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SATELLITE Markets & Research
Industry Trends, News Analysis, Market Intelligence and Opportunities

Trends to Watch 2014

by Virgil Labrador, Editor-in-Chief

2013 was another landmark year for the global satellite industry. In this issue, we look back at the key events in 2013 and how they will shape the trends to watch in 2014 and beyond.

Direct-to-Home Services will Continue to be a Key Application

In all markets, worldwide, DTH services are booming, despite threats from OTT (over-the-top), terrestrial and mobile services. In the highly competitive U.S. market, DTH services are actually gaining subscribers, while cable providers are suffering from the effects of "cord cutting" by more savvy consumers. In the emerging markets of Asia, Latin America, the Middle East and Africa, demand for DTH services continues to grow and are driving the expansion of satellite fleets in those regions. DTH is so much in demand in South and Southeast Asian markets that SES dedicated an entire satellite launched in December 2013, SES-8, just for DTH services.

Despite challenges from terrestrial media and Over-the-Top services, Direct-to-Home satellite services continues to grow worldwide.

The continued growth of DTH is reflective of the unique advantages that satellite technology provides in serving areas not reached or underserved by terrestrial means. This gives satellite an advantage over cable companies who often have to compete directly with other terrestrial media.

The New Space Race

The satellite industry should follow developments in space more closely. We are now in the midst of a Space race that is reminiscent of the competition in space by the U.S. and the former Soviet Union during the Cold War. In 2013, China landed a probe in the moon (only the third nation to do so) and India launched a rocket to explore Mars. China has announced plans for a manned mission to the moon within the next decade. Like the Space race of the late 50s through the early 70s, there can be many commercial dividends from such a race. China and India's satellite industry are certain to benefit from their government's renewed commitment to space. This will in turn result in increased competition with the Western countries in terms of satellite manufacturing, launch services and other segments of the industry.

Continued on page 4

What's Inside

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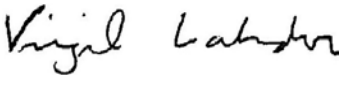
From the Editor

2014 Prediction

I'm going to make a bold prediction for 2014: The satellite industry will continue to grow in real terms globally. Actually, it's an easy prediction to make. The satellite industry has been growing at an average rate of 7-8 percent each year since the Satellite Industry Association started issuing their annual State of the Industry report in 2002. That includes the years of global economic downturn from 2007-09. In fact since we started tracking the Satellite Markets 25 Index in January 2008 when we first published the Satellite Executive Briefing magazine six years ago, the index has increased in value by a whopping 70 percent!

The signs are indeed very promising that this growth trajectory will continue in the next few years. There is so much coming in the pipeline including many High Throughput Satellites and the demand for bandwidth from Ultra HD and broadband services is growing at an exponential rate. We will continue as wel as we face our seventh year of publication to report the trends and opportunities in this exciting and dynamic industry.



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Trends to Watch 2014 ...From page 1

Space Tourism

In April 2013, Virgin Galactic successfully conducted its first test flight of its SpaceShipTwo craft that will ferry would-be civilian astronauts to space. Initial commercial space flights are scheduled to start in 2014. Analogies have been made between the development of the commercial airline industry and the spill over effect that has had across other industries and the development of space tourism. As we have seen from the business models of the main players in the space tourism segment, they are not limiting themselves to simply providing short space flights for the general public but are also banking on other revenue streams such as proving research services in space, launching smaller satellites in to Low-Earth Orbit and other ways to monetize space flights.

Virgin Galactic has already announced that it will be introducing a new vehicle specifically for launching satellites called *LauncherOne*. One innovative feature of this launcher is that it can be launched from multiple sites depending on specific clients needs. This shows that the technologies and innovations developed by the space tourism industry can be repurposed for other related industries such as the satellite business. Conversely, some of the technologies and innovations developed by the satellite industry can find a new market in space tourism when it takes off.

The Changing Military Market

Military budget cuts, the "sequestration" and government shutdowns dominated the headlines for most of 2013. However, the outlook for the military satellite market in the long-term is not that gloomy. NSR projects that the military segment will generate US$ 5 billion in revenue growth by 2022 primarily from rising transponder and bandwidth demand of UAVs and airborne manned missions.

The positive impact of HTS and MEO-HTS services for mobility applications (maritime, aeronautical and land-mobile) as well as comms-on-the-pause, fixed VSATs and bulk leasing, will also play important roles in the market growth, according to NSR.

The growth in the military satellite market, despite the budgetary cuts across the board in the US military budget and the withdrawal of forces in Afghanistan, has been reaffirmed by several other research firms. Research and Market published a recent study that values the global military satellite market at US$11.8 billion in 2012, and will increase at a Compounded Annual Growth Rate (CAGR) of 3.9% during the forecast period, to reach US$17.3 billion by 2022. The market consists of three categories: communications,

Artist rendition of the Virgin Galactic SpaceShipTwo craft

Intelligence, Surveillance and Reconnaissance (ISR) and navigation. The communications segment is expected to account for 52.8% of the global military satellite market, followed by the ISR segment with a share of 28.4%, and navigation with the remaining 18.8%.

NSR acknowledges, however, that before a growth phase takes place however, there will be a lull in the coming years, due to government budget cuts and the hit satellite communications will take from the withdrawal of troops from Afghanistan and Iraq. Despite some regional hotspots and the impending strategic shift of the U.S. towards Asia that could drive demand, NSR's study points to a real dilemma that could negatively impact market growth.

Game Changer in the Launch Industry

On December 3, 2013, Spacex successfully launched the SES-8 satellite on its Falcon 9 v1.1 rocket. The launch represents the first commercial geostationary launch for Spacex. It follow-up that success with a launch this month of the Thaicom-6 satellite .

Spacex has been positioning itself as a low-cost alternative to the established satellite launch providers. To get new high profile clients such as SES, it had to discount its already low rates even further.

The unique feature of of the Falcon 9v1.1 rocket is that it can be re-used. Although it did not re-use the rockets used for its first two satellite launches, it has tested this capability before and Spacex is confident of the use of this technology for future launches. This will radically alter the launch service market. As launch services repreent one of the biggest costs in launching a satellite, reducing the cost for operators to launch a satellite will ultimately impact of transponder prices and the ability of operators to launch more satellites and new services.

Ultra HD is for Real

Every trade show in 2013 Ultra HD demos from almost all the major satellite operators. Ultra HD or 4K TV is really the next big thing for satellites. With is high bandwidth requirements, Ultra HD will help fill out many of hew High Throughput Satellites that are coming on board in the next few years.

Adoption of Ultra HD will be gradual but steady. Already Ultra HD sets prices are coming down. At the CES show in Las Vegas this month, Ultra HD sets were on display for about US$ 1,000.00 By 2018, IHS is predicting that there will be 38.5 million Ultra HD sets globally. Almost all the pieces are lining up for Ultra HD, the satellite operators are on board and TV manufacturers are pushing it, the only thing holding back Ultra HD adoption is the availability of content. As content providers produce more Ultra HD content and make it available as HD has in the past few years, Ultra HD will be format of choice for most households.

Disruptive Technologies

2013 saw the introduction of disruptive technologies such as the Aereo broadcast service, which uses a hybrid over the air reception and IP streaming to redistribute over the air broadcast content and metamaterials technology from Kymeta Corporation which promises to revolutionize antenna technology. Watch out for more of the same in 2014. This year, the first electric propulsion satellites manufactured by Boeing will be launched.

Not all disruptive technologies will succeed, as the Aereo service is now the subject of many lawsuits from broadcasters, but innovation has been the hallmark of the satellite industry and there is no sign of that spirit abating in the next few years.

Virgil Labrador is the Editor-in-Chief of ***Satellite Market and Research*** based in Los Angeles, California. He is the author of two books on the satellite industry and has been covering the industry for various publications since 1998. Before that he worked in various capacities in the industry, including a stint as marketing director for the Asia Broadcast Center, a full-service teleport based in Singapore. He can be reached at *virgil@satellitemarkets.com*

The Latin American Satellite Market

by Virgil Labrador

Satellite communications continues to be a growing market in Latin America for C-, Ku- and Ka-band applications for broadcast, Internet, backhaul, mobile communications, and for oil & gas segments, among others.

During a Latin America satellite forum held in August 2013, a panel representing the biggest international satellites operators agreed that Latin America's bull market in satellite bandwidth has plenty of life left and is unlikely to be stopped by new commercial and government capacity about to be launched by Mexico, Brazil and Argentina. The increased capacity will be allocated for consumer broadband applications and for the continued demand for Direct-to-Home (DTH) satellite services. Panelists said high-definition television, which has substantial room for growth, will only add to the demand for satellite capacity.

Another key factor is the new legislation working its way through the Mexican government that will remove the constraints to establish satellite operations there. If approved, the legislation increases the ownership a foreign satellite provider may have without needing a local partner. This means there will be basically no more need to set up a joint venture with a Mexican partner.

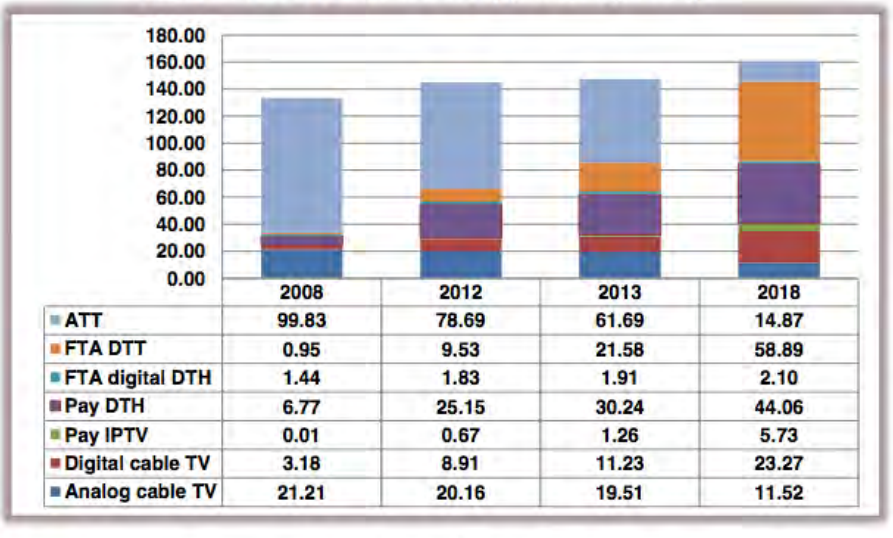
But many satellite operators active in the region including Star One of Brazil, Hispasmar/ Hispasat of Spain, Telesat of Canada, and SES of Luxembourg as well as Intelsat, Eutelsat and Satmex, are adding new satellite capacity over the region. The new capacity is projected to fill the needs for the FIFA World Cup in 2014 and the Olympics Games in Rio de Janeiro, Brazil in 2016, plus the regular demand for backhaul, DTH and Internet services.

