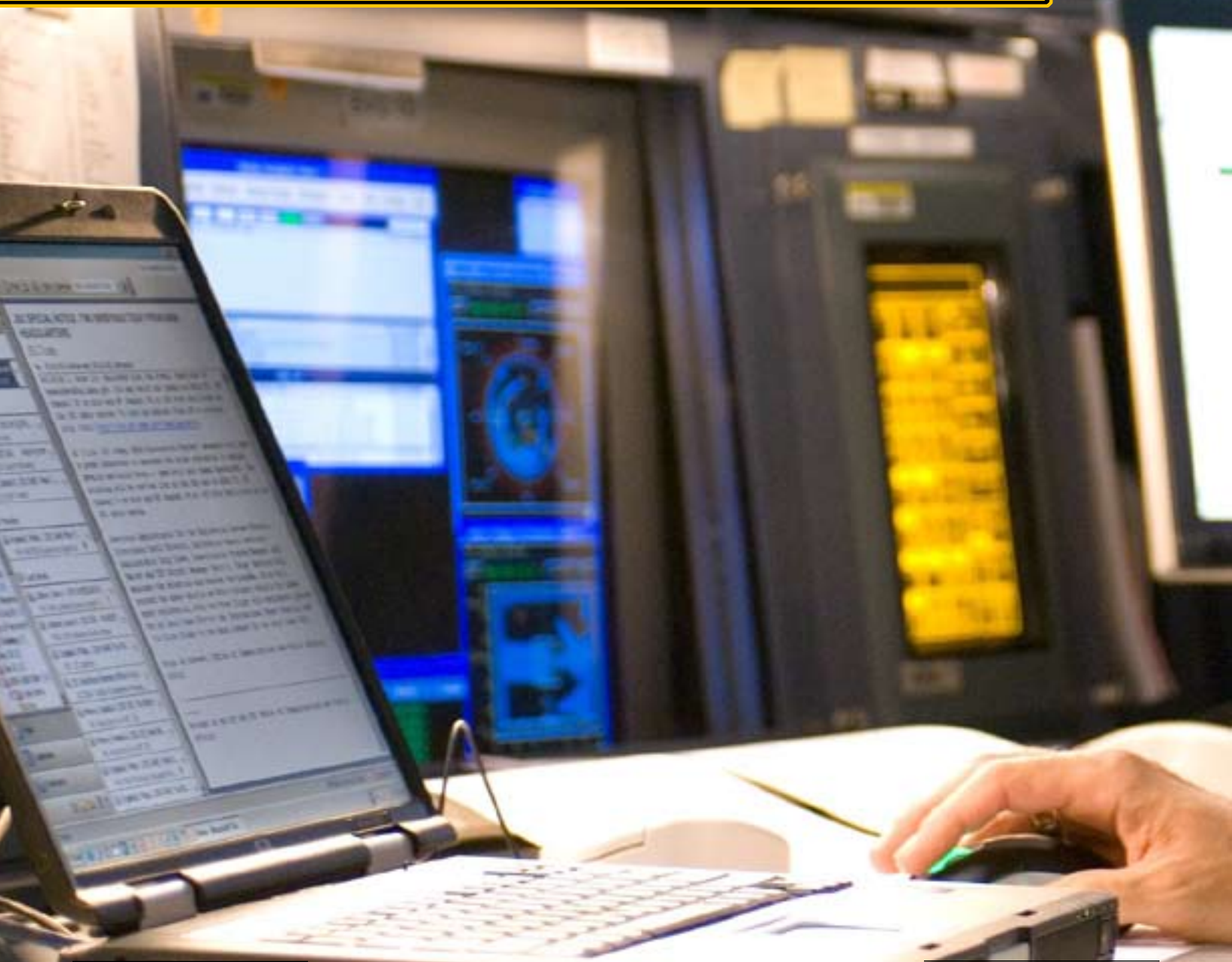




WHEN FAILURE IS NOT AN OPTION



SATMAGAZINE

COVER STORY

7 Failure Is Not An Option : A Process For Halting Launches & Satellite On Orbit Failures

by Len Losik



Rockets blow up and have been doing so for quite some time. Every other month, or so it seems, a news story reports another billion-dollar rocket destroyed during an attempt to place a satellite into orbit. With all the latest technological breakthroughs, can't somebody invent a technology or a system to stabilize rockets?

REGULAR DEPARMENTS

- 03 EDITOR'S LETTER
- 23 SPOTLIGHT
- 11 MARKET INTELLIGENCE
- 17 FEATURED SATELLITE
- 31 CALENDAR OF EVENTS
- 32 COMPANY ACTIVITY
- 34 EXECUTIVE TRANSITIONS
- 34 NEW PRODUCTS

FOLLOW-UP

5 Apax Partners Gloms Onto Telenor With Aplomb

by Hartley Lesser

The somewhat unusual financial aspect of Norwegian-based Telenor's acquisition by Apax Partners revolves around a 30-year old firm attuned to global private equity funding and deciding to continue their investments within the global communications sector.



FEATURES

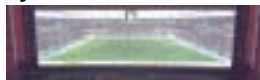
11 The Transformation Of Oil & Gas Operations... Via Satellite

by David Hartshorn

Oil and gas companies are using a variety of wireless platforms to talk, fax, e-mail and transfer their all important data to and from their remote offices, staging areas, well sites, off-shore rigs and yes, even ships.

14 HDTV: Satellite's best friend

by Chris Forrester



The introduction of an increasing number of flat panel televisions is great news for HDTV fans, but as the industry has recognised for some time, flat-panel sets do not necessarily do the best for a broadcaster's expensively transmitted images. Which is where satellite has moved in nicely.

18 The Threat to C-band Satellite Services

by Matthew Botwin

The satellite systems that operate in the 3.4 to 4.2 GHz band are essential links of communication for millions of people, corporations and defense-related systems. Regrettably, these links are now also at great risk.

21 Broaden Your Broadband Perspective—Think Aviation

by David Gross

The aviation broadband industry is now poised to transform the commercial satellite data service from a narrower marine and gas focus to become a more inclusive service that will include millions of air passengers.

23 Satcoms Save Lives

by Danielle Edwards

Previously, satcoms lacked the key and necessary features required by groups such as the fire service and the police. Thanks to rapid technological satcom improvements, this situation has changed.



26 On the Lightwave... Optically speaking

by Jörg Schmidt

Optical fibres provide additional reliability when compared to coaxial cables, due to an effective galvanic isolation between the antennas, the feeder location, and its infrastructures.

28 Battling Asia's Signal Pirates

by Peter I. Galace

The APEC's call to anti-piracy action was brought on by the stark reality that pay-TV piracy in Asia now exceeds \$1 billion and is on the rise.

EDITOR'S LETTER

Here's another stellar issue of *SatMagazine* for the improvement of your gray matter and the subsequent firing of synapses as you deposit into your mind all you have learned! As none of us *truly* understands everything there is to know regarding our vibrant industry, I hope the articles in *SatMagazine* and our sister publication, *MilsatMagazine*, prove worthwhile for your individual needs.

We received a letter from Mr. *Ivor McClure* of the Goonhilly Satellite Earth Station in Helston, Cornwall, United Kingdom, regarding a... "...very basic and glaring error about the origins of satcoms. Telstar was in fact the first active telecommunications satellite, built by AT&T's Bell Labs and launched by NASA on 10 July 1962. It heralded a period of experimentation between the satellite earth stations at Goonhilly Downs in the UK, Andover in the USA and Pleumeur Bodou, France. However, Telstar was never a geo orbiting satellite; the orbit was elliptical with a period of around 158 minutes giving periods of mutual visibility between Goonhilly and Andover, which varied between 8 minutes and 40 minutes but averaged around 20 minutes. Early Bird was the first commercial geo orbiting satellite."

There were actually two Bell Telephone Laboratories, which managed Telstar satellites, with the second vehicle quite similar in payload to Telstar 1. In Telstar 2, the command decoders used radiation-resistant transistors. The second Telstar launched aboard a Delta rocket on May 7, 1963, and remained in operation until May of 1965. Thanks to possessing a higher apogee than Telstar 1, time in view for ground stations was increased while Van Allen belts exposure was decreased and Telstar 2 operated for a total of 2 years.

Toward the end of this month **MILCOM 2007** occurs. This show offers a robust program focusing on the most recent technologies of interest to government and defense communications' firms. Technologists and military/industry leaders will be on hand in Orlando to share information with the expected 4,000 attendees. In the 50,000 square feet of exhibit space, the latest military communications technology will be on display as well as interesting demos. MILCOM 2007 runs from October 29th through the 31st at the

Gaylord Palms Resort and is sponsored by **AFCEA**. Check out www.milcom.org for all the details. An added bonus will also be the distribution of our **FIRST PRINTED** edition of *MilsatMagazine*!

This issue's cover story is authored by *Len Losik* whose **Telemetry Prognostics** information should be of interest to any company operating within the satellite launch sector — *Failure Is Not An Option...* Taking an in-depth look at the transformation of oil and gas operations is the expert analysis by author and subject-matter expert *David Hartshorn* in the *Marketing Intelligence* column...European Editor, columnist and author *Chris Forrester* managed a busy schedule during the recent IBC exhibition in Amsterdam. His travels throughout the trade show served an excellent purpose — he reports some of his findings in his featured European column entitled *HDTV: Satellite's Best Friend*. Extremely interesting and holding great portent for the satellite industry in the years to come!

Author *David Gross*, the Chief Analyst at **Freesky Research LLC**, weighs in with his look at broadband and aviation... the ever present controversy surrounding BWA services using the C-band is tackled by *Matthew Botwin* in **Point Of View...** *Jörg Schmidt*, the owner and founder of **DEV Systemtechnik GmbH & Co. KG**, writes about the need for high signal fidelity for the new types of signals, especially digitally modulated HDTV with "On The Light-wave... Optically Speaking"... *Danielle Edwards* of NSSL reveals how satcoms can save lives, and I add a perfect example of how such is already being accomplished by **Télécoms Sans Frontières**... Asia-Pacific Editor and author *Peter Gallace* offers an in-depth exam of the income degenerating issues of signal piracy in Asia... I also take a look at the **GE-23** satellite and the **Apax Partners** acquisition of **Telenor** and the merging of that company into **Vizada**.

This is a dynamic industry and we continue to work at ensuring *SatMagazine*, *MilsatMagazine*, and our daily and weekly news blasts meet both your needs and expectations. Please contact me with any comments, concerns, ideas for future articles, and, yes... even positive impressions! Thanks for "reading". ■

Sincerely,
Hartley Lesser, *Editorial Director*

SATMAGAZINE

Production Team

EDITORIAL

Silvano Payne
Publisher

Hartley Lesser
Editorial Director

Chris Forrester
Editor, Europe, Middle East & Africa

Peter I. Galace
Editor, Asia-Pacific

COLUMNISTS

David Hartshorn, Martin Jarrold
Market Intelligence

Tara Giunta
Regulatory Issues

CONTRIBUTING WRITERS

Matthew Botwin
Danielle Edwards
David Gross
Len Losik
Jörg Schmidt

SALES

Jill Durfee
Advertising Director
jill@satnews.com

PRODUCTION

Simon Payne
Creative Manager

Published monthly by
Satnews Publishers
800 Siesta Way,
Sonoma, CA 95476 USA
Phone (707) 939-9306
Fax (707) 939-9235
E-mail: design@satnews.com
Website: www.satmagazine.com
© 2007 Satnews Publishers

PUBLISHERS NOTE

A FEW WORDS FROM OUR PUBLISHER

A great deal of talent from many contributors and dedicated staff is required to produce our two magazines, SatMagazine and MilsatMagazine. The satellite communications industry is exciting and alive... and the content must reflect that energy.

Our editorial director firmly believes even the most technical of materials should prompt reader investigation by enticing them further and further into the content. News need not be mundane nor just a "cut and paste" press release. If content is enjoyable to read, or produces a query in your mind that needs to be satiated, the odds are you will remember what you have read. This is

especially handy when you need to recall that SatNews information to "wow" a client or an investor.

Content should reflect the strengths and values of our industry and be impartial as to its coverage. This means all satcom'ers are welcome to join our family, from the largest of companies to the smallest of shops. No one is irrelevant. Thoughts, ideas, suggestions, all are vital to industry growth... and no question should be considered illegitimate. Which is why our Editorial Director thoroughly enjoys hearing from those who would wish to contribute to our publishing efforts. You do not become a sub-

ject-matter expert until you expound upon your theories with solid reasoning - when your words appear in a publication, your voracity regarding a particular technology or theme is more highly valued. And, you can also add your published article to your résumé!

In case you are unaware, SatNews Publishers offers a broad range of content for your information and enjoyment. Each day, we seek and receive the latest news and information to ensure our subscribers are well armed for their daily involvements in the satcom industry. The stories are fine-tuned, tested for legitimacy, and quickly written and edited in a timely fashion. This means each morning when you check www.satnews.com, you'll receive the most up-to-date industry news — read about that upcoming satellite launch, get a chuckle or two from industry rumors, learn who is joining which company and why, find out about the most current company acquisitions, dig into company financials and quarterly reports, schedule upcoming trade shows and symposiums of interest, and far more.

In addition to daily news email notification, SatNews Publishers also offers a weekly news blast... the most important stories of the past week are sent to your email address each weekend to prepare you for your workweek ahead. Go to www.satnews.com/cgi-bin/register.cgi. Give either of these services a try. After all, THEY'RE FREE!

- Silvano Payne - Publisher

APAX PARTNERS GLOMS ONTO TELENOR WITH APLOMB

by Hartley Lesser

As the readers of *SatNews Daily* and the *SatNews Weekly* news blasts are quite well aware, a major acquisition occurred quite recently—**Apax Partners** acquired Norwegian-based **Telenor**. The somewhat unusual aspect of this financial move revolves around a 30-year old firm attuned to global private equity funding and deciding to continue their investments within the global communications sector.

Q: How will this acquisition impact Apax?

