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Military Force Deployment in the Maritime Space: Naval Communications in Non-Conflict Situations

by Martin Jarrold
Director, International Programs, GVF

In a previous column I referred to the operational deployment of naval and naval auxiliary forces in "non-conflict" roles and within "non-conflict" environments – across multiple and varied geographic theatres – particularly during times, and against a general backdrop, of "international peace."

Specifically, such deployments include fisheries and oil/gas installation protection; human trafficking and narcotics trade interdiction in home waters; international sea lanes security; emergency food aid distribution in drought/famine-struck regions; and, similar types of task for which naval resources are particularly suited. It is in the context of such deployments that, once again, the fundamentally mission critical role of satellite-based communications – as characterized by some of its most crucial features of flexibility, reliability, rapidity of deployment, footprint ubiquity, and cost-effectiveness – becomes evidently clear.

"International peace". What? When? OK, so, as has been pointed out to me, we have never really had that. But, I am nevertheless drawing a distinction between instances

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The Other VSATs

by Bruce Elbert
President, Application Technology Strategy

Much attention is being paid to consumer broadband service via satellite as this has the potential to match the US penetration of DTH TV and Satellite Radio (DARS). However, there is still a very substantial ongoing business using various types of VSATs to serve commercial and government needs in developed and developing regions of the world. After all, satellite communications is the best alternative if modern terrestrial infrastructure is not available.

There is a substantial ongoing business using various types of VSATs to serve commercial and government needs in the developing regions of the world.

We address several factors that are making this form of communications more readily available at acceptable costs in regions such as Asia-Pacific, the Middle East and North Africa, and South America. As described below, these factors include: the coverage ability of the new generation of GEO satellites at C, Ku and Ka bands; the remarkable new performance and features of the VSAT terminals for fixed, transportable and mobile installation; and the array of service providers who have invested in hubs and support organizations in these regions. The resulting mix of capabilities and applications are giving broadband satellite links a new lease on life, moving them into the mind-space of telecommunications professionals worldwide.

For the purpose of this article, we define broadband satellite service as one capable of at least 1 Mbps data rate on the forward and

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A Tale of Two Shows

The year started with two important shows that the satellite industry are watching more closely this year. The first one started the very first week of January in Las Vegas, the Consumer Electronics Show, which showcased the latest gizmos like 3D television and mobile technology, which many believe will be driving demand for satellite bandwidth and services in this new decade. The other show came a week later in Hawaii.T he Pacific Telecommunications Council (PTC) conference focused on "Cloud Computing" and naturally, the participants from the satellite industry were keen to know what's in it for satellites.

Those who attended the CES were convinced that bandwidth demands will just continue to grow, but were adopting a wait-and-see attitude on 3D. The convergence of the computer and TV is still has a ways to go. The devices demonstrated at the CES that let you watch videos stored in computers on a large screen, left much to be desired.

View a video interveew with Viasat's Mark Dankberg and other executives at PTC at: www.satellitemarkets.com/current

At the PTC, the recurring theme was bandwidth and lots of it, but delivered at a reasonable cost. Lou Zacharilla of the SSPI, wrote an interesting take on the satellite sessions at the PTC and Viasat's Mark Dankberg's optimistic view on the future of satellite technology (see page 10).

If even half of the projected increase in bandwidth demand in the new decade actually materializes, the satellite industry should be in good shape. Provided that is, that it continues to be on top of customers' requirements and be creative in meeting those demands. Being creative means being open to various options and hybrid solutions. That's why you'll probably see more and more satellite professionals at the CES and PTC in the future as the industry forges closer relationships with the consumer electronics and IT sectors.

Virgil Labrador

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return links. The general trend is to offer asymmetrical bandwidth, with the forward link providing download speeds up to 10 Mbps and the return link upload rate at the lower end of the range. Pricing is dictated by these data rates, and generally speaking, you pay in proportion to data rate.

Satellite Coverage

It would seem that 250 GEO satellites would be enough to blanket the earth with broadband capacity, but the devil is very much in the details. Leading satellite operators Intelsat, SES, Eutelsat and SkyPerfect JSAT Corp (SJC) provide appropriate satellite capacity at C and Ku-bands with coverage of all regions of the world. There are also regional and national operators who likewise serve VSAT markets: Telesat Canada, Satmex, Arabsat, Asiasat, Thaicom and Measat are good examples. Owing to the higher power and flexibility benefits, Ku-band is preferred by VSAT service providers and users. It is not surprising that the vast majority of VSATs, as many as one million throughout the world, employ Ku-band. However, the domain of Ku-band coverage is generally limited to the land mass of developed regions of the world and as a result C-band becomes the common denominator. Operating at lower power and with restrictions due to sharing of this band with terrestrial microwave systems, C-band VSATs employ large dishes that may depend on local RF shielding. As users of satellites know, C-band may be preferred for service in tropical regions due to substantially less rain attenuation.

Selection of the best satellite often involves a review of several different options in terms of satellite operator and specific satellites. This is where the process of systems engineering comes into play: defining the requirements of the link in terms of locations to be served, bit rate, service quality, transmission system (modulation and forward error correction), terminal constraints (maximum antenna size and transmitter power), and special requirements such as encryption and network management. Satellite effective radiated power (EIRP) and receive sensitivity (G/T) have not changed substantially in the past 10 years. A combination of factors contributes to this, such as the importance of limiting adjacent satellite interference and maintaining a cost/effective service. In the latter regard, the monthly charge for a 36 MHz Ku-band transponder has hovered around US$150,000 for nearly 20 years. In the presence of inflation, the real cost per MHz has declined substantially.

