Dealing with satellite interference

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Editor's View....

Offering real insight

We're at that time of year again - conference season, as I like to call it, is in full swing. Satellite 2017, CABSAT 2017 and NAB Show are behind us, while CommunicAsia and IBC are looming.

Events like these provide a massive stream of value. Hearing about the leading trends in conference sessions and learning about the latest technology at the exhibition are the two most overt aspects of an event for many of us, but in truth, the value goes far beyond that. For my part, I find that the one-on-one interviews and spontaneous conversations provide the most insight into what's really going on, and how people truly feel about the latest developments.

One of my key finds at Satellite 2017 was an off-the-cuff interview with Isotropic, a relatively young company developing 'the world's most spectrally-efficient, low-profile, conformal, multi-band, electronically steered satellite antenna.' Speaking with Founder John Finney, I learned a great deal about the company's product concept and plans for future development (read the full interview with Isotropic in the July/August issue of Satellite Evolution Asia). The technology is unique, far removed from that championed by Kymeta, Phasor and C-COM, all leaders in the field of next-generation antennas, and each with their own game-changing technologies. It's meetings like this, that open the mind to new ideas, new ways of delivering solutions, that really make these events what they are.

We saw a lot of big news come out of Satellite 2017. Intelsat and OneWeb announced plans to merge in a share-for-share transaction, with a US$1.7 billion investment from SoftBank, which, combined with the debt exchange offers, could reduce Intelsat's debt by around US$3.6 billion. According to Stephen Spengler, Intelsat's CEO, the combination will create 'an industry leader unique in its ability to provide affordable broadband anywhere in the world.' The deal is expected to close in the third quarter of 2017. In further news, Intelsat acquired an equity stake in Kymeta following the achievement of critical development milestones, and coinciding with the launch of Kymeta's mTenna antenna and the introduction of its KÂLO services, which will reportedly change the way satellite services are purchased by direct users, integrators and service providers. Intelsat's bold moves certainly mark a major change for the industry, and what it might look like in the years to come.

It's absolutely vital that those of us in the satellite community keep an eye on the sector as a whole. The industry is in a major state of flux right now, and the future is far from certain. With key trends like overcapacity, interference, spectrum and pricing all hot topics for debate, it can be a challenge to keep on top of the latest ideas. And, without the latest information, it's impossible for people to make informed decisions. With events like CommunicAsia and IBC coming up, there's still plenty of opportunity to get up-to-date.
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The state of satellite interference

Over the past few years, the problem of satellite interference has been widely discussed, with most stakeholders well aware of the problem, and in many cases, some of the solutions available to resolve it. However, it remains a challenge for the satellite industry, and we have not quite solved it yet. If we look at the military satellite environment, its inherent and unique challenges make it even more difficult to resolve when it does occur. As with all sectors, the biggest challenge right now for the satellite industry is getting the users on board with the tools and techniques to do their bit towards resolving interference and increasing mitigation methods in to standard products. Martin Coleman, Executive Director of the Satellite Interference Reduction Group, discusses the key challenges and solutions in the fight against interference today.

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Erwin Hudson joins Telesat to lead global LEO satellite program

Telesat has announced that Erwin Hudson, one of the industry’s most accomplished executives in the field of satellite-enabled broadband networks, has joined the company as Vice President, Telesat LEO, reporting to President and CEO, Dan Goldberg.

Mr. Hudson will be based at Telesat’s headquarters in Ottawa and direct the development and implementation of Telesat’s planned advanced, high throughput, low latency, global LEO constellation. As previously announced, Telesat has obtained priority ITU rights on a global basis to LEO Ka-band spectrum and has developed an innovative (patent pending) constellation design and system architecture. In addition, Telesat has procured two prototype LEO satellites that are scheduled for launch later this year as part of the test and validation phase of its LEO initiative.

Mr. Hudson has had a long and distinguished career in the satellite industry. A highly-experienced communications engineer, he was Chief Technology Officer of WildBlue, an early satellite broadband provider later acquired by ViaSat, that began building its US subscriber base using Ka-band spot beam capacity on Telesat’s Anik F2 satellite. Prior to WildBlue, Mr. Hudson was a senior executive at Space Systems Loral and was Director Satellite Communications at TRW Space & Electronics. He recently led the ViaSat team that NBN Co selected to provide the ground infrastructure for the satellite portion of Australia’s national broadband network. Mr. Hudson holds a number of patents and his innovations, technical and commercial, have driven the growth of satellite broadband in markets around the world.

“Erwin is a tremendous addition to the Telesat team and I’m delighted to have someone with such vast technical and commercial experience in the design, implementation and operation of satellite-enabled broadband networks leading Telesat’s game-changing LEO initiative,” said Dan Goldberg, Telesat’s President and CEO. “Telesat has a long and successful track record of bringing the most advanced and innovative communications services to the market and our cutting-edge LEO program springs from that same pioneering spirit. The Telesat LEO constellation is precisely the network architecture satellite users are demanding and I have every confidence that Erwin will contribute significantly to its success.”

Shenzhen Airlines begins evaluation of Swift Broadband-Safety

Beginning in May 2017, Shenzhen Airlines has launched its in-flight evaluation of SwiftBroadband-Safety (SB-S), Inmarsat’s next generation IP-based broadband service for the flight deck. The SB-S platform, which will be installed on Shenzhen’s Airbus 320 aircraft using Cobham avionics’ AVIATOR 300D hardware, will deliver powerful and flexible in-flight communications and secure, real-time, in-air information to enhance Shenzhen’s safety, security and operational capabilities – both in the air and on the ground.

The Shenzhen partnership is part of a joint venture between Inmarsat, Beijing Marine Communication & Navigation Company, Ltd. (MCN) and Aviation Data Communication Corporation (ADCC) to provide aviation safety services to the rapidly growing Chinese market. Under this partnership, MCN and ADCC will deliver satellite voice, ACARS (Aircraft Communications Addressing & Reporting System) and data services. MCN will serve as project manager for Shenzhen’s SB-S evaluation process.

In addition to compliance with the Civil Aviation Authority of China (CAAC) mandates CCAR 121 and AC-121, Shenzhen Airlines will focus its evaluation on three core SB-S satellite communication (satcom) capabilities, including:

- Satellite Voice (satvoice) Communications – Two-channel satellite-based services that enable faster and high-quality voice communication between the flight deck crew and its designated contacts on the ground, including air traffic controllers and airline operations personnel.
- Integral Global Flight Tracking – This enhanced, live tracking feature pinpoints an aircraft’s location through regular transmission of position reports. SB-S flight tracking enables the airline and Air Traffic Control (ATC) to know where the aircraft is and to understand its status in real time, which is essential for both safety and delivery of fuel-efficient flight.
- ACARS Over IP – Traditionally used to communicate with both the Airline Operations Centre and ATC, this short-text capability over IP is a prerequisite for FANS 1/A compliance in remote oceanic areas.

Shenzhen Airlines also will be able to take advantage of other SB-S platform features, including real-time electronic flight bag applications, such as networked graphical weather and, ultimately, flight data streaming (“Black Box in the Cloud”). And, in addition to providing critical flight safety solutions, its high-speed communications capabilities also allow SB-S to deliver operational savings to airlines in the form of reduced fuel costs, improved efficiency and enhanced security. A recent study by Helios showed that satellite communications has already delivered US$3 billion in benefits to airlines to date.

Through its SB-S evaluation, Shenzhen Airlines is preparing for China’s explosive growth in passenger demand, which, according to the International Air Transport Association (IATA), is expected to more than double over the next 20 years. IATA also predicts that China will displace the United States as the world’s largest aviation market around 2024. Much of this demand will be for international travel and Shenzhen is anticipating this demand by employing next generation satellite connectivity, which allows aircraft to travel in oceanic areas and across remote continental areas where terrestrial networks are not established. These satellite-based capabilities will allow Shenzhen to offer passengers a vastly wider range of service destinations that, until now, could not be realized due to the decades-old limitations of traditional, ground-based communications.

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Captain Shao Bin, Vice President of Operations for Shenzhen Airlines said: “As China’s skies become more crowded and advanced flight-tracking capabilities become a necessity in the region’s airspace, Shenzhen wants to be at the forefront of this exciting next chapter of aviation history. We look forward to evaluating SwiftBroadband-Safety as a pioneering, satellite-based connectivity solution that will enable Shenzhen to offer enhanced safety, increased capacity and more efficient operations to our passengers – both in China and beyond.”

Mitsui USA partners with Rajant
Rajant and Mitsui & Co. (USA), Inc., a wholly owned subsidiary of Mitsui & Co., Ltd., Tokyo, Japan, will jointly develop and market Rajant’s Kinetic Mesh™ wireless networks, and extensive information assurance and security expertise to solve the advanced communications challenges of IIoT (Industrial Internet of Things), drones, V2V (vehicle to vehicle), and other autonomous applications.

With its mission to help companies evolve and achieve their strategic goals, Mitsui USA plans to connect Rajant with companies desiring to streamline operations, increase revenue, and achieve real-time intelligence for better corporate decision-making. Optimizing network infrastructures is a key requirement toward realizing these objectives. “We’re looking forward to leveraging the IIoT expertise and deep experience in information assurance and security of Rajant to meet the needs of existing and new markets,” said Kichiro Takanami, SVP, IT & Communication Business Division at Mitsui USA. “Rajant's InstaMesh® networking software and sophisticated military-grade security and cryptography will have a significantly favourable impact on organizations trying to capitalize on autonomous applications.”

Encompass Digital Media strengthens partnership with MEASAT
MEASAT Satellite Systems has announced that Encompass Digital Media is expanding their presence on MEASAT’s leading 91.5°E video neighbourhood.

Eight more channels are now available from 91.5°E: HITS HD, KIX360 SD, Zee Sine SD, beIN Asia Pacific’s Indonesia feeds – beIN SPORTS 1, beIN SPORTS 2, beIN SPORTS 3, WAKUWAKU JAPAN SEA HD and WAKUWAKU JAPAN Taiwan HD, all of which are distributed to TV platforms in more than 100 countries across the Asia-Pacific.

“Encompass is delighted to increase our video line-up in MEASAT’s 91.5°E video hotslot. With satellite still the preferred means for linear TV distribution for emerging markets, MEASAT and Encompass are working together to expand in this segment,” said Deepakjit Singh, Chief Innovation Officer, Encompass.

The 91.5°E prime video hot slot is home to the MEASAT-3, MEASAT-3a and MEASAT3b satellites, forming the region’s strongest video neighbourhood. From 91.5°E, MEASAT supports broadcasters and DTH operators to distribute UHD, HD and SD channels to audiences across Asia, Australia, East Africa and South Eastern Europe.
How important is compensation during hiring?

Compensation and hiring - they go together like cookies-milk, scotch-soda and business-performance. Regardless of the technical complexity of your business's product or service, the most important and complex part of all businesses are the human beings who work there. There's nothing more important than attracting and hiring the right people to work in your business. Bert Sadtler explains.

Regardless of the technical complexity of your business' product or service, the most important and complex part of all businesses are the human beings who work there. There's nothing more important than attracting and hiring the right people to work in your business.

What does compensation have to do with hiring the right people? A great deal.

To address that question, let's use two compensation details of a hiring process.

1) Can't emphasize enough that compensation needs to be stated.

Position descriptions vary in their level of detail. Some are very brief while others are thorough and informative. What does the position description reveal about the employer and what does it say to a qualified candidate? What is the message to prospective candidates when the position description states for salary to 'Submit your salary requirements' or 'Comensurate with experience'?

As the employer, shouldn't your organization have taken the necessary time to define the need you have when hiring?

As the employer, shouldn't you also know your company's pay scale?

Isn't it the employer's responsibility to have some idea of the compensation for the role while defining the responsibilities of the role?

Best Practice Hiring should filter out the candidates who are not qualified and filter in the ones who are. A candidate who currently earns way more than your company can afford is not a qualified candidate.

Hiring is about attracting the right talent. When candidates are told to submit their salary requirements, they may be hearing that your organization really has no idea what compensation to pay and may also have no idea what the role is or how to run an effective organization.

Perhaps the employer clearly knows the compensation range but does not want to make it public. While that makes sense, it leaves prospective candidates with doubts about your company. They may not even be comfortable applying. Is the trade-off worth that?

2) Why does it matter that salary only compensation isn't enough?

While members of today's workforce are looking for stability and earnings assurances, times have changed from the days of Salary Only compensation. In my experience, a Salary Only compensation plan is unfavorable to both the employer and to the employee.

There are many examples in today's workplace of companies that should make quick, financial adjustments. One of the areas to control expenses is payroll. Companies looking to cut their payroll will look at cutting the biggest payroll costs. If the newly hired employee is receiving a large base salary, they can find themselves quickly on the chopping block. This is a major loss to the business that will never find out what the new employee could have become. It is devastating to the employee who now has a very short employment cycle in their work history and must find another job.

Salary Only compensation plans offer little or no ability to measure and reward for performance. Shouldn't the employees who exceed their performance goals be rewarded?

Let's look at professional athletes. Their total compensation consists of guaranteed earnings along with specific incentives. Examples can include number of innings pitched during a season or number of touchdowns scored, etc. Isn't their success measured by their performance? Shouldn't great performance be highly rewarded? You cannot do that with a Salary Only plan.

Business professionals are like professional athletes. Business professionals should be compensated with a combination of base salary plus performance bonus. The bonus delivers a higher reward to the employee who has exceeded the performance goals.

The bottom line

In summary, businesses invest a lot of time and money hiring the right talent. The compensation aspect of hiring deserves the same amount of time. Compensation has a lot to do with hiring. The wrong approach to compensation can turn-off top prospective candidates before they ever consider expressing an interest in the role.

As a business owner / business leader, how is your organization addressing compensation when you need to hire critical talent? Is it time to revisit this sometimes-overlooked detail?

Bert can be reached at: BertSadtler@BoxwoodSearch.com and at BoxwoodSearch.com
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ND SATCOM
Challenging perceptions

By Richard Swardh, Senior Vice President, MNO for Comtech EF Data

Over the following months, I will be sharing a series of pieces that will address many of the myths that I find exist as satellite service providers look to best team telecom networks with satellite networking options to provide cost effective solutions with carrier grade service levels. First, I look at a large container shipping company that was searching for the best solution to deliver a business-critical communication service globally to 400 vessels that were to roam between 20+ satellite beams across the world.

Not surprisingly, the answer that jumps immediately to most people’s minds when they hear these requirements is “must be a TDMA solution.” However, after diving into the requirements of the applications that were to be supported, evaluating the cost effectiveness of the solution in terms of both CAPEX and OPEX, along with the flexibility and headroom for growth of the network, the solution that was best suited to this network turned out to be a dynamically allocated SCPC solution.

This example brings to the forefront a number of myths that we as an industry need to re-address as we move into a world proliferated with high throughput satellite (HTS) offerings, including:

- **Myth 1:** TDMA is the only technology that supports large networks;
- **Myth 2:** TDMA is the only technology for roaming networks;
- **Myth 3:** SCPC is only applicable for high bandwidth solutions; and
- **Myth 4:** SCPC does not offer dynamic bandwidth sharing.

While in many cases, these assumptions will be true, we owe it to ourselves as an industry to dig deeper and find that best solution that fits a given need. Often, the answers to whether these statements are true or not are not easily answered. While it unfortunately takes an amount of analysis and effort to determine the answers to these questions, it is imperative that a service provider do this homework before making a network decision that they will have to live with for a long time.

First and foremost, what is key to understand in any network solution selection is whether the underlying transport technology has the ability to support the application mix of the end user. If the application calls for low latency and jitter and has a high degree of compressible data, there is a good chance that a high horsepower SCPC solution is the best fit.

