

**Worldwide Satellite Magazine**

**November 2011**

# ***SatMagazine***



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# SatMagazine

## Vol. 4, No. 8 — November 2011

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## Long-Term Data Archiving

Earth observation activities from meteorology and geology to gas concentrations, vegetation and forest fires, have considerably increased in the past decade. These activities provide scientists and engineers with a great deal of insight and information. However, this increase in data gathering is resulting in an information overload; there is a lot of data to understand and no universal way to understand and preserve it.

GMV, in coordination with the European Space Agency (ESA), pioneered the Long Term Data Archive Study on new Technologies (LAST) study. The study created solutions for evaluating currently outdated and unreliable archiving systems.

The study involved analyzing the current data-archiving technology available. GMV looked at various archiving-system designs and worked with Long Term Data Preservation (LTDP), a leading, worldwide data archiving firm, to create a systematic evaluation system. Using the classification system, GMV developed methodology and assessment models to evaluate the existing technologies objectively and thoroughly.

The study resulted in improved assessment of current systems,

allowing manufacturers to better understand these systems and make more informed decisions when comparing future systems.

This leads to more efficiency and cost savings. In addition, archiving firms now have a methodology for making decisions and creating a standard list of attributes to assess related policies defined by LTDP.

The assessment models developed through the study can be shared publicly, openly debated, and tweaked over time to change and improve with technology. In addition, the models can be used by different benchmark archiving firms developing their own conclusions on the technologies being used. Lastly, new metrics have been put forward for tracking a system's technological progress in comparison with others on the market.

"Preservation of all compiled data is crucial to be able to analyze the cause-effect relationships, evolving developments and more happening through earth observation activities," said Jorge Potti, general manager of GMV Aerospace. "The analysis of this data will give much more information that will be useful in terms of forecasting future situations and recognizing patterns."

For further information, please [access the GMV Company website](#).

## South Africa's Satellites Focus

South Africa is planning to build its third satellite, to form part of a new African satellite constellation, as part of a government drive to grow the country's share of the global market for small- to medium-sized space systems.

"Our intention is to expand our investment in 'micro' satellites, building on the existing SumbandilaSat platform," Science and Technology Minister Naledi Pandor told delegates at the 62nd International Astronautical Congress, the prestigious annual congress of the International Astronautical Federation (IAF), in Cape Town.

The country's second satellite, the two-year-old *SumbandilaSat*, has been out of commission since a blast of solar radiation damaged its on-board computer in July.

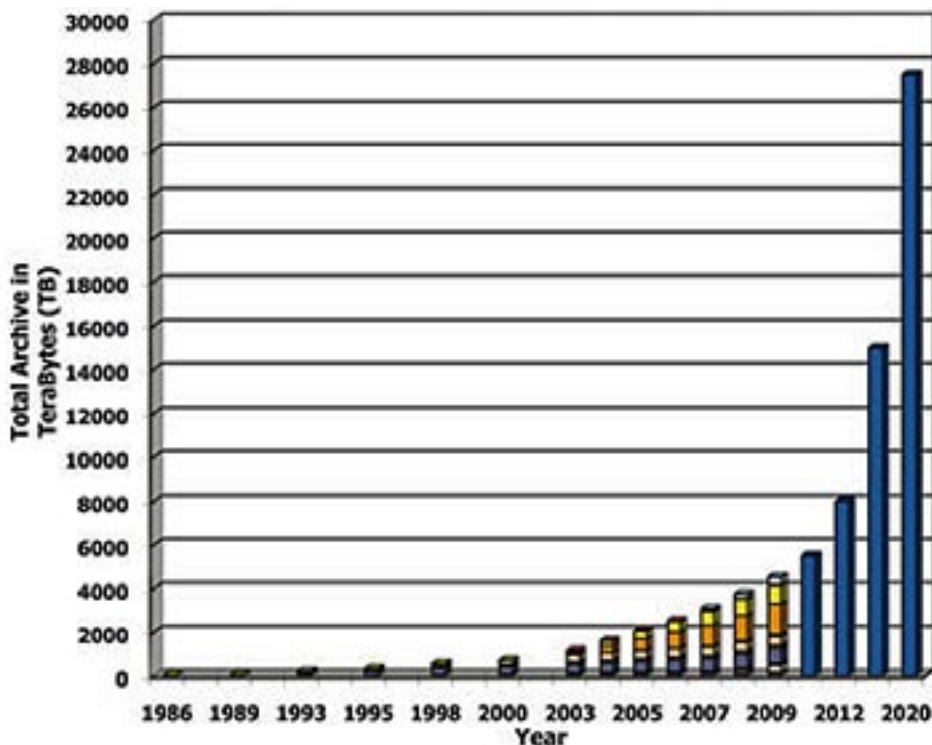
Sandile Malinga, chief executive of the SA National Space Agency (Sansa), announced in September that South Africa hoped to start building a new, fully operational satellite — not just a prototype or "pathfinder" satellite such as *SumbandilaSat* — as early as 2012, for possible launch by 2014/15.

The new satellite would cost in the region of R400-million — compared to the R26-million spent on *SumbandilaSat* — and would also be used for Earth observation, in line with the country's space strategy, which seeks to apply satellite data to help to improve livelihoods, reduce poverty and manage natural disasters in the country and the region.

Ideally, the new satellite will be one of at least four satellites, which together would form the *African Resource Management (ARM) Constellation* of satellites that was formally agreed on between South Africa, Nigeria, Algeria and Kenya in 2009.

"The basic idea behind the ARM concept is that a number of African countries each contribute one satellite to the constellation, but can access data from all the other satellites as well," Pandor said in Cape Town this week, adding that ARM was "open to other interested African countries to join on the basis of their needs and capabilities."

Nigeria and Algeria each have two satellites already operating, *Business Day* noted, as does Egypt, while Angola has one, leaving South Africa somewhat lagging behind in Africa's "space race".



This graph shows the archiving trends over recent years and the expectations of the future. (Courtesy: ESA)



if seasons showed any unusual behaviour such as being too warm or cold. With 30 years of Meteosat data, climatologists can start to construct climate normals from satellite data only.

"Three decades is just enough to start looking at decadal variations," Schulz explained, adding, however, that "there is no guarantee of detecting climate trends." EUMETSAT carefully analyses, reprocesses and validates the satellite data, which are then used by *National Meteorological Services*, the *European Centre for Medium-Range Weather Forecasts (ECMWF)*, and research institutions for several climate applications. The longer Meteosat is in orbit, the better their analysis of the climate system will be.

U.S. **Geostationary Operational Environmental Satellite (GOES)** and polar-orbiting satellites with the *Advanced Very High Resolution Radiometer (AVHRR)*, *(Advanced) TIROS Operational Vertical Sounder ((A) TOVS)* and the *Solar Backscatter UltraViolet (SBUV)* instruments have also provided climate data since the late 1970s. The analysis of these long series of satellite data is a challenge for all satellite operators because of instrument changes and failures, as well as changing calibration algorithms and sampling strategies, and the data are not, per se, consistent over the three decades. However, the gain in scientific understanding of the Earth's climate system is worth the investment into a reanalysis of the satellite data, according to Schulz.



Artistic rendition of the now-defunct SumbandilaSat

"But unlike the others, we build our own satellites," *Business Day* quoted *Malinga* as saying.

SumbandilaSat was built by Stellenbosch-based company **Sun Space and Information Systems (SunSpace)**. Its predecessor, **Sunsat**, launched in 1999, was designed and built by **Stellenbosch University** staff and postgraduate students, leading to the formation of SunSpace, in which the state is seeking to acquire a majority shareholding.

"SunSpace has secured orders from international clients for satellites and subsystems, and has also demonstrated that it can train engineers in other emerging space nations," *Pandor* told delegates at the IAF's congress. "In the field of satellite development, South Africa possesses some space facilities that are unique in Africa. These include a satellite assembly, test and integration facility, situated not far from here in Grabouw, and a launch facility situated at Arniston [also in the Western Cape]."

Further development in this field, *Pandor* said, would be accompanied by the development of applications for the provision of geospatial, telecommunications, timing and positioning products and services in the country.

"Here we are working to develop our capabilities in Earth observation, communication and position, timing, and navigation," which would play a big role in understanding the causes and effects and climate change, among other

applications. "We are particularly interested in South Africa in tele-medicine and tele-education, and we have only just begun to tap the possibilities," *Pandor* said.

While SumbandilaSat is now out of action, it had succeeded as a satellite technology demonstrator program, *Malinga* said. The satellite was designed and built from scratch in one year, at low cost, by South African engineers, who also developed a world-class mission control system for the program.

SumbandilaSat delivered more than 1,000 usable, cloud-free images before being damaged by solar radiation, and became well-known by the worldwide amateur radio satellite society for the excellent results from its amateur radio payload.

"The success of the program as assessed by the international space science community has placed South Africa on the map for its ability to develop and operate small- and medium-sized satellite programs," *Malinga* said in a statement last month. "Many of the nine black satellite engineers trained as a result of the program are still active in the satellite industry and are performing excellently."