Recent developments in the satellite field primarily involve Ku-band satellites with coverage of new areas. For example, Sky Perfect JSAT (SPJ) just launched JCSAT 85 in partnership with Intelsat, a Ku-band satellite that provides an overlay of the

Indian Ocean region. SPJ provides some VSAT services exclusively within Japan on JCSAT-2A and Superbird-B2. Regional networks from SJC in this hemisphere were all C-band yet many customers employ VSATs in Asia/ Oceania (Australia, Malaysia, Singapore, Laos, Vietnam, etc.) on JCSAT-2A and JCSAT-3A.

Likewise, YahSat will be operating a new satellite with Ka-band capacity. Mubadala Development of the UAE is investing heavily in the space and ground segments and will introduce their YahClick Ka-band VSAT service around 2011. Their intention is to serve government military, civil and commercial broadband users in the Middle East. They have chosen the ViaSat Surfbeam technology and expect to apply it across the board. What is perhaps unique about the YahSat business model is that they will offer Ka-band transponder capacity to the regional market.

VSAT Technology and Services

The "other VSAT" in this article is actually not the VSAT that you see attached to someone's home or on the typical gasoline station. The technology has been totally revamped and now benefits from innovations in SSPA technology, DVB-S2 functionality, and dynamic networking. Taken together, these improvements increase the effective data rate for the same dish diameter, and provide protection from heavy rain and interference. I believe we are seeing a divergence between the consumer market focus on low cost Internet access and the industrial/international market demand for reliable broadband Intranet services to extend the corporate backbone to previously-underserved locations.

The largest operator in the region, SkyPerfect JSAT, serves many customers that own their own networks composed of VSAT equipment from HNS, Gilat, Viasat, and iDirect. (photo courtesy of Sky Perfect TV)

A common denominator is what had been called the "private network", meaning a telecommunications network for use within one organization and separate from public networks. This morphed into the "virtual private network" (VPN), made popular first by Sprint for corporate telephone networks and more recently by Cisco for secure IP networking over the public Internet. A private network using satellite communications has the unique feature of true independence and dedication to one set of users and possibly even one application. VSATs always played well here but were the domain of big corporations with lots of locations to serve and lots of money to dedicate to resources. A large part of this was the hub station which cost in the millions of dollars. This hurdle has been removed by low-cost hub solutions from iDirect and ND SatCom.

We want to give special consideration to the Asia-Pacific region where we find nearly half of the world's population and which has a heavy dependence on VSAT technology. Satellite links are vital to remote islands of the Pacific and in Southeast Asia. One only has to remember how the loss of one satellite or one fiber optic cable impacted heavily on basic services. Established operators like AsiaSat, Thaicom and Measat support a variety of VSAT service providers. Thaicom, in particular, has committed substantial resources to IPStar and its VSAT services, an innovative program that extends well beyond Thailand.

The largest operator in the region, SkyPerfect JSAT (SPJ), serves many customers that own their own networks composed of VSAT equipment from HNS, Gilat, Viasat, and iDirect. An important application for the VSATs is the earthquake warning satellite delivery service in Japan, called "Safety BIRD". Once the earthquake occurs, the alarm signal will be broadcasted instantly through the satellite and the operations of important infrastructure (elevators, trains, and power plants) will be stopped automatically in order to prevent them from malfunctioning. SPJ sees opportunity in the utilization of these VSATs for petroleum and mining in the Pacific/Oceania region. As the result of their focus on Indonesia, they will launch JSAT-13 in 2013 to be provided with an Indonesia Ku beam and a steerable beam targeting DTH and VSAT demand.

Prospects

We've only scratched the surface on the current state of affairs for what I call the other VSATs. Whether we are talking about Asia-Pacific or any of the other comparable regions of the globe, we find numerable places and needs best served by the providers of this technology. Greater use of Ku and ultimately Ka-band help to reduce the size of dishes and simplify installation at fixed locations as well as on vehicles, ships and aircraft. This market is likely to grow at better than average for the industry, as these benefits are better understood and as the service providers expand the footprint in terms of satellite coverage, hub availability, and end-user service and support.

Bruce Elbert has over 30 years of experience in satellite communications and is the President of Application Technology Strategy, Inc., which assists satellite operators, network providers and users in the public and private sectors. He is an author and educator in these fields, having produced seven titles and conducted technical and business training around the world. During 25 years with Hughes Electronics, he directed major technical projects and led business activities in the U.S. and overseas. He is the author of The Satellite Communication Applications Handbook, second edition (Artech House, 2004). Web site: www.applicationstrategy.com Email: bruce@applicationstrategy.com

News Analysis

The Satellite Industry Responds to the Haiti Relief Efforts

by Virgil Labrador, Editor-in-Chief

The satellite industry's response to the catastrophic 7.0 magnitude earthquake last January 12 in Haiti that claimed over 200,000 lives was swift and decisive. Within hours of the earthquake, satellite operator Intelsat established two communication networks—one in C-band and one in Ku-band—to provide critical communication links.

Many companies donated equipment, services or satellite capacity to assist in the relief efforts. Among them were SES World Skies which donated capacity on five of their satellites as well access to teleport facilities. CapRock Government Services provided end-to-end communications support to the US. Marine Corps, while Spacenet set-up a Rapid Resonse Team to support units deployed in Haiti.

Images like this from Geoeye and Digital Globe provided damage assessment, route planning and other crucial aspects of relief efforts in Haiti. (satellite image from Geoeye).

