

Satellite Ground Segment Update

by Dan Freyer

As many in the industry head to CABSAT 2015 in Dubai and Satellite 2015 in Washington, D.C. this month, Satellite Executive Briefing takes a quick look at developments in the earth station business by talking with some key providers.

While new segments such as mobile, or aeronautical applications are a source of growth, the consistent theme coming from suppliers always seems to tie back to High Throughput Satellite (HTS). One popular antenna system supplier points to the recent study by Euroconsult estimating that global high-throughput satellite capacity will nearly triple from 600 Gbps in 2014 to 1,720 Gbps in 2017, and expecting that "Ku-band HTS capacity usage is projected to accelerate from 2017 to reach around 150 Gbps by 2023, largely driven by professional user markets which often have high reliability and availability requirements." Provisioning all this bandwidth of course takes similarly massive new amounts of hardware on the ground.

Antennas

In the earth station antenna business for large fixed gateways and medium-sized mobile gateways, manufacturers are seeing the strongest demand coming from high-throughput satellite markets.



The global high throughput satellite capacity will nearly triple in the next three years. This increase in bandwidth will require new investments in ground systems.(photo: AvL Technologies)

An example is the recent experience of ASC Signal Corporation, one of the major suppliers of large antennas to the industry. According to CEO Keith Buckley, "ASC Signal's business in large gateways has more than quadrupled in the last 18 months, and orders for our mobile C-, X-, Ku- and Ka-band No-madic and TriFold antennas are at the highest level – by a factor of more than 3 times – than any time in the history of the company. We also had a record year for 9-meter dishes that we think is driven by a growth in the satellite teleport sector of the market. So teleports, which are an important part of any company with products like ASC's, are growing, especially in Eastern Europe and Africa."

W.B. Walton Enterprises Inc. (also known as Walton
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Satellite Industry Growth



One of the important features of our publication is the **Satellite Markets 25 Index™** (see page 52) where we track the growth of a representative sample of various satellite companies from different market segments. We started tracking this Index on January 1, 2008, when we began publication. At the outset, the Index value is 1000. Now seven years later, the Index hit over 2,000 for the first time since we started tracking it. That means the satellite industry has double in value in just the last seven years. What makes this more remarkable is that three of those seven years, were characterized by the worst global recessions in recent history.

It should be noted that the S&P 500 Index which we also track alongside the Satellite Markets 25 Index™ has also doubled in value in the same time. So, the satellite industry is growing at about the same pace as other industries. If you need further validation, the Satellite Industry Association (SIA) in its annual State of the industry report, has also found that the industry almost doubled in size during the same period to nearly US\$ 200 Billion last year. In fact, the satellite industry has been consistently growing since the SIA started tracking it in 2002. With all the challenges facing the global economy today, the past performance of the satellite industry is a good indicator of things to come.

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Ground Segment Update ...From page 1

De-ice) designs, manufactures and provides equipment for preventing the accumulation of snow and/or ice on satellite earth station antennas. According to Bill Walton, Founder and Owner of Walton De-Ice, "The satellite industry is evolving its use of new frequencies, so we have had to evolve our products over the past 35 years, starting with C-Band and adding Ku-Band, S-Band, L-Band, Q-band, and, now increasingly, Ka-Band. Higher frequencies like Ka-Band required us to improve heat-distribution, sensing and monitoring systems, so that, for example, there is no more than a 5 degrees differential on any parts of a heated reflector surface. We continue to evolve our control and monitoring technology and other features, to always keep up with the changes in the satellite industry."

Another area of growth, he says, is in the cable and broadcast segment. "Our Snow Shield antenna cover products continue to lead the industry in antenna protection from ice, snow, and rain effects for antennas from 6.3 to 0.6 meters, and we've seen it become really popular in the cable industry recently," says Walton. He sees two reasons for the product's growth. "First, because our RF-transparent fabric material is superior and will not absorb moisture, our systems work as advertised, unlike other antenna covers on the market. Second, with the new digital signal formats and higher order modulation being used, link margins are tighter. In this environment, Snow Shields help operators protect their signal availability, while new covers from other brands have caused immediate reception issues, according to our customers," he added.

Tracking the Challenges

Suppliers also say customers are expecting shorter and shorter delivery time frames. Another challenge coming from customers is increasing quality

requirements.

According to Tony Wilkey, Senior VP Sales, Marketing & Customer Service for AvL Technologies, the Asheville, NC-headquartered designer and manufacturer of transportable antennas and positioner systems, the trend of moving to a new generation of antennas and services brings new challenges.

End users are attracted to Ka-Band because of the throughput efficiency gains over conventional C- and Ku-Band in a growing number of applications. However, narrower antenna beam widths at Ka-Band require higher quality hardware and much more precise antenna pointing to achieve optimum satellite alignment.

"For transportable platforms, (e.g. SNG broadcast trucks and military fly-aways) that use sophisticated auto-acquisition antenna controllers, it is more difficult to locate and peak on the satellite. It is also a greater challenge to maintain the critical alignment with the satellite, especially in gusting wind," says Wilkey.

To minimize interference with adjacent satellites, Ka-Band antenna positioners must have significantly more stiffness than Ku- or C-band antennas. Additionally, the new generation of medium Earth orbit, or MEO, satellites has a reduced orbit path, requiring antennas on the ground that can follow these "low fliers" across the sky. Therefore, Ka-band MEO antennas must have more dynamic tracking capabilities, and typically work in tandem pairs due to the reduced orbit path. And the dynamic tracking also requires a more dynamic antenna control system.



AvL Technologies mobile antenna for the Viasat exede satellite broadband system.
(photo: AvL Technologies)

"AvL's new AAQ controller has been developed to address these kinds of needs," says Wilkey.

For its part, developing new products that continue to improve and perfect tracking has been a top priority for ASC Signal Corporation as well, says Buckley. "The tracking requirements for military and commercial satellite networks remain extremely rigid – in many cases more rigid than in previous years –which forces our engineering teams to continue to focus on all of the various pieces of the tracking puzzle," he adds. For example, a huge portion of the company's R&D over the past 5 years has been spent perfecting the tracking abilities of its Next Generation Controller (NGC) and in adding features to enable better antenna system performance for GEOs, LEOs and MEOs. ASC also approached the demands of Ka-band tracking from an additional per-



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spective with its patented Sub-Reflector Tracking (SRT) system. By adjusting the antenna's sub-reflector instead of the main reflector (which can weigh 4 – 5 tons), the SRT not only provides satellite tracking accuracy to 1/1000th of a degree, but also compensates for thermal dynamics that occur in all antenna structures.

"Some global SATCOM users have delayed plans to deploy updated equipment and services, while many others have continued to invest in innovating their use of SATCOM with the new generation of lighter, smaller Ka-band antennas and service with new high-throughput Ka-band satellites," says AvL's Wilkey. Conceding that many global SATCOM users will continue to use Ku-band services for the foreseeable future, he believes that the market is clearly headed in the direction of Ka-band. "AvL recognized a two-fold increase in sales in Ka-band systems over the last two years, and our customers tell us that the reason is the long-term cost savings realized with Ka-band's faster data rates, increased bandwidth, and lower cost per bit."

AvL customers in the NASCAR industry started moving to Ka-band services over a year ago for the 2014 race season. These NASCAR teams are now taking advantage of these enhanced services to actively support critical high-definition voice, data and video communications during races, and with Ka-band the teams are realizing "game changing" data rates of 15 Mbps down and 10 Mbps up, according to AvL.

VSATs

In the VSAT market, HTS payloads being adapted by satellite operators is the key trend that suppliers are watching. Dave Rehbehn, Senior Director, International Marketing for Hughes, notes that many of the regional and national satellite operators are putting HTS payloads onto their new satellites. "This is bringing significant opportunities for cost-effective broadband VSAT thanks to the economics of this HTS capacity.

Hughes is tracking about thirty different HTS projects that will be launched in the next 2-3 years," he says.

"The applications that these HTS systems will perform will more than support the classic Internet access to a household. With these systems, we believe we will see 'community VSATs' that support a cluster of subscribers whether served via Wi-Fi or 3G/4G cellular services." In the developing world, national broadband plans will continue to drive of "digital divide projects" where governments seek to bring broadband services to rural areas.

Looking ahead, Rehbehn's view is that, "In the VSAT market segment, we will see new ground systems introduced that are designed and optimized for operation on HTS capacity." These new ground systems will operate with wideband carriers and higher order modulation in order to maximize the efficiencies of these new satellites. They will also support higher throughputs per terminal to meet higher data rates of the future.

Higher Frequencies: Q and V-bands

Another trend is growing demand for new applications in higher frequency satellite networks (Q- and V-Bands). These require technical expertise that is not needed with the lower frequency bands.

Communications & Power Industries (known as CPI), Satcom Products division provides ground-based satcom



CPI's LifeExtender™ software can extend tube life by up to 50% for traveling wave tube amplifiers (TWTAs).
(photo: CPI Satcom)

amplifiers and block upconverter (BUC) products for both the commercial and military/government segments of the satcom market. According to Andy Tafler, President of CPI's Satcom Division "We see the market continuing to move towards higher efficiency amplifiers and BUCs. Ka-band applications have grown over the recent years and we see this not only continuing, but also moving to even higher frequencies, such as V-band. In fact, CPI has already supplied V-band amplifiers that will be utilized to evaluate the future use of this frequency range."

On the antenna side, ASC Signal Corporation's Buckley sees similar interest in high frequency applications, "In anticipation, ASC Signal has enabled every new antenna we've designed in the past four years to work in Q- and V-bands."

Powering up Tomorrow's Signals

Taking a look at earth station high power amplifiers, and block upconverters (BUCs), some tech suppliers report slower military markets, but say they have growing applications for Ka-band and higher frequencies in recent years. Competitive focus continues to be about adding higher efficiency into amplifiers, BUCs and related components. More transmit power to accomplish more data transmission capability continues driving customer requirements, say executives.

Product advances span the gamut, from incremental improvements for long-proven products and technologies, to the insertion of new components for greater performance. An example is CPI's LifeExtender™ technology, a method of extending tube life by up to 50% for traveling wave tube amplifiers (TWTAs). The company has added LifeExtender™ software to some of its TWTAs and plans to add more. For its part, Comtech Xicom's Constant Current Life Xtension technology which extends the useful performance life of its amplifiers is available in its new products, and the company has shipped over 2,000 amplifiers equipped with this feature since its introduction.

In U.S. military markets, there is a shifting emphasis from CENTCOM to PACOM, in other words towards more communications activities under Asia-Pacific region regional command, according to Heidi Thelander, Senior Di-

rector of Business Development for Comtech Xicom, a top supplier of Traveling Wave Tube Amplifiers (TWTAs), Klystron Power Amplifiers (KPAs), Solid State Power Amplifiers (SSPAs), and Block Upconverters (BUCs) for commercial and military broadcast and broadband applications around the world. On the commercial side, "Demand is strong in some regions including some parts of Latin America, Asia, and Africa," says Thelander, but currently growth is slower in Europe, and China.

At the same time, airborne markets are creating new opportunities, as are Ka-Band, and very high power HPAs for DTH and DBS applications. Ka-Band is undergoing "a transition from mainly very high power amplifiers for ground station infrastructure for new systems, to a mix of terminal types including user terminals requiring Ka-band HPAs," in Thelander's view.

Trading off in Size, Weight, Power and Heat

GaN SSPAs (Gallium Nitride Solid State Power Amplifiers) and BUCs (Block Upconverters) have received a lot of press over the last few years. GaN devices are more efficient than the GaAs (Gallium Arsenide) versions that have historically been used in satcom applications, CPI's Tafler explains. "This makes GaN BUCs a very attractive choice in systems that demand smaller, lighter BUCs or in applications where waste heat is a challenge, such as under a radome. CPI has introduced several GaN BUCs recently and will expand this line over the next few years."

Nevertheless, he says, "TWTAs and KPAs are still the best choice at higher RF operating power levels in terms of size, weight, and operating cost."

Comtech Xicom's Thelander offers a

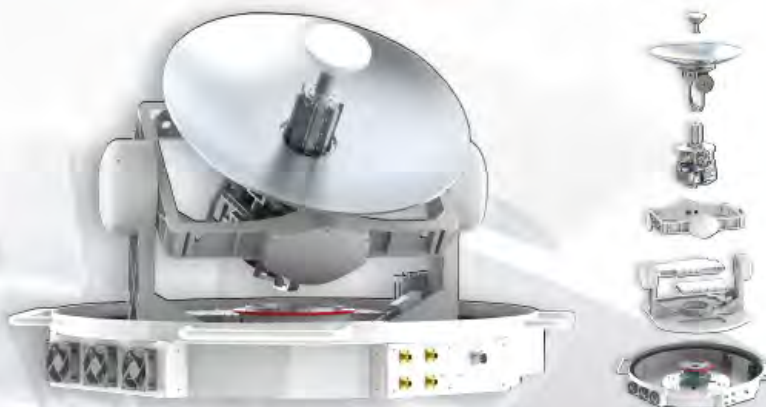
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similar view: “We think that those predicting the demise of the TWTA are wrong again, as they have been since the introduction of the transistor. Many new high capacity satellites require very high power transmit amplifiers to transmit many channels at high rates. To reach higher powers than what is available from individual amplifiers, integrators have resorted to phase combining multiple amplifiers to achieve the required EIRP,” she explains.

High Power Segment

Another HPA segment is demand for higher power outdoor HPAs. “We are introducing higher power DBS and Ka-band TWTA products this year,” says CPI’s Andy Tafler. “CPI’s high efficiency SuperLinear® amplifiers have proven to be very popular since their introduction, and we have been expanding this line of indoor and outdoor amplifiers. They are the most power-efficient amplifiers on the market and reduce users’ yearly operating costs,” he says.

Comtech Xicom also is seeing things heat up in the segment requiring new very high power systems, according to Thelander. Comtech Xicom is expected to introduce two new “SuperPower™ TWTA,” which offer double the power of the most recent standard TWTA. The new high efficiency TWTA are rated at 1.5kW for DBS band and 2 kW for Ku-band versus currently deployed 750W TWTA in both bands. According to the company, this represents a significant breakthrough in technology, because it enables the direct replacements of Klystron power amplifiers (KPAs), with 1.5kW or 2kW TWTA. At the same

time, these new TWTA can eliminate the cost and complexity of phase combining older TWTA, while reducing power consumption for a given EIRP requirement by as much as 50%.

Wide Bandwidth, Uncertain Frequency Plans

One challenge that amplifier, BUC and LNB/downconverter manufacturers face at the moment is the very wide bandwidth and many different frequency plans at Ka-band. Ka-Band comes with no standardization, unlike the developments in Ku- and C-bands.

Regulatory certifications for obtaining approvals for sale of satellite equipment in the new bands, and for new applications such as aeronautical can be slow, requiring customers to stay with older technology despite the potential benefits of adding state-of-the-art gear, say manufacturers.