If the business case calls for bandwidth to be shared to achieve acceptable service price points, this robust data handling and on-board processing can be teamed with intelligent dynamic SCPC (dSCPC) to automatically setup carriers on demand and maximize overall network efficiency.

In addition, if roaming between beams or satellites is needed to support vessels traversing the globe, field-proven intelligent roaming capabilities can be added. To maximize network efficiencies even further, dSCPC provides the means to individually optimize links to each vessel to achieve the highest possible throughput as link budget conditions change from beam center to beam edge and vessels move into and out of adverse weather conditions. Lastly, and very importantly as HTS offerings are launched and become operational, a network solution that is rolled out today must have headroom for growth to allow service providers to unleash the potential of the new spacecraft designs and not be throttled.

The results of the dynamic SCPC solution? This operational network is currently the world’s largest maritime GSM/VSAT network, providing the underlying application support that is required while having the horsepower to easily incorporate additional services beyond the initial requirement.

For more details on this network, please refer to our case study: [https://goo.gl/nQ1AFJ](https://goo.gl/nQ1AFJ)

Richard Swardh is Senior Vice President, Mobile Network Operators for Comtech EF Data. In this role, he leads the market development and direction for the 2G/3G/LTE mobile backhaul market, directing long-term strategic initiatives and defining solution suites and feature sets. A mobile network backhaul veteran, Swardh’s background includes strategic and operational positions at Ericsson with business development, partnership management and strategy execution responsibilities. He holds both a Bachelor of Science degree in Mechanical Engineering and a Bachelor of Business degree in Administration and Logistics from Vaxjo University in Sweden.
Kacific is a next-generation broadband satellite operator delivering high-speed Internet services to urban areas, rural villages and remote territories in the Pacific and Southeast Asia. The company plans to address the endemic lack of high-speed Internet to empower public services, businesses and consumers alike. Amy Saunders met with Christian Patouraux, CEO of Kacific, to talk about the company’s upcoming Kacific-1 satellite and its plans for growth.

Question: What can you tell us about Kacific’s establishment and goals?
Christian Patouraux: Kacific was founded in 2013 to provide low-cost, high-speed Internet directly to homes and premises of the rural and remote Asia-Pacific regions. We’ve come a long way in the years since. Our value proposition is very appealing for the markets we cover, and we’ve raised several rounds of funding to get off the ground and start selling to customers. The beauty of satellite is being able to cover any pocket of demand at almost the same price, and we plan to meet that demand by supplying highly-focused Ka-band technology to ISPs and governments in 22 countries of the Asia-Pacific region.

Moreover, we plan to deliver that service with an equivalent price throughout the entire market.

Question: In February 2017, Kacific ordered its first satellite from Boeing. Can you provide a timeline for this project, and outline how this new capacity will improve Kacific’s operations?
Christian Patouraux: While we’re already delivering Ku-band services to customers, they’re more like interim services while we build out and launch our first satellite, Kacific-1. Right now, we have a bare-bone service that we’re providing on existing satellites that we’ve contracted with. When we founded the company, we were hoping that today, after three and a half years, we’d have our first satellite, but it always takes longer than you’d like.

We ordered Kacific-1 in February, and it’s a condominium satellite that we’ll be sharing with SKY Perfect J SAT. The condominium model will provide us with economies of scale. We had a long period of selecting and contracting before eventually ordering our satellite from Boeing. We started construction in early 2017, and the satellite will be launched in the second half of 2019.

With Kacific-1, we’ll have 57 Ka-band beams projected onto 22 different countries, spanning East of Singapore all the way to French Polynesia, from the North part of the Philippines down to the South of New Zealand. We’re
going to have a very dispersed coverage. Each of the beams is capable of up to 1.25Gbps, so it's a lot of new capacity to bring into the markets. The bandwidth is tailored to the needs of the underlying market, so people will still get served with the same quality of service whether they are in a remote pacific island, New Zealand or the Philippines, for instance.

Kacific-1 will make a huge difference once it's launched. It's going to propel Kacific into a global stage, and we anticipate that we'll have demand in many new parts of the world which will drive us to launch a second, and subsequent satellites. We're already looking at that very seriously. We've built a good level of credibility now, and we're anticipating that customers are probably going to sign up even faster for the second satellite. I hope that in a year and a half, we'll be looking to start that project.

Question: In July 2016, Kacific launched its first operational service, a high-speed broadband Internet connection into Vanuatu. Can you provide an overview of this service, and how it has been received?

Christian Patouraux: We arranged our first major pilot project to take place in 10 villages in Vanuatu, albeit using only a small amount of capacity. We wanted to test how easy it would be to deploy to those remote villages, whether people would use it, and whether they would have the electricity supply and the devices required.

It was a fantastic experience, and the response was incredible. In addition, the logistics were much easier than we'd expected. The antennas were delivered to the capital, from where they had to be transported to very remote places, and they were arriving there just four days later! The local people have been transporting things around their country for thousands of years, and they're very good at it. Another plus was that the whole community came together to clear areas to enable the satellite signal to get through, and upon its launch, they started using the service at an amazing rate.

This little network, which was the start of the Kacific operation, was in some months pumping as much as 3TBytes of data. There's a real thirst for connectivity. The service goes far
Beyond simply supplying Internet connectivity for recreational purposes, it supplies a public service and has potentially saved lives already. The service has also been a massive improvement for education; those children have a massive thirst for knowledge, and with their own pre-existing devices, they’re able to gain a wealth of information over broadband.

Since that project, we’ve started undertaking many more. We’ve acquired more bandwidth to deliver our services in Papua New Guinea, the Solomon Islands and Vanuatu, while many other places in the Pacific have now tested services and are now evaluating deployment. We’re hoping that, in the next couple of years, we’ll have 300-400 places connected.

**Question: Where do you think the greatest market opportunities lie for Kacific?**

**Christian Patouraux:** Our markets are the places that will be able to utilise our high-speed Internet as a public service. We’re already in Papua New Guinea, the Solomon Islands and Vanuatu as I mentioned before, and these sorts of places with remote communities and schools stand to gain the most from the Kacific service. Schools in those regions typically educate their children until the age of 12, or sometimes a local teacher might be able to teach them until 14. But what typically happens is that those children are uprooted and sent to the provincial cities to continue their education.

There’s a lot of social difficulties present in such regions. The local health clinics don’t operate at full capacity, because often patients are sent to the provincial centre. Many governments are entrusted with decentralising infrastructure and actually pushing it outwards, empowering local communities with more capabilities. That’s really where the bulk of the demand lies for a service like Kacific.

We can provide those entire communities with a local Internet connection for US$300-500 per month, and that’s for about 10Mbps.

**Question: With more and more operators launching HTS into orbit, the available capacity is booming. Do you believe that overcapacity will be a problem in the near future?**

**Christian Patouraux:** Is there overcapacity for this part of the satellite communications industry? When you hear everywhere that Internet demand doubles every year, why are we continuing to wonder whether there’s overcapacity? There may be overcapacity in broadcast, mobility, multinational corporate networks, but not in Internet.

The problem with Internet is that, to be part of the Internet revolution, to insert a satellite specifically for that application, you must be daring enough to believe that there is adequate demand to achieve a price point that is low enough to achieve high utilisation. That’s what we do, and that’s what we’ve achieved. Kacific-1 is already 70 percent full, and we’ve achieved that because of our pricing. It’s no surprise to us; Internet is there and everyone is using it, or wanting to. That 70 percent fill rate, even at the low price, makes us profitable already.

**Question: What trends are you seeing within the satellite industry right now, and what’s your take on them?**

**Christian Patouraux:** The industry is still suffering from those failed constellations of the past, and as whole,
H-DNA
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Designed for the Heights™ Networking Platform’s return links, Heights Dynamic Network Access (H-DNA) is another example of Comtech’s best-in-class capabilities. H-DNA is a culmination of new waveforms, enhanced bandwidth management algorithms and robust multi-layer QoS that make it highly dynamic and automatically able to react to real-time traffic demand. This access scheme is fast, flexible and uncompromised, delivering unprecedented benefits to users, service providers and satellite operators. H-DNA can:

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the industry is potentially missing investment opportunities because of that. It's not justified, it's just emotional for some investors who have lost out on failed satellite projects of the past. Those projects really weren't thought through enough, and it's still affecting our industry today.

The question of these massive satellite constellations and their latency is everywhere right now. There's definitely a market for various types of innovation, but do we really need all those constellations, or is it just an excitement for Silicon Valley? Low Earth orbit (LEO) and medium Earth orbit (MEO) constellation supporters talk about latency a lot, but can you really sell latency? It is the fallacy of latency. We have Ku-band services from GEO satellites right now, and you can run Netflix on those with no problem. For certain types of applications, such as remote drilling or online trading, lower latency is a strong selling point, but how many people really need that out of the tens of millions of people that we're covering? Bandwidth is everything, not latency.

My question is, why can't we fill the world with geostationary Ka-band satellites? The industry has spent so much money on Ka-band, to develop it to a point where all the ground systems and technology is ready, but there's very few geostationary Ka-band satellites in space right now. We could put one at every three degrees on the geostationary belt, and they would serve the world at an amazing rate. With Kacific-1, for example, our capacity is 4-5 times cheaper than that of the massive constellations, and we are able to do that because we have a specific target market in mind: Pure play Broadband. With Kacific, customers can surf the Internet at a great speed and get 3Gb of data for maybe US$10 per month. And that's the retail price. Kacific sells at the wholesale level as a much cheaper rate, which allows our wholesale customers to make a good profit as well. We don't need to innovate for the sake of innovating. We can innovate with business models, but there is enough technology available with geostationary Ka-band to efficiently serve the broadband market, and it is far from being properly exploited at global level.

**Question: What is the biggest challenge you expect Kacific to face as it grows out its capabilities?**

**Christian Patouraux:** I don't see much in the way of challenges, just a massive field of opportunity. Of course, we need time to ramp up our services, but with the support of the technology brought by partners like Gilat and Newtec, our customers know how to get our services to the markets they need to be in. We still need to get the satellite in space and get it operational, of course, there's a lot of technical things still to do, but the bulk of challenges are behind us now considering what the team had to achieve to get where we are today.

**Question:** What does the near future look like for Kacific?

**Christian Patouraux:** Firstly, we're going to continue selling on Kacific-1, trying to fill it completely now that we have achieved a credible position with a fully funded project and a satellite in procurement to be inevitably launched. The next priority is accelerating the move towards our second satellite: I'm personally going to spend a lot of effort on that. We'll be designing it from the ground up and working out the best place to put it to augment the existing capacity we have placed on Kacific-1, although this is only part of the idea – our major focus is to grow far beyond our current geographies.

Lastly, we'll be making sure that the interim service continues to operate well, while possibly adding to it with new contracted capacity and services over that capacity. We already have a number of satellite operators that we're leasing capacity from, and we could expand on those or beyond.

Helping customers in a hands-on way to get off the ground or grow will continue to be a key priority. A few of our customers today are small, but we know their businesses are going to vastly expand when Kacific-1 comes online. Their current operations are already in the right locations, they're just waiting for the price point to decrease fivefold. Their market is going to be enormous.
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Establishing efficient, effective communications is vital in the wake of a disaster to enable governments, local authorities and disaster relief agencies to identify causes, effects and repercussions, and to coordinate response teams to get help to where it’s needed most. In many cases, terrestrial communications networks may have been entirely destroyed by the incident, while in others, networks may have become overloaded due to the massive increase in traffic.

In such situations, satellite is an ideal solution for restoring order out of the chaos. Imagery of the affected areas can provide answers, as well as giving an overall picture of the extent of the damage. In addition, unlike terrestrial networks, satellite is not affected by the vast majority of disasters, making it possible to quickly and efficiently establish emergency communications.

In the aftermath of a disaster, satellite capabilities are literally the difference between life and death for many.

Preparing for disaster
We all know that disasters will always happen, so preparation is an essential task for governing bodies of every country. In the case of disaster, multiple agencies are often involved in delivering relief efforts, making coordination between the different entities critical. It’s vital that everyone is on the same page to ensure that aid can get to where it’s most needed, making emergency response manuals key to strategy planning.

In November 2016, SES announced that it had been selected by the International Organisation for Migration (IOM) to create a digital emergency manual in a project funded by the Government of Luxembourg.

The IOM carries out humanitarian operations around the
Disaster Recovery....

world, addressing the most urgent needs of displaced populations. The entity updated the emergency manual in 2016 to further support its crisis response operations. To ensure the information can be regularly updated and shared with field staff, the IOM has also created an electronic platform that can share information with all stakeholders in real-time.

SES was selected to create the digital platform for the emergency manual based on its expertise in delivering similar emergency manual platforms for crisis response and humanitarian operations via its emergency.lu solution, which provides connectivity and applications for humanitarian interventions over dedicated SES satellite capacity and communication infrastructure.

"Partnering with SES for the creation of our digital emergency manual was an easy choice due to SES’s experience in providing end-to-end solutions for disaster recovery and crisis response,” said Vincent Houver, Head of the Preparedness and Response Division at IOM. “The manual will be accessible through a website or mobile application, in both an online and an offline mode, ensuring our staff has access to the latest information and guidance, wherever they are in the world.”

Providing redundancies
Of course, not all countries can afford to have the latest satellite communications equipment on standby just in case disaster strikes. In addition to the cost, there's also the need to store such equipment in an easily-accessible place where it will be safe from disaster events, as well as ensuring the technology remains ready-to-go at a moment’s notice when the time comes. This can be a major challenge considering how quickly technology is advancing in today’s world.

That’s where international entities such as the International Telecommunication Union (ITU) come into play. Acting as the United Nations’ specialised agency for information and communication technologies (ICTs), the ITU allocates global spectrum and satellite orbits, develops technical standards, and strives to improve access to ICTs to underserved communities around the world.

In January 2017, Thuraya Telecommunications Company donated new emergency equipment supplies to the ITU under the Emergency Telecommunications support arrangement. The satellite equipment will enhance the scale at which the ITU can deploy mobile communications to assist countries affected by disasters, strengthening response, relief and recovery interventions.

The newly-donated equipment includes Thuraya XT-LITE handsets, SatSleeve+ and SatSleeve Hotspot units, meeting the transportable, ease-of-use and ease-of-deployment needs of disaster-affected regions. The Thuraya XT-LITE is reportedly the world’s smallest satellite phone, while SatSleeve and SatSleeve Hotspot transform standard smart...
phones into satellite smart phones, providing users with access to calls, emails, instant messages and social media apps in satellite mode.

“We remain deeply committed to continuing our involvement in emergency communications programmes, and to strengthening our partnership with the ITU,” said Thuraya’s Chief Commercial Officer Bilal Hamoui. “At Thuraya, we strongly believe in our purpose to save and improve lives, and we also believe that if we continue to get our technology into more of the right hands at the right time, we can save even more lives.”

Hamoui emphasised that Thuraya’s contributions go beyond handset and terminal donations, including providing additional capacity over disaster-affected areas, as well as technical training support to make sure the devices are used effectively. “Giving people equipment they don’t know how to use or cannot afford defeats the purpose of the donation,” Hamoui added.

Thuraya’s previous donations have provided critical relief in emergency and disaster situations such as the 2016 floods in Sri Lanka, where Thuraya’s terminals were deployed to support relief and coordination efforts on the ground.

“The role of telecommunications in disaster risk reduction and response is critical in order to improve preparedness, and the timely flow of crucial information needed for appropriate assistance to be delivered before, during and after a disaster occurs. For this reason, we are vigorously forging partnerships with the private sector to organise activities related to disaster mitigation with the aim of saving lives. We are working to help countries to preserve and save human life, as well as create a better life for their citizens,” said ITU Chief, Projects and Knowledge Management Department, Cosmas Zavazava. “ITU is also supporting countries by ensuring that technology helps in environmental protection, climate change mitigation, and e-waste management. Resilient partnerships such as the one we have with Thuraya help us get results.”