A: Apax Partners is a global private equity group that invests in the telecommunications and technology sector as well as other major industries. Apax' is in the business of building and strengthening world-class companies such as Vizada.

Q: Will the Telenor brand name be retained, or will the moniker be incorporated into the Vizada brand?

Telenor was immediately merged into another Apax Partners acquisition, that being **Vizada**, formerly known as France Telecom Mobile Satellite Communications. Hmmmm, do we see a trend here?

Apax Partners has established offices in London, Madrid, Milan, Munich, Stockholm, New York, Tel Aviv, Hong Kong and Mumbai. With more than \$20 billion in funds under advisement throughout the world, their investments extend into the worlds of technology and telecom, the media, retail and consumer, healthcare, and financial and business service sectors. In fact, since 1965, more than 65 companies owned by Apax Partners' Funds have managed to successfully go public on stock markets throughout the world.

Which led to an inquiry of the company's executive team...

Q: Why did Apax Partners wished to acquire Telenor, and why was Telenor the focus of the company's interest?

A: Combining Telenor Satellite Services with Vizada bundles the strengths of two industry leaders to create a new, more competitive market leader in global satellite communications. The combined entity offers an extensive portfolio of mobile satellite services and VSAT services, making it one of the world's largest and most experienced providers of two-way satellite communications services.

FOLLOW-UP

(Continued From Page 5)

A: The Telenor Satellite Services brand name is no longer in use. Vizada, the new company brand, was created from a blending of the two words “voice” and “data” representing the two essential communications the company delivers via satellite.

Q: Please explain how Vizada is going to be organized into two business lines and what will be the focus of each line?

A: Vizada has a mobile services group and a VSAT group. The mobile services group sells traditional mobile satellite services (ex. Inmarsat, Iridium, Thuraya, and Globalstar) as well as some off-the-shelf VSAT solutions through a global network of indirect channels. This group is headed by *Robert Baker* for the Americas and *Erik Ceuppens* for Europe and the Rest of World (ROW).

The VSAT (very small aperture terminals) group sells custom VSAT solutions and integrated hybrid networks through a highly specialized direct sales force. This group is headed by *Morten Tengs*.

Q: Will current Telenor employees and corporate officers be required to relocate, find new positions, or will most be retained?

A: No changes in staff or office locations are occurring at this time. Customers and partners can expect the same service, contacts, support and 24-hour customer care they’ve learned to rely on.

Q: How do you see the Telenor acquisition impacting the industry? Will Apax have to re-express their future financials?

A: Integrating Telenor Satellite Services with Vizada instantly creates a new market leader in the satellite services industry. Vizada intends on competing in the marketplace through their globally distributed channel partner distribution network. Vizada is committed to providing the most innovative and reliable solutions possible while providing the access to make services selling easy for partners.

Q: Will Telenor merge well with the business goals of your former acquisition, France Telecom Mobile Satellite Communications, now Vizada?

A: Vizada’s business objective is to become the world’s leading provider of satellite communications services by offering world-class mobile and VSAT network solutions. Vizada’s strategy is to empower partners by delivering innovative and reliable satellite solutions. Building strong partner relations is seen as core to Vizada’s future success. Vizada’s business commitment to partners is what distinguishes the company from other players in the market.

Vizada Group CEO and Chairman, *Michael Collins*, said, “Vizada combines the resources of talented employees, superior technology and global infrastructure to provide the best satellite communications solutions, service and support to each Vizada reseller and end-user, now and well into the future.” One could hardly expect him to say any less...

Vizada’s MSS focus calls for close work with 400+ reseller partners. The products combine off-the-shelf (COTS) services with a broad range of value-added tools and apps. Each offering is customized to fit the needs of their client base. The company is a provider of broadband fixed satellite solutions for maritime and land-based customers. Plus, there are now teleport facilities in the Czech Republic, France, Norway, Slovakia and the United States. And let’s not forget, due to this acquisition, Vizada is now one of the market leaders in global satellite communications with annual revenues of US\$685M. Not too shabby! ■

FAILURE IS NOT AN OPTION

A PROCESS FOR HALTING LAUNCHES AND SATELLITE ON ORBIT FAILURES

by Len Losik

Rockets blow up and have been doing so for quite some time. Only a few years have passed since the Challenger space shuttle tragedy. Every other month, or so it seems, a news story reports another billion-dollar rocket destroyed during an attempt to place a satellite into orbit. With all the latest technological breakthroughs, can't somebody invent a technology or a system to stabilize rockets?

\$100,000,000.00. The early communications satellites orbited below geostationary altitudes. In the 1970's, geostationary altitude orbits emerged as the front-runner as enabling technology became available.

This did not occur overnight. The radio signal RF output needed to operate from space at a 22,000-mile altitude was unavailable and this forced communication satellites to operate at an altitude of just a few hundred miles. As private research and development pushed RF output via the traveling wave tube (TWT) in the early 1970's, geostationary satellites finally became a reality.

LAUNCH VEHICLE SUBSYSTEM FAILURES, 1980-2006

Country	Propulsion	GN&C	Separation	Electrical	Structural	Other	Unknown	Total
U.S.	20	4	8	1	1	1		35
USSR	33	3	4			1	19	60
Europe	7	1						8
China	6	1			2			9
Japan	4	1						5
India	1	1	1	1		1		5
Israel	1							1
Brazil	4							4
N. Korea							1	1
Total	76	11	13	2	3	3	20	128

(Courtesy of Aerospace Corporation)

Failure Analysis, a company in Salinas, California, has done just that—developed the ability to predict rocket malfunction and on orbit satellite failures before they occur. This new technology is called Telemetry Prognostics.

Spacecraft telemetry is used to predict future equipment failures and is the process of measuring a quantity, or quantities, and then transmitting the measured value to a distant station. The engineers at the station then interpret or record the measured quantities. When speaking of spacecraft telemetry, such includes various parameters such as spacecraft temperature, power supply, and condition of electrical equipment, microprocessors, gyroscopes, batteries, and orbital information. All of this data is transmitted to the ground stations that are monitoring spacecraft status. Engineers use this telemetry to determine if equipment has failed as well as to predict upcoming electrical and mechanical equipment failures.

A LITTLE HISTORY, PROFESSOR

Today's commercial communications satellite industry actually started in 1984 when Rene Anselmo founded PANAMSAT. Satellites used for commercial space evolved from early, low cost, spin stabilized canisters popularized by Hughes Communications to the now gigantic, 3-axis stabilized platforms costing more than

In 1978, the U.S. Air Force contracted with manufacturers for the first 12 GPS satellite builds. To ensure success for the GPS program, all of the satellite telemetry was to be analyzed by a staff of engineers. The Air Force needed to know what the performance of the GPS satellite payloads would be during the weeks and months ahead. This was necessary to obtain valid test results to ensure continued program funding. The author led a 15-person team to learn how to predict future failures before they occurred. The successful failure prediction technology developed by the author was used by the Air Force to maximize the success of the GPS system testing. The system yielded tremendous performance advantages over existing space based navigational systems. The Air Force funded the entire program in 1980 due to the success of the project.

Over the next 15 years, the author used telemetry prognostics technology on several other satellites and launch vehicles including the NASA GOES I, NASA's EUVE, SCC SUPERBIRD, and IN-TELSAT 7 satellites. Other successful telemetry prognostics projects include the ATLAS, TITAN and ARIANE launch vehicles.

FOCUS ON THE SATELLITE

Operating commercial communications satellites from space has changed little from the early days. Operators sit in mission control centers with computers digesting computer-generated telemetry. The data is beamed down from each satellite and routed to the mission control centers via remote ground stations located around the world. Computer software then crunches the telemetry data to determine if any of the engineering information indicates a problem has occurred on any of the satellites' equipment.

COVER STORY

(Continued From Page 7)

Satellite telemetry is narrowband, but because it is available all of the time, it creates huge databases. The data becomes extremely substantial to evaluate. Computer processing power to the rescue...

Commercial satellites often have fewer telemetry measurements available for equipment performance analysis. The reason for this is cost—telemetry instrumentation is expensive and negatively impacts the total satellite cost, mass, complexity, reliability and testing time.

Comparison of the number of telemetry channels for commercial, NASA & Air Force satellites

THE ART OF REMOVING FAILURE

Commercial satellite telemetry is used throughout the spacecraft's life to determine when failed equipment should be replaced with working equipment. This is especially true for communications channels using TWTs to amplify received ground signals and retransmit them to the ground stations. Because TWTs are active RF sources, their reliability is low. This often requires up to 4:1 redundancy to maintain an operating communications channel for the duration of the satellite's lifetime.

Commercial satellites use instrumentation from each piece of equipment to determine if enough electrical power is being drawn and the temperature is normal. As TWTs age, RF output degrades. Instrumentation is available to monitor the normal, decreasing RF power output from each TWT.

When a piece of equipment fails on the satellite, the operators have to determine which unit failed and switch in a back-up unit. Using traditional diagnostic techniques developed during the missile programs of the 1950's and 1960's, the operators use computer software to examine the satellite telemetry to decide which equipment has failed. This takes time and, while this is going on, the communications channel signal is interrupted and the customer becomes, shall we say, "displeased."

Satellite communication channels service availability is graded by the amount of time the channel can be expected to be available during a year. A 99.9 percent channel availability means a channel can be expected to be unavailable for at least 9 hours per year. A 99.99 percent availability means that a channel can be expected to be down at least 1 hour per year. Down time includes interference from bad or ground equipment not working properly. Just as our cell phone links fade in and out, satellite links perform

identically, albeit far less often.

With a commercial satellite operating dozens of communications channels simultaneously, keeping all of them operating reliably is a huge task for the operators.

There have evolved four main problems in the commercial satellite industry: launch failures, on orbit failures, unreliable service and a high risk of mission failure. The latter occurs when the owner of the satellite network fails to earn back the cost to create the system.

Once a satellite has arrived on orbit, it is subjected to an environment that immediately degrades the equipment performance. The craft's communications channels are over-designed to make certain each channel is operable for satellite's life cycle.

Sometimes, satellite Bus support equipment fails at a much higher rate than was predicted. This causes the satellite to become useless or reduces income-earning capabilities. Commercial satellite owners pay insurance companies to insure against such contingencies. In fact, the health of the commercial com-

COVER STORY

(Continued From Page 8)

Ranking	Company Satellite Bus	Number of Successful Deployments	Number of Successful Deployments with Insurance Claims	Percentage of Satellite Fleet with Claims
1	Hughes HS 376	55	6	11%
2	Lockheed Martin A2100	23	3	13%
3	Space Systems/Loral LS 1300	41	8	20%
4	Hughes HS 601	62	14	23%
5	Spacebus 3000	18	5	28%
6	Eurostar E2000	19	6	32%
7	Hughes HS 702	8	6	75%
A summary of commercial communications satellites on orbit performance (Frost & Sullivan Marketing)				

munications satellite industry is determined by the availability of insurance for satellite systems insurance and the cost of such protection. Pricing of satellite policies is determined by actual satellite and launch vehicle performance statistics.

Commercial satellite equipment reliability has increased substantially, with the greatest growth in dependability occurring during the 1980's. Commercial satellite builders realized some of their satellites were operating at many times their original, projected

COVER STORY

(Continued From Page 9)

lifetimes. Obviously, the equipment reliability models used to predict the lifetime of equipment were conservative.

Commercial satellite builders looked closely at piece part reliability. They determined only a few of the hundreds of thousands of piece parts in a satellite were restraining them from claiming much longer lifetimes for their equipment. These few parts were exchanged for more reliable ones—some circuits were redesigned. The mission lifetimes for commercial satellites increased from 5 years to nearly 20 years, almost overnight.

Telemetry Prognostics reveals hard to extract information that is often only temporarily available. This data, which can be read by a prognostician, can forecast when spacecraft equipment will stop working correctly. This technology does not require a great deal of information with which to work and even electrical noise during telemetry is not a problem.

Telemetry Prognostics has been applied to many satellites and rockets and does not require a specific computer system or software to work. The technology can be used on any platform that uses telemetry to confirm proper working order. This includes missiles such as the Trident D4, any satellite, rocket, computer, nuclear power reactor, racing cars, aircraft, helicopters and even medical devices, such as a pacemaker.

The impact of telemetry prognostics technology to commercial geostationary communications satellite services is immense. Telemetry prognostics allow, for the first time, the knowledge of what equipment will fail and when, months ahead of time. With this knowledge, commercial satellite communications service providers can improve communications channel reliability to new levels of reliability and availability. In addition, launch failures can be stopped—satellite equipment failures can be stopped—increasing equipment life, lowering risk, and meeting mission durations.

The benefits of Failure Prediction Telemetry Prognostics is that on orbit

failures are stopped before they occur, no more launch pad delays, launch vehicle failures are eradicated, and the usable remaining equipment life is extended on faulty equipment. Telemetry Prognostics identifies flight equipment that is going to fail, predicts day of equipment failure, and extends on orbit satellite mission life.

The author is Len Losik, President of Failure Analysis and creator of Telemetry Prognostics technology (www.failureanalysisco.com). Len Losik can be contacted by email at: lenlosik@failureanalysisco.com.

The author will be presenting a paper at the International Telemetry Conference, to be held in Las Vegas, Nevada October 22–25, 2007 entitled, “Stopping Launch Pad Delays, Launch Failures.”