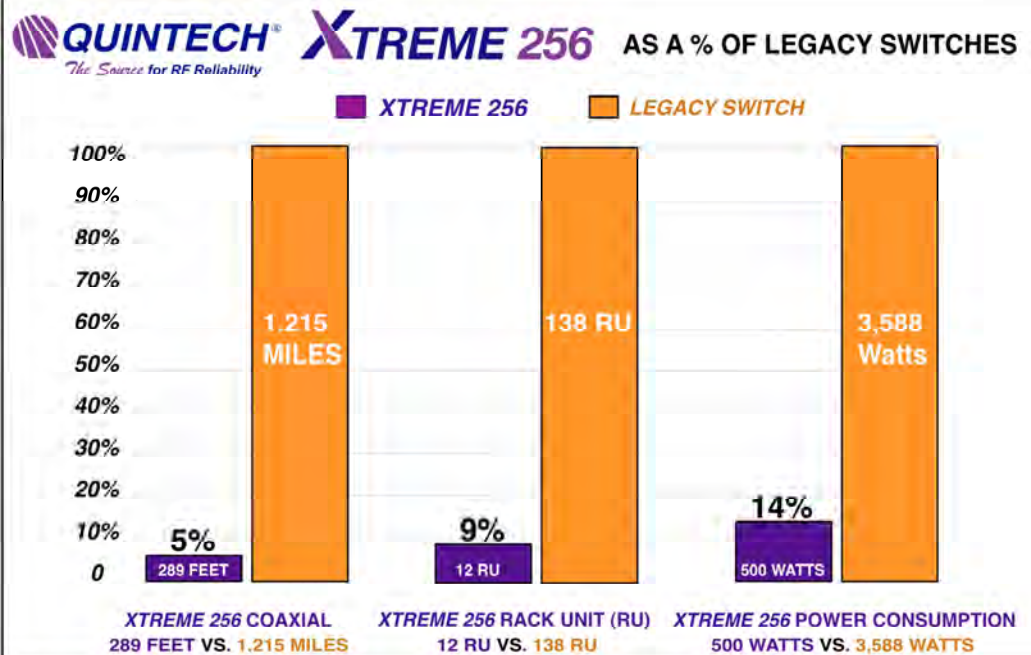
According to Comtech Xicom’s Thelander, a hot segment is “in-flight com-

munications (often called IFEC) both in Ka and Ku-band, which is being driven by the move from air-to-ground (ATG) communications to the adoption of satcom-based systems by aircraft operators.

Test and Monitoring Equipment

The increased demand for Ka-band, and HTS projects is also impacting demand for earth station components such as RF distribution equipment, splitters and combiners, matrices, RF test and measurement equipment, frequency converters, and uplink power control units.

A.G.Franz, of Plainsboro, New Jersey, USA is a master distributor of RF test equipment and low-power distribution equipment. According to Gerhard Franz, President of A.G. Franz, a number of customer trends are apparent. “Lately HPA providers have integrated frequency converters into their high power upconverters to save cost, but sometimes resulting in lower signal quality. Higher quality, specialized fre-



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 - With IP streaming output (MPTS)

quency converters are again in demand. Another trend is to install the equipment outdoors where it has to be rugged to withstand the elements." Manufacturers such as Peak Communications of Brighthelm, UK have added L-band to antenna interfaces in addition to the legacy infrastructure that is typically 70/140 MHz.

Another trend Franz sees with smaller operators is more of them are adding **AUPC** (automatic uplink power control) to ensure reliability, especially with Ka-band coming onto the scene. "With the AUPC, it is automatically possible to increase the peak power in adverse weather conditions, and return to optimal power and uplink conditions, without having to reduce the modulation scheme and bandwidth."

Smaller operators have also been following a trend set previously by larger

earth station operators in adding remote spectrum monitoring equipment to better identify frequency interference, and better monitor their services, according to Franz.

Downstream Ka-band Effects


Turning to the area of RF and signal distribution inside earth stations, technology suppliers report continued demand for higher efficiency, more integrated, intelligent and higher capacity products, as well as Ka-band and HTS opportunities for RF-over-fiber equipment and flexible switching.

An example of Ka-band services creating demand for new earth station components in this area is a solution provided for a European Ka-band satellite operator by DEV Systemtechnik, a Quintech company and key supplier of RF-over-fiber and related cable, satellite, and broadcast equipment based in


Friedberg, Germany to mitigate 20 to 30 minute Ka-Band (26.5-40 GHz) outages during heavy rainfall, the HTS operator deployed a solution that switches signals between two Ka-band gateway antennas. The antennas are located at separate facilities 100 kilometers apart in different rain cells. DEV Systemtechnik helped the operator connect and synchronize its two gateway antennas using off-the-shelf Dense Wave Division Multiplexing (DWDM) products from the DEV Optribution® family.

In this network, a diverse site-switching feature allows seamless switching between the main and "diversity" sites during heavy rainfall on the gateways. All user terminals can be automatically switched in the network without losing connections. This avoids outages during heavy rainfall, and lets the Ka-band operator switch about 40,000 concur-

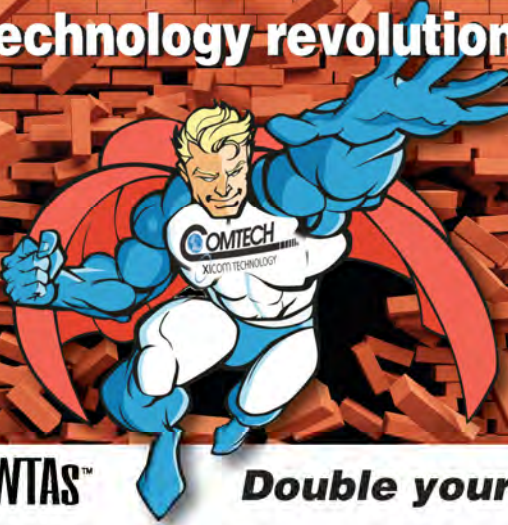
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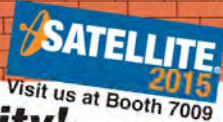
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rent users of its HTS system between Ka-band gateways. DEV's solution is scalable. Additional antennas and traffic can be added and connected using its RF-over-fiber system, according to the company.

Need for more RF Switching and fiber interfaces

Another potential growth area is RF distribution and matrix switching inside earth stations, head ends and associated network operation centers (NOCs), due to key tech gains in cost, energy, efficiency and performance.

According to Oliver Vogel, Director Sales & Marketing for RF-Design based in Lorsch, Germany, a supplier of RF distribution equipment for satellite and related segments, "For RF distribution infrastructures in ground-segments (Teleports, Earth-Stations) we see an increasing demand for Switch-matrices and RF-over-Fiber systems, and we have supplied various RF-over-Fiber systems combined with fiber-input switch-matrices to Teleports and Earth-Stations."

A market dynamic that he sees changing in this segment is the technology for RF distribution infrastructure from the antenna to the NOC. "Instead of typical RF distribution material such as splitters/combiners, operators increasingly want flexible and expandable RF distribution solutions such as Switch-Matrices, RF-over-Fiber solutions and remote monitoring systems." The company's new "FlexLink-K7-Pro" L-Band Switch-matrix targets these kinds of opportunities.

Saving Space, and Operating Costs in NOCs, Teleports and Headends

RF matrix switching from any port to any port or multiple ports (fan out) provides the most flexibility for earth station operators to route signals in a large earth station facility, teleport or NOC. Older, large-configuration leg-

acy RF matrix switching systems require miles of coaxial cable and thousands of watts of power to operate. They can be very labor-intensive for satellite ground facilities to install and maintain.

Quintech Electronics and Communications Inc. is introducing a next-generation L-Band Matrix called the XTREME 256, a 128x128 scalable L-Band Matrix switch which the company says delivers a more than six-fold (6.5X) reduction in electrical power consumption, while saving over 3.5 miles (5.6km) of RF cable runs per comparable system. (see Graphics). The U.S.-headquartered company, with its global network of distributors, has long been a key manufacturer of RF communication equipment such as matrix switches, RF-over-fiber, routers, redundancy switches, relay switches, splitters, combiners, amplifiers, and frequency converters.

"The XTREME 256 greatly increases satellite and teleport facilities' operational capabilities while vastly reducing power requirements, cabling and rack unit footprint," says Dan Prushnok, CEO of Quintech Electronics & Communications, Inc. "The business case for replacing the industry's installed base of older, large-configuration legacy RF matrix switching systems with the XTREME 256 offers a high return on investment (ROI)." According to Prushnok, the product reduces the number and length of cables and connections by up to 97% compared with legacy systems, which can require miles of coaxial cable and 1,000s of watts of power to operate. Advanced RF design and power management methods enable the XTREME 256 to achieve industry leading RF per-

formance while cutting power consumption by up to 80%, allowing for greener operation, he says.

Face Time for Business

High throughput satellite (HTS) architectures can require significantly more complex, and numerous, gateway networks. Demand for pieces of this new ground infrastructures, from gateway components to components in the growing variety user terminals, is definitely exciting demand for new products for earth stations.

With new requirements, from ultra light HPAs for Ka-band aeronautical applications, to Q-band/V-band compatible systems for future programs, to faster Ka-band VSATs and gateways, there are opportunities that could add up to record new business in the next several years for those with the right product in the right segments.

As executives and technologists from the satellite industry head to the CABSAT 2015 tradeshow and exhibition in Dubai March 10-12, and SATELLITE 2015 conference and tradeshow March 16-19th in Washington, D.C. to meet with prospective customers and suppliers, HTS and Ka-band is sure to be the hottest topic in earth station RF technology.



(Note: Companies mentioned in this article will be exhibiting at either CABSAT 2015 in Dubai or SATELLITE 2015 in Washington (in some cases both shows) for more details go to the Product and Services Guide to CABSAT and SATELLITE on page 26)



Daniel Freyer is the Principal of **AdWavez Marketing** (www.ADWAVEZ.com), a marketing agency serving the satellite industry. Since 1990, he has worked with leading spacecraft and ground equipment manufacturers, satellite operators, services providers, broadcasters, associations and event producers to grow the businesses and brands. He can be reached at dan@adwavez.com.

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Expansion in the Middle East Market

by Elisabeth Tweedie, Associate Editor

If I had to choose one word to sum up 2014 for the satellite world in the Middle East and Africa, it would be “expansion.” Expansion, in terms of new satellites, new alliances, new ventures and new audiences.

With four satellites on the books, and three new alliances, Arabsat takes first place. Two of the satellites are for Hellas-Sat 3 and Hellas-Sat 4, the Greek operator that Arabsat acquired in 2013. Hellas-Sat 3, will be built by Thales Alenia Space and is essentially a condo-sat shared between Inmarsat and Arabsat. The Hellas-Sat 3 payload will be 44 Ku transponders and 1 Ka-Band transponder and will provide broadcast and telecommunications services. Europasat, the Inmarsat section will carry an S and Ka-Band payload. This will provide mobile service across Europe augmented by a Complementary Ground Component (CGC). Europasat will also provide passenger connectivity for the aviation market.

Hellas-Sat 4 will carry a hosted Ku-Band payload for Telesat on the European beam. This will be used for telecommunications services. Arabsat will be using Ka and Ku-Band beams in the Middle East, Africa and Europe. At the time of writing a contract had not been awarded for Hellas-Sat 4, nor for the other two satellites, Arabsat 6A and 6E. However according to Khalid Balkheyour, President and CEO of Arabsat, manufacturers were given the option of suggesting one large satellite instead of two smaller ones. Electric propulsion was also given as an option.

In the meantime, to provide extra capacity in the Middle East and North Africa, Arabsat has signed a strategic partnership with ABS to lease 10 Ku-Band transponders on ABS-3A. ABS-3A is an electronic propulsion satellite due to be launched by SpaceX, early this year.

In February of this year, Arabsat signed a contract with Media Speed to develop a new digital satellite TV platform. At the signing of the contract Khalid Balkheyour said “We are delighted that Arabsat is the first satellite operator involved

in building and operating this platform, hoping this to be a real start for building media cities all over the major regions of the Kingdom in the near future, as Saudi Arabia is highly ranked globally, economically, politically and religiously.”

Arabsat also has a strategic partnership with Selevision, a Saudi set-top box manufacturer and on-demand service provider, to introduce Hybrid Broadcast Broadband TV (HbbTV) in the MENA region.

Expansion in the region is not confined to the Kingdom of Saudi Arabia and Arabsat. Yahsat, based in the UAE, ordered Al Yah 3 in September of last year. It has said that expected revenue from Al Yah 3 will move it to number eight in the global rankings of Fixed Satellite Services (FSS) operators. The high throughput Ka-Band satellite will be built by Orbital Science and launched in Q4 2016 by Arianespace. This satellite will be the first to expand Yahsat’s coverage beyond the Middle East and Africa. The footprint will cover Brazil and surrounding areas as well as parts of Africa.

The UAE is keen to expand technical skills in the country

and both Orbital and Arianespace will provide on the job training for Yahsat’s employees and UAE students. Yahsat is also planning to expand into new markets with the introduction of an aviation service later this year. Yahsat was awarded the SatCom Star Award for “Satellite Operator of the Year” in 2014. This is an award to recognize outstanding new contributions to the field of satellite communications in Africa.

Thuraya, a major Mobile Satellite Services (MSS) operator, and recipient of Telecom Review’s Satellite Operator of the year award for 2014, is also based in the UAE. It has not ordered any new satellites, but it has been expanding its portfolio of products and alliances.

Last year it signed a partnership agreement with Bharti Airtel International, that would allow Airtel Africa to extend



Hellas-Sat 3, a joint satellite by Inmarsat and Hellas-Sat will provide Mobile Satellite Services (MSS), Fixed Satellite Services (FSS) and Broadcast Satellite Services (BSS).
(image: Thales Alenia Space)

its reach to remote and rural areas in 17 African countries. The new service, which offers both fixed and mobile connectivity, was launched in November, in 12 countries including Gabon, Ghana, Kenya, Zambia and the Democratic Republic of Congo.

Towards the end of 2013 Thuraya signed, what turned out to be a very fortuitous, partnership agreement with Smart Communications of the Philippines. The agreement was to provide maritime voice services for Filipino crew on major sea lanes in Australia, New Zealand, the Indian Ocean, Middle East, Africa and Europe. Fortuitous, because the partnership was initiated, just before the dreadful typhoon that struck the country in November. As well as providing government and relief agencies with phones and Satsleeves, Thuraya was able to work closely with Smart to convert maritime phone units for use in the free call centers, that were established on land in the aftermath. As a result of this cooperation the partnership was extended last year.

Thuraya's humanitarian efforts are not confined to disasters. In October last year it partnered with SOS Children's Villages International, in Africa to provide satellite connectivity to remote communities in the Central Africa Republic. This enables the charity to communicate between its different villages in the Republic and to coordinate emergency preparedness.