**Keeping communications open**

When disaster strikes, communications capabilities are vital so that people can reach out to friends and family in the disaster zone to check on their whereabouts and well-being. There are few situations as worrying as not knowing whether a loved one is safe or in critical danger, and with the rapidly-changing situations following a disaster event, every second counts.

When it comes to staying in touch with loved ones, mobile networks are key, however, these are often one of the first services to be disrupted or brought down during a disaster event, effectively cutting off all personal communications. Responding to the demand for communications capabilities in the midst of disaster are several companies that are testing and launching innovative solutions that utilise satellite as a go-between to restore vital services.

In February 2017, Avanti Communications demonstrated the successful deployment of disaster recovery technology with UK mobile network operator EE at The Oval cricket ground in London, UK. The solution showed how EE’s patent-pending balloon air mast technology could maintain mobile coverage in rural areas during disaster recovery and search and rescue operations over Avanti’s satellite connectivity. The mini mobile sites attached to a helium-powered balloon called a ‘Helikite’ can provide wide area 4G mobile coverage when permanent sites have been damaged or in areas of no availability.

EE also unveiled Rapid Response Vehicles (RRV) to keep networks operational through essential maintenance and local site outages. Avanti’s high throughput satellites (HTS), which provide coverage over the entire UK, are able to provide reliable and flexible satellite backhaul capabilities to around 1,000 fixed and portable base stations across the nation. The solution uses small cell technology, which connects back into
Disaster Recovery...

the EE network over Avanti’s HYLAS 1 and HYLAS 2 satellites, or using EE’s own 4G spectrum, to make calls and access the Internet in the most remote locations. EE plans to reach 95 percent UK geographic 4G coverage by 2020, reaching more remote and rural parts of the country, and boosting the resilience of the network.

“EE’s breakthroughs in developing innovative aerial solutions have been achieved with the support of the most innovative partners from the mobile industry and beyond,” said Marc Allera, Chief Executive Officer of EE. “Avanti has enabled a fast, reliable satellite backhaul connection, and looking ahead, beyond even our ambition to reach 95 percent of the UK geography, I see innovations like this revolutionising the way people connect.”

AT&T is another company innovating in the field of keeping communications capabilities online in the event of a disaster. In February 2017, the company completed what it believes is an industry first: A successful live test flight of its Flying COW (Cell on Wings) drone transmitting and receiving high speed data above a field outside Atlanta, USA.

The Flying COW is essentially a cell site on a drone, designed to beam LTE coverage to customers on the ground during disasters or major events. The drone is connected to the ground by a thin fibre, which provides a highly-secure data connection and power for an unlimited flight time. Equipped with a small cell and antennas, the Flying COW uses satellite capacity to transport texts, calls and data between recipients. It can operate in extremely remote areas, and is monitored and operated by a pilot during operations. With a flight altitude of more than 300 feet, the Flying COW could eventually provide coverage to an area of up to 40 square miles, the equivalent of 100 football fields. Multiple Flying COWs can also be used in tandem to expand that footprint. The Flying COW is expected to play an important role within AT&T’s Network Disaster Recovery (NDR) team, since it can be transported and deployed quickly, and can accommodate rapidly-changing conditions during an emergency. It can also be operated during high winds and in heavy smoke.

Collaboration is key
As in many vital services fields, keeping communications available, or restoring them rapidly in the wake of a disaster, is a vital need that sees many entities collaborating from the ground up. Governments, satellite operators, equipment vendors, technology trainers and disaster response teams must all work together to deliver a viable, efficient solution. While today we have some fantastic systems available, the innovations of tomorrow will surely provide ever-more advanced solutions that can be installed and operational in increasingly short time periods for the benefit of people everywhere.
The state of satellite interference

Over the past few years, the problem of satellite interference has been widely discussed, with most stakeholders well aware of the problem, and in many cases, some of the solutions available to resolve it. However, it remains a challenge for the satellite industry, and we have not quite solved it yet. If we look at the military satellite environment, its inherent and unique challenges make it even more difficult to resolve when it does occur. As with all sectors, the biggest challenge right now for the satellite industry is getting the users on board with the tools and techniques to do their bit towards resolving interference and increasing mitigation methods in to standard products.

Martin Coleman, Executive Director of the Satellite Interference Reduction Group, discusses the key challenges and solutions in the fight against interference today.

The military accounts for a sizeable proportion of interference, both within their own environment, as well as affecting commercial services, and there are a number of reasons for this. Firstly, the military often uses equipment to its limits. Using the right kit with quality technology that ensures errors in operation are minimised makes a massive difference to delivering the service and less likely to create interference issues.

Secondly, there is often a lack of training amongst military users, with many users unfamiliar with the operational aspects of satellite equipment, let alone how to spot and deal with interference issues. This is not surprising of course, as high rotation of staff means that the same people won’t be in the post for the length of time we would be looking at in the commercial world. However, if each military user tasked with operating satellite equipment was given proper satellite training at the start of that post, it would have a significant impact on reducing interference instances.

Added to that, there is often a lack of testing or operational verification of new systems with satellite operators. The equipment is, more or less, ready-to-go, and simply switched on in the field. However, making those preliminary checks is vital to ensuring that systems are working properly, and those tasked with operating it are familiar with what to do and what to look for when things aren’t working as they should be.

Finally, and a major element that makes the military environment more challenging than most is exactly that - the military environment. Systems are pushed to the extreme and used in situations where there is a massive margin for error and very little time for the operators to worry about that. One example is the use of unmanned aerial vehicles (UAVs) in extreme operational conditions, which often generate interference when control of any UAV must be absolute. To achieve this, higher transmit levels are often used and thus create problems of interference. Therefore, we need to ensure future designs of UAVs are built to minimise interference for all operational circumstances. Again, better design and testing of satellite equipment with real-life simulations will help minimise this, and also give those operating it much better understanding of the operational concerns.

The satellite operator perspective

Whilst it is true that a lot needs to be done by the military (and other) users themselves, the satellite operators do have a big part to play in reducing interference. And for the most part they have been doing their bit well, with many operators instigating a number of processes and tools to help resolve interference as quickly as possible. This includes using control centre analysis tools, such as spectrum monitoring and geolocation tools. The more data they can collect, the easier it is to determine the source quickly and ultimately remove the interference. Ruben Marentes, Director of the Network Operations Center at Intelsat, commented: “The more efficient the isolation and mitigation tools are, the faster we can address the interference. Ruben Marentes, Director of the Network Operations Center at Intelsat, commented: “The more efficient the isolation and mitigation tools are, the faster we can address the interference. Ruben Marentes, Director of the Network Operations Center at Intelsat, commented: “The more efficient the isolation and mitigation tools are, the faster we can address the interference.

When it comes to military customers, the satellite operators cite adjacent satellite interference (ASI) as one of the biggest problem areas. Sometimes this is due to the extremely small antennas often deployed by the military, but it can also come down to a lack of pointing accuracy. This includes from fixed terminals, but also mobile terminals, where ensuring pointing accuracy is of course particularly tricky. ASI is also caused by the increasing number of UAVs deployed by the military with a severe lack of accuracy.

As well as the challenges of a harsh environment, making it more likely for the military to cause, or experience, satellite interference, the processes make resolving military interference far from

Martin Coleman, Executive Director of the Satellite Interference Reduction Group

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Satellite Interference

simple. For starters, operators are very often having to work with discreet information on location, type of use, and duration of the operation. Without all the information, it is very difficult to investigate and isolate the cause of the interference. Dealing with stakeholders can also be long-winded, as highlighted by Marentes: “The number of stakeholders and the communication proxy demanded by the military brass makes the transfer of information rather complex and slow.”

The tools

However, despite the military environment and processes themselves being unique, the tools used by satellite operators are the same for all sources of interference. Marentes adds: “We use the same monitoring tools to detect interference sources in commercial segments than when ones used to isolate and troubleshoot RFI cases from the military. The way we proceed demands more from the staff in different steps, but for the most part, the resolution process is the same.”

These tools enable operators to analyse and identify the interference, its characteristics, and, if geolocation can be used, they can locate the source. Over the past couple of years, we have seen a number of great innovations that are making a huge impact on interference.

It starts with solutions from companies like Integrasys, aimed at reducing interference occurring by ensuring antennas are setup and pointed correctly from the start. Alvaro Sanchez, Sales and Marketing Director, Integrasys comments: “Remote systems are often setup by soldiers that do not have the required technical skills, and cannot call the NOC for guidance, so they need easy-to-use tools to streamline the process. At the same time, soldiers’ lives are dependent on the communications being provided, therefore it is absolutely essential to ensure maximum availability for accurate and reliable communication.”

Integrasys has a growing product portfolio aimed to help here. That includes Satmotion Pocket, a simple mobile app that helps those users through a simple step-by-step process to install a satellite link. The tool makes sure that the antenna is not misaligned and greatly improves accuracy and reduces errors, including satellite interference.

Following installation, whether that has been done correctly or not, there will always be a need for constant monitoring satellite transmissions. There is a growing number of tools available to do just that. That includes Crystal’s Spectrum Monitoring and Recording (SMR) solution. It gives an overview of all spectral bandwidth at a glance and allows hundreds of transmission spectral segments to be periodically sampled and examined for any of several user-defined error conditions. Roger Franklin, CEO at Crystal, cites a large government maritime company, which is using Crystal SMR to control 30 physical spectrum analysers located around the world. The customer experienced episodes of false interference on a particular carrier. He comments: “A situation like this could take days or even weeks to isolate, which is simply not acceptable in a military situation.”

Thanks to Crystal SMR, the interference was quickly isolated and could subsequently be resolved.

Kratos is another company providing RF monitoring, as well as interference detection, and geolocation services for both military and commercial environments. These include Kratos’ Monics family of products, providing centralised RF spectrum monitoring and advanced interference detection, including carrier-under-carrier detection and characterisation.

John Monahan, Senior VP for Kratos SATCOM Products, understands the challenges of military satellite communications: “Protected MILSATCOM must provide low probability of interception, detection, and exploitation, and be survivable, to include anti-jam communications. Strategic protected MILSATCOM must also provide robust command and control services in benign, contested, and nuclear operational environments.”

Bearing this challenging environment in mind, Monahan believes the industry as a whole needs to get much better at assuring satcom in a contested environment: “As reflected in the Space Enterprise Vision (SEV) outlined by General John Hyten, Commander, United States Strategic Command, military service leaders are looking closely at a variety of ways to restructure space operations, including expanding commercial partnerships. Commercial SATCOM providers need to...
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be ready to step up to the challenges of protecting military communications using their commercial capabilities."

An example of such cooperation is the work Kratos is doing for the US Department of Defense (DoD). Kratos provides RF monitoring, interference detection and geolocation services for all DoD leased Ku, C, and X-band commercial bandwidth worldwide. To provide DoD with worldwide coverage, Kratos is expanding its infrastructure by adding seven new worldwide monitoring sites, hosting more than 60 antennas and providing visibility to over 50 satellites, 100 beams and 200 transponders.

Franklin echoes that belief: “We need to get the whole industry behind the initiatives to reduce interference. This includes getting on board with Carrier ID. Better monitoring tools and automating processes will also have a massive impact on reducing errors before they happen.”

Integrasys has also launched a number of solutions for continuous monitoring, including its Alusat seamless network maintenance system, which allows the NOC operators to detect any degradation from remote sites. Sanchez notes: “The combination of Satmotion Pocket and Alusat has solved major Adjacent Satellite Interference between two major satellite operators. Alusat was able to detect which remotes needed repointing and the remotes were easily repointed within minutes, using Satmotion Pocket.”

Sanchez believes the satellite operators should be doing more to incentivise interference reduction: “In our opinion, satellite operators should increment prices if customers cause interference, as the satellite operators lose revenue from other customers due to noncompliance with Service Licensing Agreements.”

Better geolocation tools are also important, helping operators to locate the source of interference once identified. Companies such as Kratos and Siemens Convergence Creators have been innovating a great deal here.

Using all the tools in the box
It is clear that, when it comes to interference, no matter the source or who is affected, we need to be working together as an industry, and using all the tools in the box. There is a growing number of technology solutions and a number of industry-wide initiatives in place, now we just need everyone to adopt the tools available to really make a difference.
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Solving industry challenges in a ‘cool’ way

Integrasys was established in 1990 to provide signal monitoring software solutions for the satellite, broadband and telecommunications market. The company values speed, flexibility, efficiency and scalability in its products. Today, Integrasys is devoted to developing new strategic alliances with manufacturers, integrators and operators in the satellite ground station sector. Amy Saunders spoke with Juan Carlos Sanchez, CEO at Integrasys, about the company’s operations, and the ins and outs of the VSAT market.

The product line started as signal monitoring for regulatory institutions, ensuring the quality of communications provided back in 1995. Then, we moved onto enhancing capabilities for satellite operators, where we won a significant market share thanks to our state of the art technology, which had incredible speeds for that time. Today, we still have customers dating back to these times that we have been working with for more than 20 years.

In 2003, Integrasys developed a system for the broadcast industry called Satmotion, which allows the broadcaster to have all the tools required to access the satellite in their truck. In 2004, this product was migrated to VSATs thanks to a satellite operator who needed to manage a large VSAT deployment. The project was a huge success, and today there are even remotes that remain active from this project.

From 2013, the company has invested significantly in developing new products for new platforms such as Smart phones, watches and glasses, and more intelligent devices. This has provided a key differentiator, as smart phones are used anywhere and every day. In 2014, we received the Most Innovative Product of the Year Award at NAB, Vision Awards, and in 2015, the Most Innovative Product of the Year Award at the VSAT Global event. The industry has recognised that we have very innovative ways of solving industry challenges in a ‘cool’ way.

Today, we are releasing a new product that enables service providers to be the most efficient and accurate in service delivery and operation, by streamlining the maintenance process.

Question: What are Integrasys’ most recent product developments?

Juan Carlos Sanchez: Our newest product is called Alusat (Always Up). Alusat enables service providers to analyse their networks and recover out of service remotes without the need to send someone to the remote site, which requires significant expenditure. Alusat provides a full status of the network; in one view, the operator can see if any remote is misaligned or has any power misconfiguration, and can fix it with a single click. Once again, Integrasys has managed a major challenge with a straightforward automation solution.

Integrasys has partnered with iDirect to provide Alusat to their customers, enabling a smarter way to maintain and revalidate the remote within the operational thresholds for maximising the SLL compliance and QoS.

Alusat is an evolution of Satmotion Pocket. While Satmotion Pocket automates the deployment face to minimise interference, Alusat automates the maintenance and operational face, detecting any possible interference that the VSAT remote could be generating. Interference is one of the major issues of the satellite industry today, and Integrasys is able to mitigate this by providing tools to service providers to analyse their networks.
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Question: Where does Integrasys see itself in the market, and how does it stand out from its competitors?

Juan Carlos Sanchez: I see Integrasys as a pretty important company in the satellite industry, not only because of the company growth or the advances in technology, but also because these advances solve major challenges that the industry has had for a number of years.

Integrasys has a unique technology, in both of its latest products; Satmotion is integrated in iDirect, Hughes and Comtech platforms, so it is widely considered a standard for commissioning and deployment. On the other hand, Alusat is so new that only iDirect customers can benefit from it at this point.

Integrasys dominates the VSAT market in terms of monitoring systems, commissioning and remote maintenance, and each day we become stronger in the legacy markets such as broadcast and regulatory.

Question: VSAT terminals are a great solution for providing connectivity to the unconnected in emerging and rural markets. How big an impact are rapid-deployment tools such as Satmotion Pocket having on the installation of these systems, and what challenges remain that restrict more widespread roll-out?

Juan Carlos Sanchez: There is no greater solution than VSAT to connect the unconnected in emerging and rural markets, but when there is an alternative solution, VSAT is the most complicated option, due to the installation and maintenance of the terminals. That is exactly what Satmotion solves, making VSAT an easy proposition.

