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WELCOME



I have been hearing about low earth orbit satellites for a while now but it's not until I had a chat with people from different parts of the same sector that I was able to comprehend the magnitude of what this new ring around the earth could mean for the world in terms of connectivity. No doubt, the challenges with LEO constellations will be many. With small satellites having a lifespan of just three to five years, there will be a need to continuously replenish them and with the current lead time to launch a satellite being between six and two years, one believes there is tremendous opportunity in this market for those who see it and seize it. LEO satellites and how they will dramatically boost 5G in the coming years is only one of the many discussions that will take place at CommunicAsia, which is one of the three segments under the ConneCTechAsia brand in Singapore this year. We will be there and look forward to having conversations with you on new trends in the market and

how all of us can work together. On another note, there has been a lot of activity in the UAE Space sector with the Mars mission making progress, a new home-made satellite design being reviewed and the first Emirati astronaut programme gradually taking shape. The UAE is looking to boost its space sector and we had the opportunity to speak with the agency's Director General as well as the former NASA Administrator and European Space Agency Director. Some of those video interviews are featured on our web site. I encourage you to subscribe to our online newsletter so news can reach your desktop as they break. This is my first issue of *SatellitePro* so I hope you enjoy reading it but I promise to bring more new elements to it in the coming months. See you in Singapore.

Vijaya Cherian

VIJAYA CHERIAN
Editor
SatellitePro ME

Yahsat to acquire majority stake in Thuraya

ACQUISITION
Yahsat has entered into an agreement to acquire a majority stake in UAE-based mobile satellite services operator, Thuraya, subject to final pre-closing conditions being met. The acquisition of Thuraya will significantly expand Yahsat's current satellite solutions portfolio for both commercial and government verticals, as well as its global footprint, a

company release stated. Thuraya's two satellites, serving more than 140 countries, will join the Yahsat fleet, expanding the group's satellite fleet to five. The combination of geostationary satellites operating in the C, Ka, Ku and L-bands will jointly cover Europe, Africa, the Middle East, South America, and Asia, providing a broad range of fixed and mobile satellite services

spanning voice and data communications to both commercial and government sectors. The transaction is expected to close after customary conditions have been met and regulatory approvals have been obtained. The tender process will start shortly to offer current shareholders the option to participate in this sale. In a separate move, Yahsat hosted a forum recently in Amman, Jordan titled *Enabling through Connectivity*. The forum discuss initiatives to support humanitarian emergency response and sustainable development projects, with the primary focus being to bring reliable broadband connectivity to facilitate the provision of basic services such as healthcare and education in Jordan and its neighbouring regions.

Arabsat expands with uplink facility at twofour54 Abu Dhabi

NEW UPLINK FACILITY
Arabsat has established a satellite uplink-platform from twofour54 Abu Dhabi, which will see the two companies launch a new set of satellite TV channels on the Arabsat Badr-4 satellite.

Arabsat will allocate a transponder to uplink from the twofour54 facility. The tie-up enables twofour54 partners and broadcasters across the region to distribute their content to the Arabsat audience directly from the free zone.

Arabsat also aims to work with twofour54 on a number of projects to develop the teleport services, including an HDR platform which will be the first in the UAE. Twofour54 and Arabsat will also begin testing the HbbTV platform, which will enable twofour54 to provide state-of-the-art technology through working with partners.



Yusuf AL-Butti, Head of Technology and Engineering, twofour54 at the facility

Arabsat provides more than 500 TV channels, 200 radio stations, pay-TV networks and HD channels to homes in more than 80 countries across the Middle East, Africa and Europe.

Speaking about the new uplink partnership, Eng. Khalid Balkheyour, Arabsat President & CEO, said: "twofour54 is a remarkable community of content creators from across the world and from every part of the media industry. Arabsat is proud to expand its broadcasting partnership portfolio by launching our new bouquet on

Arabsat Badr-4 satellite from there, enabling new premium capabilities and quality of service for our clients in MENA, as well as empowering twofour54's clients to reach MENA, Europe and beyond. This all forms part of our development strategy for our Hotspot at 26° East."

H.E. Maryam Eid AlMheiri, CEO of Media Zone Authority – Abu Dhabi and twofour54, added: "The satellite uplink-platform at twofour54 is yet another example of the thriving media ecosystem that is being built in Abu Dhabi as well as the growing

demand in the region for high-quality content. "Content creation is at the heart of everything we do at twofour54 and we are delighted to be working with the largest satellite company in the region on a project that will also allow us to play an important role in its distribution. Arabsat has been serving the growing needs of the Arab world for more than 40 years and this service is yet another example of their commitment to the region. This uplink will serve as a great incentive to those looking to join our community in the future."

Quest Arabiya is a partner that has migrated to the new uplink facility. Speaking about the benefit of the facility, George Baroudy, Head of Operations and Planning at Quest Arabiya said that it "will save us so much valuable time now that it is on our doorstep".

Kenya launches its first university-developed satellite into space

NEW LAUNCH
Kenya made history as its first home-developed university satellite was launched into space last month by Japan Aerospace Exploration Agency (JAXA) from its International Space Station (ISS). The satellite was developed by the students of the University of Nairobi (UoN) in partnership with JAXA. This was the first CubeSat to be deployed from Kibo, which is the Japanese Experiment Module of the International Space Station (ISS). The CubeSat was developed under the KiboCube programme run by the United Nations Office for Outer Space Affairs (UNOOSA) along with JAXA. Professor Peter Mbithi, Vice Chancellor of UoN called this a "historic occasion". Speaking further about the satellite, one of the Kenyan scientists who worked with the students on this project, explained: "The satellite is a 10x10 CubeSat that weighs about 1.4 kg. The important thing is that this is a journey we have started to develop higher capacity and to enable Kenya to participate in space exploration and space science. We believe that the University of Nairobi can provide the required leadership to enable Kenyans to become operators in space. This is an area where we haven't engaged much but we believe that this is an important area in terms of the development of science and capacity to use space resources." Professor Mbithi added: "We hope that we can build more of these cubes so we can create a constellation and enjoy the wider benefits of satellite technology." The deployment ceremony took place at Kibo Space Centre on May 11, 2018 and was attended by the Cabinet Secretary, Ambassador Amina Mohamed and a government delegation comprising officials and university researchers.

China announces first overseas BeiDou centre in Tunisia

PARTNERSHIP
A China-Arab States BeiDou System/Global Navigation Satellite System Centre, the first overseas centre for China's BeiDou Navigation Satellite System (BDS), was inaugurated in Tunisia this April. The centre is a pilot project between China and the Arab Information and Communication Technology Organisation (AICTO) to promote the global application of BDS, Ran Chengqi, Director of the China Satellite Navigation Office, said. Mohamed Ben Amor, Secretary General of AICTO, hailed the centre as a unique technology project for the Arab region and the entire world. The centre is aimed at strengthening cooperation in satellite navigation between China and the Arab nations, while also enabling China to offer more BeiDou-based services to all the Arab nations. The centre, which is jointly run by the Chinese and Arab entities will evaluate and explore BeiDou's navigation and positioning services in the Arab world, while also carrying out research and training on BeiDou. Five Chinese experts provided a three-day training session at the centre to more than 40 satellite navigation professionals from Arab nations. China and the Arab League held their first cooperation forum in Shanghai. The two sides pledged to strengthen their communication and collaboration in satellite navigation and to bring BeiDou-based services to Arab states to benefit social and economic development. BeiDou is one of the four space-based navigation networks along with GPS from the United States, GLONASS from Russia and Galileo from the European Union. Since 2000, when the first BeiDou satellite was placed into orbit, 33 satellites have been launched for the network. BeiDou has provided positioning, navigation, timing and messaging services to civilian users in China and parts of the Asia-Pacific region since December 2012. China plans to launch 18 third-generation BeiDou satellites into space before the end of 2018. The network will include 35 satellites before the end of 2020 to give BeiDou global coverage. Several now in orbit will be decommissioned by then. BeiDou currently covers more than 30 countries, including Pakistan, Egypt and Indonesia.



Director of China's Satellite Navigation Office, Ran Chengqi (l) and Secretary General of AICTO Mohamed Ben Amor (r) at the inauguration ceremony in Tunisia



Jean-Claude Tshipama to lead Eutelsat's broadband division in Africa

NEW APPOINTMENT

Eutelsat has appointed Jean-Claude Tshipama to head its satellite broadband operations in Africa. In his new role, Tshipama, a seasoned telco expert, will ensure that Eutelsat's broadband business is successfully deployed across Africa, drawing on the in-orbit resources of the Al Yah 3 satellite which will operate the service after entering operational service during next summer. The operation of the Al Yah 3 satellite will be followed next year by the launch of the KONNECT satellite.

The appointment of Tshipama completes the team in charge of Eutelsat's fixed broadband activities, led by Béatrice Beau, Executive VP for global broadband services, and Catherine Carde, who heads up broadband activities on the European continent.

UAE's MeznSat 3U CubeSat design under review

TECH NEWS

The UAE Space Agency, working in partnership with Khalifa University of Science and Technology and the American University of Ras Al Khaimah (AURAK), has reviewed the preliminary design of the MeznSat 3U CubeSat, which is being developed to monitor and study the Earth's atmosphere.

The Preliminary Design Review (PDR) was chaired by Khaled Al Hashmi, Director of Space Mission Management at the UAE Space Agency. It brought together representatives from Khalifa University of Science and Technology, AURAK, Mohammed Bin Rashid Space Centre (MBRSC), Yahsat, and the National Space Science and Technology Center (NSSTC).

Launched in February 2018, AURAK students are designing and building the satellite to collect and analyse data about carbon dioxide and methane levels in the atmosphere above the UAE. The students are utilising Masdar Institute's

facilities during the satellites design and construction.

MeznSat is to be launched in late 2019 from a site in Japan, in coordination with the Japan Aerospace Exploration Agency (JAXA). Once in orbit, the satellite will use a visible camera as well as a shortwave infrared spectrometer to measure the abundance and distribution of methane and carbon dioxide in the atmosphere. A team of students will monitor, process, and analyse the data sent from the satellite at a ground station in the UAE.

Speaking about the project, Khaled Al Hashmi, Director of Space Mission Management at the UAE Space Agency, said: "The MeznSat project is an important addition to the UAE's satellite capabilities, which include remote sensing, earth observation and communications. The project's objective falls within the Agency's mission to develop national capabilities, strengthen scientific research and organise the sector."



The team reviews the design in Abu Dhabi.

RascomStar ties with SatADSL & Global Telesat to connect Africa

PARTNERSHIPS

Satellite operator RascomStar, VSAT services provider SatADSL and Global Telesat, which provides telecommunication services to rural and remote locations, have joined hands to offer affordable satellite broadband connectivity across Africa.

Under the agreement, Global Telesat will manage the services from its teleport facility in Spain. Global Telesat will connect its iDirect Evolution hub to SatADSL's cloud-based service delivery platform (C-SDP), enabling it to offer a range of services for communities, businesses, administrations and non-governmental organisations (NGOs) without investing in any physical infrastructure.

