and efficient technologies providing higher compression with lower latency, WAN optimization and bandwidth optimization for OPEX savings. The main services provided by the new Es'hailSat hub are internet Services, VoIP Services and Corporate Network Connectivity.

Es'hail-2

Es'hailSat is on its way to delivering on their plan to provide additional premium satellite capacity in the MENA region with the expansion of the Es'hailSat fleet. Es'hail-2, will continue to further boost broadcasting and global connectivity for Qatar, the entire MENA region and beyond. Es'hail-2 is a high-powered, advanced satellite with both Ku-band and Ka-band capabilities to provide TV distribution, telecoms and government services. The satellite footprint covers the Middle East and North Africa and will be positioned at the 26°E hotspot location.

New Teleport for MENA

The new Es'hailSat Teleport will be a state-of-the-art facility providing satellite Telemetry, Tracking and Commanding (TT&C) facilities and capacity management, together with a wide range of teleport services such as uplink, downlink, contribution, multiplexing, encoding, playout and broadcasting, tailored for our customers and business partners. The high-tech teleport will also provide back-up studios for TV channels and serve as a disaster recovery facility for broadcasters. The site will be connected to the key media broadcasters in Qatar and to the international fiber gateway by means of a redundant, dedicated and diverse fiber optic link. Construction of the teleport at a 50,000m2 site north of Doha started in 2015



Es'hailSat VSAT Services

and the first phase will be ready to support services by end of 2016. The teleport is a custom built facility for the Es'hailSat fleet of satellites and will be fully owned, operated and controlled by Es'hailSat.

Solving The Challenges of Interference for MENA Broadcasters

As secure transmissions continue to be of paramount importance in the MENA region, Es'hailSat is working closely with the IRG (Interference Reduction Group), underlining our commitment to reduce and eliminate satellite interference and provide a secure transmission network for our customers. The IRG Group has achieved a number of accomplishments, including the widespread adoption of Carrier ID in time for the 2012 Olympics, resulting in satellite operators achieving an interference-free Olympics. With Qatar hosting the 2022 FIFA World Cup, Es'hailSat is encouraging its customers to use Carrier ID as part of its cooperation within the IRG community. Both Es'hail-1 and Es'hail-2, scheduled for launch in 2017, have been designed with the most advanced anti-jamming capabilities to meet the needs of the MENA market.

Future Expansion

Having both Ku-band and Ka-band capacity at the 25.5° / 26°E hotspot locations enables Es'hailSat to provide the region with the most advanced and sophisticated services including broadcast, telecommunications and broadband. In terms of geographic markets, its core focus continues to be the MENA region, but with intentions to be a global player in the satellite arena. Its expansion plan will continue with more new satellites in prime hotspot locations offering customers the most flexible and reliable services and they are also adopting the concept of "world-wide footprints" through partnerships with leading regional and international satellite operators around the globe.

Building A Satellite Industry For Qatar

Es'hailSat's goal is to contribute to the development of a knowledge-based economy and a communications-based society in Qatar. In addition to building the communications infrastructure, they are also investing in and developing local talent through training programs with satellite manufacturers and providing scholarships for students to study satellite communications. In 2013, they initiated a capacity-building and development program with their first satellite Es'hail-1. Four engineers from Es'hailSat completed a 26-month intensive training program with SSL in California, designed to provide the engineering staff with the ability to specify, oversee the manufacture of, launch and operate commercial communications satellites. They have continued this program for Es'hail-2 with trainee engineers at Mitsubishi Electric Company (MELCO) in Japan. In addition, they sponsored a number of Qatari school leavers who have enrolled in degrees specializing in satellite communications at the University of Surrey in the UK. Having satellite knowledge and operational experience plays a vital role in greater self-reliance and therefore sustainability of the space industry in Qatar. PRO

Es'hailSat سهيل سات

Qatar Satellite Company الشركة القطرية للأقمار الصناعية

Providing high quality satellite communications, connectivity and teleport services for the Middle East and North Africa

Regional satellite operator based in Doha, Es'hailSat owns and operates satellites to provide television, internet, corporate and government services across the Middle East, North Africa and beyond

Space to deliver your vision

Es'hailSat Key services include:

- TV Broadcasting
- Newsgathering
- Business Communications
- Corporate Networks
- Telecommunications Services
- GSM Backhauling
- IP Trunking Services
- Government Services

Es'hail-2 launching in Q3 2017

Our first satellite, Es'hail-1, was successfully launched in 2013 and our second satellite, Es'hail-2, is expected to be launched in Q3 2017. Both satellites will be co-located at the 25.5°/26° East MENA broadcast hotspot.

www.eshailsat.qa

YouTube