*Malinga* said that **Sansa** was also exploring whether or not South Africa should try to establish its own satellite launch capability.

At least one South African company has an interest in this. **Marcom Aeronautics & Space** recently announced that it was developing a rocket engine as part of its development of a two-stage, liquid-fueled launch vehicle capable

of delivering a 1,000kg payload into low-Earth orbit.

The South African *Sunday Times* reported last year that the government was considering reopening apartheid-era space rocket launch sites in order to fast-track the country's national space program.

Last month, *defenceWeb* reported that South Africa "has existing infrastructure that could be utilised for local satellite launches, notably facilities at **Air Force Base Overberg**."

Marcom head *Mark Comminos* told *defenceWeb* that, although Overberg's launch pad was destroyed as part of South Africa's nuclear stand-down and the payload processing facility was mothballed, the site had retained almost all of its space launch capability, including mission control centre, radar and telemetry tracking facilities and range safety systems.

"According to the *U.K. Space Strategy*, the overall world market for the space industry is likely to grow from £160-billion in 2008, to at least £400-billion by 2030, with a yearly growth rate of 5 percent," *defenceWeb* wrote.

"In September 2010, *Space News* reported that the global satellite market stands at between 20 and 30 satellite launches a year.

"An estimated 20 new satellites with coverage on Africa will be launched in the next five years to address the current capacity shortage on the continent."

(Source: *SAinfo reporter*)

## Kelp Captures By Satellite

**Marine scientists have a new view of the giant kelp in the Pacific Ocean — through a scuba mask and a satellite's "eye."**

Forests of giant kelp, or *Macrocystis pyrifera*, are found in temperate coastal regions and are among the most productive ecosystems on Earth.

In a melding of data from the beneath the waves and from the skies above, researchers have developed a method for studying how environmental factors affect the kelp forests.

The results have allowed scientists to look at changes in giant kelp across hundreds of square miles in California's *Santa Barbara Channel* over 25 years, from 1984 through 2009. The findings are published in the journal *Marine Ecology Progress Series*.







Underwater view of the giant kelp canopy in the Santa Barbara Channel. Credit: *Stuart Halewood*

Obtaining a quarter-century of imagery from the same satellite, in this case the **Landsat 5 Thematic Mapper**, is unprecedented, said **David Siegel** of the **University of California at Santa Barbara (UCSB)**, one of the paper's co-authors.

"A satellite mission that goes on for more than 10 years is rare," says

**Siegel**. "One that continues for more than 25 years is a miracle."

Until recently, the high cost of Landsat images limited their use in research. Then, in 2009, the Landsat image library was made available at no charge.

"In the past, it wasn't feasible to develop long time series

using Landsat images," said **Kyle Cavanaugh** of UCSB, the paper's lead author. "Once these data were released free of charge, however, we could access hundreds of pictures that show an area over time."

Images from the Landsat 5 satellite provided the researchers with a view of how giant kelp forests change over time across a broad geographic region.

"Giant kelp forms a dense floating canopy at the sea surface that's distinctive when viewed from above," write the scientists in their paper. "Water absorbs almost all incoming near-infrared energy, so the kelp canopy is easily differentiated using its near-infrared reflectance signal."

In southern California, giant kelp is found primarily on shallow rocky reefs distributed in patches. The plants' numerous fronds extend upward in oceans and bays, forming a canopy at the surface. The plants grow to lengths of more than 100 feet, at a rate of up to 18 inches per day.

"Giant kelp provides food and habitat for many ecologically and economically important near-shore fish and other species," said **David Garrison**, program director in the **National Science Foundation's (NSF) Division of Ocean Sciences**, which funded the research along with NSF's **Division of Environmental Biology**.

The kelp is also an important source of food for many deep-sea species. Giant kelp that's uprooted



An underwater canopy: Kelp plants grow toward the sea surface on strong, flexible stipes. Credit: *SBC LTER Site*



Aerial view of the canopy of giant kelp floating offshore near the city of Santa Barbara, California. Credit: *Jeff Jones*





from the seafloor is transported offshore into deeper waters, where it sinks and fuels deep-sea ecosystems with “phytodetritus.”

Through the recent research, scientists found that giant kelp growth in exposed areas of the Santa Barbara Channel is mostly controlled by large waves. The kelp’s growth in more protected areas, however, is limited by low nutrient levels.

During winter months, storms in the north Pacific Ocean create large swells that enter the Santa Barbara Channel. Waves breaking during and after these storms are a major source of giant kelp death in this region. Giant kelp is particularly sensitive to changes in climate that alter wave and nutrient conditions.

Using Landsat data, the researchers discovered that most years had a seasonal kelp cycle, with minimums in the winter followed by rapid growth in the spring and early summer. This growth in turn led to maximum amounts of kelp in late summer and early fall.

Short lifespans of both fronds and entire plants — four to six months for fronds, and two to three years for plants — produce a kelp forest that renews itself six to seven times each year.

“We know from scuba observations that individual kelp plants are fast-growing and short-lived,” says Cavanaugh. “The new data show the patterns of variability that are also present within and among years at much larger spatial scales. Entire kelp forests can be wiped out in days, then recover in a matter of months.”

Information collected by scientists at the *Santa Barbara Coastal Long-Term Ecological Research (LTER)* site, one of NSF’s 26 such LTER sites around the world, was added to the satellite data.

Dan Reed of UCSB, a co-author of the paper and principal investigator of the Santa Barbara Coastal LTER site, has spent many hours as a scuba diver studying giant kelp.

“The kelp occurs in discrete patches,” he says, “but the patches are connected genetically and ecologically. Species that live in them can move from one patch to another. “Having the satellite capability allows us to look at how the different patches are growing, and to get a better sense of how they’re connected,” said Reed. “We can’t get that information through diver plots alone.”

Continued large-scale and long-term observations are needed, he

says, to understand how ecosystems — including giant kelp forests — might behave in a future climate.

The fourth co-author of the paper was Philip Dennison of the **University of Utah**. The research was also funded by **NASA**.

— **Story by Cheryl Dybas, NSF**  
cdybas@nsf.gov

### Three Decades Of Climate Data

**On August 16, 1981, the *Meteosat-2* geostationary weather satellite began operationally to supply data relevant for climate monitoring. The imager on *Meteosat-2* and subsequent satellites in the series has now provided 30 years of data.**

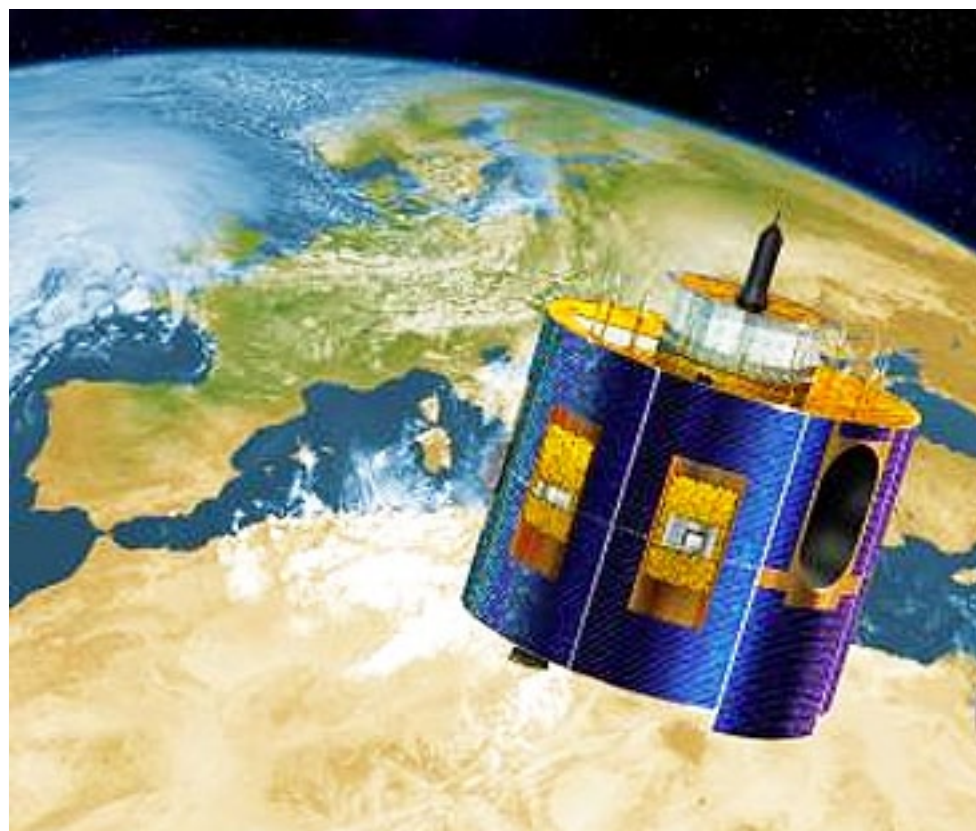
“This is one of the longest time series of climate relevant data collected by satellite in the world,” said Jörg Schulz, Climate Product Expert in **EUMETSAT’s Meteorological Operations Division**. Furthermore, *Meteosat* is the only European satellite system which can provide such a length of records.