Inmarsat's BGAN service was made available to US government crews and non-profits working in Haiti such as Telecom Sans Frontieres. GlobeCast set-up a broadcast facility in neighboring Dominican Republic to facilite coverage of the disaster. Nearly all the major satellite companies including Echostar, Vizada, Eutelsat, Telenor and many others provided crucial support to the relief efforts.

Satellite technology plays an important role in disaster recovery, especially during the first stages after a catastrophic event when terrestrial and other infrastructure are down. Often satellites are the only link to the outside world in the disaster areas. This was proven time and again in recent disasters such as the Tsunami in Asia a few years ago, and as in Haiti, the satellite industry responded well to that too.

"Natural disasters can leave countries feeling helpless when traditional communication infrastructure fails. The loss of contact with the outside world impedes obtaining the critical aid that is needed in the aftermath. Satellite communications is often the first communications technology to provide restoration following unfortunate events such as the Haitian earthquake," said Jay Yass, Intelsat's Vice President, Network Services.

However, just as the vital role of satellite technology come into focus during disasters, they can also show its limitations. Satellite technology as a communication medium can effectively coordinate relief activities to ensure that help is provided where it is needed most, when it is needed. But as we painfully saw in Haiti, even with the right communication equipment, relief efforts can be uncoordinated and some crucial supplies do not reach their intended recipients. Satellite technology, like any technology is just a medium, they are operated by humans who sometimes have different agendas or are just inherently inefficient.

The other limitation lies in the satellite industry itself. The outpouring of support among satellite companies, while most admirable, were largely *ad hoc* and not coordinated on an industry-level.

There should be international bodies that prepare and anticipate such disasters even before they occur and have the ability to mobilize resources from satellite companies at a moment's notice, instead of the individual efforts by companies that we have seen in the last few weeks. I'm sure if there were such a coordinating body, it would have mobilized a lot more support from the industry and maximized resources so that those that need it most, get it in time.

There has not been a lack of effort on the part of the industry. The GVF for example, has had a program educating its members and the public on appropriate responses to disasters, as does the Satellite Industry Association. What is need is to take these efforts to the next level and have a dedicated group whose sole task is to coordinate industry efforts during emergencies and other catastrophic events.

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where naval forces are engaged in state actor-versus-state actor situations (a.k.a. wars), and other instances where the nature of force deployment is prompted neither by aggressive intent, nor, primarily, by an imperative defensive preparation. The "soft" engagement of naval resources is one way to describe it, though this should not be taken to mean easy or imply the absence of potential dangers.

It is in the context of such "soft" deployments that international, and cross-sector/inter-agency, communications at sea which encompass the networking technologies and capabilities of various national naval forces – that are deployed in addition to air-sea rescue services, border protection patrols, coast guard, police forces, civilian rescue organizations, the commercial maritime sector, and the authorities governing marine navigational safety and vessel identification in coastal and international waters – are illustrated to be just as much of an essential support to all types of joint operation (see above, paragraph 1), as to times of actual conflict in the state actor-versus-state actor mould.

In this, and in the next following column, I want to look at three facets of this networking communications environment. Here I will characterize Network Enabled Capabilities and communications system resilience now and in the future; next time I will deal with the application of ICT solutions to the fields of Complex Humanitarian Disasters/Complex Humanitarian Emergencies (as defined by the UN and other international organizations); and, their role in enhancing Maritime Domain Awareness/Maritime Domain Protection. Unsurprisingly, Network Enabled Capabilities focuses on the 'network' and on a core of communications network interoperability. Unfortunately, it is exactly during times and within theatres

of actual conflict that we are often forced to realize the lack of interoperability that can maintain between the communications systems of the different arms of the military of a single nation, let alone the militaries of different nations. And yet, what is required, what is needed, for the types of situation under discussion here is a degree of network integrity and resilience that spans not only different militaries, but also a non-military, and a multi-agency, environment.

Beyond even this, what is required are Network Enabled Capabilities that are robust enough to survive extremely challenging environments. For example, naval vessels and civilian ships, deployed to deal with such widespread disasters as exemplified in the Indian Ocean tsunami, would be spread over a large geographic region. In sharing the same satellite capacity, but connecting at varying transmission rates as dictated by local conditions – for example, atmospheric interference – these ships must communicate within the network without negatively affecting the communications functionality of the other vessels in the same network. Put another way, a single ship experiencing tropical latitude rain-fade must not bring down the data rate of other sites on the same satellite segment. It must clearly be recognized that there are readily available satellite technologies that overcome this problem and maximize network functionality.

The most effective networks in these types of situation are mobile networks. COTM/SOTM – or Communications on the Move/Satellite on the Move – will increasingly become a functional imperative for naval, auxiliary, and multi-agency force deployments, where operations must extend deeper into a territory than its coastal waters, perhaps a significant distance into its interior. Seaborne communication can be greatly enhanced by extension to the land interior using cutting-edge versions of platforms designed for the simultaneous transfer of voice, video and data traffic, for example, by using DVB-S2 over the newest Time Division Multiple Access (TDMA) technologies.

Underpinning the practical effectiveness of the inter-relationship of military and non-military maritime forces is the core resource of the collective naval communications asset base, which at any one time is the result of the *ad hoc* tactical, and long-term strategic, merging of communications infrastructures that are products of domestically-orientated defence concerns and the vagaries of changing government budgetary policy considerations. This asset core is itself determined by quality of service configurations or profiles which at the outset must be designed to ensure that (a) when required, all remotes within a deployed naval network have access to an aggregate of an absolute minimum amount of bandwidth as well as a share of unused bandwidth; and (b) when required, specific sites have their traffic prioritized to facilitate, for example, guaranteed performance of real-time services, such as voice over IP.