Governments in Mexico, Brazil and Argentina are planning new satellite systems, mainly for government & defense applications, and to reduce the digital divide. Venezuela has its own government telecommunications satellite. While Bolivia, Colombia and the Andean group of nations are in various stages of development of their own systems.

Star One, the Brazil domestic operator, launched C3 satellite in late 2012 and Star One C4 will be launched in mid-2014. The company is preparing a bid request for another spacecraft to be launched in 2015.

Hispasat was the first major supplier of Ka-band capacity in Latin America with the Amazonas-3 satellite owned by its Hispamar subsidiary, which recently entered service. In addition to its C- and Ku-band capacity, the satellite has nine Ka-band spot beams. A major telecommunications network operator has recently purchased part of this capacity for a Ka-band consumer broadband service using Hughes VSAT ground systems.

Latin America TV households by platform (million)



	2008	2012	2013	2018
ATT	99.83	78.69	61.69	14.87
FTA DTT	0.95	9.53	21.58	58.89
FTA digital DTH	1.44	1.83	1.91	2.10
Pay DTH	6.77	25.15	30.24	44.06
Pay IPTV	0.01	0.67	1.26	5.73
Digital cable TV	3.18	8.91	11.23	23.27
Analog cable TV	21.21	20.16	19.51	11.52

Source: Digital TV Research

The fill rates of the satellites over Latin America range from 80-90 percent, so there is no oversupply at this stage, but demand is set to rapidly increase over the next decade. An estimated 400-500 new transponders in the region is required to keep up with the demand in the coming years, according to some forecasts analyst.

There are five countries in the region with domestic satellite coverage partnered with local operators. These countries include Brazil, Mexico, Venezuela, Bolivia and Argentina. In addition, all major international players have partial capacity or full satellites covering the region, among them Intelsat, SES, Eutelsat, Telesat and Russian satellite operator RSCC.

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BRAZIL

Starting with Brazil, there are local operators and international operators offering capacity for all key markets in the Brazil region. Among the licensed domestic operators are Star One, Telesat do Brasil, Hispamar, Eutelsat and Dish/Echostar.

One of the top stories of 2013 was the announcement of the Brazil Government Satellite Program in August selecting Thales Alenia Space to build an X- and Ka-band satellite for military and civilian use. The announcement followed a year-long competition that turned in part on how much technology the winning bidder would be able to transfer to Brazil's fledgling space program.

The Geostationary Defense and Strategic Communications Satellite (SGDC) was viewed by several bidders as a door opener to further work in Brazil on Earth observation and meteorological satellite programs. Visiona Tecnologica Espacial SA, a joint venture of Brazil's Telebras Telecommunication Government Operator and Embraer Defense, has been assigned the role of future Brazilian satellite manufacturer under Brazil's ambitious space program.

The Brazilian Defense and Communications ministries, which both lease satellite capacity from Brazil's Star One satellite fleet operator, were in the steering committee that oversaw the SGDC competition. Brazil had budgeted 716 million Brazilian reals (US$314 million) for the SGDC project, a figure that includes the satellite's construction and launch aboard Arianspace's Ariane 5 heavy-lift rocket in early 2016. It will operate at 75 degrees west longitude in geostationary orbit. Because of its potential as an entry into Brazil's ambitious national space program, the SGDC competition drew bidders from the United States, Canada, Europe, Israel, Russia and Japan.

In the Brazilian DTH market, EchoStar and Hughes have purchased rights to an orbital slot over Brazil but have been unable to close a deal with a potential joint-venture partner for a satellite-television or consumer-broadband service.

Hughes has also expressed interest in a Latin American consumer broadband venture, but to date, has not moved forward on its own satellite for the region. But the company recently contracted Telefonica of Spain to install two gateway Earth stations, in Texas and Chile, to provide Ka-band consumer broadband in Latin America. The service will be using the Ka-band capacity on Hispasat's Amazonas-3 satellite and will provide broadband access to subscribers in nine nations in Latin America. This will give Hughes a foothold in what is likely to be a fast-growing Latin American broadband market even if the bandwidth is not from a Hughes spacecraft.

Considering this latest development, DirectTV is moving ahead with its own strategy, announcing last October a contract with Astrium Satellites to build a Ku-band satellite to be launched in early 2016 and to operated over Brazil by DirecTV Latin America's Sky Brasil division.

The Alcantara Space Center in Brazil's northern Atlantic coast is scheduled to begin launch operations in 2015.

Astrium is also building the DirecTV 15 satellite, to be launched in late 2014, and the Intelsat IS-32 satellite, to be launched in 2016, and to be used for Brazilian television by DirecTV Latin America at 43 degrees west. IS-32 and its Sky Brasil-1 payload will carry 81 Ku- and Ka-band transponders. In the past, DirecTV had used satellites owned and operated by Intelsat for its Brazilian subsidiary because Intelsat has access to radio spectrum at the relevant orbital slots.

Astrium said that its latest order from DirecTV Latin America is a satellite that will carry as many as 60 Ku-band trans-

ponders and as many as 20 spot beams for regional television coverage. The satellite is expected to weigh about 6,300 kilograms at launch and provide 16 kilowatts of power to its payload at the end of its 15-year service life.

In August 2013, Space Systems/Loral announced that will build the tri-band Star One D1 telecommunications satellite for Brazil's commercial satellite fleet operator, Star One with C-, Ku- and Ka-bands. Star One operates a fleet of seven in-orbit satellites and has been one of the fastest growing commercial fleet operators in recent years.

A month earlier, Eutelsat said it had ordered a hybrid C-, Ku- and Ka-band satellite from Space Systems Loral (SSL) to operate starting in 2016 at 65 degrees west longitude over Brazil. Eutelsat do Brasil Ltda., a subsidiary of Eutelsat, had won rights to the slot from Brazilian regulators at auction in early 2012. The satellite will have 10 54-megahertz C-band transponders, 24 36-megahertz Ku-band transponders and up to 24 Ka-band spot beams. The satellite is designed to be operational in time for the Olympic Games in 2016.

At the same time, Brazil is looking for an alternate launch site. A decade after it was created by a Ukrainian-Brazilian bilateral treaty and after the investment of several hundred million dollars, Alcantara Cyclone Space (ACS) says an inaugural flight from the Alcantara launch site in Brazil's northern Atlantic coast will likely occur in 2015. Last September ACS and Ukrainian officials said the issues that have slowed development have been resolved. Some three-quarters of the development needed for the Cyclone 4 rocket using Cyclone 3 and Cyclone 4 first and second stages, and a new upper stage designed by Ukraine's Yuzhnoy have been completed, ACS officials said. In addition, some 48 percent of the launch site's construction has been completed.

Brazil and Ukraine agreed in October 2003 to develop the Alcantara launch site using Cyclone 4 after Brazil's own domestic rocket development floundered with an August 2003 on-pad explosion. But the Cyclone 4 project was innovative in a way as France's decision to import Russia's Soyuz rocket to Europe's Guiana Space Center, next door to Alcantara, has always appeared to be the result of a political agreement, not always appreciated by the Brazilian Space Agency, AEB.

MEXICO

Mexico has two domestic satellite operators -- Satmex and Mexsat, which is part of the Government Program for Defense Security and Digital Divide program.

The top news in 2013 coming from the Mexican satellite market was Eutelsat's acquisition of Satmex. In its second major effort to expand coverage in Latin America, Eutelsat Communications announced in July that it will pay US$ 1.14 billion for Satélites Mexicanos SA de CV, better known as Satmex.

The news followed Eutelsat's announcement that it had ordered a new satellite to provide coverage in Brazil and other markets in mid-July. Eutelsat CEO Michel de Rosen said that the push into Latin America was part of a focus on markets with higher growth curves, as the satellite industry's expansion slows. Eutelsat will pay US$ 831 million in cash and assume US$ 311 million in debt for the project.

SatMex generated US$ 89.1 million in adjusted EBITDA in 2012, against more than US$ 110 million in sales. Eutelsat deputy CEO Michel Azibert said demand for digital infrastructure is growing in Latin America. Satmex is the fourth-largest satellite operator in the region, with an 11% market share. While Eutelsat's to-be-launched satellite would expand its coverage in Brazil, Satmex is stronger in markets such as Chile, Colombia, Mexico and Peru.

Another major development is the Mexican Secretariat for Communications and Transportation announcement last December 12 that it will open for bidding licenses for two orbital slots at 113 and 116.8 degrees west. The bidding process will be managed by Mexico's Federal Telecommunications Institute, IFETEL.

Mexsat Government Project

The Mexican government's Mexsat communications system, has the goal to provide mobile L-band government and civilian broadband communications, while supporting humanitarian needs and enhanced coverage for domestic communications in Mexico. The system will consist of two Boeing 702 HP GEO satellites, Mexsat-1 and -2, and one FSS satellite, which was subcontracted out to Orbital Sciences Corp.

Boeing has teamed up with the Mexican government for US$1 billion contract to build a three-satellite system and two ground sites for use in civil communications and national security. Each of the Boeing satellite will supply 14 kilowatts of power through five-panel solar array wings that use high-efficiency, ultra triple-junction gallium arsenide solar cells.