We have had numerous projects in every area in the world, wherein our customer service providers and satellite operators have been able to minimise the time of deployment, interference, and skills required.

The latest challenge that we must address is training. Even the simplest tool requires training. We have partnered with SatProf and the GVF for this purpose, launching the CVF514 certification programme for Satmotion Pocket.

We saw one pending challenge; VSATs are left for years operating in remote environments, with animals around, extreme weathers, temperatures, and the tendency to break from time to time. There are multiple pieces that can cause malfunctions or interference, such as the BUC, LNB, cables and modem. The industry required a way to analyse whether a VSAT was saturating a network, creating ASI or Crosspol interferences, sweeping in frequency, or even retransmitting a GSM signal. We are very pleased that today we have Alusat, which enables satellite operators and service providers to solve interference challenges before they become unmanageable.

Question: While the Capex of VSAT systems has fallen rapidly, Opex has remained remarkably stable – how can operators bring down prices to make VSAT installations more affordable?

Juan Carlos Sanchez: Opex is becoming an issue in our industry. Previously, the satellite launch was more expensive, remotes were more expensive, even BUCs and LNBs were more expensive. Nowadays, these services and products are more reliable and less expensive. Adding the complexity that HTS brings to the table, the companies working in this new evolution of the industry are required to hire more qualified personnel and train them to support these complex systems.

In our opinion, the more automated processes we can provide our partners, the more cost-effective Opex will become. Simplicity is at the heart of the systems we build at Integrasys; by simplifying the systems, we manage to require a lower skills and knowledge set for completing complex tasks.

One example of this that we are very proud of is that Integrasys has developed a new interface that allows connectivity customers to install the antenna themselves, without the need to understand anything about satellite. This is unprecedented in the satellite industry, and represents a 100 percent saving in VSAT deployment.

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revisits to the remote sites, which can be extremely costly operations.

**Question:** As more and more VSAT terminals are installed across the world, interference is becoming an ever-greater concern. Carrier ID is a great solution for broadcast transmissions, but where are we headed for VSAT networks?

**Juan Carlos Sanchez:** Carrier ID is a very good initiative headed by iRG. We are starting to see an effect in TV distribution, and we have customers in the USA that have minimised broadcasting interference thanks to Carrier ID detection. However, this ID codification is not present in VSAT terminals. Therefore, we have built Alusat, which allows our partners to actively monitor every remote site periodically, and if any issue is detected, they can solve it themselves.

The VSAT market has grown significantly in the last ten years. In the last five years, HTS has enabled an industry ‘facelift’ for connectivity on the move, with large numbers of antennas, both the traditional parabolic and innovative flat panel antennas, being manufactured to take advantage of these new capabilities. Flat panel antennas, in particular, are being manufactured to be extremely cost-effective. Costs fall with economies of scale, new markets such as the connected car are enabled, and maritime and aviation connectivity booms. It’s likely that, at some point in the future, consumers will be able to connect with a backpack in the same way that satellite phones are used today.

The number of these devices is predicted to be huge, and the smaller the antenna, the wider the beam, and the more interference it creates. Thus, we see a need to allow users to access the satellite in a simple and secure way.

**Question:** Which emerging trends and challenges do you think will have the biggest impact on Integrasys’ business in the coming years, and how will the company respond?

**Juan Carlos Sanchez:** We work closely with satellite and network manufacturers to define our roadmap to address the needs of satellite communications in the future.

HTS is having a tremendous impact on our business; we’ve been working on projects with a variety of satellite operators, including Yahsat, which have adopted our technology.

At Integrasys, we see that new types of MEO and LEO satellites and terminals will enable us to grow our business even more by solving the challenge of these future payloads.

**Question:** What’s on the horizon for Integrasys for the rest of 2017 and beyond?

**Juan Carlos Sanchez:** We consider 2017 as our year. Integrasys has been growing significantly in the past few years, and there is more to come, so stay posted.

On the project side, we have an exciting new project just starting up with Velocity Networks adding new capabilities to our existing product line, as well as scaling it to a large number of beams.

Another exiting example is the development of a scalable HTS Controlsat that allows monitoring and detection of any possible interference at any remote beam from the main NOC, in a cost-effective manner.

And to conclude, our latest product Alusat is expected to be the most popular of our 2017 offerings, with multiple customers planning to benefit from it during 201
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Today there are millions of VSAT terminals in operation worldwide. Market estimates project continued growth as devices trend smaller and cheaper, coupled with an increasing deployment of Internet of Things (IoT) and mobility applications. But, the impressive growth history and rosy projections for further VSAT growth should be tempered by potential storm clouds on the horizon: VSAT systems are already responsible for the majority of all interference, according to the Satellite Interference Reduction Group (IRG). Arguably, VSAT networks are one of the most challenging satellite environments to manage, especially with respect to interference, defying traditional monitoring techniques, taking operators weeks to months to find the offending terminals.

Continued VSAT growth complicates the interference picture for the industry. Fortunately, recent innovations in detecting and mitigating VSAT interference have arrived to tackle this challenge. These advances are being used by some of the largest operators, such as SES, who are now able to resolve VSAT interference in minutes as opposed to months, as well as proactively monitor VSAT interference. In this article, we’ll address the unique interference challenges presented by VSATs and the game-changing solution for solving this problem.

The major challenge with VSAT interference is the operation in TDMA mode, where many terminals share the same frequencies. A mis-pointed terminal will normally operate flawlessly; otherwise the problem would be detected and corrected. The misalignment is not affecting normal operations, but can disturb services on the opposite polarization or adjacent satellites. Traditional tools cannot tackle the TDMA nature of VSATs efficiently, making it very difficult to determine which terminals are the sources of interference.

The only way to identify an offending VSAT has been to isolate terminals in groups through binary search; narrowing down the group size until eventually the interfering terminal was found. This is a lengthy troubleshooting process, especially for large networks that also disturbs user traffic. As a result, interference can continue for weeks or months on end, or, an interfered segment might simply be left unused.

The growth of VSAT interference has been fueled by reduced equipment cost, reduced installation costs, and relaxed procedures for bringing terminals online. The major cause, however, has been the inability to police and monitor VSAT terminal interference with efficient, automated tools. This has allowed improper installations of VSAT terminals to remain undetected until problems that affect other services are spotted by a satellite operator. When the problem is detected, it is complex to solve without suitable monitoring solutions.

No more woes from VSAT interference

VSAT networks have enabled incredible connectivity capabilities, and as such are growing at a rapid rate. While this is fantastic for consumers, enterprises and governments around the world, VSAT networks are one of the greatest sources of interference today. Petter Amundsen, General Manager at Kratos Norway, outlines how VSAT interference can be effectively mitigated in a matter of minutes, solving a key global connectivity challenge.

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“What is impossible today will be possible tomorrow”
— K. Tsiolkovsky

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Existing approaches

Current carrier monitoring systems perform RF characterization and detect the interference, but RF characterization cannot provide any insight or actionable intelligence as to which specific terminals are causing the problem.

The introduction of the SatGuard solution from Kratos changes this situation. For the first time, it is possible to monitor the level of interference AND identify the responsible VSAT by its terminal ID. This ID is the same identifier used in the VSAT hub station for managing the terminals. SatGuard extracts this ID from the operational link bursts, analyzes and correlates the links and the power levels of each burst, generating a list of all the terminals causing interference by power level and terminal ID. It can measure levels of XPI/ASI for each terminal as low as -10dB SNR. Martin Coleman, Executive Director of the Satellite Interference Reduction Group, an industry consortium dedicated to reducing global interference, observed that “the SatGuard solution is widely regarded in the industry as a game changer.”

In action

SES, a leading satellite operator, has been using SatGuard operationally for more than 24 months with systems deployed across its global network. “Issues caused by MF-TDMA systems contribute to almost 50 percent of all of our interference events,” explained Chris Grogan, Senior Vice President of Customer Service Delivery at SES. “SatGuard has transformed our capability in dealing with these problems, and we routinely work with adjacent satellite operators and service providers, giving them specific terminal information in order to expedite resolution of any problems. We have had cases whereby the time taken from receipt of a complaint, through the analysis and escalation phases to permanent resolution of the problem has taken less than 10 minutes.”

Proactive and pre-emptive

Once an interfering terminal is identified by its specific ID, it can be remotely switched off by the network operator or other remediation measures can be initiated such as re-aligning the antennas. The ability to identify VSAT interference in minutes rather than weeks or months is generally experienced as a great boost to workforce productivity. Staff time spent mitigating VSAT interference can now be used on more productive activities. Customer satisfaction benefits as well. With issues resolved quickly, quality of service can be maintained with fewer service penalties. Even better, operators can monitor VSAT interference proactively in real-time, in the same way continuous carriers are monitored. By measuring and reporting when terminals levels might be approaching interference, problems can be prevented and network performance optimized.

Autonomous

SatGuard operates independently of the VSAT network it is monitoring, requiring no interaction with the VSAT hub equipment. After the offending terminal IDs have been found, the network operator is informed about which terminal IDs are causing interference and can then do the required actions to resolve the interference. SatGuard supports open standard VSAT technologies such as DVB-RCS/RCS2 along with major proprietary VSAT technologies, and can be adapted to specific VSAT technologies at request (Figure 2).

Geolocation

Prior to SatGuard, geolocating a VSAT system had been difficult due to the TDMA signal nature, with many terminals sharing the same frequency. With the SatGuard technology incorporated into satID, Kratos’ geolocation product, precise geolocation of an interfering VSAT is now possible, with the same accuracy as for continuous signals. This capability can be used to verify the location of terminals, or to allow operators or regulators to validate whether the terminals are being used in the licensed areas.

New VSAT interference monitoring capabilities

Kratos is adding the ability to demodulate GSM carriers caused by VSAT retransmission, enabling the operators to find the base station position by demodulation of the GSM carrier contents. Together with the geolocation ability of VSAT terminals being introduced in satID, the terminal causing the GSM retransmission can then be identified.

Given this newly introduced VSAT interference monitoring technology complementing other Kratos satellite communication monitoring solutions, satellite operators, service providers and network operators around the globe are now able to perform comprehensive VSAT monitoring, including automatic classification of TDMA carriers in real-time, VSAT interference management, and geolocation of VSAT terminals by terminal ID. When utilizing this technology, VSAT interference is minimized and operations improved for all satellite industry participants.

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Figure 2. SatGuard has been tested for multiple platforms, and supports over 90 percent of deployed VSATs.
System reliability and ease-of-use

KNS has been one of the world’s leading manufacturers of next generation VSAT antennas, equipment and parts for the maritime, military, oil and gas and fishing industries, among others, for over a decade. It provides Ka, Ku, C and X-band VSAT antennas, as well as spare and optional parts, in addition to Ku-band TVRO antennas and spare parts. Amy Saunders spoke with Noah Chung, Director of KNS, to find out more about the company’s latest activities and expectations for the future.

**Question:** Can you provide an outline of KNS’ business, services and solutions? Which products and markets are key to the company’s success?

**Noah Chung:** Our core business is the delivery of VSAT communication through our global partners of distributors and resellers. KNS has recently made some powerful strategic modifications to our current business model to accommodate the important changes currently taking place in the VSAT market. KNS plays a significant role by contributing to military spec VSATs to the commercial market, that encompass system reliability and ease-of-use. These drastic changes to our business model have enabled KNS to succeed in the oil and gas, shipping and OSV markets. It has also enabled KNS to grow substantially, and provide efficient customer service globally.

**Question:** What are the key emerging trends and challenges that will affect KNS’ business, and how is the company responding to these?

**Noah Chung:** I believe the emerging trends are going to be multiband frequency antennas. The ability to have a single antenna that can go from Ku to Ka to X bands automatically will affect the way KNS and service providers develop business. This will allow vessels to use high throughput Ka-band beams when available and then switch to Ku-band automatically when Ka-band is not available. This type of technology is what our customers are looking for, but it does come with a few challenges. Unfortunately, it’s not all about the antennas and the satellite beams, the entire infrastructure will need to be updated, including a multiband network that can handle this type of service, and a new modem technology to support single multiband antennas.

**Question:** In February 2017, KNS launched its Cellular IP Modem (CIM), which enables operators to monitor and control more than 100 antenna systems with a single PC. How does this product compare to others available on the market, and what kind of feedback have you received so far?

**Noah Chung:** There is nothing in the
market compared to our Cellular IP Modem that I know of. The CIM was developed for service providers who wanted to receive text messages to their phones to verify the antenna had no technical issues. As a vessel comes in to port and gains cellular access, the CIM sends a text message to the engineer stating the system is operational and has no issues. In the event of a malfunction, the CIM will send a text message to the engineer stating what technical issues it had. Engineers will also be able to diagnose the VSAT by responding to the text message. This feature allows technicians to gain spare parts and tools in advance and head towards the vessel quickly. This provides a very efficient and cost-saving solution to VSAT maintenance.

Question: Last time we spoke, you said that KNS planned to launch a new MK4 platform, which would include all the features of the MK3 and added dual-band capabilities. Can you tell us how this project is developing?

Noah Chung: We are in the final stages of completing the antenna. The antenna will be a 1.2m antenna capable of X, Ku and Ka-band in any dual combination. The antenna will have all RF parts within the radome and users will be able to switch bands with a press of a button. We are utilizing the technology from our M9Mk1 COTM antenna.

Question: KNS initially found its feet in the maritime sector, but you’ve hinted previously that the company might start to expand into new markets. Where do you see the most opportunities going forwards, and what plans are you making to this effect?

Noah Chung: Yes, we have expanded into new markets in mid 2016 and had a lot success. KNS has transitioned into mainly focusing on military COTM and Naval VSATs.

The COTM move system is a 4-Axis system that can be operated anywhere in the world. One of the unique features is that it is a true 4-Axis system, therefore it has no zenith paradox when tracking the satellite. We are proud to have achieved a re-acquire time of less than five seconds and integrated a 40W BUC to the base of the antenna. The COTM is available in X, Ku or Ka-band and has been tested to the toughest military standards.

The new KNS 10ULV antenna is a 1m Naval antenna, capable of surviving and operating in Sea State 7 conditions. The antenna meets MIL-STD- 901D, 461, 810G and 167 and is available in Ku, Ka or X-band. The antenna is equipped with direct drive motors, carbon fibre reflectors and a uni-body pedestal. 2017 promises to be another exciting and successful year for KNS. We look forward to creating a new generation of VSATs for the next era of communications.
The world has an insatiable hunger and need for data, especially while on the move. However, mobility and location continue to be the ultimate roadblocks for terrestrial and satellite connectivity solutions. Terrestrial because it is spotty — and that is being charitable. The gimbled parabolic dish or phased array antennas used today are expensive, large, have mechanical parts that break, produce too much heat and are difficult to install. They are also impossible to install on smaller, mobile platforms like most cars, and so they can’t take advantage of the growing capacity from high-throughput and low Earth orbit (LEO) satellite constellations. Until now.

Meet the Kobayashi family
It's a typical winter Saturday morning in Tokyo. In the Azabu neighborhood, the Kobayashi family is getting ready to set off on a four-and-a-half-hour road trip to Hakuba for a weekend ski retreat. Mr. Kobayashi, a father of two, and CEO of one of Japan’s largest banks, makes sure to pack his corporate laptop, knowing he’ll need to send emails and join video conferences from the road. His wife, a stay-at-home mother and part-time photographer, packs her high-end Nikon camera and personal laptop, excited to upload photos and show her followers the breathtaking landscapes that she will soon be immersed in. Add their 11-year-old twin boys, typical of Generation Z, who are inseparable from Netflix and the digital world. The two boys crawl into the back seat of the family’s satellite-connected VIP civilian armored vehicle (CAV), holding their tablets tight to their chests as if their lives depended on it. And off the Kobayashi family and driver goes, embarking on a nearly 300km drive.