Then, over and above this, the satellite technologies used in maritime contexts must inter-relate with, and complement, other wireless technologies such as WiFi and WiMax. There are precedent examples for this particular aspect of interoperability in other "vertical market" contexts, for example, in the exploration and production segment of the oil and gas industry.

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Has the Satellite "Reformation" Been Launched?

by Lou Zacharilla
Director of Development, SSPI

Not even the most senior satellite industry executive remembers the Reformation. If they did it would mean that they have been drawing a Social Security pension for at least 428 years!

It was October 1517 when a fellow named Martin Luther shook the foundations of the established order of Europe with a list of 95 recommendations for improving the system then in fashion. As we learned in school, he promptly tacked his ideas (called "theses") to a church door in Saxony and, open-minded soul that he was, invited experts to debate him. In those days church doors were the blogs of Germany. However a newer technology had recently emerged which had really begun to disrupt things. It was called the printing press. Using the new technology, he soon gained more supporters than anyone thought possible. Of course, because he had new ideas and was using new technology to spread them, it was immediately perceived as a threat to the established order.

At the PTC 2010 in Hawaii earlier this month more game-changing ideas were put forward than at any other time in a satellite industry forum.

As we know all too well, challenging the established order is never as easy as a walk on the beach in Honolulu. The great reformer was put on trial and exiled. But there was a happy ending. Within a relatively short time he emerged to discover that many of his ideas had been accepted. The rest, as they say, is history. The "Reformation" that he is credited with launching changed the politics, economy and the way millions of people viewed the world. It persists to this day.

Let us now fast-forward five centuries to Honolulu, where on January 17, 2010 another "reformation" was launched during the annual Satellite Industry Workshop, produced by SSPI and WTA. In truth it had been launched long before, but for the sake of industry history let us say that during a three-hour series of special presentations and panels titled "Integrating Satellite Services into the 'Cloud,'" more game-changing ideas were put forward than at any other time in an industry forum. This one revealed an industry that is being re-energized.

The equivalent of the satellite industry's "95 theses" was presented on a Powerpoint projector this time by someone referred to as the industry's "Martin Luther." That would be the man with the 100 Gbps satellite (actually 140 Gbps) and a vision with even more capacity: Mark Dankberg, ViaSat's Chairman and CEO. Mark led the day with a Keynote that yet again laid it out in plain, simple and stark terms. ViaSat-1 is not a gamble. It is the start of a high-capacity model for satellite service which revolves around one simple idea: that the modern economy will increasingly rely as much on the consumption of bandwidth as it does on the consumption of petroleum. To fuel the "knowledge economy," and to remain relevant to consumers, low-cost bandwidth from Ka-band satellites must become available. They need to be put into retail service and become as commonplace to the market's buying habits as DSL.

Says the heretic Dankberg, a member of the Rice University Engineering Hall of Fame who actually has done his homework all the way on this, “So far so good.” The ViaSat-1 payload and bus modules have been integrated and system testing has begun. The launch date remains early 2011, and the company’s recent acquisition of WildBlue brings 400,000 customers into the fold. This will bring the improvements of the new Ka-band technology to over one million new consumers of broadband in time.

ViaSat-1 turns the entire paradigm of satellite, and the most corrosive bias against the industry, if not sideways or on its head, certainly into a more inclined position than ever before. It may be the third most significant development in the history of satellite operations, followed only by the launches of Sputnik (1957) and Rene Anselmo’s PanAmSat (1982). ViaSat’s CEO, unlike Martin Luther, will not be exiled irrespective of the outcome, and the company is far too modest and accomplished at this stage in its history to adopt PanAmSat’s original motto, which was *Truth and Technology Will Triumph over Bullshit and Bureaucracy*. However he may start a Ka-band race to space, however, in which ViaSat will have a huge lead.

After his case was made, Mr. Dankberg was followed by a new member of the satellite family, Cisco. Greg Pelton of Cisco joined iDirect and Hughes to discuss “routers in space versus routers at the teleport.” The IRIS project with Intelsat may be another game-changer, as more “brains” go up where there once merely a bent pipe went round and round. Gary Hatch (ATCi’s founder) and Alan Young next participated on a panel which rolled out more ideas than you could capture. Hatch, a recipient of an SSPI Innovator’s award accurately noted that with IP addresses and much information flowing through teleports, designing value-added services was simply a matter of performing analytics of the buying habits and creatively bringing tendencies, eyeballs and click-throughs to advertisers eager to figure out a way to re-establish relationships with consumers. Young, the CTO of SES World Skies, again dazzled with a report of discussions with media companies and his own studied view of how satellite will continue to look “cheap” as the number of eyeballs grow. “We have a natural advantage when the numbers scale,” he said.

Globecomm Systems and its Network Engineering Vice President Steve Spreizer then offered not merely an idea of how content distribution and IP would be the building blocks for the new “media processing center,” he went on to show how the company had built the world’s first for Bharti Airtel. *Any content on any device at any time* was the unwritten motto.

The day concluded and poetically came back around to “The Reformation” and the reformer who led it off when Glenn Katz, the COO of Spacenet, and his panel discussed the demands on bandwidth for a range of verticals.

