SatMagazine

★ **The European Market** ★

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SatView: Europe

UPLINK

by Hartley and Patricia Lesser

The European satellite communications market is most certainly alive and well... The research analysis firm, Futron, finds a 77 billion euros market worldwide, with satellite services generating some 38 billion euros of this global revenue. Europe is a dominant force in the satcom marketplace, and as Futron estimates, the European space industry can claim approximately 40 percent of the world market in the trinity of satellite environs: manufacture, launch, and operation. In addition, just in case you were unaware, three of the five largest satellite system operators in the world are European based.

Mix in estimates from companies such as **Northern Sky Research** who determined new service launches in Europe will assist in revenue growth for the broadband satellite market of more than 22 percent per year through 2011. To learn more about how the European market interacts with the global environs, I invited leading, subject-matter experts, and company executives to comment on this marketplace.

Here are the thoughts of those who bring all of the disparate pieces together, in company alphabetical order...

Pedro Schoch afforded his insight into the European market and identified his company's strengths in this market.

"GMV is a large company that has been providing solutions, from products to systems integration, to the space market, worldwide, for more than 20 years. We are involved in a wide array of activities including satellite control, flight dynamics, payload management, mission data processing, mission analysis, mission planning, and navigation systems and applications.

"In particular, for the satcom market, GMV is one of the leading providers of ground systems for satellite control, flight dynamics, and payload management. Our systems have been selected to fly over 100 satellites from 18 commercial satellite operators worldwide. Our position as a leading supplier for ground systems to a large number of satellite operators, and our relationship with the six largest satellite manufacturers in Europe and the U.S. provide us with a unique view of the market.

As to the market's strengths, Pedro added, "Satellite operators need to plan ahead and prepare satellite ground control infrastructures in order to accommodate fleet expansions for the coming years. We have seen a solid market with healthy growth in the past years and we expect to see a strong European market going forward. New broadband applications, Internet-related services, and HDTV seem to be carrying the brunt of the market growth as many analysts have already pointed out, and the HDTV market still has a long way to go in Europe. Capacity is growing and new satellite orders are being developed for European satellite manufacturers, not only from European satellite operators but from operators in other regions of the world. GMV is certainly as busy as ever and has a strong order book going into the future.

"Another interesting area for further growth will be provided by the convergence of navigation, Earth observation, and communication technologies for the development of systems and applications for different markets. The European GMES program is certainly fostering the development of these applications in the security and environmental areas, and the market is slowly being built. The satcom market should benefit from this promising trend."
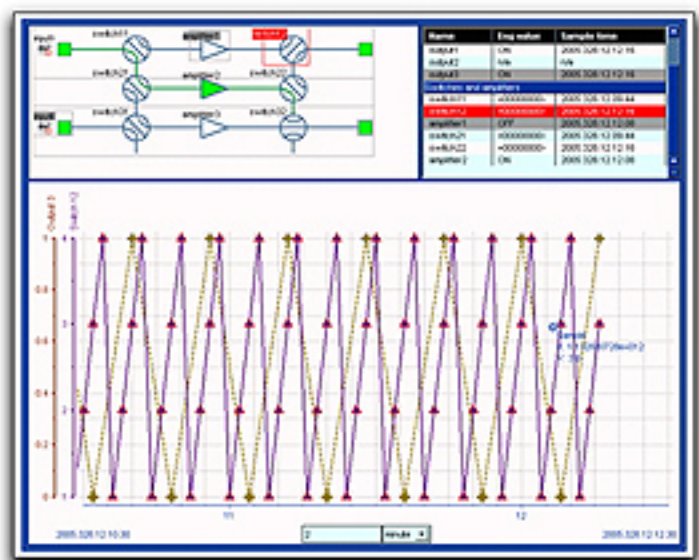
When it boils down to issues that need to be confronted, the GMV marketing and communications director said, "The market is extremely competitive and this puts a lot of pressure on independent suppliers of ground systems such as GMV. We are working on our competitiveness to offer the market good value for their money, and above all, solutions that target our customer needs.

"As satellite operators examine methods by which they can lower their operational costs, they are closely looking into the ways they conduct operations and the systems they have at their disposal to manage this work. Satellite operators' concentration has also furthered this trend and changed the dynamics of the market. GMV is responding to these issues by providing an array of products and services to our customers by offering multi-satellite systems that can accommodate any number of satellites of different manufacturers for homogeneous control of heterogeneous fleets. Other services include augmenting system

automation so operational costs can be lowered and system reliability can be increased, and by introducing new technologies to address obsolescence and improve maintainability.

"GMV also offers support for LEOP operations and expert consultancy for satellite collocation. As a matter of fact, GMV has been asked by several actors in the market to increase our role and to integrate larger systems for the satellite ground segment. The bottom line is reacting to market demands and doing so in complete alignment with customers' needs. GMV has a number of innovations, thanks to a strong R&D policy — 10 percent of the Company's annual revenues fund research.

"We just released version 6.0 of our hifly® satellite control system, which supports satellites built by manufacturers around the world, with everything from launch and early orbit phase (LEOP), to routine on-station operations of satellites. We continue to add new capabilities to focusSuite, our family of flight dynamics products, and to smart rings, our payload management system. We are also looking into other areas in the ground segment to discover areas where we can add value with new systems. The years to come are going to be quite busy as we move forward with new systems and services."

GMV's hifly views
(standalone) telemetry client

But there's more to research than simply funding the work. As Pedro stated, "The key issue here is that we not only incorporate new functionalities and improve our products based on our market knowledge, but most importantly, we work hand-in-hand with our current customers to address their specific needs incorporating these solutions into our systems and products."

Integral Systems, founded in 1982, provides satellite ground systems and has supported more than 205 satellite missions as of this writing. The Company's customer global customer base includes various commercial and government satellite operators, spacecraft, and payload manufacturers as well as aerospace systems integrators. The company also owns four subsidiaries: **SAT Corporation**, **Newpoint Technologies Inc.**, **RT Logic**, and **Lumistar**.

The President of **Integral Systems Europe** (ISE), *Bruno Dupas*, graciously took the time to answer a few questions regarding the European market. When asked how he believes growth within the satcom environs will be evidenced, he answered, "Integral Systems Europe believes the European SATCOM market will grow significantly in two major areas: military support and television-related services. SATCOM is increasingly becoming a larger issue for armed forces across all of Europe. It is

especially important to nations currently involved in coalition and peacekeeping operations. Because these operations are often in extremely remote regions, SATCOM services are a logical option for satisfying communication requirements."

Regarding the commercial side of growth, as well as issues that need to be addressed, Dupas said,

"Integral knows that new applications and services such as satellite radio services like Ondas or television on mobile phones, will create added demands for the SATCOM industry. In addition to these growing demands, there are significant pressures facing operators, including the need to reduce operations costs, while at the same improving quality of service and working on interference management. We are well aware of the industry growth and the associated issues amplified by such growth. To address these issues, Integral has introduced new approaches for managing the ground segment to increase situational awareness and automation to reduce operations costs. We are also improving reactions to operational and business-related issues, resulting in improvements to our delivered services."

Integral has additional plans and projects in the works. Dupas stated the company's integrated solutions are proving highly successful because they are delivering real measurable value to their end customers. As a result, the Company continues to expand and improve their integrated service solutions. He added, "Beyond delivering turnkey ground control systems, ISE continues to investigate other ways to provide solutions for our customers. If we do not have the product or capabilities required to address a customer need, we reach out to our numerous partners and integrate their product and/or capabillities into our overall solution to address that need."

Certainly, Integral has grown far beyond its early days as solely a provider of satellite control systems. The Company has extended their product and capability

offerings into signal monitoring and network management. They have also entered other markets, such as satellite data processing. As Dupas said, "We have repeatedly demonstrated our ability to provide complete systems from antennas, satellite command and control, transponder planning and monitoring, to network management as well as baseband and network functions. Integral has delivered these systems with pre-integrated products and a commitment to maintain the solution for the entire life of the system."

We all possess "wish" lists for changes in the industry. Dupas, "would like to see more open competition, particularly in regard to government involvement in industry and in government procurements. We want to ensure that government institutions do not directly assist in commercial product development, thereby potentially rendering procurement processes unfair and non-compliant with WTO rules. On the positive side, I applaud the European Union's new procurement guidelines for Galileo. We believe they will improve the competitive process and deliver better value to taxpayers. As a result, it has allowed ISE to be able to bid on the GCS work package, where under the old procurement method we were effectively locked out of the process.

"You know the saying, 'there is no place like home', and this is the sentiment behind one of the major drivers for capacity in Europe—programming entering the market that originated elsewhere." *Jean-Phillipe Gillet* of **Intelsat** dives directly into the European market growth patterns. "DTH platforms will also continue to expand, especially in Eastern Europe, where a few operators have been

very successful in entering new regions and spreading their service areas. Proliferation of HD programming has accelerated in North America over the last year, and we are now seeing European programmers' HD requirements heating up — especially coming off of a successful summer of the European soccer championships and the Beijing Olympics.

"Our European customers are benefitting from the globalization trend, and we literally offer them access to any market that they need to reach. Our Fuchsstadt, Germany, hub has become one of the largest access points in our global network, and so our technical team is continually upgrading our facilities there in order to make access to the Intelsat network as easy and efficient as possible. A growing number of our customers use two, three, or even five satellites as they deliver programming and services to different regional markets. This trend is a by-product of serving the European market for many decades, and partnering and supporting our customers as their business challenges grow.

"Actually, Intelsat has been serving the European market with video, voice, and network services for more than 40 years and has a solid operating platform in the region. Nearly $400 million of our annual revenues are earned by serving European customers in the media and network services sectors. One of our major strengths rests in video distribution of ethnic programming, both into and out of the region, and providing DTH platforms for major operators in Eastern Europe. Europe continues to be one of the most important regions for Intelsat's business."

In regard to Company initiatives, Jean-Phillipe said, "Our initiatives take the form of smart, strategic investments that result in better service to our European customers. For instance, Intelsat and Telenor Satellite Broadcasting (TSBc) announced the completion of an agreement for Intelsat to purchase 10 transponders on Telenor's THOR 6 satellite, due to launch in Q2, 2009. Under the contract, Intelsat will gain additional capacity to expand its growing DTH business within Central and Eastern Europe."

MITEQ, an acronym for *Microwave Information Transmission EQuipment*, designs and manufactures a complete line of high-performance components and subsystems for the microwave electronics community. Located on Long Island, New York for more than 38 years, the Company is dedicated to achieving technical excellence, producing quality products, and satisfying their customer's specific needs.

The President of the company, *Howard Mausman* sees the growth areas for the European markets as follows... "Broadcast television via satellite is still a competitive alternative to terrestrial systems. The growth in HDTV and the related requirements for wider bandwidths continues to drive growth for the satellite Industry. The satellite industry challenges all of their suppliers to come up with more advanced and higher reliability products on a daily basis. MITEQ Inc., with its diversified engineering staff, meets these challenges and continually adds to its widely diverse product offerings. Currently, Internet access through Ka-band is a growing satellite application. MITEQ has a complete line of products for uplinks and downlinks in Ka-band, and continues to offer a more diversified product line as customer demands increase."

MITEQ does have some additional programs and projects in the works. "We are working on higher power Ka-band amplifiers; more integrated solutions for Earth Station up- and downlinks, and integrated high dynamic range fiber optic links to connect antenna systems to base stations independent of their respective locations."

PBLSat specializes in the occasional use marketplace and provides customers with global satellite capacity, mobile services, uplinks, downlinks as well as expert advice on the requirements for global connectivity. In April 2007, the Company acquired the rights to BT Media & Broadcast's ad hoc satellite infrastructure, which allowed PBLSat to offer an even wider range of broadcast services to an international client base.

When queried regarding growth in the European market, *Paul Claydon* of **PBLSat** said, "We see European market growth for occasional services coming from the increasing demand for HD transmissions. Broadcasters' thirst for coverage of niche sporting events to fill airtime on the growing number of HD sports channels continues to increase. An example of the escalating requirement for repeat HD solutions year after year is demonstrated by the coverage of the Wimbledon Tennis tournament. In 2007, PBLSat provided the first HD transmission from the venue. In 2008, three of our four customers transmitted in HD. We predict next year's tournament feeds will all be in HD.

"Currently, HD satellite solutions require additional bandwidth to ensure a lucrative proposition for service providers. However, this also brings challenges, such as, how to source enough capacity in an already scarce European market. We have also noticed an increased demand for fully diverse redundant paths for high profile major events — customers

request both hybrid fibre and satellite solutions. Given the value of certain sporting property rights, the reassurance of a diverse path offers sensible insurance against unforeseen problems."

The challenges include "Establishment of the value of our brand by delivering excellent service and advice. We have developed our own dedicated customer service center that offers a fully trained booking, and major event, staff working around the clock on a 24/7 basis. Whatever time a customer calls our Space Centre, they will be able to speak to an experienced booking operator and discuss our full range of services. The development of the Space Centre and our new scheduling system has been a considerable investment. However, this financial commitment has proven to be essential in helping us increase our market share by providing world-class service.

"We operate a Pan-European truck fleet, field experienced operators, as well as offering three in-house, European satellite solutions. Due to the increase in HD broadcast events, we are currently assessing the market for additional dedicated satellite capacity to meet growing customer demands. Locating the correct satellite option to enhance our services portfolio is becoming increasingly difficult, as suitable capacity

is a scarce resource. An additional challenge with the increase in HD requirements is the need to increase our fleet of mobile HD capable units. We have recently purchased three redundant HD trucks and such investments will need to continue over the coming year."

A number of new programs are also on tap for PBLSat. "The heritage of PBLSat is built on the playout business

developed by the PBL Group in 2004," said Paul. "We are addressing how best to integrate these playout options into our Occasional Use business to offer a complementary layer of services. In addition, we have added permanent uplink and satellite services to our portfolio over the last few months and are looking to develop and grow that division. We are also building streaming and archiving solutions to best meet the increasing demand for those value-added services. A key project, central to company expansion and development plans, is our head office move scheduled for October of this year. The new premises in central London will provide us with much needed new space to solidify our infrastructure plan that's focused on the company's future initiatives and service diversifications. The building will centrally house our Booking Centre, MCR, Playout, and Commercial teams, and will also provide us the opportunity to develop, over time, our own teleport infrastructure."

PPM delivers components, modules, and system solutions to customers from a wide range of industries. For example, the Company offers an extensive range of fiber optic links, typically used in satellite and broadcast, military, security, cellular and radio operations. ViaLite is PPM's RF over fiber technology.

Colin Morris at **PPM** expects to see modest growth in Europe in 2009. He adds, "Most of the new business will be derived from existing markets responding to the uptake in areas such as DTH across the region. Anticipated growth in the newer developing Eastern European countries has been slow to materialize and while we have had some general interest, the market is extremely price sensitive."

This, naturally, brought up the subject of challenges that will have to be faced. "The industry is becoming ever more competitive with other equipment suppliers looking to design in fibre optic interfaces into their existing equipment," said Colin. "PPM is working hard to educate manufacturers and show them that they do not have to spend valuable resources on designing their own solutions and that PPM can provide them with OEM modules that will integrate simply and effortlessly into their new and existing products. We currently have plans to launch new products in time for IBC, which include SNMP monitoring for our existing product platform and new wideband RF over Fibre modules with the additional capability to carry low speed digital data in RS232,422 and 485 formats along side the main data carriers."

SatLink Communications is a recognized pioneer in the worldwide satellite services arena and a leading provider of transmission solutions for video, audio and data over satellite platforms, fiber optics and IP. Their CEO, *David Hochner,* estimates the growth markets in Europe as follows…

"The satellite communications market in Europe, as a whole, is growing across the continent from East to West. HD channels are being added on an almost weekly basis, DTH operators — especially in Central and Eastern Europe — are moving forward and this is something we expect to continue. SatLink's operations bridge the world from the U.S. to Asia, effectively making Europe the center of our operations universe and provide us with the ability to offer superior service. With a number of multi-channel platforms on satellites over Europe,

we are fulfilling the growing need for more services for channels and creating neighborhoods over Western, Central, and Eastern Europe as well as in the Mediterranean Basin. The Olympics provided more opportunities for broadcasters to enter the HD market and the constant stream of breaking news and entertainment programming continue to make the European satellite industry exciting. SatLink fully intends on continuing our growth pattern, one that led the World Teleport Association to rank us the world's fastest growing teleport in 2007."

What are the challenges David believes will need to be addressed? "Frankly, one of the biggest issues facing our industry presently, and most likely for a few more years, is the growing demand for satellite space and the lack of satellite capacity. We are dealing with the challenge by ensuring that we provide multi-channel platforms on more than one bird orbiting Europe. Currently we have platforms on HotBird 8, Eutelsat W2,

Eurobird 9, Hellas Sat, and AMOS. This flexibility allows us to offer services on a regional or a technology basis.

"With our teleport and transmission facilities, we are able to offer comprehensive transmission solutions including downlinking and uplinking channels for distribution to cable head-ends, re-broadcasters, and individual home viewers in the region. In 2008 and into 2009, we will also be looking at other opportunities to expand our presence in the European market. This may include co-operations, acquisitions, partnerships, and other joint ventures. We have excellent cooperation with France's Globecast, and this is a plus when considering new projects in Europe. For our existing platforms, we are in the process of adding new channels to our neighborhoods and are investing time seeking more opportunities to add new platforms to our global distribution network."

Spacecom operates the **AMOS-3** and **AMOS-2** satellites (constructed by **Israel Aerospace Industries**), which are co-located at **4° W**. These satellites offer a wide range of communications and broadcasting services in Europe, the Middle East, and across the Atlantic Ocean, as well as connecting the U.S. East Coast to the Middle East and Europe. *David Pollack* leads off the conversation with his thoughts regarding where he believes the growth areas in Europe will reveal themselves over the next year or so.

AMOS-3 satellite

"The expansion of DTH, broadband applications and HD throughout the continent are making Europe the place to be over the next five years. Central and Eastern Europe are growing at a rapid pace and should remain high growth markets. Spacecom is continuing its successful expansion into Central and Eastern Europe as well as the Middle East and U.S. Our AMOS constellation at the 4° W orbital slot is meeting broadcasters and operators' needs across Europe and further afield. We have found that working closely with clients and customizing service initiatives goes very far toward enhancing market and business opportunities. With the recent addition of AMOS-3, which came on-line in June 2008, we are able to deliver advanced satellite services to current and prospective customers. We believe that Europe will continue to be a fertile region for our business."

He continued, "The global demand for satellite services is expanding, yet capacity – especially in Europe and the Middle East – has not kept up. Therefore, we are exploring new opportunities and initiatives to both further our presence in our existing service areas over

Europe and the Middle East, as well as expand our services to new regions throughout the globe. As a business, we believe it is important to be flexible and cooperative within the industry so that we can take advantage of opportunities that open up with potential partners. We remain confident that satellite services, as compared to other technologies, will continue to grow, and we plan to play our part in this growth. After all, communications is what the world is based upon, and our industry's support makes communications and the proliferation of entertainment easier.

"Spacecom plans to expand its reach into new service areas throughout the globe with the AMOS-4 satellite announced last year, which will extend our footprint into Asia. Additionally, the recently announced AMOS-5 will further expand our service footprint into new regions, while future AMOS satellites that will be announced in the near future are planned to enhance our offering in existing markets in Europe and the Mediterranean Basin. We are always considering new initiatives with potential partners to increase our presence and offer additional services to our clients. At present, as a public company, we cannot comment on the details — except to report that our goal is to transform Spacecom from a leading regional player to an emerging global provider in the satellite communications industry."

When asked about his company's product lines and initiatives, David answered, "Spacecom's aim is to provide superior broadcasting and communications services to DTH operators, TV broadcasters and programmers, government organizations, and VSAT network operators. We currently serve three DTH platforms on

the AMOS satellite constellation with more than 300 channels onboard, including many HD channels, such as BOOM TV in Romania, a new DTH platform initiated by T-Kabel in Hungary, and YES in Israel. 2008 is proving to be a very exciting year so far with the launch of AMOS-3 in April and commencement of its operations in June. Replacing AMOS-1 with AMOS-3 is increasing revenue by adding capacity, expanding coverage areas and providing advanced capabilities, such as Ka-band and steerable beams."

Space Systems/Loral (SS/L) is subsidiary of **Loral Space and Communications.** The Company designs, builds, and tests satellites, subsystems, and payloads; provides orbital testing; procures insurance and launch services; and manages mission operations from Mission Control Center in Palo Alto, California.

"The Ku-band/ FSS market is strong in Europe, as evidenced by this year's satellite procurements by Eutelsat, HISPASAT, and SES," commented *Arnold Friedman*, Senior Vice President, Marketing and Sales for SS/L, when asked about European growth markets. "We expect this trend to continue and we are excited about the market expansion in mobile video and broadband, which is helped by new S-band and Ka-band frequency allocations."

We inquired if SS/L has any immediate plans for additional programs or projects, the Senior Vice President answered, "So far in 2008, Space Systems/Loral has begun work on two satellite programs for European companies. We are providing satellites to SES New Skies and HISPASAT. Both these satellites will broaden the availability of video programming in Europe when they are launched in late 2010." He quickly added, "At SS/L we are proud to say that more bits are delivered over satellites that we have built versus satellites from any other manufacturer."

STM is a supplier of IP networking solutions via satellite, based on the open, international DVB-RCS standard. With their **SatLink™** products, the Company offers complete hub systems, VSATs, turnkey managed networks, and global teleport services. And now STM is leading an international R&D consortium to develop and test technologies aimed at the nexgen of DVB-RCS products and standards.

The Company's Vice President of R&D and General Manager for **STM Group for Europe,** *Bjorn Platou*, "expects strong growth in the European market for consumer broadband VSAT services for Internet access, particularly in areas with poor terrestrial access. There are currently a number of companies jockeying for position and market penetration in the Ka-band spectrum, with the first services coming online in late 2009."

Challenges that will need to be addressed, "are not unique to us, but to the industry as a whole. European consumers have either not had any experience with satellite broadband Internet services, or the experience so far has been

less successful than one would hope for. This is for a variety of reasons, including price and service quality, which we expect will be addressed when new Ka capacity with lower price points and higher throughput becomes available.
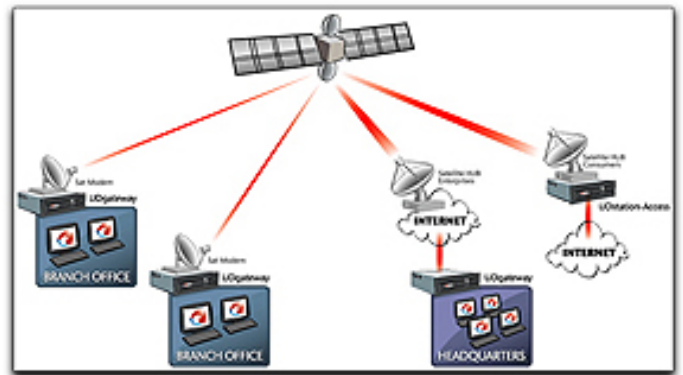
"Nevertheless, the main challenge is to reach areas and have customers accept that satellite broadband is a good and viable alternative, just as they have accepted satellite TV. We are currently involved in the Hylas project with Avanti, which will target Ka services in Europe once the Hylas satellite is launched in 2009."

UDcast is a leading software company providing IP broadcast solutions for wireless networks worldwide. The company's products and solutions provide the broadcasting and telecommunication industry with the necessary tools for delivering data and media applications, anytime, and anywhere. UDcast is a provider of platform-independent, satellite-aware IP routers that make it possible to access satellite-based services throughout the enterprise. UDcast services have been approved by all of the leading satellite service providers, with thousands of units deployed throughout the world. The acceleration technology of UDcast is also available for usage in terrestrial WAN and WiMAX net-works through collaboration with external partners.

When discussing European market growth, *Filip Gluszak*, UDCast's Vice President of Marketing, had this to say… "The consumer Internet services are going to become the main driver for the growth of VSATs in Europe. Following the success of the

Filip Gluszak
Vice President Marketing

UDcast's satellite IP solutions

'low cost' satellite services in U.S. and Asia, the main European operators are about to launch equivalent solutions in the European countries.

"The second growth area is linked to the green energy production. The contribution of green energy to the overall energy production in Europe is expected to grow from three percent today to more than 20 percent within the next 20 years. Several thousand wind turbines are installed every year in Europe. Many of the new turbines require efficient data connection for real time remote control and monitoring. UDcast is already present in this market.

"Finally, Internet on trains is becoming a high demand application. The railway services operators invest in on-board Internet solutions in order to differentiate themselves as well as to face progressing deregulation and internationalization of the mass transportation market. UDcast has recently equipped a number of high-speed trains in France with a secure broadband solution and we foresee an important growth over the next few years.

UDcast is going to address upcoming challenges in two main ways, says Filip. "On the one hand, we make sure our products correspond to the need of the consumer and SOHO market, through adequate product packaging and reseller partnerships. On the second hand, the demand of professional customers becomes increasingly sophisticated; therefore, we continue to invest in advanced application-specific software features (eg. CIFS acceleration, data redundancy elimination WANcompress) and platform-specific hardware integration (eg. enabling integration of our equipment

on board of high-speed trains).

Where will UDcast be heading with their upcoming projects? "UDcast has launched a WAN optimization solution for WiMAX and terrestrial networks. Ipaname, a leading vendor of solutions for terrestrial network optimization, has integrated this technology by default in their routers. We also continue to develop Mobile TV, and in particular, DVB-SH standards, making use of hybrid satellite-terrestrial transmission, as well as satellite distribution for DVB-H."

The company has also recently launched a new compress technology for wide area networks called WAN-compress. This technology enables acceleration of file transfers 25x, and there's an average bandwidth reduction of as much as 50 percent for business customers. The system is now on trial with one satellite operator and one WiMAX network in Europe. In addition, UDcast will soon announce the deployment of an e-Learning system into one of the countries of Oceania.
Vizada is a provider of global satellite communications solutions. The Company has more than 40 years of direct satellite innovation experience combining the technical and market expertise of the former France Telecom Mobile Satellite Communications and the former Telenor Satellite Services organizations.

Erik Ceuppens, the CEO of **Vizada** EMEA & Asia, is an expert on the European market and his comments included... "The European mobile satellite services (MSS) sector experienced significant growth during the first half of 2008 and this is set to continue into 2009. We can say this specifically for on-demand MSS services in the three key market segments, which are maritime, land, and aeronautical. This is the first time that we are seeing growth on all three, which is very positive. At Vizada, we partner with multiple satellite network operators (SNOs) to offer customers in these segments more choice in terms of MSS services — we're well placed to tap into that growth.

"On the land segment, growth has been strong and even higher than industry forecasts, and driven more by data than voice. The Inmarsat BGAN service, for example,

has seen very strong uptake during H1. Media companies were typically the first adopters, as BGAN allowed them to report on events in ways they were not able to do so previously. A good example of this is the coverage of the Israeli-Hezbollah conflict in 2006, which earned our customer CNN and Vizada two IBC awards.

Erik Ceuppens
CEO
Vizada EMEA & Asia

"In the maritime market, growth is spurred by the increase in trade and maritime transport as well as the number of new-builds. These new-builds require communications systems, which is where we come in. Our customers are among the world's largest shipping companies and we have developed a specific offering for them, meeting their needs in terms of cost-efficiency and remote control of operations. We're seeing an increasing need for data connectivity from services like Inmarsat Fleet-Broadband or the upcoming Iridium OpenPort, as well as for crew calling solutions.

"In the aeronautical market, demand is being driven by two main elements: an increasing need for data connectivity and passenger communications. We are currently conducting the first commercial trials of cabin communications solutions with key partners, and this is an interesting market evolution to follow over the coming months."