ADVANTAGES OF TELEMETRY PROGNOSTICS

To The Satellite Owner	To The Flight Equipment Supplier	During LV or Satellite Factory I & T	During Satellite & LV Integration	During Launch	During On Orbit
Lowers risk of mission failure	Reduces shipping faulty equipment	Stops shipping of faulty equipment to the launch pad	Stops infant mortality	Stops infant mortalities	Stops infant mortality
Lowers insurance premium	Reduces infant mortalities	Reduces delivery delays to launch pad	Stops launch delays	Stops launch failures	Stops equipment failures
	Increases equipment reliability	Increases equipment reliability	Stops launching faulty equipment	Stops launch failures	Extends equipment mission life
	Reduces equipment returns	Stops infant mortalities	Increases equipment returns	Stops launch delays	Reduces service downtime
		Increases equipment reliability	Increases equipment reliability	Stops launching faulty equipment	Increases system availability
				Increases equipment reliability	Increases equipment serviceability
					Reduces number of expert personnel, lowers cost
					Increases equipment reliability

MARKET INTELLIGENCE

THE TRANSFORMATION OF OIL & GAS OPERATIONS... VIA SATELLITE

by David Hartshorn

John Puetz, GVF Energy Sector Advisor, on how state-of-the-art solutions are addressing customer challenges in “The Patch” Are you still offering energy sector clients the same service that you offered five years ago? One energy services company recently turned their entire business model upside down in regards as to how they deploy their geological expertise and exploration services. Before deploying its satellite-based broadband wide area network (WAN) across the Americas, West Africa and Europe, the company experts traveled to where the geological data was located. They often spent half of their time in non-productive trips, getting to exploration sites at sea or in hard-to-reach land locations many hours or even days after their original departure. Once on site, they would analyze large amounts of data captured in real-time using specialized computing applications, and make drilling or process recommendations on the spot, yielding immediate improved results.

After deploying their broadband small antenna satellite network or broadband VSAT, the data now comes to the experts instead, turning the process on its head. The high-volume, real-time data is brought to the regionally located experts and even to the client, who can now collaborate on the project far more effectively. Furthermore, these experts can even support operations at several sites concurrently. The results? Increased productivity, better decision-making, larger service revenues, and happier customers and employees. And when local conditions warrant, expert on-call help is just a videoconference or a telephone call away for the drill crews. At a time when the price of crude continues to climb, this is the essential value proposition for satellite-based services in the oil and gas “patch”.

So, what has changed?

Technology has. By integrating broadband capacity with smart IP routing capability, companies are now successfully deploying VSAT-based WANs that bring together their LANs, which are thousands of miles apart at speeds of 2Mb per second or more.

Oil and gas companies are using a variety of wireless platforms to talk, fax, e-mail and transfer their all important data to and

MARKET INTELLIGENCE

(Continued From Page 11)

from their remote offices, staging areas, well sites, off-shore rigs and yes, even ships. These platforms include: Inmarsat, Iridium, Globalstar, Thuraya, microwave, HF radios and VSATs. Of these, VSATs provide the highest data capacities with the longest reach — five thousand miles or more.

"We find our customers may not necessarily be informed buyers of technology, but they know what they want. Their expectations are that they can have voice and email communications in remote areas just like they have in their corporate HQ. That's what they expect and that's the challenge we are successfully meeting," stated Ian McPherson, Vice President of Remote Connectivity, Schlumberger Network Infrastructure Solutions. Schlumberger NIS is one of a handful of specialized telecom service providers bringing VSAT solutions to the global oil and gas marketplace.

"In the foreseeable future, this situation is not going to change, because VSAT will be the preferred means of communications due to the lack of infrastructure and the nature of the hostile physical environments that the oil and gas exploration takes place in," elaborates McPherson.

The VSAT benefits

Several of the most attractive benefits of VSATs are their cost independence of distance, exceptional reach, anywhere-to-anywhere connections and high reliability — banks, stock exchanges and governments across the globe have used VSATs for years. VSATs are used in disaster recovery because they can provide an instant communications infrastructure, and their bandwidth-on-demand intelligence keeps efficiency high and operating costs low.

John Miller, Director Satellite Networks for Cable & Wireless, says, "If one is going to use their Inmarsat terminal for more than about an hour a day, you should probably be looking at VSATs. That's the trade-off we generally see. And when you use their 64Kbps data service you very rapidly reach that trade-off point where VSATs have the price advantage. Having said this, Inmarsat is a well recognized brand with a very good service providing true mobility, which in the end, you pay for."

According to Ron Wagnon, Director of Sales at CapRock Services, data needs are going higher and higher as rigs need to send data back to shore for processing. Miller is seeing this trend as well. "There's been a definite long-term uptrend in increasing data rates for the oil and gas sector. This is a result of the greater use of networked IT and the driving economics of getting well logging data back to base for almost real-time analysis by the experts."

Miller continues: "Most of the oil majors are using VSATs somewhere. For the majors, they are likely to be using a variety of service providers in different places, and a patchwork of contracts because of regulator changes. Now they are looking for one provider across whole regions to get better management of their networks and better volume-based pricing."

C&W provides VSAT-based services to all of the oil majors, as well as banks, financials, manufacturers, hotels, governments and telecom service providers. One such oil major needed a reliable communication network throughout Africa to support downstream activities in many sub-Saharan countries. Voice was their major telecoms expense, and it was unreliable. Their data network relied on dial up X25, which operated up to 9.6 Kbps and was inadequate for their latest software. They desperately needed the same IT functionality deployed across Africa, as well as saving on voice as a priority. Lack of adequate communications was a barrier to their business expansion.

C&W deployed a hybrid TDMA and DAMA VSAT network, to support both the smaller depot sites and the large country headquarters. The traffic on the network has changed dramatically. Voice (where allowed) is increasingly deployed as VoIP. Email is now the major application, reflecting changing work patterns across the region. They also transfer files around quickly using FTP. New IT projects can now be deployed much more easily across the region without worrying about the reliability of communications. "Key to the design was flexibility and expansion," comments Miller. "Now, some two and a half years after the contract was signed, we are the oil major's preferred telecoms supplier for Africa."

CapRock is a long-standing 'one-stop-shop' service provider that has focused on the global oil and gas market for some 20 years. For over five years, CapRock has been providing satellite services to the Sakhalin area supporting offshore drilling rigs, fixed jack-up rigs, their land-based office and their main housing camp. Their main applications include voice and data (email, intranet to HQ, well logging data, internet and files) connectivity within the region and between Sakhalin and Houston. Even though Sakhalin is a particularly harsh environment, CapRock has provided a highly reliable service over the years.

CapRock formed a strategic partnership with Halliburton and will manage Halliburton's on-demand broadband VSATs, hubs and networks at more than 200 global locations. CapRock now has earth stations in more than 60 countries and on every continent except Australia.

Wagnon continues: "VSATs are fairly mobile and are ideal for drilling rig operations that move from location to location. For fixed antenna VSATs deployed on jack-ups, they can quickly re-point upon arrival and be operational within a few minutes. With a semi-sub, stabilized antennas are used and you have constant communications even under tow. This is a huge advantage over line-of-sight systems like microwave."

"Remote communications present two challenges for the service provider," comments Mark Slaughter, President of Stratos Broad-

MARKET INTELLIGENCE

(Continued From Page 12)

band. "These are: accommodating multiple users on a single, shared VSAT and gaining an understanding of the existing support facilities and resources in these far-reach areas in order to develop the appropriate solution. Furthermore, clients are requiring tighter turnarounds on solution design and implementation as they seek to lower drilling and producing costs. Lastly, they are looking for superior customer service and network reliability. And Stratos has successfully met these challenges for a variety of customers."

Stratos provides broadband and mobile communications services and solutions to the upstream energy industry (oil and gas operators, service companies) in remote and offshore producing regions around the world. For example, in Central Asia, voice, data, and IP-based communications at the wellsite are down-linked to their teleport facilities in the United Kingdom, and then backhauled to client headquarters in the United States or Europe via their terrestrial fibre network called Stratos Nexus.

Tapping the International Offshore Communications Marketplace In response to these growth trends, targeted events have been planned and endorsed by GVF during November for the Gulf of Mexico and West Africa, where the satellite industry will address leading executives from the offshore business. Against a backdrop of increasing fuel prices — and increasing offshore exploration activity — these events include the following:

- *Offshore Communications 2007*
www.offshorecoms.com
- *West Africa Satellite Communications Summit (WASCS3)*
martin.jarrold@gvf.org

John Puetz (john@mwc.cc) is President of MasterWorks Communications, a satellite focused business and technical consulting services firm and member of the Global VSAT Forum.



David Hartshorn is Secretary General of the GVF, the London-based non-profit international association of the satellite industry. GVF consists of more than 170 member organisations from every major region of the world and from every sector of the industry, including mobile and fixed satellite operators, manufacturers, system integrators, and other service providers. Supported by 15 affiliate offices, two regional offices and seven working groups, Mr. Hartshorn leads the Forum's global efforts to facilitate the provision of satellite-based communications solutions throughout all nations of the world.

Mr. Hartshorn has worked in the satellite communications industry for nearly 20 years, serving in business development, sales, publishing, and association offices based throughout the world.

FEATURES

HDTV: SATELLITE'S BEST FRIEND

by Chris Forrester

American HD viewers are lucky. They have terrestrially a fat, juicy amount of bandwidth able to deliver sparkling images to viewers. Much the same applies to the MPEG4 compressed signals being transmitted by DirecTV and EchoStar. There's also still a huge legacy of Cathode Ray Tube (CRT) television sets in North America, and a considerable number of either CRT or Digital Light

Processing (DLP-chips) driven rear-projection sets in millions of Dens and family rooms.

Europe is very different. We don't have 'Dens'. Our rooms are smaller, and back-projection TV, while about, has never been popular because of the very size of the cabinets. Indeed, we Europeans are fast throwing away our CRT TVs. The UK, with just 25.3m TVHHs, purchased an incredible 3m flat-panel TV sets in the year

to the end of August. Flat panel's now represent more than 90 per cent of all sets bought. Britain's major electrical retailers (Comet and Currys) have just announced they are phasing out all CRTs, even the 12-inch and 14-inch sets that would go into kids' rooms, in favour of flat panels.

It's the same story in Germany, Europe's most-populated country, where tumbling prices have made large-screen TVs all the more popular. LCD sales are up 57 per cent in the year to June 30, and where some 250,000 full strength (1080p/50Hz) sets are expected to be sold, even though there's a zero chance of any broadcaster transmitting in 1080 "progressive" for years to come.

All this is great news for HDTV fans, but as the industry has recognised for some time, flat-panel sets, whether Plasma or LCD, do not necessarily do the best for a broadcaster's expensively transmitted images. European viewers are suffering horrible artefacts and smearing on their flat-panels, fairly blamed on those broadcasters who are twisting the "compression" dial down just a little too far. It is something akin to the anecdotal stories about the volume control on a Marshall amplifier, beloved by musicians because of its ability to be turned up to "11" on the volume dial. In this case, it seems far too many European broadcasters are cranking the compression ratios down

so far (to below 4Mb/s for some Standard Def services) that viewers are suffering – and complaining loudly.

Which is where satellite has moved in nicely. Germany's two important public broadcasters (ARD, ZDF) have already increased their satellite bandwidth on SES Astra to better serve viewers with flat panel sets. More German broadcasters are said to be following this trend. This was confirmed by extra capacity being bought by movie channel Tele5 in September. Remember, these are only SD services, not HDTV.

Tele5's position summed up the general thrust towards image quality: Ludwig Bauer, MD at Tele5, explained, "The digital transmission of our channel becomes increasingly important for us as the share of digital satellite households is steadily growing.

Our ambition as a movie channel is to offer the 8.2m digital satellite households in Germany top cinema quality in their living rooms. With this additional capacity agreement with Astra, we can further strengthen our profile as a premium movie channel."

Last month we covered the strong position that Europe's two largest satellite operators, SES (and its SES Astra operation) and Eutelsat enjoy. Their prospects are good, helped by the growth in HDTV. But now this massive shift of consumers towards flat-panel sets means that even broadcasters transmitting in Standard Definition might need more capacity – and this is only the start of capacity expansion – especially if we take the longer-term view, and satellite operators designing and building their satellites for a 15-18 year life are bound to look at what's happening over the horizon.

Satellite's best-ever friend



SMPTE's Peter Symes, hard at work on 4000 lines

The recent giant IBC technology show in Amsterdam in September offered some strong clues as to what is happening

in today's television R&D laboratories. First up was Peter Symes, SMPTE's director/standards and engineering, who announced that

FEATURES

(Continued From Page 14)

SMPTE was had been formally asked by NHK, Japan's public broadcaster, to start creating a standard for Ultra-HD. Ultra-HD is undoubtedly satellite's best friend ever, and talks about 4000 lines of definition. "It is very much under way," says Symes. "You only have to look at NHK's track record," he added. "They are saying Ultra HD might be 20 years away. People thought they were just as crazy when they invented HD, in analogue, and first shown in the US at our SMPTE Conference in 1981, twenty-five years ago last year. One very well-known pundit at the time said

FEATURES

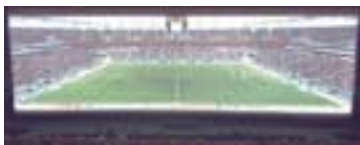
(Continued From Page 15)

'HD television will be delivered to the home at the same time as the anti-gravity machine'."

Symes says that everyone knows this is not something for the next three or four years, far from it. "But the overall concept of UH-TV is somewhat different from today's HD. Yes, it is much more detailed, potentially being wall-sized, showing different segments at the same time. Few can doubt the beautiful pictures, even on today's inadequate screens, where the technology is now lagging. NHK's track record is impressive, and it looks like they're doing it again."

And whatever developments are made in image compression over the next 10-15 years, it is also inevitable that Ultra-HD will need significant amounts of bandwidth per channel – and this is great news for satellite. Not that this is the only good news to emerge from SMPTE. HDTV – as we know it today – is far from done and dusted, says Symes: "One of the directions HD has to go is in the greater use of the medium in practical terms. When more people are viewing HD, then there will be increased benefits. HD, as far as the USA is concerned, has arrived. It is no longer something that will happen one day and we are beginning to see real take up in the home. Europe has a great opportunity, helped by our overall digital experience."

"And these options are not really open to the US or Australia," says Symes. "What we are also exploring at SMPTE how the two, now established transmission standards, 1080i and 720p, might move forward. For example, many engineers looked at 1080p (in 50Hz or 60Hz) as something of a 'super production' standard, which would easily convert to 1080i or 720p and be a good archiving format. Thoughts are now changing, asking whether it makes sense to move the standard from a production format to potentially much wider distribution. The EBU has done some excellent work in this area, which suggests 1080p could well be a transmission format as we move forward. Our session looked at the challenges and opportunities for this. We looked at whether there should be an interim step first, and generally just explore the choices."