RascomStar will supply the capacity over its satellite RQ1R located at 2.9° East, covering the whole of Africa in C and Ku band connectivity.

Global Telesat is the latest service provider to connect to SatADSL's C-SDP, which is now being used by 76 Africa-based partners.

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* APSTAR-5C is currently under construction, it will replace APSTAR-5 in Q3 2018.

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Intelsat and Gilat partner to expand broadband access in rural Uganda

CONNECTIVITY

Uganda's Communications Commission (UCC) will utilise Intelsat satellite services and Gilat Satellite Network's ground infrastructure to advance the deployment of 3G wireless communications infrastructure and expand affordable broadband access for businesses and communities in the country's rural areas.

Under a pilot programme, UCC will use IntelsatOne Mobile Reach Solar 3G satellite services delivered via the Intelsat 37e satellite and Gilat's SkyEdge II-c multi-application platform to provide broadband connectivity to two communities – Bufundi in Rubanda and Kibuku in Ntoroko. The objective of the remote connectivity project is to demonstrate the ease of deploying the satellite solution and study the commercial viability and sustainability of the solution. This effort will be instrumental in helping to accelerate the Ugandan government's broadband strategy, particularly its goal of achieving minimum broadband speeds of 3 Mbps and coverage of 100% of Uganda's rural areas by 2020, the release stated.

Committed to working with member states to achieve the United Nation's Sustainable Development Goals by 2030, the International



Intelsat's CEO Stephen Spengler commented that the company strives to improve its technology to ensure better satellite connectivity especially in ultra-rural areas.

Telecommunications Satellite Organisation (ITSO) played a critical role in coordinating efforts and bringing the private and public entities together to benefit the two communities in Uganda.

"Extending broadband connectivity and delivering fast, affordable internet services to everyone in Uganda remains one of the Ugandan government's primary missions," said Godfrey Mutabazi, Executive Director of the Uganda Communications Commission. "With more than 80% of our population living in rural areas, this has been a technological and budgetary challenge. With this combined effort and the innovative approach the companies are bringing, we believe citizens in some of our most isolated communities will experience the power of reliable connectivity and the

economic and social benefits it delivers."

Mobile Reach Solar 3G, part of the IntelsatOne portfolio, is an end-to-end, solar-powered managed solution powered by Gilat cellular solutions, for mobile network operators (MNOs) who want to expand their service footprint into ultra-rural regions where traditional network buildouts are uneconomical. Under the partnership, Intelsat oversees the space segment, traffic configuration and project management, while Gilat Satellite Network supplies, installs, and maintains the ground network infrastructure. This results in a turnkey, solar-powered package that provides everything an MNO needs to expand 3G service over a 2.5-kilometer radius, including power supply, mono-pole, and all satellite and cellular equipment.

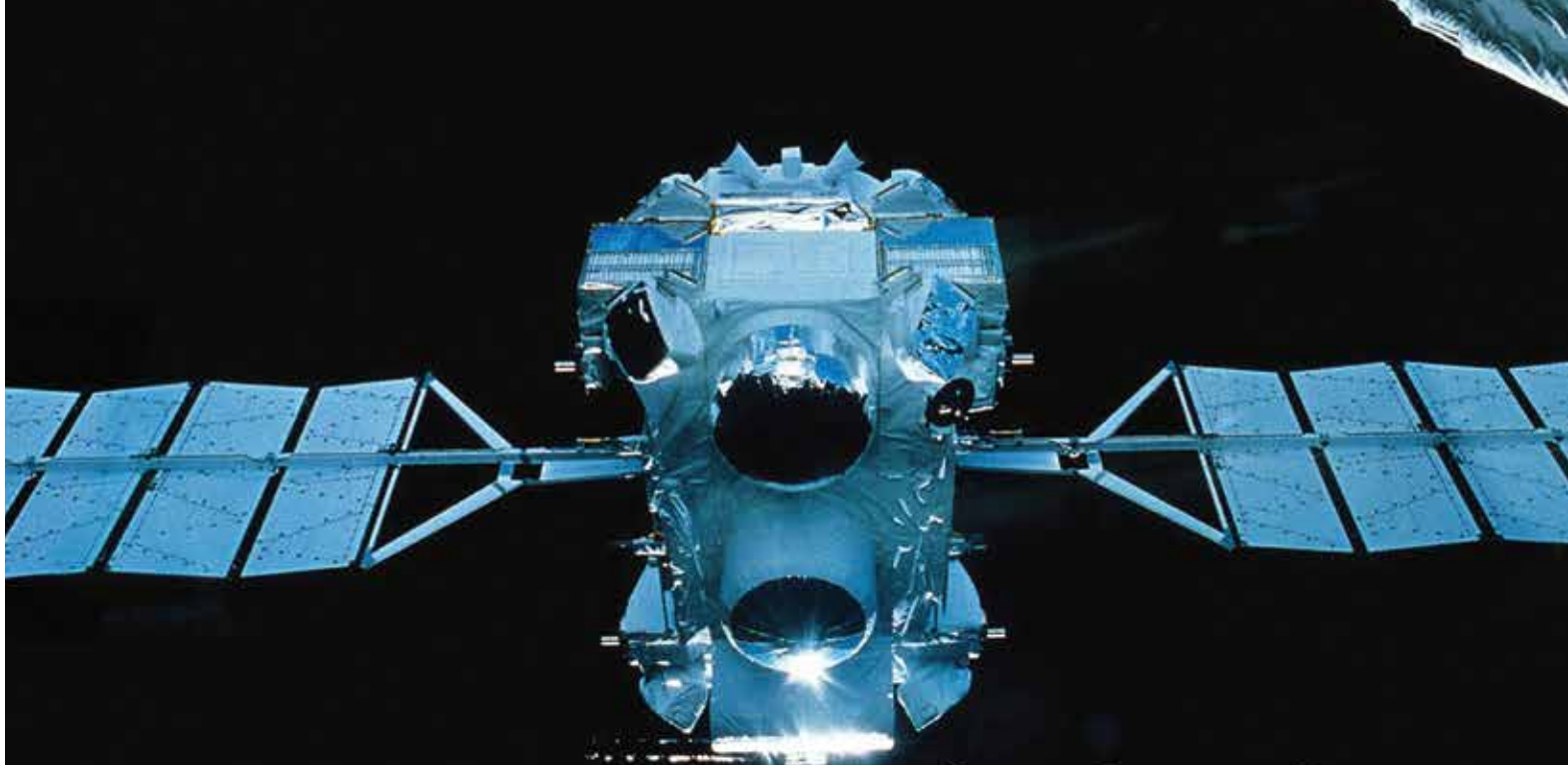
For the pilot project, MTN

Uganda will integrate the sites into the core network.

"Satellite services have been at the core of communications networks throughout Africa for decades, but too many people in rural areas remain unconnected," said Intelsat CEO, Stephen Spengler.

"We continue to improve the technology in space and throughout the delivery ecosystem to make it easier to access satellite connectivity. But simply improving technology is not enough to trigger the widespread expansion of networks. The entire telecommunications sector needs to make it simpler to integrate all technologies into a seamless network to truly overcome the challenges that network operators and governments face. New business models such as IntelsatOne Mobile Reach will solve the cost and deployment problems associated with reaching rural populations."

Patrick Masambu, Director General of ITSO added: "Our hope with this pilot project is that it will not only succeed at the Bufundi and Kibuku sites, but it could be expanded throughout Uganda and replicated in other ITSO member states. We plan to fund a training event that highlights the benefits of satellite technology in Uganda and invite other member states to witness the benefits this project on-site."



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IEC Telecom’s FlexiYacht launch wins maritime award from Thuraya

TECH AWARD

IEC Telecom Group received the ‘Best Performance Maritime Award’ at the 16th annual Thuraya Partner Conference, held in Dubai recently.

Speaking about the award, Nabil Ben Soussia, Managing Director at IEC Telecom Middle East said: “This award comes at a significant period in the maritime market, when the industry as a whole is evolving under the influence of fast-changing commercial and technological dynamics. IEC Telecom Group’s deep domain expertise and comprehensive solutions have helped Dubai’s maritime sector operate more efficiently and profitably in these changing environments.”

Changing economic and regulatory environments have a profound impact on the way in which the maritime industry operates. The Group works closely with Thuraya Telecommunications Company to offer state-of-the-art solutions for the maritime sector. Its long partnership resulted in the recent launch of FlexiYacht, an internet broadband solution designed specifically for leisure boats.



Nabil Ben Soussia of IEC Telecom says FlexiYacht addresses the technical and payment needs of end users.

Launched at the Dubai International Boat Show and powered by Thuraya’s compact Orion IP terminal, it can be set up even on the smallest yachts keeping them connected across Thuraya’s footprint that covers around 60% of the world’s maritime routes.

Based on the latest technology for fast, long-range access, this solution incorporates a full function Wi-Fi router as well as wired LAN and WAN ports. It also supports advanced filtration for smart and cost-effective consumption. The solution is manageable via an online account and is equipped with

advanced reporting tools. 24/7 technical support is also available.

The new solution allows users to select broadband bundles based on their consumption needs, with no lock-in monthly commitment. Data is offered in pre-paid packages of 1, 5 and 10 GB for a period of three, six or twelve months.

“We are the first company to offer yacht owners and operators a flexible and affordable internet solution providing connectivity across all seas between the Atlantic and Pacific oceans. Staying connected means that yachts will no

longer be limited to a leisure experience, they may also function as an office, a hotel or anything a customer needs them to be. We are proud to launch this solution in the UAE and moving forward, it will be available through all our IEC offices across the globe,” Soussia said.

The yachting industry has been one of the main pillars for the growth of Dubai’s maritime sector and has emerged as the main contributor to the emirate’s economic development.

Fahad Kahoor, Director of Market Development at Thuraya commented: “FlexiYachts is being introduced during an important time in the maritime sector where users are increasingly cost-conscious, and the need for quality data connectivity at affordable rates is of vital importance.”

Kahood added: “Thuraya’s maritime terminals, built by the best manufacturers in the world, undergo extensive testing to ensure they are highly reliable and robust to cope with the harsh maritime environment. This includes testing to IEC 60945 marine standards which make our terminals a ‘life line’ for those at sea.”

What portion of the world’s population will be connected for the World Cup?

CONNECTIVITY

As the FIFA World Cup kicks off on June 14 in Moscow, Inmarsat undertook a Connectivity World Cup survey to test what portion of the world’s population would be connected to the internet to watch the games. The survey was triggered by the International Telecommunications Union’s Connect 2020 Agenda, which aims for at least 50% of households in developing nations to have internet access in two years’ time.

Inmarsat analysed the proportion of households with internet access among participating nations in this summer’s football showcase.

“Somewhat surprisingly, it was Iceland who took the trophy, with an impressive 98% of its population online, closely followed by its Nordic neighbour Denmark (96%) and England in third position at 94%,” points out Phil Meyers, VP Capability and Innovation, Inmarsat Enterprise, in a recent blog he wrote about connectivity and how four billion people around the world still do not have connectivity.