As the words “bandwidth” and “capacity concerns” popped-up continuously throughout the Workshop. ViaSat’s founder did not smile whenever he heard his premise reinforced, but with a satellite that will have more capacity than any bird in the sky, and a global marketplace in need of access and the ability to watch more and more YouTube and other video (which according to Alan Young is responsible for 27% of all traffic on the Internet and growing) the man most responsible for the satellite reformation had to be looking ahead hopefully to 2011.

Lou Zacharilla is the Director of Development of the Society of Satellite Professionals International (SSPI). He can be reached at lzacharilla@sspi.org

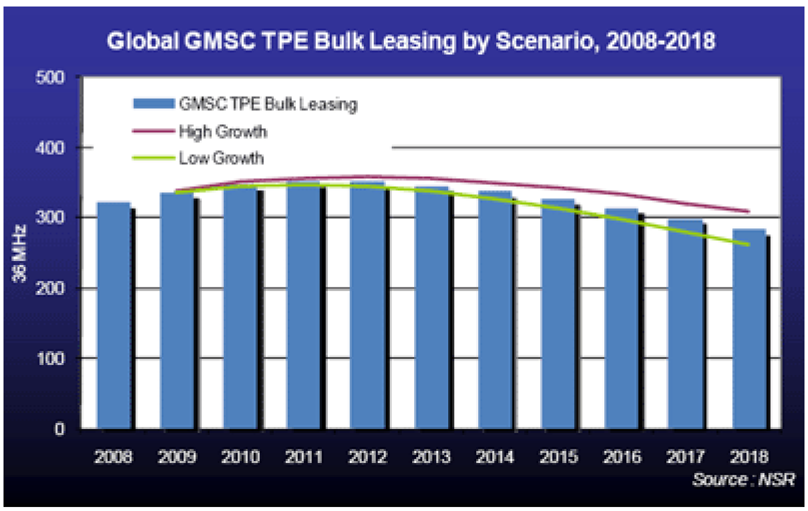
MarketCast

To view a video of a comprehensive interview with Viasat CEO Mark Dankberg and other key satellite executives conducted at the PTC 2010 in Hawaii, go to: www.satellitemarkets.com/current

Is Growing Government Capacity Demand Driving Down Commercial Leases?

by NSR

Recent news items from around the world give a strong indication as to the path that governments will follow in procuring satellite capacity in the coming years. The issue at hand is finding an answer to the ever increasing demand for bandwidth, and the solutions lies either with commercial satellites or a growing number of government-owned platforms. This means the impact on commercial operators' revenues for government bulk leasing is at risk of declining, and here is why:



First, in late 2009, President Evo Morales of Bolivia traveled to Geneva to meet the International Telecommunications Union in Geneva to secure an orbital slot for a satellite over his country. To conclude his trip, he met representatives from China to discuss purchasing a $300 million satellite that will be named after a Bolivian indigenous leader who fought against Spanish colonial rule. This strong signal of independence from a South American government in dealing with its own needs for communications is nothing new in the space business, but it is adding a new and dynamic competition parameter in the business for commercial satcom in emerging markets. The delegation from Bolivia expects to sign on the dotted line during an upcoming trip to China to seal the deal and see the start of construction of their first national satellite.

Also late last year, an emerging power in Asia has started a procurement process to keep an orbital slot but also to get more capacity since its first satellite is already 70% full. Vietnam's Vinasat-2 project was kicked off in the spring of 2009 and has been accelerated recently when the capacity of Vinasat-1 was found to be used faster than expected. The government of Vietnam said that the entire capacity of Vinasat-1 could be well be used up this year, so it is urgently working on a follow-on bird to be launched at the earliest in 2012. Costing over $300 million and funded entirely by the Vietnam Post and Telecommunication Group's (VNPT), Vinasat-2 will bridge a gap for data and broadcast customers in government and private industry (oil and gas notably). Vinasat-2 will cover Vietnam, Laos, Cambodia, Thailand and part of Myanmar and will have up to fifty percent more transponders than its predecessor. Until it is launched, VNPT will sign short-term contracts with regional satellite companies, which will give a reprieve to commercial operators in Asia.

Lastly, early in the New Year, it was reported that Astrium Services signed a small contract from the European Defence Agency (EDA) to pool the demand for commercial satellite capacity from European Union members in order to offer economies of scale compared to today's spot market rates they are paying. Much like the United States Government did with the Future Commercial Satellite Acquisition (FCSA) by consolidating the DSTS-G, Inmarsat and SATCOM II Program managed by two agencies, the EDA hopes to pass on savings to governments of up to fifty percent from today's capacity prices.

The exercise, if put in place successfully, could reduce revenues for satellite operators starting as early as next year as demand is aggregated and results in reduced leases of bandwidth.

So with government-owned spacecraft bringing more competition in the field and aggregation of demand savings on what are perceived to be high-costs transponders, it is quite likely that operators of commercial satellites will have to deal with some reduced revenues from government leasing contracts. These initiatives are likely to be repeated as Nigeria, Venezuela and other countries such as Kazakhstan purchase more satellites.

Plus, the steady stream of military satellites lifting off is likely to continue adding capacity that is not sold on the commercial market. The latest launch contract announced for the fourth Wideband Global System (WGS) spacecraft, WGS-4 slated to enter service in early 2012, is another step in the direction of deploying publicly-financed and operated satellites that compete head-on with privately-funded ones. And these satellites are not used for just one application but for myriad of needs that range from maps for soldiers to two-way data and video from UAVs, voice calls, messaging, and even television broadcasts and e mail for troops on the ground. Late last year, the French government's €35 billion "Grand Emprunt" (large national loan) was reported to be the likely source of financing to accelerate the joint military Ka-band Athena-Fidus project with Italy. This is to supplement the capabilities recently orbited on the French Syracuse-3 and the Italian Sicral-2 satellites, which are already providing much needed bandwidth for these two countries and other friendly nations.