The data collected by the first generation *Meteosat Visible and Infrared Imager’s (MVIRI’s)* three channels — visible, infrared and

water vapour — are also provided by *Meteosat Second Generation (MSG)*, whose 12-channel *Spinning Enhanced Visible and Infrared Imager (SEVERI)* includes similar channels to those used by *MVIRI*, providing continuity in climate data over three decades. The *Flexible Combined Imager (FCI)* on *Meteosat Third Generation (MTG)* will also include similar channels, meaning that all three generations will have provided over 60 years of climate data.

The long series of *Meteosat* observations has already provided benefits to users, helping protect lives and property around the world. The observations were successfully used for the monitoring and analysis of precipitation and vegetation changes during the severe drought in the Sahel area of Africa in the 1980s. *MSG* satellite observations just became available when Europe suffered one of the worst heat waves ever in 2003. The data were used to estimate surface temperatures and also to monitor the occurrence of fires.

The *World Meteorological Organization (WMO)* has defined climate normals that are averages over 30 years of data. Deviations from such a normal are used to describe



Artistic rendition of the *Meteosat-2* satellite

unusual behaviour such as being too warm or cold. With 30 years of Meteosat data, climatologists can start to construct climate normals from satellite data only.

"Three decades is just enough to start looking at decadal variations," Schulz explained, adding, however, that "there is no guarantee of detecting climate trends." EUMETSAT carefully analyses, reprocesses and validates the satellite data, which are then used by *National Meteorological Services*, the *European Centre for Medium-Range Weather Forecasts (ECMWF)*, and research institutions for several climate applications. The longer Meteosat is in orbit, the better their analysis of the climate system will be.

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## Getting The Picture

**As cinema owners worldwide begin to embrace new digital technologies via satellite, audiences are being given more ways to enjoy an evening at the movies.**

The **European Space Agency (ESA)** has helped to pave the way to digital and electronic cinema by helping a consortium of Italian companies to develop a secure, cost-effective networked cinema system known as **ISIDE** – *Innovative Satellite Interactive Digital Entertainment*.



The ISIDE hardware that is used to download the films. Credit: ESA

Thanks to ISIDE, cinema operators can now browse a catalog of hundreds of movies, order online from the comfort of their office, and their selections will be downloaded via satellite.

The network also assists in new forms of entertainment such as broadcasting live sporting events in 3D, or offering virtual theater. Such was the case when ISIDE contributed to a broadcast that put two groups of actors, one located in Rome and one in Burkina Faso (West Africa), together on the same virtual stage.

Satellite capacity is a costly resource. In order to make distribution via satellite cost effective, the same content has to reach a sufficient number of cinemas. ISIDE brings the convenience of satellite technology within reach. When multiple locations in the network download a film, the costs of satellite capacity are shared among them.

Top quality digital standards must be maintained, which involves the transmission of high volumes of data. A single movie can exceed 200 gigabytes – the contents of four blue ray discs. High transmission rates of up to 100 megabits per second must also be achieved.

The system is being put to use by Italian companies **Microcinema** and **OpenSky**. Today, Microcinema, with more than 200 cinemas connected in a network over satellite, has become a leader in Italy for providing film, audiovisual content, live opera from Italian and European theatres and supporting cultural events. Microcinema distributes two

or three live events per month, plus one or two films per week.

OpenSky mainly delivers movies from major Hollywood studios and distributes live events to more than 500 cinemas spread throughout Italy, France and Germany. Most of the cinemas are equipped with the state-of-the-art receivers and projectors.

"The opportunity provided by the ISIDE project has been very instrumental to Microcinema, as it occurred when the company started to approach the market proposing possible satellite services," explains *Silvana Molino* from Microcinema.

"The successful pilot phase of the system, developed and tuned in 2010 during the ISIDE project, proved to be fundamental for cinemas owners' persuasion."

According to *Walter Munarini* from OpenSky; "The ISIDE project was fundamental to Opensky to implement the first European network of digital cinema capable of receiving satellite services like the live events and movies via satellite, as well as its evolution to live 3D events."

ISIDE was developed through ESA's **ARTES** applications program. The companies involved in the consortium included Microcinema, OpenSky, Skylogic and Digital Pictures, with the support of the Business Incubator Centre BIC Lazio in Rome.



Typical satellite dishes that can be used to receive the digital films. These dishes were used to test the system at the Business Incubation Centre Lazio. Credit: ESA



## Goonhilly — Yesterday, Today + Tomorrow

by Bob Gough, Managing Director, Carrick Communications Ltd.

July of 2012 will witness the 50th Anniversary of a grand, seasoned lady of satellite communications — Goonhilly Satellite Earth Station in the U.K. Not wishing to pre-empt the many events and publications planned to mark this event by people far better qualified than I, October's launch of two ground-breaking satellites — namely ViaSat1 and Galileo — has triggered memories of my 35 years of personal involvement with Goonhilly, its management and its staff. Here's my personal, brief overview of some of Goonhilly's "Firsts"...

### *The Beginning*

**Goonhilly Downs** — a windswept, out-of-the-way location on the *Lizard* peninsular near the Atlantic Ocean in south west Cornwall (U.K.) became a dramatic focal point at the dawn of the satellite communications era. Why? Well, the first communications satellites were totally dissimilar to the complex craft of today. Their power and antenna coverage on the Earth's surface was quite limited. In order to communicate between the USA and the U.K., for example, it was necessary to locate the USA station as far to the east as possible, and the U.K. station as far to the west as was possible. Goonhilly Downs was ultimately selected for the Earth station and the site was acquired by the **U.K. GPO**, which later became **British Telecom**, and then renamed as **BT**.

Built in 1962 for the **TELSTAR** experiment, **Goonhilly 1** is a 26m, front-fed antenna that set a world standard for the open parabolic design of the dish.

Goonhilly received the first live transatlantic television broadcasts from the United States via the **Telstar** satellite on July 11, 1962. Since that point in time, Goonhilly grew considerably on its 64 hectare (160 acre), 3.5km (2.2 miles) perimeter site. For many decades, Goonhilly was the U.K.'s main international

gateway for all telephone, television and data to and from the rest of the world.

An excellent paper covering these early years is by *Des Prouse: TELSTAR - The Birth of Transatlantic Satellite Communications*. This was presented at the **IET 150th Anniversary of Transatlantic Communications** event in Manchester, U.K., on October 28, 2008. The paper is available at the IET Digital Library website [at this direct link](#).

Goonhilly actually started life as an experimental facility to test the feasibility and reliability of long distance satellite communications [Reference: "*Goonhilly Revisited*" by Donald Wray, *Post Office Engineering Department*; *New Scientist* 1 April 1965.], and it was several years before they became an operational Earth station. Staff were drawn from the GPO's R&D department, then based at *Dollis Hill* and the *Radio Laboratories* at Backwell, where *Neil White* and several other long serving Goonhilly engineers and technicians originated. When the site became operational, the development teams were retrained on site under Neil's leadership, evaluating new ideas, equipment and systems, and then moving them into operations. They remained active all through Goonhilly's operational life.





## Meeting Goonhilly

For many years, the dominant frequency band used for commercial satellite communications was C-band, with 6 GHz uplinks and 4 GHz downlinks. During the 1970s, the use of L-band for maritime mobile links (1.5/1.6 GHz) and Ku-band (12/14 GHz) for fixed satellite services was being pursued in Europe. Working at the **European Space Agency's ESTEC** technical centre in The Netherlands, I was involved in the development of the communications systems for the **MAROTS** (later **MARECS**), **OTS**, **ECS** and the ill-fated **OLYMPUS** satellites, with the latter also carrying a Ka-band payload.

The **Orbital Test Satellite** (OTS) was one of the first three-axis stabilized spacecraft in geostationary orbit (**ATS-6** being the first), and the first satellite to carry six, Ku-Band transponders.

In parallel with the work of Dr. R A (Bob) Harris and myself on the 60 Mbit/s, 120 Mbit/s, and 180 Mbit/s **QPSK/TDMA** systems for OTS and ECS, BT at Goonhilly were doing similar developments in the context of BT's membership of **INTELSAT** and what was to become **EUTELSAT**. It was the Goonhilly team that developed the first U.K. TDMA terminal in 1976, interfacing with a *Digital Speech Interpolation* (**DSI**) terminal developed for BT by **Cambridge Consultants Ltd.** and with a burst-mode modem developed by **Marconi Research Labs**, again for BT.

With these components, the U.K. successfully engaged in the **INTELSAT TDMA/DSI Trial**, along with France, Germany, Italy and the USA (**Comsat**) which lay the operational foundations of this technology. On the basis of experience gained, it was the Goonhilly team that set up and ran our hardware simulation laboratory at ESTEC (under contract to ESA).

In the late 1970s, I was carrying out the in-orbit testing of the OTS Ku-band transponders from **Telespazio's** Earth station at *Fucino* (Italy). Goonhilly was actively working with the OTS satellite using their **Goonhilly 4** antenna, which was one of the first Ku-band terminals in Europe.

It was definitely part of the testing strategy for Goonhilly and Fucino to exchange TV recordings of popular soccer matches — in order to check transmission quality, of course!