“It has been surprising how some countries that are extremely competitive on the pitch haven’t matched this in terms of internet connectivity. Argentina might have won the World

Country	% of population online
Iceland	98%
Denmark	96%
England	94%
Japan	93%
South Korea	92%
Germany	89%
Switzerland	89%
Sweden	89%
Australia	88%
Belgium	86%
France	85%
Spain	80%
Russia	73%
Poland	73%
Saudi Arabia	73%
Croatia	72%
Portugal	70%
Argentina	70%
Serbia	67%
Uruguay	66%
Costa Rica	66%
Brazil	60%
Mexico	59%
Colombia	58%
Morocco	58%
Panama	54%
Iran	53%
Tunisia	49%
Peru	45%
Egypt	41%
Senegal	25%
Nigeria	25%

Source: International Telecommunications Union

Cup twice, but only has 70% of its population online, while Brazil has been a winner five times, yet 40% of its population remains offline. And the biggest surprise? The USA. It won’t even be at the finals this time around – its first

absence since 1986 – and has just 76% of its population online. At the other end of the scale, the poorest performing nations in terms of connectivity were Nigeria (25%), Senegal (25%), Egypt (41%) and Peru (45%).”

In a world where

connectivity is no longer a luxury, Meyers points out that “mobile satellite communications will play a significant role in closing the connectivity gap in the next few years”.

“High-throughput satellites, massive non-geostationary satellite orbit constellations and high altitude platform stations will bring pervasive, reliable, affordable connectivity to even the remotest regions.

“It is here that satellite connectivity can really be harnessed to help these countries feel less isolated and also deliver social and economic benefits. After all, fans are not only using a variety of devices such as tablets, phones and laptops to watch the games themselves, but also the power of connectivity to engage in the experience in real time, from apps to text a friend a score update to calling family back home to celebrate a win,” he pointed out.

Inmarsat is now working with the UK Space Agency and local governments to improve healthcare outcomes in Nigeria, by bringing connectivity to a number of remote clinics across the country through its BGAN voice and data service.

Inmarsat will be at ConneCTechAsia in a panel discussion titled Service Provider Panel: IoT, 5G & ROI on Day 1.

Saudi payload on Chinese satellite to facilitate further lunar exploration



LUNAR MISSION

Saudi engineers and researchers recently completed work on a payload for a Chinese lunar communications relay satellite that will explore the moon.

The satellite includes a payload with a small lunar optical imaging detector developed by Saudi engineers and researchers for filming and taking photos of the moon. The cooperation between Riyadh and Beijing follows a memorandum of understanding concluded between the two countries during the visit of the Custodian of the Two Holy Mosques, King Salman bin Abdulaziz Al Saud to China last year. This laid the foundation for cooperation with the Chinese Space Agency to explore the moon.

The payload was reportedly readied in a record time of 12 months during which

the Saudi research team faced numerous challenges, most prominent of which was the importance of manufacturing a compact payload with a high capacity of less than 10.5 cu.cm and a weight of 630 grams on the Chinese satellite.

Dr. Turki bin Saud bin Mohammed, President of King Abdulaziz City for Science and Technology, confirmed that Saudi Arabia's participation would boost its efforts to develop its satellite technologies and use it in several fields of reconnaissance and distance censoring as well as space telecommunications.

He said the payload consists of photographic and data processing, among others, that is not only light in weight but also able to endure the space environment. The equipment is designed to take photos of the moon from different angles and altitudes with accuracy.

He added that a specialised team of Saudi engineers and researchers contributed to the designing and manufacturing of the lunar filming payload system at the city's labs.

SES reaches 11m Nigerian TV homes

RESEARCH

Satellite operator, SES, has increased its technical reach in Nigeria to more than 11m TV homes in 2017, up from 3m in 2015, according to Satellite Monitor, based on a market study commissioned by SES. The Satellite Monitor results reveal 3.5m of the 11m homes are directly served by its satellite fleet – a twofold increase compared to 2015. SES now directly serves 37% of satellite TV homes in Nigeria.

Digital Terrestrial Television (DTT) homes fed indirectly by SES also contributed to the increased reach. The prime orbital position at 28.2 degrees East was reportedly a key driver for the growth of SES'

direct reach, with 3m TV homes directly served via this orbital slot, up from 1.3m in 2015. This video position hosts SES' free-to-air TV platform for Nigeria, giving broadcasters access to the highest technical reach in West Africa. The growth of SES' reach was also driven by direct satellite broadcasting and feeding DTT head-ends via five degrees East.

The report states there are a total of 35m TV homes in Nigeria, of which close to 10m are served by satellite, and the rest are served by terrestrial networks. The penetration of digital TV has expanded to 25m homes receiving digital TV signals, which represents 35% growth compared to 2015.

Satellite operators sign agreements to support global disaster relief

CRISIS CONNECTIVITY

Members of the satellite community have signed contribution agreements with the United Nations World Food Programme (WFP), on behalf of the Emergency Telecommunications Cluster (ETC), to support global disaster relief. These agreements are the final steps in operationalising the Crisis Connectivity Charter signed in late 2015 between the EMEA Satellite Operators Association (ESOA), the Global VSAT Forum (GVF), the UN Office for Coordination of Humanitarian Aid (OCHA)

and the ETC. The charter, signed by Eutelsat, Arabsat, Global Eagle, Hispasat, Inmarsat, Intelsat, SES, Thuraya and Yahsat, will help the humanitarian community by enhancing their access to satellite-based communications when local networks are affected.

Under the charter, the signatories commit equipment and capacity for emergency responses. The charter enables ETC to identify which pre-planned solutions are immediately available for any given region to meet a 24-hour deployment timeline following a crisis.

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BREAKING INTO AFRICA

With a reach of more than 10m households across Tunisia, Algeria and Morocco, COO of Yahlive, Ammar Baranbo, explains, in conversation with SatellitePro ME, that the company's focus on serving culturally diverse communities, above and beyond just selling satellite capacity, is working



The journey from a zero-customer base in 2015 to more than 10m Maghreb households in just

two years in the face of entrenched competition is nothing short of phenomenal. According to SES' annual market research, Satellite Monitor, Yahlive at 52.5° East now serves 64% of households in Algeria, 51% of households in Tunisia, and 58% of households in Morocco.

Yahlive's Chief Operating Officer, Ammar Baranbo, attributes the exponential growth to one word: communities. He presented a detailed report of the survey at the recently concluded Arab States Broadcasting Union's Radio and TV Festival held in Tunis.

Speaking to *SatellitePro ME* on his return, he elaborates: "Yahlive is in the business of serving communities, generally defined as a social grouping that shares common norms, values, identity, and often a sense of place that is situated in a given geographical area. This central mission permeates everything we at Yahlive do; from establishing partnerships with broadcasters to communicating with viewers and understanding their requirements and preferences. Similarly, in North Africa – also known as the Arabian Maghreb – we targeted communities by bringing them the content they want.

"FTA DTH is the most prominent platform across all three countries, and the countries share the same interest in languages and content including French language content and sports."

Yahlive launched its first bouquet of Arabian Maghreb channels in November 2015, with 43 Algerian channels. Today, Yahlive serves this community with more than 160 Arabic and French channels, of which 115 are only available on Yahlive.

The focus on sports, movies

and news, combined with image quality offered by Yahsat's Al Yah 1 satellite, makes Yahlive a compelling proposition for its customers and viewers, Baranbo claims. "One of the reasons we focused on these three countries since 2015 is the relatively large populations that is significantly young and is eager for new content. Most importantly, 97% of that content comes through satellite."

Recounting Yahlive's growth trajectory since inception, Baranbo says: "Yahlive launched its broadcasting services in 2011. Today, Yahlive broadcasts more than 400 TV and radio channels to more than 26m households across Southwest Asia and MENA, targeting various culturally diverse communities. The numbers – which have been concluded by global reputable research companies – speak for themselves.

"In the Farsi market, the number of dishes pointing to 52.5° East have been exponentially growing year after year from 6m households by the end of 2014, to more than 16m households by the end of 2017 – according to IPSOS Connect – with a market share of 45% of the Farsi speaking community living in Iran, Afghanistan, GCC, and Tajikistan. The same strategy was applied in the Arabian Maghreb, by which Yahlive signed its first agreement with 43 TV channels in November 2015. By the end of 2017, according to global market research and information group Kantar TNS, Yahlive had a reach of more than 10m households across Tunisia, Algeria, and Morocco, with more than 100 channels."

Elaborating on the region, Baranbo states: "The Arabian Maghreb TV market continues to expand and satellite remains the first choice for viewers. The Arabian Maghreb – specifically Tunisia, Morocco, and Algeria – has a population of over 85m, of

which 97% are satellite homes. Out of those, there are more than 8m HDTV homes, with Algeria having the highest penetrations of the three countries. Advertising expenditure is also very high according to media agencies, with TV accounting for more than 40%. Morocco is the largest advertising marketing in North Africa, followed by Algeria.”

The Maghreb especially Tunisia, Algeria and Morocco, has been a fertile ground for satellite television since early 2000. With a restless youthful population looking for content beyond what the state channels offered, there was what one expert described as an “international stampede to the video marketplace of ideas” in the Maghreb and larger Arab world. While selling capacity for a satellite operator over the Maghreb may not have been a big challenge, creating stickiness with viewers would have been an uphill battle.

Baranbo credits three factors

“ In addition to TV advertising, PR and installer workshops, we are extremely active on social media and use this platform as a means to engage directly with our viewers in the region”

Ammar Baranbo, Chief Operating Officer, Yahlive

that aided Yahlive’s growth in the region. “The bouquet we created there, the strategy, and the on-ground partnerships — all of these resulted in the successful penetration of the market. We were keen to have exclusive channels on our satellite not offered anywhere else. Moreover, we complimented our bouquet with channels or a group of channels that were not from the Maghreb, but top rated

globally and highly requested by our viewers. In that sense we kept our offering unique.”

In 2016, in addition to the 57 channels on the bouquet, Yahlive offered a line-up of entertainment and local channels as well as international channels including France 24, BBC Arabic, Abu Dhabi TV, Abu Dhabi Drama, Abu Dhabi Sports 1 & 2, National Geographic Abu Dhabi and Fashion 4K.

Describing the chain of partners and local partners as intricate and vital to their success, he says: “Our strategy across all our markets is to work with local partners who understand the market needs and requirements to better serve our customers and the viewers in each community. “We work closely with our local partners creating targeted TV channel offerings for our viewers. It is not just about signing contracts and leaving them. We support them and facilitate their work through marketing and training for local dish installers. During our training sessions we sense a huge amount of interest from the installers who are on the ground selling satellite dishes because they see potential in the content we offer, which in turn increases their sales.”

With Eutelsat in the region since 1967 followed by Nilesat, Arabsat and Noorsat, it would be fair to say Yahlive was joining a crowded field in 2015.