Fraunhofer's Ultra-Wide images

There's more. German-based R&D technology specialists Fraunhofer HHI continues to work on its Ultra High Resolution Video Panorama, a breathtaking concept that is made up of 5 conventional 16:9 images knitted together into one mega-wide image. Currently using two specially adapted fixed cameras, the system has been used to capture the Germany vs. Poland World Cup soccer match and deliver the image to a 20m-wide cinema screen. Under development, says Ralf Schaefer, is an omni directional camera. The end result looks simply stunning – and soaks up a massive amount of bandwidth. It is of only lim-

ited interest to consumers having more appeal to cinema-based viewing, or bars, or museums. The cameras stay fixed and yet provide a wonderfully detailed image that's perfect for viewing events like a sports game, or a museum display of a live event.

A packed room at IBC heard Kohji Mitani, a senior engineer at NHK Japan's Science & Technical Research Labs, flesh out the likely timetable for Ultra HD, intended for viewing on 100"-200" screens, and wall-sized projection of its 33m pixels. He explained that further work is also needed on projection equipment, cameras, storage capacity as well as screens. Meanwhile, many experimental transmissions had been successfully undertaken, including NHK's important New Year's Eve live 4-hour transmission of the annual concert from NHK Hall in Tokyo to NHK's Osaka studios, some 500km apart and at 640Mb/s transmission rate. Japan's plan is to use the 21 – 22GHz satellite band and they have made experimental broadcasts this year.



NHK's pioneering work on 4000 line Ultra-HD

Phase 2 starts in 2009 and is likely to take 4 to 5 years to include actual satellite transmissions, as well as promote public viewing of the "immersive" elements of the overall concept as well as talking to museums, medical facilities and other potential users. But there are also concerns. The first problem is one of the human body: Anyone – like me – old enough to remember the 'Cinerama' technology in cinemas (1963, in my case. Three overlapping projectors delivered massive screens wrapped around the audience to 146 deg of arc. You might also remember some viewers were physically sick when the technology showcased an American roller-coaster ride, where you – the viewer – were "seated" in the front seat of the roller coaster. Evidently there can be similar responses to Ultra-HD, and part of the scheme allows for projection onto complete walls allowing for complete immersion in the image (and also supplies 22-channel surround sound to add to the realism).

NHK's "practical" Phase 3 is likely to start around 2012 – and with considerable interest in the London Olympics – and more aggressive transmission trials perhaps lasting a further 10 years, while at the same time allowing camera, lens, and especially displays, to catch up with their own development.

For most of us – and especially our children - Ultra-HD will not simply be a sexy new device, but a major re-think of the way we live. But 18-20 years from now it's more than likely that satellite will be providing the links, and hopefully the images, directly to our homes. ■

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.

FEATURED SATELLITE

GE-23 SATELLITE AT 172° E

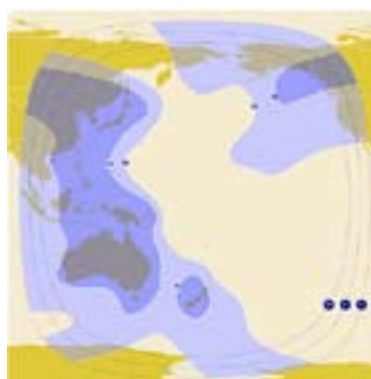
by Hartley Lesser

History Helper

Originally commissioned as AMC-23 by Americom, the GE-23 satellite is now managed by SAT-GE. This happens to be the only satellite operating company in the entire breadth of the General Electric group. GE-23 has offices located in Singapore, Sydney (Australia) and Bethesda, Maryland.

The Alcatel-designed and manufactured satellite was launched on December 28, 2005 from the Baikonur Cosmodrome (Kazakhstan) on a Proton/Breeze M launch vehicle for International Launch Services (ILS). After geostationary transfer orbit, all orbit testing was completed by March 2, 2006 and the then-AMC-23 was transitioned to its final orbit position at 172° E and entered into service.

Capabilities



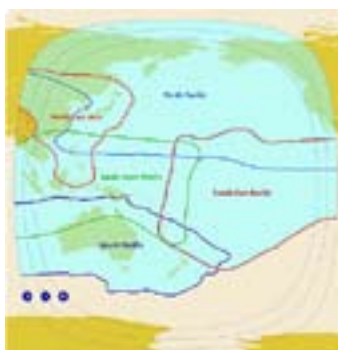
C-band Aggregate Coverage

Signals from California to Bangladesh can be received and delivered by the GE-23, from as far north as Alaska and as far south as Australia and New Zealand... and, of course, from all points in between. The life expectancy of the GE-23 is 15 years.

This high-powered, hybrid C/Ku-band satellite is comprised of 5 Ku- and 1 C-band beam.

The C-band offers conventional landmass coverage while the Ku-band brings into play innovative Ku-band oceanic coverage, making for a terrific, business-oriented combo, as the five separate beams ensure complete and overlapping coverage of all major shipping routes and flight paths over the Pacific Ocean.

The eighteen-transponder C-band payload, comprised of twelve 36 Mhz transponders and six 72 Mhz transponders with 80-watt channels, enable reception via sub-2M antennas. Broadcasters, cable programmers, Internet service providers, government agencies, educational institutions, carriers and private networks for connectivity to, and within, North America and the Pacific Rim, are prime users for this satellite's reach.



Ku-band Aggregate Coverage



The teleport gateways for GE-23 are located in...

- Honk Kong
- Yamaguchi, Japan
- U.S. West coast
- South Mountain, California
- Brewster, Washington
- Europe (via U.S. fiber connectivity)
- Leuk, Switzerland

GE-23 At A Glance

GE-23 Technical Characteristics	
Spacecraft Design	Alcatel Spacebus 4100
Orbital Location	172° East
Launch Date	December 29, 2005
Design Life	15 years
Polarization	Dual-Linear

GE-23 Payload Specifications	
C-Band Payload	12 x 36 MHz; 6 x 72 MHz
Amp Type	TWTA, 80 Watt
C-Band Frequencies	3,700 – 4,200 MHz downlink 5,925 – 6,425 MHz uplink
Coverage	Alaska, Australia, Asia-Pacific, Hawaii, New Zealand, Western North America
Receiver Redundancy	4 for 2
Transponder Redundancy	22 for 18
Ku-band Payload	20 Channels, switchable among 27, 36 & 72 MHz bandwidths
Amp Type	TWTA, 138 Watt
Ku-Band Frequencies	10,900 – 12,800 MHz downlink 14,000 – 14,500 MHz uplink
Coverage	Entire Pacific Ocean Region
Receiver Redundancy	1 spare unit per frequency group
Transponder Redundancy	26 for 20

For further information regarding GE-23 and SAT-GE, email info@sat-ge.com or visit their website at www.sat-ge.com

POINT OF VIEW

THE THREAT TO C-BAND SATELLITE SERVICES

by Matthew Botwin

Within the satellite industry, the frequency ranges 3.4 to 3.7 GHz and 3.7 to 4.2 GHz are often referred to as the C-band and extended C-band, respectively. The entire C-band is used for broadcasting television signals, Internet delivery, data communication, as well as voice telephony and aviation systems. The satellite systems that operate in the 3.4 to 4.2 GHz band are essential links of communication for millions of people, corporations and defense-related systems. Regrettably, these links are now also at great risk.

Links in the C-band are suffering substantial interference, to the point of system failure, in places where national administrations are allowing Broadband Wireless Access systems to share the same spectrum bands already being used to provide satellite services. Even worse, agenda item 1.4 at this year's World Radiocommunication Conference at the ITU (International Telecommunications Union) in Geneva, Switzerland, will decide whether to list 3.4 to 4.2 GHz as a candidate band for a new, global spectrum allocation for IMT (International Mobile Telecommunications such as 3G and 4G mobile) services.

To eliminate this harmful interference, operators of satellites, earth stations and users of satellite communications services have united to communicate their positions and technical requirements to national and international telecommunications regulators. Regulators and radio frequency managers need to allocate spectrum in ways that recognize the reality of harmful interference. They need to validate the right of current operators to run, and their customers to enjoy, their services, without disruption by new users.

C-band satellite and the BWA (Broadband Wireless Access) and IMT mobile services are important services. However, there are ways to find suitable spectrum for all to operate without impeding current C-band operations.

The Problem

Several national administrations have designated portions of the frequency band 3.4 to 4.2 GHz for terrestrial wireless applications, such as BWA and future mobile services ("IMT advanced", "systems beyond 3G", 4G...). This band is already in use by sat-

ellite services, radar systems, and domestic microwave links.

In places where administrations have allowed BWA services to use the C-band, there have been massive interruptions of satellite services. Satellite operations in Australia, Bolivia, Fiji, Hong Kong, Pakistan and Indonesia have already been negatively affected. Other national administrations can, and should, avoid repeating this costly mistake. Alternative approaches are available.

Importance of the C-band

Use of the C-band for satellite communications is widespread throughout the world. C-band is particularly vital for many developing countries, particularly in South and Central America, southern Asia, and equatorial Africa due to its resilience in the presence of heavy rainfall. C-band earth stations are also extensively used in many developed countries. C-band ("Standard C-band" and "Extended C-band"¹) frequencies have been assigned for satellite downlinks since the industry was inaugurated more than 40 years ago.

C-band beams cover large areas. They facilitate intercontinental and global communications and provide a wide range of services in developing countries. Services in this band now provide critical applications such as distance learning, telemedicine, universal access, disaster recovery and television transmission in many tropical regions.

Technical explanation

Antennas, which receive satellite downlink signals in the C-band, are by necessity extremely sensitive devices. They are designed to receive a low-power signal emitted by small transmitters located in orbit 36,000 kilometers above the equator. In the C-band, satellite services have co-existed with domestic microwave links and radars for many years, because the latter systems operate via tightly focused beams from fixed points, and de-confliction can take place when necessary.

By contrast, terrestrial wireless applications are by definition ubiquitous and increasingly mobile/nomadic. Mobile *and* base stations for terrestrial wireless applications emit signals from many locations, in all directions, simultaneously and are powerful enough to saturate the sensitive C-band satellite receiving systems. This causes potential for total loss of service in the C-band. Recent operating experience in Australia, Fiji and Indonesia, and field trials in Hong Kong have confirmed this interference. (In the Hong Kong experiments, television signals feeding 300,000,000 households throughout Asia were inadvertently knocked off the air!)

The sensitivity of C-band satellite receiving systems also means that they may be disrupted by mobile terrestrial use of frequencies in immediately adjacent bands. Field tests by the Office of the Telecommunications Authority in Hong Kong concluded the use of frequencies for terrestrial wireless services in the Extend-

1 The bands 3.4-3.7 GHz and 3.7-4.2 GHz are usually referred to as Extended C-Band and Standard C-Band, respectively.

POINT OF VIEW

(Continued From Page 18)

ed C and Standard C-bands was not practical.

A Particular Problem for Developing Countries

C-band services are especially important for developing countries. The supporting equipment is relatively inexpensive and the signals effortlessly cover large areas. Such services are well adapted to provide voice, data services and Internet connectivity in remote areas underserved by other communications methods. They are an essential component in the ITU's push to bridge the "digital divide" between the developed and developing world.

As they cover wide areas with minimal susceptibility to rain fade, they have proven to be exceptionally useful for disaster recovery in tropical areas – for example, C-band based services were vital in facilitating clean up and recovery after the 2004 Asian tsunami disaster.

Growing recognition of the problem

Band segmentation is not a solution. This has proven to be ineffective in real-world tests. Large-scale disruptions of services operating in non-overlapping frequency bands have taken place in several countries. As a result, governments, intergovernmental bodies, and the satellite industry have begun to recognize the threat posed by ill-considered assignment of standard C-band and extended C-band frequencies to terrestrial wireless services.

- Even in the case where BWA and satellite earth stations operate on different frequencies in the same portion of the C-band, geographic separation is necessary. The Hong Kong Telecommunications Authority Working Group conducted an extensive series of field tests, concluding that "BWA equipment within an area of several kilometers around existing licensed earth station operating in the same frequencies may cause interference to the latter... protection by separation distance is only meaningful for fixed access but not for mobile access... Based on the assessment in this paper, there are interference problems caused by the proposed allocation of BWA in the 3.4 to 3.6 GHz band to the reception of satellite signals by FSS (Fixed Satellite Services) systems in the 3.4 to 4.2 GHz band. For coexistence of the two services in the same territory, some technical constraints must be observed. The technical constraints would imply significant costs to be incurred by both BWA operators and FSS users and they may make it difficult for a wide and cost-effective deployment of BWA systems in a dense urban environment."
- In South America, the Bolivian Superintendencia de Comunicaciones (SITTEL) approved the usage of the 3.4 to 3.8 GHz band for telecommunication as the primary allocation for the WiFi industry. During the short testing period prior to the planned May 2006 rollout, satellite signals carrying televi-

POINT OF VIEW

(Continued From Page 19)

sion channels in Bolivia were severely interrupted and major interference was reported. Viewers were missing World Cup games. SITTEL issued an administrative resolution mandating that wireless access system deployments in the 3.7 to 3.8 GHz band be suspended throughout Bolivia for a period of 90 days in order for SITTEL to adopt measures to solve this issue. The resolution also instructs the spectrum-planning department of SITTEL to propose a new norm for channels in the 3.4-3.8 GHz band.