On the product side, Thuraya has just introduced a Satsleeve for the Samsung S3 and S4 Android phones. Satsleeve is a sleeve that fits over a mobile phone (previously, only iPhones) to give it satellite capability when no terrestrial service is available. And in December last year, it introduced what it describes as, "the industry's best value smart phone", the XT-Lite. This basic phone provides voice and SMS and is designed for casual users.

The space industry is of strategic importance to the UAE. The country has already invested US\$5.44 Billion in commercial and scientific projects. The investments were made by Yahsat and Thuraya as well as the Emirates Institution for Advanced Science and Technology (EIAST). In July last year it established the UAE Space Agency. This is intended to develop the UAE's technical and intellectual skills leading to an unmanned mission to Mars in 2021. The agency is hoping to establish strategic partnerships with other European



The Emirates Institution for Advanced Science and Technology (EIAST) announcing last year the development of the Khalifasat satellite which will be designed and manufactured completely in the UAE. (Photo: EIAST)

and international space agencies. EIAST has launched two earth observation satellites, DubaiSAT 1 and 2, the latter being launched in 2013. A third satellite dubbed Khalifasat announced last year will be developed and manufactured completely in the UAE. It is now working on a High Altitude Pseudo Satellite (HAPS) in a partnership with Airbus DS. The HAPS flies at 65,000 feet and to date has stayed aloft for over two weeks at a time. It can carry various payloads, including temporary communications networks and video imaging. The first generation is expected to go into service at the end of 2016.

"...So what is driving this need for new capacity? Primarily, what satellite does best: point to multipoint video..."

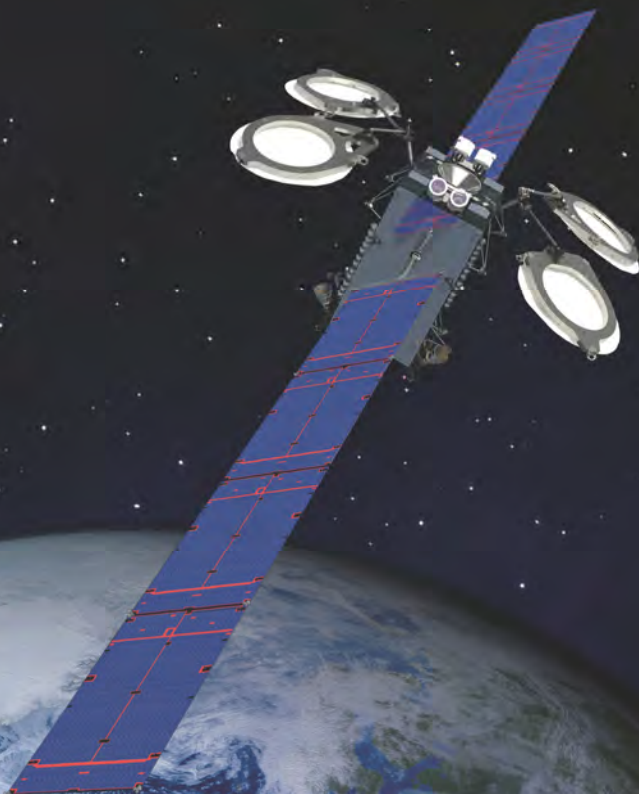
Es'hailSat, the new Qatari operator has just ordered its first fully owned satellite, Es'hail 2 from Mitsubishi Electric Co. (Melco). The satellite will be launched at the end of 2016 by SpaceX. Es'hail 1

is co-owned with Eutelsat. Es'hail 1 is almost fully booked and Es'hailSat is now leasing an additional four transponders from Noorsat. Noorsat has eight transponders on the Eutelsat part of the satellite. The company is planning to order Es'hail 3 in 2016.

Two other new operators in the region have found similarly creative ways to get into business. Afghanistan has leased Eutelsat 28B, renamed it Afghansat 1 and moved it to a new orbital location. The satellite is expected to remain in service until 2020 and Afghanistan has said that it will order its own satellite to follow. Azerbaijan, which launched its first satellite in 2013 has just announced that it is partnering with Intelsat to build and launch its second satellite. Azer-space 1 is a joint venture with Measat, which owns the orbital slot (46E). Measat's portion of the satellite is known as

ABS-3A^{3°W}

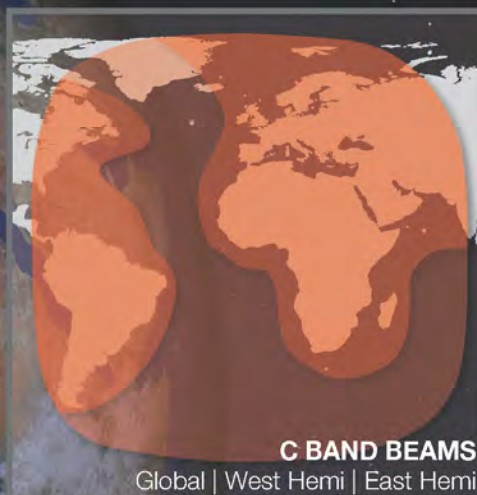
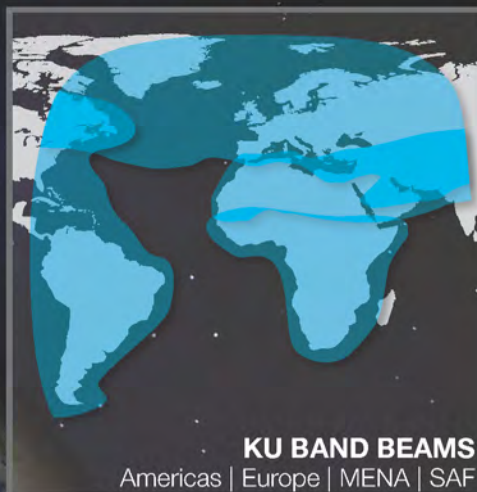
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Africasat 1A. Azerspace 2/Intelsat 38 will be located at 45E and for Intelsat will be a replacement for Intelsat 12 currently located there. The satellite is due to launch in 2017.

So what is driving this need for new capacity? Primarily, what satellite does best: point to multipoint video. Satellite is the primary source for television in the region, with over 90% penetration of the free-to-air (FTA) market and 74% penetration of the pay-TV market. IPTV accounts for the other 26%. There is great disparity across the region, with 85% household penetration of pay-TV services in the UAE and only 2.4% in Egypt. According to research from the Arab Advisors Group, in October 2014 there were 237 pay-TV channels available in the region.

The number of high definition (HD) channels, which by definition require more bandwidth, are also increasing rapidly, with 158 in 2014, compared to just two channels in 2009. However unlike most other parts of the world, nearly half of those are FTA.

Pay TV is a relatively new concept in the Middle East, so in terms of absolute numbers of households it has much

lower penetration. However according to statistics released by IHS April last year it is growing rapidly. In 2013 the number of pay-TV subscribers increased by 14.43% to reach 9.4% of the households in the region. From 2004 to 2013 the numbers of households virtually quadrupled from 1.33M to 4.35M. That leaves plenty of room for further growth in the region.



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



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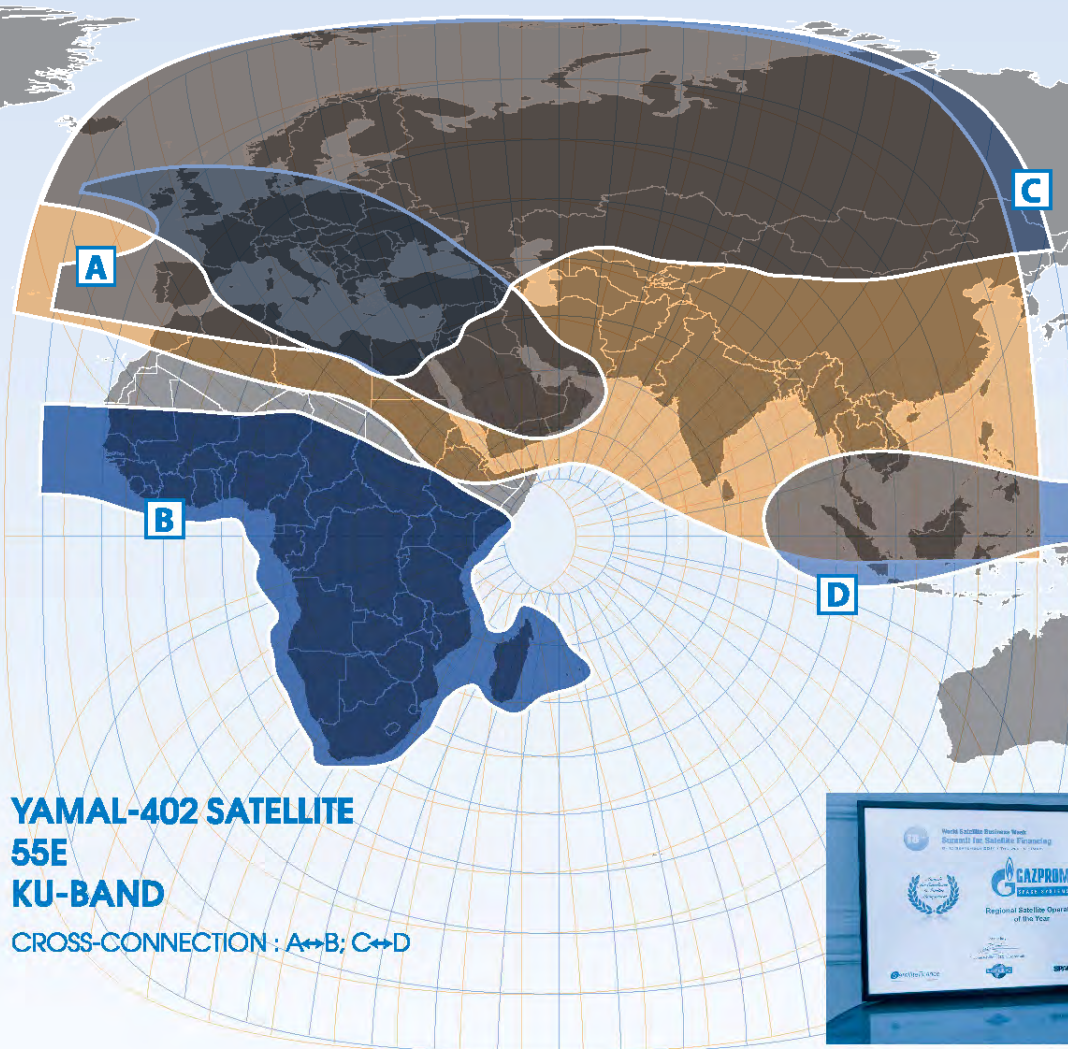


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Teleports Must Stay Ahead of the Curve

by Andrew Bond

The satellite industry is continually growing and new developments are constantly providing consumers with better technology. However, consumers always want more, and the continued growth only brings higher demands and higher expectations.

In 2013, the satellite manufacturing and launch industry generated almost \$35 billion globally, according to the latest figures from Northern Sky Research (NSR). More than 100 new satellites were ordered and another 100 were launched. Clearly, the sector is expanding and there are a number of indicators which suggest this will undoubtedly continue as we move into 2015 and beyond.

When it comes to exploring the drivers of this growth, there is one overriding factor which immediately comes to mind – the large, and relatively fast, change we have seen in consumer technology use.

In some ways, ten years is a long time. The Rosetta mission, for instance, the most detailed study of a comet ever attempted, was launched in March 2004 and has only last month delivered the lander Philae to the comet's surface. Yet, in terms of technology, if we think back to just ten years ago, the iPhone, the first Smartphone as we now know them, did not exist. Today, household items such as the smart phone have become slicker and slimmer and televisions are bigger and better – driving demand for a clearer, higher quality picture.

Both trends are only going to get bigger too. Forget high definition television, ultra-high definition televisions are already appearing on the market and are likely to instigate a surge in demand, with many buyers choosing to either upgrade their HD sets or, for those that don't have HD, bypassing it and choosing UHD instead.

The result of this change in consumer behaviour is a demand for more; more portability, more bandwidth and more

“...To remain ahead of the curve, investing in tomorrow's technology today through the upgrade of teleports is essential for any operators who wish to stay in business...”

feeds. For satellite, the only technology which can reach people regardless of whether they are in an inner city, up a mountain or at sea, all of this equates to one thing- growth.

Where, then, do teleports come into this equation? The role they play is unquestionably important – for operators, one of the big questions always asked by their customers' is whether their infrastructure is up to the job of handling their signal requirements. This will, of course, only become more important as the amount of content being distributed continues to grow.

To remain ahead of the curve, investing in tomorrow's technology today through the upgrade of teleports is essential for any operators who wish to stay in business need to continue the evolution. Teleport operators who want to experience growth within the satellite industry, need to ensure that their quality of signal is maintained and equipment is as reliable as possible. Within a satellite teleport, whether it contains two or 200 dishes, downtime is an evil word and as traffic density increases, so too does this risk. Thankfully, technology has evolved so as to negate this risk.

In order for the satellite industry to continue to expand, then, now is the time for teleport operators to act. While the increasing demand for content, both over mobile devices and DTH is undoubtedly driving growth, implementing the right teleport infrastructure is key – not just for the development of individual businesses, which it will undoubtedly contribute to, but also for the continued expansion of the entire satellite market.

Since satellite owners have begun to invade parts of the teleport market through added services, teleport operators can no longer *just* create teleports. They must look to new IP-based strategies and other solutions that would meet the needs of satellite owners and develop solutions that satellite owners cannot solve themselves. Looking to the future, there is a lot of potential for teleports, much of which has not even been imagined yet.

For those operators that choose not to invest, not only is the risk of failure during downtime greater, but there is also a danger to the industry as a whole. Those not convinced this risk exists, need look no further than the impact of the Smartphone which, less than ten years ago, might not even have been conceived as an idea but yet today is viewed by the industry as a game changer. Right now, satellite technology is the only equipment that can provide connectivity anywhere and everywhere in the world, no matter how remote a location. However, if operators cannot guarantee their customers the backbone to deliver new services and to handle the increased traffic those services will bring, all that could change – and quickly.

With the right infrastructure, then, continued success is guaranteed for the satellite industry, although the driving force behind this remains the huge demand for data that comes from new and exciting inventions, like the Smartphone. With even more data-hungry trends on the horizon, such as virtual reality, future growth of both this demand and therefore the satellite industry is extremely positive.