On the strategies deployed to stand out from the crowd, Baranbo says: “Social media usage in the Arabian Maghreb is very high with more than 90% of the population using Facebook and WhatsApp. Hence, in addition to TV advertising, PR and installer workshops, we are extremely active on social media and use this platform as a means to engage directly with our viewers in the region. In March 2018, we launched a mini survey by collecting a sample of 800 viewers to enquire

about Yahlive viewership in support of the Kantar TNS study. More than 50% responded saying that they watch Yahlive. Additionally, we were able, through such surveys, to better understand our target audience and bring them the channels they want.”

Technology, according to Baranbo, is ultimately at the heart of the Yahlive experience. Yahlive, headquartered in Abu Dhabi in the United Arab Emirates, was launched in 2011 as a joint venture between global satellite operator SES and Yahsat, a UAE-based satellite operator. Yahlive provides its capacity via Yahsat’s Al Yah 1 satellite, which provides a powerful signal, using a small dish and uninterrupted reception, which makes it high quality at an affordable price. The association with SES has enabled Yahlive to drive new technology in the region including launching in 2016 its first free-to-air 4K channel, Fashion One 4K, in the MENA region.

Baranbo elaborates: “We don’t just sell capacity. Our services range from uplink to playout, in addition to many more, and are provided when needed to support our customers.

On the future looming with the prospects of better fiber connectivity in these countries and the impending arrival of 5G, Baranbo sounds optimistic.

“I do not see these developments as a threat to our services. We are already aligning ourselves and creating new synergies with the new technologies and we see ourselves complementing other services, not competing,” he says.

Baranbo’s team is now looking to replicate the Maghreb and Farsi success elsewhere with the continued focus on targeted viewing communities.

We are looking at enhancing our offerings in the communities that we service as well as looking at other



We don't just sell capacity ... we support our partners with a whole range of services, says Ammar Baranbo, COO, Yahlive.

“ One of the reasons we focused on these three countries since 2015 is the relatively large population that is significantly young and is eager for new content”

Ammar Baranbo, Chief Operating Officer, Yahlive

communities within the reach of our coverage areas.

Going forward in the Maghreb, Baranbo believes the market will only expand given the appetite for new content.

On what has surprised him most about their presence in Algeria, Tunisia and Morocco, Baranbo says: “What has surprised me is the immense potential these countries have, the adaptability to new offerings and the awareness

and passion for the broadcast industry. For example, any channel additions or drops we have, we immediately see high engagement on social media.”

The journey to achieving considerable market share in the Maghreb was not easy, Baranbo admits. “We were patient and were always present on the ground studying the channels that had appeal, monitoring the market and following up with our partners.” **PRO**



A MENA-based training session in progress with service providers.

SMALL SATELLITES MOVE INTO SPOTLIGHT

Increasing demand for cheaper connectivity and imaging requirements have put small-satellite players and related businesses on the map with an estimated 11,631 launch demands predicted by 2030, according to Frost & Sullivan. The firm's analysts, Vivek Suresh Prasad and Arun Kumar discuss the drivers and the challenges in this sector with Vijaya Cherian



By 2030, there will be an estimated 11,631 launch demands for new constellation

installations and replacement missions, which could take the market past the \$62 billion mark, according to a report by Frost & Sullivan titled *Small-satellite Launch Services Market, Quarterly Update Q1 2018, Forecast to 2030*. This surge in launch demand has been attributed to the evolution of small satellites from being mere technology demonstrators to providers of low-cost operational services across distributed industry segments. As the lifespan of these satellites is between two and five years, there will be constant launch demand and



While North American and European companies are leading in this sector, APAC players are also looking to follow suit, says Vivek Prasad from Frost & Sullivan.

participants will look to enhance their systems and infrastructure.

"While North American and European companies will be the leading developers of flexible,

dedicated launch vehicles, players in Asia-Pacific are looking to follow suit," says Vivek Suresh Prasad, Space Industry Principal, Aerospace & Defense, speaking about the report, which is part of Frost & Sullivan's global space Growth Partnership Service programme.

"Many players are also analysing the feasibility of the small satellite spaceport business model to provide dedicated launch services to small satellite operators."

The analyst points out that at present, more than 30 commercial operators are already building their own constellations.

"Most of the commercial players including SpaceX, planning to launch their small satellites constellation, are in the development phase. Currently,

these companies are launching their experimental missions in small batches. These companies will generate the demand for small satellite launch services for their constellation installation and replacement missions. At present, only Planet and Spire Global have advanced in installing their low earth orbit small satellites, with Planet realising 100% of their in-orbit planned constellation and Spire Global realising 60%. Launch services demand will primarily be generated from the US and European region, as most of the commercial operators are from these regions," says Prasad.

One of the main reasons why small satellites have become especially attractive is because they are cheaper to deploy, cost

significantly less than their high-end predecessors and are able to provide cheaper services and solutions to the market.

"You may find, for instance, that small satellites are not able to provide very high-resolution imagery but the end user does not require such high-quality images for urban planning and town infrastructure or forestry. So, while the images from small satellites may not exactly match the capabilities of bigger satellites, some applications do not require images in high resolution," explains Arun Kumar Sampathkumar, Team Leader, Aerospace & Defense at Frost & Sullivan.

Kumar explains that the story of small satellites began around eight years ago, when everyone was

thinking of how they could gather much more data in a Sensor-agnostic mode. He points out that imagery-based intelligence has given this industry a huge boost.

"The small satellite players plan to provide end-to-end solutions to the customers and hence, are calling themselves intelligence providers. Historically, big-satellite operators held the unique position of running the upstream side of the business. Small satellites are now enabling the value chain expansion from both ends. Small satellite manufacturers are planning to launch their own satellites and offer satellite as a service. Also, satellite operators are building their own satellites in order to offer low-cost downstream services."

The analyst's report studies the demand for small satellite launch based on operators' maturity, mass classes, and user segments. It forecasts the number of small satellites, payload mass, and launch revenue based on defined scenarios.

The high volume of launch demand for small satellites is driving launch service providers to increase their launch capacity. The current rideshare capacity is insufficient to meet the upcoming launch demand. Most small satellites use the rideshare capacity as a secondary payload on existing launches. This makes their project schedule and mission requirements dependent on the primary payload. Many incumbent and emerging commercial operators are preparing for the impending capacity expansion by providing dedicated services and launch flexibility to small satellite operators. Once these unit shipment needs are met, the market could grow impressively.

The report outlines a number of significant numbers. For instance, the total projected launch capacity supply, including the success of multiple dedicated planned launch

services, is 11,631 small satellites. In this case, a total payload mass of 2,473 tonnes can be potentially launched. Small satellites in the mass segments of 0 to 15 Kg and 150 to 500 Kg could account for as much as 65% of the small satellite launch demand. 32 small satellite commercial operators will generate more than 90% of the launch demand.

Overall, significant market opportunities will be created by high-volume subsystem demand, dedicated launch services for small satellites, capacity expansion of ground station services, and standard platforms for downstream services.

“The key to resolving production challenges is to standardise, optimise and deploy low-rate serial production lines for small satellites and the launch hardware for the relevant launch vehicles,” notes Prasad, adding that the small satellite market is not without its challenges but they also serve as huge commercial opportunities to the market.

He points out, for instance, that the short life span of two to five years for a small satellite means it needs to be continuously replaced.

“Planet, for instance, has 150 satellites which means to keep the whole constellation live continuously, they have to launch 60 to 70 satellites every year. You then need a manufacturing setup that provides satellites with lower lead times. At present, the waiting period for any launch service is between six months and two years and to maintain a whole constellation, you need faster on-demand launch services. Several dedicated small satellite rockets will have to come into the picture to cater to this demand.”

He adds that ground station infrastructure needs to simultaneously evolve to meet the increasing demand for small



Although small satellites may not be able to match the high-res imagery provided by larger satellites, they are often sufficient for urban planning and forestry requirements, says Arun Kumar.

satellite launches. “With real time imagery and seamless global connectivity, you are talking about satellites being connected to the ground station all the time. The present ground station infrastructure is not enough to cater to this demand. Incumbent ground station operators and small satellite players are all expanding their ground station infrastructure, on the one hand. On the other hand, we see an evolving service that we have called the uberisation of ground stations.

“RBC Signals and Infostellar have launched a web platform, where ground station operators can post their idle time so that those who need it can access it for a fee.”

Kumar explains further that being in touch with ground stations globally ensures a steady stream of satellite imagery even when one’s satellite goes beyond one’s own point of view, because another satellite picks up the image and shares it.

“This way, we ensure a steady stream of real time imagery.”

Added to this, spectrum and interference issues have cropped up with small satellites, he points out.

“Small satellite operators are operating from low-earth orbit so they will not be operating at

the same power. But it is to be confirmed whether there will be interference. The regulatory framework for this is still evolving as they need to include new players along with the existing ones.”

While some would think that the small satellite players have brought in competition for the geostationary players, the latter have quickly realised that the former offers complementary rather than competitive services.

“There is some overlap but when you go to the low-res imagery segment, the overlap is very small.

“Small satellite players operate in lower earth orbit, which the big boys don’t cover. This means the small satellites are able to go around multiple times, making the frequency of global data updates significantly higher and creating greater opportunity for real time imagery intelligence. Realising their potential, a number of big players have invested in small satellite companies,” explains Kumar, who cites DigitalGlobe as working with Saudi Arabia’s King Abdulaziz City for Science and Technology since 2016 to build, integrate and launch six or more small satellites to collect imagery with a resolution of 80 cm. Similarly, he cites Intelsat as having a 20% stake in Oneweb, a small satellite operator planning to launch 720 satellites for affordable global connectivity.

“Big satellite players are consciously investing in small satellite businesses to ensure that they can offer a mix of big and small price services especially in terms of imaging and communication services.”