- The Asia-Pacific Telecommunity (APT – a regional intergovernmental organization), in a report from the APT Wireless Forum (AWF), has warned “... BWA systems within several kilometres of an FSS receive earth station operating in the same frequency band, but on a non-co-channel basis, would need to carefully conduct coordination on a case-by-case basis. Moreover, to avoid interference in non-overlapping frequency bands... a minimum separation distance of 2 km needs to be ensured with respect to all FSS receivers, even where BWA and FSS operate on different non-overlapping frequencies.”
- The APT has agreed on a provisional APT document asking that the ITU not include 3.4 to 4.2 GHz among the candidate bands for IMT services.
- In Europe, CEPT (Conference for European Postal Telecommunications) has prepared a new ECC Report — “Compatibility Studies In The Band 3400-3800 MHz Between Broadband Wireless Access (BWA) Systems And Other Services (Draft ECC Report 100)”. The studies have shown that to meet all relevant interference criteria, for a representative FSS earth station, the maximum distances required for BWA central stations are between 270 km and 320 km. These distances are referred to as “mitigation distances” in the report, to indicate that smaller distances may be achievable through coordination of each BWA central station. However, even with coordination, it is clear that the necessary separation distances are at least tens of kilometres and may be hundreds of kilometres. The feasibility of the use of mitigation techniques by BWA systems to reduce the separation distances has not been demonstrated.
- The Asia-Pacific Broadcasting Union (ABU -- a regional organization grouping government and non-government entities) has warned, “BWA is a promising technology. However, if implemented in the same frequency bands as the satellite downlinks, it will have an adverse impact... and may make satellite operation in the entire C-band impracticable. These bands are by far the most important frequency bands for satellite communication in Asia.”
- Sharing studies conducted by ITU-R Working Party 8F have shown that a minimum distance separation of approximately 35 to 75 kilometers must be maintained between an IMT transmitter (a 4G mobile system) and an FSS receiver. There is no practical way to maintain such large separations be-

tween these two systems. Moreover, given the large number of FSS receive stations currently receiving in the 3.4 to 4.2 GHz, it is highly unlikely that the requisite separation can be maintained with respect to all of these stations.

It is important to understand that satellite transmissions in the 3.4 to 4.2 GHz band are received by a large number of stations worldwide. Many of these stations are “receive only”, and are therefore not registered at the ITU (or generally even with the local administrations) because such registration is not required. With unregistered terminals, of course, their location is not listed either. This makes any potential coordination of these sites with IMT or BWA terminals a practical impossibility. Co-frequency operation of BWA systems would severely disrupt reception of satellite transmissions.

Alternatives to C-band

Fortunately, this is not an insoluble problem. Many other candidate bands have been identified during the course of ITU studies. The merits of these have been documented at length and the alternatives will be presented to the ITU WRC-07 in the form of the report from the WRC Conference Preparatory Meeting that convened in February 2007.

It is critical that governments and spectrum management authorities recognize the very real damage caused, and tremendous threat posed, to existing satellite services by use of the Standard C and Extended C-bands for terrestrial wireless systems.

Expanding International Dialogue

In advance of the upcoming WRC conference in Geneva in October 2007, all members of the international satellite community are encouraged to reach out to their governments and representatives at the ITU. The message is clear – a new allocation for IMT services in the C-band would be a mistake. It would cause debilitating interference to existing services and would cause significant interference to the new IMT services.

Matthew W. Botwin is Managing Director of the Regent Square Group, a telecom and government affairs consulting practice. In this capacity, he serves as a bridge between governments and telecom companies seeking greater market flexibility. He is expert in matters of spectrum policy, foreign market entry and raising capital for start-up telecom ventures.

Regent
Square
Group



Botwin also serves as Chairman of the Regulatory Working Group for the GVF, an industry association for the satellite industry. In this capacity, he manages the government affairs efforts for an entire global industry and seeks to protect the spectrum rights of the satellite community for purposes of national defence, telecommunications and broadcasting. He is also an advisor to the World Bank's Global Innovation Fund. He is based in New York.

BROADEN YOUR BROADBAND PERSPECTIVE—THINK AVIATION

by David Gross

With Inmarsat ready to rollout SwiftBroadband, and Iridium working on a competitive response, aviation has re-surfaced and requires critical attention by satellite datacom providers. Nearly a billion people fly each year across the world. No wonder the aviation market offers a dramatically larger opportunity than the maritime industry on which mobile satellite services have for so long relied.

Examine the VSAT market. Over the last two years, noticeably lower terminal prices have stimulated demand for satellite-delivered broadband in rural areas. A decline in LCD prices has stimulated the market for vehicular seat back entertainment systems. No such trend has yet hit the airborne satcom antenna market, where most devices still cost between \$50,000 and \$75,000.

The Port of Miami is the most prevalent embarkation port in the United States with approximately 1.8 million passengers served each year — that's about 2 percent of the total annual number of people who pass through the Hartsfield-Jackson airport in Atlanta.

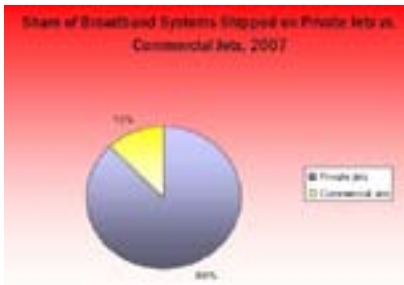
General aviation broadband growth is nearly 40 percent a year. In order for Inmarsat's Aero (Aeronautical services) revenue to rise to a level that would rival their maritime service revenue requires, well, such requires a true stretch of the imagination.

There are about seven times as many corporate jets and turbo-props in the world as there are container ships, not counting the number of piston-engine planes flying in and out of general aviation airports. True, container ships are far larger than private planes. Yet, many container ships carry 11 or fewer passengers, which is equal to the number of passengers usually found on a small jet, due to a requirement of having a doctor onboard if the passenger number reaches 12 or more.

A number of issues prevent the mass adoption of broadband-in-the-sky. Two concerns stand out — persistently high antenna prices and high utilization requirements on commercial jets.

FEATURES

(Continued From Page 21)



Several advancements in fuselage-mounted antennas have occurred over the past few years. However, this market is primarily one of incremental improvements, not the exponential price/performance gains seen in many of the mar-

kets that surround it. Fuselage-mounted high gain antennas, six feet long ten years ago, are now around three feet in size. Plus, the product life cycles of antennas can stretch for the better part of a decade. That includes the wait for Aeronautical Radio (ARINC) and Inmarsat certification.

While antennas have been inching forward in price, weight, and space improvements, cabin systems have leapt ahead, mostly on the back of price/performance gains seen in data communications electronics elsewhere in the technology sector. When Connexion first released 802.11b in 2001, WiFi cards were rare. Those that did exist cost \$200. They required \$300 routers to connect them into service.

Today, an 802.11g system with nearly 5x the capacity of the original can be purchased at BestBuy for less than 20 percent of the price of its early-decade equivalent. In addition to the advancements in WiFi, price/performance gains in 10/100 Ethernet ports, TCP Acceleration hardware, and wireless baseband semiconductors, have all helped push down the price of cabin systems.

As cabin systems deliver more bits per dollar and per kilogram, the antenna is increasingly the limiting hardware device. Cost and footprint requirements become more onerous for smaller, cheaper planes. This is one reason why high take-off weight aircraft are running well ahead of their lighter counterparts, in spite of the fact that the larger planes have no advantage when it comes to paying for expensive satellite bandwidth.

The short-term importance of high weight general aviation aircraft to this market cannot be overstated. Over the next 18 months, we expect business jets with maximum take-off weights of over 50,000 lbs. to account for approximately 60 percent of all private jet broadband installations, even though they account for only 15 percent of all corporate jet sales.

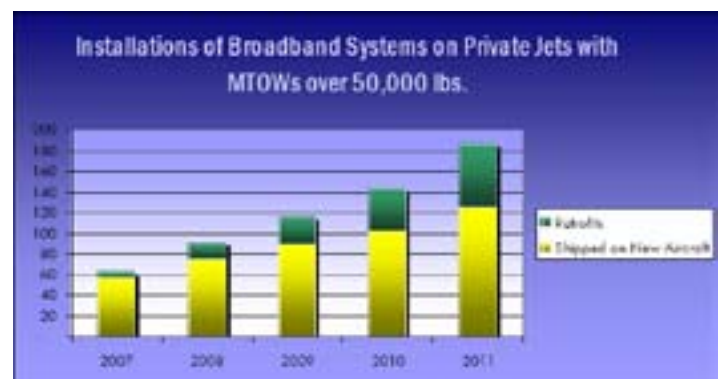
Much of the excitement about broadband capabilities on commercial airliners has been derived from company announcements and press releases. Those releases reveal little about how systems will pay for themselves.

Heavy, private jets deploy broadband because the economics work. The planes cost from \$25 to \$50 million each. The

price is even higher for Boeing and Airbus wide-body airliners. A \$200,000 - \$500,000 broadband system is more easily offset on a large jet due to the cost being a much smaller share of the overall purchase price than the total cost of a mid-size or small jet. The heavy jets also possess intercontinental range. This furthers the need for on-board productivity and entertainment systems. Such jets are all large enough to handle the newest Ku-band and L-band antenna technologies as well as the latest in cabin electronics.

Aircraft focus should include the Gulfstream G550, the Boeing Business Jet, the Airbus Corporate Jet, the Bombardier Global Express, and the fly-by-wire Dassault Falcon 7x. In addition to their advantages over lighter aircraft, private owners/corporations do not have the per flight utilization concerns of public airline owners—revenue generating passengers are not required to break-even on an aircraft broadband system.

The airline market for broadband is going to require another two years to develop. The first noticeable trend will be for retrofits on 737s and A320s owned by discount airlines. Since JetBlue introduced personal television (PTV) across its fleet in 2000, many discounters have leapt ahead of legacy carriers in terms of in-flight entertainment (IFE) capabilities. Today's low-price carriers, whether Virgin America, Southwest, or Ryanair, are sensitive to the customers' experience in order to gain repeat business. Established and international carriers offer frequent flyer programs as one of several return incentives. Bargain carriers have less generous incentives program. A "plus" revolves around the fact that low-price airlines fly only one or two aircraft models. Standardization of broadband installation and revenue equations for low-price airlines are far easier to adjudicate than for a flag carrier with six differing types of aircraft.



The aviation broadband industry is now poised to transform the commercial satellite data service from a narrower marine and gas focus to become a more inclusive service that will include millions of air passengers.



David Gross is Chief Analyst at Freesky Research LLC, a market analysis firm covering satellite data communications. Prior to founding Freesky Research, David worked at MCI, Cable & Wireless, and was an industry analyst at Communications Industry Researchers. He may be reached via email at dgross@freeskyresearch.com.

SATCOMS SAVE LIVES

by Danielle Edwards

In a disaster situation, a key factor in saving lives is good, clear communications. Interactions between emergency service teams, the police, armed forces, the government and hospitals is essential to coping with a crisis. With understandable communication the needs of victims and those in harm can be quickly identified. Plus, lines of responsibility and control can be organized to help avoid the doubling up of tasks and the incorrect investment of precious resources.

“The collapse of the World Trade Centre crippled many of the connections that downtown Manhattan depended on, threatening crucial links for the police and emergency crews. Cellular sites were knocked out. A switching office for local service was badly damaged by falling debris and burst water pipes. Fibre-optic transport equipment was crushed. Power failures cut off high-speed Internet service for many companies across the city.”

Simply put, the better the communications, the greater the chance that lives can be saved, property protected and further crisis averted. Clearer contact can increase the response times of emergency services and enables existing resources, such as helicopters and manpower, to be used more efficiently and effectively.

Sadly, in today's increasingly tumultuous world of extreme weather and terrorism, the communication process often breaks down. Landlines and mobile phone masts are fragile — they are frequently disrupted by the disaster itself. Floods, earthquakes, fires and terrorist activity can all quickly knock out and eliminate masts. Even should the mobile phone masts not be damaged, networks can become quickly overloaded. Many of us may recall that on the day of 9/11 and the London bombings, networks quickly collapsed and phones rarely worked. This hampered co-ordination efforts and added to the general atmosphere of panic.

I recently reviewed an old copy of the *New York Times* from the 20th of September, 2001. Journalist *Lisa Guernsey* detailed the communications problem shortly after the twin towers attack.

OCTOBER SPOTLIGHT

(Continued From Page 23)

In a crisis, many emergency services teams are able to call upon radio communications to support their critically needed work. However, these networks tend to be a restricted and are specialized to that particular emergency service group. This means other groups, often governmental or specialists, are excluded from the communication channels.

A lack of communication will often lead to poor disaster management. Emergency teams find themselves unaware of the location they need to be situated in, what tasks need to be prioritized, and what resources must be invested to mitigate the disaster.

Governments and emergency service groups are now looking at new ways to improve their communications. One route gaining more interest and support is that of satellite-based communications.

Previously, satcoms lacked the key and necessary features required by groups such as the fire service and the police. It just wasn't practical to expect men and women in the field to carry bulky, temperamental equipment which could only offer limited coverage and less than powerful battery life. Ultimately it was the high expense of the hardware, calls and support that proved to be the deterrent.

Thanks to rapid technological satcom improvements, this situation has changed. Now it is highly cost effective to invest in satcoms. Today's satcom devices are lighter, far more portable, offer far better battery life and are physically more robust. These are key elements if such equipment is to survive as a practical and hardworking tool within the rigours of a disaster zone.

Improved coverage, enlarged capacity of the networks and the ability to quickly create focused zones for high traffic areas have also assisted in improving satcom use in emergency situations. Many of today's mobile phones also have the capability to integrate with local mobile phone networks, offering even more practicality for its users. And, of course, satcoms don't rely on fragile terrestrial infrastructures.

Considering that defence experts are in agreement that the world faces more terrorist attacks, and the globe continues to face the threat of natural disasters, it is unsurprising that governments are now increasing their investment in crisis management and disaster handling. The challenge of saving more lives doesn't necessarily mean investing millions in the latest evacuation helicopter — the solution can be as simple as ensuring that whatever the crisis, those in charge can communicate with one another. Satcoms can play a key role and... save lives. ■



With over eight years experience in technology firms, Danielle Edwards has a rich and varied background. Her first technology appointment was in 1999 when she joined Internet Solutions in South Africa. She has held positions with Internet Solutions and moved from South Africa to the United Kingdom in 2005 to Join NSSL. Her assignments have included promoting the launch of Broadband Global Area Network (BGAN) to various clients, including the launch of the company's maritime-focused BGAN offerings. She also established NSSL and e-go Solutions as separate satellite communication providers within the same company. NSSL offers an international service in satellite communications and is one of the leading BGAN providers.