Andrew Bond is Sales Director at **ETL Systems**. His speciality is the sales and marketing of technical communications products with a focus on developing international brands and sales networks. He can be reached at: andrew.bond@etlsystems.com

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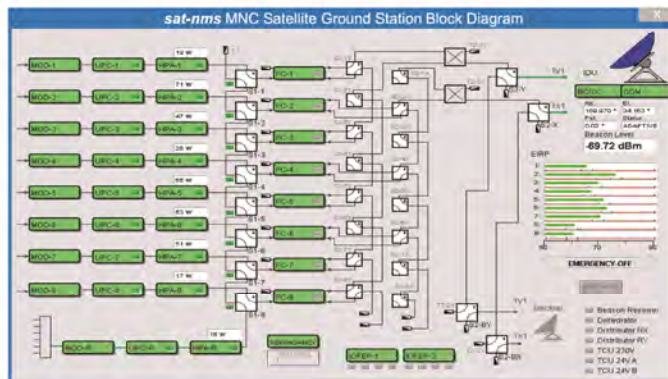
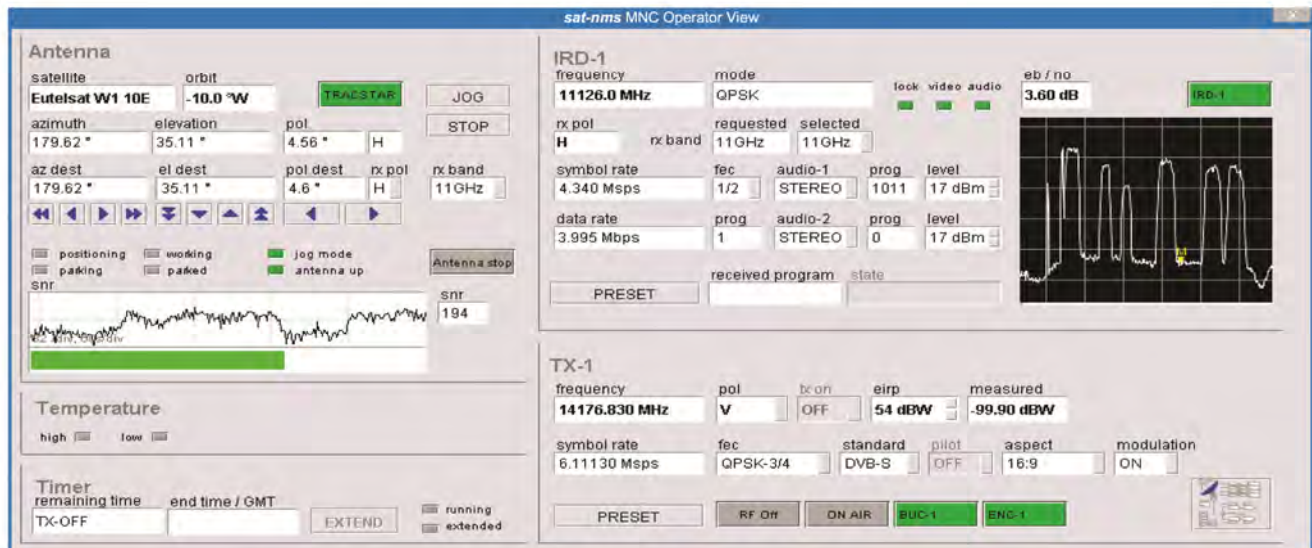
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New, Innovative Products from RF-Design

RF-Design from Lorsch, Germany is developing, manufacturing and marketing high quality RF-distribution solutions for the international satellite, broadcast and broadband communication industry. Over the recent years the company has developed itself from a provider of custom-made products to a key-player in this industry.

Their extensive product-range includes different types of Switch/Router Matrices, RF-over-Fiber systems, Signal-Quality Analyzers, Line-Amplifiers, Switches/Redundancy-Switches, Splitters/Combiners and LNB-supply/control products while still today RF-Design is well known for developing and manufacturing custom-made RF-distribution equipment. Their products are used by major satellite operators, earth stations, teleports and system integrators around the globe and are distinguished by high quality, stability and excellent performance.

ratios from 8:8 to 256:256 while its unique cascading concept allows easy expansion (increments of 8) without the need of any additional devices.

The FlexLink-K7-Pro offers innovative features and functionalities such as gain-control, slope-equalization RF-power monitoring and switchable LNB-supply while outstanding RF performance and stability especially at isolation and frequency response are standard at any RF-Design product. Besides this, the FlexLink-K7-Pro is the only L-Band Switch-Matrix on the market that has an integrated Signal Quality Analyzer which allows RF and DVB-S/S2 monitor-

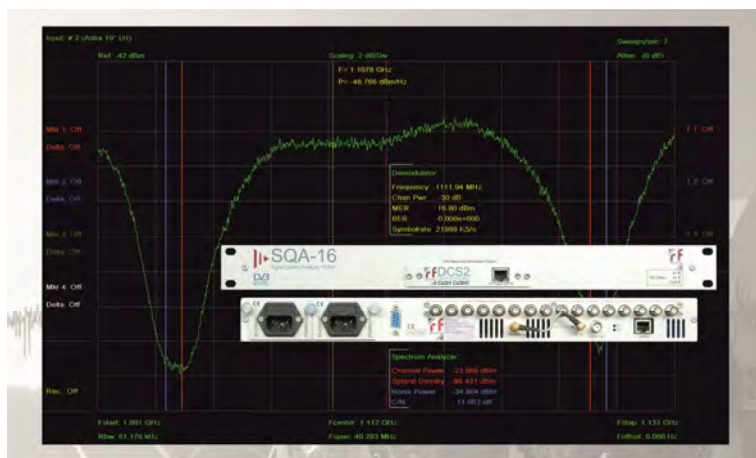
the future success of the company.

Another innovation of RF-Design is their new Broadband Signal Quality Analyzer SQA-16. This unit has multiple inputs and allows RF measurement and DVB monitoring (DVB-C, DVB-S/S2) in a space saving 1RU/19 rack-mount unit.

The SQA-16 is an excellent solution for remote monitoring purposes wherever continuous monitoring, prompt detection of faults and overall performance issues are essential factors to maintaining customer satisfaction. RF-Design's RF-over-Fiber product series FiberLink will be extended with their new Fiber-

Link-ODA which represents a compact and weather-proof Outdoor-Application chassis (IP65) intended to be mounted close to the antenna. The Outdoor-Application chassis comes with an internal fiber patch-panel and temperature controlled heating and cooling allowing to integrate it in almost any environment.

The FiberLink-ODA can house up to 8 Transmitter- or Receiver-Modules while redundant operations (1:1



RF-Design's new SQA-16 Signal Quality Analyzer 16 port

Thanks to ongoing new product developments, comprehensive sales and marketing activities, their ability to design and to manufacture not only off-the-shelf but also custom-made products and last but not least the confidence of their valued customers the medium sized company has achieved a great reputation around the globe.

In 2015 RF-Design's R&D team has developed some notable and innovative products like their new L-Band Switch/Router-Matrix "FlexLink-K7-Pro". This scalable and expandable L-Band Switch/Router-Matrix systems is available with various input/output configura-

ing at any input & output of the matrix system. RF-Design has sold more than 240 FlexLink Switch/Router-Matrix systems with different input/output configurations in the past 4 years and is about to deliver the first FlexLink-K7-Pro system in a 64:64 configuration to one of their key-customers which is a major and globally operating satellite operator.

RF-Design is firmly convinced that their new FlexLink-K7-Pro is a perfect fit for RF-distribution infrastructures in satellite earth stations, teleports and Broadband CATV/IPTV headend systems and that it will significantly contribute to

or N:1) are also possible. The optical Transmitter-Modules feature switchable LNB-supply, gain-control and RF-power monitoring while the Receiver-Modules also provide gain-control and RF-power monitoring. This outdoor RF-over-Fiber system assures superior RF performance and stability and can be configured and monitored remotely via its Ethernet-interface (WEB-GUI/SNMP).

At CABSAT visit RF-Design at Hall 7, Booth # D7-43 or go to www.rf-design-online.de for more information.



Signal Quality Analyzer 16 Port



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RF-Parameter Measurement

- ✓ RF-Power, C/N, Bandwidth

Carrier Parameter Measurement

- ✓ DVB-C & DVB-S/S2
- ✓ Frequency & Channel-Power
- ✓ MER & BER, Symbol-Rate
- ✓ QAM Constellation
- ✓ Network-ID & TS-ID
- ✓ Service-ID & Service-Type
- ✓ Service Provider

San Francisco International Gateway

by Virgil Labrador, Editor-in-Chief

SFIG's antenna farm in their teleport overlooking the San Francisco Bay.

The San Francisco International Gateway (SFIG) teleport has been around since 1989 when it was started by a pair of entrepreneurs who saw the coming boom in satellite broadcast services. It has since passed into different ownership, the latest being ABS-CBN International which purchased the teleport in 2006.

ABS-CBN is one of Asia's largest broadcast and content distribution companies. Since taking over the teleport in 2006, it has invested several million dollars to make substantial upgrades to the facilities and have expanded the capabilities of the teleport to include many leading-edge applications.

"Being part of a broadcasting company, we are very familiar with the specific needs and requirements of broadcasters. We also believe that a teleport should provide services beyond the traditional teleport, and that is the reason why we have converted this into a 'transmission hub' for ABS-CBN," said Sherry Ann Supelana, Head of Global Engineering and Technical Group of ABS-CBN International, whose group oversees the teleport. Leveraging their broadcast capabilities, SFIG clients can avail of studio, editing and post production facilities at ABS-CBN International's campus in Redwood City, California, about 30 minutes drive away. ABS-CBN's Redwood City facilities are connected by fiber to the teleport.

Apart from traditional teleport and transmission services, SFIG has been expanded to provide IPTV distribution services, playout facilities and other Over-the-Top (OTT) delivery services and App integration for various media devices. SFIG has recently soft-launched a new service called Billboard-on-Air—an advertising platform.

Facilities

SFIG today is a state-of-the-art, full-service teleport strategically located in one of the largest metropolitan areas in

the West Coast of the United States. From its location in the San Francisco Bay area, it can serve the Asia-Pacific, Continental USA and Canada with any telecommunication, video and data transmission service for various applications.

The teleport has the ability to access all domestic satellites serving Canada, USA and South American satellites which have footprints over the Western portion of the USA. It can also access all Pacific Ocean satellites.

SFIG is a large "carrier class" satellite communications facility and remains one of the few independent and multi-platform capable operators in the world.

SFIG has the required F.C.C licenses to transmit and receive video, audio and data circuits (including telephony and IP) to all satellites on the F.C.C.'s "Permitted List" which generally includes all North American spacecraft operators and satellites serving North America and Pacific Operating Region.

SFIG has extensive fiber connectivity within the San Francisco Bay area and the U.S. West Coast's largest carrier point-of-presence (POP) at One Wilshire in Los Angeles and London Telehouse. SFIG is also connected via its Manila Uplink center for various disaster recovery needs.

Ready for Any Service

"We are ready for any service for a variety of clients and applications. At SFIG, we work with clients on a highly personal level and offer flexibility and 'out of the box' commercial arrangements. SFIG is open to all options and is the perfect partner to grow your business," said Supelana.

SFIG will be exhibiting at SATELLITE 2015 in Washington, D.C. Go to Booth # 2106 for more information or visit www.sfig-teleport.com

The advertisement features a background image of the Golden Gate Bridge in San Francisco. In the foreground, there are several large satellite dishes pointing towards the sky. Below the bridge, there is a collage of various Asian television shows and logos, including "Panda's", "SNN", "TV Patrol", and others. In front of this collage are images of a laptop, a tablet, and a smartphone, all displaying different video content. The overall theme is international media distribution and streaming services.

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LEO HTS: The Silver Bullet to Bridge the Digital Divide?

by Brent Prokosh

With the dust still settling following the recent wave of well-publicized investments in LEO satellite broadband constellations, many industry stakeholders are asking themselves what effect these plans may have on existing satellite markets, and particularly for the rapidly developing ecosystem of high throughput satellites (HTS). The new breed of satellite constellations, including Greg Wyler's Qualcomm/Virgin-backed OneWeb and Elon Musk's Google/Fidelity-backed SpaceX ventures, aim to provide rival global communications networks designed to bring broadband connectivity to the billions of people in world who remain unconnected to the internet.

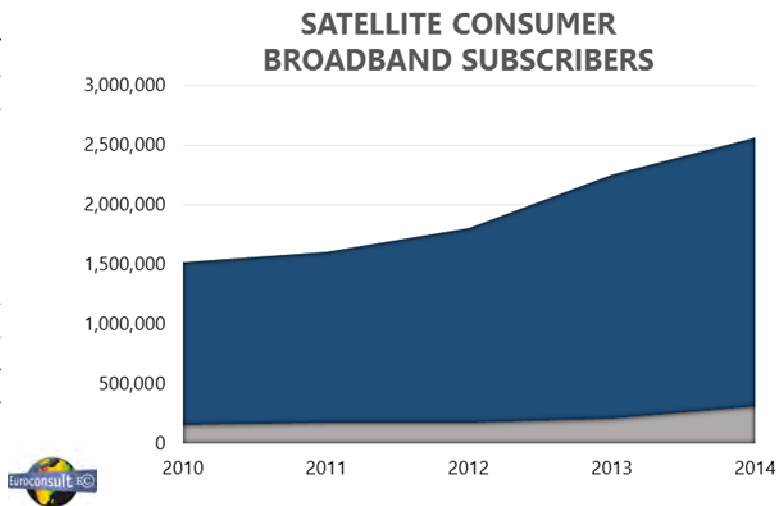
The plans of SpaceX and OneWeb should be cause for concern for a number of high throughput satellite operators, many of whom are providing capacity for broadband connectivity services to under-served markets in the developing and developed world alike. To start, the sheer scale of these constellation projects, in terms of investment and capacity, would undoubtedly shake up the satellite industry. Total investment in high throughput satellites and payloads has topped \$13 billion in the 10 years

since 2004, according to Euroconsult's recently released report, *High Throughput Satellites: On Course for New Horizons*. This level of investment, while impressive, would be eclipsed by OneWeb and SpaceX, whose constellations are estimated to cost roughly US\$ 2 billion and up to US\$ 15 billion, respectively. These constellations would also offer a quantum leap forward in terms of capacity with OneWeb's 649 satellites slated to add nearly 9,100 Gbps of Ku-band HTS capacity, while SpaceX's prospective 4,000 satellite constellation would add upwards of 40,000 Gbps of capacity. As a comparison, global supply from high throughput satel-

"...While a portion of the coming HTS capacity will be targeted towards more niche mobility applications such as maritime and in-flight connectivity, the vast majority is designed to serve consumer-grade broadband and telecommunications ..."

lites and payloads is expected to reach just 1,800 Gbps by 2018, although forecasts are rapidly increasing as new HTS projects multiply.

The "other 3 billion"



Source: Euroconsult Satellite Communications & Broadcasting Markets Survey 2014.

While a portion of the aforementioned HTS capacity will be targeted towards more niche mobility applications such as maritime and in-flight connectivity, the vast majority is designed to serve consumer-grade broadband and telecommunications trunking/backhaul applications, precisely the target markets for SpaceX and OneWeb. These two applications are expected to account for over 70% of HTS capacity usage by 2023.