Later, I was part of the ESA team planning the ECS

**IOT** testing and negotiating with EUTELSAT for the transfer of the ECS satellites from ESA to EUTELSAT. Goonhilly again played its part in a number of ways and some of the key meetings were hosted by BT at Goonhilly.

## Working As A Supplier To BT @ Goonhilly

After leaving ESA and returning to the U.K., I was foolhardy enough to start my own business in the satellite communications area — **Communication Systems Research Ltd. (CSR)**. The company operated at the bleeding edge of software, firmware and hardware development, and BT was one of the company's customers. Here are but some of Goonhilly's "Firsts" that CSR was involved with.

Starting in 1982, the U.K.'s **INMARSAT** coast Earth station (CES) was Goonhilly, operating through *Antenna 5* with C-band between the CES and the satellite, and L-band between the satellite and the mobile terminals. With the extensive expansion of services for Maritime, Land and Aeronautical applications, *antennas 14, 24 and 25* were added to work via the **AOR** (*Atlantic Ocean Region*) **East** and **AOR West** satellites, as well as the **IOR** (*Indian Ocean Region*).

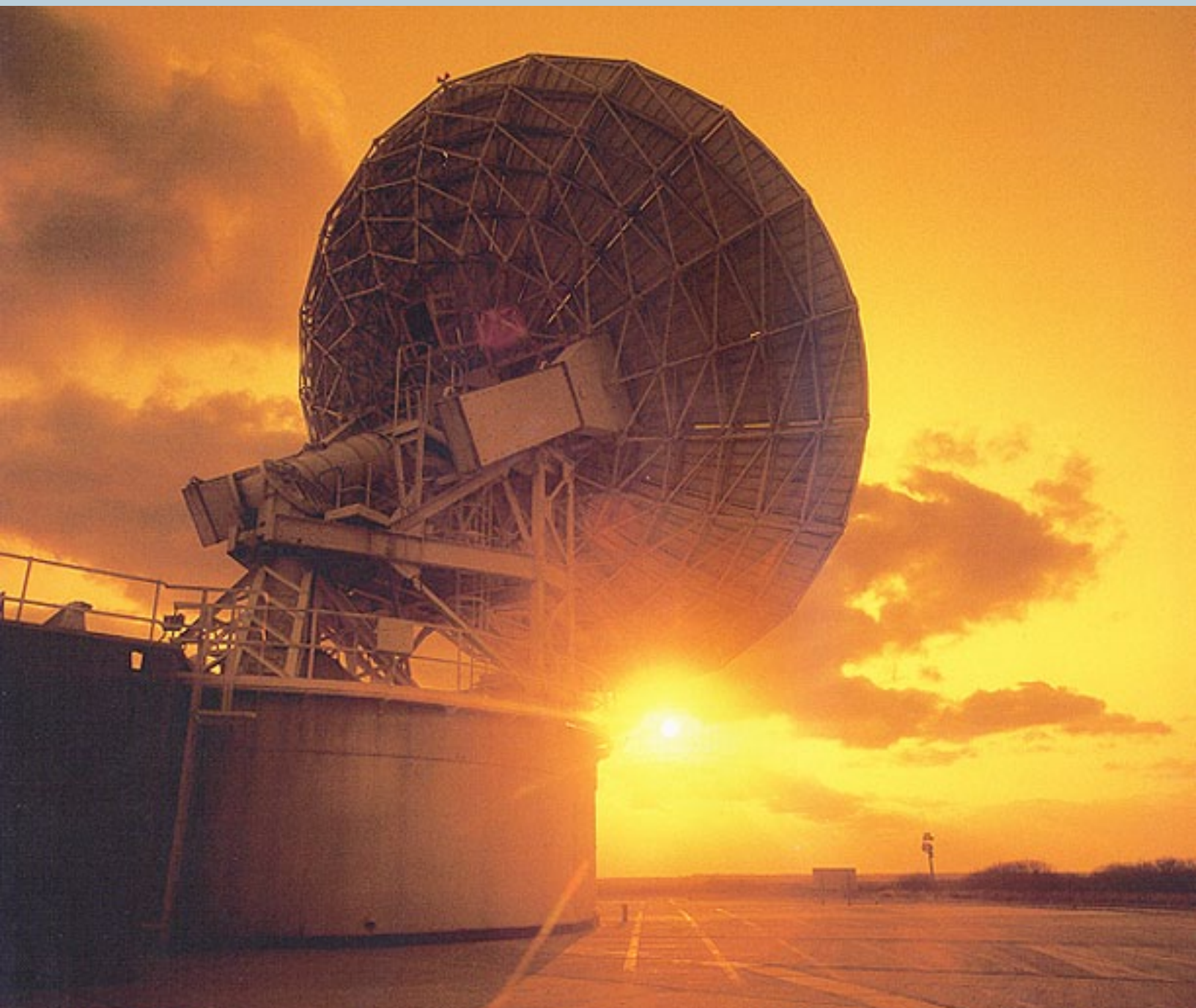
For small mobile terminals, exceptional frequency accuracy and stability of the downlink signals is essential. Correction has to be made for a variety of effects, not the least of which is Doppler-shift due to satellite movements. Based upon its phase-locked receiver technology, CSR developed and produced such pre-compensated AFC systems for, among others, the Goonhilly CES.

BT, through Goonhilly, achieved a first with the Aeronautical services which were launched in 1989 with **SKYPHONE**. These services were acquired by major airlines including Virgin

Atlantic, British Airways, Lufthansa, Lauda, Austrian, Singapore Airlines and others.

Under contract to BT, CSR developed the CES-based SKYPHONE modem that carried voice, fax, and data services to passengers and crew. **Racal Ltd**, with their airborne equipment and flight qualification experience, developed the airborne modem.

CSR's complicated 10-layer-board, DSP-based modem used voice codec technology developed in BT's research laboratories at *Martlesham Heath*. What is really worthy of note is that Racal and CSR carried out their modem developments entirely independent of each other, but based upon a three-inch thick specification document produced by INMARSAT. The very first time the two modems established a link and "talked to each other" was in a live trial between Goonhilly and an aircraft via an INMARSAT satellite. Incredibly, it worked the first time! Now, that *is* a tribute to INMARSAT and to BT's project group.





## Changing Times

Times and technologies change — since the late 1990s, fibre optic cable has predominated in the trunk transmission of international traffic, making Goonhilly less and less critical for BT's operations. As a consequence the site was gradually downsized, then eventually mothballed, and is now scheduled for demolition.

One sometimes hears criticism of BT for the decision to pull out of Goonhilly, but I hold a contrary view. Personally, I believe that had BT so wished, on purely commercial grounds it could have implemented that decision much, much earlier than it did. So, good for BT!

Total demolition has not occurred at Goonhilly and nor is such expected. Certainly, the original *Goonhilly 1* antenna has been the subject of a *Preservation Order* since 2003, being deemed part of the U.K.'s heritage. The 29m *Goonhilly 3* C-band antenna followed suit in 2008. Further, BT has entered into agreements with other parties that will lead to a rebirth of the Goonhilly complex.

## Goonhilly's Rebirth

Not only does **Avanti PLC** have one of its *HYLAS 1* Ka-band satellite Earth stations (equipped with a **Hughes Network Systems** hub) on a small part of the site, but a new company called **Goonhilly Earth Station Ltd. (GES)** has been formed with the aim of transforming the remainder of the site.

GES plans to turn Goonhilly into a center of excellence as an *International Space Communication Gateway* for commercial satellite communications, Space Science (Deep Space communications) and Radio Astronomy. Apparently, the company has agreements in place to upgrade the still-serviceable antennas for deep space communications, and to create a commercial space communications gateway. It appears as though the plans also include a co-located business center, training and a visitor center, which could generate as many as 750 jobs in the region. The concept, developed and led by *Ian Jones* of GES Ltd ([www.goonhilly.org](http://www.goonhilly.org)) is backed by the Universities of Oxford, Leeds and Herts, as well as **QinetiQ** and other institutions.

Meanwhile, it's "business as usual" for the existing and future SATCOM activities and contracts at the Goonhilly site.

In 50 years, Goonhilly has moved from an experimental facility working a tiny C-band satellite in low Earth orbit to a site hosting a modern operational Ka-band system with plans to reach into deep space and the stars. Now, that's what I call a rebirth!

## About the author

Bob Gough has spent more than 35 years in the satellite communications business, both with the European Space Agency and in Industry. In 1980 he was one of the first six staff members of Filtronic PLC, which grew to be a multi-billion dollar public company in the mobile communications business. Bob was Marketing and Sales Director and instrumental in opening up the company's U.S. market. In 1982, Bob founded a successful satellite communications equipment manufacturing company with an international customer base. That company was acquired by a major U.S. Defense contractor in 1987. He has also held senior management positions in publicly listed computer & communications companies. In 1990, he founded Carrick Communications Ltd. Also in 1990, Bob co-founded a software company which became the leading provider of operational planning and timetabling systems to railways on every continent. That company was acquired by a major German engineering company in 1999, and Bob still retains strong links at senior levels in the railway industry. Bob possesses in-depth technical, commercial, business development and management experience that is brought to bear on the projects undertaken by Carrick Communications. Bob Gough, BSc (Hons), PhD, MIET, CEng is a Chartered Engineer and a Member of the Institution of Engineering & Technology.