Like the Kobayashi family, most people in the modern world expect to be connected wherever they go. However, the fact of the matter is, many parts of the world are disconnected from terrestrial networks — even areas just
outside major metropolitan centers. Furthermore, if you own a CAV, like Mr. Kobayashi, you demand not only reliable, high-bandwidth mobile connectivity, but also the highest levels of network privacy to keep your data secure, without impacting the vehicle’s natural aesthetics. That's where the powerful combination of satellite connectivity and cutting-edge, flat-panel antenna technology steps in to solve these problems.

One satellite communications company is helping to obliterate communication barriers for any vehicle that moves across land, sea or air. Kymeta, for one, has created an electronically steered, small, lightweight, lower-power, flat-panel antenna, called mTenna, which has no moving parts and fits invisibly between the headliner and roof of a CAV. This antenna provides secure, reliable, high-bandwidth global satellite access to passengers anywhere on the go.

**Security finally meets connectivity**

CAV passengers traditionally rely on terrestrial networks for connectivity and therefore risk compromising all the data that flows to and from their connected devices. Terrestrial networks are crowded and operate on shared radio frequencies, making them notoriously easy to attack. Someone wanting to hack a cellular-connected CAV could infiltrate it from many different access points. Satellite connectivity acts as a single point-to-point entry solution, meaning the connection is much less vulnerable or susceptible to disruption, giving individuals like Mr. Kobayashi peace of mind that his data and phone conversations stay private.

**Reliability equals productivity**

With satellite connectivity and advances in flat-panel satellite antennas for CAVs, Mr. Kobayashi can achieve the highest levels of productivity. For example, while his driver negotiates the rural highways, he can send emails or do WebExes, and he can take Skype meetings from his private lodge at the base of the mountain. Another factor to consider is that mountains and other regions can be susceptible to extreme weather conditions. There's the risk that a natural disaster or catastrophe can wipe out terrestrial networks. Satellite connectivity provides Internet access where terrestrial networks are unavailable and eliminates the threat of lost communication during such events.

**High-throughput connectivity enables entertainment**

Other passengers traveling in CAVs demand the same ubiquitous, mobile connectivity for the most connected experience. With Ms. Kobayashi capturing high-resolution images and uploading them to her social media channels along the way, and the two children streaming continuous Netflix and playing ‘Mobile Strike,’ this type of simultaneous activity requires very high-throughput connectivity for an uninterrupted experience. Most of the spotlight on the renewed interest in space has been on the creation and upcoming launch of new, high-throughput LEO satellite constellations. However, until now there has been no on-the-ground technology, or antennas, that can acquire a signal fast enough to unlock the potential of these high-throughput satellites. With 50 billion connected devices expected by 2020, LEO satellites are critical to alleviating the often crowded and congested terrestrial-based networks, and only the mTenna can unlock this available capacity.

**Connectivity marries aesthetics**

Traditional satellite antennas that are used across markets leveraging satellite connectivity have mostly taken the form of stationary gimbaled dishes that are heavy, bulky, power-hungry and require mechanical moving parts that make them costly to install and maintain. The smaller ‘shark fin’ antennas used on most vehicles today protrude from the roof and can ruin a car’s sleek aesthetics; furthermore, they can only receive around 256Kbps of data or less, and they lack the ability to transmit data. Until the recent introduction of small, lightweight, lower-power, flat-panel satellite antennas that can fit invisibly between the headliner and roof of vehicles, CAV owners were unable to purchase an antenna that provides secure, high-throughput satellite Internet with a single transmit-and-receive aperture, while also maintaining the car’s natural lines.

**A truly connected world**

In the end, the advancements in satellite antennas and the ability of their technology to unlock the potential of LEO satellite constellations will enable global, high-speed connectivity to anything that moves. Another shift in the industry that needs to occur is in the way satellite access services are sold. Today, buying satellite capacity is very confusing and extremely expensive. To make satellite connectivity available to mobile platforms, purchasing services must be simplified. Kymeta is also pioneering this with KÂLO, offering CAV owners and other industries a new, easy way to buy satellite services in much the same way as cellular services are purchased — in gigabyte-based plans that everyone is familiar with.

**An extended stay**

The weekend getaway in the mountains was such a great success for the Kobayashi family that they all agreed to stay a couple of extra days. By staying in touch for a couple of hours each morning with the outside world, the family was able to extend their time together on the slopes.
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Connecting the world

The enterprise sector plays a key role in the satellite world, and is the bread and butter for many satellite service providers. From commercial aviation and maritime, consumer broadband, banking and financial, to e-learning and telemedicine, the enterprise sector is an extremely wide and varied space in which to work. Satellite service providers today are honing their capabilities and developing specialised solutions customised for highly-specific applications in order to beat the competition in an extremely competitive environment.

Enterprise is one of the most dynamic markets in the satellite sector today. As some segments rise, others fall, and it’s down to the satellite service providers to assess the market accurately in order to target new customers and upsell to existing customers at the right time. It’s a very delicate balance that takes great skill on the part of the companies.

Internet is big business right now. While fibre is being rolled out to many new locations around the world, limiting factors such as geography or cost-efficiency mean that coverage will never be ubiquitous. It’s simply not worth the expense of installation to take fibre to a village of 500 people, nor is it practical to connect the tiny remote islands in much of Southeast Asia. Satellite, therefore, is making up for much of the shortfall in unserved and underserved regions.

Demand for Internet connectivity is said to double every year, making it one of the safest markets for satellite service providers today. It’s no surprise then that providers are developing dedicated solutions for consumer Internet and business connectivity that can be rapidly deployed in any environment around the world.

Talia introduces business continuity service

The majority of enterprises today gain Internet access via fibre, a high-speed, cost-effective and convenient solution for many. In most cases, that connectivity is a great solution. However, for those companies that require 100 percent, always-on connectivity, having a back-up service in place isn’t just an option, but a necessity. There’s also still a great number of unconnected locations, such as much of Africa and Asia, as well as vessels at sea or in the air, where terrestrial fibre will never be an option. In these cases, satellite provides an excellent solution.

Talia is one such company working on designing services for the unconnected, or those in need of redundancy. In March
2017, Talia introduced a business continuity service that will be built on iDirect’s satellite ground infrastructure platform. Talia OnDemand was designed for companies operating in locations where fixed line services are unreliable or where occasional use, backup, redundancy or disaster recovery solutions are required. The company expects improved service economics enabled by high throughput satellites (HTS) to make satellite connectivity more competitive than alternative solutions.

Talia OnDemand is powered by Talia’s patent-pending ConnectPlus, a connectivity solution working in conjunction with the iDirect satellite platform. ConnectPlus is a network edge appliance connecting the customer’s network to the Talia OnDemand service.

“Today, uninterrupted Internet connectivity is an essential requirement to the success of organisations,” said Jack Buechler, Vice President, Business Development at Talia. “By building our OnDemand service on the iDirect platform, we are leveraging iDirect’s industry-best technology to deliver the reliable performance our customers require when it comes to running their core operations.”

Marlink launches hybrid network for oil and gas companies
Oil and gas has seen some turbulent times in recent years, tracing back to major price crashes in 2008 and 2014. By February 2016, audit and consulting company Deloitte stated that, with global crude oil at near ten-year low prices, 35 percent of listed exploration and production oil and gas companies were at a high risk of bankruptcy.

The uncertainty in the oil and gas sector resulted in a significant reduction in spending in that market, which was felt deeply by satellite service providers. Indeed, at a time when many areas of maritime activity, including cruising, yachting, fishing, etc, were investing heavily to provide the connectivity expected by crew and passengers and increase on-board operational efficiencies, the oil and gas companies were falling behind the digital curve.

More recently, however, some oil and gas companies have been changing tact. As argued by the satellite service providers, increasing on-board connectivity for exploration and production companies can deliver significant cost reductions through increased efficiency, automation and remote sensing, reducing costs and overall risks in a sector where even small delays can result in massive losses.

In March 2017, Marlink, service integrator Defaultroute and Internet provider Abr Al Manara teamed up to deliver a ground-breaking hybrid digital connectivity service, seemingly at just the right time to take advantage of the changing market. The availability of that new service resulted in a multi-million Dollar contract for a major Iraqi oil and gas company.

The partners will seamlessly integrate Marlink’s Terralink
VSAT service with MEO satellite services and fibre Internet connectivity. The hybrid digital network approach provides levels of redundancy and service not seen previously in Iraq, with the end user receiving almost 100 percent SLA for always-on connectivity. The solution creates a platform for increased digitalisation of commercial and industrial operations in Iraq, with provision of high bandwidth for a variety of applications, including logistics operations, safety, security, surveillance, remote monitoring and emergency response.

Defaultroute’s quality assurance and service delivery management expertise will ensure smooth running of all aspects of the network, and will cooperate with Abr Al Manara on delivery of the MEO satellite services and fibre connectivity. Abr Al Manara operates 70 percent of the commercially-available MEO satellite bandwidth over Iraq, and can provide in-country compliance, licensing and logistics.

“A big part of the success of this joint venture is the mutual understanding between the partners when it comes to operating together within the complex Compliance and Licensing laws in Iraq,” said Michael Iwanow, COO of Abr Al Manara. “Abr Al Manara and its parent company have been operating in Iraq since 1976, so we know this better than anyone. We believe this is just as important as the technology we bring together as partners.”

SES bridges the digital divide across Africa

While fibre’s reach is continuing to expand across the globe, delivering reliable, high-speed Internet to many, there are still many regions where terrestrial connectivity solutions are absent, or low-quality. We all know that satellite provides a great alternative to fibre, but its market penetration is still developing as satellite operators and service providers roll out solutions that are attractive to their target enterprise companies.

In November 2016, SES announced a multi-year agreement with MADA Communications International S.A.L. (Offshore), which delivers telecommunications services across Africa, to provide Internet services to an Internet Service Provider (ISP) and Mobile Network Operator (MNO) in Juba, South Sudan. The deal includes capacity on a C-band Hemi beam with 115Mbps Internet capacity over SES-5 linked through the SES Betzdorf Teleport.

“Our main focus is to provide value added services to our customers,” said Dominic Fahed, Director of Africa Operations at MADA. “This agreement allows us to tap into SES’s infrastructure for the greater good of end users and avail high quality Internet services to fulfil their daily online needs. Beneficiaries of this deal include: MNOs requiring 3G data access, 4G Telecoms, ISPs, corporate businesses and NGOs, given that connectivity has become a basic requirement to fulfil day-to-day operations in the workplace.”

“We live in a digital era where consumers expect to be always connected from a personal and business perspective, regardless of their geographical location,” said Ferdinand Kayser, Chief Commercial Officer at SES. “This deal will enable end users to have Internet connectivity, communicate across social media platforms and stay connected to the digital world, thus, bridging the digital divide. With this new deal, SES is able to bring Internet connectivity to MADA’s customers where terrestrial infrastructure is currently non-existent.”

Meanwhile, in March 2017, SES and Intersat announced a new multi-year agreement to deliver Internet services across Africa over SES’s NSS-12 satellite. The agreement includes a new C-band capacity lease, infrastructure services out of
the SES Betzdorf Teleport, and a renewal of upgraded Ku-band capacity out of the SES Djibouti Teleport.

Intersat will also use the SES Enterprise+ Broadband service to deliver high-speed broadband connectivity across Africa for the banking sector, corporate customers, and Internet service providers. Launched in 2015, SES’s Enterprise+ solution is a managed, ready-to-deploy, customised satellite connectivity solution providing carrier-grade services and allowing a wide range of applications including connectivity for Enterprise Resource Planning (ERP), Virtual Private Networks (VPN), Voice over IP (VoIP) services, remote data traffic and video multi-casting.

“As demand for connectivity grows beyond big cities, communities need faster, more reliable broadband to support business growth, as well as healthcare and educational services. Our partnership with SES will further strengthen our collective ability to deliver this connectivity,” said Hanif Kassam, Executive Director at Intersat. “With the new and upgraded capacity and customised connectivity platform on NSS-12, combined with an extensive teleport infrastructure, we will be able to offer truly differentiated services to our customers.”

Hispasat targets digital isolation in Spain

It’s not just developing countries that are suffering from poor Internet connectivity. Western regions like Spain are still blighted by the digital divide, suffering massively in terms of business, economic activity, social improvement, education and healthcare, and so on.

Indeed, according to the ‘Broadband coverage in Spain in mid-2016’ report presented by the Secretary of State for Information Society and Digital Agenda, there are still 2,682 remote or sparsely-populated towns in Spain that are subjected to digital isolation because they do not have Internet access with speeds of at least 10Mbps. In addition, in almost half of the Spanish towns, fixed broadband does not reach speeds of 30Mbps, which the European Digital Agency established as an objective for 100 percent of the population by 2020.

Accordingly, March 2017 saw Hispasat launch its Conéctate project to bridge the digital divide, make society aware of the advantages of satellite Internet connectivity, and to make the Digital Agenda part of the political debate. With a competition format that will be made highly visible on social media, Hispasat plans to bring broadband connectivity via satellite to remote or sparsely-populated areas of Spain that are underserved or unserved. The #enREDatupueblo contest will see all residents, homes and businesses of the winning town receive one year of free 30Mbps Internet access under the project, including installation and servicing.
The contest is open to towns or single population entities (ESP) in Spain with less than 500 inhabitants and without Internet access, or with only low quality access. The town council must endorse the competition entry. Participants must creatively express the benefits they would receive with the arrival of high-speed Internet connectivity in any format; photographs, videos, songs, collages, written, or oral presentations. The benefits should focus on improvements in town life, including culture, education, business, health, communication or personal life, among others.

Satellite service provider Eurona is responsible for managing the final provision of services to the client, including logistics, coordination of the facilities and post-sale services, while FENITEL will collaborate on the installation of antennas in the winning town.

The deadline for the project was 30 April. According to Hispasat, a selection committee would then choose three finalists to be announced on 17 May, when social network users will vote for the winning town until 27 May. The winner will be announced on 29 May.

Hughes launches ground-breaking Internet service
Providing Internet everywhere is one of the key selling points of satellite versus terrestrial options, however, not all Internet services are equal. Low speed basic packages might be more cost-effective from some suppliers, making them initially more attractive to consumers, but many of us today are so accustomed to high-speed connectivity that these lower-speed options are like a great step backwards in technology. This can lead to dissatisfaction, complaints, and, eventually, cancellations.

With high-speed Internet connectivity becoming more than a nice-to-have for many, and practically a necessity for anyone using the top (OTT) video streaming services, investing in more advanced, true broadband speed solutions is more often than not a more intelligent plan when future requirements are considered.

In December 2016, Lockheed Martin successfully launched Hughes Network Systems’ EchoStar XIX communications satellite on board an Atlas V 431 from Space Launch Complex 41. According to Hughes, EchoStar XIX is the world’s highest capacity broadband satellite. In conjunction with the existing EchoStar XVII satellite and a hosted payload on the Eutelsat 64W satellite, Hughes will launch the world’s fastest and largest satellite broadband network to support consumer, business, enterprise, in-flight and cellular backhaul applications.

Later, in March 2017, Hughes launched HughesNet Gen5, the first and only US satellite Internet service to provide Federal Communications Commission (FCC) defined broadband speeds (25Mbps download and 3Mbps upload) from coast to coast.

EchoStar XIX and EchoStar XVII are both powered by the Hughes JUPITER System, the first and only VSAT platform with System on a Chip (SoC) technology incorporating the latest DVB-S2X air interface standard, wideband 250MHz carriers operating at more than 1Gbps, and with throughputs of more than 100Mbps on each terminal. As such, HughesNet Gen5 delivers faster speeds, more data, and built-in Wi-Fi for consumers and small businesses across the entire continental US and key areas in Alaska. There are no hard data limits, so if monthly plan data is exceeded, service continues at a reduced speed until the next billing cycle. The service also includes a bonus zone of 50GB of free data per month during off peak hours (2am – 8am).