Several HTS operators will have a head start in their attempts to connect the "other 3 billion", including Avanti, Yahsat, and the aptly named O3b. Both Yahsat and Avanti have made significant investments to grow capacity and coverage of underserved broadband markets in Africa, MENA and Latin America, however penetrating these markets has not been without its challenges, many of which will likely be shared by OneWeb and SpaceX in the future.

Despite the higher speeds and data allowances enabled by high throughput satellite technology, affordability is one of

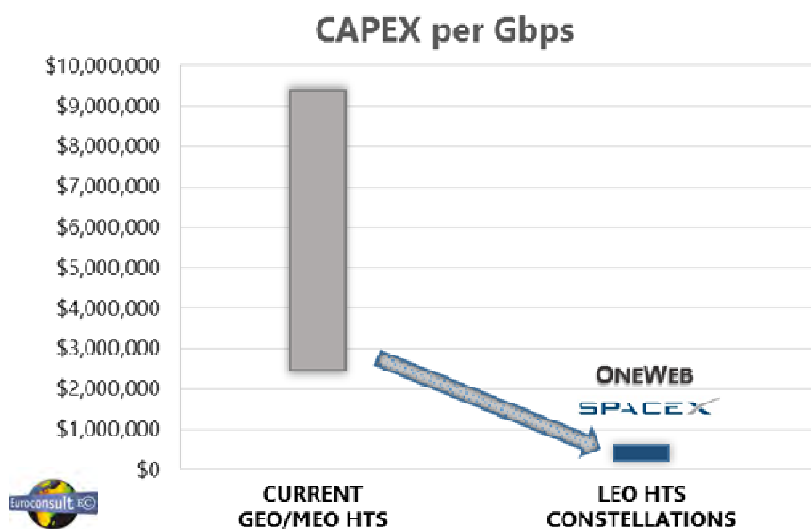
the foremost challenges, as the ability to pay for broadband services in many of the world's least developed markets effectively limits the addressable consumer market to higher income brackets. In fact, the largest satellite broadband markets today are countries such as the U.S., Canada, Australia, the U.K., France and Germany which combined account for nearly 90% of the world's 2.5 million satellite consumer broadband subscribers in 2014. Equipment prices, which range from \$200 to \$500, are also a limiting factor to satellite broadband adoption in emerging regions where installation and equipment tend to be billed up-front. Securing landing rights and efficient distribution partners or networks in a medley of nations and regulatory regimes has also contributed to slower than anticipated ramp-up of consumer broadband services in most emerging regions.

Given these challenges, many of today's HTS operators have pivoted to higher margin markets such as enterprise (including SMEs) and government markets which carry higher revenues per site. As evidence, while O3b's backhaul solutions have been adopted by a number of telecom operators in remote and underserved regions, the operator has also made significant inroads in the cruise ship sector, offering broadband connectivity to passengers aboard three of Royal Caribbean's massive vessels.

Is scale the answer?

The technologies of SpaceX and OneWeb may not be disruptive for the satellite sector on their own, however their scale, funding and business models may combine to stir the current order. The large scale of these prospective broadband constellations will greatly improve the efficiency of capital spending in terms of capex dollars per Gbps (gigabit per second) of capacity. By reducing manufacturing costs through economies of scale, SpaceX and OneWeb aim to drive their capex per Gbps down to the range of \$250,000, an order of magnitude of improvement over recently procured stand-alone high throughput satellites.

The proposed business models of SpaceX and OneWeb are also likely to offer cost advantages. Taking SpaceX as an example, the traditional mark-ups for manufacturing and launch services would be eliminated, or more accurately "reinvested" to support further growth, as both activities would be effectively vertically integrated.



Ultimately, this lower cost base would engender lower capacity pricing, which would help confront the issues associated with affordability in emerging regions, increasing the likelihood of satellite broadband migrating from a niche to a mass market solution. These economies of scale will also need to be replicated to lower the cost of user terminals.

Strong user uptake or demand is generally a precursor to the kind of large batch production likely needed to drive down prices of terminals, which are expected to feature phased-array antennas, to the \$100 to \$300 range cited by Elon Musk.

That leaves distribution, a challenge which will persist despite the improved volumes, affordability and coverage of the capacities proposed by satellite broadband constellations. While funding, engineering and related technological advancements are definitely keys to disruption, they do little to solve the quagmire of building efficient distribution networks and partnerships across the myriad of regulatory frameworks and national markets that house the world's "other 3 billion" people.



Brent Prokosh is a Consultant at **Euroconsult** specializing in strategic planning, financial forecasting and market assessment. He is also a main contributor to Euroconsult's recently released research report on High Throughput Satellites.



Products and Services MarketPlace

■ A guide to key products and services to be showcased at CABSAT 2015 in Dubai, UAE from March 10-12 and SATELLITE 2015 in Washington, D.C. from March 17-19.

ABS

@ CABSAT Hall 8, C8-20 @ SATELLITE booth 1099
www.absatellite.com



ABS is a young, dynamic and fast growing global satellite operator. ABS offers a complete range of tailored solutions including broadcasting, data and telecommunication services to broadcasters, service providers, enterprises and government organizations.

ABS operates a fleet of six satellites; ABS-1A, ABS 3, ABS-4/Mobisat-1, ABS-6, ABS-7 and the recently launched ABS-2. ABS-2 is a highly sophisticated multi-mission satellite, equipped with a communication payload of 32 C, 51 Ku and 6 Ka-band transponders (a total of 89 active transponders) across 10 different beams.

ABS-2 brings unparalleled coverage and expansion capacity at ABS' prime location of 75 degrees East. ABS-2 offers a range of services including direct-to-home and cable television distribution, VSAT services, data networks, and telecommunications services for commercial and government customers as well as military applications. ABS-2 covers Eastern and Central Europe, Africa, the Middle East, Asia Pacific, Russia and the CIS countries and has an operational life for at least 15 years.

Advantech Wireless

@ CABSAT Hall 7, 710 @ SATELLITE booth 7019
www.advantechwireless.com

Advantech Wireless is the leading wireless broadband



**Advantech
Wireless**

SMARTER SOLUTIONS,
GLOBAL REACH.

communications
solution
provider

for Commercial, Critical Infrastructure & Government and Military clients. We design turnkey terrestrial and satellite communications solutions that maximize performance and minimize operational costs, all with uncompromising quality. With our customized approach, award-winning R&D and innovative engineering, we empower you to achieve excellence in communication, while you experience reduced CAPEX and OPEX overall.

The company's products include World-leading GaN technology based High Power Amplifiers, SSPAs, BUCs, Next Generation VSAT Hubs and Terminals, Microwave Radios,

Antennas and Controllers, Frequency Converters, Routers, Satellite Modems and Ruggedized Products.

Advantech Wireless was awarded the Vision Award for "Most Promising Company of the Year 2014".

This Vision Award recognizes the company that has experienced substantial growth in the market while demonstrating long-term viability of their enterprise.



Amos Spacecom

@ SATELLITE booth 5061
www.amos-spacecom.com



Spacecom, operator of the AMOS satellite constellation, consisting of **AMOS-2** and **AMOS-3** co-located at 4°W, **AMOS-5** at 17°E, and

AMOS-4 at 65°E. The AMOS satellites provide high-quality broadcast and communications services in Europe, Africa, Russia, Asia, the Middle East, & North America. With the launch of AMOS-6 to 4°W in 2015, enhancing coverage over Europe and the Middle East with its new Pan-European beam, Spacecom will further strengthen its position as a global satellite operator.

Spacecom's AMOS-4 satellite provides a full range of services to Southeast Asia, Russia and China. AMOS-6, planned for launch in 2015, will provide steerable Ku-band across Europe and the ME and high-throughput Ka-band coverage in Africa and Europe. Ku-band and Ka-band on AMOS-4 is now available.

ARABSAT

@ CABSAT Hall 8, B8-10
www.arabsat.com

Founded in 1976, **Arabsat** has been serving the growing needs of the Arab world for over 30 years. Now one of the world's top satellite operators, it carries over 500 TV channels, 160 radio stations, pay-TV networks and wide variety of HD channels reaching tens of millions of homes in more than 80 countries across the Middle East, Africa and Europe—including an



audience of over 170 million viewers in the (MENA) tuned into Arabsat's hotspot at 26° E.

Operating a growing fleet of owned satellites at the 20° E, 26° E, 30.5° E and 34.5° E, ARABSAT is the only satellite operator in the MENA region offering the full spectrum of Broadcast, Telecommunications and Broadband services, making Arabsat satellites' fleet the youngest in the region.

Arabsat also maintains strategic partnerships with most of the world's leading satellite companies and VAS integrators and recently acquired Hellas Sat, allowing customers to reach farther than ever and deliver content and state-of-the-art solutions.

ATCi
@ SATELLITE booth 9027
www.atci.com

ATCi is a custom communications solutions provider specializing in commercial satellite communications systems and services including: the Simulsat multibeam, parabolic antennas, complete uplink systems/services, teleports, cable television headend and plant components, test equipment and input matrix switches, as well as fiber optics components for corporate, broadcast, cable television, government and education.



AVL Technologies
@ SATELLITE booth 8045
www.avltech.com

AvL TECHNOLOGIES

AvL Technologies' booth at SATELLITE 2015 will showcase our newest 2.5m vehicle-mount antenna for military applications. This robust quad-band antenna features a lightweight, new design AvL carbon fiber reflector with notched corners enabling it to be transported by helicopter. The antenna's positioner comes from the lineage of 1,200 antennas in active use with the JNN program, and has received Munson Road, ARSTRAT and DISA certification as integrated in several systems. The antenna stows to 24.4" (62cm).

Additionally AvL will feature our new 70cm axi-symmetrical manual flyaway antenna. This ultra-compact, lightweight antenna



AVL's new ultra-compact, lightweight antenna

features an eight-segment carbon fiber reflector, assembles in five minutes, and packs into a carry-on sized travel case or backpack. The antenna operates in Ku-, Ka- or X-band and was designed to be in compliance with the currently proposed FCC rule for Ka-band apertures.

AvL's new 1.2m vehicle-mount broadband antenna with a motorized, auto-selecting sliding multi-feed system will also be on display. AvL's Ka-band broadband antenna family is noted for its versatile configurations, high reliability and cost-effective "go-to" solutions for mobile accessibility with High Throughput Satellites.

AvL antennas are the industry benchmark of excellence for mobile broadband Internet access, SNG, Oil & Gas Data Backhaul, and Defense & Government solutions.

C-COM Satellite Systems Inc.
@ CABSAT Hall 8, 805 @ SATELLITE booth 6047
www.c-comsat.com

C-COM Satellite Systems Inc. develops commercial grade mobile satellite-based technology for the delivery of two-way high-speed Internet, VoIP and Video services into vehicles in remote areas.

The iNetVu[®] VSAT's have been adapted to be airline checkable and easily transportable for crucial access to communications. C-COM's broadband satellite-based products and services deliver high-quality, cost-effective solutions for both fixed and mobile applications throughout the world such as Broadcasting, SNG, Oil and Gas, Exploration, Military Communications, Disaster Management, Emergency Communications Backup, Cellular Backhaul and many others.

Come visit C-COM's booth at Cabsat featuring the iNetVu[®] FLY-981 and Ka-75V Driveaway (booth #805) and discover the iNetVu 981 Driveaway, FLY-75V and ACFLY-1200 at Satellite2015 (booth#6047).

Both the 75cm ka-band driveaway and flyaway antennas are "Authorized for use on ViaSat Exede[®] Enterprise and on KA-SAT NEWSSPOTTER NEWSGATHERING service by Eutelsat".

COMTECH EF Data
@ CABSAT Hall 8, A8-22 SATELLITE booth 7009
www.comtechefdata.com



Comtech EF Data Corp. – the global leader in



C-COM 's Ka-75V antenna

satellite bandwidth efficiency and link optimization. Our integrated SatCom infrastructure solutions encompass Advanced VSAT Solutions, Satellite Modems, RAN & WAN Optimization, Network & Bandwidth Management and RF Products. The offerings feature groundbreaking efficiency (industry-leading coding, modulation, compression and physical layer operation), robust intelligence (traffic shaping, dynamic bandwidth allocation and integrated network management) and unparalleled horsepower (processing power for your pps and Mbps transmission requirements). Commercial and government users utilize our solution suite to reduce OPEX/CAPEX and to increase throughput for the most demanding fixed and mobile networks.

COMTECH Xicom Technology
@ CABSAT Hall 7, B7-42, SATELLITE booth 7009
www.xicomtech.com



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

At Satellite 2015, Comtech Xicom will be introducing new SuperPower TWTAs with radically improved efficiency that will help you achieve your savings goals.

EM Solutions
@ SATELLITE booth 5103
www.emsolutions.com.au



EM Solutions is a high-technology manufacturer of broadband telecommunications equipment primarily focused on satellite-on-the-move ground terminals, and Ka-Band RF subsystems. The company delivers products to systems integrators and other manufacturers who serve both defense and commercial end users.

EM Solutions has recently delivered a range of land mobile on-the-move terminals based on its proprietary tracking technology at both Ku and Ka-Band and is currently under contract to deliver maritime systems that provide simultaneous services at X and military Ka Band frequencies plus switchover to commercial Ka Band when required. EM Solutions family of Ka Band BUC products has also been recently updated to include a number of products based on GaN components with power levels up to 100W. Its new split system 28-31GHz BUC incorporates the company's innovative linearization technology that makes it ideal for use with third-party SSPAs and TWTs, or for deployment as an integrated system with our own GaN SSPAs in manpack and on-the-move terminals.

Gazprom Space Systems
@ CABSAT Hall 8, E8-40
www.gazprom-spacesystems.ru



Gazprom Space Systems (formerly Gascom) is a private commercial, non-governmental satellite operator based in Russia. The main shareholder is Gazprom, one of the largest energy companies in the world. Gazprom Space Systems' orbital fleet consists of four satellites under the Yamal brand. Gazprom Space Systems' ground infrastructure consists of four teleports in the city of Moscow and in the surrounding Moscow region, which are connected to the main telecom backbones by means of fiber-optic lines. The company also has a wide network of earth stations across Russia.

In Russia Gazprom Space Systems is not only a satellite operator but also a service provider and system integrator. Within Russia, along with satellite capacity, it provides satellite services including satellite links, video distribution, Internet access and network development and management.

Globecast
@ CABSAT Hall 7, C7-20
www.globecast.com



Globecast is a leading-edge content contribution, media management and distribution company. It brings together bespoke management and monetisation solutions and the most extensive connectivity mix, ensuring that broadcasters and media companies can maximise the value of their content.

Hispasat/ Hispamar Satélites
@ SATELLITE Booth 6081
www.hispasat.es



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

Hunter Communications Canada
@ SATELLITE booth 5140
www.huntercomm.net



HUNTER
COMMUNICATIONS

Hunter Communications was founded in 2002 as a satellite bandwidth and tele-port provider. We work as an independent agent, working with satellite network service providers, US Government contractors and teleports worldwide, to support them with bandwidth procurement, analysis, and teleport facilities.