In discussing upcoming projects, Erik said, "A key focus for us is to introduce and develop new broadband and IP-based services and solutions, as we see a real increase in the need for high-speed connectivity in many different sectors. Our offering already includes a number of key broadband services such as Inmarsat BGAN on land and Inmarsat Fleet at sea, and we

will continue to extend our portfolio later this year, and next with the Iridium OpenPortSM maritime solution as well as ThurayaIP. At the same time, we have a great deal of in-house broadband and IP expertise, and have developed a range of interconnection solutions that are designed to meet varying needs in terms of quality, flexibility, security and bandwidth. What's more, these solutions are available over multiple satellite network services, and I believe this will be a key driver in the development of broadband in the MSS industry."

Change, We Must

Certainly nearly everyone working in this industry has ideas as to what changes he or she would like to see incorporated into the various processes. Let's absorb what our subject matter experts reveal as to their "wish lists"...

Pedro J. Schoch, GMV

"The big changes in the satcom market are going to be led by both the satellite operators, which need to respond to their final users, and the satellite manufacturers, who will be proposing new technologies for their satellite systems to respond to market trends and customer needs. These are the real satcom market movers.

"Satellite ground control systems constitute a fraction of the development and cost of an entire satellite system and are, therefore, not central to change for the satcom industry as a whole. However, ground control systems need to be viewed under a new light... they should not just be another element of operational cost for a satellite operator. Ground control systems are vital for satellite operations and can play a significant role in securing efficient and robust operations. They are business critical and are intimately related to customer satisfaction, which, in the end, translates directly into the bottom line of the satellite operators.

"Advances in IT systems are fast-paced and provide the means for welcome competitiveness in many industries. Satellite ground control systems are IT systems and, as such, they should benefit from these advances. However, the industry has been traditionally slow in accepting new technologies and advances in IT systems for their ground control systems. Operators value

flight-proven and robust systems above all they are reluctant to change or upgrade them. In some extreme cases, change has been induced by obsolescence. This is something that should be changed, and a more open attitude to new IT systems and technologies should be developed by the industry. We think that industry stands to gain a lot from the incorporation of IT advances within their ground control systems. GMV is certainly going to continue proposing new and innovative advanced systems incorporating new technology for the benefit of our customers."

Howard Hausman, MITEQ

"Any customer base is best served when future equipment requirements are accurately forecasted. With that said, MITEQ understands and accepts the fact that changes in the satellite industry are normal as systems are updated and improved."

Paul Claydon, PBLSat

"Always a good question! From my point of view, I would like to see greater options available for occasional use satellites to help us provide solutions to meet customer demands. Over the past few years, we have gone from a period of near-capacity saturation to a virtual drought. The launch of new satellites in 2009/10 should help ease the situation, somewhat. However, there is always an element of risk with launches and, consequently, all service providers need to develop contingency plans. Another area of development I strongly support, and one I hope will accelerate in the coming year, is interconnectivity between the booking systems used by third parties. Strong links between suppliers can only strengthen relationships and speed up the booking process for everyone."

Arnold Friedman, SS/L

"This is a great industry. While competition at times can be fierce, there is also a spirit of teamwork among the manufacturers, operators, and suppliers. We are all working together to expand the availability of information and communications worldwide."

Bjorn Platou, STM Group Inc.

"We think a wider acceptance of standards based technology will help the growth of the overall market. STM is a big advocate of this movement, as a major flag holder of the DVB-RCS standard and its upcoming new releases. Our hope and expectation is that more operators will base their service roll out on standards based technology to expand the market."

Eric Ceuppens, Vizada

With specific reference to the MSS industry, I can say that, after many years operating in a very competitive environment, I'm looking forward to a business driven by product innovation: one that provides real value to our customers. Satellite services have become so much more affordable that now I think it is time to capitalize on the expertise we have in the industry and ensure that it is innovation that will drive further demand for mobile satellite services, rather than price. The way in which we can create value for customers is by driving the MSS industry towards greater simplicity and accessibility.

"This means making the services and solutions we provide easier to use and to integrate into our customers' business operations. Vizada has some of the best networking experts in the industry with the ability to seamlessly integrate MSS services and solutions into our customers' network. This way we ensure that satcoms are an essential building block forming an integral part of a complete communications solution."

There can be little doubt the European market segment is ripe with opportunity for companies that are flexible and understand how to drive technology, without alienating customers. As can be said for almost any global industry, regardless of genre, customer satisfaction is the key to any success — most satcom businesses already understood the relevance between happy clients and increasing revenue generation. Those who fail to recognize this significance will soon fail to be recognized at all. — *The Lessers*

by Hartley Lesser

European satellite services without the need for numerous approvals — that's the aim of the European Union (EU) and their latest decision to provide satellite operators with a single authorization to offer their technologies to customers. The Executive Commission of the EU believes creating a single permission process will create services that can extend to the most remote areas, as well as assist in ensuring the viability of such services, which would include high-speed data and mobile TV throughout Europe. With 27 member EU states, the number of approvals by satellite operators to bring their product to customers within bloc member nations was time consuming, costly and, many times, frustrating.

Directly from the *European Union Commission*'s QA, here is their information on how the selection process will work. This article will close with a look at some of the QA developed by the EU regarding this procedure.

In The Beginning

This new procedure for mobile satellite services was entered into force in July. Mobile satellite systems use radio spectrum to provide services between a mobile earth station and one or more stations either in space or on the ground at fixed locations. They have the capability to cover a large territory and reach areas where such services were economically unviable before. The new European selection procedure could allow companies to offer innovative wireless services throughout Europe over a specifically reserved spectrum as of 2009.

"Mobile satellite services have the tremendous advantage of being able to cover most of the EU's territory, thereby reaching millions of EU citizens across borders. They represent an unprecedented opportunity for all Europeans to access new communication services, and this not only in metropolitan areas, but also in rural and less populated regions," said EU Telecoms Commissioner Viviane Reding. "However, these satellite services depend on substantial investment and therefore need simple and swift procedures as well as

long-term legal certainty. This is why the Commission, in close cooperation with the European Parliament and the Council of Ministers, set up, in a record time of only ten months, a single EU procedure for selecting interested operators of mobile satellite services. There is now one market, not 27, in Europe for mobile satellite services. Henceforth, the ball is in the camp of the industry. I expect intense competition among operators offering satellite-based communication services reaching consumers from the North of Sweden to the South of Spain. This could pave the way for first satellite launches already in the course of 2009."

The competition among satellite operators launched by the European Commission is a first, as it takes place under a single European selection procedure. Until now, in spite of the clear cross-border dimension of satellite services, existing national rules obstructed the creation of a single market for mobile satellite services by leaving the selection of operators to each Member State. The result was a divergence in national approaches that created a patchwork of procedures, legal uncertainty, and a substantial competitive disadvantage for the satellite industry in Europe.

To remove these obstacles, the Commission proposed on August 22, 2007, based on its single

market competences, a new EU decision under which a single selection procedure for mobile satellite services can be organized at European level (**IP/07/1243**). This decision was adopted by the European Parliament and the Council and entered into force on July 5, 2008. It establishes common EU rules for the use of the 2 Ghz bands by mobile satellite services. This will not only simplify and speed up licensing procedures for

operators, "encouraging investment and the roll out of mobile satellite services," but at the same time make sure that these services cover at least 60 percent of the EU's territory, an important step towards gradually achieving coverage of all EU Member States.

Interested companies have until October 7, 2008 to present their applications to the European Commission. During the first phase of the selection process, technical and commercial ability of the candidates to launch their systems in time will be assessed.

The criteria in the second selection phase include, among other things: the speed at which all Member States will be covered; the range of services, including in rural areas, and the number of end-users to be served and the capacity of the system to fulfill public policy objectives and spectrum efficiency.

All Member States must ensure that selected candidates have the right to operate in their country. Depending on the number of candidates, the Commission expects that the selection procedure can be completed in the first part of 2009. First satellite launches could take place in 2009.

The full text of the call organized by the Commission and further background information are published at this link. The new *EU Mobile Satellite Services Decision* is available at this link.

Making The Grade

This selection process is comprised of two phases. During the first phase, technical and commercial ability of the candidates to launch their systems in time will be assessed using five pre-defined milestones. If more candidates pass the first phase than could be accommodated within the spectrum available, they shall be assessed in the second selection phase against the following four selection criteria:

- **Consumer and competitive benefits provided (20 percent weighting)**
- **Spectrum efficiency (20 percent weighting)**
- **Pan-EU geographic coverage (40 percent weighting)**

- **And, the extent to which public policy objectives, not dealt with by the other criteria, are achieved (20 percent weighting)**

The credibility of applicants and the viability of the proposed mobile satellite systems will be taken into account throughout the process. A *Commission Decision* selecting the successful candidates will conclude the procedure. All Member States will have to make certain selected candidates have the right to operate in their country.

Why do satellite operators need legal certainty from the EU to launch mobile satellite services? The costs of producing and launching a satellite can run to hundreds of millions of euro — satellite operators have to pay those costs before any revenue can be generated from the use of the satellite in question. Investment on such a large scale can only be undertaken by relying on a stable, legal environment, making sure that satellite operators will be able to offer mobile satellite services across Europe throughout the lifetime of the satellite.

Any mobile satellite services operator established in the EU can apply by the deadline date to be included in this process. Services have to cover at least 60 percent of the EU's territory as of the date the services commence. Coverage of all Member States is required, at the latest, seven years after the selection decision. In addition, the geographical coverage is one of the criteria that will be assessed in the selection process. It is obviously in the operator's interest to reach as many potential customers as achievable by serving an area as wide as possible.

The number of services to be provided by the selected systems is not determined as of this writing. Many industry players are seriously interested in being selected to provide a number of services over the 30 MHz available for uplink and downlink, but the eventual number of selected systems will partly depend on the frequency capacity they require.

However, the selected systems themselves are generally expected to be capable of carrying a variety of mobile satellite services depending on spectrum efficiency options and business models. For instance, emergency communications and mobile television services can

potentially sit on the same system. In addition to the number of services, the potential number of users is expected to be important, as satellite systems typically have a much wider geographical coverage area than other types of communication networks.

Will the selected candidates receive a "European license" and pay a "European license fee"? And the answer to that question is a definitive "No". Only the selection of the operators of systems of mobile satellite services will be made at European level. Operators will be "licensed" or "authorized" by each Member State, subject to a number of harmonized authorization conditions.

In other words, there is now a "European template" for decisions that continue to require implementation at national level. If there are fees, these will be determined nationally. Any fee must be justified, transparent, non-discriminatory, and proportionate to the intended purpose.

Operators will benefit directly from economies of scale which will result from consistent national authorizations across the EU. This process will encourage investment in the sector, thanks to the transparency and legal certainty offered by this consistent EU approach. Businesses and citizens will also benefit from the high-speed services that will be offered by opera-

tors such as: high-speed internet access, mobile TV services, emergency services, and so on.

Mobile satellite systems also open up new geographical areas to services that were once considered too expensive to reach. This in turn, should energize local economies and help close the digital divide.

INSIGHT

Europe's Bullish Satellite Market

by Chris Forrester

The U.S. market demand for satellite capacity might be growing modestly. The Asia-Pacific region, with China and India experiencing progress, might also be seeing some cause for DTH optimism. But it is Europe that is the world's powerhouse for satellite growth and optimism.

Take Paris-based **Eutelsat** as an example, and its 3,120 video channels (as of June 30). Then there's **SES Astra**, the busiest (and most profitable) of SES' 'federal' operation of **Astra**, **Americom**, and **New Skies**. Astra has 79.5 percent of its fleet utilized (252 transponders out of 317), and while it is fair to say that both Americom and New Skies are fast catching up (Americom's utilization stands at 77.9 percent (334 out of 429) while New Skies, which was once the struggling newcomer, is now at a very appealing 73.6 percent (234 out of 318), it is still Astra that's SES' 'cash cow'.

We'll return to SES in a moment. Let's not ignore the rest of Europe with outfits like Norway-based **Telenor**, Greece's **Hellas**, Spain's **Hispasat** plus the European roles played by **Intelsat**, Israel's **Spacecom/Amos** (with a nice portfolio of Central and Eastern European clients), and you start to understand the buoyancy of the greater European market.

In August, **Eutelsat** unveiled some fascinating data, with CEO *Giuliano Berretta* reporting an overall increase of 20 percent in Eutelsat fleet capacity, which had helped deliver an EBITDA margin of 79.3 percent, up 0.6 percent, which he claimed was the highest in the Fixed Satellite Services sector. He said that Eutelsat was busier

Giuliano Berretta
CEO

than ever, "and is consequently targeting revenues of more than one billion euros in fiscal year 2010-2011."

Eutelsat now has 468 leased transponders, or transponder equivalents, up 15.8 percent from 404 a year ago. Operationally it has 501 available transponders, down fractionally on last year's 505. Fill rate is a claimed 93.4 percent, up from 80 percent a year ago. Revenues grew 5.9 percent to 877.8 million euros, from 829.1 million euros, and helping push EBITDA forward 6.6 percent (at 695.7 million euros, from 652.6 million euros). Eutelsat is now beaming out 3,120 channels. "The decrease of the number of operational transponders from 505 units at June 30, 2007, to 501 at June 30, 2008, is due to the technical incident on the W5 satellite in June 2008, which resulted in the switch-off of four transponders," said Eutelsat. This incident, which has generated much comment in the press, resulted in a controversial Chinese channel being removed from W5.

> *"In total our satellites are now broadcasting over 3,120 TV channels"*
> *Giuliano Berretta, CEO Eutelsat*

"This performance enables us to pursue one of the industry's most important investment programmes, with seven satellites to launch by end 2010," said Berretta. "A number of significant contracts underscore our commercial achievements, notably for capacity at our 9° E video neighbourhood less than one year after it was opened for business. Customers at this new neighbourhood can capitalise on the benefits of the audience of our Hot Bird position," he added. "Emerging markets in our Second Continent have also experi-

Eutelsat's Eurobird satellite

enced continued strong growth. Our major video neighbourhoods, which in particular address these markets, are now broadcasting over 1,500 channels, matching the success of Hot Bird and Eurobird-1 neighbourhoods in Europe."

Berretta also praised the progress of HDTV within the fleet, which he claimed meant that Eutelsat now held the number one position in HD across "extended Europe". "The number of commercial HDTV channels broadcast by Eutelsat's fleet grew almost threefold y-o-y, to 49 channels at June 30, compared with 17 commercial channels at June 30, 2007. HDTV channels broadcast by Eutelsat's fleet represent almost half of the total number of 113 HDTV channels broadcasting in extended Europe at June 30, 2008." Berretta said HDTV is by no means the monopoly of so-called 'Western' countries, with excellent growth coming out of Russia and countries like Turkey. At the end June, Eutelsat's fleet was broadcasting:

- **21 HDTV channels from its Hot Bird and Eurobird-1 video neighbourhoods**
- **28 HDTV channels from major video neighbourhoods serving emerging markets of which seven channels at 7° E (Turkey), five channels at 36° E (Russia and Africa), five channels at 16° E (central Europe) and eight channels at the new 9° E neighbourhood (western and central Europe).**

As to future demand for HDTV, Eutelsat is looking to take its share of an estimated 480 channels forecast to be on air by 2012 (over extended Europe).

Eutelsat seemingly enjoyed growth right across its transmission arc, none more so than at 7° W, an orbital position it shares with Nilesat and where Eutelsat's client roster has grown from 172 channels to 253.

Satellite operators love to quote the contract backlog they have secured. Eutelsat's backlog has reduced somewhat over the past few years from 4 billion euros in 2006, to 3.7 billion euros in 2007 and further

down to 3.4 billion euros in the year to June 30, 2008. "Compared with one year ago, the slight erosion of backlog reflects a higher average fleet age, a major part of the backlog being composed of contracts which are generally concluded, or renewed, upon entry into service of new satellites for their entire operational life," said the Company.

As to Eutelsat's current objectives, the results statement said, "At the end of its 2007-2008 fiscal year Eutelsat is ahead of the three-year objectives disclosed in November 2007. As a result of this performance, the fill rate of the fleet has reached a record level of more than 93 percent at June 30, 2008. Given the progressive entry into service of additional satellite capacity expected during the second half of 2008-2009, the Group is confident of exceeding 900 million euros of turnover for fiscal year 2008-2009."

Eutelsat's W2A satellite

As well as an aggressive build program with a total of seven new satellites under construction (and representing a cap-ex of more than 2 billion euros), Eutelsat has a couple of other interesting milestones over the next few months, not the least of which is the launch of its JV with SES of 'Solaris Mobile', the craft that will deliver S-band capacity on W2A, scheduled for the spring on 2009. Additionally, as the potential for TV to mobiles and cellular devices, it has a bi-directional role, which could, for example, marry its services

to the European Galileo positioning satellites. "W2A is progressing well," says Berretta, and will launch around February next year.

But Eutelsat is far from alone. SES reported its half-year numbers on August 4, and they were bullish, and quietly optimistic about future trading. SES was helped by recurring revenues up 8.7 percent y-o-y, and with recurring EBITDA up 7.7 percent on a year ago. Recurring operating profit was a comfortable 10.3 percent ahead (329.5 million euros vs. 298.8 million euros).

Some 40 percent of SES' revenues are in U.S. dollars (and near-matching expenditure) and this helps the company's structure operate as a natural 'hedge' against Dollar/Euro currency fluctuations, but when those actual currency variations are taken into account

Sirius-2 (Astra-5A) satellite

the actual revenues and EBITDA numbers mean that this past six month's numbers are more or less flat (this current half-year at 788.5 million euros vs. 789.1 million euros a year ago).

Putting **Thor-2** to work at **5° E** also allows SES to relocate its **Sirius-2** craft to a new orbital slot (and renamed **Astra-5A**) at **31.5° E**, a new 'hot spot' for Astra, with six transponders already contracted.

Premiere to accelerate HDTV
"I would not be surprised to see [German pay–TV operator] Premiere accelerate the roll–out of HD, and ahead of that which they have announced so far."
Romain Bausch

Romain Bausch reported transponder capacity rose during the half-year to June 30 from 1048 to 1064. But this increase is nothing compared to the capacity that SES has coming on stream over the next few years. Bausch said that SES has 10 satellites under construction with launches scheduled between now and 2011, which will add a total of 237 incremental transponders, or 23 percent more capacity overall.

Bausch also said that new markets (for Astra) in Central and Eastern Europe, North Africa and the Middle East were also important to SES. "We are also entering into these new markets, all of which are very dynamic. But you also need to have the right customers. There is no great point into entering into contracts which might only be for a short term." He said that Astra was looking for sustainable customers in Central and Eastern Europe, but at realistic prices. "It is true that as far as DTH is concerned we are not that active in North Africa and the Middle East, but we have certainly not given up in these regions."

Fleet utilization remains a robust 77 percent overall, with 803 transponders in use (at March 31) and 820 in use (at June 30) out of the total 1064.

HDTV is helping soak up European capacity, and SES now beams 42 HD channels over Europe and is expecting some significant increases to this demand as the year progresses. Bausch said that the U.K.'s **BSkyB** (promising 30 HDTV channels before the end of this year) is by far the most aggressive HD player in Europe and that the U.K. and Ireland would lead Astra's HD manifest. "Other markets, like France in particular, are also proving to be very interesting in regard to HDTV. But so is Germany, where Germany's public broadcasters have made a decision to launch HD in early 2010 with the Vancouver Winter Olympics, but also with Premiere, where the presence of BSkyB is in Premiere's shareholding structure. I would not be surprised to see Premiere accelerate the roll-out of HD, and ahead of that which they have announced so far."

The Astra division remains as SES' busiest, with 79.5 percent utilised (252 transponders out of 317), but both Americom and New Skies are fast catching up. Americom's utilization stands at 77.9 percent (334 out of 429) while New Skies, which was once the strug-

gling newcomer is now at a very appealing 73.6 percent (234 out of 318).

Contract backlog fell back 3 percent (from 5.84 billion euros to 5.66 billion euros) largely attributable to the declining value of the U.S. dollar in which satellite contracts are usually priced. "Demand for satellite capacity remains strong across the majority of applications and geographic regions, with pricing generally stable to gently improving. We expect revenue growth to continue, as per our guidance, driven by the solid underlying conditions in our business and in particular television channel proliferation," said SES, in their upgraded, and improved, guidance for the upcoming period.

Solaris Mobile — Update

Bausch covered the situation with **Solaris Mobile**, its JV with Eutelsat, which will come into use early next year offering clients TV-to-mobile devices, and possibly audio. At the moment Solaris' transmission rights are somewhat confused. "Solaris has an ITU top priority filing (under the French administration) and with Thales [as the applicant]. This has first priority at the ITU and as such is not a problem. But as regards the European Union framework the satellite and the terrestrial transmissions [the 'complementary ground component'] will be approved nationally at EU level, and we applaud the initiative by the European Commission on this aspect. The downside is that a kind of 'beauty contest' will be held and this takes time. We expect the EU to send out their call for applications by about now, and then potential interested parties have two months in which to apply. So Solaris Mobile is already preparing its filing application, and by early October the EU will then look at the different applications (received) and select the bidders. If the number of bidders is below the capacity available then everyone will get what they asked for. If the total is greater than that available there will be a second round Beauty Contest with milestones and other aspects taken into account. We are really confident that

Solaris will get that which it is asking for, given that it is based on a real satellite. I doubt that other [applicants] will be as well advanced."

Details regarding Solaris Mobile may be found by selecting the homepage graphic, below...

Europe's satellite future is truly buoyant. Competition is as tough as ever between the various players, but that's good for clients. In some markets (Germany, the Benelux and some parts of Spain and Eastern Europe) cable is still a powerful rival, but the growth in the market comes from DTH. HDTV is only beginning to happen, which is good news for capacity.

About the author
London-based Chris Forrester is a well-known entertainment and broadcasting journalist. He reports on all aspects of the TV industry with special emphasis on content, the business of film, television and emerging technologies. This includes interactive multi-media and the growing importance of web-streamed and digitized content over all delivery platforms including cable, satellite and digital terrestrial TV as well as cellular and 3G mobile. Chris has been investigating, researching and reporting on the so-called 'broadband explosion' for 25 years.

SES admits solar panel problems

On August 4, SES revealed it was suffering problems with its fleet of Lockheed-Martin (L-M) A2100 satellites. SES president and CEO Romain Bausch explained that SES had a total of nine L-M satellites with "varying degrees of power loss due to solar array circuit failures. These anomalies occur on a more or less regular basis [particularly] early on in a satellite's life cycle. [It is for this reason] that satellite operators ask for power-generation margins in excess of that needed for nominal usage and allowing for power degradation problems. There have been improvements in design into the newer generation of satellites," he added, explaining that more recent craft sourced from L-M did not appear to be suffering the solar panel problems. "The problems [on older L-M craft] are being experienced by SES and other operators," said Bausch.

"We did not want this problem to be misunderstood by the market," said Bausch, hence the formal disclosure now "even though we expect the problem to be limited and to have a marginal impact on revenues."

Bausch stressed that the problem is not predictable. "AMC-4 and AMC-16 are affected," and that mitigating actions have taken place (see panel) with AMC-4 being the most severely impacted of the SES fleet. Bausch added that AMC-16, which is also affected, and is contracted by Echostar. This is already being compensated for by a price modification formula under the contract terms that came into play with the problems.

Almost all satellites experience some technical problems during their lifespan. "To date, the power loss has caused a minor reduction in available commercial capacity in two of these nine satellites (AMC-4 and AMC-16). AMC-4 C-band customers have been transferred to AMC-2, which has been co-located with AMC-4 at the 101° W orbital position. The AMC-16 satellite capacity reduction resulted in an adjustment to the monthly revenue payments by the customer," said an SES statement released along with their half-yearly financials. "The payloads are split between AMC-2 and AMC-4," said Bausch, "so there is no commercial impact."

The SES statement suggested that the problems, while now understood, might still get worse. "Together with Lockheed Martin, we have undertaken an extensive assessment of the potential impact of solar array circuit anomalies across the fleet. There is some potential for future additional degradation, although the likelihood of this is difficult to estimate.

SES has in-orbit backup capacity for certain of these satellites. If the observed solar array circuit degradation continues at historical rates, over time we may need to switch off additional payload on affected satellites or advance the procurement of replacement satellites."

By any measure this is bad news for Americom. While at Corporate HQ the financial compensation problems might be resolved, it is always difficult to adequately compensate clients for months, and in this case, years of lower power and technical problems. Americom placed the first-ever order for an A2100 satellite, AMC-1, which was launched in September 1986. Since then, Lockheed Martin has built more than 30, which must be a worry for its other satellite operating clients. This client list includes SES subsidiary New Skies Satellite and SES Astra, and in total SES operates nine of the L-M A2100 satellites.

The information is also bad news for Lockheed Martin. It was only a couple of years ago that the giant defence operator received an award (from Frost & Sullivan) for two years running for "satellite reliability", and specifically highlighting the A2100 models. "Frost & Sullivan concluded that the A2100 is the most reliable satellite now available for a majority of satellite services," said a statement at the time.

L-M's A2100 satellites are built at their Sunnyvale, California plant, and in addition to SES, has been a regular supplier to Echostar as well as ChinaStar, KoreaSat, Canada's Telesat, Indonesia's Telkom and others. Some 30 craft have been supplied in total.

CFO Mark Rigolle, questioned on the state of play in regard to insurance compensation on the A2100 problems, explained: "There has been a claim filed, and there will be proceeds once we come to an agreement with the underwriters on AMC-4." Rigolle said that AMC-16 falls under a new group policy in place at SES, and the mechanics of that claim were still being considered.

SES also revealed it had contracted Thor-2 (owned by rival Telenor) to operate at 5° E (although in Inclined Orbit) alongside Sirius-4. Thor 2 was redundant as far as Telenor was concerned, having been replaced earlier this year by Thor-5. Thor 2, in addition to being put to work at its new position, also protects ITU regulatory filings SES has filed for the future development of the position. Bausch explained that SES had a contract in place with a client for the lifetime of the satellite. "It could also serve at other orbital positions," he said.

by Hartley & Pattie Lesser

Publications, digital and analog, broadcasters of all ilk, CEOs and CTOs, businesses, prosumers and consumers, all function best when acquired knowledge is put to use. We are a hungry lot — hungry for content, whether static or graphic, animated or sedated. We devour content — video, music, sound, text, graphics, and data. Thankfully, the digital age has arrived and continues to mature with more advanced technologies. These advancements ease our insatiable appetite for content by offering viewing and delivery options heretofore relegated to the realm of science fiction. (Hello? Capacity?)

Where do we, the sat and digi folk, find this much relished content? Any number of venues — from reading informative magazines, such as *SatMagazine*, *Milsat-Magazine*, and **digiGO**! — to web-based news sites, HD television, radio, mobile feeds and, yes, even the rumor mill. All of the aforementioned can, and in most cases are, brought to you courtesy of the satellite's downlink of content, be such HDTV, data, imagery, voice and more.

In spite of the expense involved, there is also another venue where "face-to-face" rules the day. Where expertise is display via a plethora of subject matter experts, and where business and friendships thrive — the trade show.

The **IBC 2008 Conference** is definitely one of **THE** major expositions conducted in Europe. For *SatNews* **Publishers**, this show offers new contacts, concrete content, and "chummanship". From our satcom and milsatcom publications through our pro digital world offering, IBC is a show not to be missed. Given the event's tagline — "The world of content management delivery" — you will understand why thousands in our industries make the trek to Amsterdam.

Businesses and individuals attending IBC continue to grow each year in number. This is amazing, given the ever increasing cost for such attendance. Proof that something worthwhile is always worth the expense. This year, IBC will be "open for business" beginning at 12:00 noon on Friday, September 12th. Then from Saturday, September 13th, through Tuesday, September 16th the doors are open from 9:30 a.m. through 6:00 p.m. Yes, you will need to spend quality time each day at the RAI Center if you wish to ensure a full content feeding frenzy!

Amsterdam's RAI Center, the IBC 2008 home

There are, basically, five reasons for IBC's popularity — to *buy*, to *sell*, to *learn*, to *network*, and *to be inspired* — worthy motivators for attendance. So if you believe this show is for you, we recommend you make your arrangements as quickly as possible.