As these large government customers continue to increase their demand for reachback capabilities and communications to and from headquarters to theatres of operations and remote locations, government and military users continue to have requirements for solutions that give them security they need at the lowest possible risk (and cost) for their users on the ground while at the same time balancing budgets. The solution is obviously a sophisticated hedging plan that includes proprietary capacity and commercially-operated bandwidth leases. But while planning for the next twelve or fifteen years (which is the usual life of a satellite), these customers are seeing the gap growing and as such, realize that these needs will require internal capacity to be deployed at a faster rate. NSR believes that while there will certainly be a lot of commercial capacity aimed at government and military users in the next decade, much more supply of satellites funded and operated by government and military entities will be put into operation.

The number of proprietary government-owned satellites under construction or currently in-orbit will offer a minimum (and likely much more) of about 15 Gbps of throughput. This is a significant increase, and it means that some contracts using commercial capacity will go away over the medium-term, as users are taking up internal asset services. In the U.S. alone, some reports indicate that as much as two-thirds of the capacity currently on commercial satellites could be migrated to systems such as WGS. Finally, even if tangible benefits will be realized in the short-term in the bulk leasing market from sending more personnel and troops to Afghanistan, the announced downsizing of these contingents will impact the market negatively starting in 2012.

The Bottom Line

More internal (i.e. government-owned) transponders launched mean a migration of users away from commercial bandwidth. Nonetheless, given the restructuration of large cancelled programs and troops' deployment in the Middle-East, a reprieve of a few yeas in the bulk leasing market is expected until about 2012, when all systems under construction are launched and aggregation of demand accelerates.

Information for this article was extracted from the NSR report entitled: **Government & Military Satellite Communications, 6th Edition**

Brazil Accounted for 50% of Latin American Satellite Demand in 2009

Signals Telecom Consulting published the 3rd edition of its report entitled: "Latin American Market for Satellite Capacity." Statistical information contained in the report includes, among other variables, forecasts on the availability of satellite capacity, growth in service revenue and the development of prices.

The report indicates that Brazil accounts for around 50% of the demand for satellite capacity in the region. "In addition to its large broadcasting industry, there has been phenomenal growth in the number of Pay TV subscribers, boosted by the country's largest telecoms operators, who have chosen DTH as their mass market option.

"Brazil is another major source of demand for satellite capacity, mainly as a result of its social connectivity programs and government networks for various purposes. Although the country's available capacity is close to the limit, Signals considers that adequate capacity will be guaranteed following the announcement of new launches and the repositioning of existing units," declared Carlos Blanco, Market Research Director for Signals Telecom Consulting and author of the report.

Satellite Pay-TV Subscribers Reach 131 Million Worldwide

Euroconsult announced that growth in the satellite pay-TV market remained strong in 2009 despite the global economic downturn. According to the just released 4th edition of "**Satellite TV Platforms, World Survey & Prospects to 2019**, ***Growth through the Crisis"***, the number of **TV Platforms** in service increased to 113 in 2009 (+38% in three years). Pay TV platforms combined currently reach **131 million subscribers** and earned **$70 billion** revenues in 2009.

"Subscriber growth in the satellite pay-TV market has been robust, increasing 15% worldwide," indicated Pacôme Revillon, CEO of Euroconsult. "Growth in emerging digital markets has been particularly strong with subscribers reaching the 60 million mark in 2009, a nearly five-fold increase over the previous few years" he added. "Looking forward, the market is expected to remain bright with Euroconsult forecasting roughly 235 million subscribers worldwide by 2019."

Nearly all markets, with the exception of Europe, saw revenue growth in local currency last year. However, more aggressive pricing strategies, both due to the crisis and to more intense competition, weighed down the average revenue per subscriber (ARPU), resulting in revenues growing more modestly than subscribers. While the aggressive pricing strategy currently practiced by many platforms drives subscriptions more than revenues in the short term, fee increases — which are very likely over time — should help securing long term revenue growth. This commonly-used strategy enabled platforms like Russia's Tricolor TV to sign close to three million subscribers in only three years of operation with a basic package at around one dollar per month. Meanwhile, its rival NTV+ is still striving to reach the one million subscriber mark after more than a decade.

Emerging Digital Markets

Emerging digital markets have experienced tremendous growth in the past few years. According to Euroconsult, the number of platforms in emerging digital markets reached 88 in 2009, up from only 30 in 2000. Subscribers in these markets grew from 11.9 million to nearly 60 million from 2003 to 2009. In India alone, there were 19 million subscribers spread over six platforms in 2009, despite a slow start in 2003/2004. The adjustment of subscription fees to compete more effectively with analog cable TV is partially responsible for stimulating subscriptions. Similarly, subscriptions in Central and Eastern Europe, at only 2 million in 2005 rose to 15.9 million in 2009, according to the Euroconsult report.