INTEGRASYS
@ SATELLITE booth 9127
www.integrasys-sa.com



INTEGRASYS is the technology leader in signal monitoring software systems for satellite, broad-band and telecommunications market.

Our software products are the state-of-the-art in Control Systems in terms of speed, flexibility, efficiency and scalability and introduces a new concept in signal monitoring communications.

At Satellite 2015, Integrasys will be showcasing its Satmotion Pocket is the most innovative technology worldwide for VSAT commissioning and maintenance, minimizing OPEX time and interferences. Satmotion Pocket is the winner of the "Most Innovative Technology of the Year" Award 2014.

ITC Global
@ SATELLITE booth 5109
www.itcglobal.com



ITC Global is the world's largest privately-owned satellite communications provider exclusively focused on mission critical operations in the energy, mining, and maritime markets. Companies in remote and harsh environments require communications with both global coverage and unwavering customer service. ITC Global enables improved real-time decision making and enhanced health, safety and environmental management through a unified communications solution, tailored to the requirements of each client. Solutions include custom network design, hardware implementation, field engineering, technical support and enterprise-grade satellite bandwidth. ITC Global operates 24 x 7 carrier-class networks across the Americas, Europe, Asia, Africa and Australia.

Narda Test Solutions
@ SATELLITE AG Franz Booth 4119
www.agfranz.com/narda-satellite/

Narda Test Solutions designs and manufactures highly sen-

sitive signal analyzers for RF interference detection and monitoring (rack-mountable and portable).

At the Satellite Show we will be showcasing the new **Narda Remote Spectrum Analyzer NRA-6000 RX**. The NRA RX is a 1RU rack mountable, high speed (12 GHz/sec), low-power fan-less test-equipment with 10 MHz reference input that can be used in a variety of applications. It has been easily inte-



grated and remotely controlled in various network monitoring systems. Up to 500 channels can be pre-programmed for fast carrier monitoring, with up to 600,000 samples per sweep. The NRA RX is extremely sensitive with a noise floor of -155 dBm to be able to detect low-level interferences. The wide bandwidth (9kHz-6GHz) of the NRA-6000 RX enables the operator to simultaneously monitor a variety of signals; the NRA-3000 RX model (9kHz-3GHz) is optimized for satellite signal interference monitoring and troubleshooting. The high-speed I/Q data streaming capability is ideally suited for signal identification and characterization.

The Narda RF signal analyzers are available in North America through **A.G.Franz, LLC** www.agfranz.com/narda-satellite/

ND SatCom
@ CABSAT Hall 7, D7-40, @SATELLITE booth 3135
www.ndsatcom.com

At CABSAT and SATELLITE, **ND SatCom** will be highlighting its new SKYWAN 5G product. SKYWAN 5G is an MF-TDMA modem with integrated DVB-S2 receiver, allowing data to be transmitted in single-hop directly from their origin to their destination; avoiding double hops and extra delays. Bandwidth is dynamically allocated as required, which brings substantial savings on satellite capacity cost since the overall network capacity can be reduced.



No matter if you request a star, multistar, hybrid or full mesh network, the unique hardware design of SKYWAN 5G reliably fits all existing topologies within the VSAT world. Following the approach of a single hardware unit for all purposes, each SKYWAN 5G has the full functionality on board. One small hardware for all network roles simplifies logistics and unprecedented scalability enables the growth of your network in a very cost efficient manner. SKYWAN 5G – The ONE.

Newtec

@ CABSAT Hall 8, E8-20 @ SATELLITE booth 4039
www.newtec.eu



Founded in 1985, Newtec is celebrating 30 years of connecting people this year. The global leader in satellite communications equipment and technologies is marking this milestone with 20% growth and new market expansion, including cellular backhaul, multiservice and High Throughput Satellites (HTS).

Solutions for these, including the Newtec Dialog[®] multiservice platform, with new patented technology Mx-DMA[™] which combines SCPC and MF-TDMA qualities, will be demonstrated at CABSAT and Satellite 2015. Technology for established markets, like broadcast and VSAT, including the new DVB-S2X transmission standard as software-upgrade available will also be showcased.

Online Business Communications

@ CABSAT Hall 7, 702
www.online.com



Online is leading the way in providing high quality, secure and reliable business communications to customers across the globe. Online provides premium quality VoIP, Internet and data connectivity over VSAT or fibre to enterprise, government, military, oil & gas, mining, banking, NGO and many other customer groups.

With its extensive satellite coverage, across Europe, Africa, the Middle East, Central Asia through the Caribbean and South America, as well as dedicated access to a growing network of fibre links and with a range of the latest technology platforms, wherever an organisation is in the world, Online is there to provide an unrivalled communications environment for business.

RF-Design

@ CABSAT Hall 7, D7-43
www.rf-design-online.de



RF-Design with headquarters in Lorsch, Germany is successfully developing, manufacturing and marketing professional and high-quality RF-distribution solutions for the international Satellite, Broadcast and Broadband communications industry. Our extensive product portfolio includes **LNB supply/control solution, Splitters, Combiners, Switches, Redundancy Switches, L-Band Switch/Routing Matrix systems, RF Line-Amplifiers, RF-over-Fiber solutions and Broadband Remote Spectrum-Analyzers.**

At CABSAT 2015, RF-Design will be showcasing its new, innovative L-Band Switch Matrix System, Flexlink-K7-Pro

and the new signal quality analyzer, SQA-16 for RF and DVB monitoring.

RSCC

@ CABSAT Hall 8, B8-30 @SATELLITE Booth 2097
www.rsc.ru



The Russian Satellite Communication Company (RSCC) is the national state satellite operator whose spacecraft provide a global coverage. RSCC belongs to

the ten largest world satellite operators and owns five teleports and its own optical fiber infrastructure. The company possesses the largest satellite constellation in Russia located in the geostationary orbital arc from 14 West to 140 East and cover the whole territory of Russia, the CIS, Europe, the Middle East, Africa, the Asia Pacific region, North and South America, and Australia. RSCC offers a full range of telecommunications services such as TV&radio broadcasting, data transmission, telephony, multimedia and others using its own terrestrial engineering facilities and satellite constellation.

ScheduALL

@ CABSAT Hall 2, F2-32
www.scheduall.com



Since 1989, ScheduALL has been providing Enterprise Resource Management (ERM) solutions to the largest media, broadcast and transmission businesses in more than 50 countries across the globe.

During CABSAT 2015, ScheduALL will demonstrate its self-provisioning scheduling solution. ScheduALL will showcase the ScheduALL Portal[™] platform, a browser-based user-friendly wizard for selling transmission feeds. Portal[™] simplifies making complex bookings of Occasional Use feeds in real-time, directly into a transmission provider's system.

Portal[™] uses the unrivalled power and complexity of LINK[™] to deliver efficiency and streamline the booking process for satellite, fiber and Ethernet transmissions.

Walton De-Ice

@ SATELLITE booth 5049
www.de-ice.com



Walton De-Ice, the world's leading designer and manufacturer of satellite earth station antenna (ESA) weather protection solutions, Walton will showcase its latest Ka-Band satellite ESA weather protection solutions, **Ice Quake, Rain Quake, and Snow Shield** during SATELLITE 2015.






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occasional use bookings
so you don't have to be

We'll schedule
your available
capacity, so you
can focus on
the rest.



 scheduall.com

See us at CABSAT, stand **F2-32**

 Schedu**ALL**®

The Canadian Satellite Market

Canada is the second largest country on earth, with nearly 10 million square miles (6 mil. sq. miles) and the longest coastline in the world. Due to its geographic vastness and extreme weather conditions as well as a sparsely distributed population, Canada heavily depends on satellite technology to deliver essential services, including broad-band communications, emergency services and monitoring of its landmass and waters in support of sovereignty, public safety and natural resource management.

Given the challenges posed by its unique geography, Canada is one of the pioneers in applying satellite technology as part of its national communications strategy. It is the fourth country in the world (after the former Soviet Union, US and the UK) to launch its own satellite, Allouette 1 in 1962. Canada was the first country to launch its own commercial domestic satellite system in 1972 with the launch of the Anik A1 satellite in 1972 by Telesat, a joint-venture between the Canadian government and private telecom companies. The Anik A1 satellite enabled the Canadian Broadcasting Company to broadcast television to the remote communities in the north of Canada for the first time.

Today, Canada has one of the most developed satellite communications industries in the world. It has a healthy Direct-to-Home (DTH) satellite broadcast market as well as a developed satellite broadband sector. Canadian companies are leaders in various segments of the satellite industry including satellite manufacturing, ground equipment and satellite services. It has an extensive telecommunications network— including a number of teleports. Companies planning to enter the

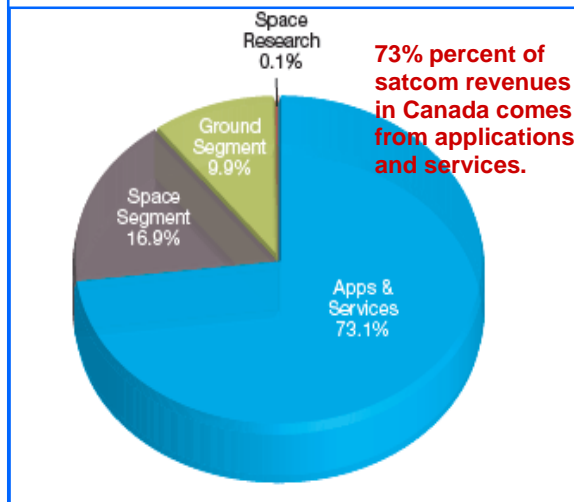
Canadian market will have no problem finding partners in any segment of the industry.

According to the Canadian Space Agency, the satellite communications sector in Canada represented 80% of total space sector revenues in 2012. Of the CDN\$ 2.655 billion in satellite communications revenue, CDN \$ 1.941B (73%) was derived from activities in Applications and Services. Of the re-

issues,” said Jean-Pierre Blais, Chairman of the Canadian Radio-television and Telecommunications Commission (CRTC). “Canadians in rural parts of our country, and especially in the North, do not enjoy the same telecommunications services as those living in urban centers. We are working to provide those Canadians with even greater choice,” he added.

Hunter Communications has the exclusive use of EUTELSAT 115 WA, formerly known as Satmex-5 for much needed Ku-Band capacity for the Canadian market. EUTELSAT 115 WA was repositioned over Canada for Hunter as an interim solution until the firm's hosted payload is made available on the EUTELSAT 115WB (formerly known as Satmex-7) satellite, which was successfully launched on March 1, 2015. The Hunter Ku-Band beam in the orbital location of 114.9°W is in the center of the Canadian arc. This position provides some key advantages, according to Hunter, including: It is the only satellite orbital location that can see both the northwest tip of the Yukon and the southeast tip

Canada Satellite Communications Revenues



73% percent of satcom revenues in Canada comes from applications and services.

maintaining 27%, the break-down was as follows: CDN\$ 262 million from Ground Segment activities; CDN\$ 449 million from Space Segment; and CDN\$ 2.5M from Space Research. Over the last five years, satellite communications revenues have increased 24% or CDN\$ 510 million (1 Canadian Dollar= .80 US cents approximately).

Despite its healthy communications industry, most of the services are concentrated on the southern part of the country bordering the United States where the majority of the population are concentrated.

“While Canadians generally are well-served by their communication system, the Commission must remain vigilant and responsive to emerging trends and

of Newfound-land at a 10 degree elevation or better. All other satellites in the US and Canadian domestic arcs have restrictions placed on them due to adjacent satellites.

There are no Canadian beams on either of its two neighbouring satellites, so the Hunter Ku-band beam enjoys no adjacent satellite interference. For any application involving small antennas less than 1 meter, this is a critical benefit that allows clients to use fewer MHz of transponder capacity to achieve the same Mbps of throughput. The Hunter beam in Canada has the strongest power, measured as EIRP, of any beam available on competing satellites, making it ideal for various mobile, maritime, aeronautical and VSAT applications.



HUNTER COMMUNICATIONS CANADA

Hunter Ku-beam launching end February 2015

- 288 MHz new Ku-band satellite capacity
- In-service Q4 2015
- Designed and Built for Canada
- Exceptionally high power enables small antennas for:
 - Aeronautical
 - Marine
 - Land mobile

*Hunter Beam
Ready for Launch.*



Land Mobile



Marine



Aeronautical



www.huntercomm.net

Brent Perrott
brent.perrott@huntercomm.net
914-723-3595

Roland Renner
roland.renner@huntercomm.net
613-612-0501

Occasional Use Video as the Sign of the Times

by Robert Bell

The satellite communications business used to change at about the same rate as the seasons in a temperate climate. You were aware of a long, slow cycle of change but the odds were that each day would be pretty much like the last one. There was always plenty of time to get the snow tires on the car or put away the sweaters and get out the short-sleeved shirts.

Those days are gone. Satellite operators are grappling with running a long-term business on revenue from ever-shorter contracts. Technology vendors wait interminably for contracts to be signed – and then have to produce at warp speed to meet deadlines that had been reasonable back when they submitted the contract. Teleport operators are challenged to design unprecedented flexibility into their facilities to handle just about anything that a customer can throw at them.

When Everything Is Connected

The reason for all this is that customers themselves are struggling to adapt to change in demand and requirements. The world is moving from an age when discrete communication networks did the job to an age when everything has computing power and everything is connected. It is the difference between a telephone call and a Google Hangout. It is difference between the nightly news making its stately journey from the broadcast center to the viewer's home, and thousands of on-demand programs streaming to TVs, smartphones and tablets around the clock, while viewers feed back over social media.

For a prime example of its impact in the satellite world, look at two side-by-side comments from interviews for [Best Practices in Occasional-Use Video](#), the latest 4Nines report from the World Teleport Association. Occasional-use is the business of selling transmission services by the hour, day or month for sports and news contribution on TV, for government and military operations, disaster relief and business communications. It is a complex and exacting business that is not only unpredictable but almost always involves live events where downtime or mistakes are not an option.

Smaller and Larger

"I wouldn't recommend anyone to move into OU," said one contributor to the report, "because it is more competitive than it has ever been. Margins are getting smaller." An equipment supplier is quoted in the report as saying he knew of some service providers who were doing jobs for less than \$100.

"...Looking to the next three to five years, there was general consensus that the Internet would continue to grow in importance for occasional use video..."


But that is just one side of the story. A different executive offered the other. "Historically," he said, "delivery was to broadcast TV. Now it's going to all devices, growing at warp speed. Sometimes it will double in volume from one week to the next."

The OU business has traditionally been rather small; an add-on to businesses that make most of their money delivering full-time services. The sheer volume of video from sports and news – not to mention user-generated content and training videos – may be upending that traditional relationship. Advances in camera technology have resulted in more video being captured at sporting events as shots are produced from multiple different angles. Cameras are placed inside racing cars, at goal posts and on players' heads.