We discussed the IBC mystique with some of the folk in Europe who know the show very well. *Paul Claydon* of **PBLSat** believes, "IBC is important to PBLSat because our largest customer base is across Europe and the Middle East. This exhibition gives us the chance to meet a high proportion of these customers in an informal setting, and to review the services we have provided and appreciate the potential in new opportunities. IBC also offers a showcase and marketplace for the industries latest technologies enabling us to stay on top of latest developments and giving us the opportunity to discuss benefits and integration processes direct and face-to-face.

"As we are a new company, we are constantly developing new products and services; we have increased our stock in Eutelsat W1 capacity and now have 18 MHz

available for occasional use services, which has been very welcome news to many of Europe's broadcasters. In addition, we have recently launched PBLSat LiveNet offering fibre from all major UK sports grounds and exhibition venues; we have made the complete connectivity map available for download."

How about your "favorites" in Amsterdam? Paul answered, "I have always enjoyed the buzz around the Rembrandt Plein, the area is full of popular bars and restaurants. For a more refined dining experience try the Altmann Restaurant at Amsteldijk 25." Thanks, Paul.

Colin Morris of **PPM** also sees IBC attendance of value to his company. "PPM will be attending IBC this year because we see the show as key to reaching many of our existing and new customers alike. As with most players in the satcom and broadcast industry, many of the exhibitors are also PPM customers who have either bought ViaLite solutions, or are looking to buy. In this

case, IBC provides a valuable opportunity to meet up with many of them and discuss solutions to problems and ongoing projects.

"PPM will be exhibiting four new additions to the existing ViaLite range. The first will be a plug-in SNMP module that's capable of monitoring up to two fully populated ViaLite racks of equipment. Then we have two new Wideband RF over Fibre modules with bandwidth coverage from 2 KHz to 4.2 GHz, and one with an additional ability to carry low speed (19.2 KB) digital data alongside the main carriers. Last, but not least, we have a new data module capable of carrying traditional serial data in RS232, 422 and 485 formats over bi-directional fibre links." Colin added, "I would recommend [your] readers attend the IBC party, which is a great place to unwind at the end of the show, as well affording you the time to network with other exhibitors. Plus, the food is great and you can relax with a beer or two as well!"

UDcast is certainly going to have a presence at IBC, where they will be demo'ing the next advance for the TV industry — targeted advertising. According to *Filip Gluszak* of UDcast, "Jointly with PacketVision, the U.K.-based specialists when it comes to targeted IPTV advertising, we will create a live demo of geographically addressable ads in Mobile Television. One of the particularities of this system is that it is designed to benefit satellite prime distribution of TV content and the commercials. The targeted advertising will increase the revenues of TV broadcasters, while making the commercial breaks more acceptable to end-users, as the ads will be more relevant to their needs."

Vizada's *Eric Cueppens* believes IBC is a must-attend show for companies who have connections to the media segment. His firm has attended IBC for several consecutive years, with the venue proving to be a most amenable area to meet their network of more than 500 service providers, as well as to network and meet existing and potential media company clients.

"Last year, at the IBC 2007 exhibition, CNN, partnered with Vizada and service providers L-3 Global Communications Solutions (GCS) and Galaxy 1 Communications, and won two awards: the IBC Innovation Award (Content Creation category) and the IBC Judge's award for innovation. The awards were for coverage of the Israeli-Hezbollah conflict in July 2006, using the BGAN (Broadband Global Area Network) mobile satellite technology and service. Several CNN journalists were able to report live through BGAN from locations all over the conflict zone and other key sites in the Middle East as events unfolded."

Those In The Know...

A guide to the companies we are visiting at IBC reveals the firms whose presence we believe are important to acknowledge from a technological and business side. Our "**MUST SEE**" IBC visit list in alphabetical order...

Advent Communications: Stand 1.A61

Advent Communications is planning to unveil an enhanced version of their 1.5-m and 1.8-m **NewSwift** antenna, which will support high power C- and Ku-band RF and HD system requirements. The enhanced NewSwift antenna will have a larger electronics pod to accommodate a pair of 400W C- or Ku-band TWTAs, either as 1+1 phase combined or 1:1 redundant pair, or a 1:1 redundant pair of 750W C or Ku-band TWTAs, or a 1:1 redundant pair of outdoor SSPAs. The NewSwift's compact and lightweight design is styled to meet the operational requirements of the antenna and vehicle onto which it will be mounted. There are also five new additions to Advent's 1U ½ rack width 5000 Series range, which will also be on display for the first time: the Advent receiver/decoder **IRD5000**, the Advent SCPC IP modem **ADM5000**, the Advent Multiplexer router **AMR5000**, the Advent Protection Switch **APS5000** and the Advent System Controller **ASC5000**. Also on show will be Advent's **DVE5000** 1U ½ rack width encoder/modulator, now with MPEG-4 PT10, H264 SD & HD 4:2:0/4:2:2 encoding, SNMP and web browser control options.

AMOS by Spacecom: Stand 1.C36

With **AMOS-4** already on the drawing boards, AMOS-5 is also now a confirmed build... on July 30, in Tel Aviv, a contract was signed between the **Reshetnev Company** and Israeli-based **Spacecom**, which will result in the building of the geostationary satellite system **AMOS-5**, based on the **Express-1000H** platform. Spacecom operates the AMOS satellites, which offer a broad range of communications and broadcasting services to Europe, the Middle East, as well as making that all-important connection to the U.S. East Coast. **AMOS-3** was launched on April 28th of this year from Baikonur.

EVENT PROFILE

ArabSat: Stand 4.B78

Founded in 1976 by the 21 member-states of the **Arab League**, **Arab-sat** has been serving the Arab world for more than 30 years. ArabSat carries 340+ TV channels and 160+ radio stations, reaching tens of millions of homes in over 100 countries across the Middle East, Africa and Europe. The Company operates a growing fleet of 4 satellites at the 26° E and 30.5° E positions of the geostationary orbit, One of their latest accomplishments was the broadcasting of the Beijing Olympics throughout the MENA viewing area via HDTV on **ARABSAT Badr-4** satellite in collaboration with *Arab Satellite Broadcasting Union* "**ASBU**". The company plans an aggressive fleet deployment of one new satellite per year from 2008 to 2011.

ASC Signal: Stand 1.C31

ASC Signal is a global manufacturer of antennas and RF electronics for enterprise and consumer satellite communication applications. The Company has more than 70 years experience in the design and manufacture of communications products. In addition to hardware, ASC Signal provides solutions-based services such as turn-key system design, engineering, installation test and maintenance, product integration and program management. The Company recently launched their **4.6 Meter Trifol**d® Transportable antenna, which is F-1 and E-2 Ka-band compliant, and available to customers around the world. ASC Signal's 4.6 Meter antenna compliments the popular ASC Signal 3.7 meter and 4.5 meter Tri-fold® antenna products. The Company in July signed an agreement with **Globecomm Systems, Inc.** (GSI) to supply commercial-off-the-shelf (COTS) antenna products. ASC Signal was selected to provide antenna products that support the recent major award to GSI by a global, multilateral organization.

Foxcom: Stand 1.F33

Foxcom has been developing fiber optic solutions for pro satellite, TV, and video distribution markets since 1993. The Company's latest release is their **Sat-Light/Platinum** suite, which includes a full range of L-band, IF, and wideband transmitters and receiver satellite communication links that offer high RF input power and wide dynamic range. The user has full control of the all-important functions via the front panel LCD, or by using a MCP card in the chassis. The company has also integrated all of their point-to-multipoint products under the **BsmarTV™** brand. This brings HDTV, voice, and high-speed data to the user through a single wire and into the home.

GlobeCast: Stand 1.A59

GlobeCast, a subsidiary of **France Telecom**, is a provider of content management and worldwide transmission services for professional broadcast delivery. The Company operates a secure global satellite and fiber network to manage and transport 10 million hours of video and other rich media each year. Such provides ingest, aggregation, transmission, and repurposing of content for delivery to DTH satellite platforms; cable, IPTV, mobile, and broadband headends; as well as corporate and digital signage networks. GlobeCast's fleet of SNG trucks is deployed globally to support coverage of the biggest news and sporting events each year in SD and HDTV formats. One of GlobeCast's latest projects was the upgrade of their HD infrastructure and formation of new strategic alliances in the Americas. The firm installed new state-of-the-art encoding and converting equipment at its broadcast center in Culver City, California, using gear that included MPEG-2 and MPEG-4 HD decoders and the **Snell & Wilcox** *Alchemist Ph.C*™ HD standards converter with motion compensation. GlobeCast can receive and process HD signals into any international format as well as down convert to SD and deliver the signal worldwide using a combo of MPEG-2 and MPEG-4 HD/SD compression.

Hellas Satellite Consortium Ltd.: Stand 4.A71

HELLAS SAT owns and operates the **Hellas-Sat 2** satellite located at **39º E**, which offers services in Europe, the Middle East and Southern Africa. HELLAS SAT is a subsidiary of **Hellenic Telecommunications Organization** (OTE SA) and operates two DTH platforms in Romania (Dolce) and Bulgaria (Bulsatcom). **Hellas-Sat 2** has emerged as one of the most popular satellites in the region. The number of the households served by the satellite is estimated to be well in excess of one million in number. The Company further strengthened its position in the international satellite market, especially in Europe and Middle East, regions where utilization rates approach 100 percent, making it 79 percent for the total of the satellite capacity. The total number of TV channels broadcasted on the satellite reaches 170, including the transmission of an HDTV channel in cooperation with the *Greek Ministry of Communications and Transportation*. During the last year, HELLAS SAT has also initiated cooperation with the national PTT of the *Republic of South Africa* for its combined voice and data satellite services.

Hiltron GmbH: Stand 4.B89

Hiltron is a leading European system integrator, manufacturer, and distributor of satellite communication and wireless broadcast solutions. The Company designs and manufactures pro controllers for redundancy switching, monitoring, and control of communication equipment based on their controller platform, **HCS3**. One of their most recent debuts is the Hiltron L-Band **Matrix HMS**, built as a distributive (non-blocking) matrix. Any input may be routed (switched) to as many outputs as desired. It can be used to switch/connect 16 single signals to up to 32 independent outputs in one small and lightweight rack mountable 19-inch unit (5HU). The unit was initially developed for IPTV Headends to provide redundancy switching in case of failure and flexible routing of the required signals to the receivers. For this application the matrix is optionally available with a level (LD) detection and monitored LNB power supply (LNB). All essential parameters can be controlled and motored via Web-interface, or the remote control interface via UDP/IP protocol.

Hispasat: Stand 1.A34

Spanish satellite operator **Hispasat** offers a wide range of commercial and governmental communication services including broadcasting, broadband and advanced systems. The **Hispasat-1D** satellite's coverage includes Europe, North Africa, and America, at **30º W** (1C & 1D), at **61º W** (Amazonas) and governmental services in X- and Ka-bands through **HISDESAT** (Spainsat and Xtar-Eur satellites). The Company recently initiated a beam over the Middle East to the 1D satellite's coverage zone to provide American and European clients (and vice versa) access to Asian satellites via a double link, and nearly achieving global coverage. The satellite was launched in September of 2002 and was Hispasat's fourth satellite launch.

Intorel: Stand 4.A49

Intorel develops monitoring and control solutions for the broadcast and satellite industries. The company's **Visionic** platform is used by satellite operators and broadcasting companies around the world. **Visionic** directly, or remotely, operates any number of satellites and broadcasting devices, from any manufacturer worldwide, via a click-and-drag interface. Visionic is based on **MS Visio** and allows any recognized satellite or broadcasting component, regardless of its complexity, to be displayed, operated and modified on screen by system engineers in broadcast centers, satellite uplink and TTC stations. At IBC, Intorel will be debuting their

new 4.0 version of Visionic, which includes new beta testing spectrum analyzer software. In addition, this new Visionic element can be used independently and without Visionic, as well as fully integrated into it. The **Visionic Professional** system compiles *Microsoft Visio* drawing into a modern, state-of-the-art M&C (monitor and control) system.

ND SatCom: Stand 1.C51 + OE320

An **SES ASTRA** company, **ND SatCom** is a supplier of satellite-based broadband VSAT, broadcast, government, and defense communication network and ground station solutions. As a global company with more than 25 years of experience in the satellite networks and systems businesses, ND SatCom is a reliable source of turnkey and tailored system engineered solutions. ND SatCom will be presenting their new **SkyRAY Light IPS HD**, an end-to-end video streaming solution that incorporates the latest **SkyWAN®** modem as well as advanced H.265/MPEG-4 AVC HD/SD encoder technologies for high video quality. The product is easy to operate by non-satellite users and features fully automatic antenna pointing and one-button operation. There's an intuitive touch screen for all functions, and remote control is also possible from the studio. This system can be ready for video streaming in less than 10 minutes and can be quickly and easily installed on most any vehicle.

Newtec: Stand 1.C51 + OE320

Newtec delivers a range of products and solutions to their customers within the satellite and telecommunications industry. Clients include TV broadcasters, telecom service providers, and satellite operators across the globe. Founded in 1985, Newtec offers a range of products that include highspeed DVB and DVB-S2 modulators, DVB-RGS based IP broadband access networks, DTV

and radio distribution networks, as well as interactive Satmode TV networks. Just recently, their **Tellitec®** IP Software product *TelliNet* was selected by satellite broadband supplier **ND SatCom** to be integrated with the **SkyARCS** platform to provide fast and secure Intranet access via satellite to the **Bundeswehr** (German Federal Armed Forces). Additionally, the Company recently conducted successful satellite transmission tests using their Azimuth equipment with the Russian operators, **RSCC** and **Gascom**.

PPM: Stand 1.A10

Pulse Power & Measurement Ltd. (**PPM**) now provides a large range of RF-over-fiber products. The Company's **ViaLite** products are used in the transmission of analogue, RF, and digital data signals over optical fiber for telephone and satellite ground stations, **TETRA** mobile radio networks, cellular antenna remoting, metro GPS, GPS timing and TV/broadcast signal distribution applications. The ViaLite fiber optic link range removes the need for users to understand the complexities involved in sending RF signals over optical fiber. A variety of channels are offered that range from 1 MHz to the new 4.2 GHz bandwidth. Users can purchase a ready-to-go system off the shelf as well as supplying some of the largest Earth stations across Europe, such as the *European Broadcasting Union*. PPM constantly strives to improve existing product solutions and is launching a new version of ViaLite at IBC 2008.

RRsat: Stand 1.A40

RRsat provides uplink, downlink, turnaround, and playout services, offering end-to-end transmission for TV, radio, and data channels. Also offered are production services to the global satellite broadcasting industry, which includes channel distribution and backhaul services, SNG,

sports feeds, and other occasional feed services. The Company's teleport has several, fully equipped playout centers, production support, and various value-adds, all using advanced digital MCPC platforms, currently in support of more than 285 TV channels, more than 80 radio channels, with coverage to more than 150 countries. In fact, in early July, RRsat signed an agreement with **WatchIndia TV**, a popular video platform supporting live and on demand broadcasting of well-known Indian TV stations worldwide. WatchIndia TV is a subscription-based service that enables the global Indian Diaspora to watch local Indian channels and programming through the Internet. WatchIndia TV is a subsidiary of Live Asia TV.

SAT-GE + Satlynx: Stand 12P.C38

SAT-GE offers satellite capacity on their **GE-23** satellite, formerly **AMC-23**. With coverage of the Pacific basin, the satellite brings into play one C- and five Ku-bands for landmass and ocean coverage from Perth in Australia to Los Angeles in the U.S. and from Alaska to South New Zealand. The complimentary exhibitor, **Satlynx**, is an end-to-end managed network service provider, and they will be unveiling their new contribution — *Satlynx Media Streaming,* a combination of product and service. Satlynx comprises a transportable solution for the encoding of captured video and its transmission via satellite to a Satlynx teleport. From there, streamed media can be routed anywhere in the world via its global VPN infrastructure, or via a dedicated circuit if required.

SatService: Stand 1.F55

Offering turnkey solutions and products for satellite-based communications, **SatService** provides solutions with quick reaction times, with a wealth of experience having worked on numerous Earth station and VSAT installations throughout Europe. Plus, the Company

operates a service center for the repair of satellite ground stations. At IBC 2008, SatService will be exhibiting their own equipment, ranging from M&C systems and network management systems, to L-band distribution amps, switch matrixes, and optical links as well as I/O frontend processors and more. The company occupies a two floor building with more than 400m2 working space with offices and two laboratories for software/hardware development and testing.

Sintec Media: Stand 2.B41

This Company provides management solutions for the media industry, including their flagship product, *OnAir*. Leading networks in North America, Asia, and Europe (such as CBC and BBC) use the OnAir solution for managing airtime sales, traffic, programming, rights management, as well new media use. Founded in 2000, the company addresses the needs of DTV, VOD, and PVRs to assist in maximizing revenues. Earlier this year, **STAR Group** (a wholly-owned subsidiary of News Corporation) selected OnAir to manage its broadcast ops, which was no small matter, given that STAR broadcasts more than 60 channels in ten languages to 53 countries across Asia and around the globe.

SISLink: Stand 1.D35 + OE330

(**SISLink** is one of Europe's largest suppliers of satellite uplinks. Company services are provided to a wide range of leading news, sports, and outside broadcasting organizations. One of the Company's largest assets was the April acquisition of the **BBC Outside Broadcast Division** from **BBC Resources Ltd**. Upon completion of that deal, SISLink was able to own and operate the BBC Outside Broadcasts fleet of TV production units as well as sound, support, and communications vehicles, plus some award-winning and rather special cameras. Founded in 1987, the Company also cemented into place a

strategic alliance with **Intelsat**, which enabled the firm to introduce their services into the U.S.

SWE-DISH Satellite Systems: Stand 1:A39

The Company is expanding their **CommuniCase® Technology** (CCT) terminals to feature Ka-, X-band and Ku-band capability. The new CCT systems will support mobile warfighters operating beyond the edge of the network to improve bandwidth availability and communications flexibility by using the *Wideband Global SATCOM* (**WGS**) system. The WGS system supports U.S. military operations worldwide by supplementing commercial capabilities. Military, intelligence, and other users will be able to use the new CCT terminals to leverage the WGS system as well as other military and commercial networks. **SWE-DISH** is a **DataPath** company.

UDcast: Stand 1.E90

UDcast provides IP broadcast solutions for wireless network environments around the world. The Company supplies mobileTV head-end and distribution solutions as well as provides all-in-one WAN optimization controllers to enhance the performance of satellite, terrestrial, and WiMAX data networks. The firm has also received prestigious awards from Red Herring and Innovation Stars. At IBC 2008, UDcast will be demo'ing what they believe to be the world's first solution for targeted advertising for mobile TV. Examples of a geographically targeted ad campaign will be presented, showing how content can be delivered to mobile TV users over standard DVB-H networks. **UDcast Mobile TV** is already integrated into the transmitters of a number of vendors, and additional announcements may be expected at IBC 2008, as well.

If Only We Had The Time…

There are a number of firms we wish we could also visit... unfortunately, due to a limited schedule and the enormous number of firms at the show, such is not to be... however, others should not miss these opportunities...

Advantech AMT, Booth 1.A11, provides satellite and terrestrial wireless communications solutions, with three business units and facilities in Europe, Canada, and the U.S., featuring their mobile antenna solutions for DSNG and VSAT flyaway.

AnaCom, Inc., Booth 1.F41, manufacturer of satellite transceivers with carrier-grade, integrated networks for IP transport over satellite, covering all satellite commercial frequencies.

AVL Technologies, Booth 4.B54, designs and manufactures mobile, motorized antenna systems and positions, featuring their patented **Roto-Lok®** cable drive system, auto-acquisition controllers, and carbon fiber reflectors, and demo'ing their antennas for SNG, C-, X-, Ku-, DBS-band and Ka-band for military and other specialized applications.

Comtech EF Data, Stand 4.A51, manufacturer of satellite communications equipment that includes modems, bandwidth and capacity management, IP Encapsulators, receiver, amplifiers, converters, BUCs, transceivers, and terminals.

Intelsat, Stand 1.C71, provider of FSS worldwide, with telecommunications solutions available to 99 percent of the world's regions, also possessing extensive teleport and fiber infrastructure.

MITEQ Inc., Stand 1IA18, manufactures a variety of subsystems and components for satellite and microwave communications, ranging from IF through Ka-band. Their impressive product line includes up- and down-converters, translators, redundant switchover units and amplifier systems, **INMARSAT** equipment, video mods and demods. In addition, the firm has 22 supporting sales agencies and 13 service organizations located around the globe.

Paradise Datacom, Stand 1.C28, designs and manufactures a complete range of satellite modems, SSPAs, BUCs, LNAs and redundancy equipment. They'll also be showing their latest additions and enhancements to their *Evolution Series Modems*, *Vision Series* DVB-S2 modems, their solid state power amps, and their nexgen vBUC.

Radyne Tiernan Xicom, Stand 1.D41, will present the Radyne satellite Earth equipment, satellite modems, frequency converters and DVB modems. They will also showcase their hub-less TDMA modem, **Skywire** — Xicom will demo their high power and compact SSPAs, TWTAs, and Klystron amps — Tiernan will show their HDTV and SDTV encoders and decoders as well as audio and data receivers.

STMicroelectronics, Stand 1.F89, brings semiconductor solutions across the entire spectrum of microelectronics applications for the digital consumer market, including STBs, DVD, TV, audio. They'll also have solutions for multimedia applications, application processors, and energy management as well as wireless connectivity and mobile imaging, with presentations regarding their display ICs and devices for wireless and wireline network infrastructures.

Wait… There's Even More…

IBC continues to be a must-visit event for professionals from all over the world who are interested in the entire scope of electronics communication. IBC 2007 witnessed more than 1,300 companies exhibiting from 130 countries, with an audience exceeding 46,000 in number.

Sunday night is awards night. Leading the celebrations will be the winners of IBC's four **Awards for Innovation**. These awards honor the partnerships between suppliers and users, who incorporate technology into real, creative, commercial service.

IBC 2008 should satisfy all. We look forward to meeting you at the show in Amsterdam. Select the graphic below for full conference and registration details.

John L. Pittas
Consultant, Video and Broadcast Technology
Fujitsu Computer Products of America (FCPA)

John Pittas provides guidance for Fujitsu's MPEG-4 AVC codec products to FCPA's New Products Group. Codecs are critical to the success of broadcasting and to any company's bottom line, which is why John's strategic technology and business development planning for TV broadcast products being brought to Fujitsu's Strategic Planning Office stream is so important. He joined FCPA in 2006 and has been instrumental in introducing the company's MPEG-4 AVC HD Codecs into the U.S. broadcast market. He possesses more than 30 years of experience in film and video production, video circuit and system design, and broadcast product and engineering management.

Today's broadcasting industry has seen an increase in demand for High Definition (HD) news content. While many national, and some local, news programs are being broadcast in High Definition, and due to the high cost of satellite transmissions, remote news broadcasts in HD are quite rare. Fujitsu announced the IP-9500 MPEG-4 AVC HD Encoder for broadcasting companies that desire to transmit remote HD content through existing satellite configurations, while minimizing costs by using only a single satellite channel.

SatMagazine

Good day, John. We appreciate your time in helping us to understand the role being played by Fujitsu and their IP-9500... would you please provide us an overview of the encoder? Why did Fujitsu decide to introduce this product to the global market?

John Pittas

Fujitsu has been in the video compression, end-user business for more than 20 years, but their technology and products were initially focused and contained within Japan. Once MPEG-2 arrived, Fujitsu adopted the MPEG-2 standards for Standard Definition (SD) and eventually for High-Definition (HD). However, we've since found that while MPEG-2 was fine for SD, this was not an optimal technology for HD. For example, MPEG-2 for HD requires very high bit rates, typically 20 Mbps or more, to produce high-quality pictures. This often exceeds the channel capacity of many transmission systems, particularly if multiple HD signals are carried.

When MPEG-4 AVC debuted, Fujitsu adopted the format due to its ability to produce very high-quality HD pictures at low bit-rates. In fact, the company's research labs in Kawasaki, Japan are now considered one of the world's leading laboratories of MPEG-4 AVC compression research and algorithm development. Our IP-9500 MPEG-4 AVC encoder was introduced to the Japanese market about two years ago and is currently available to the U.S. and global markets. While the global broadcast industry is now just witnessing what appears to be the first video compression product from Fujitsu, our technology actually has a long and storied history in Japan and the products are widely deployed there.

SatMagazine

John, what are your current product offerings? Can you talk about their features?

John Pittas

Fujitsu has two primary MPEG-4 AVC products. The flagship product is the IP-9500, an MPEG-4 AVC HD/SD encoder and decoder, primarily offered as an encoder, but which can also be used as a decoder, if needed. The IP-9500's most sought-after feature is the very high picture-quality that it yields.

Fujitsu IP-9500 MPEG-4 AVC HD/SD encoder

Those within North American broadcast networks have stated Fujitsu has the best MPEG-4 AVC HD picture-quality in the business, which is mostly due to years of research completed in the labs. The IP-9500 lends itself to picture optimization based on the Human Visual System (HVS) response. The labs have developed special algorithms that optimize picture quality based on how the Human Visual System perceives images. It was found that the HVS of the average observer is primarily focused on moving objects, foreground objects, and facial features. We've optimized picture quality so that these regions of an image appear with greater accuracy and are resolved in higher detail, as that's where the average observer's attention is primarily concentrated. Fujitsu is currently the only company with this specialized capability.

Our other product, the IP-9500D, is a dedicated MPEG-4 AVC decoder that uses much simpler technology and is less expensive, but cannot be used as an encoder.

SatMagazine

Are you experiencing growing interest in the IP-9500? How does the IP-9500 differentiate from the competition?

John Pittas

Absolutely! As some of *SatMagazine*'s readers may know, CBS News selected the IP-9500 as their preferred encoder for HD Satellite News Gathering (HD-SNG). In addition, the 2008 State of the Union Address was broadcasted by CBS in HD using our product, as will be the Republican and Democratic National Conventions.

The primary differentiator is our very high HD picture-quality, which applies to all the various applications of the encoder. For example, for SNG we've provided a special low-latency mode that significantly reduces the delay through the encoder and the decoder, down to 300 milliseconds or less. Other MPEG-4 AVC vendors are transmitting with a two- to three-second delay. The IP-9500 enables a SNG shot from a remote field location back to the studio where the field and the studio talent can have a conversation without annoying delay. The encoder operates similarly between two remote field shots, as well. Long latency slows down an interview, making it awkward. Reducing the latency allows the interview to flow more naturally, as would a normal conversation.

SatMagazine
How quickly do you see broadcasters moving to HD-SNG? Do you think it will be necessary to remain competitive?

John Pittas
To answer the second part of your question first, most certainly! It will be a trickle-down effect with the major networks adopting HD-SNG first. News networks will adopt HD-SNG in order to remain competitive because, once one organization uses the technology, and their pictures look superior, viewers will immediately detect a difference. The network using HD-SNG, offering the highest picture quality, could certainly change viewing habits.

We believe 2008 will be the first year of accelerated adoption of HD newsgathering. We are talking to major broadcast networks, news, and cable programming networks about deploying the IP-9500 — they all want to maintain the highest picture-quality from "glass-to-glass" (the glass of the camera lens, through their system, to the glass of the viewer's display).

SatMagazine
It's grand when a technology can deliver so much more to the consumer. However, migration is always a rocky road... do you see any obstructions to this adoption?

John Pittas
From a technical point of view, I don't think that there are any roadblocks. If you couple MPEG-4 AVC en-

coding and decoding with DVB-S2 modulation, which provides more bandwidth on a satellite transponder, such makes for a smooth transition to MPEG-4 HD newsgathering.

There are other potential roadblocks that are not necessarily technical in nature. Pricing is one issue, and not everyone immediately appreciates the value of the new technology. Buying new encoders, decoders and other technologies, and deploying them into existing transmission infrastructures, does not occur overnight! Such a rollout typically takes a year or two. I think 2009 will be the breakout year when MPEG-4 AVC in SNG becomes more commonplace. At the point when organizations see one or two of their peers making the transition, it's just a matter of time before they all jump on-board in order to remain competitive.