“HughesNet Gen5 builds on the success of America’s #1 satellite Internet service—with over 1 million subscribers, and rated by the Federal Communications Commission (FCC) as the nation’s leading ISP in delivering on advertised speeds according to the “2016 Measuring Broadband in America” report - bringing the many benefits of high-speed Internet to people everywhere across America, no matter where they live or work,” said Pradman Kaul, President of Hughes.
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Low distortion for high signal integrity
- Built-in linearizer enables low distortion in power transmitters

Ku-band GaN HEMT line-up expansion
- Combining GaN MMIC with existing 50W and 80W GaN HEMT enables configuration of multiple power amplifier stages

Mitsubishi Electric's Ku-band 20W monolithic microwave integrated circuit (MMIC) amplifier for satellite earth stations, features the world's first gallium nitride (GaN) high-electron mobility transistor (HEMT) MMIC with integrated linearizer to compensate for distortion. The MMIC GaN HEMT, has an output of 43dBm (20W) and linear gain of 20.0dB, will contribute to the downsizing, high-performance and faster development of power transmitters. Along with the company's existing 50W and 80W GaN HEMTs the range enables power transmitters to be configured for a wide range of output power.

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Environmental awareness: All products comply with regulations governing the use of hazardous substances in electrical and electronic equipment (RoHS).
DTH broadcasting has traditionally been one of the most stable and safe market segments for satellite operators for many years. However, in recent times consumer viewing habits have changed drastically, with more people than ever before watching media over alternate devices, and switching from traditional free or paid-for TV to subscription streaming services. Cristi Damian, VP of Business Development at Advantech Wireless, outlines how teleports have to change in line with the evolving DTH market, and explains how new technologies can provide vast improvements in operations.

Legacy DTH teleports
The vast majority of DTH teleports were designed and built almost 20 years ago. As business grew, the teleports grew too. More antennas were added, with bigger shelters and large UPS systems with diesel generators for back up. As generations do not have plasma TVs on their buying agendas, but they do need uninterrupted high speed Internet access and unlimited data on their smartphones.

After almost two decades of being one of the most 'change resistant, risk averse' segments in the telecom industry, the reality is fast catching up with traditional satellite based DTH operators. Companies and technologies that did not exist 15 years ago are now several times larger and riding fast on the most advanced technology available. There is probably as much, if not more, video content being distributed by YouTube today than by the entire DTH industry.

Add to that the rapid change driven by the demography in the way we access video today, we can easily see the challenges. Traditionally, DTH operators provided video content directly to the end user, or via cable operators. We've seen a 20 percent fall in the last 2-3 years on cable TV / satellite TV subscriptions in mature markets. Young
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newer satellites offered better equivalent isotropically radiated power (EIRP), and better coverage, traffic was moved periodically from one antenna to another, trying to meet customer demands. Soon, the teleport become a spider net of intermediate frequency (IF) and waveguide routings, and tasks like frequency planning become ever more complex.

The need to maintain perfect availability, as well as technology limitations, required all indoor equipment, including modems, frequency converters, and HPAs. Technical personnel would supervise the installations 24/7 and would be able to act on the spot in case of malfunctioning. Fines for loss of traffic during a major sporting event would be huge.

But that came at a cost we could afford only 20 years ago. In a recent study a few years ago, we identified typical RF power losses anywhere between 60 percent to 80 percent on the wave guide runs connecting the indoor high power amplifiers (HPAs) to antennas. We have highlighted electricity expenses 7-8 times higher than they should be. The OPEX cost to run this expensive infrastructure would easily exceed millions of Dollars. Bandwidth management becomes difficult, and we would even end up paying for it when not used. Soon, the high OPEX cost would make any new investment in CAPEX problematic. Our productivity would suffer, and cash flow would be affected. We have to act now, and act fast.

Advanced DTH teleport architecture
For the overall business side, there are several points that should be covered:

- Bandwidth costs are falling, and that will make the DTH teleport business case stronger. However, this will imply more customers for the same or even lower revenue. It will require a priority change in OPEX cost allocation from equipment maintenance to customer handling and support. It implies directly a much lower teleport architecture complexity.

- UltraHD 4k or 8K is here to stay, and it will grow. That means 4-8 times more bandwidth, and 4-8 times more RF power required to transmit. Yes, we can use higher order modulation to reduce bandwidth, as specified in DVB-S2X standard, but that also requires more power.
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modem. On output, the klystrons run on complex 1:N redundancy schemes, and have all outputs connected to a network of high power filter combiners in order to be able to concentrate multiple klystrons (i.e. multiple transponders), on the same wave guide run to the outdoor antenna. This traditional architecture severely limits our flexibility in the teleport, to route carriers from one antenna to another, or simply split traffic.

We are now in charge of a massive investment into a very expensive shelter, which is using massive electricity on UPS and diesel generators, plus expensive air conditioning systems. But when we look at how efficient we are, we notice that we lose anywhere up to 80 percent of RF power on these frequency combiners and long wave guide runs.

We believe that there is no reason to continue doing that. Today, GaN-based solid state power amplifiers (SSPAs) are military grade and designed for all outdoor harsh environments. They exhibit reliability values at least three times higher than legacy klystrons or older SSPAs. These systems are wide band, and do not require frequency combiners. The frequency converters are built-in.

At the minimum, we should keep the modems and the encoders in the teleport. All RF should be outdoors, and we should run L-band outdoor cables, instead of wave guides, at a fraction of the cost. Just by moving the RF section outdoors, we will easily reduce the amount of energy consumption by 50 percent, as we need less RF power now.

In a simple step, we have eliminated the need for:

- Frequency converters and their redundancy;
- Expensive high power filter combiners; and
- Expensive outdoor waveguide runs.

And reduced the size of:

- The air conditioning; and
- The UPS and diesel generators.

Additional power savings are possible by installing the SSPAs behind the antenna reflector, on a mobile platform that is moving in synch with the antenna as it tracks the satellite.

By adopting these simple changes, a massive cost reduction can be achieved in electricity bills, and we now require much less RF power to transmit. And, with more and more high bandwidth transmissions and Ultra HD4K and 8K, rest assured that we will need all the RF power that we can get.

This brings us to the second thing that we can now achieve by this simple change. GaN-based SSPAs are much more linear, hence they have much better capability for transmitting higher bandwidth signals, and higher modulation. They are a safe investment for future demands for more power and more bandwidth.

We should consider a digital IF architecture. IP becomes the way video is being transmitted. To push the change even further, we should consider running IP data cables instead of L-band cables between the shelter and the RF. Complex and expensive matrix switches can now be replaced by simple IP routers. Traffic can be sent on multiple paths via Internet or via satellite. The increase in flexibility is truly outstanding. We can reach more content, and we can reach new customers.

There are at least two ways to send data via IP:

- Use additional IF to IP external converters, at both sides of the IP cable network; and
- Consider the migration to a more advanced architecture in which the modem is also outdoors, built in the RF.

The Advantech Wireless C8000 All Outdoor Terminal is a full transceiver, operating in Ku and/or Ka-band, and includes a built-in advanced DVB-S2x or DVB-RCS modem. This is the first to be launched in a series of completely integrated modem plus RF all outdoor solutions. It takes advantage of a full software defined radio platform, where even the satellite access mode, i.e. SCPC or TDMA, can be changed. Future modulation and error correcting codes can be simple software upgrades. At this point, even the need for a shelter is questionable. All video content can be sent to the teleport from the processing studio, on a fibre cable line.

We will need to access more customers, and have more than one service. The selected platform for the teleport should be a truly multiservice platform. We should be able to provide:

- High video content when needed, without wasting bandwidth when we do not transmit;
- Complement the services with Internet access, generate more business on a TDMA classic platform;
- Be able to extend cellular networks, like 3G and 5G; and
- Be able to take advantage of low cost HTS bandwidth, where having an all IP network with very high flexibility is mandatory.

The most advanced solution today is the ASAT II™ Multiservice and Multi-Waveform VSAT Platform. This innovative satcom access platform won the "VSAT Manufacturer of the Year Award" at the VSAT Global Conference, London, in 2015. At the core of this platform is Advantech Wireless WaveSwitch™ technology, which allows different satellite access schemes from the same terminal, and the intelligent 3D BoD™ bandwidth allocation scheme, which analyses in real time the traffic profile, assigns the requested level of quality of service, and allocates the bandwidth. The entire idea is to have a real multi-service platform in the teleport that can service markets larger than traditional DTH broadcast.

The teleport would be able to uplink large SCPC DVB-S2X carriers, with the most advanced modulation and error correcting codes available, in a typical DTH architecture. It could also allocate bandwidth from the same pool for traditional Internet bidirectional applications, in a very efficient pure TDMA access mode. It could also do optimal cellular backhauling with a traffic profile that will allow burst and SCPC using the advanced ASCPC™ access mode.

This integrated platform, with its built-in intelligent algorithms, basically replaces three different networks, all of them designed for different applications and different markets. It offers a future proof solution, in a dynamic and unpredictable market evolution.
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Question: Can you provide an overview of C-COM’s development over the years, from its founding to where it stands today?

Jonathan Lee: Twenty years ago, C-COM was a startup company with a focus on the fixed satellite business. Today, we are a leader in the mobile VSAT market and have become a benchmark that our competitors follow. As one of the leaders in the field of mobile, comm-on-the-pause (COTP) auto-pointing satellite antennas, C-COM’s development is characterized by a combination of market savvy, technology leadership and first-rate entrepreneurship.

Just to give you an example: C-COM was the pioneer in creating one-touch controller technology which allows users, with no satellite experience, to simply press a button and lock onto satellite in just a few minutes. Our controller has been integrated and made compatible with over 30 different satellite modems from major vendors in the satellite services industry. We were also the first to use DVB and DVB-S2/ACM in our advanced controllers and, I believe, our latest generation of antennas provide the fastest satellite acquisition solution on the market today. We have sold more than 8,000 systems to our dealer network, in over 100 countries. Most importantly, our partners are extremely happy with our products and the after sales service they receive. We work very closely with them to keep innovating and make improvements to our antennas. Many of them cannot afford to be down, or offline, for even a moment. It can make the difference between saving many Dollars and/or saving many lives.

C-COM is also involved in developing satellite-on-the-move (SOTM) products which should be introduced to the market later this year. Our R&D team is also working on a revolutionary next generation intelligent Ka-band electronically steerable phased array antenna, which is being developed in conjunction with a team of scientists and engineers at the University of Waterloo.

Question: What can you tell us about C-COM’s products and services?

Jonathan Lee: Extremely reliable, durable, easy to use and cost effective.
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For us, reliability not only means ‘lasting longer with less problems.’ It also means that every time, when the user presses the button on a C-COM iNetVu® antenna controller, they will find the desired satellite and begin communication.

I can share with you an example of this reliability as it compares to our competition. We visited one of our customers, a multi-billion Dollar company in Asia, which has deployed many hundreds of our antenna systems. We asked them how C-COM could improve our product based on their user experience. They told us that they had purchased many of our competitors’ product to compare with ours, and the reason they keep buying our antennas was simple: It was the brand that has exhibited the lowest failure rate in five years of continual use.

C-COM is very proud of the service level it provides to our customers. When people talk about C-COM, they never fail to mention the excellent after sales service they receive. Our technical support team is carefully selected, well trained and experienced. They work responsively in a timely manner to make sure our customers and resellers get the best support possible. As an industry expert, we also provide informative and intensive training to our resellers, both on site and in our Ottawa location.

Question: Where does C-COM see itself in the market, and where does it see the greatest opportunities for growth going forwards?

Jonathan Lee: Since we are already present in over 100 countries around the globe, we do not see significant changes to our geographic composition or the industry segments we are presently serving. However, with the rollout of Ka-band services, and the notion that everyone wants more data for less, we do see the change of their communications needs shifting to lighter, more portable products capable of greater bandwidth speeds.

C-COM works very closely with major HTS operators and service providers to ensure compatibility and certifications with upcoming new services. C-COM was the first to market with ViaSat Exede in North America, Eutelsat Tooway and Avanti Hylas in Europe, as well as Yahsat YahClick in the MENA region. The investment we made into this technology, over five years ago, has been paying off with large number of C-COM Ka-band
antennas deployed on Ka-band services.

Today, C-COM has a wide range of Ka-band auto-deploy antennas supporting all major Ka-band HTS services including HNS Jupiter, SES Thor7, Avanti, Yahsat, RSCC and others.

HTS services are on the expansion, and year-after-year new regions are being covered with HTS satellites, and so is the opportunity to roll out our approved antennas along the way.

**Question:** How does C-COM differentiate itself from its competitors?

**Jonathan Lee:** Besides reliability and service, C-COM’s delivery is also the fastest in this industry. We deliver product, from stock, in days, compared with others doing this in weeks or months. In some cases, we can fulfil an order the same day we receive it - particularly important in cases of emergency when a product must ship as fast as possible. This unburdens the reseller from having inventory and he can rely on just in time delivery from C-COM, a critical feature in our ‘immediate demand’ industry.

It is worth noting, as well, that C-COM is a publicly traded and well-managed company with zero debt and a very strong balance sheet. We are working in a very competitive market place, and a strong financial position ensures that we can overcome business downturns, which happen from time to time in this sector. Over the years, we have seen several of our competitors come and go, leaving many of their customers with unsupported and obsolete technology. Our resellers are aware of this and appreciate the stability C-COM provides to them and their customers.

**Question:** The satellite industry is currently in a major state of change, with massive small satellite constellations and high throughput satellites (HTS) really shaking up the field. Which emerging trends and challenges do you think will have the biggest impact on C-COM’s operations?

**Jonathan Lee:** Regarding HTS, our existing products are well positioned to take advantage of this new and rapidly developing market, especially in Ka-band, in which we see large opportunities for C-COM. Our new generation antenna terminals have all the adequate approvals from major satellite operators and modem manufacturers. We will continue to integrate with any new modems and services which are rolled out in this market.

As for the new constellations of LEOs and MEOs, it’s a bit too early to tell, but we see this as a very large opportunity for C-COM to develop new antenna terminals which can cater to these emerging services. We are hoping that the new phased array antenna technology being developed with the University of Waterloo will address these constellations.

At this moment, all those massive small satellite constellations seem to be missing one important element - a low cost electronically steerable phased array terminal. Conventional terminals are not able to deliver the full potential of many of the LEO and MEO constellations being launched, especially when it comes to mobility. This is part of reason why C-COM has decided to invest in the development of a revolutionary, intelligent, conformal, scalable, electronically steerable phased array antenna, which will eventually make it possible for GEO and LEO constellations to penetrate all
market segments, presently not reachable cost effectively. This will also include cars, ships, trains, buses, UAVs, aircraft etc. that will benefit from the availability of a low cost intelligent terminal.

Question: What can you tell us about development of your modular phased array antenna to date, and how does the technology compare with other phased array systems under development by rival companies?

Jonathan Lee: The phased array project with the University of Waterloo is progressing very well. Last year we successfully tested our first 4x4 ka-band phased array module, which was based on our patented phase shifter technology.

This was followed by beam steering tests on a small 1x4 module, and later last Autumn we filed a patent-pending new technology to calibrate a two-way phased-array mobile antenna.

The main advantages of the new technology is its modularity, scalability, low-cost, low power consumption and the capability for phased-array systems to auto-calibrate in the field.

In January of this year, C-COM announced co-funding of an Industrial Research Chair held by Professor Safieddin Safavi-Naeini in Intelligent Antenna and Radio Systems for the next-generation millimeter wave mobile communications at the University of Waterloo alongside the Natural Sciences and Engineering Research Council of Canada (NSERC). The five-year project’s primary goal is the development of a new modular, low-cost, intelligent antenna for the next-generation of mobile satellite communications.