THE PROOF OF THE PUDDING IS IN THE EATING, OR, THE FACT OF THE SATCOM MATTER HAS ALREADY BEEN PROVEN

by Hartley Lesser

Ms. Edwards' knows of what she speaks... and the proof such is an effective method of dealing with communication emergencies is to take a look at one organization, one concern that has proven the case that satcoms are highly effective during emergency relief situations.

The worldwide organization that knows full well the efficacy of the role of satcoms during disasters is **Télécoms Sans Frontières (TSF) — Communications For Life.**

This Non-Governmental Organization (NGO) was formed in 1998 and now leads in emergency tele-

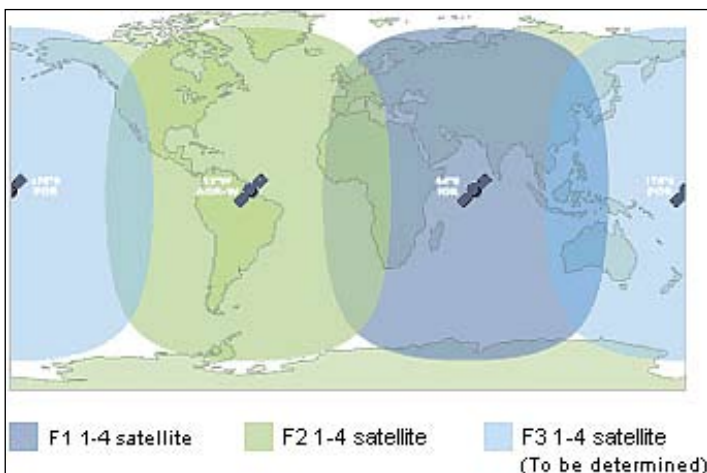


communication specialization. After many years of experience with general, humanitarian charities, TSF noted that more than the medicine and food aid was needed by disaster survivors. There was a critical need for reliable, emergency telecommunications services due to such infrastructure being destroyed or otherwise inaccessible.

The organization purchased their first satellite phone during the crisis in Kurdistan and in the Balkans. And ever since that time, the mission of TSF has been to provide a free, 3-minute call to any affected family using their satellite communications equipment. International response teams needed reliable telecommunications services in the first days after an emergency. The organization's operations were expanded, technology improved, and TSF formed rapidly deployable emergency telecoms centers. These centers served the United Nations, governments, UNICEF, OCHA, and other NGO humanitarian workers. In fact, the TSF now has the reputation of being among the first to arrive on a major disaster scene.

Today TSF provide most services within 48 hours of the emergency. Broadband Internet access, voice communications, fax lines and all of the IT equipment needed for a field office are deployed, using highly portable and light satellite terminals with worldwide coverage. They have teams on-call 24x7 in three regional bases located in France, Nicaragua and Thailand. TSF has assisted in 55 emergencies on all of the 5 continents since 1998.

As indicated in Ms. Edwards' article, the use of satphones in emergency situations for reliable communications can make all the difference, from ensuring emergency workers are applied to the most important tasks, to psychologically uplifting disaster victims through the simple use of a satphone to contact family to let them know they are safe. This is accomplished through the use of 4 geostationary satellites. Their spotbeams cover 98 percent of the Earth's total land surface.



Some of the satellite technology used by the TSF includes the following units...

Inmarsat BGAN: One of the latest innovations in satcom equipment, this device enables broadband Internet access to 10 computers as well as voice and fax services. The BGAN weighs less than 4 kg and is deployable within minutes of arriving on scene.



The organization also has several **Mini-M** devices (**Capsat Phone TT-3060A**). This unit offers digital phone facilities at 4800 bps as well as fax, data transfer and email at 2400 bps. Their advantage resides with their light weight and small size (52x270x200mm, 2.kg). A fully charged battery can operate for approximately 2 hours and 30 minutes.

For enabling broadband data to be transferred through an ISDN connection (64 to 128 kbps), TSF has the **GAN M4**. They use this device for large file transfers such as are required for animated or still imagery, video-conferencing and good- to high-quality audio recording. Plus, this unit also has an MPDS (Mobile



OCTOBER SPOTLIGHT

(Continued From Page 24)



Packet Data Service) connection for full-time Internet connectivity. There's also new **Regional BGAN** equipment for information transfer at an even higher rate than the M4, but at moderate cost — an element always of concern for NGOs and public service agencies during times of budgetary analysis and financing approvals as well as ensuring donation drive campaigns cover all required needs.

A picture can be worth a thousand words, and that's why TSF employs the mobile video-emergency system. Enabling live video transmission directly from an emergency site, real-time assessment of the situation in the field can be judged to crisis centers or headquarters for analysis. Communication between the TSF technicians and the video recipients can be conducted at any time. Requests for close-ups or landscape views can be accomplished in real-time. Additionally, those with the power to make judgment calls can immediately adapt their plans to meet specific needs as highlighted by such videos. And there's nothing like good video in times of fund raising and to garner support.

For more information regarding TSF, I heartily recommend you visit their informative website at www.tsfi.org. You can learn about their work in the varied locales where their communications expertise has been highly valued by officials and victims alike, from Ghana to the United States to Peru to Uruguay to Indonesia to Mozambique... satcoms can save lives and they can also aid with the smaller things in a disrupted life, such as a simple 3-minute call to family.

FEATURES

ON THE LIGHTWAVE... OPTICALLY SPEAKING

by Jörg Schmidt

New types of signals necessitate high signal fidelity, such as the digitally modulated HDTV (high definition television). Most of today's optical transmission systems already meet such requirements, even though HDTV broadcasting remains rather limited. Simultaneously, optical system use accommodates the trend toward enhanced security in large head end stations.

For some time, feeding antenna arrays have been set up redundantly. They are also installed with the greatest geographical distance to ensure high reliability. For example, if lightning damages an antenna array, the active transmission is completed via the backup array, which is located outside the area affected by the thunderstorm. In regard to the signal transmission, the distance of the antenna arrays means they transfer high quality RF signals and they must also be suitable for long distance transmissions.



Due to the inadequate transmission properties of coaxial cables over long distances, high signal fidelity can only be ensured through the use of optical transmission systems. Optical fibres provide additional reliability when compared to coaxial cables, due to an effective galvanic isolation between the antennas, the feeder location, and its infrastructures.

Lightwaves and Perspectives

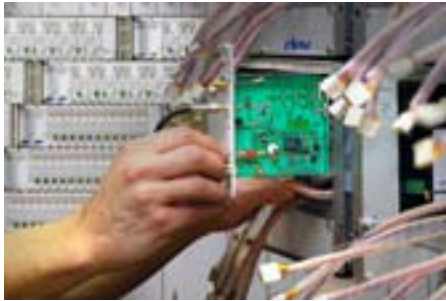
Optical signal transmission means the incoming antenna signal is modulated onto a laser, transported via a glass fibre cable, and then *converted* into the original signal at the head station. Currently, distances of up to 20 kilometers and more can be bridged – in the near future it should be feasible to bridge even greater distances.

For the use of optical transmission systems it is absolutely essential that the analog components of the system meet the demands of the coming TV generation and boast above-average specifications. Error correction algorithms are only, to a certain extent, capable of compensating amplitude distortions caused by analog transmission errors. Thus, when selecting a transmission system, it is also important to choose a system provider with experience and competence in analog signal processing and transmission.

The systems that are already available on the market (e.g. the DEV 7000) do not differ much in their optical performance, but rather by their added value. In this context, *added value* must mean: high configuration flexibility, a compact construction, compatible product families for signal transmission

and above-average operational reliability, as well as various alarm and control options, in case of errors.

Added Value



Using fewer module racks and wiring enhances the operational reliability of a system. In addition to enhanced reliability, this shift of complexity from the system to the device also reduces the mounting volume

and allows for greater signal fidelity. A compact and integrated system facilitates the mounting of additional components in order to create greater redundancy. For example, the integrated systems of DEV Systemtechnik offer six, instead of the common two 1+1 redundant routes in a casing of 3 RU (Rack Units). See the sidebar for more information on the DEV 7000 Series.

With regard to easy monitoring and control, it is recommended to use systems that integrate advanced management and monitoring functions for optical as well as RF-signals. Transmission system providers are thereby able to detect defects quickly, which are transmitted to them by detailed alarm messages via SNMP (Simple Network Management Protocol). That makes it possible to plan and carry out maintenance work and repairs in a more efficient manner, resulting in a significant increase of system availability, lower costs, and greater customer satisfaction.

From Operational Reliability to Investment Security

Investment security plays a decisive role in the implementation of new technologies. If systems are able to anticipate future technological developments, this also provides for the required investment security. Future formats and standards set the benchmark for the performance and future security of optical and electronic components.

It is absolutely essential to have a technology partner who can provide first class support to its customers as well as a genuine competitive advantage through continuous improvement of their own products – a partner where you can rest assured their products will meet any future technological challenges.



Jörg Schmidt is the owner and co-founder of the DEV Systemtechnik GmbH & Co. KG, specialist for the development and production of user-oriented devices and systems for the transmission of electrical and optical RF-signals.

Further information: www.dev-systemtechnik.de/optik/pr/

FEATURES

(Continued From Page 26)

ENDNOTES (ON THE LIGHTWAVE)

by Hartley Lesser

The author's company offers the DEV 7000 Series optical transmission equipment for professional use, as mentioned in his article. This series is highly suited for use at cable head end stations with distant dish farms, redundant distributed dish sites, extended L-Band transmission over distances up to 60 km, and satellite ground stations.



DEV 7103

The DEV 7000 features two different chassis, carrying up to 16 modules. There are optical transmitter modules with RF sensing, Manual Gain Control (MGC), as well as Automatic Gain Control. The output of incoming and outgoing RF signal can be monitored, as well as optical transmission in transmitter and receiver modules. Only 3 Rack Units (RU) are required for space. Redundancy switching can be integrated for transmission lines 1+1 and n+1.

The **DEV 7000** series is a modular system, which can be configured by the user for the individual application. Chassis and the different (extended) L-band optical transmitter and receiver modules, for short range or long distance, can be combined freely to match application requests. Optical redundancy systems with automatically switching capability in **1+1**- and in **n+1**-configurations are possible as well (see below).

The chassis **DEV 7103** and **DEV 7123** are the base of the system. They offer redundant and hot swappable power supplies as well as 12 slots on the front side and 4 slots at the rear side of the chassis for integrating the transmitter and receiver modules. On the rear side of the chassis, the RF connections are configurable either in 50 Ohm with SMA-connectors (DEV 7781) or in 75 Ohm with F-connectors (DEV 7783). The chassis DEV 7103 additionally carries a CPU module which is used for remote surveillance and if redundancy is required.

The optical transmitter modules **DEV 7211** (L-band) and **DEV 7212** (extended L-band) deliver bias current for driving an LNB via the input connector of the module. This can be switched on and off from the front side of the module, the web application and SNMP.

The electrical output of the optical receiver modules **DEV 7311** (L-band, 20 km), **DEV 7312** and **DEV 7313** (both extended L-band, 40 km and 60 km) are DC free and DC isolated.

1+1 Is Not Equal To 2... Redundantly Speaking

N+1 redundancy is different than 1+1 redundancy. **1+1** finds each critical component with a redundant backup component to ensure component-level continuity. **N+1** redundancy describes a system configuration wherein multiple components (N) possess at least one independent backup component. This ensures the continuation of system functionality even in the event of a system failure. A level of **N+1** requires overall system integrity should not be impacted by the failure of any one component. The system should also function at acceptable performance levels even if a component fails.

FEATURES

BATTLING ASIA'S SIGNAL PIRATES

by Peter I. Galace

Call it a thundering broadside against signal piracy in Asia from the powers on high. Leaders at this September's APEC (Asia Pacific Economic Council) meeting in Australia called on governments in the region to "effectively address" the issue of satellite and cable TV signal

theft. APEC noted that TV signal piracy does great harm to copyright owners, legitimate pay-TV operators and broadcasters.

The call to anti-piracy action was brought on by the stark reality that pay-TV piracy in Asia now exceeds \$1 billion and is on the rise. Signal theft is increasing at a rate of 11 percent a year in Asia, hindering the growth of the multi-channel pay industry. The APEC

statement followed a recommendation last year by the APEC Business Advisory Council that urged governments to revoke operating licenses of pay-TV operators who distribute content without authorization from copyright holders.

The smoke and flames from this blast against satellite and cable TV signal theft may look quite impressive, but whether the shells hit their mark is another thing altogether. And judging from recent piracy data from the Cable & Satellite Broadcasting Association of Asia (CASBAA), it's going to take a lot more than imperial bluster to finally break the back of signal piracy in Asia.

The Cost Of Piracy

CASBAA and Standard Chartered Bank (Hong Kong) Ltd, in their "Cost of Pay-TV Piracy study for the Asia Pacific region for 2006", estimated pay-TV piracy in the region rose to \$1.13 billion in 2006, up from \$1.06 billion in 2005. In fact, the cost of pay-TV piracy has risen the past four years. In 2006, the number of illegal subscriptions across Asia Pacific is estimated to have increased 20 percent to 5.2 million connections.

The report said pay-TV piracy would result in an estimated tax revenue loss of \$158 million to the region's governments in 2006. The report notes the piracy situation in India, Hong Kong and Vietnam continues to worsen. The number of illegal connections

across those regions jumped 20 percent — more markets are showing signs of serious revenue loss.