## A New Look For SES + Approval For EUTELSAT

by Chris Forrester, European Editor, SatMagazine



Romain Bausch, CEO, SES

SES used the giant IBC broadcasting technology show to unveil its 'new look' philosophy and logo and to flag up the fact that the Company was now carrying 6,000 TV and radio channels across its satellite fleet, with more than 2,400 being transmitted over Europe. SES is claiming the world's top spot for HDTV channels, with 1,071 now on air around the globe. (216 over Europe).

Romain Bausch and Ferd Kayser, SES' CEO and COO respectively, told the press covering IBC that SES was now transmitting to a record number of homes, some 245m, spread across cable, DTH and IPTV, and via 43 DTH platforms. The 'new

look' SES brings the former diverse and regionally-focused operations of SES into a more streamlined structure with "a strong focus on emerging markets". Kayser said demand for video capacity remained strong, and by the end of 2011, he expected to be carrying some 230 high definition (HD) channels.

He explained SES would be launching 10

new satellites by the end of 2014, the first of which was a new craft (*QuetzSat-1*) to serve the Mexican and Latino region, which was scheduled for launch during Q4.

SES Astra (the 'Astra' name stays in use over Europe where it has a solid brand value) says it has further boosted its reach in Germany, with a record 17.1m homes now receiving satellite TV. In its latest study of German viewing — Astra's largest market — indicates that while IPTV connections are rising, cable and DVB-T are losing viewers. The numbers were presented at the IFA technology show in Berlin on September 6th and again at IBC.

In the first half of 2011, direct-broadcast satellite was beamed into 430,000 additional households, taking the overall total up to 17.1m. By contrast, cable TV is losing in popularity. The first six months

of the year saw 260,000 households switch to a different form of TV reception. This has reduced the reach of cable TV to 17.9m households. Digital terrestrial TV has also fallen in popularity. It has lost 300,000 households, bringing its coverage down to 1.7m. However, Internet TV has continued to grow this year. For the first time ever, IPTV in Germany has reached the one-million mark.

The above data comes from their latest *Satellite Monitor* results for the first half of 2011. The research was carried out by market research company **TNS Infratest** on behalf of SES Astra and in cooperation with the broadcasting institutions of the German states. Between May and June 2011, TNS conducted 8,000 interviews across the country.

Astra says there are now 14.5m households using DVB-S — digital broadcasting via satellite — which brings the percentage of homes that have gone digital to 85 percent. Cable TV users are also going digital, but with the proportion at just 43 percent, the majority (10.1m households) are still receiving analogue services.

Analogue (satellite) switch-off in Germany is scheduled for April 30, 2012. Astra estimates that just 2.5m homes still look at the satellite operator's dwindling analogue transmissions, which will end next April. Some 400,000 have converted to digital this year.

Wolfgang Elsässer, Managing Director of Astra Deutschland, said, "Astra remains the most popular choice for TV reception. More and more people are realising that satellite TV is ahead of the competition when it comes to cost, variety and quality. Astra households throughout Germany can receive — with no monthly connection charges — around 270 German-language programmes, over 30 of which are broadcast in HDTV. We are confident that the remaining analogue households will switch to digital."

Germany now has 4.5m satellite households watching content in HD quality. That is almost a third of all digital satellite users. An analysis by **GfK Group**, a market research group, revealed the proportion of satellite receivers that are HD has also increased. In the first six months of 2011, HD had a 61 percent share. In the same period last year, the figure was 55 percent.

In absolute terms, the number of HD devices sold rose from 863,000 to 906,000. During the first half of 2011, a total of 1.531m digital satellite receivers were sold in Germany. That's roughly the same number as in the first half of 2010 (1.596m). However, sales last year were boosted by major sporting events such as the Olympics and World Cup soccer, which have not been a factor in 2011.

### SES channels\*

Europe .....	2,405
North America.....	1,746
India/MEA.....	895
Asia Pacific .....	335
Latin America.....	524

\*TV and radio

### TV reception in Germany (m/homes)

	30 June 2011	31 Dec 2010	Change
Cable	17.9	18.2	-1 percent
Satellite	17.1	16.6	+3 percent
DVB-T	1.7	2.0	-17 percent
IPTV	1.0	0.9	+12 percent

### Digital TV in Germany (m/homes)

	30 June 2011	31 Dec 2010	Change
Cable	7.8	6.8	+13 percent
Satellite	14.5	13.7	+6 percent
DVB-T	1.7	2.0	-17 percent
IPTV	1.0	0.9	+12 percent



## ***Eutelsat's Reasons To Be Cheerful***

SES' European arch-rival **Eutelsat** also has many reasons to be cheerful. A new report from investment bankers **Morgan Stanley** covers Eutelsat's prospects, and it is almost entirely positive. "Management has one of the best track records of the industry. Trading at a ~10 percent discount to historic multiples, we view valuation as attractive," says the bank, while at the same time praising the FSS sector in general.

Eutelsat's (ETL) core business is poised to continue to deliver strong growth over the next three to five years. ETL's video business, two thirds of group revenue, should continue to benefit from strong structural demand for satellite capacity. Two main drivers should stimulate revenue growth over the next five years: (i) The broadcasters, in ETL's markets, are expected to keep launching new channels. The roll-out of DTT technology coupled with the increasing penetration of Pay-TV means that the number of TV channels should keep rising. (ii) Secondly, HD is being rolled-out at a rapid pace across most of ETL's markets. In addition, 3D is starting to emerge, at least in the developed world. Recent research suggests that the number of households equipped with a 3D screen should rise substantially within the next five years."

While demand for 3D capacity remains embryonic, it could push transponder demand further, maybe from 2014-2015, says the bank. They highlight two studies published in June 2011 confirming that view. **Futuresource Consulting** published an analysis forecasting that stereoscopic TV will be available to 40 percent of homes in Western Europe by 2015, equating to an installed base of nearly 65 million. On June 15th, **DisplaySearch** published a study forecasting that 3D-ready TV sets will represent 12 percent of the global TV screen market in 2011, rising to 20 percent in 2012. 'Full' 3D requires 50 percent more capacity than HD.



Michel de Rosen, CEO Eutelsat

Morgan Stanley also reminds us that the number of channels to increase in Eutelsat's markets: "In extended Europe (Western Europe, Central Europe, Russia, Central Asia, Middle-East, North Africa, Sub-Saharan Africa), the total number of TV channels is expected to grow by 50 percent, from ~10,000 in 2010 to ~15,000 in 2020 (source: Euroconsult). Most of this growth is expected to come from new HD channels. Moreover, HD penetration is expected to rise significantly by 2020: HD penetration is expected to grow strongly over the next 9-10 years. In Western Europe, HD penetration is forecast to rise from 8 percent in 2010 to around 36 percent in 2020. On average, across ETL's markets, HD penetration is expected to grow from

## 148 New TSPs By Mid-2014

	Launch	Xders	Replace	Expand
W3C	Oct-11	56	37	19
Atlantic Bird 7	Dec-11	50	39	11
W6A	Dec-12	40	29	11
W5A	Dec-12	48	20	28
EB2A	Jun-13	23	16	7
W3D	Mar-13	56	35	21
Eutelsat 3B	Mar-14	51	0	51
<b>Total</b>		<b>406</b>	<b>176</b>	<b>148</b>

Growth vs. 2011 ( percent) 20

Source: Eutelsat data, Morgan Stanley Research

4 percent to 19 percent by 2020. HD requires twice as much capacity as standard definition, meaning that it will provide a very significant boost to transponder demand."

The bank's report also examines Eutelsat's new craft, Ka-Sat, saying: "Launched in December 2010, Ka-Sat should start producing meaningful revenue in fiscal 2012. We forecast Ka-Sat will produce 40m euros of revenue in 2012 rising to 80m euros in 2013 and 100m euros in 2014 (in line with guidance). While it is still in its early days, management expects KA-Sat's revenue mix to be 40 percent Professional and 60 percent Consumer by 2014. During the 2011 FY results presentation, management highlighted that it would likely generate negative EBITDA in its first full year. ETL signed contracts with several retailers across 51 countries who are in charge of commercialising ETL's broadband offer (B2B2C). Consumers must purchase a dish and a decoder / modem in order to use the service. Scaling up this business will take a few more quarters while ETL is paid by retailers on a monthly basis. We believe the impact on group EBITDA should remain limited. We forecast 2012 EBITDA margin of 78.3 percent, 100bp below that of 2011, but 100bp above guidance of "at least 77.3 percent". Also, we believe monetizing Ka-Sat's professional offer will prove easier since it does not require the type of upfront investment entailed by B2B2C. Ka-Sat's B2B offer targets mobile video (e.g., TV reporters) and broadband services for remote businesses.