The Mexsat Bicentenario satellite, built by Orbital Sciences Corp., sent its first signals from space following launch from Kourou aboard an Ariane 5 rocket in March 2013. Bicentenario is the first of three Mexsat satellites for the Secretaria de Comunicaciones y Transportes (SCT) that will enhance the country's communications for domestic, military, civil and humanitarian needs.

The Secretaria de Comunicaciones y Transportes (Secretary of Communications and Transportation) of Mexico, through Telecomunicaciones de Mexico (Telecomm), is responsible for oper-

Artist rendition of the Orbital-built Bicentenario satellite, the first of the three satellites in the Mexsat system.
(image courtesy of Orbital Sciences)

ating the satellite following a successful launch and completion of functionality testing. Bicentanario is the first of three satellites within the Mexsat system.

The hybrid C-band and Ku-band communications satellite is based on Orbital's flight-proven GEOStar-2 platform. Boeing is building the remaining spacecraft, two 702HP geomobile satellites and completed work on the second satellite this month.

Boeing is integrating the Mexsat network, which includes two ground telemetry and control sites, associated operations systems and reference user terminals in addition to the three satellites. For Bicentenario, Orbital is also providing command and control ground equipment, software, and training and operational documentation.

The two ground sites in Mexico will be created with advanced beam-forming flexibility to direct mobile user spot beams to government agencies operating in Mexico and its nearby seas, including the Pacific Ocean and Gulf of Mexico.

Boeing awarded contracts in September 2011 valued at approximately US$ 40 million to Viasat to develop a ground-based beam forming (GBBF) system for the Mexsat. The beam forming system is designed to operate with the Boeing L-band geomobile satellite system being provided for Secretaria de Communicaciones y Transportes (SCT) of Mexico.

Viasat is under contract to supply Boeing with GBBF processors, the control and management system, and the uplink beacon stations to be deployed in two ground stations in Mexico City and Hermosillo, Mexico. The system creates hundreds of small, flexible, adaptive "spot" beams on Earth that link small, handheld satellite devices. While the beams are projected to the earth by the satellite, the GBBF system performs the actual beam-shaping signal processing.

Another subcontractor to Boeing, Hughes will provide the ground communications network for Mexsat, which will be installed at two gateway sites, consisting of satellite base stations, core cellular network switching and related equipment, and customer care and billing systems.

Integral Systems announced that it has received an Authorization to Proceed from Orbital Sciences to provide the major ground segment elements for the Mexsat-3 satellite program. To support Mexsat-3, Integral Systems will provide primary and backup satellite control centers incorporating its industry leading EPOCH Integrated Product Suite (IPS), as well as executable satellite procedures and displays. Integral Systems will also provide primary and backup Telemetry, Tracking and Control (TT&C) stations located in Mexico, and deliver its COMPASS Network Management System (NMS) from Newpoint Technologies, a wholly-owned subsidiary of Integral Systems. A turnkey carrier monitoring and frequency planning system based on the Monics Carrier Monitoring and Interference Detection solution from SAT Corporation, also a wholly-owned subsidiary of Integral Systems, will be installed at two locations in Mexico. Integral Systems Europe, a wholly-owned subsidiary of Integral Systems, will provide all antenna and radio frequency aspects of the ground segment.

ARGENTINA

Empresa Argentina de Soluciones Satelitales S.A. (AR-SAT) is developing three domestic communications satellites and the first one is set to be launched in 2014. AR-SAT is a government-owned corporation which started operating in July 2006. AR-SAT has exclusive rights to operate and commercialize geostationary orbital position 81 degree West in Ku-band (North & South America) and C-band (Hemispheric coverage).

AR-SAT also holds rights over the engineering and development of national satellites to be manufactured within the scope of the Communications' Argentine Geostationary Satellite Project, which was launched on December 2007 upon the signature of a contract with an Argentine corporation named INVAP. The national government transferred NAHUELSAT operational assets to AR-SAT.

ARSAT-1 satellite development, pro-

duction and integration will be done in Argentina. AR-SAT has scheduled the launch of at least three geostationary satellites in geostationary positions 81 and 72 West starting in 2014. AR-SAT will upgrade and expand Benavidez Satellite Control Station.

Astrium and Thales Alenia Space were awarded contracts by AR-SAT to provide components for ARSAT-1 satellite. Thales Alenia Space will provide payload components for the first argentine satellite while Astrium will provide the hardware of the unit processor that hosts the software designed by AR-SAT and INVAP engineering team in Argentina. Astrium was also awarded with the central cylinder of the satellite and other components for ARSAT-1 thrust subsystem.

ARSAT-1 is the first of the Argentine geostationary satellite fleet under the SSGAT Program (Argentine Telecommunications Geostationary Satellite System), and INVAP was selected by AR-SAT as prime contractor of ARSAT-1 to integrate all these components.

ARSAT-1 is designed with 24 Ku-band transponders and positioned at the 71.8º West orbital slot. The spacecraft aims to provide data, telephone and television transmission services for Argentina, Chile, Uruguay, and Paraguay.

AR-SAT and Arianespace had signed the launch Service & Solutions to orbit the ARSAT-1 satellite by mid-2014. Weighing about 2,900 kg at launch, Arsat-1 will be placed into geostationary transfer orbit by an Ariane 5 or Soyuz launcher from the Guiana Space Center, Europe's Spaceport in French Guiana.

VENEZUELA

Venezuela has a domestic satellite program which was launched in 2008. The first satellite called Venesat-1, also known as Simón Bolívar, was the first Venezuelan satellite. It was designed, built, launched, controlled and monitored by the CGWIC subsidiary of the China Aerospace Science and Technology Corp. It was launched on a Chinese Long March 3B carrier rocket, from LA-2 at the Xichang Satellite Launch Center in October 2008. Venesat-1 is operated by Venezuela's Ministry of Science and Technology and has 12 C-Band Transponder and 14 Ku-Band Transponders and has expected service life of 15 years. It is based on the DFH-4 satellite bus. The satellite occupies an orbital slot, 78-West, designated for Uruguay and ceded to Venezuela by mutual accord.

Launch of Venesat-1 by a Chinese rocket.
(photo courtesy of China News Agency)

China launched the second satellite for the Venezuelan government on September 2012, a few days before President Hugo Chavez ran for re-election. The observation satellite named Miranda was launched from the northwestern Chinese province of Gansu.

Venesat-1

Venesat-1 also known as Simón Bolívar satellite will provide services for the following segments in Venezuela:

- 10,200 schools will receive teleeducation and internet services, benefiting an estimated educational population of 2 million students.
- 7,700 clinics to receive telemedicine services, remote diagnostics and medical consultations, benefiting more than one million patients.
- 340 small business in small towns will facilitate inventory control, purchase products and other network processes, which will benefit 70,000 users.
- 108 village of 500 inhabitants benefit through the phone service during the first quarter of 2009, benefiting over one million inhabitants.
- 300 sites of border protection, defense and protection of terrestrial, aquatic and Venezuelan airspace, allowing among other things, the fight against drugs.
- 1,000 sites to address oil wells, barges, ships, pumps, among others.

The current status of the Simon Bolivar Satellite is listed below:

Fifty-three percent of Simon Bolivar satellite antennas are oriented to the education sector providing access to satellite TV services for 600,000 Venezuelan. As reported by the Minister of Popular Power for Science, Technology and Innovation, Jorge Arreaza said that about 5.4 million people have benefited from the installation of antennas while 535,500 are using satellite Internet service. Arreaza stressed that the

National Electoral Council (CNE) has more than 5,000 stations connected to satellite services. At the same time the holder of the office of Science and Technology said that the Venezuelan Foundation for Seismological Research (Fuvisis) owns 32 TV stations interconnected with the Simon Bolivar satellite. Finally, the Deputy Minister for Telecommunications, Information Technology and Postal Services, Manuel Fernandez, said the National Government uses outer space for peaceful purpose.

BOLIVIA

Bolivians watching the launch of its first satellite at a public square in the capital of La Paz. (photo courtesy of Xinhua news)

Bolivia announced in August 2011 the launch of its own telecommunications satellite with the support of China. Ivan Zambrana, executive general director of the Bolivian Space Agency, said during the contract signing on December 13, 2010, that China will provide Bolivia with a number of services related to the satellite. These include help in building and launching the satellite, the construction of a monitoring station, and in training Bolivian workers to operate the satellite system. The services will cost the Bolivian government about US$ 294 million. China Great Wall Industry Corp, China's sole commercial organization selling satellites and commercial launch services, signed the contract with the Bolivian government.

To help Bolivia pay for the work, China Development Bank has agreed to give the country a loan. The project is being carried out by the China Aerospace Science and Technology Corp, a State-owned enterprise group that is the administrative body of China Great Wall Industrial. Among the company's well-known products are Long March rockets and Shenzhou spaceships. "China provides one-stop service for the satellite project, which brings much convenience to Bolivia because we don't have to sign many contracts with different companies," Zambrana said.

Bolivia's first satellite operators graduated from China's Shenzhou Institute in October 2012, and they now look forward to operating and managing Bolivia's first telecommunication satellite, which will be launched by China in December 2013. Some 78 Bolivian professionals have concluded their courses in China, with the training forming part of the Tupac Katari satellite project (TKSAT-1) between China and the Andean country. The project also includes the construction of two control stations, one in La Paz and the other in the eastern city of Santa Cruz de la Sierra.

The TKSAT-1, which will provide Internet, TV and mobile communications throughout Bolivia, was successfully launched on December 20, 2013 from the Jiuquan space center. in northwest China. TKSAT-1 has 26 Ku-, 2 C- and 2 Ka-band transponders.

Gilat Satellite Networks will supply equipment and services to Entel, the largest telecom operator and satellite network operator in Bolivia. Under the terms of the project, valued at more than US$ 12 million, Gilat will supply Entel with a SkyEdge II VSAT platform, including HUB and VSATs, teleport, DTH and solar solutions. The project also includes professional services for the central site installation, project management and training. The network is to be used for the Bolivian government's national digital inclusion initiative (PRONTIS).

Conclusion

Latin America is truly a growth market for satellite services. Demand continues to grow despite the influx of many new satellites and the emergence of new national satellite systems.