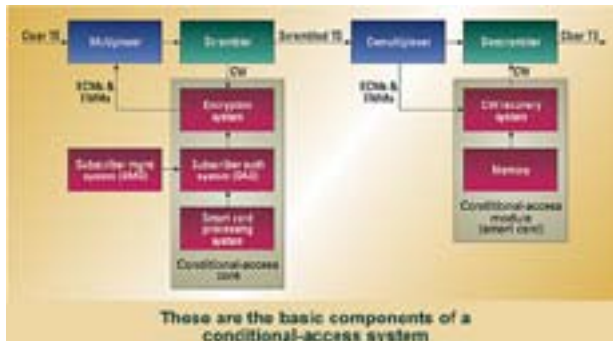
CASBAA is an industry-based advocacy group dedicated to the promotion of multi-channel TV via cable, satellite, broadband and wireless video networks across Asia-Pacific and represents 125 Asia-based corporations serving more than three billion people. The good news in this gloom is the rate of growth in the dollar value of pay-TV revenue leakage has slowed, albeit slightly.

CASBAA CEO Simon Twiston Davies said that as a result of this, “pay-TV piracy is possibly the number one issue facing the entire industry in the Asia Pacific.” He noted that CASBAA would continue to work with the industry, regulators and the community at large to improve the situation. In 2006, CASBAA lobbied Asian Pacific governments and continued legal actions against pirate operators and the commercial distribution of unauthorized signals in bars and clubs.

DTH: India's Piracy Solution

India's pay-TV revenue leakage, the largest in Asia Pacific, hit \$685 million in net losses in 2006. The grey market deficit in India, caused by under reporting by last mile cable operators, grew from \$632 million in 2005 to \$667 million in 2006.

The Indian television industry paints an even bleaker picture with estimated losses of almost \$3 billion in pay-TV revenues annually, again due to content leakage as well as piracy in content distribution chains. Under reporting of cable and satellite (C&S) subscribers is as high as 85 percent. This is a worsening problem as analog cable dominates Indian TV distribution. The only solution able to address this issue is content digitization, implemented through DTH Conditional Access Systems (CAS) or Internet Protocol television (IPTV).



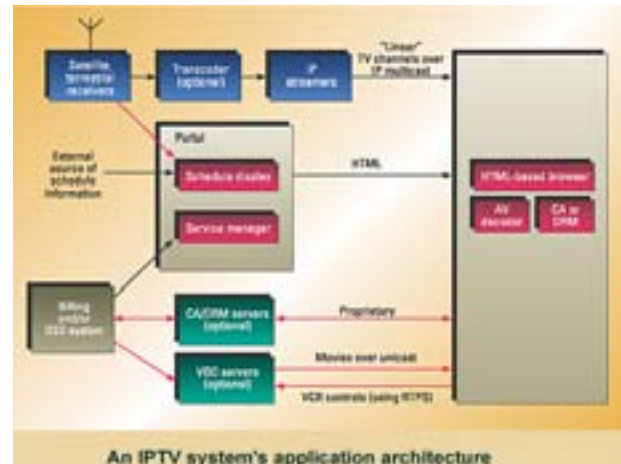
Diagrams courtesy of Broadcast Engineering magazine's online website at http://broadcastengineering.com/mag/broadcasting_facets_ipstv/

Signal piracy has consistently been identified as a major obstacle blocking the adoption of digital cable in India. Industry analysts attribute the rampant signals piracy to the fact that many Indian cable operators are unlicensed and that few cable systems use CAS to encrypt video signals. One source estimated that as much as 80 percent of cable and satellite TV viewers might not even be reported in the government's official figures.

The Indian government is now attempting to resolve this problem by considering the adoption of mandatory CAS for cable operators. Such a move, however, would force cable companies to install

FEATURES

(Continued From Page 28)



Diagrams courtesy of Broadcast Engineering magazine's online website at http://broadcastengineering.com/mag/broadcasting_facets_ipstv/

digital STBs in subscribers' homes — that would significantly increase subscription costs.

Thailand suffers from a rising cost of pay-TV piracy, running at \$160 million, and is the second largest dollar loss in the region. Thailand has some 1.27 million unauthorized connections.

The cost of pay-TV piracy in Hong Kong for 2006 was placed at \$32.4 million, a jump of 29 percent over 2005. CASBAA said the rising level of Hong Kong losses could be partly traced to increases in illegal set-top box use and to satellite overspill reception.

Other markets facing rising pay-TV piracy are Vietnam and the Philippines. Vietnam has the worst ratio of piracy in the region with one legal pay-TV subscriber to every 15 illegal connections, said CASBAA. There are only 90,000 authorized subscribers in Vietnam compared to 1.37 million illegal subscribers.

In the Philippines, the number of illegal pay-TV subscribers increased to 887,000. The estimated net piracy cost due to illegal distributors, largely in the provinces, rose by 24 percent in 2006. Indonesia is suffering from a revenue leakage of \$23.8 million as government and industry insiders indicate a substantive piracy growth.

Macau has the region's second highest piracy rate with 10 pirated connections for every one legal subscriber. In Singapore, however, the piracy issue appears to be under control. There, an actual reverse is registered with a 16 percent decline in pay-TV piracy costs.

Piracy losses in China are placed at some \$168 million in a market where cable TV reaches only 29 percent of homes and where DTH remains officially banned. China's multichannel subscription revenues are estimated to be around \$2.1 billion. China has said DTH launch services would be initiated before the Beijing Olympic Games in 2008, but a firm date has not yet been indicated. They have also announced the Games will be broadcast in HDTV. China, however, remains a closed

FEATURES

(Continued From Page 29)

market to foreign-owned satellites. The failure last year of the Chinese DTH satellite, Sinosat-2 (due to a power failure), is forcing Beijing to reconsider the satellite service offerings of foreign operators.

Raids Against Pirates

CASBAA continues to conduct highly publicized raids on cable companies carrying illegal signals in coordination with local law

enforcement agencies. The first of those raids was conducted in late 2005 on Mindanao Island and the metropolitan Manila area. With intelligence CASBAA gathered on the operators after several months of surveillance, police confiscated equipment in Cotabato City and Butuan in Mindanao, all being used for unauthorized pay-TV signal use and distribution.

CASBAA's unrelenting campaign against piracy comes at a time when TV applications such DTH, HDTV, Mobile TV and broadband Internet access is driving growth in the Asia-Pacific satellite market. Asia is expected to lead other markets in subscriber and revenue growth in satellite pay-TV. Western Europe and North America should continue to account for the largest market shares,

according to research firm In-Stat who projects total DTH pay-TV subscribers at over 117 million in 2010, while global DTH-TV revenues should top \$88 billion in the same year.

A similarly positive outlook for the worldwide satellite industry from international research firms matches the upbeat outlook for Asia's satellite industry. The Teal Group believes the commercial satellite industry is on the verge of growth cycle that might extend until well into the next decade. Teal said 2006 was a year of positive change, with 107 satellites launched, or a 32 percent increase over each of the previous two years. This represents the highest number of satellites launched since 2000.

Before 2006, the satellite market had been stagnant for five of the first six years of this decade, launching around 80 satellites per year.

Asia's huge expanse and diverse cultures will continue to present a huge challenge for any anti-piracy effort. The key to lasting success lies in homegrown anti-piracy campaigns coordinated with associations such as CASBAA.

CASBAA and their allies have no other recourse but to attempt to reduce piracy — no doing anything would be nothing less than criminal. ■

CALENDAR OF EVENTS

Visit: <http://www.satnews.com/calendar.shtml> for additional listings

Date	Event	Location	Contact	Web Address
October 1-4	NAB Satellite Uplink Operators Training Seminar	National Association of Broadcasters, Washington, DC	NAB Satellite Uplink Operators Training Seminar Tel: (202) 429-5346 Fax: (202) 775-4981 E-mail: ccolerid@nab.org	http://www.nab.org/AM/Template.cfm?Section=Satellite_Uplink_Operators_Training_Seminar
October 4-6	Sat Expo	Vicenza, Italy	+39 0444 543133	http://www.satexpo.it/en
October 9-11	Strategic Space and Defense 2007	Omaha, Nebraska	Tel: +1-800-691-4000 or +1-719-576-8000	http://www.stratspace.org/
October 9	ISCe Satellite Investment Symposium (ISIS) NYC '07	The Princeton Club, New York, NY	David Bross Tel: +1.301.916.2236 E-mail: dbross@hfusa.com	
October 10-11	SATCON: The Satellite and Content Delivery Conference & Expo	Jacob K. Javits Convention Center, New York, NY, USA	203-371-6322 Email: info@jdevvents.com	
October 29-31	MILCOM 2007: "Interoperability: Policy to Performance"	Orlando FL	AFCEA Exhibits Department c/o Spargo & Associates, Inc. 703-631-6200 / 800-564-4220 Email: milcom@jspargo.com	
October 30 - November 02	CASBAA Convention 2007 "It's all about Content"	HONG KONG	Kevin Jennings Tel : +852 2854 9916 Fax: +852 2854 9530 Email: kevin@casbaa.com	http://www.casbaaconvention.com/
October 30-31	Broadcast India 2007 Symposium	Y.B. Chavan Centre, Mumbai, INDIA	Kavita Meer Tel: 91 22 2215 1396/2215 2721 Fax: 91 22 2215 1269 Email: saicomtradefairs@vsnl.com	http://www.broadcastindiashow.com
November 5-7	Global MilSatCom 2007	Millennium Conference Centre, London, UK	Teri Arri Tel: +44(0) 20 7827 6162 Email: tarri@smi-online.co.uk	
November 11-16	EuCAP 2007 - The Second European Conference on Antennas and Propagation	Edinburgh, UNITED KINGDOM	Emily Woodman Tel: +44 (0)1438 765648 Fax: +44 (0)1438 765659 Email: eucap@ietevents.org	http://www.eucap2007.org
November 13-15	DoD Commercial Satellite Users Workshop	Renaissance Hotel, Washington, D.C.	David Bross Tel: +1.301.916.2236 E-mail: dbross@hfusa.com	http://www.sia.org
November 28-29	Aerospace & Defense Finance Conference	New York, NY, USA	Lydia Janow Tel.: 800-240-7645 Fax: 212-904-3334 E-mail: janow@aviationweek.com	http://www.aviationweek.com/conferences/
November 30	ISCe India SatCom Forum @ INFOCOM	HITEX Convention Center, Hyderabad, India	David Bross Tel: +1.301.916.2236 E-mail: dbross@hfusa.com	http://www.isce-india.com
December. 03-06	ITU Telecom Europe	Sofia, BULGARIA	Fernando Lagrana	http://www.itu.int/EUROPE2007/
Jan. 13-16	PTC 2008	Hilton Hawaiian Village Beach Resort & Spa, Honolulu, Hawaii, USA	Tel: +1.808.941.3789 Fax: +1.808.944.4874 Email: info@ptc.org	http://www.ptc.org/
February 5-7, 2008	WEST 2008	San Diego Convention Center, San Diego, California, USA	Tel: (703) 449-6418 E-mail: westregistration@jspargo.com	http://www.afcea.org/events/West/

RECENT NEWS

BACK OF THE BOOK

There is so much more to *Satnews* than what you read between the covers of *SatMagazine*. Our daily and weekly news is designed to give you a quick read of the important news stories for our industry, from new projects and events to business activities ranging from financial information to new products brought to the light of day.

Our news stories for the last two weeks are available at our website... access http://www.satnews.com/recent_stories.shtml or, if you are elsewhere on the SatNews website, simply selected the menu item **RECENT STORIES** and, well, there you are!

Some of the most interesting stories we've presented over the last four weeks include the following items... if you would like to read the entire story, you can click on the URL at the bottom of the story and then inwardly digest...

COMPANY ACTIVITIES

Swift Reception From Advent To Assist RTE

Ireland's National broadcaster, **RTE**, is purchasing two **Newsift** satellite antennas from Advent Communications. They will be added to the broadcaster's already-owned Newsift equipment to increase the size of the satellite communications fleet. These new antennas are to be mounted on new radio communications vehicles.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=530451707



Flying High With SatWi-Fi Is Alaska Airlines

Alaska Airlines has announced their plans to launch in-flight wireless Internet service next year based on the company **Row 44's** satellite-based broadband connectivity solution. The airline will test Row 44's system on a next-generation Boeing 737 aircraft in spring 2008 and, based on the trial's outcome, plans to equip its 114-aircraft fleet. The technology should provide customers with a unique entertainment and business network at 35,000 feet. Passengers with Wi-Fi-enabled devices, such as laptop computers, PDAs, smartphones and portable gaming systems, will have high-speed access to the Internet, e-mail, virtual private networks and stored in-flight entertainment content.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1023035192

Antennas Acquisition By NovAtel

Atel Inc. [NASDAQ: NGPS] has acquired privately held **Antcom Corporation**, a communication company specializing in the de-

sign, development and manufacturing of antenna and microwave products for commercial and military customers in the space, ground and avionics telecommunications markets. Under the terms of the agreement, NovAtel will acquire Antcom for US\$5.0 million in cash and an additional US\$1.0 million in cash, subject to Antcom's achievement of certain financial targets for the calendar year ended December 31, 2007.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=797848628



Boeing & COSMO Continue Partnership



The third **Constellation of Small Satellites for Mediterranean basin Observation (COSMO)-Skymed** commercial satellite (comsat) contract has been awarded to **The Boeing Company's** [NYSE: BA] commercial launch business for **Thales Alenia Space Italia**. They are the prime contractor of the **Italian Space Agency**. Boeing successfully launched the first COSMO-SkyMed satellite on June 7th from Vandenberg A.F.B. in California and is planning to place the constellation's second of four satellites into orbit later this year.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1958218078

Dish Could Dish Out Dish-Sized Portions

EchoStar Communications Corporation's [NASDAQ: DISH] Board of Directors has directed Management to pursue a possible separation of its businesses into two distinct, publicly traded companies. EchoStar recently submitted a request to the Internal Revenue Service for a ruling as to the tax-free nature of the transaction. Under the proposed plan, EchoStar's U.S. consumer pay-TV business would continue to operate as the DISH Network. Most of the company's other technology and infrastructure assets would be spun-off in a transaction intended to be tax-free to EchoStar and its shareholders.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=211769162

Galileo SatNav Funding Draws Cold EU Block Shoulders

You may recall reading about the funding troubles plaguing the European Union's (EU) **Galileo** satellite in previous issues of *SatNews*... processes for an implementation to pay for this positioning system space vehicle continue to have trouble. A week



after the EU proposed to pay for the satellite using the bloc's joint budget to come with the needed 2.4 billion euros. From unused farm subsidies, 1.7 billion euros would be dedicated from the 2007 budget and 500 million euros next year. The remainder of the money would be acquired from funds originally earmarked for

administering EU institutions that have been unspent.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=433166973 AND http://www.satnews.com/cgi-bin/display_story.cgi?number=1607258279

GeoEye Looks At Improved Imagery And Buys In



GeoEye owns and operates the IKONOS satellite and is nearing completion of the integration and testing of its next-generation commercial satellite, GeoEye-1. This space-based camera will provide imagery with a ground resolution of 0.41-meter panchromatic (black & white) and 1.65-meter multispectral (color). When operational, GeoEye-

1 will be the world's highest resolution and most accurate commercial imaging satellite. The launch of GeoEye-1 is slated for late first quarter or early second quarter 2008 from Vandenberg Air Force Base, California. The company has announced their MJ Harden subsidiary's (acquired by GeoEye in March of 2007) acceptance of Optech's Airborne Laser Terrain Mapper (ALTM) Gemini 167 LiDAR imaging unit.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=387885647

Globecom Gets Government Goodies

Globecom Systems Inc. [NASDAQ:GCOM] has been awarded two contracts from U.S. Government agencies for **Auto-Explorer** portable satellite terminals valued at \$4.0 million. For the first contract, Globecom will continue the development of its **X-band** family of portable satellite terminals. X-band is primarily used by military and space agencies for non-commercial satellite apps. The second contract is for multiple, 1.2-meter terminals that support Ku band operation.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=411994365

You Bet Your Assets, Globalstar

Globalstar, Inc. [NASDAQ:GSAT] has signed an agreement with **Radyne Corporation** business unit **AeroAstro** to purchase AeroAstro's **SENS (Sensor Enabled Notification System) Appliqués**.