Morgan Stanley also reminds us that Eutelsat's own guidance has always beaten — "We have looked at the differences between start-of-the-year guidance and actual reported results over the last five years. We discovered that in each of the last five years, reported revenue exceeded guidance by around 30m euros to around 70m euros, i.e., between 3.6 percent and 4.7 percent. On average, reported revenue came in 4.2 percent or 39m euros ahead of initial guidance. 2012 guidance is "group revenue to exceed 1235m euros". If we were to rely solely on ETL's track record, we could expect revenue to reach around 1270m to 1280m euros. We forecast 1255m euros vs. consensus of 1252m euros. The same remark also applies to margins. Over the last five years, management has beaten initial margin guidance by approximately 150 basis points. This, added to the revenue beat, means that on average, group EBITDA has exceeded start-of-the-year guidance by 45m euros. Our current 2012 forecast is 28m euros above guidance." ↵

## SES Links With Russia's Gazprom

SES has struck up another of its special relationship agreements. This time it is Russia's **Gazprom** and its *Gazprom Space Systems* division. SES now has a "strategic partnership" with the giant Russian company to provide new satellite capacity to serve the fast-growing Russian market.

"Under the terms of a multi-year agreement, SES has re-located its Astra 1F satellite previously located at 51 degrees East to the orbital location 55 degrees East. GSS will use 16 Ku-band FSS transponders on the Astra 1F satellite to provide communication services for Western Russia ahead of the arrival of GSS' Yamal-402 satellite in 2012. In return, SES will use capacity on GSS' Yamal-402 once it becomes operational at 55 degrees East. Yamal-402 is currently under construction and scheduled for launch in November 2012," says SES.

The use of **Astra 1F at 55 degrees East** is part of a strategic partnership between SES and Gazprom to explore opportunities for the provision of satellite capacity for Russia. GSS will use the capacity on Astra 1F and, later, **Yamal-402**, together with Russian satellite service providers to deliver a wide spectrum of services. These services include; the transmission of TV bouquets for direct-to-home (DTH) satellite TV operators; the distribution of TV signals to cable and terrestrial networks and broadcasting stations; the delivery of broadband access for corporate clients and the consumer market; and point-to-point communication, as well as cellular backhubs and **Satellite News Gathering (SNG)** services.

Dimitry Sevastiyonov, General Director of GSS, said, "The move of Astra 1F is good news for the Russian market. The additional satellite arrives at a time of high demand and scarce capacity and brings us in a position to meet the actual and growing capacity needs of our customers. The cooperation with SES is very productive and we may see additional joint projects in the future."

## About the author

Chris Forrester is a well-known broadcasting journalist and industry consultant and has been reporting on the "broadband explosion" for more than 25 years. Since 1988, Chris has been a freelance journalist who specializes in content, the business of television, and emerging applications, on all delivery platforms.





# Executive Spotlight

## Eyal Copitt, Senior Vice President, Spacecom

Having joined Spacecom in 2009, Eyal Copitt leads African sales for the Company. Mr. Copitt possesses more than 20 years of worldwide consulting and sales experience, of which 15 are in the African IT and Communications Markets working with governments, private and nationally-owned telcos, the finance industry, and education networks. Prior to joining Spacecom, Mr. Copitt served as the Vice President of Sales, Africa, at Gilat Satcom and as the Africa District Manager for NetApp, where he was in charge of developing new markets in Africa.



### *SatMagazine (SM)*

*Good day, Mr. Copitt. Would you please tell us about your duties in your current position*

### *Eyal Copitt*

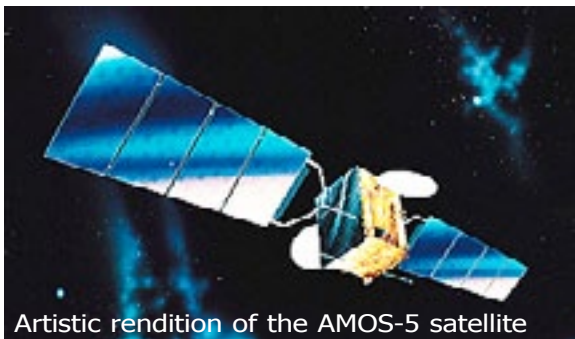
I have more than 20 years of worldwide consulting and sales experience, including 15 years in the African IT and communications markets. I've worked with governments, private and nationally owned telcos, the finance industry and education networks. In my current position as senior vice president of sales for Africa and the Middle East at Spacecom, I am responsible for all of the company's sales operations in these regions. Right now, we are pre-selling capacity and have reached more than 50 percent of capacity on the **AMOS-5** satellite prior to its deployment. We have built a dedicated and experienced sales team for the African market.

### *SM*

*What prompted the Company's move into the African SATCOM market? How was such accomplished? Also, what are the differences between, and similarities with, the Company's other market endeavors?*

### *Eyal Copitt*

Spacecom launched Israel's first commercial communications satellite – **AMOS-1** – to **4 degrees West** in 1996 because we perceived a growing need for commercial satellites that would serve our region, as well as Central and Eastern Europe. Since then, we've developed methodologies to identify developing markets in need of capacity. Developing markets allow for substantial growth opportunities for our company, enabling us to become a recognized brand in these markets as they mature. Our business acumen, technological capabilities and reliability have brought us to this stage, and we are looking for our fourth satellite, **AMOS-5**, to take us further. The African market is the perfect next step for Spacecom. **AMOS-5's** coverage for the entire continent, with connectivity to the Middle East and Europe, will reach throughout Africa's developing areas with rural, outlying and urban opportunities. As the communications industry advances worldwide, there's a need for more capacity and a growing interest in commercial satellite services from governments, telcos, broadcasters, ISPs and large corporations. Our team is working hard to position **AMOS-5** as the satellite of choice for these and other entities.



Artistic rendition of the AMOS-5 satellite

### *SM*

*Given the ever-increasing competition for this regional market segment, why would a prospective client consider Spacecom's satellite offerings? What capabilities are offered with your satellites in C- and Ku-bands?*

### *Eyal Copitt*

For more than 15 years, Spacecom's top priority has been providing high quality satellite communications services to maintain and exceed customer service expectations. Our reliable and flexible broadcasting and communications services continually satisfy our solid customer base, which includes *direct-to-home (DTH)* and *direct broadcast satellite (DBS)* operators, ISPs, telecom operators, network integrators and government agencies, corporate organizations and VSAT network operators.

Once in orbit at **17 degrees East**, the **AMOS-5** satellite will feature a fixed, pan-African C-band beam and three regional Ku-band high power beams. The Ku-band beams combine to create an overall exposure over the continent. Coverage from both C- and Ku-bands will span the entire African continent with connectivity to Europe and the Middle East. The satellite will support multiple transponders in both C- and Ku-band. Already we have ground stations that have leased transponders, as well as communications groups, that have taken capacity on the satellite and quite a few teleports will point antennas towards **AMOS-5** to deliver connectivity from Europe to Africa.

### *SM*

*There is a great deal of talk regarding fiber and undersea cable penetration into the African market... won't this negatively impact Spacecom's SATCOM intentions? How does Spacecom compete with other SATCOM providers in the area who have already established their market presence?*

### *Eyal Copitt*

All of these extra capacities bring new opportunities, applications and businesses to Africa that end up bringing benefits to everyone and promote economic development. City dwellers will become early adopters with residents of rural areas following their lead. **AMOS-5** will provide immediate coverage to the entire continent, so people in outlying and rural regions will have enhanced opportunities to develop more quickly. There will always be competition. It enhances market quality and encourages businesses to keep customers satisfied. Spacecom will be a long-term player in this competitive market by creating a strong, stable customer base. We've shown that we can establish a solid market presence in Europe, and we plan to do the same in Africa.

### *SM*

*Back in July, the prime for the under construction AMOS-5 notified you of a problem with the satellite. Would you please tell us about the problem that occurred during construction of the AMOS-5 satellite?*



# Executive Spotlight

## *Eyal Copitt*

All is fine; the technical issues were resolved, and AMOS-5 is in great shape for its scheduled launch in December of 2011. It will be launched from a Russian **Proton-M** rocket at the **Baikonur Cosmodrome** in Kazakhstan. We're eagerly anticipating the deployment of AMOS-5, so we can start providing comprehensive coverage to the African continent.

## *SM*

*A bit of forecasting here...how do you project the opportunities within the African market over the next year or two? Will Spacecom also be entering the non-commercial environs with programs for various governments, agencies, and military access?*

## *Eyal Copitt*

There is immense potential for growth in the African market. First, the urbanization process is continuing, bringing more people in contact with improved technologies. Second, there are more investments in the continent's overall technology infrastructure. Also, we need to take into account larger events, such as the *2010 FIFA World Cup* held in South Africa that produced many exciting technology advances for the continent. Our team sees more incoming cellular traffic and outgoing sports and news broadcasts from Africa than we did a few years back. Looking further into the future, we believe the entire continent will increase usage of satellite capacity, furthering our opportunities in the Eastern, Western, Northern and Sub-Saharan regions.