It's not just satellite services that are taking off in Latin America. As we have seen, the region is poised to be a player in the launch services sector with the commencement of operations in 2015 of the Alcantara Space Center in Brazil. Argentina has also entered the satellite manufacturing business by choosing to integrate its own satellite using components from European manufacturers.

B. H. Schneiderman contributed to this article.

The Satellite Industry in Israel is Thriving

by Virgil Labrador, Editor-in-Chief

In October 2013, I was privileged to have been invited to participate in Israel-based satellite operator Spacecom's annual customer event where I moderated two interesting panels that delved on some of the burning issues affecting the global satellite industry today.

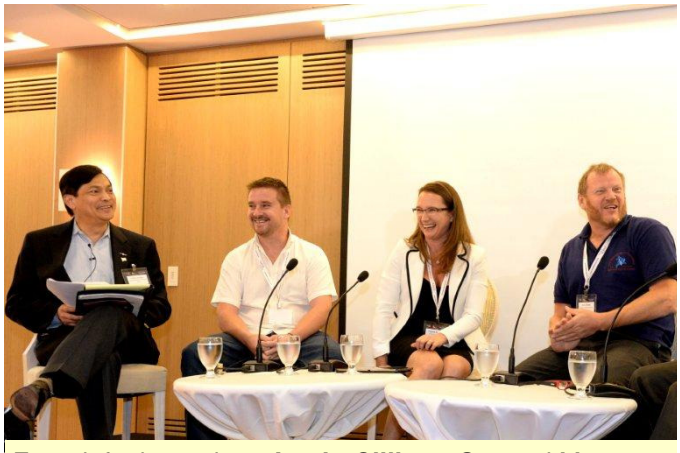
The first panel was on the "New Multiscreen, Multiplatform Media Environment" which focused on the changing distribution platforms for content. We had a distinguished lineup of panelists consisting of three representatives from content providers: **Dave Alpert,** VP Operations & CTO**, HBO Europe**; **Maja Jelesic Cooper,** CEO, **Klassik TV** (Croatia); **Valentyn Koval,** Head Producer and CEO, **M1 & M2 music channels** (Ukraine)**;** and one representing the service providers: **Anatoly Sosnovskiy,** Director of **GT Satellite Systems** (Russia).

The consensus among the panelists was that the media environment has undergone major changes in the last decade and will continue to do so in the next decade. Whereas before there were essentially only a handful of platforms, now we live in a multiplatform world where you have to distributed content over many distribution channels including the computer, smart phones, mobile devices and even gaming consoles.

Maja Jelesic Cooper of Klassik TV emphasized that it's important to have a strategy when deciding on which platforms to distribute content. She started Klassic Tv in Croatia in 2010 and has enjoyed phenomenal ratings because they distribute their content to the audiences in the format in which they expect it. Valentin Koval of M1 and M2 music channels in the Ukraine saw the new distribution platforms as an opportunity as well as a challenge. The opportunity is obvious in that it reaches out to audiences especially the younger demographics, but the challenges include digital rights management over the content and the dangers of piracy. Anatoly Sosnovskiy of GT Satellite Systems, which is a teleport and service provider in Russia, said that in order for teleports to survive they have to be able to provide the services that clients require. So it can't be business as usual for teleports.

The second panel I moderated picked up where the first panel left off and focused on "Fiber; Threat or Opportunity." As opposed to the first panel, all the panelists were service providers including: **Justin Cilliers, Omnisat,** Owner and General Manager, **OnmiSat** (Botswana); **Paul O'brien,** Managing Director, **Cobbett Hill Teleport** (UK) and **Virginie Tintignac,** CFO, **Afrique Telecom.**

The unique composition of the panelists gave a perspective from several continents including Europe, Africa and Asia. Paul O'Brien started off the discussion by saying that the teleport business has changed, echoing what was said in the previous panel. Many teleports who are unable to adopt to the changing media environment end up closing down or being bought out by larger service providers. Justin Chillers and Virginie Tintignac who both work in Africa, also said that demand for services in Africa is growing but there are certain challenges in different markets.



From left, the author, **Justin Cilliers,** General Manager, **OnmiSat** (Botswana); **Virginie Tintignac,** CFO, **Afrique Telecom**; **Paul O'brien,** Managing Director, **Cobbett Hill Teleport** (UK) .

On the subject of the panel, which is fiber, the panelists were unanimous in saying that fiber does present a threat, but teleports have accumulated enough experience to "handle" the threat and be able to thrive. They cited examples where they work with fiber in providing hybrid services to customers and also how fiber's limited reach does not impinge upon satellite's coverage, which is ideal for remote areas in wide expansive regions like Africa and Asia.

The Spacecom customer event also included presentations from their partner companies in Israel such as Gilat Satellite Networks, among others. I took the opportunity of my first visit to Israel to see first hand some Israeli satellite companies.

It doesn't take much insight to find that a relatively small country like Israel, about the size of New Jersey and a population of only eight million people, has a thriving satellite industry that has global reach. Apart from the satellite operator, Spacecom, Israel is home to a satellite manufacturing company, Israel Aircraft Industries and over fifty tele-

Gilat CEO Erez Antebi

ports, satellite service providers and equipment manufacturers. Time and other constraints prevented me from visiting as many of the companies as I would liked but I did visit a few representative ones, including two equipment manufacturers-Gilat and Orbit Communications and a teleport, Satlink Communications.

Gilat Satellite Networks

Gilat Satellite Networks is one the largest and most successful satellite equipment companies in Israel. Started by several entrepreneurs from humble beginnings in a small office in Tel Aviv in 1987, it is now one of the leading global brands for VSAT equipment.

Gilat has over one million installed VSATs worldwide and employs over 1,000 people. The majority of its employees are in its headquarters in the Tel Aviv suburb or Petah Tikvah. I caught up with Gilat's CEO Erez Antebi and he says Gilat's success as well as other Israeli companies can be attributed to the "excellent technical education available in Israel and the unique experience many have from their military service where they gain technical experience which they find applications in start-up companies."

The relatively small size of the Israeli market may also be an important impetus for Israel-based companies to venture abroad, said Entebi. Gilat has made strategic acquisitions over the years, most recently the U.S.-based Wavestream and a company in Bulgaria called Raysat Antennas. Entebi noted that less than two percent of its revenues come from Israel.

Satlink Communications

I visited a teleport that is positioning itself as a content distribution network provider, Satlink Communications. Their main teleport is located halfway between the major cities of Tel Aviv and Jerusalem and is co-located with a large production facility owned by Jerusalem Studios.

Like Gilat, Satlink does extensive business worldwide and has also acquired other companies abroad. Doron Revivi, Satlink's COO gave a tour of their impressive facility and mentioned that they are building another playout facility near Tel Aviv. Satlink and Spacecom have common shareholders in Eurocom Communications, Israel's largest media company.

Master Control room of Satlink's state-of-the-art teleport in Neve Ilan near Jerusalem.

Orbit Communications Systems

Finally I visited another equipment manufacturer, Orbit Communications in Netanya, a large city on the mediterrenean coast not too far from Tel Aviv. Orbit's facility and headquarters is located in a technology park that looks very similar to those in Silicon valley in California.

Orbit provides a full range of mobile satellite communications solutions for maritime, transportation, earth observation and remote sensing applications. I was given a detailed briefing by their key executives on their latest line of S – and X-band ground stations called Gaia-100 series for earth observation applications.

Having a large pool of satellite companies located in a small country can have its advantages. Spacecom's SVP of Sales and Marketing Eyal Copitt said "when we do joint projects with other companies, it's always good to look first in your neighborhood and see what other Israeli companies can offer. It's easier to work with companies near you, but our main concern is providing the best solutions for our customers."

Good for One, Bad for All

by Robert Bell

There is an economic fact of life that most of prefer to ignore. What is good for just one of us, or for a group of us, can be a very bad thing for all of us.

Governments often try to prop up industry sectors through trade barriers. Or they fight job losses with that make it really hard to fire people. Economists don't like these market interventions – not because they are more hard-hearted that the rest of us – but because of the unintended consequences.

In practice, protecting weak industries makes them weaker, not stronger. Businesses respond to incentives and, with the incentive to improve removed by law, businesses stagnate faster than your slacker nephew playing video games on the couch.

It sounds like kindness to throw up roadblocks to companies that want to downsize staff or just fire underperforming employees. But it has the perverse effect of reducing demand for new employees. Business owners think twice or three times about entering into employee relationships that they can't get out of in the future. Every job that we prevent the market from destroying curtails job creation. That's a truly counter-intuitive idea but the evidence supports it.

So, what does this have to do with satellites and all the service and technology businesses that put them to work?

I have never seen a year of more revolutionary change in this business than 2013. Huge leaps in signal compression. Internet TV delivery going mainstream. The successful commercialization of Ka-band. And in December, the first launch of a major communications satellite (SES-8) aboard a vehicle whose stated goal is to slash the cost of launch by a factor of 10.

The changes are coming at accelerating speed in the sky and on the ground – and it is making people in the satellite industry a little unsteady on their feet. Increasingly, everybody's business model is coming under new pressures that are forcing a rethink of their assumptions. Plans have to come with many more options and budgets become harder to finalize – in an industry whose pace has traditionally been set by the 10-20 year replacement cycle for spacecraft.

And you know what? It's terrific. A mix of technology and markets is rearranging familiar incentives. The pressure of change, with all of its discomforts, is making the industry think a little more deeply and step a little faster. The stability that the business has enjoyed, thanks to decades of steady and growing demand from broadcasters, is eroding. That disruption is the necessary prelude to new opportunity.