Growth and its Discontents

Looking to the next three to five years, there was general consensus that the Internet would continue to grow in importance for OU. As well as providing contribution to traditional broadcast locations, service providers will substantially grow their businesses in streaming in multiple formats. The result, some respondents believe, will be robust growth driven by services and market niches that hardly existed five years ago.

Seizing that growth, however, requires companies to craft their technology platforms, staffing and business practices to deliver exactly what customers need now, even when customers are hard-pressed to explain what it is. And having done that, to be able to scale up quickly to meet demand and scale down just as quickly when that demand eases.

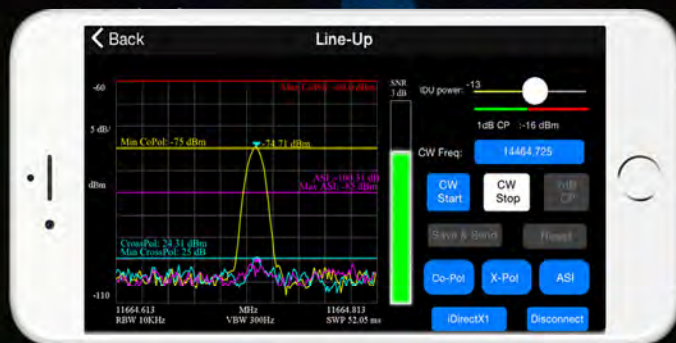
On the one hand, it presents tremendous challenges to business management and capital investment. On the other, it offers opportunities that, in the old days of the slowly-changing seasons, the industry could hardly dream of. 



Robert Bell is Executive Director of the World Teleport Association, which represents the world's most innovative teleport operators, carriers and technology providers in 20 nations. He can be reached at: rbell@worldteleport.org



Most Innovative Technology for Carrier Monitoring VSAT Autocommissioning On Android & iPhone



25 Years Building Success from Innovation

For Demos at SATELLITE15, Visit Booth 9127 or contact
info.sales@integrasys-sa.com
www.integrasys-sa.com

SpeedCast Acquires Geolink Satellite Services

Hong Kong, February 24, 2015 – SpeedCast International Limited announced the acquisition of Geolink Satellite Services, a provider of satellite communications solutions in the African region, and part of the CETel Group.

Geolink is a leading provider of satellite solutions in the African market and has strong positions in the maritime industry. The company services customer requirements in over 20 African countries,

with key customers in the oil & gas, mining, media, NGO and maritime sectors. Geolink specializes in mobile satellite solutions, as well as fixed VSAT solutions, in the increasingly important African market. The company also has experience providing services to the media industry in Europe. Geolink is based in Paris, France and works with a network of technical partners through-

out Africa, in addition to the company's own field engineering team, for the support of its solutions.

“With the Geolink acquisition, SpeedCast expands its presence and its capabilities in the African market,” said Pierre-Jean Beylier, CEO of SpeedCast. “Geolink uniquely complements SpeedCast’s business with great strength in

able to offer its customers a wider portfolio of products and services and better serve its customers’ needs worldwide. SpeedCast will partner with Geolink’s experienced management team and staff to continue to deliver best-in-class services to Geolink’s customers, while enhancing SpeedCast’s own expertise. Geolink will further complement and extend

SpeedCast’s global network in the strategic African market according to the company.



mobile satellite services, extensive experience in and satellite coverage over Africa, and strong customer base in the energy and maritime sectors. There are interesting synergies between the two companies, which will further enhance our ability to deliver complete end-to-end solutions to our respective customers globally,” he added.

Joining SpeedCast, Geolink will now be

The acquisition follows SpeedCast’s successful acquisitions of two established satellite industry players, SatComms Australia and Oceanic Broadband, in the Australasia region in the past 12 months.

The closing of the transaction is subject to regulatory approval.



NEC Acquires all Shares in Space Joint-Venture with Toshiba

Tokyo, Japan, February 27, 2015—NEC Corporation (NEC; TSE: 6701) announced a decision to acquire all shares in NEC TOSHIBA Space Systems Ltd. (NTSpace), a joint venture established in partnership with Toshiba Corporation in 2001. Shares are due to be acquired from Toshiba on March 31, 2015.

As one of its core businesses, NEC provides space solutions that cover everything from satellite systems and terrestrial satellite operation and control systems, to systems for utilizing satellite data. NTSpace is due to become a wholly owned subsidiary of NEC and change its name to NEC Space Technologies Ltd. on April 1 this year, after which time it will handle design, assembly and testing of sensors and other on-board equipment for satellites and rockets as part of NEC’s space business.

NEC has managed the integration of 69 satellites, dating

back to Japan’s first satellite Osumi (launched in 1970). Others include Hayabusa, the asteroid explorer that successfully returned samples from the asteroid Itokawa, and its successor Hayabusa 2, which was launched in December last year.

In addition to its compact satellite assembly plant operating out of Sagamihara (Kanagawa prefecture), NEC also operates a Satellite Integration Center at its premises in Fuchu (Tokyo). It is planning to establish an integrated in-house production system for its NEX-TAR Series of standard satellite systems and develop satellite infrastructure in areas such as environmental monitoring, disaster monitoring and positioning.

NEC also intends to actively target demand for satellites in countries new to space exploration in Asia and other parts of the world, with the aim of establishing a 100 billion yen space-related business by fiscal 2020.

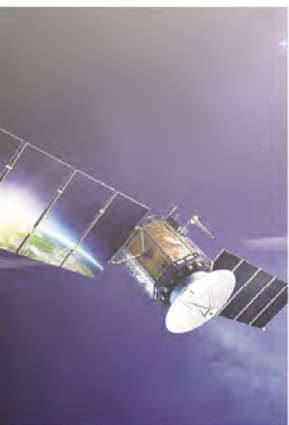




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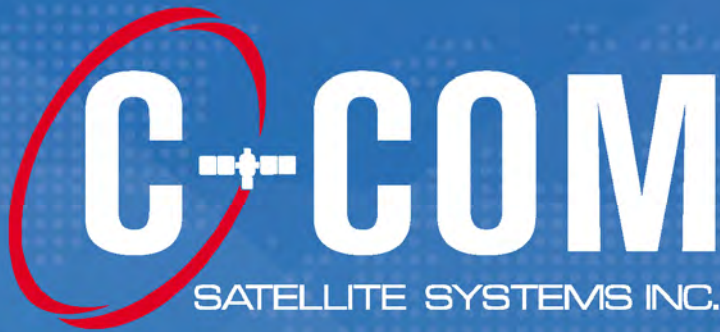
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Clayton Retires, Ergen Reassumes CEO position at DISH

Englewood, Colo., February 23, 2015--DISH Network Corporation (NASDAQ: DISH) announced that President and Chief Executive Officer **Joseph P. Clayton** will retire from his position effective March 31, 2015. Clayton, who is a 42-year veteran of the consumer electronics industry, leaves the post he assumed in June of 2011. Clayton's retirement from the DISH Board of Directors also will be effective March 31. DISH Co-founder and Chairman **Charles W. Ergen**, who has previously served as DISH's President and CEO, will succeed Clayton in those roles.

Ergen's direct reports will include EVP/COO Bernie Han, EVP/General Counsel Stanton Dodge, EVP/CHRO Mike McClaskey, EVP/Head of Corporate Development Tom Cullen and Sling TV CEO Roger Lynch.

Prior to his appointment at DISH, Clayton served as chairman of Sirius Satellite Radio Inc., from November 2004 through July 2008 and served as chief executive officer of Sirius from November 2001 through November 2004. Before joining Sirius, Clayton served as president of Global Crossing North America, as president and chief executive officer of Frontier Corporation and as executive vice president of Marketing and Sales for the Americas and Asia of Thomson S.A.

Clayton has received numerous accolades throughout his career including Bellarmine University Alumni of the Year in 1996, and induction into both the Indiana University School of Business and Consumer Electronics Hall of

Fame in 2008.

Charlie Ergen co-founded DISH more than 30 years ago and currently acts as Chairman of both DISH and EchoStar. In June 2011, he stepped down from his role as President and CEO of DISH to focus on long-term business development and acquisition tactics in an effort to reach new markets, expand product and service offerings and bolster the company's customer base.



Charlie Ergen

SSTL Appoints Wood as CEO

Surrey UK, February 17, 2015--Surrey Satellite Technology Ltd (SSTL) has appointed **Patrick Wood** as Group CEO, with effect from April 1, 2015. Wood joins SSTL from Airbus Defence and Space, where he was most recently Head of Engineering and Operations and an Airbus Group Executive.

Wood brings with him an outstanding track record within the space engineering sector, having previously steered the Skynet 5 program to success including in-orbit delivery of three geostationary military telecommunications satellites and associated ground network and infrastructure. He was also CTO for Airbus Defence and Space satellite business, and later Engineering and Operations Director with pan-European responsibilities.

Sir Martin Sweeting, Executive Chairman of SSTL said: "We are very fortunate indeed in finding someone with Patrick's rare combination of detailed engineering experience, proven management capability and passion for satellites to join SSTL. He takes up this important role at a time when the small satellite industry is burgeoning and he will be taking charge of a full production line at SSTL, where we have



Patrick Wood

21 satellites and 22 Galileo payloads currently in manufacture."

Previous to his roles at Airbus, Wood worked for Medelec, part of Vickers plc, and Thorn EMI Sensors Group. Patrick Wood is a Fellow of both the Institute of Engineering and Technology and the Royal Aeronautical Society.

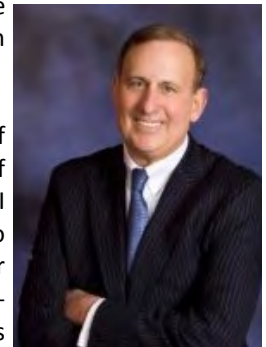
Artel Names Interim CEO

Herndon, Va., February 10, 2015--Satellite service provider **Artel** has named **Paul Domorski** to serve as interim president and CEO in the wake of the departure of **Ted Hengst**, who has left the company to pursue other interests.

The company praised Hengst, who took the reins in November 2012. "He quickly developed a strategic roadmap for the company and significantly improved and streamlined operations and processes to position Artel for growth," the company said in its statement.

"On behalf of Artel's board of directors, I would like to express our deepest appreciation for Ted's strong leadership and integrity, his exceptional contributions to the success of the company and his dedication to its customers, employees and partners," said Steve Kappes, chairman of the board.

Domorski comes to Artel with a range of experience including leading Syncordia, a large European network management and outsourcing company. He also was an executive with Unisys and Avaya. More recently he was the CEO of PAR Hospitality Solutions.



Paul Domorski

Satservice Appoints Koppenburg as Sales Director

Steisslingen, Germany, February 4, 2015--SatService GmbH, a turnkey systems integrator based in the Lake Constance area of Germany has appointed **Kai Koppenburg** as Sales Director. Koppenburg will be leading all of SatService's sales efforts worldwide.

Koppenburg is an electrical engineer specializing in RF technologies. He started his career as a scientific researcher at the Institute for High Frequency and Electronics



Kai Koppenburg

(IHE) of the University of Karlsruhe, Germany and at the Institute of High-Power Pulse and Microwave Technology (IHM). Before joining SatService he worked for satellite equipment manufacturer Work Microwave where he started as a development engineer and since 2007 led their international sales and marketing team as Sales Director.

Eutelsat's Rawlins Elected Chairman of SDA

Isle of Man, February 3, 2015--Mark Rawlins, Eutelsat's Director of Communication System Operations, has been elected as the new Chairman of the **Space Data Association (SDA)**, an international non-profit association of satellite operators that supports the controlled, reliable and efficient sharing of space environment and RF spectrum data.

Rawlins succeeds the current SDA Chairman, Ronald Busch who is Vice President of Network Engineering for Intelsat. The SDA was set up in 2009 by the international commercial satellite operator community to coordinate activity and safeguard space-based infrastructure in the space environment in which satellites are operating. The organization runs the Space Data

Center, an automated space situational awareness system designed to reduce the risks of on-orbit collisions and radio frequency interference. Today the SDA counts 25 participating satellite operators accounting for 374 satellites of which 237 are GEO and 137 LEO/MEO.

"The SDA is making a significant contribution to enhancing the safety of satellite operations, and safeguarding the operational environment in space communications" Rawlins said. "Our membership has steadily grown to embrace a broad range of members and participants. One of our key challenges going forward will be to enhance the services provided by the SDA to make for a bet-

ter working environment for all space borne services for all industry sectors with a particular focus on the



Mark Rawlins

Radio Frequency environment. This will need to happen in the same spirit in which the SDA was created, to be able share data in a safe way that improves the efficiency and coordination of activities," he added.

WTA Names Elara's Jorge Villareal Teleport Executive of the Year

New York, NY, February 19, 2015--The World Teleport Association announced that **Jorge Luis Villarreal Schutz**, CEO of Mexico-based **Elara Comunicaciones**, has been named as its 2015 Teleport Executive of the Year. Villarreal will be honored during WTA's Teleport Awards for Excellence luncheon on March 17 during SATELLITE 2015.

A successful entrepreneur with more than 20 years of experience in the satellite industry, Villarreal is the founder of an outstanding telecommunications company that has transformed satellite connectivity. His company has excelled in ethics, professionalism and commitment, continuously fostering the use of tailor-made satellite solutions through values such as customer service, honesty, teamwork and innovation, allowing him to reach others and generate a positive impact by providing satellite technology in new frontiers.



"The 20th anniversary of the awards has produced a Teleport Executive of the Year from a part of the world which, two decades ago, had not yet made its mark in the industry," said WTA Director of Development Lou Zacharilla. "Jorge is not only an excellent tactical leader focused on customer service systems and innovation, he also has enabled his company to profitably address the most pressing economic issue in Latin America, the digital divide. Under his leadership, Elara is part of a digital inclusion effort with the government of Mexico that provides coverage to more than 3,000 small villages. His teleport helps make a better world," he added.

During the 2015 Teleport Awards for Excellence luncheon ceremony, sponsored by SES, WTA will also honor its Independent Teleport of the Year and Teleport Technology of the Year. The luncheon begins at noon on the 17th of March and is free to WTA members who register. Attendance is also available on a paid basis to non-members. Registration is available online at: www.worldteleport.org.

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Satellite Manufacturing and Launch Services to Enjoy Unprecedented Growth

Wilmington, DE, February 24, 2015 – NSR's Satellite Manufacturing and Launch Services, 5th Edition, report projects that over 1,800 satellites weighing more than 50 kilograms will be ordered and launched over the next decade, generating US\$ 300 billion across global markets. Satellites launched by entirely new commercial and national operators will complement replacement and expansion missions from traditional players, sustaining the market above \$26 billion per year.