SatMagazine
What are the advantages of MPEG-4 AVC versus MPEG-2 compression technologies?

John Pittas
The great advantage of MPEG-4 AVC over MPEG-2 is in picture-quality versus bit-rate. For HD pictures, we typically find MPEG-4 AVC can deliver equivalent picture-quality at one half, or even less, the bit-rate needed by MPEG-2. This is a significant improvement!

This means an HD picture that required 18 Mbps to 20 Mbps in MPEG-2 can now be delivered with 9 Mbps to 10 Mbps. This bandwidth improvement will result in immediate and significant savings to the network through the reduction of transmissions costs. We are just at the front end of the learning curve for MPEG-4 AVC, whereas MPEG-2 is a mature technology with little incremental improvement in the years ahead.

As the art and science of MPEG-4 AVC rapidly improves, the technology is poised to deliver even better HD pictures at significantly lower bit-rates when compared to MPEG-2. For example, our current lowest bit-rate for broadcast quality HD is 4 Mbps. This is an over 200:1 compression ratio that is impossible to achieve with MPEG-2. Over time, we foresee achieving even better picture quality at these extremely low bit-rates.

MPEG-2 has been a workhorse and revolutionized SD newsgathering. MPEG-2 allowed digital signals to be transmitted back to the studio with a crisper picture and much more cost effectively than previous-generation analog technology.

However, the bit-rate advantage of MPEG-4 AVC over MPEG-2 directly translates to cost savings. When it comes to SNG, the largest cost in the system is the satellite transponder — essentially renting time on the satellite to transmit the signal from the field to the studio. When MPEG-2 arrived, broadcasters could manage eight to 10 digital SD signals on a

IP-9500 Specifications				
Model				**IP-9500**
Video	Input			1 x HD-SDI 1 x HDMI
	Genlock Input			1 x NTSC/PAL Black Burst or HD Tri-level Sync
	Output			1 x HD-SDI 1 x HDMI 1 x NTSC/PAL (Down-converted)
Audio Input/Output				4 x AES Pairs embedded in HD-SDI (48KHz) 1 x HDMI 1 x Analog Stereo Pair (Balanced)
Network Interface				10BASE-T / 100BASE-TX / 1000BASE-T DVB-ASI
Video	Format	HD	1080i	1920/1440/960 (59.94/50Hz)
			720p	1280/960/640 (59.94/50Hz)
		SD		720 x 480i (59.94Hz), 720 x 576i (50Hz)
	Coding	HD		H.264 HP@L4, 4Mbps – 27Mbps
		SD		H.264 MP@L3, 2Mbps – 10Mbps
Latency	IP	Low		500ms
		Standard		1.6s
	DVB	Low		300ms
		Standard		1.4s
Audio Coding	Program			MPEG-1 L2, MPEG-2 AAC SMPTE 302M uncompressed audio (Dolby® Pass-thru)
	Voice Intercom			G.711
Error Correction				Pro-MPEG, Fujitsu FEC and ARQ
Size				425 x 350 x 42 mm (1RU)
Power Supply				100 – 240VAC
Operating Temperature				-10 ~55 deg. C
Certifications				UL, CE, FCC, RoHS

transponder, instead of the previous two analog signals. This made it much more cost-effective to use a satellite. Nevertheless, you cannot achieve the same number of HD signals on a satellite by using MPEG-2.

With MPEG-4 AVC, broadcasters can radically reduce the bit-rates required for HD. Instead of 18 Mbps for an HD-SNG shot, we can use 8 Mbps or 9 Mbps. Broadcasters are currently using 5 MHz to 6 MHz of satellite bandwidth for a single SD-SNG camera shot. By coupling MPEG-4 AVC compression with DVB-S2 modulation, they can transmit HD in the same satellite bandwidth as SD. This is hugely important! This directly translates into a better product for a news organization as they can use their existing satellite budget all the while delivering a higher quality picture. Without the development of MPEG-4 AVC and DVB-S2, this would not have been possible.

SatMagazine
What are the costs — and cost savings — broadcasters can expect when moving to MPEG-4 AVC?

John Pittas
As mentioned earlier, when you take MPEG-4 AVC compression and couple it with DVB-S2 modulation, you can now use the allocated SD satellite bandwidth for HD. You can get an HD shot with no changes to the satellite bandwidth whatsoever, using one transponder slot. Where our competitors advocate using two satellite transponder slots for transmitting HD, we use just one. When it comes to costs, these can be in the 10s of thousands of dollars. The IP-9500 allows broadcasters to spend the same amount of money on satellite bandwidth and deliver the highest HD picture quality on the market.

SatMagazine
How does Fujitsu see Pro AVCHD for advanced MPEG-4 encoding? Will it play a role in company products?

John Pittas
AVCHD pro is a technology that uses MPEG-4 primarily to address what I call "prosumer applications". That is, a codec that is designed to give acceptable picture quality at a low cost and low bit-rate for people who straddle between high-end consumer equipment and low-cost professional equipment. It is primarily used for people who are doing recordings directly to memory. However, AVCHD is somewhat irrelevant because people are now using AVC cams with solid state instead of memory.

Fujitsu foresees that AVCHD cameras are good for the prosumer video market, but not generally applicable for broadcast-quality newsgathering. Newsgathering requires low bit-rates and high picture quality. News producers want to maintain the highest picture quality possible at the camera, because these images will get stored and edited, and re-stored and re-edited possibly many times over, into a finished story. If this process is not managed correctly, each time an image is decoded and re-encoded you will lose picture quality. This means the camera encoder must have the highest picture quality possible in order to preserve picture quality down through the broadcast chain to the viewer.

The AVCHD codec is not appropriate for high quality broadcast, and Fujitsu does not see it as applicable to most newsgathering applications. AVCHD may find use in space-constrained applications, such as in military or security environs, where an inexpensive, small-format camera is highly desirable. For general newsgathering uses, this codec is not a strong fit.

SatMagazine
Do you see the IP-9500 and MPEG-4 technology playing a role in the evolution of DSNG? With digital satellite newsgathering now gathering more and more converts, even over SNG, does Fujitsu have a different role?

John Pittas
Just as analog SNG was eclipsed by MPEG-2 DSNG, five years from now, MPEG-4 AVC will have largely replaced MPEG-2 for HD because it is a more efficient, cost-effective technology. It is possible that some smaller markets will stay MPEG-2 and SD for a while longer, because it makes sense from a business standpoint. However, five years into the future, all the major broadcast and cable networks will have migrated to MPEG-4 AVC for HD and they will never look back.

SatMagazine

Thanks for your insights, John. For those wishing additional information, we conducted an earlier interview with both John and the Director of New Products for FCPS, Dan Dalton, in the attached sidebar. We asked exactly how the Fujitsu approach delivers a better experience to the customer... here is their combined answer... and for readers who wish to learn more, select the Fujitsu logo below to enter their product website!

Dual Input

There are three axes of value that we present to the client: high HD picture-quality, low bit rates, and low-latency. We believe you need all three of those to jump-start the HD-SNG business and deliver a best-in-class product for the customer.

We've applied a novel "slice-based" encoding method for our low-latency, which, while a bit different than the traditional frame-based GOP structures, is fully compliant with the H.264 toolset. Our "sliced-based" encoding allows us to get down to 300 ms of end-to-end delay through the codecs.

In addition, we've implemented a "Region-of-Interest" based encoding algorithm. This models the human visual system's behavior by tracking particular objects and scene contents, which are of greater interest to the human viewer than other areas of the picture.

This encoding algorithm allows us to produce very high subjective picture quality at low bit rates. SNG operators can always upgrade to DVB-S2 modulation to get HD picture quality through higher bit rates. However, even operators using existing DVB-S SNG modulation can receive good HD pictures at 5 Mb/s — you can use existing SD-SNG channels to accomplish HD-SNG.

You can deploy our encoder into existing SNG trucks and receive HD pictures back to the studio. It doesn't matter whether you are doing it for a local or network feed, or for taping or going straight to air. As you may know, one of the requirements for high picture quality in SNG is to survive multiple codec concatenation stages. We've had a number of clients doing tests in their labs at bit rates down to 7 Mb/s with our encoder, while going through five, six, even seven downstream concatenation stages. They still have very good HD picture quality at the end, using our encoder for the space segment.

For example, an incoming feed rarely goes directly to air. You may have to store the content on a server or record it on a VCR for later editing on a NLE system. Between the initial camera encoder and final ATSC transmitter encoder, there are at least four — and possibly as many as six — stages of codec concatenation. Our picture quality still holds up through all of those, even down into the 6-7 M/s range. (Note: ATSC is the acronym for Advanced Television Systems Committee, who are responsible for developing and establishing the U.S.-based Digital-HDTV Standards and Digital TV formats.)

How many trade shows, conferences, and exhibitions do we attend each year? And how many of these events do we leave behind and, a couple of weeks later, all we can recall are our sore feet and the number of corn pads used to protect blossoming blisters? SATCON cannot guarantee you won't still succumb to blisters — after all, there are hundreds of exhibitions to visit, and that does require a few thousands footfalls to ''meet and greet'' successfully.

SATCON is part of the trilogy of events that now comprise **Content & Communications World**, the others being **HD World Conference & Exposition** and the **IPMedia Expo**. The entire component brings attendees coverage of content creation, management, post-production, delivery, infrastructure, and a wide range of communications solutions, from satellite to fiber to hybrid networks, IP, mobile communications and more.

Breaking down the individual opportunities, **SATCON** — the *Satellite and Content Delivery Conference & Expo* assists you with strategy development for managing your communications infrastructure including video, data, voice, and Internet using hybrid networks including satellite, fiber, IP, mobile and wireless. The SATCON sessions include...

Government & Military Track
- **The Policy Rubber Meets the Road**
- **Satellite Technology and the Military: Key to Enduring Relevance**
- **Strategies for the Future**
- **Applications Today: Keeping Us Safe — The Latest in Emergency Management Technologies**

Enterprise Track
- **Making the Case for Satellite — It Just Keeps Getting Easier!**
- **99.99 Percent Network Availability: What Does It Take?**
- **Balancing Commitments, Resources and Changing Application Demands**

- **The Role of Satellites in the Move to Mobility**

Media & Entertainment Track
- **Satellite Newsgathering: The Latest and Greatest**
- **Satellite and the Hybrid Universe**
- **Finite Transponder Capacity: Where Do We Go From Here?**

Satellite Industry Track
- **Investing in the Satellite Finance Sector: Who, Why and How Much?**
- **Satellite Infrastructure — Building, Launching and Operating Tomorrow's Satellites**
- **Fundamentals of Satellite Communications Systems**

The **IP Media Conference & Expo** helps you to discover how video over the Internet, IPTV and IP networks have created the hottest new technologies for media & entertainment, telcos, government & military as well as corporate communications. If you are producing and delivering WebTV or IPTV, are a content owner looking for CDNs and technologies, or a government or enterprise firm using video applications, the latest technologies and strategies for communicating with your employees, customers, partners and consumers will be found in these tracks...

- **IP: Media - The Future of Content Distribution**
- **IP: Media - Content Distribution: Behind The Scenes**
- **IP: Media - Linear and Non-Linear Content Protection**
- **IP: Government & Military - Surviving IP Media Conversion in the Command & Control Environment**
- **IP: Enterprise - Video Relationship Management**

With the **HD World Conference & Exposition** you'll

find the premiere event focused on the challenges and opportunities associated with the implementation of HDTV, film, and other video applications. Participate in end-user panel sessions, workshops and sponsored forums and discuss a variety of strategies for content creation, management and delivery. Find solutions for file-based workflows, encoding, compression, audio issues, network infrastructure, digital asset management, archiving, production, post-production, automation and much more.

HD World Sessions include

- **Content Exchange Formats for HD Acquisition, Distribution & Archiving**
- **Automating Audio Quality; Analysis, Repair, and Manipulation in File-Based or Unattended Workflows**
- **High Definition News: The Next Revolution in Broadcast News Operations**
- **Reminiscing About the Future of Post Production**
- **MXF: Is it ready for you?**
- **Digital TV Transition: AFD and More**
- **Content Management Towards Working Libraries and Archives as an Extension of Your Current Workflow**

Workshops and Tutorials

- **DTV Audio Workshop: Practical Strategies for DTV Audio Loudness and Metadata Management Today**
- **HD Origination: Visually Stimulating the Viewer**
- **Tutorial: Video Compression Advances for Contribution and Distribution**

EVENT PROFILE

And there is even more available to attendees... the SATCON conference speaker list is a "who's who" of the satcom industry. You will find yourself immersed in solid, usable information and, yes, you can also sit down! This impressive list of subject-matter experts is a veritable smorgasbord of industry talent...

- *Robert Bell*, **Executive Director, Society of Satellite Professionals and World Teleport Association**
- *Bob Beyer*, **Chief Engineer, Merrill Lynch**
- *Simon Bull*, **Senior Consultant, COMSYS**
- **Colonel** *Michael J. Carey*, **Deputy Director, Global Operations (DJ3), Global Operations Directorate and Director, Operationalizing the Triad (OTT)**
- *John Celli*, **President, Space Systems/Loral**
- *Paul Chernek*, **TCM - Satellite and Network Enablers**
- *Arnie Christenson*, **Operations Manager, Satellites and Transmissions, CNN**
- *Mike Cook*, **Senior Vice President, Hughes Network Systems**
- *Patricia Cooper*, **President, SIA**
- *Rebecca Cowen-Hirsch*, **Director, SATCOM, Teleport and Services, Program Executive Office, Defense Information Systems Agency (DISA)**
- *Mark Cronin*, **Business Development Director, Arqiva**
- *Hoyt Davidson*, **Managing Partner, Near Earth, LLC**
- *Matt DeLoca*, **VP of Sales, The Feedroom**
- *Chris Ehrendbard*, **Director, Broadcast Distribution, CBS**
- *Tim Farrar,* **President, Telecom Media and Finance Associates, Inc.**
- *David K. Gay*, **Chief, Strategic Communications Management Division, Command, Control, Communications, and Computer Systems Directorate, USSTRATCOM**
- *John Guidon*, **CEO, Row 44**
- *David Hartshorn David David*, **Secretary General, Global VSAT Forum**
- *Susan Irwin*, **President, Irwin Communications (also KEYNOTE speaker)**
- *Pradman P. Kaul*, **President and CEO, Hughes (also KEYNOTE speaker)**
- *Mark Lalley*, **CIO US Fuels, BP America**
- *David Lamb*, **VP, Learning & Media Services, Rollins/Orkin**
- *Alan Langford*, **Network Manager, Internal Communications, JCPenney**
- *Burt H. Liebowitz*, **Principal Network Engineer, MITRE Corporation**
- **Capt.** *Kelly A. McConnell*, **USMC, Space Plans Action Officer, HQMC, PP&O, PLI**
- *John McCoskey*, **Chief Technology Officer, PBS**
- *David McGlade*, **CEO, Intelsat (also KEYNOTE speaker)**
- *Tracy Mehr*, **Managing Director, Investment Banking, Credit Suisse**
- *Andre Mendes*, **Chief Technology Integration Officer, Special Olympics**
- *Ray Milius*, **Senior Vice President, Programming Operations, Starz Entertainment**
- *Susan Miller*, **Senior Vice President of Satellite Services, MSV**
- *Shaum Mittal*, **Chief, Lead System Engineering Office, Prgrm Exec Office- Satellite, Transport & Services (PEO-STS) Directorate DISA**
- *Clayton Mowry*, **President, ArianeSpace, Inc.**
- *Michael W. W. Moyles*, **Maj, USAF, Chief, Force Enhancement Branch, The Space Superiority Panel**
- *Mel Olinsky*, **Director of Bureau Operations, CBS News**

- *Dean Olmstead*, **President, EchoStar Satellite Services (also KEYNOTE speaker)**
- *John Ordway*, **Partner, Berliner, Corcoran & Rowe, LLP**
- *Randy Palubiak*, **President, Enliten Management Group**
- *Dan Pryor*, **Vice President of Corporate Communications and Retail Technology, Safeway, Inc.**
- **Colonel** *Patrick H. Rayermann*, **Director, Communications Functional Integration Office, National Security Space Office (NSSO)**
- *Ron Samuel*, **COO, Eutelsat**
- *Kay Sears*, **President, Intelsat General**
- *Orlando Skelton*, **Vice President Enterprise Services, SES Americom**
- **Dr.** *Arunus Slekys*, **Vice President, Corporate Marketing and General Manager Russia & NIS Business, Hughes Network Systems**
- *Dom Stasi*, **Chief Technology Officer, TVN Entertainment**
- *Brent Stranathan*, **Vice President, Broadcast Distribution, CBS**
- *Andrew Sukawaty*, **Chairman & CEO, Inmarsat (also KEYNOTE speaker)**
- *Kai Tang*, **Commercial SATCOM Lead, Navy Communications Program Office**
- *Dick Tauber*, **VP Transmission Systems and New Technology, CNN News Group**
- *Jeff Trauberman*, **VP Business Development, Network & Space Systems, The Boeing Company**
- *Dianne VanBeber*, **VP Investor Relations and Corporate Communications, Intelsat**
- *Thomas Watts*, **Managing Director, Equity Research, Telecom, Cable, Satellite and IP Services, Cowen and Company, LLC**
- *Philip Westfall,* **Ph.D., Director, Air Technology Network, Air Force Institute for Advanced Distributed Learning**
- **Col.** *Richard W. White* **Jr., USAF, Director, Development Planning, Space and Missile Systems Center, Air Force Space Command**
- *Rich Wolf*, **Senior Vice President, Telecommunications & Distribution, ABC Broadcast Operations & Engineering**
- *Gwen Wood*, **VP Distribution Services and Operations, PBS**
- *Abbas Yazdani*, **President and CEO, Artel, Inc.**
- *Robert Zitter*, **Executive Vice President, Technology Operations & Chief Technology Officer, HBO**

With all of the significant challenges facing the satellite industry, making the time to avail yourself of the expertise of any of these speakers will have a positive effect on your mission and project planning. The only question is one of time... will there be enough to absorb everything you need to know?

To access this assemblage of amazing expertise, to ensure you experience the presentations of the most innovative satellite and ancillary industry products, a visit to the SATCON exhibition website for further details and registration should be your next step... simply select the SATCON logo for additional details. By the way, if you register for Content & Communications World, your CCW pass will gain you entry into each of these three super shows!

FEATURE *What's So Great About The FSS Business Model?*

by Bruce Elbert

The FSS business model is predicated on a satellite operator who makes a "sunk" investment in rather expensive space hardware that can perform its service for a specified (but limited) period of time. In the abstract, the spacecraft could perform any function as long as the operator receives revenues that effectively liquidate this investment over the lifetime. The FSS model depends on revenue from selling satellite capacity in the form of transponder bandwidth and power to a market composed of commercial and government users.

The supply side of FSS is elegant and easy to define. In dealing with an established satellite operator, the all-important prerequisites are taken care of, including:

- **an available orbit position in the geostationary orbit**
- **access to one or more countries with quality customers**
- **the ability to purchase and operate the satellite over its lifetime**
- **brand recognition**

Well-known operators such as **Intelsat**, **SES**, **SkyPerfectJSAT**, **Eutelsat**, and **Telesat**, would receive high marks for their accomplishments in these areas. For that reason, my remarks address the businesses of these companies as a group. This group happens to represent about half of the total orbital resources and revenue of the entire FSS operator segment.

The MarketFSS satellite operators enjoy a multiple segment market comprised of many deep-pocketed corporations and government agencies. The largest FSS operator, Intelsat, recently announced their first quarter revenues for 2008 of $572.7 million, broken down as follows:

Media:	36%
Network-related services:	48%
Government:	14%
Satellite-related services:	2%

The media piece at $206 million is tied to the core of television and radio broadcasting in the U.S. Even direct-to-home TV companies such as **DIRECTV** and **DISH** rely on services carried by Intelsat.

Historically, media in general, and TV in particular, were the main money makers for successful operators such as Intelsat and SES. However, the current revenue breakdown reveals a considerable shift in the distribution: network-related services at $275 million exceed that from media. Much of this comes from the delivery and exchange of digital information in various forms, and a large chunk is for computer data transferred by the Internet Protocol (IP). There is certainly a media element here as well, in the form of streamed and downloaded content through the public Internet.

Operating Leverage

According to *J. Fred Weston*'s *Managerial Finance* textbook, operating leverage is, "the extent to which fixed costs are used in a firm's operation. Breakeven analysis is used to measure the extent to which operating leverage is employed." Weston observes that where management has chosen fixed expense (such as big satellite investments) instead of variable expense (for labor and services) to produce its product, the firm is said to be "highly leveraged". The result is that a relative small change in sales results in a large change in net operating income. In the FSS trade, the availability of solid revenues from major media and telecommunications companies tends to reduce much of the risk. Any additional revenue from added customers or markets goes directly to the bottom line.

The rather large investment chunk per satellites is the result of the cost of manufacture and delivery to orbit. The satellite operator pays the manufacturer for hardware and the launch agency for services to place the satellite in orbit. Once functional, the operator puts the satellite in service in a previously-coordinated orbit position. At that point, they can sell transponder capacity to users, garnering revenues to cover the initial investment and the relatively low operating cost of the satellite and overall business.

Once a satellite is put into service, its lifetime is limited to the range of 15 to 20 years based on a number of factors. Principle among these is the station keeping fuel on board (normally enough for 15 years) and the power output of solar panels and batteries. Redun-

dancy of other elements, such as RF power amplifiers, motors, and on-board digital electronics, would normally allow the spacecraft to survive even longer, possibly at reduced capacity.

Bigger is usually better when it comes to satellite control as operating efficiencies increase with the size of the fleet. As an example of the benefit of size combined with operating leverage, **SES** just reported a "strong profit increase". This amounts to $367.11 million for the past six months through the end of June, with close to a 14 percent increase compared to the same period last year. Contributing to this were steady revenues, a high fill factor of nearly 80 percent, and good results from all major divisions, including **Astra**, **New Skies**, and **Americom.** This represents about a 2 percent increase in transponder use, which, while small, still provides a strong enhancement to profitability.

Leverage rests upon the strong foundation of good working satellites at excellent orbit positions, which is the forte of the major operators cited above. One recent example of this strategy was the Horizons 2 joint venture between **Intelsat** and **JSAT International**, the U.S. subsidiary of **SkyPerfectJSAT**. A successful JV for **Horizons-1** (the name given to the

Ku-band payload on the hybrid satellite at **127° WL** that also carries a C-band payload referred to as **Galaxy-13**) was completed. The new project took what appeared to be significant investment risk by replacing the aging SBS-6 satellite at 74° WL with a new bird with even greater power.

Timely replacement was difficult for **PanAmSat**, the operator of SBS-6 that was subsequently merged into Intelsat. Quickly, JSAT determined that this kind of investment in the U.S. would be very attractive as a result of the growth in demand for Ku-band capacity. Once launched, Horizons 2 quickly acquired long-term customers and the venture was on its way to being as successful as Horizons 1. Joint venture partner Intelsat operates Horizons 1 and 2, and treats them as their own.

Today's Challenge

Over the years, FSS operators have experienced many problems, and some rather prominent organizations have been either closed, or merged, into others. Examples include **Western Union**, the first U.S. domestic operator whose satellites were purchased by **Hughes Communications** and successfully transferred (with all customers) to the **Galaxy** system. **Spacenet** was started by the **Southern Pacific Railroad** and invested heavily in satellites and VSAT networks. After several years of poor overall financial performance, the satellites were sold to **GE Americom**, and the VSAT business transferred to **Gilat**.

Satelindo of Indonesia was established to compete with the government-owned telecom provider by introducing new FSS satellites in conjunction with GSM cellular telephone and fiber-optic services. In the aftermath of the Asian financial difficulties of the late 1990s, Satelindo and its resources were merged into PT Indosat, an international carrier that was experiencing difficulty adapting to changing market trends in the region.

How one avoids failure in this business is to have a solid footing of investments and users. The latter needs to come from good economies and solid revenues. This is the case for the U.S. operators that serve media and digital communications needs, and European and Asia operators that deliver television and other content to a major segment of the population. The leaders work hard to hold onto their customers and they continue to invest in the appropriate satellites for operation at the best orbital positions.

The payoff for this is a stable and growing business that is nearly recession-proof. This can be seen from the following:

- **Stability results from long-term use that is confirmed by leases and outright purchases of transponders by leading media and telecom companies and governments**
- **Use and revenues increase because most current markets are growing, and new uses and customers appear from within the natural broad regional coverage of the satellites**

These two factors can persist through a recession because most applications are not cyclical in nature. For example, TV viewing persists no matter how bad an economy may be, and people use their computers to access content while they are at home as well as work.

The current recessionary period is one where television broadcasting in its various forms is experiencing resurgence from greater HD penetration and increased broadcasting activity. For example, the *Wall Street Journal* reported on August 1, 2008, that Tribune Company is expanding its TV broadcast stations at the same time the firm is cutting staff at its newspapers. From an economic perspective, TV is the most cost-effective entertainment medium — it does not require its customers to travel, purchase items, or pay admission.

A well-positioned small satellite operator in a closed market can obtain these benefits and prosper for a considerable period of time. However, this is the exception rather than the rule. The best financial performance goes to the FSS operators with well-managed big fleets. These companies have international recognition and are traded on public markets, giving them access to capital for new and replacement launches.

About the author

Bruce Elbert is president of Application Technology Strategy, Inc. and assists satellite service providers, U.S. civil and military agencies, and enterprises that employ these technologies for strategic advantage. He was Senior Vice President in international business development at Hughes Electronics where he introduced advanced broadband and mobile satellite technologies in the U.S., Asia, Latin America, and Europe. During the 1980s, Mr. Elbert directed all engineering, marketing, and operations of the Galaxy System and contributed to the startup of DIRECTV. Bruce Elbert has authored eight books on satellite technology, including Introduction to Satellite Communication (third edition, 2008). He holds an MBA degree from Pepperdine University, an MS degree in communications engineering, and computer science from the University of Maryland as well as a BSEE from CCNY. He is an adjunct professor at the University of Wisconsin - Madison and an instructor in the UCLA Extension Engineering program. He can be reached at bruce@applicationstrategy.com.

Executive Spotlight On...

Chris Burdick
Vice President of Product Management
iDirect

Satellite broadcasting continues to gain momentum, especially with Digital Video Broadcasting – Satellite – Second Generation technologies, otherwise known as DVB-S2. As an enhanced specification that replaces the former standard, that being DVB-S as well as the DVB-DSNG standard for field units that are mobile, DVB-S2 supports the transmission of multiple MPEG-2 streams. DVB-S2 is also backwards compatible with DVB-S and DVB-DSNG. DVB-S2 actually arrived as a newly developed technology with both MPEG-4 AVC (H.264) and HDTV's debut — good timing!

Speaking of good timing, we were able to interview one of the major players at **iDirect** who was directly involved with the development of their **Evolution** product line that is built using the DVB-S2 standard. Their product line includes the **Evolution X3 Router**, **XLC-10 Line Card**, and **IDX Software**, which can deliver as much as a 30 percent bandwidth improvement factor to users over older DVB-S1 systems. Use *Adaptive Coding and Modulation* (**ACM**), and that gain could be as much as 50 percent! Vice President *Chris Burdick* offers his insight and expertise regarding Evolution in this interview.

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iDirect recently announced its Evolution product line built on the DVB-S2 standard. What distinguishes Evolution from the many other DVB-S2 offerings that are available?