Spacex' Falcon 9 rocket lifting off to launch SES-8 satellite. (image courtesy of Spacex)

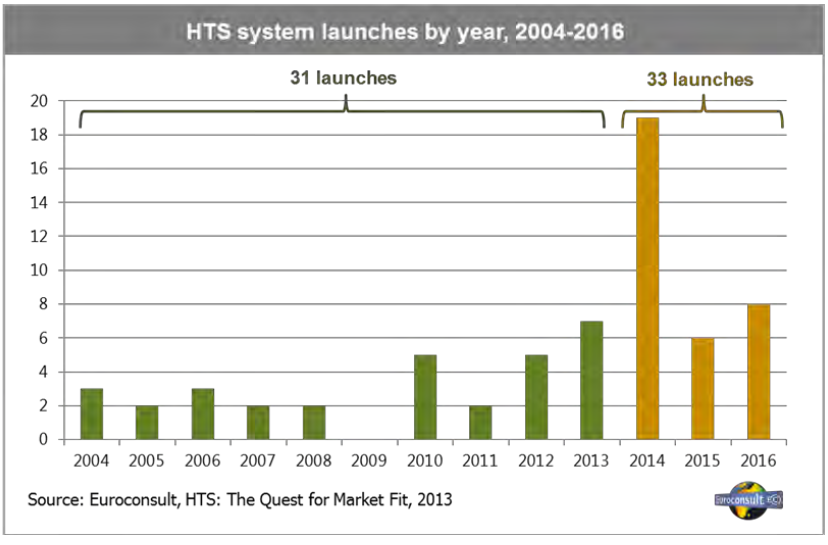
I wish you the best in this new year. But by "best," I mean a year of fewer certainties, tougher competition and accelerating progress. It's time for the slacker nephew to put away the game controller and hit the streets.

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

2014 Could be a Defining Year for High Throughput Satellites

by Brent Prokosh, Consultant, Euroconsult

The past 10 years have witnessed the steady rise of High Throughput Satellite (HTS) systems, largely dedicated to the consumer broadband market, with over 31 launches since 2004. Peering into the near-term future, nine operators are due to launch up to 19 new HTS systems (including payloads) in 2014 alone, which Euroconsult projects will result in high throughput satellite capacity increasing by over 40% to surpass 720 Gbps. However, one of the most attractive features of high throughput systems, alongside the more favorable bandwidth economics achieved through frequency reuse, is that they do not necessarily compete with existing "traditional" satellites, but also create new, incremental market demand.



Consumer Broadband to Remain Primary HTS Market

Nearly two-thirds of current HTS capacity is targeted towards consumer broadband markets, with demand in the segment largely fueled by underserved areas of developed regions such as North America, Western Europe and Australia. The United States accounts for the vast majority of the estimated 2.1 million satellite broadband subscribers today, with Echostar and Viasat on pace to add over 400,000 net subscribers over the next 12 months. However, HTS operators (e.g. Avanti, Yahsat and Eutelsat) targeting developing regions such the Middle East & Africa and Russia face headwinds to widespread consumer adoption as tariffs on equipment, high value-added taxes and installation fees hinder affordability, thus limiting the true addressable consumer market in these regions. Navigating the patchwork of various regulatory environments and the challenges of building efficient distribution networks across several diverse markets may also slow consumer broadband market penetration for HTS operators in these regions.

This confluence of factors has led HTS operators, particularly those targeting Africa and the Middle East, to place added focus on government and enterprise broadband markets due to the higher potential revenues per site. For example, Yahsat recently adopted a market penetration promotion for business-grade" Yahclick" accounts which offered free equipment and installations, a savings of over $1000 in many markets. Further evidence is provided by Avanti's recent success in Africa's education sector, as they partnered with service provider Meso Group to deliver broadband connectivity to 400 provincial libraries in South Africa, many of which are located in rural communities outside the reach of terrestrial competition.

HTS at New Heights

As HTS continues its growth in the consumer broadband market, 2014 could very well be a defining year for high throughput satellites in the commercial aviation market.

Making its entrance into the in-flight connectivity scene, Jetblue's Viasat-1 enabled "Fly-Fi" Wi-Fi solution represents the first large-scale introduction of HTS capacity into the commercial aviation sector. As the percentage of passengers using smartphones and laptops during their air travels has trended sharply higher and airlines continue to seek out ways to improve their customer experience as a differentiator, there are big expectations for HTS system adoption due to their lower capacity pricing and increased data rates. As such, the usage/take-up data from this introductory service stage in 2014 is likely to shed an invaluable light on the market prospects and economic model for in-flight connectivity on high throughput satellites.

Currently in beta-testing on several of

Jetblue's A320s, Fly-Fi's basic "Simply Surf" service is offered free to passengers until mid-2014 when installations are expected to be completed on the majority of Jetblue's fleet. Fly-Fi's paid service, "Fly-Fi-Plus", costs 9$/hour and is demonstrating user speeds of over 12 Mbps (down), well in excess of the maximum 3 Mbps (down) speeds reported by the air-to-ground service of competitor Gogo.

Early reviews from aeronautical industry analysts indicate that the paid service is both fast and reliable, allowing passengers to stream HD videos or music as they would from terrestrial DSL connections. Current generation in-flight connectivity solutions have been plagued by low-take up rates, which are in the range of 5-15% of passengers on Wi-Fi enabled flights. Furthermore, a steady stream of unsatisfied customers are taking to social media each day to vent their frustrations over lower than advertised download speeds and service interruptions. If early feedback on "Fly-Fi" is a reliable indicator of what is to come, passengers may be more willing to adopt and pay for in-flight connectivity as the higher data rates enabled by HTS systems will help match consumers' ever-growing appetite for bandwidth-intensive applications.

"...Nearly two-thirds of current HTS capacity is targeted towards consumer broadband markets, with demand in the segment largely fueled by underserved areas of developed regions such as North America, Western Europe and Australia..."

Inmarsat (GX) and Intelsat (Epic), as well as their respective distribution partners Gogo and Panasonic Avionics will surely be observing attentively, as their HTS commercial in-flight connectivity solutions are expected to hit the market in 2015. If these HTS systems prove capable of delivering the promised to data rates to a wider-base of passengers, HTS capacity usage for consumer connectivity at altitude could surpass 20 Gbps by 2022. However, a significant upside potential to these estimates exists if the services remain at least partially free.

Brent Prokosh is a Consultant of Euroconsult, based in Montreal, Canada. He supports the development of the firm's research reports as well as its consulting activities in satellite communications markets, services and applications. Brent is a main contributor to Euroconsult's new research report on HTS, "High Throughput Satellites: The Quest for Market Fit" (**www.euroconsult-ec.com**)

HTS London Roundtable: A Game Changer in Action

by Martin Jarrold

In my previous column for *Satellite Executive Briefing* I previewed GVF **High Throughput Satellites 2013: Game-Changer in Action - The London Roundtable**. I am very pleased to report that several participants in this latest program in the GVF-EMP Conference Partnership portfolio described the event as "A very successful conference, by any standard." Here, in my first contribution for 2014, I wish to provide you, the reader, with the means to access at least some of the flavor of the series of great dialogs which took place in London on 5th and 6th December.

Over 100 satellite executives attended the GVF HTS London Roundtable last month.
(photo courtesy of the GVF)

HTS - The London Roundtable

A total of 40 speakers contributed to the **Roundtable**, providing a range of keynote presentations and introductory briefings, many of which are now in the wider public domain, and can already be accessed through the **Roundtable** website at: www.uk-emp.co.uk/emp-home/current-events/hts-rtldn-2013-program/. This web page shows the **Roundtable** program in full. Additionally, in due course, a detailed synopsis of the entire program will be available from this web page.

Day One of the **Roundtable** began with Chris Baugh, President of Northern Sky Research (NSR) delivering the Opening Keynote **'Defining the Satellite Broadband Market Eco-System: Present & Future Trends in HTS'**, and beginning with some essential explanatory points:

An HTS is any satellite or satellite payload that has at least twice (though usually many times more) the throughput of a traditional FSS satellite for the same amount of allocated frequency on orbit, with these satellites using any frequency to provision a service and almost exclusively making use of frequency reuse and multiple spot beams to increase throughput and reduce the price per bit delivered.

The advent of the O3b Networks HTS satellite constellation necessitated a further definition, that of MEO-HTS, being a medium earth orbit (MEO), low latency satellite constellation, comprising satellites that can use any frequency to provision a service and make use of frequency reuse and multiple spot beams to increase throughput and reduce the price per bit delivered.

The keynote continued with a NSR's analysis of the evolution of the HTS market, which forecasts an aggregate demand – in respect of such applications as Broadband Access, Backhaul, VSAT, Trunking, Mobility, Government/Military, SNG, DTH, and Distribution – increasing from a level of 62.6 Gpbs back in 2012, to 451.5 Gbps in 2018, and to 918.2 Gbps in 2022. When factoring-in MEO-HTS, total demand could reach 1 Tbps by 2022. By the same year

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total wholesale HTS & MEO-HTS revenues are expected to exceed US$3.3 billion, though based on capacity pricing being significantly differentiated by application.

"…new satellite communications technologies and solutions bring new engineering challenges, and new development opportunities, in both space segment and a range of ground segment environments…"

Mr Baugh's keynote covered many other facets of the HTS eco-system, but notably what he described as 'Industry Bifurcation'. In the pre-HTS eco-system the C and Ku frequency bands were used for all satellite communications requirements whether for **Media/ Linear TV/OTT** in the **Consumer/Point-to-Multipoint** space, for **Broadband Access** in the **Consumer/Point-to-Point space**, for **Mission Critical/Network Control** in the **Professional/Point-to-Multipoint** space, and **IP Data/ Backhaul** in the **Professional/Point-to-Point** space.

With HTS, this has changed to the extent that HTS may be seen as most focused on the **Consumer/Point-to-Point space** of **Broadband Access**, though also touching on **Consumer/Point-to-Multipoint** and **Professional/Point-to-Point** applications. MEO-HTS may be seen as most focused on **Professional/ Point-to-Point** of **IP Data/Backhaul**, though also touching on **Professional/ Point-to-Multipoint** and **Consumer/ Point-to-Point** applications.

A **Satellite Operator Roundtable** followed, featuring representatives of **Intelsat**, **Inmarsat Global Xpress**, **Avanti Communications**, **O3b Networks**, and **Telenor**. The session provided a comprehensive, wide-reaching overview of exactly what it is that high-throughput satellite operators are already providing, or planning and preparing to provide using C, Ku and Ka band solutions.