Prasad adds that big satellites tend to have a lifespan of 10 to 15 years, while a lot of the downstream technology is evolving rapidly and as small satellites have a smaller mission life, there is greater flexibility to update them more frequently. **PRO**



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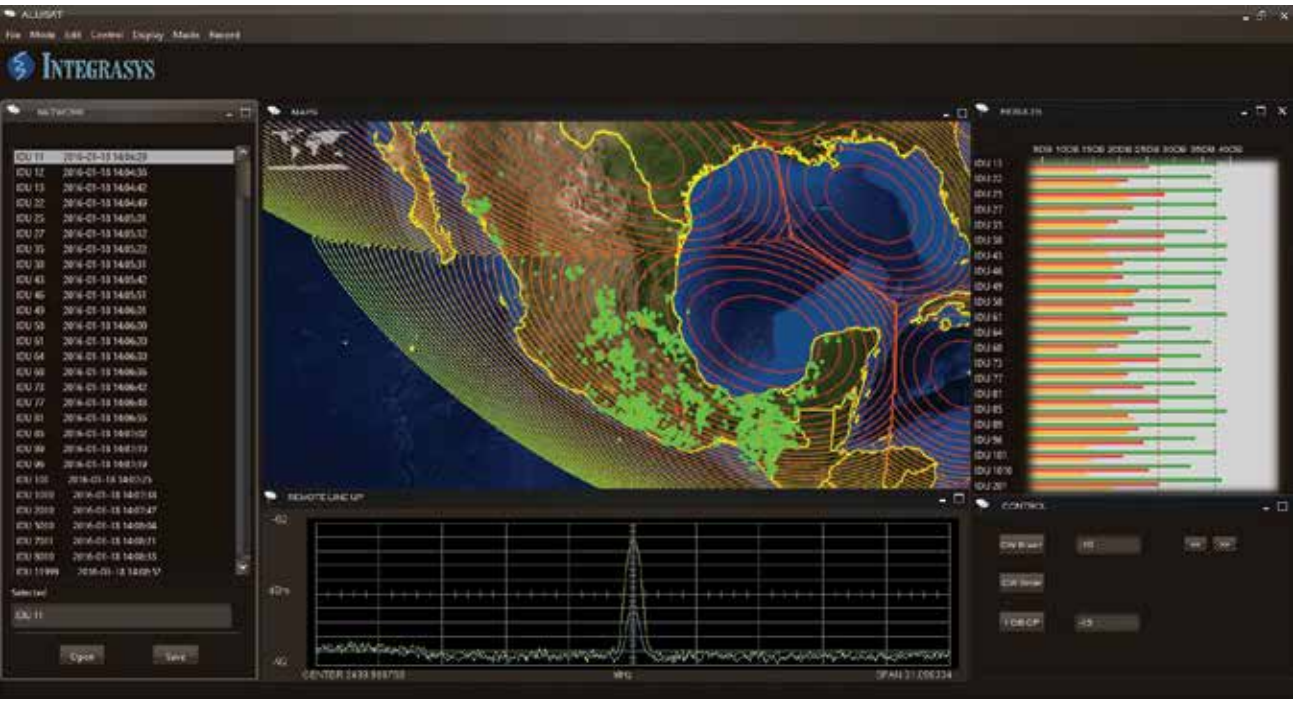
As demand for comms-on-the-move rises exponentially, Alvaro Sanchez of Integrasys lauds the array of LEO constellations while acknowledging the challenges of providing a consistent service



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

Demanding a Constant Connection
Comms on the move has always been crucial for a number of applications. For example, in the cruise industry it enables passengers to access their social media applications and OTT content, on any device. Satellite provides the best and unique communication method where no other communication network will reach. Hundreds of Mbs are being delivered per second in a reliable way to hundreds of cruises today. In a very similar manner, other maritime vessels are also connected, such as traditional shipping vessels and even yachts, a market that is currently booming.

The aero industry has for some time been another big user of comms on the move, both for commercial and cargo planes. Again, no other communication method could keep a plane connected throughout its journey. This has always been important, keeping the crew connected for important information, relating to weather and cockpit updates



among other things. However, the constantly connected consumer is making it even more crucial for commercial aircraft to also supply a connection for customers.

Consumers are used to always being online and rely on broadband connections for pretty much everything in their daily life. For a consumer on board a plane, whether that be an international or regional flight, whether that be a low cost or a flagship airline, today it has become a must have. There is an expectation that will continue on board, with very little consideration for the technical challenges of ensuring that.

This demand is set to continue at a fast pace over the coming months and years and will extend beyond just those areas. For example, we will see an increasing appetite for connected cars will begin to emerge into the market. Of course, keeping a car connected presents all the same challenges of other comms on the move applications, with the added complication that a consumer will

simply not want to, or know how to, troubleshoot any connection errors. Comms on the move will simply have to work, all the time, and be able to self-diagnose when there is a problem, without the need for any human intervention. Just imagine for a minute, that you bought the connected car of your dreams, and after couple of months you take it for a drive on a nice road, when a light on the dashboard shows it needs to go to the garage to repair and update the VSAT unit. Could you imagine the mechanic doing an update or troubleshooting the IDU or ODU or any IP? Most likely, this would be a disaster. Therefore, we need to take all measures to make it as robust as it could be, ensuring 99,99% availability and being able to maintain & test remotely.

Challenges on the Move

The technical challenges of ensuring constant communications on the move are not insignificant. The very nature of constantly moving makes maintaining a fix

on the satellite challenging. It is all too easy to lose that alignment, or calibration, point to the wrong satellite, or lose the return link completely. Add to that the possibility of changing weather conditions and temperature on a journey, which can affect the satellite connection, and customer satisfaction.

At the same time, in the comms-on-the-move environment, the terminal has to be as small as possible. Nowadays, we are talking about few inches and cm, as the smaller the unit, the cheaper to manufacture, transport and deploy. With consumer applications such as connected cars, space will be even more limited. Meaning ever smaller terminals have to achieve what bigger terminals even have challenges with. Therefore, for our industry to survive, we need to ensure the very best performance from the smallest of terminals. We already have the situation in existing applications where the people tasked with looking after the satellite equipment are often

not trained in satellite technology, imagine if the Tx beam is even wider. As we see consumer applications emerge, many people won't even realise it is satellite technology, so we need to automate even faster and further for these markets.

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

The Promise of LEO

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

These new constellations will come with their own set of challenges. One of the major concerns for the industry is the pure volume of constellations, which many fear will cause massive interferences with GEO. In our view, it does not need to be like that as long as we ensure the right tools are used. The other problem is that the nature of these means the process of connecting

There is a growing need for automated tools ... systems need to be able to self-diagnose as much as possible, flagging up any errors and even potentially fixing them remotely"

Alvaro Sanchez, GM, Integrasys

to the satellite is not as simple as in GEO where you lock onto the satellite and it doesn't move (correlated to earth coordinates), but with LEO the movement of the satellites with respect of the earth makes this all the more complicated.

How do we keep comms, on the move?

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

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

potentially fixing them remotely.

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

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



Alvaro Sanchez is General Manager of Integrasys

UAE SPACE AGENCY ADVISORY COMMITTEE DISCUSSES NATIONAL SPACE PROJECTS



The UAE Space Agency Advisory Committee commenced its third annual meeting

in Abu Dhabi to discuss the latest developments in the national space sector. The Committee also discussed current and future space projects along with methods of further developing the sector's capabilities with regards to scientific research, space technology and human capacity.

The meeting was chaired by His Excellency Dr. Ahmad Belhoul Al Falasi, Minister of State for Higher Education and Advanced Skills, and Chairman of the UAE Space

Agency. He was joined by Dr. Eng. Mohammed Nasser Al Ahbabi, Director General of the UAE Space Agency, and a number of officials, administrators and engineers.

Among members who attended the UAE Space Agency's Advisory Committee were Jean-Jacques Dordain, Former Director General of European Space Agency; Charles F. Bolden Jr., Former NASA Administrator; Koppillil Radhakrishnan, Former Chairman of the Indian Space Research Organisation (ISRO) and Honorary Distinguished Advisor at the Department of Space/ISRO; and other key people from Korea Aerospace Research Institute; Japan and Russia.

H.E. Eng. Mohammed Al Ahbabi briefed the committee on the Agency's latest developments and the current status of the national space sector. His Excellency spoke about the Emirates Mars Mission, the Mars 2117 project, Mars Scientific City and the UAE Astronaut Programme. The briefing also included a discussion on the nation's future manned space missions, means of further developing space science research capabilities, and enhancing international partnerships and collaboration.

Speaking on the sidelines of the meeting, H.E. Dr. Ahmad Belhoul Al Falasi said: "The UAE Space Agency is working to facilitate the exchange of knowledge through

The current international regulations were set in the 60s when there were only two super powers. Space has evolved hugely since then with more actors, more satellites and more applications. The international laws have to be revisited ... the best way to make international regulations is to start with national regulations and I'm glad there are more activities to develop national space regulations here in the UAE. **Jean-Jacques Dordain, Former Director General, ESA**



cooperation with the world's leading space agencies and organisations. The committee members here today have been chosen in view of their extensive knowledge and wide experience in the space sector. Through these meetings, we aim to strengthen our ambitious national space projects and ensure they are implemented in accordance with the highest international standards, in order to cement the UAE's position as a leading space-faring nation.

"Our Advisory Committee members have far-reaching experience in leading global space projects, drafting space legislation and laws, and supporting space science and scientific research. The Committee includes former astronauts who have spent long periods of time in outer space or have participated in a number of manned space missions and other missions to the International Space Station." **PRO**

The UAE Space Agency Advisory Committee has ten members, including scientists, experts, and heads of space agencies, who come annually to discuss our long-term plan and provide advice and guidelines. Space is a new domain in our region and the UAE is a pioneer in this space. We are using our space programmes to inspire, educate, train and engage with our youth. Together with our own ambitious space programme — including the UAE Astronaut Programme, the Mars Hope Probe launch in 2020, the opening of Mars Scientific City in 2021, and our long-term plan to establish a settlement on Mars by 2117 — we are inspiring a new generation of Arab space scientists and scholars. In the context of regional instability and uncertainty, we believe that our emerging regional space sector collaboration will provide hope, meaning and opportunity for the next generation. **HE Dr. Eng. Mohammed Nasser Al Ahbabi, Director General of the UAE Space Agency**



I'm excited about the coming launch of the Hope Mission, which will supplement the work that is already going on between the US and India looking at the Martian atmosphere. This will give the UAE an opportunity to become part of a team that is helping us to understand more thoroughly and fully the Martian atmosphere and that's a great example of how the UAE can fit into the international community when it comes to space exploration.

There are several technical challenges that seem minor at the moment and one of them is propulsion. Going to Mars today is an eight-month mission ... that's too long. Eventually, it must become a matter of days. That means major demands on propulsion to what we are doing today ... maybe get away from chemical

propulsion and identify other better technologies. The average age of people at the UAE Space Agency is the 30s while the average age at our agencies is perhaps the upper 50s. When you have a young population, you get fresh ideas from young people who think differently and are more likely to think of a way to speed up the transportation from what it is today. My recommendation to the UAE is to push into the international space community and become part of any international exploration group. Recently, around 25 nations put together the latest version of the global exploration roadmap and the UAE was a member of that team. Being there means you can make sure that your efforts are counted into the international milestones chart. **Charles Frank Bolden, Jr., Former NASA Administrator**

MAKING 5G A REALITY WITH SATELLITES

Low earth orbit (LEO) satellites have been touted as the answer to the world's increasing need for more connectivity. SatellitePro talks to Ronald van der Breggen, Chief Commercial Officer of LeoSat Enterprises about the opportunities for satellite, particularly the new LEO satellite systems, in developing 5G networks



With data traffic predicted to increase four-fold by 2020 to four ZB per year,

one of the key challenges for the mobility sector is achieving scalable, flexible solutions for their expanding networks. Backhaul for mobile networks is crucial to ensure speed and capacity for data transportation from distributed network sites to the network core. Now with the new developments in satellite constellations, next generation low earth orbit systems claim they can provide the guaranteed level of connectivity, resilience and security required by 5G for significant sectors of industry.

How do you see the development of 5G networks?