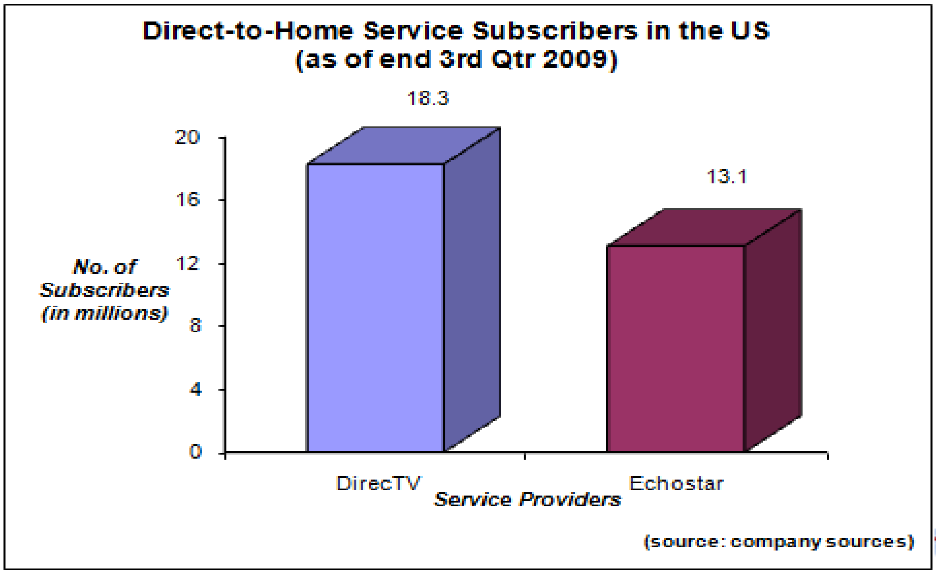
Some markets saw their first dedicated satellite pay-TV platforms in 2008 and 2009 – including the Maghreb region (North Africa), Venezuela and Bolivia. Other markets saw the introduction of several platforms simultaneously, such as in the Ukraine with three new platforms in only two years.

Solid Results in the Most Advanced Markets

Satellite TV Platforms in the most developed TV markets performed well overall, despite the economic crisis and growing competition from other delivery networks including IPTV and DTT.

In the US, the availability of new services including HDTV enabled DirecTV and Dish Network to capture more than one million new subscribers combined, despite overall belt-tightening among consumers. The economic downturn had a stronger impact in Western Europe with subscription growth at slightly over 4%, but stagnation in revenues in local currency – the only market in which this occurred. Restructuring of certain platforms and stronger competition from terrestrial platforms also affected the market. In Germany (Sky Deutschland) and Spain (Digital+), satellite TV platforms actually saw revenues decline. By contrast, Sky Digital in the UK remains a strong leader in the region, with subscribers increasing by 3% last year to 9.5 million, and revenue growth of 8% for the fiscal year ending June 30, 2009. Still, growth may resume in Western Europe, boosted by the introduction of new platforms in several markets such as France and Portugal and by the introduction of lower priced packages to drive overall market penetration.

Vital Statistics



The Satellite Markets 25 Index ™

Company Name	Symbol	Price (Jan 29)	% Change from 2-Weeks Ago	52-wk Range		% change from 52-wk High
Satellite Operators						
AsiaSat	1135.HK	11.18	-1.06%	7.10 - 12.80	↓	11.72%
Eutelsat Communications	ETL.PA	23.37	1.74%	14.90 - 23.99	↓	2.56%
Hughes Communications Inc.	HUGH	25.99	-3.71%	7.77 - 31.52	↓	17.54%
Inmarsat	ISAT.L	683.00	-0.15%	391.50 - 717.50	↓	4.81%
SES	SES.F	15.70	1.29%	12.76 - 16.38	↓	3.59%
Satellite and Component Manufacturers						
Boeing	BA	60.38	-0.61%	29.05 - 62.95	↓	4.08%
COM DEV International Ltd.	CDV.TO	3.45	-10.62%	2.52 - 4.15	↓	6.99%
Lockheed Martin Corp.	LMT	74.46	-1.87%	57.41 - 87.06	↓	14.47%
Loral Space and Communications	LORL	28.40	-18.23%	8.90 - 34.93	↓	18.69%
Orbital Sciences Corp.	ORB	15.76	-3.08%	11.60 - 17.95	↓	12.03%
Ground Equipment Manufacturers						
C-COM Satellite Systems Inc.	CMI.V	0.30	-6.25%	0.19 - 0.39	↓	17.95%
Comtech Telecommunications Corp.	CMTL	35.38	-5.78%	19.56 - 41.91	↓	15.58%
CPI International, Inc.	CPII	10.82	-21.59%	5.67 - 14.48	↓	25.28%
EMS Technologies, Inc.	ELMG	12.84	-12.30%	12.00 - 25.10	↓	48.86%
Viasat	VSAT	27.61	-13.31%	15.90 - 32.94	↓	16.18%
Satellite Service Providers						
Gilat Satellite Networks Ltd.	GILT	5.38	-5.11%	2.75 - 5.80	↓	7.24%
Globecomm Systems Inc.	GCOM	7.27	-7.97%	4.29 - 8.57	↓	15.29%
International Datacasting Corp.	IDC.TO	0.29	-12.12%	0.20 - 0.43	↓	23.26%
ORBCOMM Inc.	ORBC	2.28	-9.88%	1.16 - 3.23	↓	29.41%
Skyterra Communications	SKYT.OB	4.87	-0.41%	1.50 - 5.00	↓	44.97%
Consumer Satellite Services						
British Sky Broadcasting Group	BSY	33.82	-7.34%	23.56 - 38.54	↓	12.25%
The DIRECTV Group	DTV	30.39	-10.01%	18.81 - 34.42	↓	11.71%
ECHOSTAR Communications	DISH	18.29	-13.89%	8.79 - 22.18	↓	17.58%
Globalstar, Inc.	GSAT	0.95	-18.10%	0.19 - 2.00	↓	52.49%
Sirius XM Radio Inc.	SIRI	0.8271	19.97%	0.05 - 0.82	↑	0.90%