An **Engineering Roundtable** took as its starting point the position that new satellite communications technologies and solutions bring new engineering challenges, and new development opportunities, in both space segment and a range of ground segment environments. Speakers from **Kymeta**, **Gilat Satellite Networks**, **iDirect**, **Brightday Engineering**, **Advantech Wireless**, and **Crystal Solutions** examined both the in-orbit angle – the engineering of the high-throughput payload in terms of maximizing the potential of multi-spotbeam and frequency reuse architectures – and the ground angle – infrastructure evolution and the planning, design, deployment & managing of HTS terminals/earth stations, including antenna technology product quality and installation, HTS-enabled terminals and user expectations – as well as understanding rain fade issues, and device portability.

Contributing to the **User Verticals Roundtable** was **C-COM Satellite Systems**, **Everard Solutions**, **Hermes Datacomms**, **MTN**, **SIS Live**, **Futurenautics/ International Maritime Sales & Marketing Association**, and **Gogo**. This session asked: Who are the customers for HTS? What do they want from HTS? And how is HTS positioned to provide what they want?

These panelists were able to characterize the needs of broadcast video & satellite news gathering (SNG), aeronautical, maritime, oil & gas, and NGOs as users of critical communications solutions for humanitarian assistance and disaster recovery situations.

Day One concluded with a **Regulatory, Licensing & Financing Roundtable**. The regulatory and licensing eco-system for high throughput satellite services and technologies, and due diligence around the investment in new satellites were examined by **Inmarsat**, **Avanti Communications**, **Trinity Advisers Limited**, and **Field Fisher Waterhouse**.

Day Two of the **Roundtable** opened with a joint keynote from the **European Space Agency (ESA)**, and the **Norwegian Space Centre (Norsk Romsenter)**. Michèle Le Saux, Head of Commercial Ground Segment Section, Technical Directorate, and Alberto Ginesi, Head of Telecom and TT&C System Section, Technical Directorate, both of ESA, addressed **'The European Market & Technology Roadmap for HTS'**, covering ESA and Satcoms; Satcoms market view and trends; ARTES 1 activities; R&D Roadmaps related to HTS: Efficiency, Flexibility, Throughput, and Examples; and, Co-funded commercial development examples.

Among several key points made, they noted, in particular, that in connection with Capacity versus Revenue Growth: [a] the advent of HTS should result in more GHz leased at a lower price; [b] data-driven growth (for 3G backhaul, etc.) should support this trend; and [c] larger capacity volumes should be required to maintain revenue growth.

In the period 2007-2012 the CAGR in Capacity (GHz) was just over 6%, and for Market Value was 6%, whereas, as forecast for the period 2012-2017, the rates will be in excess of 11%, and almost 7%, respectively.

Rune Sandbakken, Head of SatCom Section, Norwegian Space Centre (Norsk Romsenter) then spoke on **'ARTES 5.1 - Ka-band Radio Characterisation for SatCom Services in Arctic and High Latitude Regions'**. As had previously been explained by the representatives of ESA, 5.1 is one of the AR-

TES program elements which focuses on technology. The study – jointly supported by Telenor, the Norwegian Defense Research Establishment, the Norwegian Defense Logistics Organization, UNIK, SITEF, assisted by Gjøvik University College and MARINTEK – amongst a number of objectives, sought to check, verify and refine propagation models and prediction methods for 20/30 GHz satellite systems (Ka-band/HTS) in high latitudes.

The **OEM Roundtable** which followed investigated the latest initiatives and developments from leading manufacturers of the terminal and antenna technologies that comprise the foundation of networks that facilitate access to in-orbit HTS assets. Contributing organizations included **Kymeta**, **Comtech EF Data**, **Gilat Satellite Networks**; and, **Newtec**.

Fixed & Mobile Networking Applications & VARs looked at the varying requirements of mobile environments on land and at sea, with panelists from **Intelsat**, **UltiSat**; and, **GVF**.

To conclude the program we featured the **Ground Infrastructure Roundtable**, with **Inmarsat Global Xpress**, **C-COM Satellite Systems**, **Cobham SATCOM**, **Sematron**, and **SkyWare Technologies**. The principal focus here was the evolutionary dynamics of products comprising the "Ground Segment", most particularly the antenna component: Antenna Technologies; Application/Market Specific Antenna Design; and, Device Portability in the COTM/COTP space.

To reiterate, if you wish to glean a sense of the highly dynamic nature of the Roundtable dialogs, please go to www.uk-emp.co.uk/emp-home/current-events/hts-rtldn-2013-program/ to view the presentations and introductory briefings slides.

Martin Jarrold is Director of International Programs of the GVF. He can be reached at

Inmarsat Purchases Globe Wireless

London, UK, December 18, 2013— Inmarsat announced the acquisition of the business and substantially all of the assets of Globe Wireless LLC Headquartered in Palm Bay, Florida, Globe Wireless is a provider of value-added maritime communications services to the shipping market.

Inmarsat will acquire the business of Globe Wireless for a total consideration of US$ 45 million and will fund the acquisition from available liquidity. In the twelve months ended June 30, 2103, Globe Wireless generated revenues of US$ 91 million and currently has an installed customer base of over 6,000 ships. Closing of the transaction is subject to certain regulatory and other approvals, which are expected to be completed in January 2014.

The acquisition of Globe Wireless is driven by multiple strategic benefits, according to the company:

- Access to a skilled engineering team that will significantly expand Inmarsat's installation capabilities and enable a faster roll-out of both XpressLink ("XL") and Global Xpress® ("GX") to the maritime market, both through its already well-established channel partnerships and direct to end-users;

- The acquisition of a portfolio of industry-leading value-added services ("VAS") for maritime customers that will jump-start Inmarsat's ambitions to move beyond pure connectivity and offer solutions and managed services to the maritime market, both through its channel partners and direct to end-users, that will be relevant to both L-band and GX customers;

- The immediate opportunity to offer the Globe Wireless VAS range to Inmarsat's entire installed base of maritime customers, both through its channel partners and direct, enabling further ARPU (average revenue per user) growth that might otherwise have taken years to develop through in-house development of an equivalent product range; and

- Significant operational synergies identified through immediate integration with Inmarsat's maritime business unit, and which are expected to deliver a material improvement in profitability within the first year.

Rupert Pearce, CEO of Inmarsat, commented: "This is a highly compelling transaction for Inmarsat". Pearce highlighted a range of important strategic benefits associated with the acquisition. These included the opportunity to swiftly deliver significantly improved financial performance through synergies. He said that rapid take-up and a growing backlog for XpressLink, had pushed Inmarsat near the limit of its existing engineering capability to meet the demand from our channel partners and customers.

Frank Coles, President of Inmarsat Maritime, commented: "Globe Wireless has created a suite of products and value added services that are unequalled in the market today, and by combining this with our FB and GX services, we believe we can further enhance our position as the leading provider of services to the maritime customer.

Rockwell Collins Completes Acquisition of ARINC

Cedar Rapids, Iowa, Dec. 23, 2013 – Rockwell Collins, Inc. today announced it has successfully completed the acquisition of ARINC Incorporated from The Carlyle Group for US$1.4 billion.

"With this move we take a major leap forward to realizing our vision of providing a richer set of seamless information management solutions that encompass the aircraft and ground-based systems," said Kelly Ortberg, CEO and president of Rockwell Collins. "The acquisition represents an exciting new growth platform for Rockwell Collins and shifts the balance of the company toward the expanding commercial aviation sector."


ARINC complex in Annapois, Maryland

"Combining ARINC's high-performance, high-quality and high-assurance networks and services with our information systems onboard the aircraft strengthens our ability to deliver improved efficiency and safety, and enhanced connectivity," added Ortberg. "In addition, the acquisition opens up adjacent market opportunities by leveraging ARINC's strong presence in airport information systems and the broader transportation and security segments."

The company expects the impact of the acquisition to be EPS accretive once certain transaction and integration costs have been incurred. The majority of integration activities are expected to be completed in six to nine months. For the near term, customers can expect business as usual, and should continue to work with their

current sales representatives, customer service centers and web-based resources.

To serve the best interests of the industry, and avoid any perceived conflicts of interest, Rockwell Collins has completed the sale of ARINC's Industry Standards Organization to SAE International simultaneously with the completion of the ARINC acquisition. In addition, due to a lack of fit with its long-term strategy, Rockwell Collins has initiated preparatory efforts to divest ARINC's Aerospace Systems Engineering and Support business, which provides military aircraft integration and modifications, maintenance, and logistics and support. In total these businesses accounted for approximately 15 percent of ARINC's FY'13 revenues, according to the company.

Echostar Acquires Solaris Mobile

.Englewood, Colo., January 6, 2014--EchoStar Corp. announced today that it has acquired 100% ownership of Solaris Mobile Ltd, a next-generation mobile satellite services (MSS) operator based in Dublin, Ireland and one of the European Union licensees of mobile satellite service with a complementary ground component (S band).

Solaris Mobile Ltd is deploying a satellite and terrestrial network for wholesale access to enhanced mobile communications across Europe in the 30 MHz S band licensed to Solaris Mobile. In connection with the acquisition, EchoStar has entered into an agreement with Solaris Mobile to provide it with MSS capacity on a new next-generation MSS satellite.

"Through this acquisition and our mobile satellite infrastructure expertise, we look forward to accelerating advanced mobile services throughout the European Union," said Anders Johnson, president, EchoStar Satellite Services. "We are excited to build upon the groundwork laid by Solaris Mobile by most immediately bringing with us access to a next generation MSS satellite which will support a wide range of innovative services across the European Union."

Solaris Mobile, a joint venture between Eutelsat and SES was set up in 2008 to develop next generation mobile communication services. In May 2009, the European Commission awarded Solaris Mobile the right to operate satellite & terrestrial services in S-Band in all EU member states. S-Band is spectrum in the 2GHz band and is adjacent to UMTS used by mobile 3G operators.