## *SM*

*How does the AMOS-5 integrate with Spacecom's overall corporate vision? What other upcoming event can you tell us about that reveal the Company's ongoing plans to increase their market share?*

## *Eyal Copitt*

By focusing on up-and-coming markets that are seeking capacity, and where digital broadcasting is emerging, Spacecom is establishing itself as a multi-regional satellite operator. AMOS-5 will position Spacecom at the forefront of Africa's emerging satellite services market. Together with **AMOS-2** and **AMOS-3**, our new fleet will cover much of the world's fastest growing and highest-demand satellite markets in the Middle East, Central and Eastern Europe, and Africa. We are continually looking ahead to evaluate other international satellite ventures. Currently, **AMOS-4** is scheduled to commence operations in 2013 with steerable Ku- and Ka-band beams to extend our footprint to South Asia and Russia. **AMOS-6** is scheduled for launch in 2014 to provide steerable Ku-band with pan-European coverage, as well as coverage over the Middle East and Central and Eastern Europe, and a Ka-band beam for broadband services with coverage in Africa and Europe. With these additions — and our long-term plan to deploy an AMOS over Latin America — Spacecom's AMOS fleet will cover more than 60 percent of the world's population.

## *SM*

*What projects are you particularly proud of?*

## *Eyal Copitt*

I am proud to be part of Spacecom. We are constantly striving to extend the reach, capabilities and service offerings of our AMOS satellite fleet. We provide millions of people with the opportunity to enjoy the highest possible quality television programming, audio channels, voice and data services. I am particularly proud of our pre-launch sale business. Thus far, we have sold more than 50 percent of the satellite's capacity. AMOS-5 will offer our customers a wide range of services, from DTH broadcasting to telephony services. I hope to continue selling capacity as the launch date approaches — and subsequently when the satellite is commercially operating — to maximize customer satisfaction. ↩

# Insight

## *Sea Change: Shipping's Evolving SATCOM Needs*

The maritime industry, like many others, is undergoing perpetual change. As we know, shipping companies have been impacted as much as any by macro-economic factors such as the recent financial crisis, while more industry-specific developments such as the increasing importance of crew retention have also brought about significant change.

Of the many suppliers to this industry, providers of satellite communications systems have had their work cut out to align themselves with these changes, particularly over the past three to four years. As the American author and economist *Robert Collier* said, "Supply always comes on the heels of demand," and as the shipping industry evolves, so SATCOM providers' offerings have had to keep up. And with the maritime SATCOM market set to grow 50 percent between now and 2018 to a total value of \$1.6 billion\*, there is significant financial motivation to understand and make the most of these changes.

A recent development, introduced by a number of major providers, including **Vizada**, is the bundling of *mobile satellite services (MSS)* and fixed VSAT systems into a single package to provide global broadband connectivity for business and crew communications requirements. The emphasis here is on the 'single package' because, while MSS and VSAT systems have been jointly provided to shipping companies for a number of years, recently offerings have been greatly simplified to avoid multiple airtime and hardware contracts, different prices and different points of contact.

*Kevin Sinclair*, IT Manager for **Scorpio Ship Management** in Monaco uses Vizada and service provider Marlink's bundled MSS/VSAT package for the company's fleet of 19 **Aframax**, **Handymax** and **Panamax** vessels. Scorpio had been looking into a suitable VSAT offering for some time to supplement their Inmarsat mobile satellite terminals, but the decision process turned out to be lengthy and complicated: "It was a difficult and confusing task to compare the different bandwidth speeds, installation terms and maintenance commitments, as we discovered that they were extremely variable from provider to provider. In the end, we went for the package that was presented in the most transparent way," said *Sinclair*.

Why is it that shipping companies such as Scorpio are stepping up their requirements and demanding simpler broadband SATCOM bundles? As mentioned earlier, a number of different factors are responsible.

First, we can look at two changes impacting all companies, regardless of their activity. A phenomenon called 'the consumerization of IT' refers to the increasing use by consumers of smartphones, tablet computers and the like, and their impact





# Insight

on business IT and communications is significant. Not only do these devices change people's expectations of the services and applications they access at work, they also clearly require IT and comms managers to stay one step ahead in providing the technology and ensuring the appropriate level of security. The shipping industry is no exception: Many crew members now expect regular access to broadband Internet and apps as they do on shore, leading the IT manager to deal with a host of dramatically different cost, security and technical issues which previously were not part of their remit.

*Sinclair* of Scorpio Ship Management clarifies the way in which consumer technology has seeped into the professional environment on board ship. "It's a pre-requisite for many crew members to have access to onboard PCs with Internet, and increasingly, connectivity through their own smartphones and tablet computers. The security and technical implications of this are significant."

Another technological phenomenon impacting companies is cloud computing, or the scalable provision of IT services over the Internet, paid for by the consumer on a fixed subscription or pay-as-you-use basis. While the cloud is still relatively nascent over maritime satellite systems, the concept of paying a fixed sum for a number of different services has definitely crossed the border from consumer to business IT and communications, as per Scorpio's bundled package requirements from Vizada and Marlink.

Another major factor impacting the way companies do business today is the financial, or banking sector crisis, which struck in late 2008. Many industries were affected by this, not the least the shipping sector, and it has brought about a great deal of caution with regard to *capital expenditure (CAPEX)*. Packaged SATCOM bundles with flexible contract duration terms and low monthly fees for hardware and airtime have been a necessary antidote to companies seeking greater control and visibility over CAPEX; and while SATCOM represents only 1-2 percent of shipping companies' overall costs, the more predictable the costs in the Profit & Loss the better.

Having taken a look at wider market issues, it is also relevant to address developments specific to the shipping sector, and which are in turn impacting the provision of IT and communications services.

A major headache for the transport industry is undoubtedly the rising cost of fuel. Rocketing demand among developing countries has put significant upward pressure on prices, and with the barrel of crude oil currently at \$86 (as *SatMagazine* went to print), shipping companies are clearly looking for savings in other areas. A bundled SATCOM service enables companies to pay up front for access to hardware and airtime. This generally represents a lower cost than paying for the equivalent services individually, and also provides greater long-term visibility over CAPEX and OPEX.

Ensuring the security of crew and merchandise on board has long been a priority for shipping companies, but recent geographical and geopolitical developments have led them to reassess their trade routes in order to ensure a higher level of protection. While many vessels previously passed through the Suez Canal on the way from Europe to the East, the highly unstable climate around the Horn of Africa, and specifically the Gulf of Aden, has caused a majority of companies to send vessels around the tip of the African continent en route to the East. Many VSAT systems which offer the highest data speeds of all maritime satellite services do not however provide the global coverage necessary to ensure constant access to broadband communications. As a result it is common for shipping companies operating on a global basis to want

to combine VSAT with mobile satellite data services such as Inmarsat FleetBroadband or **Iridium OpenPort™** which both offer global data services, but at a higher usage cost. A number of industry players have recognized this requirement and sought to package both systems into a single service.

Taking it a step further, providers such as Vizada have developed online management services to enable the IT and comms officer to switch easily from MSS to VSAT as the vessel crosses coverage zones. For companies like Scorpio Ship Management whose trading routes are in spots, the team on shore can never predict where the tankers will be from one month to the next. As a result it's incredibly important to know that, regardless of the location, they will always be covered by either the mobile satellite, or fixed systems on board.

Another key issue for shipping companies is employing the right crew, and global broadband communications play a huge role in attracting and securing quality employees. As *Sinclair* said, "We transport oil derivatives and do ship-to-ship transfers away from the coast, which means that the staff can be away for months on end. These days it's just not feasible to expect them to go without access to Internet during this time."

Bundled satellite packages enable shipping companies to provide low-cost access to many of the communications services that crews use at home.

With all these changes in mind, it's not surprising that shipping companies are demanding that SATCOM providers revise their approach and develop offerings with a clear focus on transparency, flexibility and simplicity. As the market evolves, it will be an exciting time seeing which providers follow in Vizada's footsteps and rise to this challenge. ↩

For more information, access the Company's website at <http://www.vizada.com>

*Images are courtesy of Scorpio Ship Management*



## *Bountiful Bandwidth Empowers Underserved Markets*

by Paul Sims

State and local officials from across the Amazon region of Brazil converged on the city of *Manaus* this fall to commemorate a milestone agreement between *O3b Networks* and *Ozonio* aimed at delivering connectivity to the underserved region.

**Ozonio**, a Brazilian multimedia communications and Internet services provider, will use **O3b**'s abundant and affordable bandwidth to empower companies and communities lagging behind the broadband boom.

"All of the delegates who gathered that special day spoke passionately about how exasperated they were when the remote Amazon region had been left out of Brazil's national broadband plan," recalled *Steve Collar*, CEO of O3b Networks. "It was enormously gratifying to hear them explain how important it is for O3b to enable their communities to participate in the connected world with the rest of Brazil."

O3b is really on to something new and exciting, the Amazon government leaders proclaimed, a sentiment shared across emerging markets around the world.

"We really are providing a solution that no one else can deliver," noted *John Finney*, Chief Commercial Officer for O3b. "It's a unique combination of unmatched bandwidth and cost

effectiveness that makes O3b so compelling for so many telcos and network service providers in underserved regions and more than 180 countries."