The technology will be used to further expand Globalstar's Simplex data geographic coverage and grow its **Simplex** data customer capacity in Asia and Latin America. The SENS Appliqué, an AeroAstro proprietary digital signal processing infrastructure component installed at key Globalstar ground stations, receives and decodes asset tracking, location and data monitoring information from remote Simplex integrated modems solutions via the Globalstar satellite network. The received information can

RECENT NEWS

(Continued From Page 32)

then be processed and distributed to users via the Internet.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1846584548

Hughes Gets Into Enea's Middleware + Hughes Shipping Frenzy

Enea [NordicExchange/Small Cap/ENEA] entered into an agreement during Q1 of this year whereby **Hughes Network Systems, LLC** [Hughes] is using the **Enea Element** middleware and professional services in the development of a new wireless base station and other infrastructure for Hughes' satellite base station subsystem. This new base station will provide both voice and packet data services.



Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1911493298

A Hughes Shipping Frenzy

Hughes Network Systems, LLC [HUGHES] has now shipped more than 300,000 broadband satellite terminals compliant with the **DVB-S2/IPoS** air interface standard, including the **Adaptive Coding Modulation (ACM)** feature that was introduced in mid 2006. In addition to **HughesNet** service operations in North America, Brazil, Europe and India, over 30 service providers around the world are operating Hughes system NOCs (network operations centers) that are compliant with DVB-S2/IPoS including ACM to provide broadband satellite services to their customers.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=657532250

When You Call For A Medic, Iridium Will Be There

Iridium Satellite has announced that four, major, North American air ambulance and medical transportation fleets have switched to Iridium for mobile satellite communication services. "Over the last two years, Iridium has surged to become the number one supplier of mobile satellite services for medical transportation aircraft," said *Greg Ewert*, executive vice president of Iridium Satellite.



Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1187410925

Motoring The Satellite HD Highway With KVH & Fleetwood

KVH Industries, Inc. [NASDAQ: KVHI] has **Fleetwood Enterprises, Inc.**, one of the largest RV manufacturers in the United States, extending their exclusive use of KVH's **TracVision** mobile satellite TV systems by offering the all-new 12-inch **TracVision SlimLine**

RECENT NEWS

(Continued From Page 33)

series of products on a selection of its 2008 motor homes. These systems offer RV owners the highest signal gain and reception with DIRECTV's standard and high-definition programming plus automatic satellite switching via the remote control.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=661223063

GOES To Lockheed Martin



In December of 2014, the first launch of the **Geostationary Operational Environmental Satellites (GOES-R) Series** is expected to occur. One of the critical components aboard will be the **Solar Ultraviolet Imager (SUVI)** and **Lockheed Martin** [NYSE: LMT]

has been awarded a \$178 million contract by **NASA** to design and build this component. This is a series of instruments that will provide important solar activity information as well as how the sun affects the Earth and near-Earth space environs.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=2058835353

Award Winning Ways At MicroSat Systems



Receiving a prestigious award is always a boost for any company and cause for celebration. **MicroSat Systems, Inc.** [MSI] knows full well how such can be a joyful experience — *Aviation Week* has awarded

the **Small Company Breakthrough Award** for MicroSat's **TacSat-2** satellite the company. With its successful launch on December 16, 2006, TacSat-2 became the inaugural MSI spacecraft bus to be launched, the first responsive space demonstrator operated by the U.S. military, and the initial demonstration of a deployable thin-film solar array in space.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1057678724

EXECUTIVE TRANSITIONS

Moving On Up... At COM DEV Int'l

COM DEV International Ltd. [TSX: CDV] has announced **Terry Reidel** has been appointed to its Board of Directors, as well as the Board's Audit Committee and Human Resources and Compensation Committee. Mr. Reidel is a Fellow Chartered Accountant who had a 39-year career at Ernst & Young.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=2013033183

Moving On Up... At Integral

There's a new Chief Financial Officer at **Integral Systems** [NASDAQ:ISYS]. He is **William H. Bambarger, Jr.**, is the new CFO and he replaces **William R. Lewis** who resigned from his position as the interim CFO.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=462449313

Moving On Up... At Skyport Global

SkyPort Global Communications has named two veteran satellite industry executives to key positions on its business development team. **Michael Polmar** has been named Vice President of Sales, with overall responsibility for the business development efforts of the systems integration and satellite communications company. **Peter P. Semenach** has been hired as Director of Product Management of the company.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=2115980639

NEW PRODUCTS

Load Launch Nears For Arianespace

The **Ariane 5 GS** launcher for Arianespace's fourth flight of 2007 completed its build-up on Thursday, the 20th of September, with the installation of **Intelsat 11** as its upper payload. During activity inside the Final Assembly Building at Europe's Spaceport, the upper payload "stack" was placed atop its Ariane 5. This positioned the Intelsat 11 satellite, as well as its protective payload fairing and the Sylva 5 dispenser system, over the **Optus D2** spacecraft, which was installed earlier on Ariane 5's central core stage.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=106199517



China Constructing 4th Launch Site

From the *China View* online news service, a published report indicates China is planning to build a new space launch center. According to official sources contacted by the news bureau, the construction will occur in Wenchang, which is located in China's Hainan Province. The site will be primarily used for satellite and space station launches.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1863550847

DAWN Is On Its Way

NASA's Dawn spacecraft initiated its 3 billion kilometer (1.7 billion mile) journey through the inner solar system on Thursday, September 27, at 7:34 a.m. Eastern Time (4:34 a.m. Pacific Time). The mission is to study a pair of asteroids. The **Delta 2** rocket, fitted with nine strap-on solid-fuel boosters, safely climbed away from the Florida coastline and launch complex



17B at the Cape Canaveral Air Force Station. "We have our time machine up and flying," said Dawn Principal Investigator *Christopher Russell* of the University of California, Los Angeles.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1462340123

Asset Acumen Via GE



GE Equipment Services has introduced **VeriWise RAIL** and **VeriWise INTERMODAL**. These are remote asset management solutions that provide customers with on-demand visibility into the status of their fleet and the cargo it carries. GE's VeriWise technology, already in service on more than 150,000 transportation assets in North America and Europe, can provide decision support data directly to cargo shippers and carriers, helping them enhance safety and security, improve shipment delivery cycles and increase productivity.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=90734234

GigSat Coaxes Turtle Into Its Shell

GigSat has launched a new range of fully integrated solid state BUC's (Block Up Conductor) to complement its **FA-120** and **FA-100** flyaway systems. The "**Turtle Power Modules**", so named due to their unique mechanical construction with a molded carbon fibre shell, are available in X-band, Ku-band, Ka-band and even dual band (i.e. Ku/X or Ku/Ka in one housing). Linear output power options up to 40W and direct "no cable" interfacing to the antenna feed provides ultra high efficiency, making the integrated system package ideal for rapid deployment of broadband data connectivity.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=2028931363

GMV Presents Payload Package

GMV, a privately-held satellite ground segment software company, has launched **SmartRings 2.0**. This is the company's latest version of its telecommunications satellite payload reconfiguration tool, **SmartRings**, which offers reconfiguration management of telecommunication satellite payloads. Engineers can use it during the payload reconfiguration process for changes in the transmission plan, or in response to component failures and service interruptions.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1157283945

SatPhone Usage Cost To Be Affected By ISRO Future Device

A top Indian space agency official has told *The Economic Times* (*Indiatimes*) the **Indian Space Research Organization (ISRO)** is preparing a device that could reduce the cost of satellite phone usage. The design of the GSAT-6 experimental satellite is now being finalized. A portion of its payload will be this device that will make access far less costly, even in remote areas.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=388937950

RECENT NEWS

(Continued From Page 34)

Loral Brings Telesat Canada Into The Fold... Officially!

We all knew it was going to occur, but now all is official! **Industry Canada** has approved the acquisition of **Telesat Canada** by **Loral** [NASDAQ:LORL] and their Canadian partner, the Public Sector Pension Investment Board (PSP Investments). On December 16th, 2006, the joint venture company formed by Loral and PSP Investments entered into a definitive agreement with BCE Inc. [TSX/NYSE:BCE] to acquire 100 percent of Telesat Canada's stock from BCE for CAD 3.25 billion.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1556741362

Patents Protect & Produce Pride For MSV

Pride in product and technology is heightened when such are acknowledged by patent authorities, a real "pat on the back" and recognition of competency. Now awarded with two Canadian Patents and two Australian Patents is **Mobile Satellite Ventures**, majority owned and controlled by **SkyTerra Communications, Inc.** [OTCBB:SKYT].

These patents protect essential aspects of the company's mobile satellite services (MSS) and ancillary terrestrial component (ATC) technology.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=239576164



Survey Industry Survey Products NavCom Pak

NavCom Technology, Inc., a wholly owned subsidiary of **Deere & Company** [NYSE:DE], has released its first bundled land survey solution. This is their **LAND-PAK All-in-One RTK Land Survey Solution**. By pairing NavCom



products with complementary technologies and solutions, the LAND-PAK is a complete NavCom-qualified end-user package designed to meet the needs of land survey, from field data collection to office processing. The LAND-PAK delivers precise results by combining NavCom's dual frequency receiver with radio modems, a rugged data collector and processing software.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=994638200

Winds Will Blow But None Shall Bother Oerlikon's Exacting Work

Oerlikon Space has delivered the **MIE spectrometer (MSP)** for the European wind observation satellite **ADM-Aeolus**. Together with a second Oerlikon Space spectrometer, the MSP is the core element in the payload of the wind observation



satellite, which the **European Space Agency ESA** plans to launch in **2009**. The second instrument, the **Rayleigh spectrometer**, was already delivered in January 2007. Oerlikon Space devoted four years to the development and construction of the spectrometer.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1681551556

Universal Space Network Giving Boost Where It Counts — On The Ground

The satellite ground station network in Hawaii and Australia are receiving a huge boost — in number. **Universal Space Network, Inc. (USN)** is adding capacity due to demand and record backlog, plus client requests for additional, low-latitude services. Each of the new full-motion antennas are going to provide new X-band uplink services for USN customers.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=436640022

No Sinking Feeling in India, Thanks To Terminal Technology

From the *Hindu Business Line* online news service, we learn that **VXL Technologies** is now set to manufacture terminals to be in-

RECENT NEWS

(Continued From Page 35)

stalled on fishing boats along the Indian coastline. The order for the terminals comes from the **Space Application Center (SAC)** in India after successful water trials. The first 100 terminals are expected next month and they'll be delivered to the **Indian Space Research Organisation (ISRO)** and SAC.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=596942231

Rock The Boat and Wavecom's Technology Will Tell Sunlink All About It

Wavecom S.A.'s wireless technology, complete with C-GPS companion chips, has been designed into the **KENJI KJ 8800** watercraft tracking terminal. Perhaps you don't think of mobile assets as benefiting from such devices for theft protection... but realize, any mobile asset has a higher-than-average risk of being ripped off. Sunlink's KENJI KJ-8800 tracking terminal has integrated the **Wavecom Q2686 Wireless CPU** with C-GPS companion software protocol stack and GPS chips for a complete GSM/GPRS/GPS solution.

Story link: http://www.satnews.com/cgi-bin/display_story.cgi?number=1654884911

ADVERTISERS' INDEX

21 Advantech AMT
<http://www.advantechamt.com/>

18 COMTECH EF DATA
<http://www.comtechefdata.com>

09 CPI SATCOM
<http://www.cpii.com/division.cfm/4>

23 GLOBAL LINK
<http://www.globalinktv.com/>

30 Hannover Fairs
<http://www.isis-nyc.com/>

11 L-3 Narda Satellite Networks
<http://www.l-3com.com/snd/>

12 MITEQ
<http://www.miteq.com/>

28 NewSat
<http://www.newsat.com/>

15 NEWTEC
<http://www.newtec.eu/>

14 RADYNE
<http://www.radn.com/>

08 SES AMERICOM
<http://www.ses-americom.com/>

26 WALTON DE-ICE
<http://www.de-ice.com>

COVER/05 WAVESTREAM
<http://wavestream.com/>