This kind of investment demonstrates our company commitment for the advancement of this new technology. We strongly believe that by developing a low-cost, light weight, ultra-thin intelligent core antenna module, it will provide the basic building block for antenna scalability to meet any future antenna requirements. This modular antenna approach will enable antenna designers to size up any antenna depending on the target application and its requirements.

Other possible applications for the new phased-array antenna technology include its extension to higher millimeter-wave band to be deployed in telecommunications for the next-generation 5G mobile cellular that are expected to become a reality in the near future, and also in sophisticated automotive radar imaging for sensory systems in self-driving vehicles.

Question: In addition to flat panel and phased array antennas, several companies are focusing heavily on the development and commercialization of multi-band antennas. Where does C-COM stand on this trend?

Jonathan Lee: C-COM currently has no plans to develop dual or multi-band antennas.

We believe the market for such antennas is limited to few applications which we are not looking to address in the near future. However, C-COM has developed its antennas to be field upgradable, and we do provide the appropriate upgrade kit so users can easily switch their antennas from Ku to Ka-band services and vice-versa.

Question: What's on the horizon for C-COM in the rest of 2017 and beyond?

Jonathan Lee: We will continue to increase our worldwide market share of the COTP systems by introducing our existing and yet to be deployed new products into new market segments. We also plan to release our Ka-band COTM antenna product, which should be certified for use on ViaSat and Eutelsat, providing the first such working antenna system to the commercial market place in North America and Europe. We will continue the development and testing of the revolutionary Ka-band intelligent phased array flat panel electronically steerable antenna system, and provide our customers with results of this progress as they materialize. All the new products we are developing for production in 2017 will provide our worldwide resellers network with a new opportunity to expand their product offerings and generate incremental sales in addition to the existing sat-on-pause products.
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Cobham radio signals new fire rules

Ensuring safety at sea is of paramount importance to keep crew, passengers and cargo safe in a remote environment. Amendments to SOLAS mean that all vessels must carry intrinsically-safe fire radios from July 2018. Stephan Jorgensen, Regional Sales Director, APAC, Cobham SATCOM explains why and how Cobham has anticipated the requirement.

The bursting into flames of the Zahro Express off Jakarta as 2017 dawned once more emphasised how negligence can descend into maritime tragedy in the blink of an eye. The resulting 23 fatalities brought prosecution for the overloaded ferry's master, as regulators once more sought to enforce basic requirements for the safety of life at sea in a local market.

For passengers in even the best regulated markets, fire is the threat to maritime safety that is most likely to induce panic. Properly trained crews of both passenger and cargo ships need to offer a quick and coordinated response to prevent the spread of fire, which makes an effective means of emergency communication vital.

Changing conventions
In 2012, the International Maritime Organisation (IMO) amended the SOLAS (Safety Of Life At Sea) Convention, making it obligatory for all vessels to carry a minimum of two intrinsically-safe firefighter radios per fire party. For tonnage built before 1 July 2014, these new requirements will come into effect from the first survey after 1 July 2018.

Although the IMO itself has not introduced any performance standards for firefighter radios, SOLAS Chapter II-2 Reg 10.10.4 stipulates that they ‘shall be on and explosion-proof type or intrinsically safe.’ This means these sets must be certified in accordance to relevant international standards, such as ATEX, for use in potentially explosive atmospheres. Tests carried out by an accredited laboratory to demonstrate it meets the maritime-specific EN60945 standard will validate the radio’s durability with respect to heat, vibration, rain and spray, corrosion and other harsh environmental conditions encountered on board a vessel.

When the worst happens
Cobham SATCOM recently became the first manufacturer to offer a ‘firefighter radio’ designed specifically to fulfil the requirements of the amended SOLAS regulations, says Stephan Jorgensen, Regional Sales Director, APAC, launching the SAILOR 3965 UHF Fire Fighter.

Ensuring effective communications
The preferred form of communication is radio. The trouble is that the vessel’s superstructure acts like a Faraday cage. The effect is further accentuated when fire doors and dampers have been activated and closed, thus reducing the propagation of radio signals.

UHF radios provide the best performance in such conditions. ITU specifies six frequencies in the range of 457 to 467MHz for maritime use. These, however, can be doubled by using 12.5KHz spacing instead of the more usual 25KHz.
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To avoid interference from other nearby vessels, for example in a port or close to shore, using a Continuous Tone Coded Squelch System (CTCSS) may be preferable. CTCSS is also necessary on larger tonnage where distributed antennas or leaky feeder antenna cables combined with radio repeaters are employed to ensure full coverage. Because distributed antennas typically operate on UHF, they can help extend indoor coverage into confined areas such as thruster compartments, the shaft tunnel and engine rooms.

"Ultimately it is the ship’s responsibility to demonstrate that radios are fit for purpose and able to function in the environmental conditions expected in a fire scenario and at sufficient range," says Jorgensen. "However, crew tackling fires at close range are likely to be wearing a firefighting outfit and breathing apparatus, which will significantly restrict their movements, making it difficult to operate intricate equipment."

The IMO Fire Safety Code is silent on design recommendations in this regard, which is why "Manufacturers need to take these usability constraints into account," says Jorgensen. "The radio should, for instance be designed for use with large gloves or when worn under a protective suit. Again, crew entering smoke-filled compartments to tackle a blaze may want to attach it to their breathing mask, while an incident commander may wish to affix it to a helmet headset.

Delivering new solutions
This is the context in which Cobham SATCOM has brought its new SAILOR 3965 UHF Fire Fighter radio designed specifically to fulfil the requirements of the amended SOLAS regulations to market – a safety appliance that is reckoned to be the first of its kind and the only one to meet the EN60945 standard for robustness.

While based on the same technological architecture as other SAILOR portable marine radios, the SAILOR 3965 UHF Fire Fighter incorporates specific features for use by firefighters, which will provide them with effective reliable two-way communication under extreme conditions. Operating on UHF, the SAILOR 3965 UHF Fire Fighter is compatible with other onboard radios tuned to the same frequencies, and CTCSS to avoid interference with other nearby vessels. It is also suitable for vessels using a more sophisticated communications arrangement with dedicated channels set up for, say, deck engineers or crane operators, or one involving repeaters.

Protected in a toughened IP67 grade housing (tested against water jets and immersion up to 1m), the SAILOR 3965 UHF Fire Fighter is red, to distinguish it from other onboard work radios (typically black) and from emergency GMDSS VHF radios (typically, yellow or orange). Showing consideration for usability in smoky environments and poor visibility, the handset is designed so that a change of channel is confirmed both visually on the integrated display and audibly. An ergonomic grip makes handling easier in wet conditions or when the user is wearing gloves.

Safeguarding lives
While vessels built since July 2014 have already implemented the IMO’s new fire-radio requirement, there are around 60,000 SOLAS vessels built before this date, which must comply from July 2018. In addition, non-SOLAS tonnage is expected to move towards the requirement on a voluntary basis. Over the next three years it is estimated manufacturers will be under pressure to supply more than 250,000 units.

To avoid falling foul of the regulation, and, moreover, to safeguard the lives of their crew and investment in their vessel, owners and operators would therefore be wise to act in good time to make sure they are properly equipped ahead of their first survey post July 2018.
The CASBAA Satellite Industry Forum in Singapore is a “Must Attend” diary date for the Asia Pacific satellite industry, especially in 2017.

As a sure-fire curtain raiser for the CommunicAsia show everybody (video and telco clients as well as suppliers) is in town, and so is CASBAA.

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As Asia continues down the path of digital transformation and its cities get increasingly connected, CommunicAsia and EnterpriseIT 2017 will add brand new feature zones to address the growing need for data security and the budding startup culture in the region. In addition, the event will also see a bigger augmented reality (AR) and virtual reality (VR) segment as the show grows to occupy the whole of Marina Bay Sands for the first time.

With the Cybersecurity Market Report predicting worldwide spending on cyber security to top US$1 trillion for the five-year period from 2017 to 2021, Asia seeing a record US$23.4 billion in startup funding in the second quarter of 2016, and worldwide revenues for the AR and VR market expected to reach US$162 billion in 2020, the new zones are timely additions to the event that will be held from 23 - 25 May 2017, at the Marina Bay Sands, Singapore.

Key trending technologies and network infrastructure that are the pillars of smart cities, businesses and lifestyles, such as borderless broadband, Internet of Things, cloud and data-centric solutions, satellite communications and enterprise mobility, will continue to be featured prominently at CommunicAsia and EnterpriseIT 2017.

"As cities and their populations become smarter and more connected, the amount of data they produce also increases. As reported by Cisco Systems’ latest Visual Networking Index, the Asia-Pacific region will drive 45 percent of the world’s mobile data traffic by 2020, and global IP traffic will increase nearly threefold over the next five years with the number of devices connected to IP networks exceeding three times the global population during this same period," said Victor Wong, Project Director for Communications Events at organiser UBM SES. "CommunicAsia and EnterpriseIT will provide first-hand access to the latest in constantly evolving technology and new disruptive innovations needed to ensure the sustainable growth of smart city ecosystems and the security of data that flows through them."

Innovations at CommunicAsia and EnterpriseIT 2017

Exhibiting at NXT@CommunicAsia - the event’s showcase of transformative technology, is CryptoGuard, a Swedish developer of content protection. The
company, which has experienced substantial growth in recent years, will be demonstrating its DRM platform and new OTT solution CryptoLITE as well as its proven advanced CAS platform.

“We are expanding our markets with a strong focus in Asia, and having recently established a sales and support office in New Delhi, India, exhibiting at CommunicAsia seemed inevitable in our progress,” said Hannu Vunnel, Marketing Director at CryptoGuard. “We are looking forward to further strengthening our position in the Asian market, and at CommunicAsia2017, CryptoGuard hopes to be recognised by major players as a leading innovator for content security.”

In today’s volatile business climate, there is a pressing need for digital transformation across vertical industries. The event puts a big focus on technology to enable smarter businesses, and allow visitors to learn about and source solutions that are aimed at improving efficiencies and revenue.

Also returning to CommunicAsia for the third time is Aarenet AG, which provides encrypted WebRTC audio and video conferencing in HD quality for telecom service providers. The company will be introducing its enhanced Cloud PBX solutions including a Cloud Contact Centre, and a host of other enhancements to existing products and services.

“Aarenet AG first exhibited at CommunicAsia2015, where we received great success in business development activities for our company,” said Bao Vo, Regional Director at Aarenet AG. “We strongly believe that CommunicAsia is the premier international trade show in the Asia-Pacific region due to its excellent infrastructure in Singapore, its modern facilities, and the fact that the event attracts patrons from almost all carriers and telecom service providers regionally. We are looking forward to exhibiting at CommunicAsia2017 and the new prospects it will bring.”

SatComm
SatComm, which boasts Asia’s largest gathering of more than 160 satellite communications companies, is another integral part of the event. Taking place on Level 1 of the Marina Bay Sands, SatComm will showcase satellite solutions that will enable upcoming technologies such as 4K and IoT to support smart city developments.

CommunicAsia2017 Summit
With the heightened pressure and push for seamless integration of technology, analytics and connectivity, the CommunicAsia2017 Summit is set to augment and ultimately revolutionise today’s entire ecosystem. Taking place throughout the event, the Summit will cover topics such as the Internet of Things, Security of Things, SmartCities, Digital Talent Analytics, and Broadband.

As usual, BroadcastAsia2017 will run alongside CommunicAsia2017, but at the refurbished Suntec Singapore. This change in location will allow both shows to grow and accommodate even more exhibitors and technology. Regular shuttle buses will be available to transport visitors to and from both shows.

Let us take a look at a selection of the satellite companies exhibiting at this year’s event.

ABS
ABS is a young and fast growing global satellite operator, with an entrepreneurial and creative business approach. Headquartered in Bermuda, ABS has offices in the United States, UAE, South Africa, Germany, Philippines, Indonesia and Hong Kong.

ABS is majority owned by the Permira funds which are advised by European Private Equity firm Permira. The Permira funds acquired ABS in 2010.

Led by a management team of talented and experienced professionals, ABS offers a complete range of end-to-end solutions including DirectTo Home (DTH), Cable TV distribution (CATV), cellular backhaul, VSAT and Internet backbone services with diverse IP transit through its European, Middle East and Asian internet gateways.

ABS operates a fleet of satellites serving 93 percent of the world.

ArianeSpace
ArianeSpace uses space to make life better on Earth by providing launch services for all types of satellites into all orbits. It has orbited more than 550 satellites since 1980, using its family of three launchers, Ariane, Soyuz and Vega, from launch sites in French Guiana (South America) and Baikonur, Kazakhstan. ArianeSpace is headquartered in Evry, near Paris, and has a technical facility at the Guiana Space Centre, Europe’s Spaceport in French Guiana, plus local offices in Washington, D.C., Tokyo and Singapore. ArianeSpace is a subsidiary of Airbus Safran Launchers, which holds 74 percent of its share capital, with the balance held by 17 other shareholders from the European launcher industry.

Advantech Wireless
Advantech Wireless delivers intelligent broadband communications solutions that achieve excellence, maximize performance and minimize operational costs, all with uncompromising quality. Ultimately, the company helps people stay connected and informed by designing and manufacturing the most advanced terrestrial and satellite communication technologies on the planet.

Advantech Wireless is the leading wireless broadband communications solution provider for commercial, critical infrastructure & government and military clients.

APT Satellite Company
APT Satellite Company Limited is a leading satellite operator in the Asia-Pacific region. APSTAR commenced its operations in 1992. The company currently owns and operates five in-orbit satellites: APSTAR-5, APSTAR-6, APSTAR-7, APSTAR-7B (partial), and APSTAR-9 satellites, covering regions in Asia, Europe, Africa, Australia and Pacific islands which contain approximately 75 percent of the world’s population.

Supported with comprehensive and high-quality services, the advanced APSTAR Satellite Fleet has become a very important satellite resource for the Asia-Pacific region. APT offers the services to a wide range of applications including video distribution, Direct-To-Home TV, cellular backhaul, corporate network, maritime and aeronautical mobility services.
Gas exploration, military communications, disaster management, SNG, emergency communications, cellular backhaul, telemedicine, mobile banking, and others. The company’s satellite-based products are known worldwide for their high quality, reliability and cost-effectiveness.

COMTECH EF DATA
Comtech EF Data Corp., a subsidiary of Comtech Telecommunications Corporation, is the recognized global leader in satellite bandwidth efficiency and link optimization. The advanced communication solutions encompass the Heights Networking Platform, advanced VSAT solutions, satellite modems, RAN & WAN optimization, network & bandwidth management and RF products. The company is recognized as a technology innovator, and has a reputation for exceptional product quality and reliability. The solutions enable commercial and government users to reduce OPEX/CAPEX and to increase throughput for fixed and mobile/transportable satellite-based applications.

COMTECH XICOM TECHNOLOGY
Comtech Xicom Technology has grown to be a world leading satellite communications (satcom) amplifier supplier, offering one of the broadest product lines in the industry. Its focus on customers, innovation, and quality has driven growth and created a company with a reputation for excellence. Regarded as an industry leader across the board, Xicom provides rugged, highly efficient and reliable 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. These Xicom High Power Amplifiers (HPAs) are in use in critical communications links on the ground, in the air and on the sea; they support fixed traditional and direct-to-home broadcast, mobile news gathering, transportable and flyaway systems, secure high data rate communications, and broadband access over satcom.

CPI ASC SIGNAL DIVISION
CPI ASC Signal Division (CPI Satcom) is a world leader in uplink amplifier products and systems for satellite communications. The company has played a pivotal role in the satcom industry since its inception. The first satellite projects, including Intelsat and CONUS, were supported by CPI, which was then part of Varian Associates, Inc.