Chris Burdick

iDirect has been working on our Evolution product for a number of years. We didn't want to rush a DVB-S2 product to market, but wanted to have a solution that integrates with the overall iDirect strategy. We are confident that the Evolution product line will meet the high standards our partners have come to expect from our company.
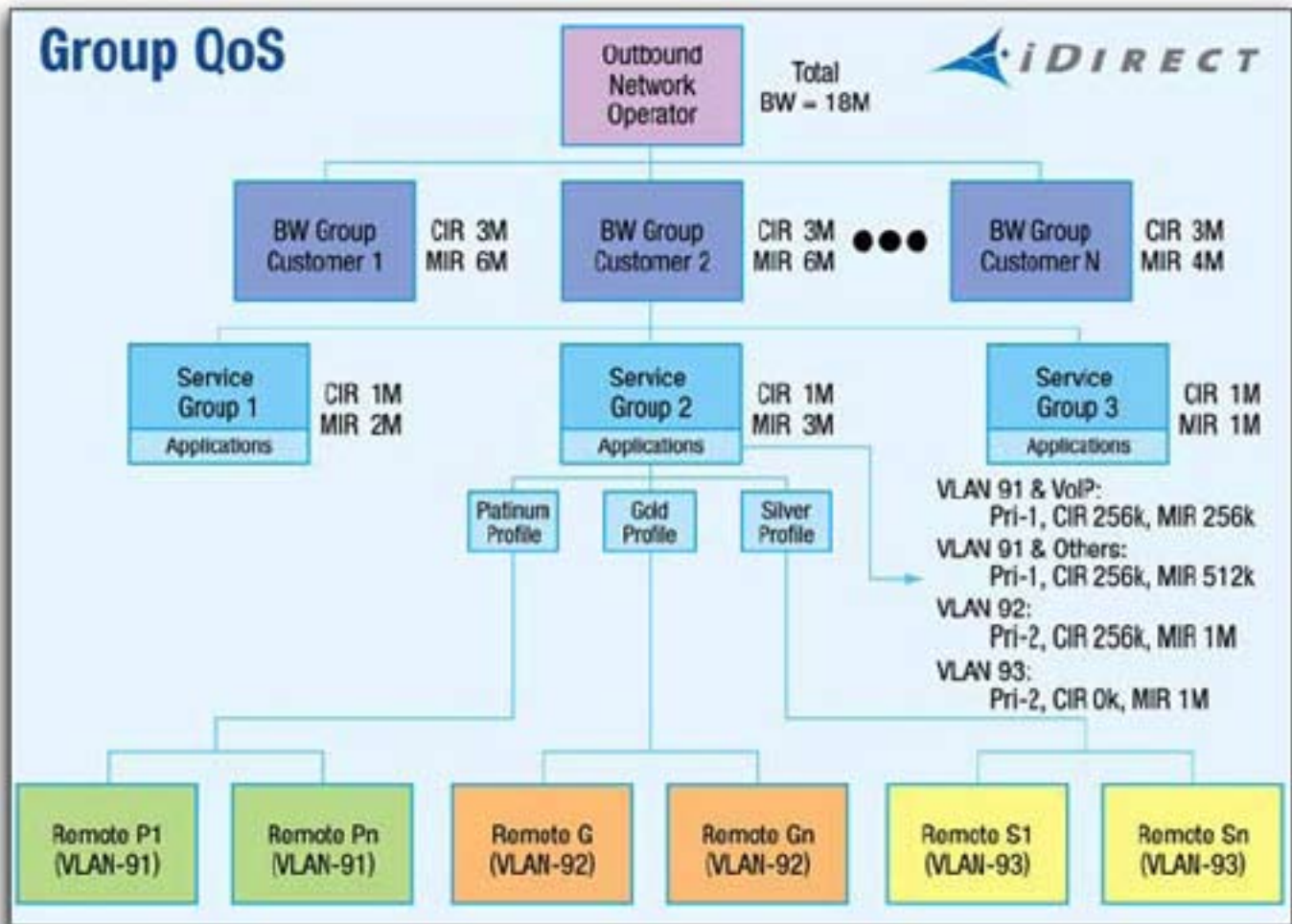
Evolution has several key strengths — it's easy and affordable to implement as well as to maintain. Service providers can deploy DVB-S2 on their existing iDirect infrastructure, protecting their hub investments. In addition, feature enhancements and upgrades on Evolution remotes can be made with over-the-air software upgrades.

Most importantly, Evolution fully integrates with the advanced features of the iDirect platform. This allows service providers to maximize their efforts using the DVB-S2 standard. For example, iDirect's Group QoS allows service providers to increase their efficiency gains by combining multiple small networks into a single, larger carrier that is better able to leverage DVB-S2 benefits. In addition, new features have been built into the iVantage network management system that enable service providers to track ACM gains in real time and configure their networks to optimize bandwidth efficiency.

Group QoS

	Outbound Network Operator	Total BW = 18M	**iDIRECT**

BW Group Customer 1 — CIR 3M, MIR 6M

BW Group Customer 2 — CIR 3M, MIR 6M ● ● ●

BW Group Customer N — CIR 3M, MIR 4M

Service Group 1 — CIR 1M, MIR 2M — Applications

Service Group 2 — CIR 1M, MIR 3M — Applications

Service Group 3 — CIR 1M, MIR 1M — Applications

Platinum Profile | Gold Profile | Silver Profile

VLAN 91 & VoIP:
Pri-1, CIR 256k, MIR 256k
VLAN 91 & Others:
Pri-1, CIR 256k, MIR 512k
VLAN 92:
Pri-2, CIR 256k, MIR 1M
VLAN 93:
Pri-2, CIR 0k, MIR 1M

Remote P1 (VLAN-91) | Remote Pn (VLAN-91) | Remote G (VLAN-92) | Remote Gn (VLAN-92) | Remote S1 (VLAN-93) | Remote Sn (VLAN-93)

Group QoS allows for multiple configuration optios that increase the flexibility for network operators when configuring by...

Bandwidth Groups
Service Groups

Applications

Default Profile
Additional Remotes Profiles

diagram courtesy of iDirect

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Many DVB-S2 offerings, including iDirect's Evolution product line, integrate Adaptive Coding and Modulation (ACM). What is ACM and why is it so important?
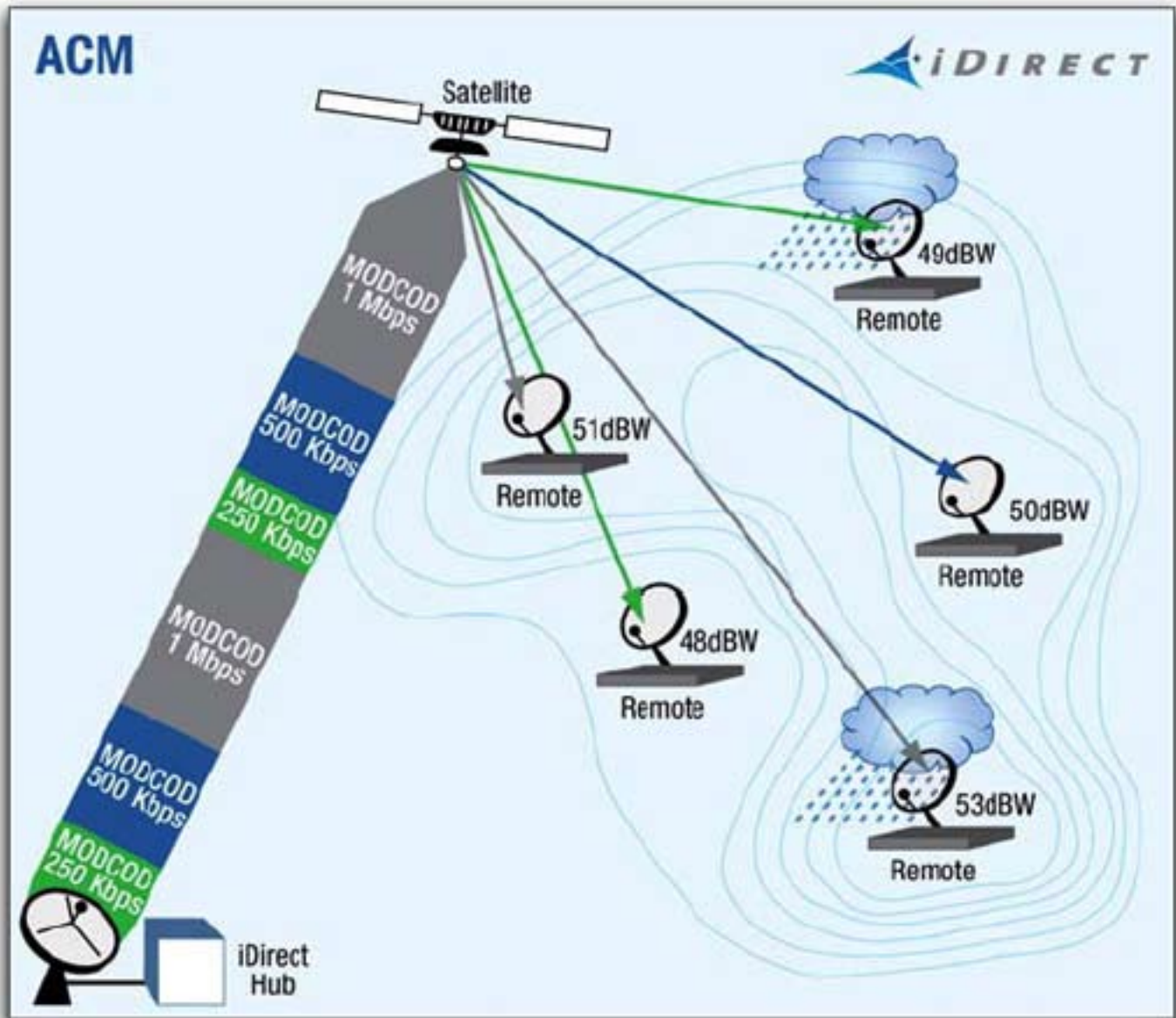
Chris Burdick

ACM automatically adjusts the modulation scheme on a network's outbound carrier to ensure each remote receives optimum data throughput at any given time. With Evolution, these adjustments are made per remote in real time, based on each remote's location within the satellite footprint, its antenna size, and local rain fade conditions. ACM allows network operators to

dramatically conserve space segment and use the additional bandwidth to increase data rates and expand their offerings.

ACM enables each remote to achieve maximum data throughput by using the most efficient coding and modulation scheme, dependent upon the location within the satellite contour, antenna size, and clear sky conditions versus rain fade.

diagram courtesy of iDirect

Chris Burdick

The Evolution X3 router, XLC-10 line card and iDX software are the first offerings within the Evolution product line.

The Evolution X3 is the central component of the new product line. It is an integrated satellite modem and IP router with an Ethernet interface that features DVB-S2/ACM on the outbound carrier and iDirect's patented, deterministic TDMA on the return channel. It supports a wide range of carrier IP data rates, FEC codes and modulation types, including downstream modulations of up to 16APSK and upstream modulations of 8PSK. This is unique in the industry. The remote is engineered for broadband applications as diverse as VPN access to enterprise networks, point of sale and Internet cafés. It also supports real-time applications such as VoIP and videoconferencing.

The Evolution offerings fully integrate with the advanced features of the iDirect intelligent platform and allow service providers to build next-generation satellite networks that significantly improve bandwidth efficiency and lower operating costs.

SatMagazine
Who benefits the most from DVB-S2?

Chris Burdick

DVB-S2 arrived at a critical time as service providers are struggling to extract the most out of dwindling

satellite capacity in an effort to serve more customers. The bandwidth efficiencies that DVB-S2 brings to the table are impacting providers in a range of verticals, especially those operating large networks. This is especially important in regions that are experiencing acute space segment scarcity, like the Middle East, Asia, Africa and Latin American.

SatMagazine

Can you quantify the gains that service providers experience by using Evolution?

Chris Burdick

With Evolution, service providers can gain a 30 percent improvement in bandwidth efficiency over DVB-S systems. This is based on a new low-density parity-check coding scheme. An additional 50 percent boost in

bandwidth efficiency is also possible through iDirect's ACM technology. The Evolution product line supports data rates as high as 156 Megabits per second. These gains have created a lot of excitement within, and for, the satellite industry. We've had an extremely busy year working with service providers to allow them to tap into the new growth opportunities Evolution makes possible. We look forward to continuing to help our partners advance their services and build next-generation networks around the world.

SatMagazine

We appreciate you sharing your knowledge with us, Chris. For readers who wish to know more about the Evolution product line, we recommend you select the Evolution product diagram below to access their platform's webpage.

Convergence: Today's Reality

by Mor Allon

Convergence is no longer a trend, but a reality. This convergence of the computing, telecommunications, and audiovisual industries has, simultaneously, impacted on both the demand side and the supply-side development of the satellite communications industry. Service providers, equipment vendors and end-users are directly affected by the changes in network topology, product development and company business strategy. The consequences of these changes have been so profound that I doubt they were anticipated when ''convergence'' was first conceived.

Initially a marketing drive, convergence was launched by the telephone and cable TV companies to provide one bill for multiple services; thus increasing the top line revenue stream without any substantial capital investments in network infrastructure. Different service providers and equipment vendors are converging through a series of merges and acquisition deals to provide "bundled", triple play services of voice, video and phone by a single distribution channel.

Market demand for these services is on the rise with a significant annual growth. More TV channels and HDTV programming coupled with need for the higher speed Internet access and services such as IPTV and high QoS VoIP require significant bandwidth growth in the "pipe" leading to the customer in the home. Operators realize that their current topology, system architecture and network equipment may provide a short term solution but, in the long run, they cannot expand to meet future demands.

De-regulation of the Telecommunication Industry

De-regulation of the telecommunication industry has enabled the "three giants"— the phone, satellite and cable companies — to use their core competences as an anchor, to build the delivery of additional services around it. New technologies were developed using the existing infrastructure.

The cable TV industry developed the DOCISS standard for the delivery of Data and voice services over the existing coaxial and HFC networks.

The phone industry developed the xDSL and xPON standards, to deliver their data and video services over existing copper twisted pair and fiber optical networks. The DBS industry has to "bundle" infrastructure and partner with an access provider to support their requirements of high speed data and voice offering to their customer base, while delivering their video content via satellite.

There are several ventures operating globally that deliver high speed data and voice services over satellite links, but these are limited and have not yet, on the whole, been accepted in the market place.

Today's Challenges

Today's operators are faced with technological and business challenges: to create and operate a profitable "end-to-end" delivery platform for video, voice, and high-speed data services. They have to decide what is the best topology needed to deliver these services over the different segments of this "pipe to the home". This decision making process, is divided into several parts:

- **The overall definition of the ''pipe''**
- **The delivery mechanisms for the different services in the platform**
- **What services to deliver and who delivers these services**
- **The largest operators are considering merging into single business entities to control:**
- **Delivery platform from studio to the home – by creating a ''seamless pipe'' from start to finish they can control technology and streamline the network, minimizing the capital expenditures and ensuring their growth capabilities for the future.**
- **Content – maximize their profits by eliminating the ''middle man''**
- **Access – capitalizing on their networks to receive incremental profits from any other services delivered over their ''pipe''**

The point to multi-point delivery of substantial bandwidth of video capacity seems to be dominated by the satellite industry, and it is the best delivery mechanism (cost and quality wise) to provide video services to a large geographical footprint such as a continent or several countries. Although the "digital optical backbone" is growing in its capacity it has to

overcome significant hurdles before it can support a global video delivery pipe. The distribution of these video signals to the home (i.e., the last mile access) can be accomplished by using either a wired media (fiber optic or copper based) or a wireless media (WiFi, WiMAX, or similar).

To converge the additional services, voice and data, the operators have to design their networks in a topology that merges the video content with these other services. Where this convergence occurs is the "million dollar challenge". Does the operator integrate all the services in one location and distribute them in a star topology (point to point) or does he create a diversified network were the different services are injected locally much closer to the customer. As an example, a small satellite dish (DBS) on top of a house can deliver the video content while data and voice services are delivered via wired networks to the home.

Looking Ahead

The "source to home" convergence model has required operators and equipment vendors to develop cost-effective triple play services to the customer's home. At present, on the supply-side the leaders are:

- **FTTx (fiber to the home/node/curb) distribution platform**
- **Active P2P Ethernet for high speed data, VoIP and the delivery of the upcoming IPTV services data architectures**
- **RF transport for TV and radio content delivery – point to multi point distribution of both L-Bands for DBS and CATV transport for analog and digital off-air TV, radio and CCTV services together with the existing Cable TV programming**

The large service providers have realized that a single fiber optic based network based on the "best of breed" architectures for the different services (RF and Data) is the most cost effective solution for the future. Major carriers across the world are upgrading their metro rings with the P2P Ethernet topology, thus positioning themselves for the next stage of pushing P2P Ethernet to the customer premises.

At the "last mile" these carriers are increasingly deploying an FTTx topology that currently is xPON based but P2P Ethernet FTTx architectures are becoming much more common. The migration to P2P Ethernet based architectures in the "last mile" access is in line with the strategy to create a "seamless" Ethernet pipe from "source to the home".

Cable TV operators are driving fiber deeper into the already HFC (Hybrid Fiber Coax) based distribution systems by creating smaller optical nodes. They are also deploying FTTx architecture in their new green

From Headend to the Home

Mouse over any environment to learn more about Bsmartv products

BsmarTV switch family

field deployments, a substantial architectural innovation. In addition, the cable industry is currently investigating Ethernet based solutions and it is yet unclear on how this will play out in the future.

The DBS operators are traditionally a point-to multi-point based distribution architecture: the Earth station (ground segment) portion is the point-and-satellite (space segment), and the home reception equipment is the multi point. In reality, they are a true broadcast architecture with the individual home acting as the point of reception. Their future business plans are based on a strategy to change their architecture from a broadcast mode to the creation of a seamless pipe from "source to home" which is fiber FTTx based.

The products manufactured for the deliver of services to the premises fall into three major categories:

- **Professional equipment: studios, Earth stations and gateways, space segment, CO, head-end, and distribution plant products [both active and passive.**
- **Commercial equipment: MDUs, gated communities and SOHO applications**
- **Retail equipment: CPE equipment such as cable/xDSL modems/routers, VoIP gateways, small LAN switches etc.**

Major technological decisions require large capital outlays to fund both the transition period and the initial set up operational costs. Consequently large operators usually try to plan ahead, defining new network topologies, system architectures and protocols to meet customer and market demands for the coming 15 to 20 years. Therefore when they look into their "crystal ball" they are confronted with the following challenges:

- **Cost-capital and operations**
- **Service capabilities**

- **Vendor neutral/inoperability**
- **Low risk development**

About the author

Mor Allon is Foxcom Network's Vice President of Marketing and a 25-year veteran in the international telecommunications industry. With his former service in the Israeli Air Force, Mor brings with him a vast experience of creating, managing, and developing global sales and marketing organizations. Mor is an Israeli cable TV pioneer, one of the founders of ICS, a MSO CATV operator in Israel. In 2001, after leaving Foxcom, Mor accepted the position of CEO of Ikusi Telecommunications, a multi-national Telecommunications systems hardware manufacturer, introducing its products to the North American Market. He later returned to Israel to lead the global sales and marketing organization at Telkoor Power Supplies. Mor re-joined Foxcom in January 2007, bringing the combination of top-level management, marketing capabilities and technical knowledge needed to lead the global marketing organization at OnePath Networks.

Foxcom's
PL7230[1550] +
PL7230R16 Link L-band
high power input 16dB

Conclusion

The changes in the technological architectures of communication infrastructure are only going to accelerate faster over the next few years — faster than we ever imagined. Competitive pressures and the global playing field for the "big players" is fueling market demand for network capacity. The ever increasing capital expenditure required to fund this momentum is causing decision makers to depend on a FTTx based network deployment that will be able to support "best of breed" delivery platforms for both RF video and high speed data. The delivery of video services into these FTTx networks will remain predominantly a satellite delivered medium, as it is currently the most cost effective transport for a large bandwidth of RF video.

Near Earth LLC: Merger Magic + More...   *INSIGHT*

by Hoyt Davidson

Finally, the FCC has approved the XM/Sirius merger!!!! Back on February 19, 2007, the Boards of XM Radio and Sirius Satellite Radio approved a plan of merger and began what would become a long, combative and historic regulatory drama. On March 29, 2007, they submitted an application with the FCC to combine their spectrum into a new merged entity. On June 8, 2007 (the FCC's Day 0), the pleading cycle was officially established. On Friday, July 25, 2008 (FCC Day 412), the approval was finally granted.

XM shareholders will receive 4.6 shares of **Sirius** stock in the merger. The new company will be named **Sirius XM** and will trade under the ticker "**SIRI**". The approval undoes a well intentioned FCC created duopoly that seemed to make sense last century. After all, the **FCC** had watched an initial five or six satellite TV competitors bludgeon each other down to a sustainable two survivors, **DIRECTV** and **Echostar.** Perhaps consumer space businesses were just too hard to expect more than a couple players to survive. When it came to satellite radio it turned out that even two was a big number and, unlike satellite TV in rural America, there is already ample evidence of serious alternative competition in the radio market. This reality has now been finally acknowledged. The FCC's approval will allow for the formation of a stronger combined satellite radio competitor with 18.5 million subscribers, comparable in scale to DIRECTV's 17 million subscribers.

The approval is rumored to have come with several material concessions and conditions, including:

- **Payment of $19 million in fines for terrestrial repeaters operating out of compliance, of which approximately 100 of XM's and 11 of Sirius' will be shut down or brought into compliance**
- **A three year freeze on subscription fees with a relook feature six months before the freeze expires allowing for public comment and a potential continuation of the price freeze**
- **The addition of smaller lower cost programming packages in a more a la carte service offering**
- **A one year deadline to establish a dual mode radio and the establishment of an open standard for manufacturing**
- **A spectrum set aside of roughly 8 percent, amounting to 24 channels, to be allocated for 12 public service channels and 12 minority programming channels**

These conditions, while material, do not seem unreasonable and should not prevent a vigorous and intelligent management team from making a go of the new combined venture.

Looking at the final result, our hats go off to the three brave FCC commissioners who were able to set aside the self interested lobbying of the powerful **NAB** to make this long overdue, common sense decision. These three commissioners got it.

Satellite radio does not merely compete with itself. It cannot, through a merger, become a monopoly in any economic sense of the word. It will continue to compete with the legacy AM/FM services who are trying mightily to convert free-to-air listeners into paid subscribers. Perhaps, more importantly, it faces an ever growing and powerful array of digital, wireless, *iPod*/MP3 and Internet music and audio distribution alternatives that threaten to capture much of those premium, technology sophisticated, young and audiophile sectors of the market who are more likely to pay subscriptions.

Many of these newer alternatives provide thousands of channels of content, offer significant individual customization of channels. The channels come with special features that allow listeners to skip, ban, or even "love" songs, all to teach their service how to better serve them in the future.

For satellite radio to compete effectively and better serve consumers, it first needed a saner cost structure, improved access to capital, and greater channel capacity. The approved merger offers a chance at all of these. There is no guarantee the new entity will achieve the level of sustained profitability that has eluded these companies since their creation over a decade ago.

So far, the market's response has been underwhelming. Clearly, investors think the FCC approval is just one step in what will still be a challenging business plan execution for the merged entity. Here are a few comments taken at random from the financial blogs:

> *"Awesome, the merger is finally approved and the stock is still going down."*

> *"Is anyone else watching this stock today in disbelief, thinking how can these stocks still go down after FCC approval."*

> *"I do not understand why this is going down, it makes no sense, it should at least go back to the stock price of when the deal was announced."*

Surprising that a "monopoly" should be treated so, but of course, it is not a monopoly and will face many competitors and many obstacles to success. The market understands this fact.

Thankfully, however, through the wisdom and courage of three FCC commissioners, consumers may one day soon experience a more vibrant and competitive satellite radio alternative, one that can better realize the full potential of this still emerging technology. FCC Chairman *Kevin Martin* said it best, "The merger is in the public interest and will provide consumers with greater flexibility and choices. Consumers will enjoy a variety of programming at reduced prices and more diversified programming choices. It will also spur innovation and advance the development and use of interoperable radios, bringing more flexible programming options to all subscribers."

Alas, the NAB (and Internet radio) will now have one strengthened competitor versus two weaker ones. We believe this will spur more innovation and provide

consumers with more and better options, but it may also help accelerate the slow secular decline of AM/FM listenership. In the final analysis, however, it is not the purpose of the FCC or any part of our government to protect old technologies from new ones. No technology is guaranteed an audience forever. If AM/FM wants to fight back, it has only to ditch its analog roots, join the digital revolution, and switch more aggressively to HD technology.

Lastly, there are also the natural cogitations, murmurs, and predictions as to what this approval might mean for a future combination of DIRECTV and DISH. By all we can tell, the consensus is that such a merger is still years away from making a similar case for alternative competition in its core markets. However, if Telcos increase their video efforts, IPTV continues to proliferate and mobile video finds a workable business model, we may face a new regulatory drama for satellite TV in the not too distant future. That one should make this one seem like child's play.

About the author

Hoyt Davidson is the founder and Managing Member of Near Earth LLC, a New York based investment banking firm focused on the satellite industry and certain sectors of media and telecom. Before founding Near Earth, Mr. Davidson was a Managing Director in the Telecom Group at CSFB and prior to that a Managing Director and co-founder of the Space Finance group at DLJ. You may email Hoyt at hoyt@nearthearthll.com.

THE WAY WE SEE IT…
by Dan Ramsden

DIRECTV took on-orbit delivery of DIRECTV-11, maintaining its lead in HD programming (150 channels) over DISH, which hit its target of 100 HD channels well ahead of plan, but suffered the loss of Echostar-2. DISH may actually lose subscribers this quarter for the first time since the beginning of DBS, but don't count DISH out yet as it has also just placed Echostar XI into orbit and is refocused on service quality. Harbinger announced the contemplated merger of two of its holdings, Inmarsat and Skyterra (MSV), a difficult regulatory proposition, but a very strategic transaction for both sides.

Two long awaited deals have either closed… first, the merger of XM Satellite Radio and Sirius Satellite Radio has been approved by the FCC, and on July 29th, the combination was consummated with the birth of SIRIUS XM Radio Inc. (NASDAQ: "SIRI"), as noted in Hoyt's article. Equally noteworthy, **Clear Channel Communications** *has announced their shareholders had approved the company's going-private transaction, with that deal now closed. Since the original announcements of both transaction agreements, more or less two years ago, much has changed in the radio sector (let alone the financial markets), and we will monitor both cases to see if these long sagas were worth the wait. Speaking of finished sagas, another that will merit close monitoring is the one involving Yahoo!, Microsoft, and Carl Icahn. Yahoo's business and transactional strategy in the months to come could be worth studying for indications of broader Internet trends and repercussions.*

To learn more about Near Earth LLC's investment banking and advisory services to companies and investors in the satellite, media and telecom sectors, select the company's banner graphic below…

This article was reprinted, with permission, from Near Earth LLC's July 2008 newsletter.

Simon Thrush
Senior Vice President
Arqiva

With the increasing demand for High Definition (HD) programming, more and more service providers and broadcasters are stepping up their infrastructure in order to provide the coveted services. Arqiva is one such company. SatMagazine talked with Arqiva Satellite Media Solutions Senior Vice President Simon Thrush to discuss recent developments on the HD front.

SatMagazine
Simon, let's start this discussion with the biggest news for Arqiva – at the end of July, the company announced a new HD platform was available from the United States for Occasional Use broadcasters. Would you tell us about this platform and what makes it unique?

Simon Thrush
Our new HD MPEG 2 and 4 Occasional Use platform is fully functional and supports both U.S. and European Broadcasters in distributing their HD content. We've invested in new state of the art facilities at Arqiva's Washington, D.C. location to provide these services for an undeniably expanding market.

SatMagazine
With this infrastructure investment, do you anticipate a significant increase in demand for HD programming?

Simon Thrush
In a word, yes. We have been asked more and more by our clients for this type of service. We felt, given the tremendous appetite for HD in the U.S., and the growing demand for it in Europe, now was the right time to invest in the new platform. The reaction so far has been extremely positive.

SatMagazine
A lot has been said lately regarding the connectivity between satellite and fiber — how do you see the two working together?

Simon Thrush
We see the connectivity technologies as complementary as we use both fiber and satellite in our own network and facilities. This gives customers maximum flexibility regarding what they wish to accomplish. This dual capability allows us to provide a more complete solution and seamless connectivity for our customers. I see no reason why this cannot — and should not — continue.

SatMagazine
The U.S.-based Satellite Media Solutions division has hit the market by storm. What do you see as the key differentiators between you and your competitors?