5G is set to radically transform our lives and major network architecture changes are already taking place to accompany this shift. Traditionally, telecom networks use satellite services to extend coverage into more remote areas – where connectivity with local or international carriers isn't available. However, as bandwidth demand increases and technology in the areas of microwave solutions, optical fiber and satellites further develops, telecom operators are now evaluating alternative solutions.

With the ever-increasing demand for data, from enterprise, end-users and now increasingly by devices, it's not just bandwidth that is required, but there is a new element – the demand for density. Mobile Network Operators (MNOs) have been at the forefront of these developments in the past decade and their requirements have grown significantly as a result, with low latency rapidly becoming key.

With the first steps toward 4G predominantly driven by the need for data applications and video services on mobile devices, moving to 5G is largely driven by the need to connect more devices in support of IoT and with that, mission critical networks and requirements for command and control for remote sites, thus fueling the need for low latency.

We see the move towards 5G signifying a trend that mobile networks are becoming more and more an extension of the wide area and local area networks that are in use today. After all, it is not only about adding more users and supporting more data applications on more devices, it is increasingly about developing enterprise grade services and an expectation that its performance will be as good or better when compared to its wired equivalents.

What are the opportunities for satellite operators?

MNOs are preparing to upgrade their networks to the new 5G standards, including the set-up of pilot sites with suppliers to test the capabilities and promote them to their customers. New features in the 5G standard, however, make this a larger endeavour than before. More use cases and service types need to be developed and tested in support of high-speed, fast moving customers as well as servicing dense footprints with many IoT devices.

For satellite operators, ideally positioned as a “network of networks” service provider, these developments provide a clear opportunity to expand their backhaul services and adopt the technology to seamlessly integrate these mobile networks into terrestrial network configurations. All this supports the business case to proceed with expanding the HTS capacity in space.



Ronald van der Breggen.

What gives LEO operators an advantage over traditional players when it comes to 5G?

First of all, it provides them with a unique opportunity to position their services characterised by very low latency. Their lower orbits put them in a unique position within the mobile 5G developments, where low latency is at the very heart of the new standards development. Secondly, in leveraging these low latency capabilities, there seem to be different go-to-market approaches among LEO operators. Some are looking to provide 5G services directly to end customers in a business model to “Connect the Unconnected”. Others envision a reseller model, supporting terrestrial and mobile telecom operators in expanding their infrastructure into maritime or more remote areas.

On the technical side, there are a number of initiatives to bring players closer together in developing the satellite infrastructure aspect of 5G. In Europe, the European Space Agency (ESA) has set up a satellite industry working group to develop a stronger integration of 5G between terrestrial and satellite telecom operators. Through the “Satellite for 5G Initiative”, ESA and the European space industry are joining forces to develop and showcase the added value that satellite brings in the context of 5G. They will collaborate on 5G service trials using satellite, with a focus on those vertical sectors for which 5G will be highly relevant, such as transport, media & entertainment, and public safety. While focusing on these markets, there are activities in the areas of application development, standardisation, resource management, interoperability and other supporting technologies.

As such, the ESA-led initiative supports a seamless integration of

“5G is promising ubiquity, high throughput, high density (where needed) and low latency. Not all aspects can be offered through existing infrastructure and, therefore, a network of networks is not merely an option to facilitate the roll-out of 5G; it will become a requirement”

Ronald van der Breggen, CCO, LeoSat Enterprises

satellite and terrestrial networks as an integral part of the 5G system.

How does satellite fit into the 5G ecosystem?

One significant bit is backhaul for telecom operators. Expanding MNOs’ service area into territories where terrestrial services are not available will continue to be an important use case in the 5G area. These requirements for mobile backhauling will continue to increase as the 5G platform is expected to carry a lot more traffic than 3G and 4G. Current

satellite technology focusing on higher throughput (HTS) and/or lower latency (MEO/LEO constellations) are better suited to address this requirement than traditional satellites.

The other element is public safety or red- and blue-light service operators, who have traditionally operated with voice-based communication systems and narrowband data services. However, it has become evident that these operators are able to provide a much better service level and are able to respond faster using high speed broadband data services and applications. These requirements are starting to come to the forefront and we’re already seeing national procurement/implementation projects active in this area.

There there is communications on the move. Cruise vessels, aircraft and trains offer WiFi services to their customers to satisfy their requirement for connectivity. For remote, maritime or scarcely populated areas, satellite services are one of few, if not the only platform that can provide these services. 5G will not only bring the required additional bandwidth, but with low latency features, more applications can be supported and all devices can be operated as part of a network with similar performance characteristics to a wired equivalent.

Cars also have their own specific use case. On board entertainment, remote monitoring and control, and remote updates for maintenance purposes are similar compared to other transportation use cases. What is very different though is the advent of the driverless car. Those applications will come with higher-priority requirements, possibly requiring the use of a much larger seamless network beyond the size of a traditional 5G network. For satellite as a

“network of networks”, this may create an opportunity to combine its global reach with its technical attributes regarding throughput and in the case of LEO, latency.

How will satellite support the rollout of the new 5G infrastructure?

5G is promising ubiquity, high throughput, high density (where needed) and low latency. Not all aspects can be offered through existing infrastructure and, therefore, a network of networks is not merely an option to facilitate the roll-out of 5G; it will become a requirement.

As such, satellite operators can support the roll out of 5G in many ways. The one that has always been at the forefront is satellites’ ability to cover large territories and cover water. In being able to do that, satellite can clearly support MNOs in expanding their footprint. With the advent of 5G and new satellite systems at the same time, there is now both the requirement and the option to bring more value to the MNO: more capacity and, in the case of LEO, much lower latency – both desperately required by 5G.

As much as these developments are underway via the expansion of HTS satellites and the new capabilities offered through LEO constellations, there is an additional aspect that is worth a closer look: the integration of all space elements with terrestrial infrastructure. A critical component of that integration is the satellite ground segment. To be able to bring the services to the customers, there is a need to continue to develop that equipment, particularly in the area of antenna systems. Flat panel, phased array antennas (FPAs) are widely recognised as the preferred solution. Lacking any moving parts and its software-based installation process are both helping to bring down the

operational costs. The industry is working very hard to also bring down the price of these FPAs such that the total cost of ownership of these systems is competitive with traditional antenna systems. An added advantage in using these FPAs is the ability to integrate a lot of hardware and software into these systems, facilitating ‘self-installation’, but also allowing it to be much better integrated with terrestrial infrastructure.

Based on these advantages and due to their more elegant form factor and improved performance capabilities presented by some manufacturers, the terrestrial telecom providers are looking to use these systems to increase the capacity to end users and cut down significantly on implementation time, relative to a roll-out of terrestrial infrastructure. In the transportation use case, the FPAs’ form factor allow for a much better integration with the car, train, cruise ship and particularly aircraft. Lastly, from a LEO/MEO perspective, the FPAs provide a

robust platform that is easier to install and maintain and is expected to be economically much more attractive than the traditional dual steerable antenna systems.

What does the future hold?

5G promises a next generation architecture where the end customer will benefit from higher throughput and access to more services in more places. Not all of that can be provided by terrestrial networking and a single network type. Satellite can play a key role in the development of 5G, provided it does a better job in seamlessly integrating its satellite services into these developments, with a focus on protocols, latency and capacity. Successfully doing so will vastly expand the number of locations where 5G can be offered and reduce the time to deployment. Those operating in this space will be able to provide connectivity, resilience and security required by 5G for significant sectors of the industry, offering a clear path for telecom operators in search of growth. **PRO**



CONNECTECHASIA GEARS UP TO ADDRESS ASIA'S DIGITAL REVOLUTION

At ConneTechAsia 2018, thought-leaders, influencers and decision makers will showcase cutting-edge responses to the converging worlds of telecommunications, broadcasting and emerging technologies



ConneTechAsia, which combines the strengths of CommunicAsia, BroadcastAsia, and the newly launched NXTAsia, will stage its inaugural edition from 26-28 June 2018, in Singapore.

CommunicAsia and BroadcastAsia have thus far served the telecommunications and broadcast media sectors respectively for nearly 40 years. The new NXTAsia will build upon this to bring new technologies that are shaping Asia's increasingly innovation-driven economy. ConneTechAsia will present a holistic ecosystem of infrastructure, technology, and services that businesses and

governments in Asia need to thrive in this new era.

"As Asia pursues digital transformation at an accelerated pace, it is critical that the event evolves alongside the dramatic shifts happening in the spaces we serve," said Victor Wong, Project Director, UBM, organiser of ConneTechAsia.

"The new event reflects the pulse of Asia today, and is the only business platform covering the converging ecosystems of communications, broadcasting and emerging technologies connecting the physical and digital worlds."

CommunicAsia especially will focus on network infrastructure/FTTx, satellite communications and telecom software and services

– the latest technologies to help companies and governments in Asia prepare for the coming of 5G and maintain a competitive edge in the communications and digital world.

With on-demand and streaming services surging in popularity, BroadcastAsia will shine a spotlight on the future of broadcasting, exploring how we have consumed news and entertainment over the past decade, and the challenges and opportunities this creates for traditional broadcasters and OTT players.

BroadcastAsia will highlight technologies that are reshaping the value chain, such as the latest innovations in UHD/HDR, IP Broadcasting, Live Production, Content Media

Security, OTT and Alternative Content Platforms.

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

The ConneTechAsia Summit this year centres on Digital Business Transformation, covering the hottest trends across ICT, broadcasting industries and enterprises to enable a digitalised future.

The three-day summit comprises three tracks – NetworkComms, BroadcastMedia and EmergingTech – that will drive business growth and sustainability.

5G, Network Virtualisation, Satellite Communications and Network Slicing will be the main topics in the NetworkComms track, while The Future of Television, Monetisation Strategies, Social Video, IP Broadcasting, 4K, AI and Immersive technologies for broadcasting will feature in the BroadcastMedia track. Topics of the EmergingTech track will include: Artificial Intelligence/Machine Learning, Blockchain Technology, Cybersecurity,

IoT, Data Analytics, Seamless Commerce/Digital Payments, Connected Industries, IoT, Augmented, Virtual and Mixed Reality, and Smart Cities.

The conference will include senior executives from UBTech, Thuraya Telecommunications Company, Go-Jek, Celcom Axiata Berhad, Singtel, Mediacorp and Darktrace among others.

"Presenting a holistic ecosystem of digital convergence and a platform for the discovery and understanding of new frontiers of innovation to elevate the global standing of Asian business and governments sits at the heart of what ConneTechAsia stands for," added Wong. **PRO**

Signalling change with ETL Systems

ETL Systems, which designs and manufactures RF signal distribution equipment for satellite communications, will be demonstrating its Griffin Redundancy Switch and 64 x 64 Hurricane Matrix at ConneTechAsia.