Today, its scope and global reach is unmatched, having shipped over 40,000 high power amplifiers to uplink stations in over 150 countries. CPI Satcom products for satellite uplink and troposcatter applications are available in all standard frequencies, including:

- S-band;
- C-band;
- Ku-band;
- Ka-band;
- DBS-bands; and
- X-band.

CPI Satcom is uniquely equipped to be your one-stop HPA sub-system supplier for standard and emerging satcom applications.

AVL TECHNOLOGIES
AvL Technologies, Inc. is a privately held US company specializing in the design, development and production of mobile satellite antennas and positioner systems. With corporate headquarters based in Asheville, North Carolina, and a regional office located in the UK, AvL is able to offer superior service and support to customers around the world. AvL provides systems integrators with positioner and complete antenna system products, product development and services that maximize the technical and commercial benefits for their customers with cost, performance, quality and reliability requirements.

AvL provides solutions and support for satellite ground terminals for SNG, mobile broadband Internet access, disaster relief, oil & gas data backhaul, and defence & homeland security customers throughout the world. AvL offers the world’s largest range of satellite antennas for vehicle-mount, flyaway and fixed Earth station applications with sizes ranging from 60cm to 5.0M.

C-COM SATELLITE SYSTEMS
C-COM Satellite Systems Inc. is a leader in the development, manufacture and deployment of commercial grade mobile satellite-based technology for the delivery of two-way high-speed Internet, VoIP and video services into vehicles. C-COM has developed a number of proprietary mobile auto-deploying iNetVu® antennas that deliver broadband over satellite into vehicles while stationary virtually anywhere where one can drive. The iNetVu® mobile antennas have also been adapted to be airline checkable and easily transportable. More than 7,000 C-COM antennas have been deployed in 103 countries around the world in vertical markets such as oil & gas exploration, military communications, disaster management, SNG, emergency communications, cellular backhaul, telemedicine, mobile banking, and others. The company’s satellite-based products are known worldwide for their high quality, reliability and cost-effectiveness.

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CPI ASC SIGNAL DIVISION
CPI ASC Signal Division is a multinational manufacturer of high-performance, highly-engineered satellite Earth station, radar and HF antenna systems. Its customers include international broadcasters and Fortune 500 companies, as well as military and government organizations. It leads through design innovation that capitalizes on a more than 40-year heritage of engineering creativity and excellence.

At CPI ASC Signal, listening to customer’s needs is a quality that has been honed and perfected over more than 40 years as a global manufacturer of Satellite Earth Station, Air Traffic Control Radar Antenna and High Frequency Antenna products for broadcast, government, military and enterprise satellite communication applications.

CPI SATCOM
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GAZPROM SPACE SYSTEMS
Joint Stock Company Gazprom Space Systems – a daughter company of Gazprom, carries out space activities in the development and operation of telecommunications and geo information systems for the companies of Gazprom Group and other customers. Gazprom Space Systems has created, and now operates and develops the Yamal satellite communication and broadcasting system as well as designs aerospace monitoring system SMOTR, providing telecommunications and geo information services.

GILAT SATELLITE NETWORKS
Gilat Satellite Networks Ltd is a leading provider of end-to-end satellite-based broadband communication solutions. It specializes in fixed and on-the-move communications for commercial and government entities. Its offerings are specifically tuned to take advantage of high throughput satellites (HTS) as well as wide beam satellites.

Gilat develops innovative technology in five R&D centres to support a wide range of high-performance satellite ground segment VSAT equipment, and small-cells for an integrated cellular offering. Gilat also provides leading satellite-on-the-move communication terminals including antennas, solid-state power amplifiers (SSPAs), block up-converters (BUCs), transceivers, and modems.

The company primarily focuses on consumer broadband, enterprise, cellular, and mobility applications for the commercial, public safety and the defence sectors, and works closely in partnership with the satellite operators to bring extensive expertise for a range of turnkey projects.

INMARSAT
Inmarsat is the leading provider of global mobile satellite communications services. Since 1979, Inmarsat has been providing reliable voice and high-speed data communications to governments, enterprises and other organizations, with a range of services that can be used on land, at sea or in the air. Inmarsat operates in more than 60 locations around the world, with a presence in the major ports and centres of commerce on every continent.

As well as merchant shipping, customers include governments, airlines, the broadcast media, the oil and gas industry, mining, construction, and humanitarian aid agencies – to name just a few. Inmarsat’s customers connect to a fleet of 11 satellites using a range of equipment, including global handheld satellite phones and notebook-size broadband internet devices, as well as specialist terminals and antennas fitted to ships, aircraft and road vehicles.

INTELSAT
Intelsat operates the world’s first Globalized Network, powered by its leading satellite backbone, delivering high-quality, cost-effective video and broadband services anywhere in the world.

Intelsat’s Globalized Network combines the world’s largest satellite backbone with terrestrial infrastructure, managed services and an open, interoperable architecture to enable customers to drive revenue and reach through a new generation of network services. Thousands of organizations serving billions of people worldwide rely on Intelsat to provide ubiquitous broadband connectivity, multi-format video broadcasting, secure satellite communications and seamless mobility services.

INTEGRASYS S.A. is a privately-owned SME software development, engineering and integration company specialising in the telecommunication and broadcasting markets. It was founded in 1990 by a group of Hewlett-Packard engineers - developers of automated RF & microwave test systems and software, starting as a turnkey project company specialising in software developments for measurement automation in distributed environments.

Since then INTEGRASYS has evolved, offering a wide range of signal monitoring products for different telecom services.

JONSA
Jonsa is a leading global provider of stabilized satellite antennas. Built upon its patented RF, design structural oriented, stabilization and upstream and downstream process integrations of manufacturing, its products support a wide range of industries, including commercial, offshore, oceanic environment, defence, disaster rescued area and weather data analysis.

KNS
The world’s most advanced satellite antenna systems are the result of a deep commitment to providing its customers with robust and reliable solutions.

All systems designed by KNS are the result of multi-dimensional technologies combined with distinguishing performances, unmistakable industrial design, and above all, a great passion for building state-of-the-art equipment.

For almost two decades, KNS has been serving customers from all around the world with the highest quality products, customer-friendly service, and industry-leading technical support. Constantly challenged in the harshest environments, its products are used in mission-critical satellite applications providing a reliable means of communication for Voice and Data Services.

Today, KNS Inc., with its diversified product line-up and core competencies for customized solutions, as well as a global sales & service network, is one of the world’s leading manufacturers of satellite antenna systems and solutions, for commercial or military applications, and provider of satellite solutions and technical support.
L-3 NARDA-MITEQ
L-3 Narda-MITEQ has been serving the microwave/RF components and sub-systems markets for over 60 years. Under the world-renowned Narda brand name, its employees and field sales representatives take great pride in bringing the highest-quality catalogue and custom components to valued military and commercial end users.

MEASAT
MEASAT is a premium supplier of communication and video services to leading broadcasters, Direct-to-Home platforms and telecom operators across Asia and Africa. With capacity across six communication satellites, MEASAT provides services to over 150 countries representing 80 percent of the world’s population across Asia, Middle East, Africa, Europe and Australia.

ND SATCOM
With over three decades of experience, ND SatCom is the premier supplier of and integrator for innovative satellite communication equipment systems and solutions to support customers with critical operations anywhere in the world. Customers in more than 130 countries have chosen ND SatCom as a trusted and reliable source of high-quality and secure turnkey and custom system-engineered communication solutions. The company's products and solutions are used in more than 200 transnational networks in government, military, telecom and broadcast environments. ND SatCom’s flagship product, the SKYWAN platform, enables international users to communicate securely, effectively and quickly over satellite.

NEWTEC
For over 30 years Newtec has developed satellite communication equipment and technologies for broadcast, government and defense, IP trunking and consumer and enterprise VSAT. Its dedicated team meets industry standards with efficient, scalable and economical solutions. Through the company's expertise and in cooperation with its customers, Newtec makes the world a safer, more informed and connected place.

NORTHTelecom
Having high-quality managed network services from east to west, NorthTelecom is delivering leading edge satellite communication services and solutions to meet customer demand across the spectrum.

Present in 12 international points of presence and seven teleport operations as well as serving more than 100 partners globally, NorthTelecom is enabling your business to be reached worldwide, leveraging the most recent and updated ICT concepts to deliver most reliable and efficient services and solutions to key industries.

NorthTelecom's achievements are a far cry from its humble beginnings in September 2007. Headquartered in Dubai, within this short pro-active period, the company has grown steadily into one of the most outstanding networking and satellite services, Internet access solutions and broadcasting service providers globally.

NorthTelecom has global reach now with offices in Dubai, Germany and Singapore and having operation and teleports in South Korea, Singapore, Dubai, Greece, Spain, UK and Cyprus.

RSCC
The Russian Satellite Communication Company (RSCC) is the Russian state satellite operator whose spacecraft provide global coverage. RSCC belongs to the group of ten largest world satellite operators in terms of satellites and orbital slots and has more than 45 years of experience.

The company possesses the largest satellite constellation in Russia located in the geostationary orbital arc from 14 West to 145 East and covers the whole territory of Russia, the CIS, Europe, the Middle East, Africa, the Asia-Pacific region, North and South America, and Australia. RSCC includes five teleports - Satellite Communications Centres (SCC): Dubna, Bear Lakes, Skolkovo, Zheleznogorsk, Khabarovsk and the Shabolovka Technical Centre in Moscow as well as its own high-speed optical-fibre digital network.

SINGTEL SATELLITE
Singtel Satellite is Asia’s leading provider of one-stop satellite communications and ICT solutions, delivering award winning innovations to meet voice and digital challenges in fixed and mobile satellite segments on both land and at sea. With more than 35 years of collective experience in fixed and mobile satellite services, it can offer customised solutions to meet the varied business needs of industries such as oil and gas, broadcast, energy, maritime, telecommunications, banking and finance, transportation and logistics, government agencies and non-governmental organisations.

SPACEPATH
SpacePath Communications was founded in the UK in 2014 to design, manufacture and deliver satellite uplink amplifiers to a global customer base. Its portfolio includes indoor and outdoor travelling wave tube amplifiers (TWTAs) and solid state power amplifiers (SSPAs), using both GaAs and GAN technologies.

SPEEDCAST
SpeedCast International Limited is a leading global communications network service provider, offering high-quality managed network services in over 90 countries and a global maritime network serving customers worldwide. With a network of 40 sales and support offices around the world and 39 teleport operations, SpeedCast has a unique infrastructure to serve the requirements of customers globally. With over 5,000 links on land and at sea supporting mission critical applications, SpeedCast has distinguished itself with a strong operational expertise and a highly

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**SWEDISH MICROWAVE**
Swedish Microwave (SMW) is a leading manufacturer of professional Low Noise Blockdownconverters (LNB) for the satellite market.

The products are used in VSAT systems (Very Small Aperture Terminals), SNGs (Satellite News Gathering), cable-TV headends, marine VSAT, and satcom on-the-move applications.

All work is in-house allowing custom-design products, short delivery times, high flexibility, quick service and support. Swedish Microwave designs and manufactures its products in Motala, Sweden, and has shipped to more than 120 countries.

Since Swedish Microwave (SMW) started in 1986 the business has seen many companies come and go. Today it is one of Europe’s oldest manufacturers of Low Noise Block converters (LNB), serving a global market.

**TELEDYNE PARADISE DATACOM**
Teledyne Paradise Datacom, a Teledyne Technologies company, is focused on the design, manufacturing and sale of satellite modems, solid state power amplifiers (SSPA), low noise amplifiers (LNA), block up converters (BUC) and associated redundancy subsystems.

Paradise Datacom has delivered products and subsystems for use in satellite communications systems to an extensive list of customers located around the world.

**TERRASAT**
Terrasat Communications designs and manufactures innovative RF solutions for satellite communications systems. Terrasat Communications brings you the IBUC (Intelligent Block Upconverter) family of products for satellite ground terminals.

Selecting from both GaAs and GaN amplifier technologies, Terrasat engineering fine-tunes the design of each model for optimal packaging and price. Its superior GaN implementation yields the highest linear output power meaning our customers get the maximum usable power from their RF investment.

All IBUCs include a microprocessor used for both performance improvement and extensive management & control capabilities. Sensors placed throughout the IBUC provide information on conditions both within and external to the unit providing diagnostic tools for installation and trouble-shooting.

IBUCs come in all popular uplink bands from C-band through Ku, X, DBS and Ka-bands. Available options include an internal 10MHz reference and innovative transmit and receive redundancy switching systems.

**THAICOM**
The Company became a listed company on the Stock Exchange of Thailand on 18 January 1994, and is officially traded under the symbol THCOM. Since its establishment, the Company has expanded its business activities to include Internet and telephone services, and DTV satellite television dish sales. As of 31 December 2012, INTOUCH, which is the Company’s major shareholder, holds 41.14 percent of the Company’s shares. Thaicom has launched eight satellites, Thaicom’s 1, 2 and 3 (all deributed), Thaicom 4, (IPSTAR), Thaicom 5, 6, 7 and Thaicom 8 which was successfully launched at the end of May 2016. The company has also built high-quality satellite service facilities besides its main earth control station. This teleport and DTH center has been ISO9001:2000 certified since 2002. In addition, the Company also received an ISO 22301:2012 certificate for Business Continuity Management System (BCMS) in 2016. This recognition assures that the Company has an effective management plan to mitigate risk of potential business disruption.

At present, IPSTAR offers broadband and mobile backhaul services to operators and providers in 13 countries across Asia while its conventional satellites serve more than 700 TV channels.

**UHP NETWORKS**
UHP Networks is a market leader in high-availability HTS-ready VSAT equipment. The company provides complete network solutions, comprising VSAT Hubs, NMS and remotes. At the heart of the technology is Universal Hardware Platform (or UHP) processing module which can operate as a remote VSAT router or as a building block in a VSAT Hub system. The UHP module is uniquely versatile and compact. It also has industry-highest processing power. SCPC or MF-TDMA, Star, Mesh supported in a single device which consumes 9W, processes 450Mbps, initializes in 5 seconds. Hub scales up to support tens of thousands of remotes. UHP NMS operates with multiple networks, multiple VNO and multiple satellite beams with handover capability for mobile applications. Over 180 networks and 13,500 remotes installed worldwide, including Fortune 500 companies and leading satellite operators.

**VIKING SATCOM**
Viking Satcom is at the forefront of innovation and technology and a leader in the commercial satellite antenna industry. It offers a wide selection of satellite communication products ranging from antennas to their related RF components.

The Viking team has years of experience both in the industry and in the field to bring you the highest level of product knowledge and customer service available.

**VT iDIRECT**
VT iDirect® is a global leader in IP-based satellite communications. The company provides technology and solutions to enable service providers and satellite operator partners to optimize their networks, differentiate their services and profitably expand their business.

For more than 20 years, the VT iDirect organization has focused on meeting the economic and technology challenges across the satellite industry. Today, the product portfolio, branded under the name iDirect, sets new standards in performance and efficiency, making it possible to deliver voice, video and data connectivity anywhere in the world.

VT iDirect’s parent company, Vision Technologies Systems, Inc. (VT Systems) and its subsidiaries are providers of engineering solutions, products and integrated systems and services. VT Systems is a wholly-owned subsidiary of Singapore Technologies Engineering Ltd (ST Engineering).
GVF

GVF serves as the unified voice of the international satellite industry

www.gvf.org
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MISSION TO SUCCESS

Arianespace stood alone in 2016 as the one launch services company that satellite operators could depend upon. Launch system reliability and availability, coupled with a business culture of transparency, proved to be an unbeatable combination. Now able to leverage greater industrial efficiencies and a new corporate governance, Arianespace is poised to use its family of vehicles to continue to serve its customer base with as many as 12 launches in 2017.