Simon Thrush
Arqiva SMS now operates one of the largest teleport and fiber networks. In my opinion, however, that's not enough to allow us to provide true end-to-end services for our clients. What Arqiva brings to the table, in addition to the teleport and fiber networks, are the studios, playout and production, satellite newsgathering and Outside Broadcasting services. What makes Arqiva unique is our ability to provide everything a client would want or need. I think it's important from a customer's point of view to be able to deal with one company, one contact, and certainly one bill.

SatMagazine
When Arqiva talks about being "global", how global is the company? And what are some of the main services Arqiva is focusing on?

Simon Thrush

To me, the term global means our company's ability to provide services to our clients who may be located anywhere in the world. In our experience, customers want a good, high-quality service from a reliable and professional organization at a cost effective price. Having facilities in the U.S., U.K., and other locations throughout Europe, allows us to do this.

SatMagazine

Arqiva has been announcing the The London Switch. Exactly what is this technology and why is it important? Will U.S. switching centers be able to leverage this feature?

Simon Thrush

Arqiva has partnered in the U.K. with The Switch to provide an innovative new service. The London Switch is the U.K.'s most advanced HD and SD switching service using state-of-the-art technology to provide point-to-multipoint switching at up to 3 Gbit/s. One of the unique features is the intuitive software that gives customers full control of their ports from their own broadcast facilities. The service also includes dedicated customer-controlled international connectivity, including U.S. switching centers in Washington D.C., New York, Los Angeles, and Miami.

SatMagazine

The U.S. presence of Arqiva is the result of the British Telecom acquisition. Do you anticipate any additional acquisitions in the U.S.?

Playout & Distribution

Occasional Video & Data

Simon Thrush

We do anticipate additional acquisitions in the U.S. but probably not in the near future. Business is going well and we're not in a hurry to make changes right now. Any acquisition would have to add value to the business and be complementary to our business model. If the correct opportunity comes along, we'll certainly look into it and we will, of course, be monitoring the landscape to make sure we stay on top of changes and customer needs. Whatever we do needs to make sense for the company and for our customers.

SatMagazine

There are a number of notable events coming up, not the least of which are the presidential elections in the U.S. What role, if any, will Arqiva be playing in transmitting the elections to interested viewers?

Simon Thrush

This brings me back to discussing our new HD facility in Washington, D.C., which is connected to the rest of the Arqiva facilities in the U.S. and Europe. We have already experienced a great deal of interest in using this new capability and services booked to date are a solid confirmation this is an ideal gateway for our clients. Clearly, the elections are one of the most significant events in the U.S. and, as such, these new HD services will be invaluable to news clients looking to acquire, and send, high quality news feeds around the world.

SatMagazine

Taking the crystal ball in hand, where do you see Arqiva in five years?

Simon Thrush

I would like to see the company double current revenue in the U.S. due to the introduction of new products and services. I think Arqiva has constructed a sound foundation with our state-of-the-art facilities, our unique product portfolio, and tremendous global resources.

A Look @ Zee TV

by Michael Fleck

Today, Zee Entertainment Enterprises is a multi-faceted media company with DTH and Broadcasting operations that encompass the world. Zee reaches an estimated 200 million viewers in more than 120 countries. From its origins in 1992 as Zee TV broadcasting based in Singapore, Zee is now at the forefront of broadcast satellite applications in South Asia.

With more than 30 years of experience in the telecommunications, Internet, and broadcast fields, *Amitabh Kumar* is the Director of Technology for the **Essel Group** of companies and also the Head of Broadcasting Operations of the **Zee Network**, India and Singapore. Kumar is responsible for setting up India's first pay DTH platform, **Dish TV.** He has been a member on the Board of Directors of **Essel Shyam Telecommunications Ltd.** Mr. Kumar has been a Director on the Board of **Telestra V-Com Ltd**., a member of **NASSCOM Executive Council** and *Governor for India* on the Board of Governors of **Intelsat** and Director of Operations of **VSNL**.

I was able to speak briefly with Mr. Kumar at *Broadcast Asia* in Singapore about plans to expand the reach of Zee's satellite services.

India today is home to about 1.13 billion people who speak 22 different languages. India is rapidly modernizing and is a country with approximately 60 percent of the population involved in agriculture. There are also over 100 cities with more than one million in population. Such a fragmented market is a challenge to television on a national level.

The primary source of cable TV distribution today in India today is through analog operators. Currently,

Zee Networks' earth station at Noida

cable TV is a poorly organized industry wherein cable companies reach approximately 80 million homes with a maximum of 60 channels. The demand is certainly resident in India for an increase in the number of channels. However, the cost of installing digital head ends is well beyond the means of most cable operators.

Increasing sales of large screen plasmas and LCD televisions is driving the growing demand for digital TV in India.

There certainly does not appear to be any shortage of content in India. Mr. Kumar's **Zee Networks** currently has access to more than 450 channels available in India and overseas and expects to grow this number to more than 500 over the next year. Channeling all of this content to users requires satellite delivery and systems such as DTH and *Head end-in-the Sky* (**HITS**).

Zee Networks has initiated a 'Head End in the Sky' to move digital content directly to existing cable operators. For approximately U.S. $2,000, each cable operator can install a trans-modulator to convert the

satellite **QPSK** (*Quadrature Phase Shift Keying* modulation scheme that uses four phase values to encode two data bits per modulated signal) to the cable QAM and is capable of delivering the entire 550 channels to their subscribers. Each service can be customized to insert local channels and advertising.

Zee Networks currently delivers content direct to home (DTH) as well as to cable operators using a variety of satellites, including six C-band transponders on **AsiaSat-4**, another four C-band transponders on **NSS-703**, 11 Ku-band transponders on **NSS-6**, with a further 6-to 12 C-band transponders scheduled for **NSS-12**, which is due for launch Q4 2008.

The DTH service of the Zee Network will also make use of the **Protostar-1** launched on July 7, 2008 with 14 Ku-band transponders dedicated to the service.

Mr. Kumar's recent book on WiMAX deals with the issues broadcasters will face in regard to this new technology, including migrating to a new generation of broadcasting that integrates the Mobile, Wireless

and Fixed network domains. Select the graphic for further details...

Mr. Kumar has also recently published a book devoted to Mobile TV. This book provides detailed insight into mobile multimedia efficient compression techniques, protocols formalized by 3GPP or 3GPP2, as well as the capabilities of broadcast and mobile networks for delivering multimedia content. He discusses network requirements for enabling multimedia services, such as spectrum, chipsets, software and handsets; delivery platforms, and content protection technologies that provide revenue assurance. All are covered in detail. Written with a global perspective, this book takes a detailed look at the networks deployed worldwide with examples and is rich in diagrams providing extraordinary visualization of the new technologies.

About the author
Michael Fleck is managing Director of Global Vision Networks, the Asia Pacific region's leading provider of services to the corporate world. Based in Sydney with representative offices in Hong Kong, Singapore, Chennai (India) and soon in Beijing, Global Vision offers complete turnkey solutions for everything from downlinks into hotels to disaster recovery capability across the region. Global Vision Networks is ISO 9001 certified, a big plus for maintaining quality in the design and management of permanent and occasional solutions for the enterprise market in 17 countries of the AP region. Since 1992 the company has assisted multinational corporations with a range of solutions including location television production, fixed and SNG uplink, temporary and permanent downlinks, and an extensive network of satellite equipped five star hotels for special events.

CASE STUDY GPS Signal Re-Radiating in Tunnel Networks

This PPM Ltd. case study describes the application of RF over fiber technology to overcome problems of transporting GPS, Galileo and Glonass signals through tunnel networks.

Introduction

The use of GPS signals is now pervasive in everyday technology as they provide high accuracy location or timing data. This enables devices that range from tracking systems through to cellular phone networks to function effectively over wide geographic areas. Taking the example of a cellular network, the base stations require accurate timing information to ensure successful hand over of connections between the cell sites.

Depending on the topology employed this timing can be provided by either E1 sync source from the backhaul network to which the remote site is connected, or from a GPS signal directly received at the cell site. With the emergence of IP based networks, time synchronization via GPS will become more prominent as no time reference is provided within the core network structure.

Network Synchronization

Where GPS signals are used in network synchronization, significant issues may arise when the base station does not have direct line of sight to the GPS satellite. This issue is overcome by fitting a remote antenna that has line of sight and can feed the base station with the GPS signal. Often the positioning of such remote antennas for optimum signal reception can be some distance from the base station. GPS signals are very weak, which means that the signal may be too weak to use when carried over copper cabling. Routing the signal over fiber from the remote antenna to the base station equipment solves this problem.

Applications

The requirement for GPS re-radiation within buildings and subterranean locations such as mines and tunnels continues to attract much attention. In response to market needs for remote GPS antennas within high-rise office blocks, PPM successfully launched **Metro GPS**, a turnkey fiber optic remoting solution. Metro GPS overcomes two problems presented in high-rise building GPS installations. First, by making use of a preinstalled single mode fiber networks that normally exist in high-rise buildings the GPS signals can be routed long distances from roof top antennas to equipment located in the basement.

Secondly, **Metro GPS** offers up to three RF channels so that fully redundant systems can be accommodated in situations where multiple antennas feed one equipment location. Metro GPS provides a point-to-point signal transfer system, but PPM has also provided other systems that cope with point to multi point requirements.
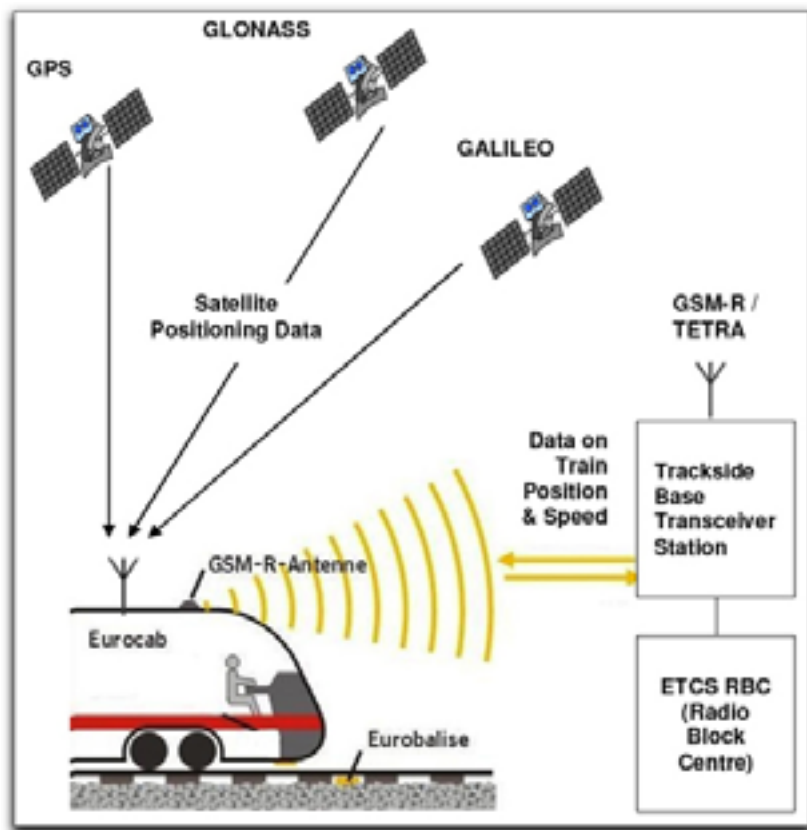

Figure 1

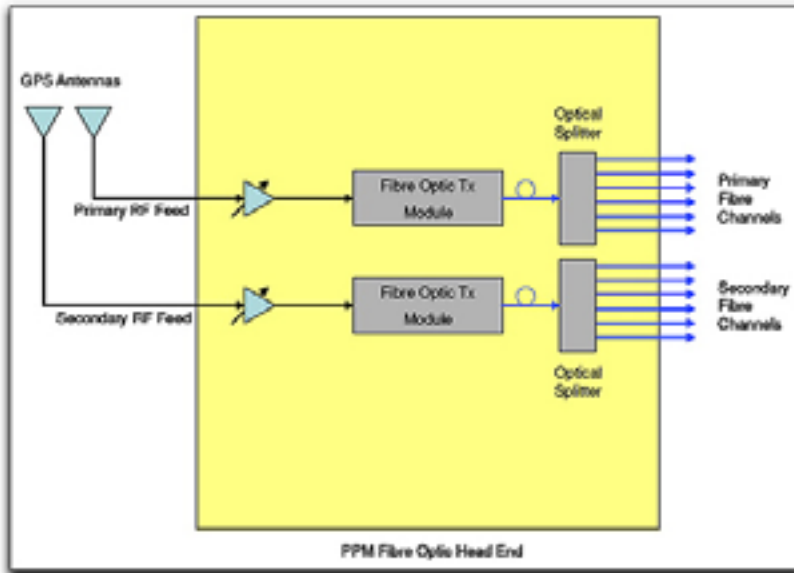**General scheme for ETCS using the GPS or Galileo satellite constellation for positioning.**

Figure 2
Schematic of fiber optic GPS distribution head-end
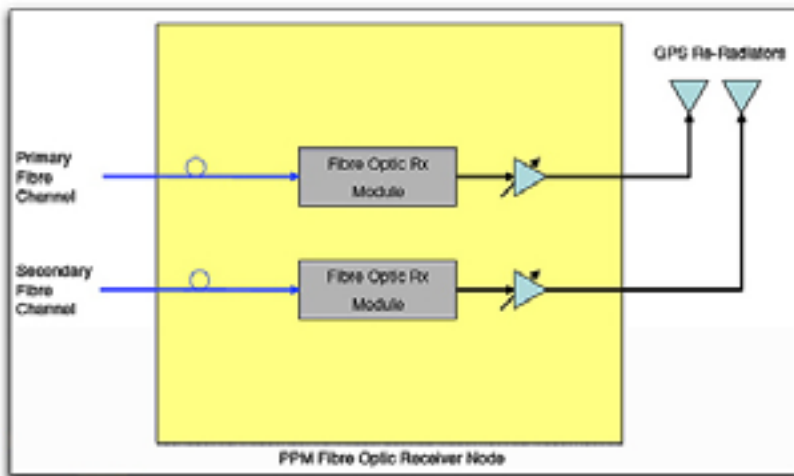

Figure 3
**Schematic of fiber optic GPS receiver node
(as used in a point-to-multipoint install**

Galileo positioning will be used as a primary reference as shown in *Figure 1* on **Page 70**.

An important element of this system will be to provide GPS signals within tunnels along the route of the railway so that the train position is always known.

This creates problems for the weak GPS signals due to the distances involved. PPM has developed an optical re-radiation system to overcome this problem.

For the ETCS project, PPM designed and manufactured the fiber optic head-end shown schematically in *Figure 2*. The electrical signal is converted into an optical signal. This is then coupled into a passive optical splitter that produces a customer-defined number of optical feeds for distribution to the nodes in the tunnel. In this particular case, both primary and secondary GPS (RF) feeds were used for redundancy purposes to maintain full signal integrity.

Each fiber channel feeds GPS signals over single mode fiber optic cable to a GPS receiving node (Rx) shown schematically in *Figure 3*. The receiver nodes are located inside the tunnel and spaced every 150 meters apart. At each receiver node, the GPS signal is converted back into an electrical signal before being fed to GPS antennae for re-radiation within the tunnel.

Variants of the Metro GPS system can be used to transmit a variety of RF signals up to 4 GHz in bandwidth.

European Train Control System (ETCS)

ETCS is the automatic train control system and will be a unifying standard for rail networks across Europe, Russia and beyond. The system uses the GSM-R, or TETRA radio network, to communicate train position information to a remote control center. Train position is currently identified by trackside sensors and radio beacons (Eurobalise). However, in the future, GPS and
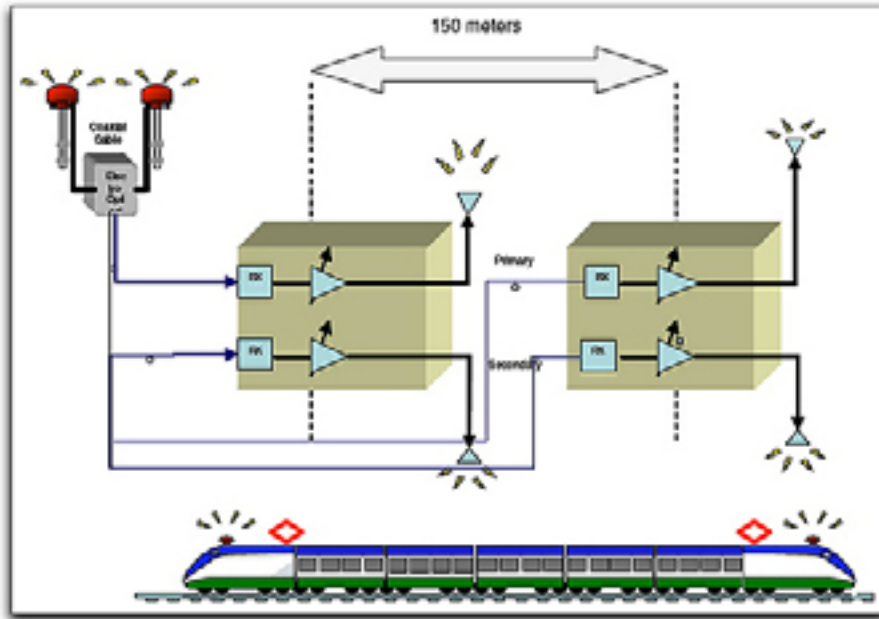
Figure 4

Deployment used by European rail operator, showing the GPS head-end outside the tunnel, and receiving nodes spaced at 150-m within the tunnel.

enclosure (IP66 rated, NEMA 13 rated) that feed re-radiating antennae. This design provides a primary and secondary path for the GPS signals, which are both in operation at all times.

Conclusions

This case study has described the principle of GPS transmission over fiber and some of the large number of applications that benefit from using this technology. The example of the ViaLite Metro GPS product is given for use in building distribution, and the case of the European rail operator that required GPS distribution through tunnel networks has been given in some detail. For further information regarding this system, please select the ViaLite graphic to be taken to the company's product web page.

Figure 3 on **Page 71** shows the technique that enables GPS extension into the 1150-m tunnel without any appreciable degradation to re-radiator performance. **Figure 4** shows a representation of the deployed multiple fiber channel point-to-multipoint distribution used by the rail operator.

The fiber optic system outlined in this case study provides a transport platform that enables extended reach into tunnels, and can typically be deployed in tunnels over 30 km in length. The point-to-multipoint configuration has a high level of redundancy already designed into the transmission fabric.

The head-end hardware comprises a standard outdoor enclosure (IP65 rated & NEMA 13) populated with redundant converters and fiber optic splitters and distribution. Each re-radiation stage is housed in a standard

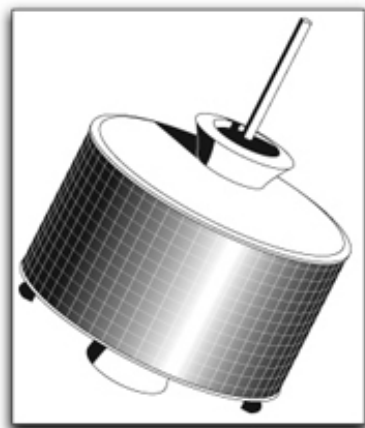*Additional information is available at these two websites...*

European Rail Traffic Management System

UIC homepage for the worldwide organization of cooperation for railway companies

*by Donald Martin, Paul Anderson and
Lucy Bartamian*

In the early 1960s, both medium and synchronous altitude communication satellites were of interest to planners. NASA conducted experiments at both altitudes using the Relay and Syncom satellites. The Syncom program [1-12] had three major objectives:

- To place a satellite in synchronous orbit
- To demonstrate on-orbit station keeping
- To make engineering measurements on a synchronous altitude communication link

Syncom satellite

The **Syncom** satellite had a short cylindrical body that was spun about its axis to provide stabilization in orbit. The antennas were mounted beyond one end of the body and were collinear with the satellite axis. All the satellite equipment was contained within the body. This design formed the basis for several later synchronous altitude satellites. The communication subsystem had two receivers and two transmitters for redundancy; either receiver could be operated with either transmitter. The channelization was similar to Relay, with two 500 kHz channels for NB two-way communications and one 5 MHz channel for one-way WB transmissions. (These capabilities could not be used simultaneously.)
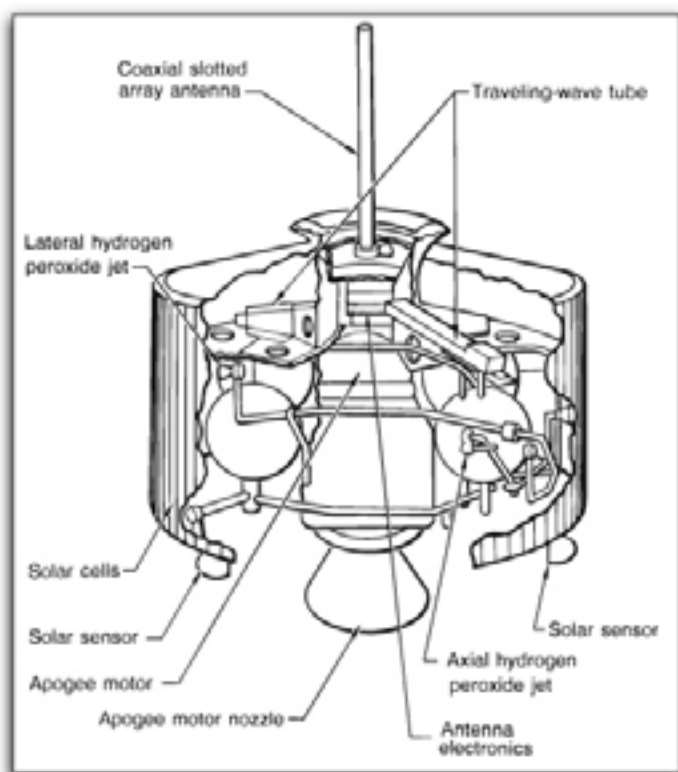
The satellite details are as follow...

Satellite
- Cylinder, 28 in. diameter 15 in. height
- 78 lb. in orbit
- Solar cells and NiCd batteries, 28 W initially, 19 W minimum after 1 year
- Spin-stabilized
- Solid rocket motor for apogee maneuver, cold gas propulsion for on-orbit use

Configuration
- Syncom 1, 2: two 500 kHz bandwidth double-conversion repeaters or one 5 MHz bandwidth double conversion repeater
- Syncom 3: one 5 MHz bandwidth and one switchable (50 kHz or 10 MHz) bandwidth double-conversion repeater (some references say 13 MHz instead of 10 MHz)

Capacity
- Several two-way voice circuits or one TV channel

Syncom satellite detail

Transmitter
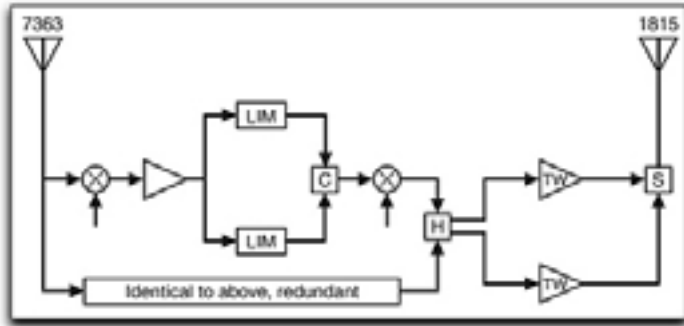- 1815 MHz
- Two TWTs (one on, one standby)
- 2 W output

Receiver
- 7363 MHz
- 10 dB noise figure

Antenna
- **Transmit: three-element collinear slotted array, 6 dB gain, 23 x 360 deg beam**
- **Receive: slotted dipole, 2 dB gain**

Syncom communication system

Telemetry and command
- **Telemetry: 136 MHz, via four monopole antennas**
- **Beacon: 1820 MHz**
- **Command: 148 MHz, via four monopole antennas**

Orbit
- **Syncom 1, 2: synchronous altitude, approximately 32° inclination**
- **Syncom 3: synchronous equatorial**

Orbital history
- **Syncom 1: launched 13 February 1963, all communications failed during orbital insertion**
- **Syncom 2: launched 26 July 1963, operated through 1966, final turn off April 1969**
- **Syncom 3: launched 19 August 1964, operated through 1966, final turn off April 1969**
- **Delta launch vehicle**

Management
- **Developed by Hughes Aircraft Company for NASA Goddard Space Flight Center**

Syncom 1 was launched in February 1963. The intended orbit was at synchronous altitude with a 33° inclination. The satellite operated properly during the ascent, but all communication was lost when the apogee motor fired to inject the satellite into its final orbit. The cause of the failure was the rupturing of a tank of nitrogen that was part of the on-orbit control subsystem.

Syncom 2 was successfully launched in July 1963. Like Syncom 1, it was not intended to achieve a stationary synchronous orbit because of the extra propellant weight and control complexity required to attain 0° inclination. NASA conducted a number of tests using this satellite, including voice, teletype, and facsimile. During its first year, in addition to engineering tests, 110 public demonstrations were conducted. Their purpose was to acquaint the public with communication satellites and to gain a broader-based, subjective appraisal of system performance.

Engineer Dave Kamm aligns Syncom before its orbital alignment: synchronous with Earth's rotation at 22,300 miles altitude.

Donald D. Williams, part of original Syncom design team, shows breakthrough traveling-wave tube.

Huge 85-foot antenna at Point Mugu, Calif., relayed TV signals from Syncom 3, shown full size at bottom left.

(Historic photos courtesy of Boeing)

Syncom 3 was launched in August 1964. By this time, launch vehicle technology had progressed to the point where a true synchronous equatorial (inclination <1°) orbit was possible. The only major change in the communication equipment was a channel, with greater bandwidth than Syncom 2, to be used for television transmissions.

Syncom satellite image courtesy of Boeing

The **Department of Defense** (DOD) also conducted a number of tests using Syncom 2 and 3. During 1965 and 1966, both were used extensively. Five ground stations and one shipborne terminal were in regular system use. Also, tests with aircraft terminals were conducted using the *very high frequency* (**VHF**) command and telemetry links. By February 1966, the Syncom 2 and 3 repeaters had a cumulative operational time of 27,000 hours, DOD use of Syncom diminished when the Initial Defense Communication Satellite Program (IDCSP) satellites became operational.

While the Syncom satellites were being developed and tested, an *Advanced Syncom* study was also being conducted. The Advanced Syncom program was sometimes called *Syncom II*, which, in some references, is difficult to distinguish from the second satellite of the original Syncom program (Syncom 2 in this report). The conceptual satellite was larger than Syncom, generated more prime power, capable of higher antenna gain, and had repeaters of two different designs. This program grew beyond an advanced communications experiment and became the *Applications Technology Satellite* (**ATS**) program.