Calendar of Events

January 19-22, 2014, **PTC'14: New World, New Strategies**, Honolulu, Hawaii**,** contact: Jamie Wan-Lopaz, phone +1-808-941-3789, ptc14@ptc.org web: www.ptc.org/ptc14/

February 06-07, 2014, **Mobile Deployable Communications 2014**: Mövenpick City Centre Hotel, Amsterdam, Phone: +44 (0)20 7827 6054, jhitchen@smi-online.co.uk web: www.mobiledeployable.com

February 11-12, 2014**, 'Connectivity 2014': Creating the New "New" Verticals – Air, Water & Surface,** London, UK, Phone: +44 7802 612 924, martin.jarrold@gvf.org & paul.stahl@uk-emp.co.uk Web: www.uk-emp.co.uk/emp-home/current-events/connectivity-2014/

February 11-13, 2014, **WEST 2014**, San Diego Convention Center, San Diego, Calif., USA, contact Paul do-Carmo, phone +1-703—631-6130 events@afcea.org web: www.afcea.org/events/West/

February 24-25, 2014, **MilSatCom Middle East & Africa 2014**: Amwaj Rotana, Jumeirah Beach Residence, Dubai, UAE. Phone: +44 (0)20 7827 6054, jhitchen@smi-online.co.uk web: www.milsatcom-mea.com

March 11-13, 2014, **CABSAT 2014**, Dubai World Trade Centre, Dubai, UAE. Contact: cabsat@dwtc.com, phone +971 4 308 6077/6282, web: www.cabsat.com/

March 31- April 01, 2014, **MilSpace 2014**: Holiday Inn Regents Park, London, UK. Phone: +44 (0)20 7827 6054 jhitchen@smi-online.co.uk web:www.military-space.com

April 1-3, 2014, **Space Tech Expo**, Long Beach, Calif. Phone: US & Canada toll free +1 877 842 6289, Europe: +44 1306 871331, info@spacetechexpo.com web: www.spacetechexpo.com

Conferences: April 5-14, 2014; Exhibits April 7-10, 2014, **NAB 2014**, Las Vegas Convention Center, Las Vegas, Nevada, USA, info@nab.org web:www.nabshow.com

April 07-08, 2014, **ISR 2014**: Holiday Inn Regents Park, London, UK. Phone: +44 (0)20 7827 6054 jhitchen@smi-online.co.uk Web:www.isrconference.com

June 02-04 2014, **Global Space Applications Conference (GLAC)** 2014: UNESCO HQ, Paris, France. Phone: +33 (0)1 45 67 68 46 Glac2014@iafastro.org Web: www.glac2014.org

June 17-20, 2014, **CommunicAsia2014**, Marina Bay Sands, Singapore. CommunicAsia@sesallworld.com, Tel: +65 6233 6638, Web: www.CommunicAsia.com

June 17-20, 2014, **BroadcastAsia2014** Marina Bay Sands, Singapore. BroadcastAsia@sesallworld.com, Tel: +65 6233 6638, Web: www.broadcast-asia.com

Ruszkovski Appointed Chief Commercial Officer of XTAR

Herndon, VA, December 30, 2013 – Andrew Ruszkowski has been named Chief Commercial Officer at **XTAR, LLC,** a provider of satellite capacity to U.S. and Allied governments in the X-band frequency. In the newly created position, Ruszkowski will continue to support XTAR's fleet development to sustain current and anticipated government and military requirements, including working with the Department of Defense to assist its acquisition and procurement of commercial satellite communications.

"Andrew's leadership in 2013 has produced a strong bottom line that has been not only stable, but actually increased by 12 percent over the previous year," said Philip Harlow, President and Chief Operating Officer of XTAR. "In a year marked by cutbacks across the DoD, we were very pleased to realize the growth we've had. Andrew has refocused our sales efforts and better defined the value proposition of commercial X-band, and of XTAR specifically. His efforts to develop our niche of providing space segment to applications well-suited to X-band, while also growing our international business, have spurred our latest success."

A. Ruszkowski

Ruszkowski joined XTAR in 2010 as Vice President of Global Sales and Marketing. He has nearly two decades of experience in the commercial satellite industry where he most recently held senior sales positions at SES, New Skies, and PanAmSat. He holds a BA degree in world politics from The Catholic University and an MA in international affairs from American University.

XTAR, LLC is a privately owned satellite operator delivering X-band services to U.S. and Allied government users.

Orbital Appoints McCabe SVP and General Counsel

Dulles, Virginia, December 23, 2014--**Orbital Sciences Corporation** announced that **Tom McCabe** will join the company as Senior Vice President, General Counsel and Secretary, effective January 6, 2014.

Tom McCabe

McCabe will direct Orbital's legal, ethics and compliance, and regulatory affairs functions and will be based at the company's headquarters in Dulles, Virginia.

McCabe is currently Senior Vice President and General Counsel at Alion Sciences and Technology Corporation in Washington, D.C. Previously, he was Vice President and Deputy General Counsel at XM Satellite Radio and held senior legal and financial positions at GRC International, Inc. Earlier in his career,

McCabe was a partner in the law firm of McCarthy and Burke and served as a judicial law clerk to Judge C.R. Richey in U.S. District Court. He holds JD and MBA degrees from the University of Notre Dame and a BA degree from Georgetown University.

Lockheed Martin Names Hamel President of Commercial Ventures

Bethesda, Md., December 18, 2013--Lockheed Martin has appointed Lt. Gen. (Ret) Michael A. Hamel as President of Commercial Ventures, a major line of business within Lockheed Martin Space Systems Company (LMSSC). Hamel reports to Rick F. Ambrose, Executive Vice President of LMSSC.

Hamel succeeds Linda Reiners, who was named Vice President of Corporate Ventures.

Before joining Lockheed Martin, Hamel was Senior Vice President of Corporate Strategy and Relations for Orbital Sciences Corp, where he was responsible for leading Orbital Science's strategic planning, product and business development, government relations and corporate communications. He served in the U.S. Air Force for over 30 years in a broad range of space operations as well as development, acquisition, policy and command positions. Hamel concluded his military career in 2008 as a Lt .General.

In his later years in the Air Force, Hamel was Commander of the Air Force Space and Missile Systems Center and Air Force Program Executive Officer for Space, Commander of the 14th Air Force, served in senior command and staff positions at HQ USAF and AF Space Command and was Military Advisor to the Vice President on defense, arms control, non-proliferation and space policy.

Hamel holds a B.S. in Aeronautical Engineering from the U.S. Air Force Academy and a M.A. in Business Administration from California State University. He is a graduate of the Industrial College of the Armed Forces and the Program in National and International Security at Harvard University. He is a Member of the Council on Foreign Relations and an Associate Fellow of the American Institute of Aeronautics and Astronautics. He also serves on the Board of Directors of several corporations and advisory groups.

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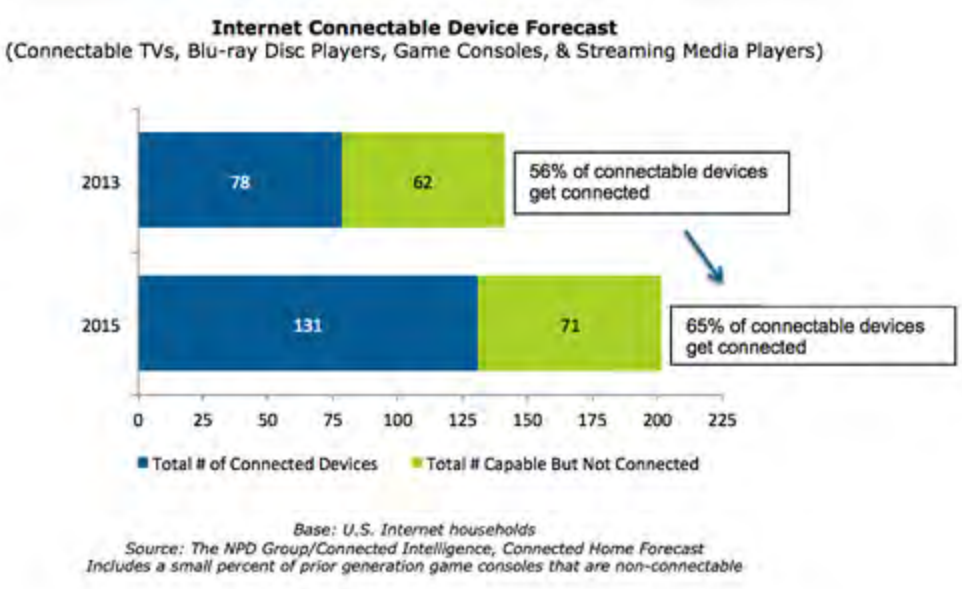
202 Million Internet-Connected Devices in U.S. Homes by 2015

Port Washington, NY, December 19, 2013 – By 2015 there will be 202 million Internet-capable TV devices in U.S homes, a 44 percent increase from the 140 million at the start of 2013, according to the new Connected Home Forecast report from NPD Connected Intelligence. Among those devices, 65 percent will end up being connected to the internet by consumers in 2015 compared to just 56 percent currently connected.



Two driving forces in the market are pushing the adoption and use of connected TV devices; streaming media players, and the TV itself. The introduction of devices, such as Chromecast, will help drive the number of installed and connected media players to 31 million by 2015, and outpace connected Blu-ray players by mid-2014.

Connected TVs, once just a middleman for connected devices, are becoming a much more prominent piece of the living room experience. More connected TVs are being produced, purchased, installed, and ultimately connected to the Internet, and by 2015 there will be 23 million installed and connected. While TVs and streaming media players are expected to see the most growth, video game consoles will remain the most connected device to the TV.

"As consumers connect TVs to the Internet, they are not only using streaming services such as Netflix, they also switch from linear and on-demand TV programming to TV network apps such as HBOGO or WatchESPN," said John Buffone, executive director, industry analyst, NPD Connected Intelligence. "This change in behavior emphasizes the importance of developing strong watch apps and ensuring they are available on all the devices viewers use to connect their TVs."

Emerging Markets Leads IPTV Growth through 2018

Boston, Massachusetts- December 20, 2013- Global IPTV subscriptions are expected to reach 102 million in 2018, with the fastest growth coming from Latin America and Africa and the Middle East, according to the newest report in the Research in Focus: IPTV series.