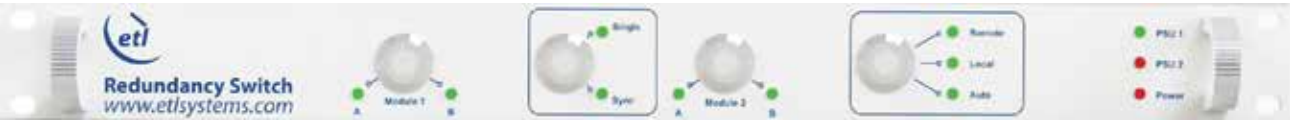
The Griffin series provides signal redundancy for satellite modulators, downconverters, or modems. The flexible design of the chassis can house up to two 2x1 redundancy

switches, with a choice of three switch modules; L-band, DC-2500MHz and Asynchronous Serial Interface (ASI) available. It can be populated with a single module of any type, or, two modules of the same type. It can be used in sync mode; enabling switching to a standby path when an error occurs. Alternatively, both modules may be operated as standalone 2x1 (1x2) redundancy switches.

ETL systems will also be

demonstrating its compact Hurricane Matrix, which provides L-band routing for up to 64 input and output feeds. It can handle multiple services, ensuring each feed is distributed to the correct place, whilst offering configurable inputs and outputs so that each satellite feed can be adapted with different features including variable gain, optical fibre inputs and LNB powering.

CommunicAsia, Marina Bay Sands, Stand 1V3-03



Peak Communications offers greater flexibility with its outdoor mounted units

Peak Communications, which has been exhibiting at ConneTech Asia for more than 15 years, will be in Singapore to demonstrate a wide range of its equipment, especially its RCU50R series of outdoor mounted units.

These units offer flexible and cost-effective redundancy switch solutions, minimising capex through reduced cross-site control and drive cable costs whilst improving electromagnetic antenna isolation.

They are compatible with most makes of LNA/LNB/BUC/BDC and waveguide switch items, so are ideal for legacy systems and new installations alike. For new installations, Peak can also supply the LNA's/LNB's, waveguide switches, mounting plate and so on as a turnkey solution, or customers may supply their own parts.

The RCU50Rseries switching units include latching switches which maintain the RF path

configuration in the event of a power failure, rather than pin diode switches which are common in lower grade designs.

DC power is provided for the



LNA/LNB/BUC/BDC units whilst current is monitored to establish correct operation and trigger automatic switch-over to the

standby unit as necessary. User settable current 'window' alarm levels are provided along with 'live' monitoring of the current drawn.

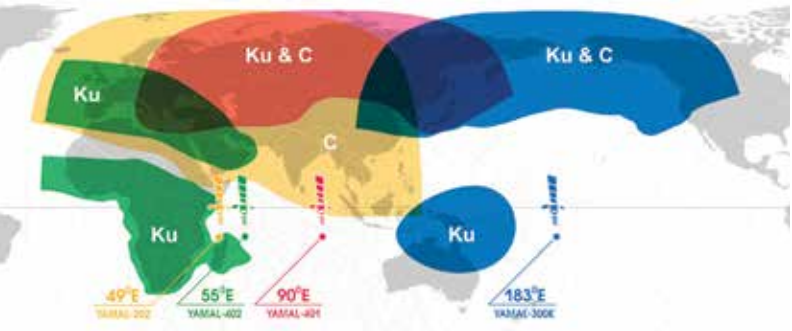
Units are separately DC-powered and are fitted with redundant DC inputs as standard. They do not rely upon the often-unreliable and limited modem-derived DC supplies, or hold-up capacitors with limited switching cycles and deteriorating life performance issues.

Reference generation with automatic external reference locking or 'pass-through' can be provided for LNB/BUC/BDC units.

Tell-backs from waveguide switches are monitored to ensure correct positioning and operation.

Units are controlled directly via Ethernet with embedded web-page and SNMP support; rack-mounted control panels can also be provided. They also contain local user controls for maintenance purposes, that can be locked-out if preferred.

CommunicAsia, Stand 1U3-07



Gazprom promises more capacity with Yamal fleet

Gazprom Space Systems (GSS) will promote its Yamal satellites' capacity at the show this year.

GSS operates the Yamal satellite fleet, which consists of four satellites positioned between 49°E and 183°E as well as advanced ground telecommunications infrastructure. The C-band payload of Yamal-202 (49°E) offers wide coverage over the Eurasian continent, in particular the Middle East and North Africa. This satellite supports a range of point-to-point connections and VSAT networks for corporate customers. It is designed for the arrangement of communication links and data transmission in the interest of government authorities, for TV distribution, as well as for the arrangement of trunks between the centres of information resources' concentration (mainly in Europe) and the centres of the consumption of these resources, which is primarily countries in the Middle East and Asia. In 2019, Yamal 202 will be replaced by a new HTS satellite named Yamal-601 to preserve the C-band coverage zone.

Yamal-402 (55°E) satellite provides Ku-band coverage over Russia, CIS countries, Europe, parts of the Middle East and Sub-Saharan Africa. Customers can operate both within the African footprint (the Southern beam) and use the interbeam communication between Europe and

Africa. The Yamal-402 capacity is used more actively for occasional use. Most often, it is used for the video transmission of political events and sports competitions. Besides, there are also many services provided in this beam for global oil and gas companies operating in the African region.

Yamal-401 is located in a position considered popular in Russia - 90°E, which is dedicated mainly for the Russian market. The satellite is equipped with C- and Ku-band payloads.

The easternmost satellite Yamal-300K has a wide contour fixed Ku-band beam covering the Far East, Pacific Ocean waterways and the western coast of North America, and is increasingly being used for aeronautic and maritime connectivity.

GSS' customer base includes more than 250 companies. The Yamal satellites capacity is used for services in more than 100 countries worldwide.

Speaking about the company's participation at ConneTechAsia, a spokesperson for the company said: "The Asian market is one of strategic markets for Gazprom Space Systems. Consequently, ConneTech is a good playground that provides an opportunity to meet current and potential customers from different countries, discuss future projects and discover new market trends."

CommunicAsia, Stand 1U2-01

Inmarsat to showcase L-band and Global Xpress Technology

Inmarsat will demonstrate how it will define connectivity on land, at sea and in the air at CommunicAsia. The company will showcase the latest L-band and Global Xpress (GX) technology. Delegates will be able to view key videos illustrating how Inmarsat is making a difference by providing the connectivity essential to smart cities; maritime cyber security; sustainable fishing; the connected cockpit and more.

On day one, Steven Rutgers, Inmarsat Director of Business Development, Asia – Strategic M2M will discuss how the company is making a difference to the way people work as part of a service provider panel. At the Xperience Zone presentation area, Shoji Koike, Channel Development Director, Asia, will introduce Land Xpress, Inmarsat's space-based solution for mining, agriculture, media, humanitarian and large scale events. On 27 June, Todd McDonnell, Vice President, Market Sector Teams & Business Development, will be in the Xperience Zone demonstrating how we are using virtual and augmented reality to bring operational scenarios to life. Inmarsat claims its iMPACT! suite is revolutionising the way complex operational solutions are presented to end users, allowing them to conceptualise and plan communications requirements way before deployment.

CommunicAsia, Stand 1S2-01



Satellite Interference Reduction Group to hold tech innovation tour at show

The Satellite Interference Reduction Group (IRG) (<http://sating.org>) is to hold a technology tour at CommunicAsia 2018, focused on innovations in interference mitigation technology.

With an increasingly congested space environment, those with a

stake in the satellite industry must work to put the necessary measures in place to prevent disruptive interference and manage their services and networks efficiently. During IRG's technology tour, participants will learn about new innovations for interference

mitigation, and service and network management, from every sector of the industry. This will include the tools and products being developed by technology vendors and the innovative techniques and processes utilised by operators to improve efficiency and reduce errors across their networks.

The tour will also look at future innovations, with experts on hand to talk about how new techniques such as machine learning and Artificial Intelligence (AI) will further improve the industry in the near and long-term future. The tour will be led by Martin Coleman, Executive Director of the Satellite Interference Reduction Group and independent consultant with more than 40 years' experience in the satellite industry. On each stand, he will be joined by an expert from that company to provide an in-depth view of current and future innovation.

Exhibitors confirmed as stops on the tour include: Atos Convergence Creators, ETL Systems, Eutelsat, Global VSAT Forum (GVF), Inmarsat, Integrasys, Intelsat, Kratos, Newtec, Novelsat, Sky Perfect JSAT and Work Microwave.

"IRG's goal has always been to encourage innovation for the vital technology and tools needed to maintain interference-free, reliable SatComs," commented Coleman.

"To this end, new interference mitigation innovations are continually being introduced, spearheaded by our group's members. I will be glad to lead another of IRG's successful CommunicAsia tours and present these innovations to participants at the show."

The tour will run every day during CommunicAsia between 26th-28th June at 11am and will start from the Meeting Point on Level 5.



Martin Coleman is an industry veteran with more than 40 years of experience working in the satellite industry.

ASTRO to demo IP and optical transmission

ASTRO, an IP and optical network systems solutions provider will be in Singapore at CommunicAsia to demonstrate its new IP streamers with multiplexing as well as optical transmission for the broadcast markets. ASTRO has several new features for the IP streamers for the U-head end platform. Besides a multiplexing option, the frontend for the reception of multistream-transponders has been enhanced. Therefore, the possible field of application for the DVB-S2 to IP-Streamer has been increased.

The devices U 144-X / U 148-X for DVB-S2 in IP and U 164-X / U 168-X for DVB-T/-T2/-C to IP will replace its predecessor. In addition to the existing features for processing SPTS



and MPTS with RTP and FEC, newly developed frontends will offer the option to multiplex four input streams to four output streams. This licensable feature promises more efficient alignment of MPTS. The signal density does not change with 24 transponders (FTA) and 12 transponders (with CI) per 19" rack unit.

On the optical transmission front, the existing portfolio will be completed with a series of direct modulated optical transmitters based on DOCSIS 3.1 standards. The new optical transmitters are optimised

for digital TV and for distances up to 40 miles delivering extraordinary performance. The OFN45 has been successfully established with well-known telcos.

Simple installation, three-colour LED for signal evaluation without any use of a measuring device, automatic adjustment of the RF level within high optical input level ranges, multiple possibilities of fibre arrangement, as well as good reception results were huge key factors for its success in the market, according to the company.

CommunicAsia, Stand 1L3-05

WORK Microwave brings new launches to APAC

At CommunicAsia, WORK Microwave, which claims to be one of the only satellite technology providers with an end-to-end solution for wideband applications, will demonstrate how it is helping operators adapt to future requirements with ease and affordability.

WORK Microwave will showcase its new three-channel, V-band block upconverter. By offering support for higher frequencies, between 47.2 to 51.40 GHz, the upconverter optimises the use of Ultra High Throughput Satellites (UHTS). Designed for early laboratory testing, it has been requested by global satellite operators to support secure, high-performance communications projects.

V-band support is available for WORK Microwave's entire range of frequency converters, including IF, block, and tracking.



The V-band block upconverter.

The company will also showcase the AX-80 Series of FPGA-based satellite modem, modulator, and demodulator platforms.