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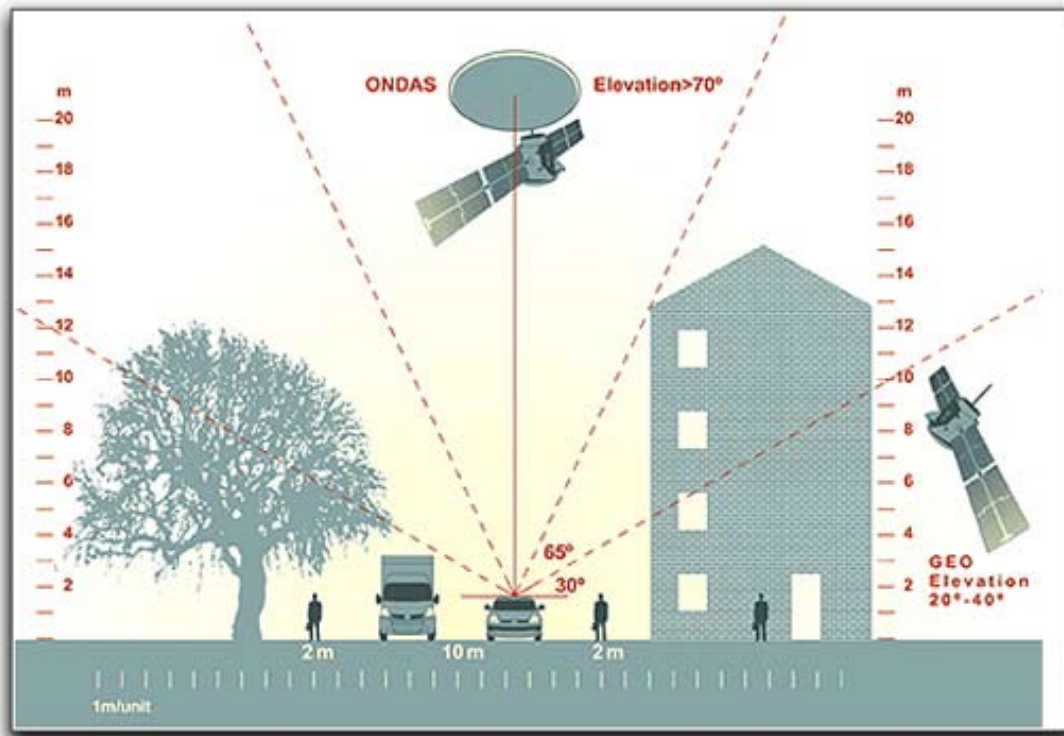
Success for Satellite Radio in Europe

by Dave Krueger

Considering the successful development and increasing maturity of Sirius Satellite Radio and XM Satellite Radio in the U.S., the timing could not be better than right now to introduce satellite radio to Europe. The two companies (now a single entity, thanks to their recent merger) reported a combined USD 2.4B in revenue last year and have, between them, generated a total of nearly USD 6B since services started six years ago.

Unreported is another estimated USD 6B in revenue earned by car manufacturers from the sale of satellite radios in their cars, coupled with several billions more in revenues for radio manufacturers and content providers. Furthermore, infrastructure companies were paid more than USD 5B to build the transmission networks. The bottom line is this: if your company has any radio leanings, you definitely want satellite radio in Europe.

The market opportunity in Europe is even more significant than in the U.S. However, Europe's radio landscape is marked by different conditions than those of the U.S. and there are a number of major distinctions and challenges to overcome in order for satellite radio to be successfully introduced into Europe.

In order to succeed, a consortium of team members must be built, a group that will carefully and accurately deal with all of the cultural and language diversities, fragmented radio markets, discriminating buyers, and a far more challenging physical broadcasting environment. The latter is created by the fact Europe is located 20° north in latitude of the U.S. markets and displays completely different features in terms of urbanization.

FEATURE

ONDAS coverage compared to convential GEO coverage

Europeans. We learned how to deal with cultural and linguistic diversity so as to satisfy users in all 27 European member states in more than 20 languages.

ONDAS' extensive market research led this team to understand what services consumers would like to receive, where, and when. ONDAS Media will use this formula to produce proprietary content, which responds to European consumers and will include often innovative, exclusive, and "extreme" content from today's perspective. But it doesn't end there... we also learned there is compelling existing content, but some consumers in Europe require this content to go mobile with them.

Content Diversity

In Europe, I have personally watched and participated in the ongoing debate regarding satellite radio. So far, this has been a 10 year long debate about technical standards, frequencies, and technologies.

How many acronyms and abbreviations can we create? *DMB*, *DVB*, *ETSI-SDR*, *UMTS*, *DAB*, *SDARS*, *DVB-SH*, *WiFi*, *WiMAX*, even *IPTV*; then there is L-band versus S-band, and, of course, *HEO* versus *GEO.* Meanwhile, 75 MHz of mobile spectrum remain unused by any meaningful European commercial project for more than 15 years. Also meaningful — nearly 50 percent of Europeans would pay a reasonable monthly fee to have a more diverse offering of digital programming available to them in a mobile environment. The CEOs of the formerly two U.S. companies, **Sirius** and **XM**, have been quoted over time as saying their business success is about "content, content, and content."

Therefore, two years ago, in cooperation with our car customers and media partners, **ONDAS Media** set about designing a massive suite of new digital content that will respond to that extremely important need of

As a result of the research, ONDAS Media will also acquire and re-distribute some widely accepted and well-established media brands to ensure European audiences will receive their favourite existing content anywhere they go in Europe, rather than just at home.

As our team developed this knowledge base, we began to be approached by key players of the music industry. We observed the business trends and set about to work with this team of experts to design new models for promoting and profiting from this irreplaceable art form. Artists need to monetise their creations — something that has not been so easy for them over the last few years. Plus, they need to monetise content in new ways as the classic revenue models in the music industry have also changed in the past five to 10 years.

We may even have to go back to the future: concerts, promotions, and derivative sales opportunities take us back to an age when artists primarily marketed

and distributed their art through live shows. We've worked that formula, and now can introduce new means of distribution and revenue generation for all elements of the content business, with methods and manners of distribution, that people today happily pay for to participate in socially.

Satellite Digital Audio Radio Service (SDARS) illustration

The time now seems right to develop and implement a serious and decisive alternative to the advertising-based "DNA" of existing commercial radio. Europeans have a love affair with some of their existing radio programs, but they also could do without the commercial interruptions in every country, and they will pay — in every country — to have them eliminated. Plus, DJs, moderators, and music artists need an alternative platform within which to entertain us and promote their works.

A key ingredient of ONDAS Media's strategy is to start service in the automotive sector. We want to make future drivers safer, better entertained, and more informed through a blend of compelling audio, visual, and data content services. News, localized traffic and weather information are extremely important parts of this mix. We offer car manufacturing clients a new, almost limitless "pipe" through which to send that data to their vehicles and our customers.

ONDAS Media will broadcast its multi-lingual radio, music, video, and data services directly to European consumers in their automobiles, trucks, homes, offices and to their mobile and portable devices through the fully integrated, digital satellite transmission network. Digital entertainment will be provided to 250 million vehicles and as many as 600 million European inhabitants on the move, 24x7, through more than 150 channels of proprietary and re-distributed music, sports, news, weather, traffic and special interest programming in all the key European languages.

As to some of the more technical aspects of this business, one of the principal considerations in designing a mobile, satellite-based broadcast system is the degree of signal loss that might occur in the highly developed, urban and suburban areas of Europe and in regions with lots of foliage. ONDAS Media uses satellites in highly elliptical orbits — this ensures that the signal comes straight down, vertically, onto the cars. ONDAS knows of approximately 10 studies sponsored by the likes of the European Space Agency, research agencies, aerospace companies, satellite manufacturers, service providers, and wireless operators, all of which conclude a GEO-based satellite radio service will not work in Europe unless it relies on several thousand terrestrial repeaters. We have faith that the hundreds and thousands of hours of testing on HEO- and GEO-based systems in the U.S. are accurate in predicting a service availability of 99.7 percent for a HEO-system versus approximately 91 percent for a GEO-system for latitudes similar to Europe (i.e., measured data in Canadian drive tests with highly calibrated equipment).

ONDAS Media has entered into direct contractual mandates from our automobile customers that state specifically that their millions of vehicles will only be serviced by a system that includes a signal coming from HEO- based satellites. The customer is always right — all our customers demand the highest quality service and know that a GEO-only service signal will be greatly inferior in quality. This is scientifically proven fact.

FEATURE

ONDAS Media does see certain benefits of combining GEO- and HEO-based satellite services. That's why the Company supports and implements a hybrid network architecture approach to ensure uninterrupted signal quality. This is not new. In the U.S., the combined networks of Sirius and XM consist of 11 satellites in HEO and GEO orbits, 25 MHz of spectrum, as well as additional terrestrial frequencies. ONDAS Media is aiming to operate a similar, although smaller scale, network across Europe. To that end, we have recently authorized our satellite manufacturer to develop state-of-the-art satellite infrastructure for our HEO-network filed in Spain. As to the hybrid complement, we have entered into an agreement with the **Radio Communications Agency** in the Netherlands, which allows ONDAS Media to place up to two geostationary satellites in premium orbital positions claimed by the Netherlands.

The ONDAS Media network is "hybrid" in terms of orbital physics and frequencies and intends to take advantage of the S-band spectrum to deliver content services to automobiles across Europe. The automobile manufacturers use S-band for Sirius Satellite Radio and XM Satellite Radio in the U.S. and are already familiar with the smaller antennas, which can be integrated into vehicle designs more easily. Meeting the needs of the automotive industry is key because this is how consumers receive a significant portion of radio content.

Our current agreements provide access to as many as 10 million subscribers. Car company's are unified in their belief Europe should use the similar S-band frequencies in order to minimize the physical re-design and re-qualification of equipment for their vehicles.

On the other hand, some markets such as navigation units distributed in retail but with "ONDAS Inside" chipsets, and even handheld mobile phone-based units, may all benefit that much of the core processing and antenna reception technology is already designed and in production in the L-band frequencies — or will be in the future. Additionally, retail units (aftermarket or any units that are not factory-installed) do not present the difficult and costly challenge of re-design and re-test that's been experienced by the car industry.

In conclusion, ONDAS Media believes if we put aside philosophical technology debates and open our minds to what our customers are saying and, frankly, demanding, we can build a consortium of companies that have the appropriate motivation and vision to make satellite radio a reality in Europe. This team of consortium members is currently being built and already consists of some of the most prominent car makers, satellite makers, and music companies in the business — we heartily welcome others who wish to participate in this digital radio revolution.

About the author

David Krueger is the Chief Executive Officer of ONDAS Media and he has 23 years of experience in satellite systems development. He has directly managed the development, launch, and operations of 67 satellites and 16 launch vehicles. Mr. Krueger and his firm advised major satellite telecommunications companies and other corporate clients in satellite imaging as well as broadband and mobile satellite-based telecommunication systems. Mr. Krueger led the development of the Global Radio (Digital Satellite Radio) concept and detailed design, managing a team of several contractors. He was a senior manager at Motorola's Satellite Communications Group, pioneering the successful delivery of the Iridium program and he led the technical implementation of the Iridium domestic launch program and the formulation of the operations and maintenance design for the entire system. He subsequently directed a team of Motorola engineers in the design and development of the follow-on "Iridium Next" project, with full responsibility for all aspects of the program including core research. Mr. Krueger holds a Bachelor of Science Degree from the United States Air Force Academy (1982) and he worked 10 years for the National Reconnaissance Agency, leading the development of advanced systems.

NSR — Avoiding A Repeat Of History

by Patrick French

Early this year, Eutelsat made a critical announcement that was somewhat overshadowed by its news from a week earlier that the Company had ordered KA-SAT, a next generation spot beam Ka-band satellite for its Tooway satellite broadband service. The January 15th press release detailed Eutelsat's new agreement with Swisscom, which had recently won a tender from the Swiss Ministry for Telecommunications to provide universal broadband services to all residential Swiss customers, regardless of where they live. Following a detailed assessment of different technologies to provide broadband services to households beyond the reach of terrestrial broadband services, Swisscom settled on the Tooway satellite broadband product as the best service to meet its needs.

The same day, **SES Astra** reported that it had signed new French and Italian distributors for its ***ASTRA2Connect*** satellite broadband product. In the same press release, SES Astra stated that it had commitments as of that date for more than 200,000 consumer terminals to be installed in three to five years, which equated to future revenues amounting to 165 million euros. This was followed by a key contract with **Deutsche Telekom** announced in early April and other distribution agreements for Belgium, the Netherlands, and again France, that have all certainly added further to the consumer terminal and revenue commitments for the ASTRA2Connect product.

At last report, ASTRA2Connect was available in 10 European countries from 11 different distributors, while 12 distributors were making Eutelsat's *Tooway* service (Ka-band and Ku-band versions) available in 14 European countries. In NSR's view, establishing strong distribution channels is essential to the development of the consumer-class single site satellite broadband market. However, this is a real challenge, given the fragmented nature of the European market and difficulties in obtaining economies of scale for individual distributors.

There are parallels to the U.S. single site satellite broadband market where there are a few large distributors, but most of the distributors are small. In the U.S

market there are literally hundreds of individual distributors and resellers compared to less than 30 in all of Europe. Distributors in the U.S. market can benefit from nationwide and regional marketing campaigns conducted by the major satellite broadband service providers. Conducting pan-European marketing campaigns is much more difficult, and expensive, due to language differences and the limited (typically national) reach of many of the traditional media channels such as television, radio, and print advertising.

Still, NSR considers the agreements with Deutsche **Telekom** and **Swisscom** as critical to the success of the European satellite broadband market. While most of the current distributors of ASTRA2Connect and Tooway are small, tier 2 or tier 3 ISPs, Deutsche Telekom and Swisscom are major PTTs and the largest ISPs in their respective countries. For other major tier 1 ISPs in Europe, the decision by DT and Swisscom to sign distribution agreements for consumer-class single site satellite broadband services adds substantial credibility to the respective satellite broadband product lines.

In particular, Swisscom's careful evaluation of several technical options to meet its universal service agreement and their decision to settle on satellite as the best option paints satellite broadband in a particularly positive light. In Germany, SES Astra signed on DT despite already having three other distribution agreements in that country. While NSR would guess that the initial reaction of the original German ASTRA2Connect distributors to the Deutsche Telekom announcement was chagrin at best, the simple fact is that DT's active participation in the satellite broadband market in Germany will raise awareness of the satellite service and probably aid all distribution players in the end.

A short history lesson on the single site satellite broadband market must be undertaken in order to sound a note of caution. In 2002, both **Tiscali** and **BT** made major waves in the satellite industry when they introduced two-way satellite broadband Internet access services targeted at the consumer market. The companies already had one-way satellite offers in circulation, and their two-way products were heralded by many inside and outside of the satellite sector as a major turning point.

Unfortunately, an "anomaly" occurred during the launch of these services and the BT and Tiscali two-way single site satellite broadband services never made it into orbit. A major issue at the time was the price of the two-way satellite broadband offers. For example, the entry level BT product was priced at 59.99 pounds excluding VAT per month for a 500/150 Kbps service, and equipment and installation was another 899 pounds, excluding VAT. Various government subsidies were available to help underwrite the cost of the BT equipment, but still the two-way satellite service was priced well above aDSL services at a time when a 500 Kbps "Broadband Basic" aDSL package could be obtained for 17.99 pounds.

More insidious and detrimental to two-way satellite broadband services was the fact that companies such as BT and Tiscali never truly embraced the product. In hindsight, it appears BT and Tiscali agreed to offer two-way satellite services in order to tell consumers, and as importantly regulators, that "yes, we can offer broadband to anyone anywhere."

In reality, anyone trying to sign up for the satellite broadband services faced major hurdles in terms of wait times for the equipment and were often encouraged to be put on waiting lists for aDSL services. In effect, the companies were delaying satellite installs in many areas in order to pool together enough potential subscribers so as to justify further rollouts of their DSL services, which at the end of the day were much more lucrative for the service provider than the satellite product. The net result was that two-way satellite services fell flat. By 2005, neither BT nor Tiscali were offering satellite products.

In retrospect, it is easy for the satellite industry today to dismiss this period as part of the "learning curve" and to claim that the latest generation of single site satellite broadband services are now priced (both for plans and equipment) at a level that is much more accept-

able for consumer services. Further, it will be claimed, and not without justification, that major European ISPs have finally come to realize that aDSL is not the "be-all" and "end-all" of broadband services. Satellite, as well as terrestrial wireless, each have a proper niche to fill in the overall broadband market.

The last statement is especially true as governments have started to view broadband services as an essential domestic utility, just like electricity or telephone services, and have begun to oblige service providers to offer competitively priced broadband services to every household, no matter where they are located.

There are lessons to be learned from the early failed efforts to introduce satellite broadband services into Europe. Most important in NSR's view is ensuring that the cost benefits for the distributors of offering a satellite broadband service are, and remain in line with, their overall business objectives (*i.e.,* it has to be a win for the satellite operator and a win for the distributor). This is especially important when looking toward the future and ensuring satellite remains the most profitable way for an ISP to deliver services to rural clients.

Today's satellite broadband offers appear to meet these criteria, but as Internet usages changes and the average Internet user expects to obtain ever more content from the Internet, satellite broadband services

must be able to keep ahead of the curve. These services must continue to be profitable for distributors, even when average monthly downloading of content from the Internet triples or quadruples over the coming four to five years. This clearly underscores the decision to move to spot-beam satellites that dramatically increase potential throughput at price points well below what can be obtained on today's typical television broadcasting satellite.

The risk remains that the crossover point where satellite becomes the best solution for serving rural populations will be difficult to find and, just as importantly, a moving target in the future. The industry has its work cut out and will constantly need to demonstrate to distributors its relevance as a product today as well as its relevance as a product for many years to come. Otherwise, major tier 1 distributors will do just as they did in the past — gravitate quickly away from two-way satellite broadband services, should they fail to meet internal rate of return objectives.

NSR remains positive that the European two-way satellite broadband players are on the right track, even if the main players might be taking somewhat different approaches. There is more than one road that leads to Rome, after all. Should the challenges that remain in the future be successfully overcome, NSR has conservatively predicted in its recent *Broadband Satellite Markets 7th Edition* study that service and customer premises equipment (CPE) revenues could reach nearly US$800 in Europe by the end of 2017. Success, after all, is as much hard work as it is remembering to learn your history lessons.

Article Information was extracted from NSR's **Broadband Satellite Markets, 7th Edition**, report — select any graphic for info.
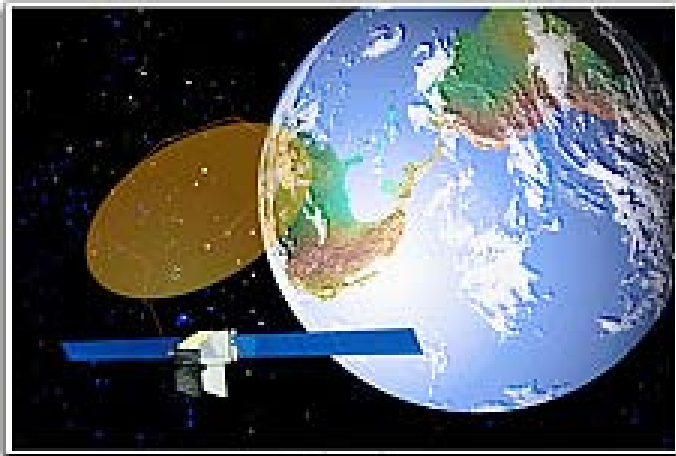
About the author

Patrick French joined Northern Sky Research in September 2003 and has since authored numerous studies, the most recent being the Global Assessment of Satellite Demand, 2nd. Edition and Broadband Satellite Markets 5th. Edition. He has sought to expand NSR's coverage of the satellite industry into areas such commercial satellite supply and demand modeling, video distribution and contribution, DTH, telephony and narrowband VSAT networks. In addition, he has undertaken client specific projects in diverse satellite applications and intends to broaden NSR coverage of the European satellite industry.

From 1990 to 1999, Patrick was a staff member of the International Space University (ISU), first in Cambridge, Massachusetts and then six years at ISU's Central Campus located in Strasbourg, France. He held numerous positions within ISU organizing conferences, short courses, and workshops. In parallel, he was responsible for managing the development of the new ISU Central Campus facilities that were completed in mid-2003. Following his work at ISU, Patrick joined Frost & Sullivan, where he rapidly advanced to the position of Strategic Analyst for the Satellite Communications group. While at Frost & Sullivan, he authored eight studies, led numerous consulting projects, and tracked other diverse markets such as satellite television, launch services, emerging satellite applications and content delivery networks.

Patrick French is based in Strasbourg, France. He holds a Bachelors of Science in Aerospace Engineering from Boston University and attended the 1999 ISU Summer Session in Nakhon Ratchasima, Thailand. He is fluent in French.

The satellite industry might soon be approaching a new era — one in which satellite and cellular networks are combined and consumers are able to use both networks on handsets similar in size to what is currently on the market.

SkyTerra Communications, Inc., and its sole operating asset **Mobile Satellite Ventures** (MSV), have been working on developing next-generation satellite services that would redefine the way mobile devices are used. And with a $500 million commitment in funding from **Harbinger Capital Partners**, SkyTerra's vision for the future is well on its way to becoming a reality. SkyTerra currently operates two satellites and delivers mobile wireless voice and data services to customers in the public safety, security, fleet management, and asset tracking industries.

The future of SkyTerra lies with its two new satellites — **MSV-1** and **MSV-2**. These satellites, which are expected to be among the largest and most powerful commercial satellites ever built, will enable the company to develop a next-generation integrated satellite-terrestrial network.

The launch of MSV-1 is currently expected to occur in the fourth quarter of 2009 or the first quarter of 2010, and the launch of MSV-2 is currently expected to occur in the second half of 2010.

An integrated satellite-terrestrial network will allow users to roam seamlessly and transparently between the satellite and terrestrial networks. Calls will go over the terrestrial network when it is available and then automatically — and unnoticeably — switch to satellite spectrum when the terrestrial service is unavailable. And because of *ancillary terrestrial component* (**ATC**) technology, the device will be similar in size, weight, look and functionality to today's cell phones.

Some analysts and others in the industry have questioned whether SkyTerra could secure the financing necessary to support the company's ambitious next-generation business plan.

The Harbinger financing commitment will fund SkyTerra's business plan through the third quarter of 2010. Specifically, it will provide funding through a number of significant milestones, including the launch of MSV-1, the construction of MSV-2, and related satellite ground system, chip set and device development, and core network and back office system development.

"We have obtained committed financing for our period of greatest financial need," said *Alexander H. Good*, SkyTerra's chairman, CEO and President. "We now look forward to bringing to market the services we believe will set a 'high-water mark' for the mobile satellite services industry, and extend the marketplace for sat
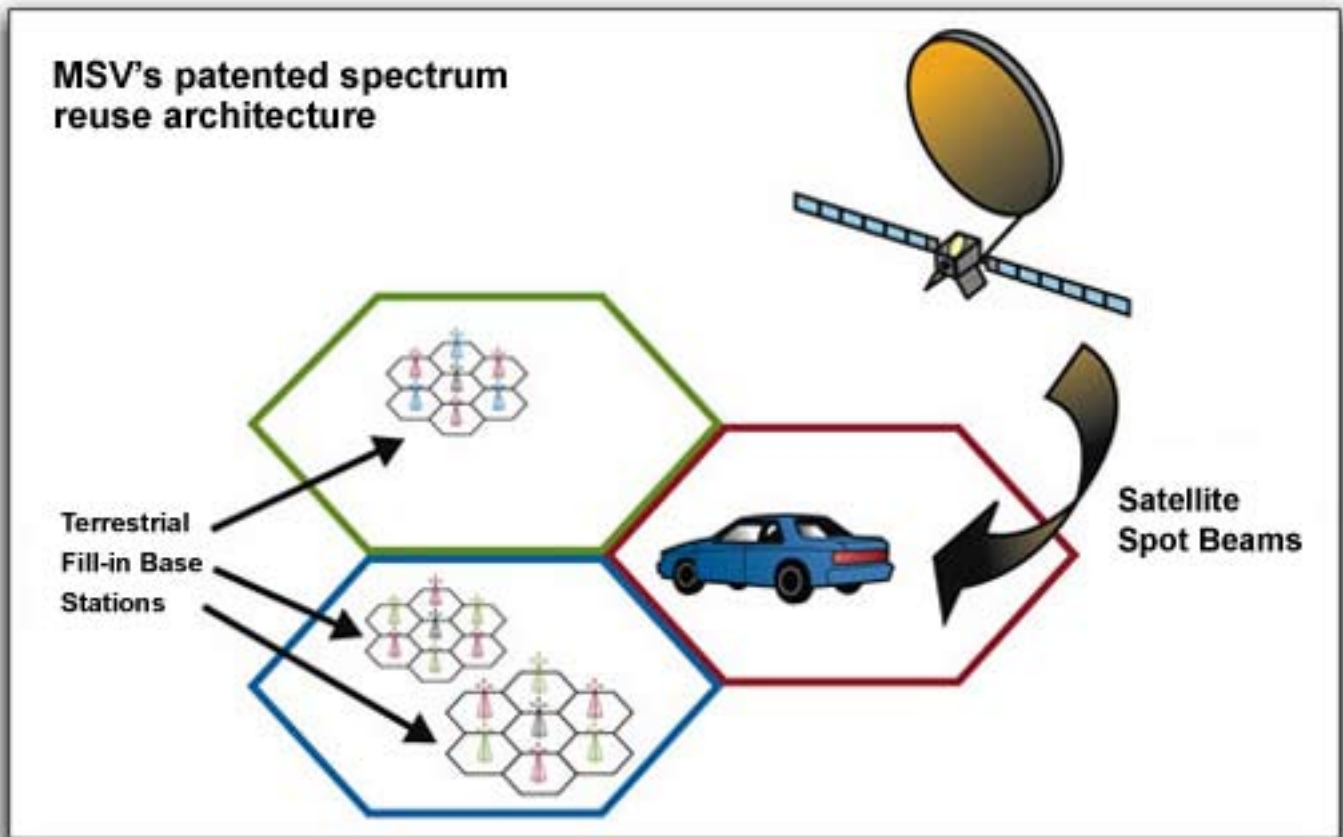
ellite services far beyond their historical bounds. This revolutionary satellite system is expected to provide service for at least 15 years and will ring in the era of integrated satellite-terrestrial networks."

Until now, communicating via satellite has required the use of bulky and expensive equipment and was typically only used in industries with workers consistently in remote locations. Consumers, of course, demand the portability of small, lightweight cellular devices, even though the terrestrial network has limited coverage and service is often unavailable in rural or remote areas.

With the development of an integrated terrestrial-satellite network, consumers, for the first time ever, will be able to communicate from virtually anywhere in the U.S. and Canada, seamlessly toggling between cellular and satellite networks.

This means individuals who live or travel to remote areas that are normally out of the cellular coverage area will now be able to stay in contact with friends, family, and coworkers. And outdoor enthusiasts, who often travel outside areas with cellular coverage, can use the expanded network to call for help in case of an emergency.

A key advantage for the public safety industry is the mobile device officials use everyday could become the same device they reach for during an emergency. Recent crises have illustrated that natural and manmade disasters often result in destroyed or congested landlines. The development of a satellite-terrestrial network along with the launch of two extremely powerful satellites will mean that emergency responders can use their advanced devices to stay in touch, even if the terrestrial network is damaged or congested.

MSV's patented spectrum reuse architecture

Terrestrial Fill-in Base Stations

Satellite Spot Beams

Next-generation satellite services are likely to change the satellite industry. Given today's economic conditions, **Harbinger**'s commitment to SkyTerra is an important step to ensuring the construction of some of the largest commercial satellites ever built — paving the way for an integrated satellite-terrestrial network.

SatBlending Possibilities...

In the company's July 25th announcement on the $500 million funding from Harbinger Capital Partners, SkyTerra Communications also announced that they have entered into a Master Contribution and Support Agreement (the "Master Agreement") with affiliates of Harbinger with respect to the possible combination of SkyTerra and Inmarsat plc, a UK public listed company and a leading provider of global mobile satellite communications services.

"The combination of SkyTerra and Inmarsat, assuming financial terms can be reached, makes a great deal of strategic and operational sense," said Good. "It would greatly enhance spectrum efficiency and North American L-Band spectrum while providing a foundation for innovation in the global mobile satellite industry."

According to Good, the combination of SkyTerra and Inmarsat would also provide opportunities for greater efficiencies and scale benefits and coordination in the pursuit of next-generation integrated satellite-terrestrial networks, products and applications.

INTOREL has integrated many M&C systems for SES-ASTRA, one of the world's largest satellite groups. As the SES's network of satellites grows, INTOREL provides the monitoring and control systems for their installations that are used for transmitting large amounts of data or multimedia from point-to-point or among multiple sites. It is crucial for the satellite operator, such as SES-ASTRA, to provide reliable service to its corporate clients, media organizations, enterprises and ISPs.