As a quarterly subscription or as a one-off resource, **Research in Focus: *IPTV*** offers analysis on global and regional subscription trends, as well as ARPS, pricing and revenue trends through 2018. This series of reports also provides five-year historical data and projections on IPTV for up to 60 markets around the world, with an excel document that contains the full data referenced in the report.

"Latin America and Africa and the Middle East are the smallest IPTV markets globally, with a combined estimate of 2.3% of global IPTV subscriptions at year-end 2013, or 901,000 and 1,432,000 subscriptions respectively," says Leslie Arathoon, Research Director at Pyramid Research. These regions will also be the fastest growing with IPTV revenue in Latin America growing at a CAGR of 56.1%, far ahead of the growth rates of other regions. This is due to a projected rapid uptake of broadband services, including IPTV, in a region that previously had a low penetration rate. Africa and Middle East IPTV revenue will grow at the second fastest CAGR behind Latin America, at 22.1% between 2013-2018, she notes.

Contribution and Occassional Use TV Market to Require 700 Transponders and 1.4 Gbps by 2022

Wilmington, DE, December 11, 2013 – NSR's *Contribution and Occasional Use TV Markets* report quantifies the market opportunity for satellite-based contribution and OU TV services. In this new report, NSR focuses on the dynamics surrounding full time video contribution and Occasional Use (or Satellite Newsgathering) applications.

From the migration to digital transmissions, to the impact of terrestrial on both contribution and OU/SNG, the market will demand over 700 transponders of FSS capacity and 1.4 Gbps of GEO-HTS capacity by 2022. Combined with over 3,400 full-time contribution feeds by 2022, and over 9.3 Million OU hours from 2012 – 2022, the market remains strong.

Source: NSR

"Continuing pressures from terrestrial solutions, encoding improvements and the migration towards all digital transmissions shape the contribution and occasional use market. With over $16 Billion in bandwidth revenues from 2012 – 2022 aimed to be generated by the sector," states Senior Analyst and report author, Brad Grady.

"The introduction of FSS Widebeam Ka-band and GEO-HTS-based offerings will help offset the ongoing decline in analogue video transmissions. However, the greatest threats to satellite services are not from within, but rather the expansion of fiber deployments, cellular networks and a fundamental shift in how live events are covered in the field," Grady added.

Contribution feeds will benefit from new satellite bandwidth such as GEO-HTS and FSS Widebeam Ka-band to help expand the market. Contribution feeds will increase by over 1,000; yet through better encoding efficiencies the net result is less bandwidth utilization. Combined with changing prices for traditional FSS and emerging GEO-HTS, yearly bandwidth revenue change from 2012 to 2022 is minimal.

Occasional Use markets will see hourly declines as access to terrestrial technologies expands. Driven largely by the even-year special events (Olympics, World Cup, Elections), occasional use traffic will begin to show signs of smoothing out as more of these live events are covered through terrestrial means. With over 4,000 In-service units by 2022, FSS Widebeam Ka-band and GEO-HTS will help drive growth within the OU/SNG markets.

In short, terrestrial is the greatest restraint in the Contribution and Occasional Use markets. However, new satellite bandwidth, better compression technologies, and a steady hunger for higher-quality content from end-users will help provide for a stable market looking forward.

NSR's *Contribution & Occasional Use TV Markets* provides a data-driven analysis that quantifies the market opportunity for satellite-based contribution and OUTV services. Aimed at providing insights and analysis to satellite operators, service providers, and equipment manufacturers, the report offers a ten-year forecast for the market in terms of feeds, hours, equipment, revenues, and satellite capacity. With quantitative coverage and qualitative discussion, the reader is provided a clear-cut picture of how the Contribution and Occasional Use TV markets are developing today, and where they are heading.

For additional information on this report, including a full table of contents, list of figures and executive summary, visit www.nsr.com or call NSR at 617-576-5771.

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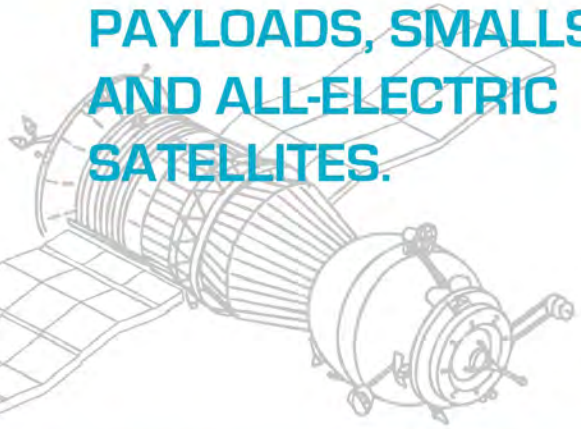

HEAR EXPERT INSIGHTS FROM:

Col. Scott Beidleman, Director, Development Planning, SMC/US Air Force

Skot Butler, VP Business Development, Intelsat

Rich Pang, Senior Director, Hosted Payloads, SES Government Solutions

Andrew Santangelo, Small Sat Technical Committee Chair, AIAA

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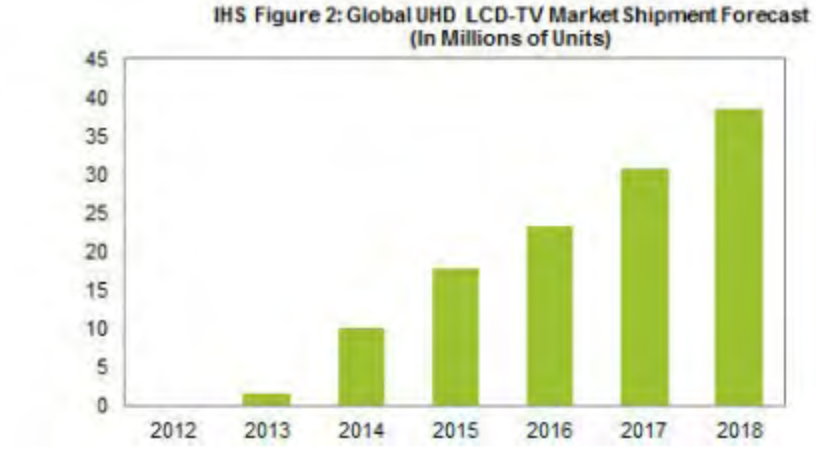
Vital Statistics

UHD TV Shipments to Reach 10 million in 2014



Source: IHS Inc. January 2014

In light of swift reductions in pricing, IHS has boosted its forecast for UHD liquid-crystal display (LCD) television sets. IHS now predicts 38.5 million UHD LCD TV sets will ship in 2018, up from 1.5 million in 2013, according to the TV Systems Intelligence Service at IHS released at the Consumer Electronic Show in Las Vegas. Shipments will increase more than 500 percent to reach 10 million in 2014, according to IHS.

"While television brands will show off their massive new ultra-high-definition sets at CES, the real focus for UHD makers in 2014 will be cost reduction," said Jusy Hong, senior analyst for consumer electronics & technology at IHS. "Lower pricing will enable the market to expand—but UHD sets still have a long way to go before they command a major share of the overall market. In 2018, UHD will account for only about 16 percent of all LCD TV shipments."

Advertisers' Index

The Satellite Markets 25 Index™

Company Name	Symbol	Price (Jan. 03)	% Change from Last Month	52-wk Range			% change from 52-wk High
Satellite Operators							
Asia Satellite Telecommunications	1135.HK	29.55	-2.48%	26.85	31.20	↓	5.29%
Eutelsat Communications S.A.	ETL.PA	23.01	7.47%	20.41	28.15	↓	18.26%
APT Satellite Holdings Ltd.	1045.HK	9.34	-0.53%	2.01	10.08	↓	7.34%
Inmarsat Plc	ISAT.L	759.00	13.54%	80.01	773.00	↓	1.81%
SES GLOBAL FDR	SES.F	23.56	8.00%	20.81	25.00	↓	5.76%
Satellite and Component Manufacturers							
The Boeing Company	BA	137.64	2.59%	72.68	142.00	↓	3.03%
COM DEV International Ltd.	CDV.TO	3.72	-11.00%	3.10	4.40	↓	15.45%
Lockheed Martin Corporation	LMT	147.06	5.27%	85.88	149.99	↓	1.84%
Loral Space & Communications, Inc.	LORL	79.54	1.88%	54.67	81.36	↓	2.37%
Orbital Sciences Corp.	ORB	23.16	-0.17%	14.01	24.16	↓	4.14%
Ground Equipment Manufacturers							
C-Com Satellite Systems Inc.	CMI.V	1.66	-2.35%	0.66	2.37	↓	29.96%
Comtech Telecommunications Corp.	CMTL	31.52	-0.06%	22.65	33.65	↓	6.57%
Harris Corporation	HRS	69.28	8.18%	41.08	70.73	↓	2.05%
Honeywell International Inc.	HON	90.52	2.70%	65.25	91.56	↓	0.96%
ViaSat Inc.	VSAT	61.18	3.40%	36.97	73.43	↓	16.80%
Satellite Service Providers							
Gilat Satellite Networks Ltd.	GILT	4.68	6.61%	4.09	6.20	↓	24.52%
Globecomm Systems Inc.	GCOM	14.10	0.00%	10.49	14.91	↓	5.43%
International Datacasting Corporation	IDC.TO	0.14	-17.65%	0.11	0.25	↓	44.00%
ORBCOMM, Inc.	ORBC	6.19	0.81%	3.40	6.63	↓	6.33%
RRSat Global Communications Network Ltd	RRST	8.19	9.04%	6.45	9.35	↓	12.41%
Consumer Satellite Services							
British Sky Broadcasting Group plc	BSYBY	55.71	5.35%	46.45	62.02	↓	10.17%
DIRECTV	DTV	69.04	3.14%	47.71	69.31	↓	0.16%
Dish Network Corp.	DISH	57.81	7.37%	33.79	58.30	↓	0.75%
Globalstar Inc.	GSAT	1.74	0.00%	0.26	2.06	↓	15.53%
Sirius XM Holdings Inc.	SIRI	3.57	-5.31%	2.95	4.18	↓	14.35%

INDEX	Index Value (Jan. 03)	% Change from Last Month
Satellite Markets 25 Index™	1,710.91	7.82%
S & P 500	1,831.30	1.69%

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