Its AX-80 product line is based on an architecture that supports the new DVB-S2X standard for ultra-wideband transponders up to 500 Mbps. DVB-S2X features include higher modulation schemes up to 256APSK and 3 Gbps per direction, a finer granularity of ModCodes, and

advanced filtering. Beyond DVB-S2X, the AX-80 platform can be extended to customised waveforms and user-defined data processing.

Through an all-IP structure, the platform supports native network operation as well as data streaming over IP, providing satellite operators with the flexibility that is critical in today's fast-changing connected world.

CommunicAsia, Stand 1V2-07

Newtec aims to bring greater satellite efficiency and performance to CommunicAsia

Newtec will showcase a number of satellite solutions at CommunicAsia 2018 aimed at boosting efficiency, performance and business potential. One key focus will be the Satellite Network Calculator, which gives end users the ability to analyse performance and evaluate potential gains to be made by their satellite network in new markets. This provides insight from the planning stage of a new network, all the way up to optimising and implementing an established network. Newtec claims that this helps maximise the operator's business potential by showing how different elements of the network would affect bandwidth consumption and, therefore, cost and capacity.

With optimum efficiency and performance being key in satellite today, the Newtec Dialog Mobility Manager aims to address this area for the mobility market, where cruise ships and super yachts are pushing the limits of traditional satellite platforms. High Throughput Satellite (HTS) networks promise more bandwidth at lower costs for mobile

VSAT operators but maximising these benefits will require important changes to equipment on the ground. This includes the ability to switch seamlessly between different satellite beams. Incorporating a rich set of APIs to provide control over beam switching logic, facilitating network load balance, least-cost routing and regulatory compliance, the Newtec Dialog Mobility Manager claims to overcome the limitations of previous systems and bring further gains through capacity sharing which is enabled by Newtec's dynamic Mx-DMA technology.

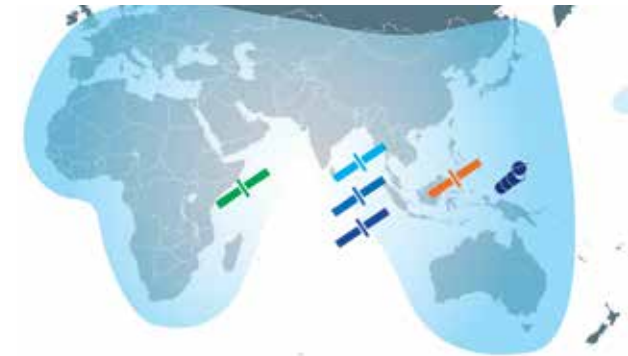
Newtec will also demonstrate its full DVB-S2X modem portfolio, which enables satellite operators to optimally address any market or application from a single network. The Newtec MDM2510 IP Satellite Modem is a two-way, high throughput satellite modem that supports a wide range of services including Internet/Intranet access, Voice-over-IP (VoIP), backhauling, mobility, contribution and multicasting. It is also designed for the mobility market including maritime.

Newtec will also showcase solutions for mobile backhaul networks that promise reduced OPEX, while delivering a high Quality of Service (QoS) and Quality of Experience (QoE).

Also making its Asian debut is the MCX7000 Multi-Carrier Satellite Gateway – used for efficient distribution and contribution broadcast applications. This dense platform is able to function as a quadruple modulator or modem with dual demodulator ideal where density and power consumption is at stake, while the optional Advanced Encryption Standard (AES) encryption of the baseband frames gives full protection for closed networks. Overall, it can increase bandwidth efficiency by up to 51%, with Channel Bonding being one method of optimisation. Using DVB-S2X, this technique splits a large transport stream into two or three parts over the satellite. It then recomposes it on the receive side, combining multiple carriers into one, large enough to maintain the efficiency gain of statistical multiplexers on a bouquet of UHD channels.

Newtec executives will be speaking on various forums in Singapore. Semir Hassanaly will present a paper on satellite's role in the successful roll-out of 5G at ConneCTechAsia on June 26, CEO Thomas Van den Driessche will be part of a CEO panel at the Casbaa Satellite Industry Forum and Market Director for Broadcast, Hans Massart will explore the requirements of news gathering teams and how broadcasters can effectively meet them in a session titled "All-IP Newsgathering: Boosting SNG" at BroadcastAsia on June 26.

*CommunicAsia, Stand 1P2-01
BroadcastAsia, Suntec, Stand 4 U3-01*



MEASAT highlights 91.5°E at 2018 show

MEASAT Global Berhad, whose 91.5°E satellite constellation is widely accepted as a video hotspot in Asia, due to its strong lineup of SD, HD and UHD channels as well as DTH platforms, will be back at CommunicAsia this year to share more details about its satellites.

"MEASAT has transformed the 91.5°E orbital location into Asia-Pacific's leading video neighbourhood from where it distributes over one thousand SD, HD and UHD video channels, and supports six DTH platforms in India, Malaysia, Indonesia and Brunei," commented Raj Malik, Senior Vice President of Sales at MEASAT.

"91.5°E is preferred by the broadcast community on account of its three collocated satellites including MEASAT-3, MEASAT-3a and MEASAT-3b, which make it a reliable and scalable satellite video neighbourhood. Our partnership approach and ability to offer customised and flexible solutions based on our understanding of customer needs and the ecosystem they

operate in make us attractive to our end users. In addition, we collaborate and work with technology vendors to test new innovations and are an early adopter in the interest of sharing operational benefits and potential commercial gains to our customers."

Since it began HD distribution in 2007, MEASAT claims to be the region's preferred UHD partner with four UHD channels.

"With the ongoing support of thousands of head-ends and pay-TV operators across the region, MEASAT will continue to be a key partner in Asian video distribution," added Malik.

He commented that CommunicAsia "attracts thousands of attendees from companies across the world".

"It is an opportunity for MEASAT to strengthen existing relationships and build new ones as we continue to strengthen 91.5°E as the region's leading video neighbourhood by making it more compelling for new and existing channels."

CommunicAsia, Stand 1T3-01

RF-Design launches fourth generation amplifier "HQA series"

RF-Design will launch the new single, quad and 1:1 redundant RF amplifiers at CommunicAsia 2018. RF-Design from Lorsch/Germany has specialised in the areas of RF-distribution, RF-over-fibre and RF amplifier technology. Part of their main product range are the 1RU/19" rack-mount amplifiers.

The company claims that a large number of RF-Design's amplifiers are in operation at satellite ground-stations, teleports and broadcasting facilities worldwide with clients ranging from Intelsat, SES, Viasat, Hughes, BT, Thaicom, Media Broadcast and Axesat among others.

RF-Design's fourth generation amplifier named "HQA series" was launched recently and will be exhibited at its booth during the CommunicAsia 2018, between 26 - 28 June 2018 in Singapore.

The team at RF-Design has reportedly adopted a "Listen to the Customer" philosophy before and during the development of their new HQ amplifiers. Considering individual requirements of customers, the company believes that the HQ amplifiers will meet the market's needs in terms of RF specifications, features and functionalities.

The new HQ series comes as single, quad or 1:1 redundant amplifiers. Units with integrated 8-way, 16-way, 24-way or 32-way splitters are available, all in a compact 1RU/19" rack-mount chassis. The units of the HQ series support variable gain-control, slope equalisation, RF power monitoring, threshold alarming, switchable LNB-supply, a 10MHz external reference signal port and 1:1 redundant dual power supply. Local configuration can be realised via a front-panel LC-Display while remote access, configuration and monitoring can be done via a rear-side Ethernet-Interface (WebGUI, SNMP).

A company spokesperson stated: "RF-Design has extensive experience in the field of RF equipment and RF distribution solutions and is well known for developing and manufacturing custom-made products and solutions. Our experienced development and project team closely cooperates with the client always focusing on individual solutions especially designed and manufactured for specific requirements and applications."

CommunicAsia, Stand 1L3-14



PLOTTING TO GET RID OF SPACE DEBRIS

Rami Ibrahim talks about the various initiatives undertaken globally to deal with space debris



Orbital debris such as non-functional satellites, objects released during satellite deployment and fragments from

the collision of space objects are now beginning to crowd space, posing a major risk to space missions, with the potential to destroy or damage a spacecraft or a satellite, as well as endanger the life of astronauts and cause potential challenges for the International Space Station (ISS).

According to statistics released by analysts, there are presently more than 29,000 useless objects that are greater than 10cm in volume, and 750,000 from 1cm to 10cm floating around in space. Furthermore, there are 166 million particles from 1mm to 1cm in size, all of which are space junk.

Many initiatives have been developed by universities to de-orbit space debris. The Space Engineering Centre at the Swiss Federal Institute of Technology Lausanne and Swiss Space Centre, in cooperation with the universities of Bern, NTB, and HES-SO in Switzerland have designed and developed CleanSpace One, a small debris recovery satellite that is designed to track an object the size of a milk brick flying at 7km/s at 720km above sea level, capture non-cooperative derelict satellites or debris which have not necessarily been designed to facilitate the capture, remove it and free its orbit

for future space operations and reduce risks of collision, and open the path for recycling those satellites.

CleanSpace One will first be used to collect SwissCube satellites that have expended their useful lifespan. If they succeed, it will be used to de-orbit much larger debris of up to 300kg after the adjustment of the capture system. CleanSpace One is scheduled to be launched in 2021-2022.

Engineers at Stanford University along with the NASA Jet Propulsion Laboratory designed a 'Robotic Gripper', which uses gecko-inspired adhesives. The gripper is not as intricate as a gecko's foot – the flaps of the adhesive are about 40 micrometers across while a gecko's are about 200 nanometers – but the adhesive works in much the same way. Like a gecko's foot, it is only sticky if the flaps are pushed in a specific direction but making it stick only requires a light push in the right direction. This gripper comes with a grid of adhesive squares on the front and arms with thin adhesive strips that can fold out and move toward the middle of the robot from either side. The grid sticks to flat objects, like a solar panel, and the arms grab curved objects, like a rocket body.

A small gripper was sent up to the International Space Station (ISS), where they tested how well the grippers worked inside the station. Next steps for the gripper involve readying it for testing

outside the space station, including creating a version made of longer lasting materials able to hold up to high levels of radiation and extreme temperatures.

The 'MAYAK mission' by Moscow State University is designed to de-orbit debris by using aerodynamic breaking systems and drag it to a lower orbit where it burns up on re-entry. Once in orbit, the satellite is designed to unfurl a giant pyramid-shaped solar reflector. The goal is for this satellite to shine brighter than any other star in the night sky. To do this, its reflector made of Mylar will span 16sqm and is apparently 20 times thinner than human hair. This mission, however, is said to have failed to deploy its reflective sail after launching.

European Space Agency (ESA) and Airbus Defence and Space are creating a solution and concept for debris removal called 'e.Deorbit' using net and robotic arm capture. Here again, they look at approaching the target, capturing it by firing the net or arm followed by removal. Once captured, deorbited satellite will be taken to a lower orbit, where it will burn upon atmospheric re-entry. This is scheduled to be launched in 2021. **PRO**

Rami Ibrahim is doing his Masters in Science in Space Studies at the International Space University, France. He is also working as an intern with SES Networks.

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