Satellite's unique ability to transmit the same signal to all points within a geographic area makes it ideal for broadcasting television and radio signals, and for multicasting data for applications as diverse as corporate networks, government missions, and Internet surfing. In order to provide secure, reliable service, **SES** is constantly building high quality transmission systems by working closely with its suppliers.

The particular attention is given to the monitoring and control systems. **SES-ASTRA**'s RFP called for a new earth station that will be used to transmit data and to assure TTC functionality needed for the operations. The **BTZ28** system contains three up/downlink stations.

The customer expressed the preference to use proven COTS-based products to enhance reliability, to cut costs and to integrate into one platform a considerable number of heterogeneous satellite and broadcasting devices.

INTOREL was selected as a prime contractor to provide complete installation of the new monitoring and control system in *Betzdorf*. The system was implemented in *Visionic* – universal monitoring and control (M&C) software that is installed on over 250 systems all over the

the world and it has a proven record of reliability. Visionic enables direct or remote management of the entire network of satellite and broadcasting devices – whatever the size and complexity. Visionic includes extensive device driver library covering all major manufactures and this fact considerably saves time and money, as there is no need for the additional development.

The Visionic M&C system was selected as the main software for all three stations. Using Visionic, a fully-featured graphical M&C system was produced that provides complex auto-backup functions. Indeed, the reliability of Visionic solutions is such that SES-ASTRA decided to run the automatic backup process and not use specialized (hardware) redundancy controllers.

Visionic system also automatically produced hardware documentation, setups for the servers, and remote GUI workstations and other information, greatly reducing the time and amount of work required per system. The Visionic GUI has been drawn in house and customer made necessary changes and touch-ups during critical design review – long before installation. The installation process itself was quick and efficient and installed system implemented exact features that Customer required.

SES ASTRA was provided with easy-to use and preconfigured hardware, all integrated into 19' rack space. The system uses Visionic software for the M&C functions.

Discrete Devices + RF Switches

Moxa ioLogik was selected for the general purpose analog and digital IO functions. This LAN-based system is capable of collecting all analog and digital signals and driving devices (such as RF switches) directly, without any special controllers. Another advantage of the ioLogik system is its possibility to easily expand capacity by adding new slots that could be used if the system has to be enlarged or otherwise modified. The **Comtrol** terminal servers are used to connect serial devices to the Ethernet line allowing full network capability to any device that has to be connected via RS-232/422/485. The COMTROL devices are also rack-mountable and provide easy mechanical interface for mounting.

Each station in the BTZ28 system was provided with the RF blanking electronics that can allow blanking of 12 amplifiers and 48 switches. RF blanking electronics greatly enhances the security of the system because it allows the amplifier to switch off whenever the RF switch is jammed or blocked.

The physical cabling has been executed by the third party under supervision of Visionic. Using the Visionic

cabling wizard, the installation team prepared full procedure and documentation in support of the third party cabling integrator.

Cabling wizard is generated automatically while the system engineer draws the Visionic monitoring and

control schematic. It contains all necessary information how to connect devices in the system, thus avoiding any intervention on site.

Using Visionic as a main development tool, all elements were prepared off-site. The installation of three sub-stations took much less time, due to the meticulous preparation.

BTZ28 was one of the biggest uplink projects in 2007 for SES-ASTRA and was successfully implemented; installation on site required three weeks. INTOREL provided the integration of the complete system and helped SES to reduce redundant efforts at different organizations, improve cost/benefit characteristics, and streamlined the system design, helping ensure that future monitoring and control requirements will be easier to integrate.

The installed platform enables SES ASTRA to expand its system when demanded. It gives the company infinite opportunities for further development and straightaway modernization. Intorel provided SES AS-TRA with a cost efficient and reliable solution, to support the development and maintenance of integrated systems, meeting the company's highest requirements.

INTOREL has provided support to the SES ASTRA systems for more than five years, assisting in overseeing the production, installation, testing, personnel training, logistic support, and the maintenance for numerous earth stations and uplink systems.

David Harrower
Regional Vice President,
Europe, Russia and CIS
iDirect

With this issue's theme revolving around the European market segment, speaking with subject matter experts seemed a most logical route for imparting information to our readers. One such subject matter expert who deals with the European Maritime world is David Harrower of iDirect— we managed to ask him a few questions regarding this growing environment.

SatMagazine
David, how would you describe the opportunity for maritime satellite broadband in the European market?

David Harrower
From a global perspective, Europe is the most mature market for maritime broadband services. This is especially true in Northern Europe where operators in Norway,

Denmark, the Netherlands and the U.K. have a very large amount of existing business. This provides an advantage as European operators have the technical capabilities and experience to capitalize on growing global demand for maritime broadband service.

SatMagazine
How are you partners capitalizing on this opportunity?

David Harrower
We are seeing diverse paths to market for our partners. Many operators are establishing customized broadband networks that meet the specific needs of maritime companies. A major trend here is the adoption of shared TDMA networks that enable vessels to benefit from broadband speeds without incurring the costs of a dedicated network when it's not required. The iDirect platform enforces service levels that can be tailored all the way to the application level. This is a strong model for a market where user activity can fluctuate significantly and where operators often support numerous small to mid-size customers on their networks.

Other partners are having success with our Hosted Network Operator/Virtual Network Operator model, which allows regional service providers to launch a maritime broadband service without a very minimal investment in infrastructure. A number of companies work through our larger HNO customers because it's financially more viable to get bandwidth where it's needed and share the hub resources with a HNO. As VNO customers grow and mature it is only logical to expect them to become their own hub operators in the regions where they are particularly successful.

Another model we are seeing is maritime equipment manufacturers growing their business by adding satellite broadband service to their product portfolio. There's certainly many ways to approach the maritime market and a lot of opportunity for our partners.

SatMagazine
What are the main growth opportunities you see in the maritime market?

David Harrower
Nearly all sectors of the industry are increasing their reliance on satellite connectivity. Probably the biggest opportunity is commercial shipping. We're seeing a major rise in ship production coupled with greater demands for vessels to support business applications onboard. Ships are spending less time in port to meet growing demand and to alleviate security concerns. That's less time for maintenance, for connecting to land-based networks, for crew to see their friends and family.

As a result, the ship is becoming a bona fide remote office. There's greater reliance on VoIP, email, Internet access, videoconferencing and file sharing. Ship operators need constant access to real-time logistics and operations data. And crew members increasingly want broadband access to deal with the increasingly long stretches at sea.

In this environment, the traditional L-band service, where you pay per minute or per data byte is too costly. It's not the right match for the industry's growing connectivity needs. Instead, many commercial shipping companies are switching to a flat fee per month model for broadband connectivity with a guaranteed throughput.

SatMagazine
What other markets are heating up?

David Harrower
In the yacht and luxury vessel market, we're seeing high demand for Internet and cellular connectivity. The challenge here is demanding clientele. On a yacht, a satellite broadband service must support sudden spikes in usage – a problem we've worked with our partners to address. A key innovation here is our Group Quality of Service feature that enables operators to meet minimum data rates while bursting upward when required, without compromising reliability.

Of course, we continue to see demand in the oil and gas industry as this is a very well established customer base for iDirect, and we have a number of partners

that have been very successful servicing this market. There is demand for VSAT not only on the rigs, but also for the supporting vessels. Many of the same issues related to commercial shipping are in play here – crew communications and fleet and vessel management. Like commercial shipping they also need global coverage. We're working with partners like Intelsat to address that need.

SatMagazine

You recently announced partnerships with Intelsat and Sea Tel to establish global network capabilities. What makes this a novel approach?

David Harrower

We have integrated our technology with Sea Tel's 9707 global C-band antenna and Intelsat's Network Broadband Global Maritime service. The goal is to provide the maritime industry and oilfield service providers with universal voice and data connectivity regardless of geographic location or network infrastructure.

The solution features two critical iDirect technologies that allow operators to deploy global networks. The first is Automatic Beam Switching, which enables ships to automatically switch connectivity from one satellite beam to another as they enter a new footprint. The other is our Global Network Management System technology, which assigns each remote with a persistent IP address so that operators can track mobile units anywhere in the world from a single monitoring site.

SatMagazine

David, how do you see the market growing over the next 12 months?

David Harrower

While business opportunities are increasing, there's a lot of education that needs to be done to mobilize new segments of end users. We're working with our partners not just on the technology front, but on a broader

message to demonstrate how satellite connectivity using VSAT can provide a more cost effective, reliable, higher capacity solution than other communication technologies for the maritime market. We expect demand for satellite broadband to rise sharply as core sectors of the maritime industry quickly expand and modernize. New applications are increasing the demand for high speed connectivity, and we expect this trend to only gain momentum for years to come in the VSAT market

For further details on iDirect's Maritime activities, select the graphic below...

by Christophe Kolbe

Many of today's satellite Network Operations Centers (NOC) are assembled from a variety of systems and products designed to simplify day-to-day communications management and transponder planning operations. Whether military or commercial, NOC operators around the world share the same objectives of:

- **Maximizing transponder use (to increase the revenues or the amount of communications)**
- **Ensuring the Quality of Service (QoS)**
- **Maintaining real-time situational awareness**
- **Assisting their customers for communications setup**

Figure 1
An Integral Systems NOC in Operation

Still, in order to meet operational requirements, many operators have assembled their own "NOC jigsaw puzzles" gluing together and augmenting the different systems with in-house developed software.

As an example, many **NOC**s received *Network Management Systems* (**NMS**) supplied by different antenna vendors, equipment providers, modem suppliers, and integrators. These systems were then maintained internally by operators, and as new equipment was brought to a station, new drivers needed to be developed by the internal staff and even sometimes by interns. At the end of the day, managing and expanding a ground station became a constantly growing challenge, and staffing requirements were far from streamlined.

In contrast to the just described scenario, by using **Newpoint Technologies**' modern *Compass* system, operators can break this cycle for existing network operators. By taking advantage of their proven *Manager of Managers* (**MoM**) solution that allows customers to re-use their legacy NMS system by interfacing the Compass system over the legacy system and using the Compass system to manage the entire network from a single console.

In addition, as Compass is easy to install and expand, network operators can enjoy a level of autonomy in the support and build-out of their operations, but with the full support of Newpoint when needed. This approach allows companies to improve both the quality of service and customer service, while at the same time reducing operations cost.

Assembling the Bricks

Integral Systems' initial success in the early 1990's was grounded in the concept that it is possible to use *Commercial Off-the-Shelf* (**COTS**) products to control various satellites. This approach has been applied over the last few years by Integral's European division to the field of NOC operations.

Today's challenge comes down to proposing flexible NOC systems incorporating the most recent technology, while reserving enough space for specific tailoring such as that required to meet customer "specifics" by assembling basic COTS elements. *See Figure 2.* Intelligently designed
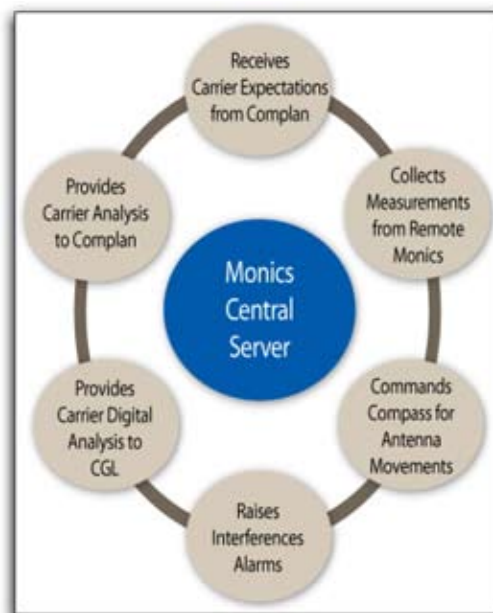

Figure 2
The Role of COTS Products (Integral's Monics Central Server) in NOC Design

COTS products resemble the ever-popular *"Lego"* bricks – easy to combine and assemble. With these "bricks", you can create complete systems supporting complex operator missions.

Our bricks are Integral's satellite ground products and third-party products that are well established in the industry. Specific attention has been paid to interfaces between products – the point where products are assembled and intended to work with each other. This function, also referred to as "integration", is often depicted as simple lines in schematics.

Due to ever increasing satellite traffic and simplified access to this means of transmission, operators are experiencing increased communications interference. As a result, operators need enhanced visibility into systems, improved prediction modeling, and methods of identifying interference sources.

Visibility is provided by the *Carrier Monitoring System* (**CSM**). Today's CSMs offer far better capabilities than traditional spectrum analyzers with user-friendly displays, more powerful alarm and event management, and distributed databases for multiple sites.

Predicting is performed using frequency planning tools proposing a modular set of software that helps operators organize future transmissions by taking into account changing space environment parameters.

Identifying a carrier is done using advanced database search features because 99 percent of unexpected transmissions have known characteristics that can be traced back to their source. For unrecognized transmissions, the need for geolocation is growing to ensure communications safety and security.
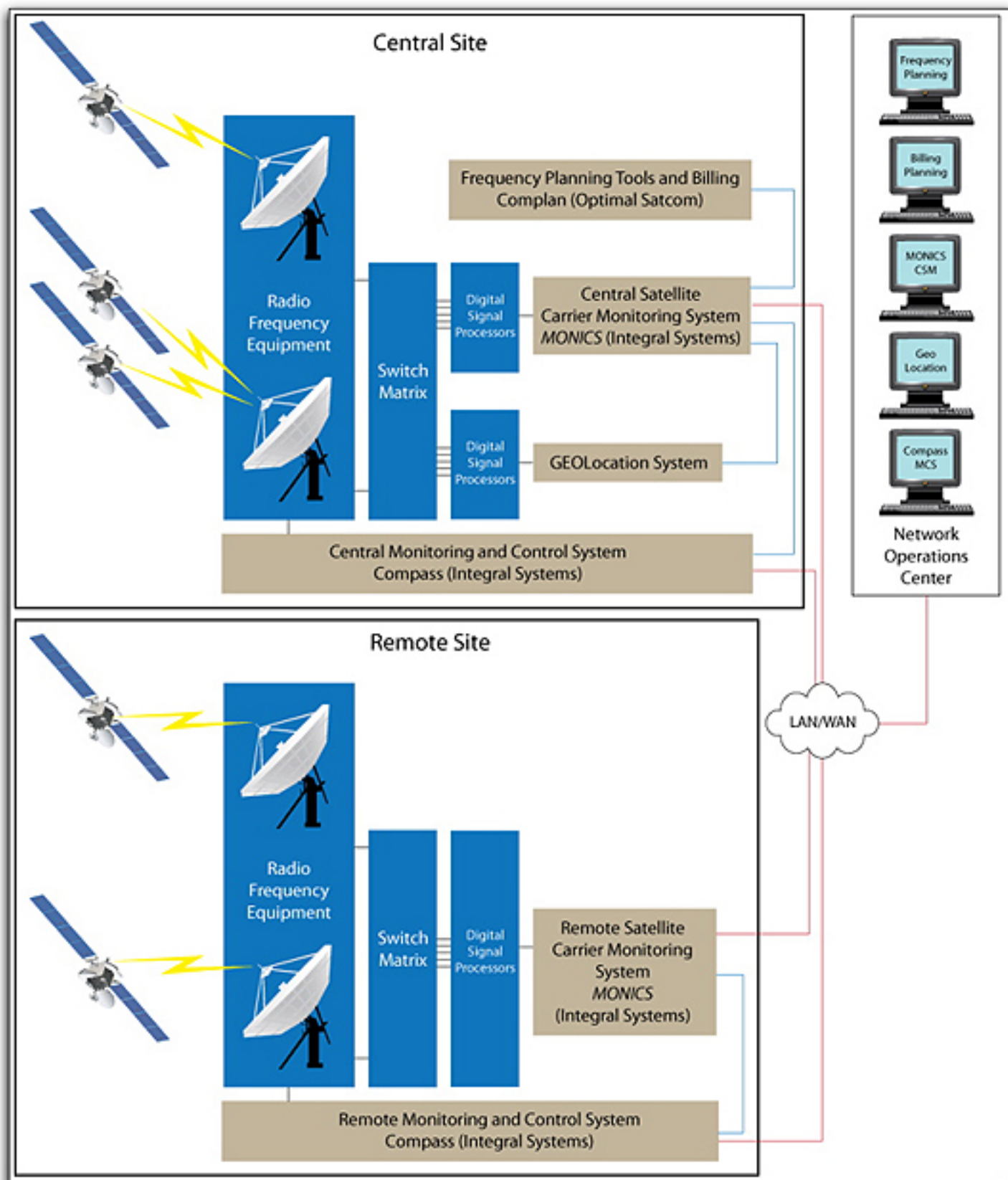
Central Site

Frequency Planning Tools and Billing Complan (Optimal Satcom)

Radio Frequency Equipment

Switch Matrix

Digital Signal Processors

Central Satellite Carrier Monitoring System MONICS (Integral Systems)

Digital Signal Processors

GEOLocation System

Central Monitoring and Control System Compass (Integral Systems)

Remote Site

Radio Frequency Equipment

Switch Matrix

Digital Signal Processors

Remote Satellite Carrier Monitoring System MONICS (Integral Systems)

Remote Monitoring and Control System Compass (Integral Systems)

Network Operations Center

Frequency Planning

Billing Planning

MONICS CSM

Geo Location

Compass MCS

LAN/WAN

Figure 3. Integral Systems' Integrated NOC Solution

A Successful Strategy

Behind the "simple lines" of our schematics, Integral System's core guideline/philosophy calls for integrating products by:

- **Building out technical advantages within each product**
- **Using simple software interfaces (primarily database driven)**
- **Maintaining the compatibility of interfaces while products are evolving**
- **Keeping the system open for future add-ons (using APIs)**

Integral Systems is delivering NOC solutions for **Rascom** (Africa), **Vinasat** (Vietnam), and **THOR** (Norway) satellites with our *Monics CSM* and *Compass NMS*, antennas from **Globecomm Systems**, and frequency planning from **Optimal Satcom**. Our customers have access to the most advanced technology, including interference detection (Carrier under Carrier), a wide range of modules simplifying frequency planning prior to transmission, and systems that provide total overviews of ground and space assets in real-time. The Integral Systems integrated NOC solution is illustrated in *Figure 3* on **Page 96**.

Another important layer in Integral's strategy ensures a NOC system's lifetime by proposing additional services such as hardware and software maintenance, and incorporating evolving system expansion through additional identical or new elements.

Many of our customers are growing, adding new satellites over new regions. As a result, they require more support for their growing or changing staff, more transponder/site visibility, and more secure communications.

Detecting space interference has certainly become a major concern, but being able to determine an interference source is the most current and growing need. Integral is addressing this issue through enhanced

computerized research capabilities and new products such as geolocation, adding new "Legos" in our existing set.

In the Integral model, a typical NOC will still include several operator positions (see *Figure 3*) – at least one dedicated to each main function (CSM, Planning, Network Management...). Our "evolutionary goal" is to reduce the number of operator positions, as user interfaces increasingly look and feel similar, and require less and less constant oversight. This evolution can be compared to Microsoft's Office software: each user works with Word, Excel, Outlook, and PowerPoint, but specialists are not required for each application.

The "NOC of the Future" could actually be unmanned, with operators working from home through web-based user interfaces.

A Bright Future

In our continuously evolving ground segment environment, there are still technological, functional, and human challenges to meet when providing universal NOC capabilities. When operators say "It would be nice to have ...," or "Ideally, we would need to ...," Integral is listening intently and we work to incorporate these wishes in our future product releases.

A word we hear quite often is "AUTOMATION" and this means increased integration and awareness with less human intervention. Working in this direction, Integral Systems has recently developed its *Executive Dashboard* product, providing rapid and global overviews of complete ground and space segments. *Figure 4* provides a sample display of Integral's new Executive Dashboard product.

Satellites have been with us now for half a century, but we are all really still just pioneers in this domain. Integral Systems is focused on making the right decisions today that will build model ground systems for tomorrow.

About the author

Christophe Kolbe is Marketing and Sales Manager at Integral Systems Europe (ISE), Toulouse, France. He graduated from the Ecole Superieure d'Electricite (SUPELEC) in 1991, and spent more than 10 years developing and selling products and systems for aerospace companies such as Thales and IN-SNEC. Mr. Kolbe joined Integral Systems in 2003 to promote sales for NOC products. He can be reached at ckolbe@integ.com.

Europeans, Satellites & The Digital Divide   INSIGHT

by Louis Zacharilla

In mid-August an event took place in steamy Taiwan which may be a precursor for things to come in the world of broadband in Europe. During that week, the nation's newly-elected president, Ma Ying-Jeou gathered experts on broadband from around the world. However, he did not bring them to Taipei, the typical site for these types of events. Rather, the event was held in Taoyuan County. This atypical location was not so unusual to those involved with broadband policy, issues of community access to broadband and the emergence of what the New York think tank Intelligent Community Forum refers to as, "the Broadband Economy."

President Ma gathered experts from as far away as Scotland, Canada, and elsewhere who have success in using broadband to stimulate economic growth to have a national advisory dialogue on a broadband future for the rest of Taiwan. His agenda paralleled a concern that persists worldwide: what to do about the underserved regions of the world. "Underserved" in this instance means those with unacceptably low levels of access to broadband or even basic telecommunications. From a business perspective these regions offer increasingly appealing potential and, if they are to realize it, must find a way to not only receive broadband, but to harness it to economic and social development. While access is only the beginning toward becoming an intelligent community, it is where many communities continue to be impeded.

Broadband is not a new topic for President Ma or for Taipei. As Mayor of Taipei in 1996, he set the city on course to become a massive user of broadband in support of the nation's robust technology, manufacturing industry and its breathtaking numbers of research parks. His strategy called for a ubiquitous infrastructure which would underpin both economic expansion and a lifestyle that would allow the citizens of Taipei to enjoy an enhanced quality of life. By 2006, Taipei had been named the world's Intelligent Community. Mayor Ma became President Ma two years later.

During the recent conference the new president set goals that were more ambitious. This time, the goal was not simply to understand how the nation's largest city could implement broadband and further its broadband strategy. Rather, it was to determine ways in which the entire nation could become an "intelligent island" with broadband at its core. An "intelligent island" is one that offers broadband cheaply and ubiquitously, supports a growing culture of knowledge workers who rely on faster and faster speeds, and successfully attacks the digital divide. Combining fiber, satellite, WiFi or other systems, the goal is to provide access to more people and to create more international markets. This in turn creates more opportunities for telecom-related applications and services.

Digital Divide Issues in Europe

In Europe the digital divide is top-of-mind for most leaders of EU communities and governments. While there may be no grand strategy, such as the one seen in Taiwan and, increasingly, in places such as Ontario, Canada and Australia, there is movement, along with a growing sense that broadband via satellite has begun to address the issue of the digital divide and offers substantive approaches from the commercial sector. The issue of a digital divide is not new to Europe. While it has not been positioned as an opportunity, the risks have been well-documented. As far back as 1999, the United Nation's Development Programme squarely addressed the risks associated with the exclusion of access when it reported that "(the) Internet poses severe problems of access and exclusion. With communications technologies playing increasingly vital roles in economic development, education, health care and governance, the exclusion of those who are poor, illiterate, rural or non-English speaking has broad ramifications. We are profoundly concerned at the deepening maldistribution of access, resources and opportunities in the information and communication field. The information and technology gap and related inequities between industrialized and developing nations are widening: a new type of poverty — information poverty – looms."

This concern remains perfectly-suited to a satellite-based solution. Covering wide areas of turf and delivering information to remote – or poorly-serviced communities - speaks directly to the unique advantages of satellite. The caveat, as always, is finding the right blend of services and pricing to enable a truly scalable business model for each economic sector. Traditional thinking may not carry the day. Fortunately, satellite

companies such as Skylogic in Europe, Wildblue in North America and Shin Satellite in Asia are probing underserved broadband communities via satellite using different approaches. What is consistent among these companies is their strategic understanding of the needs of communities.

In Skylogic's case, this means the communities of Europe. Last October this Eutelsat subsidiary announced that it would bring "full broadband amenities" to 120 communities in the region of Sargossa in Spain. Following a competitive tender, Skylogic's D-STAR service was selected as part of an extensive regional broadband program called Zaragoza Internet Provincal (ZIP). Sargossa thus became Spain's first region to initiate a universal broadband program which used access technologies that include satellite. Each town hall is equipped with a D-STAR two-way broadband system which consists of a 96cm antenna and an indoor device the size of a DVD player. According to Eutelsat, the terminals also connected to WiFi hot spots in several villages to extend Internet connectivity.

Juan Antonio Sanchez Quero, Manager of New Technologies in Zargoza says, "The D-STAR technology enables us to have universal broadband, without discriminating (or excluding) citizens in rural environments." It is a necessary first step and it mirrors the vision of people like President Ma in Taiwan, who identify the relationship between broadband and social and economic development a key ingredient for economic success.

Still smaller, governmental or non-profit groups continue to lead the dialogue and push the issue. However, in 2008, it appears that the satellite industry has found its voice on the subject. It has begun to invest in what promises to be a new era of "infrastructure building." Certainly the announcement of ViaSat's new satellite has people focused on the potential of satellites to bring the entire world across the digital divide.

According to ViaSat's Senior Vice President and head of the recently announced ViaSat-1 Ka-band broadband satellite initiative, satellite technology must begin readjust in important ways.

"For satellites to continue to be relevant to the unserved or underserved market for broadband," says Tom Moore, "satellite technology has to evolve at the same rate as terrestrial broadband grows. In other words, our industry must grow capacity an order of magnitude every seven or eight years."

Can it be done? "Human nature is such that you tend to believe things cannot be done until you see them being done, and then you find ways to do it." Moore added. He should know. Mr. Moore was one of two founders of WildBlue Communications, a North American-based provider of broadband services for rural populations. WildBlue was never going to work. Today it has approximately 400,000 subscribers.

While Europe may be slower than other parts of the world to take up the call to consider broadband an essential infrastructure, and satellite a means of serving the underserved, the satellite industry has clearly begun to step-in and fill the access gaps.

Another European based initiative which has identified broadband satellite as a key enabler for broadband community networks is England's Avanti. At last report Avanti plans to launch its Hylas bird in 2009 and offer a service for broadband community network.

Can satellites help Europe achieve important social and economic goals? Why not, says Intelligent Community Forum Chairman and Co-Founder, John G. Jung. "It is interesting to note that European companies and policy-makers have been rather slow to realize that every community has opportunities to use broadband for economic, social and political development. European governments tend to have a compassionate role in enabling citizens. But in this area, they were for a long while probing for a good solution. Satellite can be a very efficient way to get them to that point," says Jung.

Jung, who was invited by President Ma to provide the keynote address for the Intelligent Taiwan vision in August added, "Small and medium-sized companies have been, on a global basis, the primary producers of job growth. They now have trade opportunities on a global scale that were once reserved for multinational firms. When geography is no longer an obstacle, then any community in Europe or elsewhere can move into the 21st Century economy and do well. It is an exciting time."

If it takes a fixed service satellite to get communities and businesses there, it seems they are now available for the task.

About the author
Louis A. Zacharilla is Director Development for the Society of Satellite Professionals International, where he serves as strategist and spokesperson for the international society. He oversees SSPI's corporate underwriting program and serves as liaison between the Society and its corporate underwriters. Mr. Zacharilla also assists with the formation of new international chapters for the Society.

He is a frequent moderator, speaker and writer on matters related to the value of satellite communications. Mr. Zacharilla has written numerous articles for trade and business publications, appears on television worldwide and is the co-author of a book on business-to-business marketing (B2B Without the BS).

He began his career as an advertising executive in New York, where he served on the team that developed the United States Army's now-famous "Be All You Can Be" campaign — the longest-running advertising program in the history of American advertising. He also worked on the 1984 Olympics Games, held in Sarajevo, in the area of PR and sponsorship development. He was an adjunct professor of Marketing and the Media at New York's Fordham University, is a guest lecturer at Polytechnic University's Distinguished Speakers Series and holds a Masters Degree in English Literature from the University of Notre Dame (USA).

Mr. Zacharilla also serves as a senior manager and the Director of Development for World Teleport Association, another industry trade association. Contact Louis at Lzacharilla@sspi.org

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