Strong 2013 market performance continued through 2014, with 116 satellites launched globally and 149 ordered. Despite failure reviews and operational delays, NSR noted launch rate increases in all but one segment, and over \$1.4 billion in added revenues in 2014. Commercial procurements overtook government and military orders for the first time since 2010, a result of restrained government budgets as well as small satellite constellation growth. The growth witnessed in 2014 across multiple segments is expected to continue into 2015.



Image: Boeing Satellite Systems

While traditional GEO communications will continue to be the most valuable commercial segment for the manufacturing and launch industry, satellite services are gradually addressing a broader user base and causing a corresponding change in procurement. "Evolving barriers to entry and new platforms – whether small and cheaply produced or featuring higher power, electric propulsion, and flexibility – are facilitating a diversification of application markets and the emergence of new players across the value chain," noted Carolyn Belle, NSR Analyst and report co-author.

NSR is projecting that over 1,800 satellites weighing more than 50 kilograms will be ordered and launched over the next decade, generating US\$ 300 billion across global markets.

"Over the next decade we will see operators, particularly the many who proposed new EO and HTS constellations in 2014, leverage innovative techniques to drive cost reduction and ensure ROI," Belle added.

Prateep Basu, NSR Analyst and report co-author explained, "the main launch service providers are starting 2015 with

packed manifests, but to realize the full potential of these contracts, it will be critical to have fewer failures or a repeat of 2014's delays. The manufacturing industry will be similarly busy, with commencement of procurement and production of several constellations expected alongside a healthy collection of single satellite orders." The satellite manufacturing and launch industry is a variable, highly competitive oligopoly, but currently changing dynamics and the right value proposition can open the door to success for new players.

Satellite Manufacturing and Launch Services, 5th Edition, provides the industry's most comprehensive and up-to-date assessment of activity in global satellite manufacturing and launch markets. Extending from 2014 market performance to expectations for the next ten years, SMLS5 addresses how emerging trends will impact satellite design and procurement and what this means for the main players. Applying extensive proprietary data and leveraging NSR's thorough analysis of drivers in all major satellite service markets, SMLS5 offers a clear view into region, customer, and application specific demand for satellites over the coming decade.



510 Small Satellites to be Launched in the Next Five Years

France, February 26, 2015 - According to Euroconsult's newly released research titled **Prospects for the Small Satellite Market**, a total of 510 small satellites, or smallsats (meaning nanosats, cubesats, microsats and minisats) are to be launched in the next five years, a two-third increase in the average number of smallsats per year versus that of the past decade. This total includes 14 constellations of different sizes and capabilities that represent a total of 140 satellites.

75% of the 510 satellites to be launched during the next five years will be for government civil and defense agencies. Growth in government demand will be stronger than in the commercial world where a total of 130 satellites are expected. "Large constellation projects such as those announced in 2014 by OneWeb and by SpaceX in association with Google have not been included in our forecasts/scenarios for launch by 2019," said Rachel Villain, Principal Advisor at Euroconsult and Editor of the report.

"Large constellation projects could, however, represent a very significant component of launches over the following five year period (2020-2024)." The market value of these future 510 smallsats is estimated at \$7.4 billion (at

510 small satellites, or smallsats are to be launched in the next five years, a two-third increase in the average number of smallsats per year versus that of the past decade.

2014\$ prices to develop and launch the satellites). Market growth will remain strong (+17% vs. the past five years) as the small decrease over time in prices and in launch masses (for satellites greater than 50 kg) is offset by more satellites to be launched.

Growth in Asia outside the three space powers above will be strong as more countries launch small satellite for two main reasons: National sovereignty and security, and technology acquisition. Finally, four countries are at the forefront of smallsat development in the

Middle East, whom together have launched or will launch 27 satellites, i.e. about half of the total of the MEA region.

Prospects for the Small Satellites Market presents the various factors that will drive/inhibit growth in demand for small satellites over the next ten years. The forecast was built on the basis of a qualitative

and quantitative analysis conducted from two sources: A dedicated database and a combination of primary and secondary research. The market analysis has been divided into five segments, which includes three types of clients, six mission applications, three client regions, five mass categories, and three orbit types.

For more information go to: <http://www.euroconsult-ec.com/shop/home/64-prospects-for-the-small-satellite-market.html>



The U.S. is by far the most active country in smallsat deployment with almost half of the 620 satellites launched in the past 10 years; it will remain the largest country for smallsats over the next five years, with Europe as the second-largest region. Russia, China and Japan have each launched a similar number of smallsats over the past 10 years; the average number of smallsats to be launched in the region per year over the next five years is estimated to be lower than in the past five years.



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Once again Space Tech Conference will open its doors in Long Beach, California, to bring together the leading representatives of the military, government and commercial space sectors. An unparalleled line-up of expert speakers at the three-day conference will showcase the breadth of innovation in the industry, and discuss issues and opportunities in solving the space sector's most challenging problems.

With senior personnel from leading organizations – including, NASA, Orbital, SpaceX, Northrop Grumman Aerospace Systems, Space and Missile Systems Center, US Navy, DARPA, Air Force Research Lab, The US Army SMDC – coming together, the 2015 event offers unprecedented access to over 60 speakers delivering presentations and panel discussions on key topics relevant to established and new industry players alike.

The West Coast's premier space event returns to Long Beach for three days of knowledge sharing and networking alongside the largest supply chain exhibition of its kind. The conference offers a stellar line up of expert speakers from established and newer market players.

The 2015 conference focuses on the challenges and opportunities facing the military, commercial, and government space sectors; exploring the business models and technologies that will help stakeholders deliver successful missions at lower cost. Key questions and topics for debate include: how can the different stakeholders work together to better leverage available expertise and infrastructure? How are missions changing in a budget-restricted environment? Which technologies will meet future space access and exploration requirements?

New to the agenda this year is the Small Sats Focus Day. Led by **Dave Barnhart** from the University of Southern California, it will look at key considerations for the continued growth of small sats, and ask: where is the real value in de-

livering affordable access to space and how can we realize it fully?

The 2015 event will open with a keynote address from **Dr. Tom Cwik**, Jet Propulsion Laboratory (JPL), who will highlight current JPL projects, including results and their application to space missions, to examine advances in space technology for planetary exploration.



"Our expert speakers will deliver experience-rich insights into the trends, challenges, and innovations across the space sector," says Mindy Emsley, Conference Director. "The conference covers a lot in just three days, but resiliency, affordability and mission assurance are key themes underpinning the entire program and will be invaluable to all attendees," she added.

High ranking officers including **Maj. Gen. Robert McMurry**, Vice Commander, Space and Missile Systems Center, **Maj. Gen. Terrence Feehan**, USAF Director of Strategic Plans and Requirements, **Rear Admiral Brian B. Brown**, Deputy Commander, Joint Functional Component Command for Space, US Navy, feature among a stellar line up of senior military leaders discussing how to evolve space architecture to meet future mission requirements.

Now in its fourth year, Space Tech Expo & Conference is firmly established as the West Coast's premier B2B space event for spacecraft, satellite, launch vehicle and space-related technologies. The show provides an invaluable opportunity to meet, debate and explore the possibilities with other key industry players.

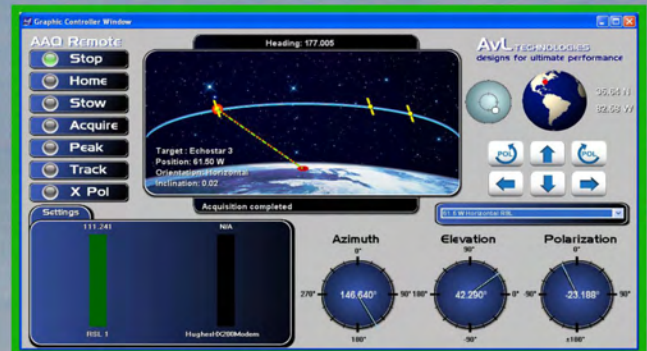
Space Tech Expo & Conference 2015 is also co-located with the Aerospace Electrical Systems Expo, an exhibition and summit covering onboard electrical power in commercial and business aviation, and military aircraft, rotary and spacecraft. Further details of this event can be found at www.aesexpo.com

For full exhibition and conference details, or to register to attend, visit: www.spacetecheexpo.com

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New Format, New Location, New Agenda... GVF Satellite Hub Summit @ CABSAT 2015

by Martin Jarrold

This year, **GVF** at **CABSAT 2015** has a dedicated satellite hub summit as a part of the CABSAT conference content, bringing an event with a brand new format, new and innovative content, and a new location, as the **GVF Satellite Hub Summit @ CABSAT 2015**.

The event, presented over two days, 11th & 12th March, will take place physically within the satellite area of the CABSAT exhibition, using a dedicated, purpose built, centrally located and high-profile meetings facility in exhibition Hall 8. Not only will this bring the GVF Satellite Hub Summit into the exhibition space, closer to CABSAT's thousands of visitors, but it will offer participating organizations – sponsors and speakers – a higher level of visibility for their support for the event program, and for the vitally important dialogues and opportunities for networking that the program facilitates and promotes.

The event will be chaired by me, with additional moderators taking-on the chairing role for specific sessions. Indeed, Virgil Labrador, editor-in-chief of this publication will be moderating two of the Hub Summit sessions.

The **GVF MENASAT Summit @ CABSAT** has been an embedded, key, added-value, feature of the annual CABSAT exhibition for many years, and 2015 will continue the complementary relationship between exhibition and summit program. GVF and CABSAT 2015 have announced a dedicated satellite hub summit as a part of the CABSAT conference, bringing an event with a brand new format, and new and innovative content, as the **GVF Satellite Hub Summit @ CABSAT 2015**.

The event, presented over two days as per previous years, will take place physically within the satellite area of the CABSAT exhibition, using a dedicated, purpose built, centrally located and high-profile meetings facility in Hall 8. Not only will this bring the GVF Satellite Hub Summit closer to the exhibition space and to CABSAT's thousands of visitors, but will offer participating organizations – sponsors and

speakers – a higher level of visibility for their support for the event program, and for the vitally important dialogues and opportunities for networking that the program facilitates and promotes.



The GVF Satellite Hub Summit program will feature a range of key themes and topics, many of which are new to the GVF CABSAT program this year, and which have been included because they are at the very core of the current global satellite communications solutions discussion arena.

The event will feature speakers from the following organizations (in order of appearance in the program):

Arab Advisors Group, APT Satellite, Kt Sat, Access Partnership, Avanti Communications, Inmarsat, Intelsat, Thuraya, Trio-EMC, Advantech Wire-

less, Comtech EF Data, Eutelsat, Globecomm, iDirect, Newtec, SES, Telenor Satellite Broadcasting, SIS Live, C-COM Satellite Systems, MenaNets, GVF Training, Mahdi Bagh Computers, Integrasys, sIRG, ArabSat, Space Data Association, ITU, ASBU, Al Jazeera Media Network, BBC World News, and ND SatCom.

To view the latest agenda and speaker line-up go to: www.cabsat.com/Content/GVF-Summit-Sessions

Don't forget - the **GVF Satellite Hub Summit @ CABSAT 2015** takes place on **11th & 12th March** at **'The Satellite Hub'** in **Hall 8** at the **Dubai World Trade Center/Dubai International Convention & Exhibition Center**. For further information you can contact me at martin.jarrold@gvf.org. The **GVF booth at CABSAT 2015** is in **Hall 8, no. 825**.



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

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The Satellite Markets 25 Index™

Company Name	Symbol	Price (Mar 02)	% Change from Last Month	52-wk Range		% change from 52-wk High
Satellite Operators						
Asia Satellite Telecommunications	1135.HK	28.50	7.55%	25.60	34.55	↓ 17.51%
Eutelsat Communications S.A.	ETL.PA	30.64	0.26%	22.64	31.50	↓ 2.71%
APT Satellite Holdings Ltd.	1045.HK	9.62	-8.38%	8.10	13.50	↓ 28.74%
Inmarsat Plc	ISAT.L	880.00	1.91%	653.00	902.00	↓ 2.44%
SES GLOBAL FDR	SES.F	30.85	-4.49%	23.70	33.45	↓ 7.77%
Satellite and Component Manufacturers						
The Boeing Company	BA	153.80	4.09%	116.32	158.83	↓ 3.17%
COM DEV International Ltd.	CDV.TO	4.11	6.48%	3.45	4.36	↓ 5.73%
Lockheed Martin Corporation	LMT	203.02	5.30%	153.54	207.06	↓ 1.95%
Loral Space & Communications, Inc.	LORL	71.24	0.15%	64.23	81.53	↓ 12.62%
Orbital ATK, Inc.	OA	67.98	142.01%	60.23	158.13	↓ 57.07%
Ground Equipment Manufacturers						
C-Com Satellite Systems Inc.	CMLV	1.13	-5.04%	1.01	1.89	↓ 40.21%
Comtech Telecommunications Corp.	CMTL	35.48	3.65%	30.02	40.69	↓ 12.80%
Harris Corporation	HRS	78.77	14.08%	60.78	79.32	↓ 0.69%
Honeywell International Inc.	HON	104.58	3.42%	82.89	105.39	↓ 0.77%
ViaSat Inc.	VSAT	65.30	15.03%	51.5	74.78	↓ 12.68%
Satellite Service Providers						
Gilat Satellite Networks Ltd.	GILT	4.88	3.00%	4.42	5.71	↓ 14.54%
Globecom Systems Inc.	GCOM	14.10	0.00%	-	-	-
International Datacasting Corporation	IDC.TO	0.0450	50.00%	0.03	0.14	↓ 67.86%
ORBCOMM, Inc.	ORBC	5.91	4.05%	5.4	8.1	↓ 27.04%
RRSat Global Communications Network Ltd	RRST	7.233	-4.07%	-	-	-
Consumer Satellite Services						
British Sky Broadcasting Group plc	BSYBY	55.74	0.00%	-	-	-
DIRECTV	DTV	88.93	0.98%	72.28	89.46	↓ 0.58%
Dish Network Corp.	DISH	75.66	-1.64%	55.45	80.75	↓ 6.30%
Globalstar Inc.	GSAT	2.5300	2.22%	1.56	4.53	↓ 44.15%
Sirius XM Holdings Inc.	SIRI	3.96	9.70%	2.98	3.96	0.00%

INDEX	Index Value (Mar 02)	% Change from Last Month	% Change Jan. 02, 2015
Satellite Markets 25 Index™	2,024.01	4.97%	10.32%
S & P 500	2,117.39	3.44%	2.77%

The Satellite Markets 25 Index™ is a composite of 25 publicly-traded satellite companies worldwide with five companies representing each major market segment of the industry: satellite operators; satellite and component manufacturers; ground equipment manufacturers; satellite service providers and consumer satellite services. The base data for the Satellite Markets Index™ is January 2, 2008--the first day of operation for Satellite Market and Research. The Index equals 1,000. The Satellite Markets Index™ provides a benchmark to gauge the overall health of the satellite industry.

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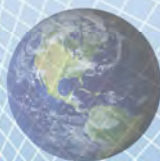
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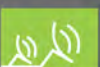
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