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

Comparison of Indices	Index value (January 11 '10)	Percentage Change 2 Weeks ago	1 yr. ago
Satellite Markets 25 Index™	977.53	↓1.87%	↑ 20.61%
S & P 500	1076.585	↓5.25%	↑ 18.51%

Featured Event

Vertical Communications Markets Series Returns to SouthEast Asia for the 2nd Annual Broadband Maritime Event

2nd Annual Broadband Maritime: SouthEast Asia
February 23-24, 2010 Singapore

The Global VSAT Forum (GVF) and United Kingdom Event Management Partners (UK-EMP) have announced that the offer of free conference registration for relevant vertical market professionals originally introduced for their Oil & Gas Series conferences will be continued for the next in the series of industry-specific communications conferences – the Broadband Maritime South East Asia: New Communications Networking Offshore & the High Seas Conference (BMSEAC) – taking place 23rd to 24th February 2010, at the Marina Mandarin hotel in Singapore.

The Conference, the second in the Series for the Maritime vertical to focus on the South East Asia region, will feature particular attention on the following key subject areas:

(1) Key hardware technology developments in the design and deployment of state-of-the-art stabilised satellite antennas which enable effective satellite tracking and maintenance of signal integrity as vessels pitch and roll, whilst maintaining constant reliability through robustness and rugged design against challenging weather conditions;

(2) New service provisioning, delivering 'always on' broadband applications with Quality of Service guarantees that go beyond basic 'pay-by-the-minute' service types and which facilitate greater predictability in mission critical delivery, as well as accuracy in the calculation of the cost of communications and, therefore, improved corporate overheads budgeting; and,

(3) Access to applications and networks: meeting today's imperative for constant, seamless and cost-effective connectivity to ensure optimised exploitation of physical maritime assets, maximised passenger satisfaction, maximized crew welfare, and optimized navigational safety.

The first Broadband Maritime South East Asia Conference, held in February 2009, was the first departure of the Global VSAT Forum (GVF)/UK Event Management Partners (UK-EMP) Partnership beyond the communications conferences it has organized for the Oil & Gas vertical market since 2006. After eight conferences for the energy industry, as well as one for the maritime vertical, comes the 2nd Annual, Broadband Maritime South East Asia Conference (BMSEAC). BMSEAC will examine the widespread deployment of advanced communications technologies and services that are constantly accessible anywhere at sea.

Moreover, the conference agenda will look to the fact that whilst there has already been much recent improvement in the availability of advanced communications at sea, it is only now that the maritime communications environment is progressing fully, from a mainly narrowband communications arena, and into the broadband age, exploiting the increased synergies of advances in satellite equipment technologies and the availability and accessibility of new bandwidth across, and linking, all the world's oceans.

For more information go to: www.uk-emp.co.uk/MA2.Sg.2010/index.htm or e-mail: paul.stahl@uk-emp.co.uk

This Conference is free to al l Maritime Industry representatives:

• Shipping Companies, Management, Owners Operators,

•Containers, Cruise Lines, Ferry Operators,

•Rig Owners & Operators, Port Authorities

Company Profile

Gilat Satellite Networks Ltd

Gilat Satellite Networks Ltd. (NASDAQ: GILT) is a leading provider of satellite communications products and services. For over 20 years, Gilat has been at the forefront of VSAT technology and services and continues to be an innovator and developer of new satellite technologies. Gilat's solutions serve the communications needs of carriers, enterprises, governments, service providers and consumers around the globe.

Gilat provides VSAT-based networks and associated professional services through its business unit **Gilat Network Systems,** (www.gilatnetworks.com). Gilat Network Systems has shipped over 750,000 VSATs to a large and diverse customer base in more than 85 countries and offers a full range of satellite communications products and solutions:

- SkyEdge™ and SkyEdge II: Advanced, high performance cost-effective and flexible VSAT systems supporting diverse needs. Gilat's SkyEdge II is a multi-service platform enabling the delivery of high-quality voice, broadband data and video services for diverse environments including enterprises, rural networks, cellular backhaul and government network applications. SkyEdge II is a standards-based system using DVB-S2 and DVB-RCS. With better efficiencies and full adaptivity for both the inbound and outbound channels, it provides higher performance that serves the growing requirements of end-users. Gilat's diverse portfolio of SkyEdge II VSATs are all supported by a unified platform, offering service providers the most suitable product for their application needs as well as the flexibility to evolve their networks. The newest addition to Gilat's SkyEdge II portfolio is NetEdge™, a dedicated solution for multi star networks, specifically designed to meet the needs of corporations and cellular backhaul applications.

- Value-added solutions for specific markets and industries, integrating the open SkyEdge and SkyEdge II systems with other technologies and applications.

- Turn-key projects to help rapidly create and implement fully functional communications solutions.

- Outsourcing for cost-effective network operations.

Gilat also provides managed VSAT and hybrid network services for business, government and residential customers in North America through its subsidiary, **Spacenet Inc**. (www.spacenet.com).

In addition, rural Internet and telephony services primarily in Peru and Colombia are offered through Gilat's business unit, **Spacenet Rural Communications** (www.spacenetrural.com)