The largest Ka-band satellite operator in the world, O3b combines the reach of satellite with the speed of fiber at a price capable of making the Internet a truly global experience.

"O3b delivers more bandwidth at lower latencies and costs than ever before," said *Collar*. "That's a powerful formula for telecom service providers determined to quench the growing thirst for broadband in the countries, regions and communities they serve."

### **More Bandwidth**

O3b was developed to deliver high-speed connectivity to the unconnected and underserved markets. Already one-third of O3b's capacity is sold, ahead of the launch of its initial constellation of eight *Medium Earth Orbit (MEO)* satellites slated for early 2013.





About 20 percent of the IP Trunking traffic across the Middle East and Africa is delivered today over standard geostationary satellites at prices significantly higher than O3b's new IP Trunking solution. Just launched this month, **O3b Trunk** is a scalable, bundled offering designed to deliver affordable, fiber-like capacity anywhere within 45 degrees of the equator.

"A broad range of service providers can simply select the speed of the connection they want and we provide them with the fully-managed O3b Trunk solution," noted *Finney*. The new O3b Trunk service offers a wide variety of broadband capacity options, from 100Mbps to 1.2Gbps.

"O3b Trunk delivers extraordinary bandwidth flexibility, enabling a broad range of providers to grow their services as market demand expands," *Finney* said. "Our offering of more bandwidth, lower latency and affordable pricing is eliminating the primary barriers to connectivity and growth in the emerging markets."

"As the pipe is opened up, more bandwidth drives new broadband applications, such as voice, mobile data and fixed line Internet access, that weren't available before," *Collar* added. "We are set to deliver very large amounts of bandwidth wherever our customers need it, at a cost that makes sense in today's emerging markets," said *Collar*.

### **Making The Correct Connections**

**Netcom Africa**, a leading provider of satellite and wireless broadband, inked a multi-year, multi-million dollar deal with O3b to deliver high-capacity connectivity to ships and oil and gas rigs off the coast of Nigeria.

Despite the availability of fiber networks on Africa's coasts, service providers have struggled to meet many of the connectivity demands across the continent and the unique needs of the oil and gas industry. Inland regions of Africa have been preparing to connect with O3b.

At the time of the O3b-Netcom Africa deal last fall, Netcom Africa's Group EVP and CTO *Yen Choi* said, "O3b's high-capacity, low latency connectivity will allow us to offer a quality of service to our oil and gas customers operating in the Niger Delta region that was never possible before. Offshore workers will be able to talk with friends and family at home with

no delay, and large volumes of data will be transferred onshore for analysis quickly and seamlessly."

In South Africa, provider **Mavoni Technologies** is going to deliver highly-anticipated connectivity at fiber-like speeds to the South African provinces of Limpopo, Mpumalanga and the Northern Cape. More than 2,000 rural schools alone will be connected.

"Together with O3b, our mission to help clients turn knowledge and innovation into real value will impact the lives of more than 185,000 students," said *Tinyiko Valoyi*, CEO of Mavoni Technologies, following the agreement with O3b earlier this year.

Ethiopia is full of opportunities, as the country's economy continues to forge ahead, reliant on satellite-based trunking services to drive much of its short-term and long-term growth and advancements.

**Etisalat** already serves more than 100 million customers across the Middle East, Africa and Asia and is now in a position to meet long-term capacity demands after inking a deal with O3b to offer regional solutions.

The Middle East is a land of opportunities as diverse as the countries that make up this vast region. "The Middle East represents very strong demand for O3b services and solutions," noted *Finney*.

In Iraq, for example, where one of the biggest challenges is the absence of reliable power, O3b is well positioned to deliver on the high demand for connectivity.

"The power infrastructure across Iraq is extremely poor and unreliable, much like the regional fiber networks that are heavily dependent on the grid," *Collar* said. "There's a huge need for communications throughout Iraq, and O3b is in a prime position to deliver on that demand over the next decade."

One of the region's largest ISPs, **NEDA** has signed on with O3b to deliver broadband throughout Afghanistan. And **Soroor** has secured substantial O3b bandwidth to deliver a range of trunking and mobile backhaul services into Saudi Arabia.

### **Countdown To The O3b Launch**

With the introduction of its core IP Trunking product, O3b Trunk complete and the launch of its initial eight-satellite constellation fast approaching, O3b is implementing seven strategic global gateways around the world. The first two teleports are under construction in Greece and Hawaii.

The command and control sites will soon be feeding the high-capacity, IP bandwidth set to eventually play an integral part in transforming the emerging world.

"As we get closer to the launch of O3b there is a real sense of excitement," said *Collar*, referring to a growing customer lineup expected to number in the dozens by liftoff. And the satellite operator's vision of closing the bandwidth gap is on the cusp of reality. "Our ability to enable whole countries, communities and companies to tap into a brighter, connected future is the main reason people work at O3b."

It's the biggest motivation for telecom and service providers that have already staked their claim to O3b capacity, ready to elevate their businesses and their customers in an increasingly connected world." ↵

For more information regarding O3b Networks or O3b Trunk, visit [www.o3bnetworks.com](http://www.o3bnetworks.com)

### **About the author**

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O3b's CEO, Steve Collar, with Mavoni Technologies' CEO, Tinyiko Valoyi

## The Connectivity Connection

by *Rashid Baba, Director of Product Management, Thuraya Telecommunications Company*

**'Data' is not just a buzzword. It's a global business phenomenon that's rapidly escalating into multi-billion dollar revenues for the communications industry. Broadband connectivity for all is top of the agenda for leading telecom organizations and governments around the world. Short-term forecasts dictate that certain Middle Eastern countries are set to overtake Western Europe in Long Term Evolution (LTE) 4G wireless broadband technology penetration. However, despite accelerated efforts in the Middle East to ease accessibility to broadband services, available networks are still behind the curve when it comes to addressing market needs. As a result, in many areas, broadband penetration remains quite low, particularly in remote areas located outside of urban centers.**

This is where satellite communications come to the fore; the most reliable and convenient choice for high-speed data services in remote areas, satellite communications serve as the ideal alternative. As a market-leader in satellite voice products, and a recognized mobile satellite solutions (MSS) operator in the Middle East, **Thuraya** is using its technical knowledge to enable broadband service across the region, in even the most remote areas. Thuraya's powerful, robust network and portfolio of innovative products allows subscribers to create remote office capabilities with the same functionality of those equipped with modern communication tools.

**Thuraya IP**, the world's smallest satellite broadband solution to support 384 Kbps streaming, lies at the heart of the broadband offering, delivering 444 Kbps standard IP and backed by a dominant network that features unique capabilities to ensure constant connectivity. Specifically designed to be one of the most powerful in the world, Thuraya's network benefits from 'high gain spot beams', a system that allows vast numbers of simultaneous users at any one time; far more than some of our competitors. In addition, the network is able to intelligently and instantly move bandwidth around various coverage zones (more than 140 countries), enabling areas with large surges in traffic to benefit from additional resources, making sure congestion is avoided and robust communications is maintained. These qualities, combined with the innovative design, size and functionality of Thuraya IP, appeal directly to various vertical markets in the Middle East.

One of the prime examples is the broadcast media. Thuraya IP is the solution of choice to relay live video transmissions to studios in separate locations, particularly during breaking news alerts. In Sudan, prominent events such as the elections and referendums were instantly available to viewers due to the advanced streaming capabilities of the product from remote areas.

Broadcast is, by nature, a fast and competitive industry where news channels fight to break stories and update compelling issues as they happen. To be able to gather news quickly and efficiently, broadcast media channels require compact, portable and highly mobile satcom broadband services, especially in hotspots. Again, Thuraya IP proves to be a most authoritative choice; it is the only mobile satellite broadband terminal to be A5 sized and weighs 1,300 grams, easily fitting alongside broadcasters' equipment. Additionally, the solution supports a full media solutions suite and is the only satellite broadband terminal to provide asymmetric streaming, which allows consumers to select their upload and download speeds, resulting in impressive cost savings. Typically, reporters in the field will upload video to the studio, a process that uses a large amount of bandwidth. However, they do not need to receive large files in return. Most operators have a pricing structure based on uploading and downloading the same amount of content, Thuraya does not

have that pricing structure. Our asymmetric streaming means you pay only for what is used, making it a far more cost-effective option.

Similarly, in North Africa, the Company has witnessed a growth in adoption of Thuraya IP by large energy corporations. Key features for this particular market were, again, size and mobility, both of which are extremely important during exploration phases. The terminal's reliability and powerful supporting network were also deciding factors. Whereas VSAT alternatives are affected during bad weather conditions, Thuraya products are not so affected.

Portability is also key. The lack of large antennas and extra engineers to carry them makes Thuraya IP a simple, affordable option. Enabling constant communication with head office is vital, but just as important is the 'feel-good' factor for users. The offering allows access to applications such as *Skype* and other web-based software, enabling users to remain constantly in touch. Most importantly, the terminal supports industry-specific applications that facilitate operational efficiency.

Government organizations in Saudi Arabia depend on Thuraya IP for border control. NGOs such as the United Nations use the solution for refugee control operations in the MENA region. The solution is also deployed as a backup for ATM machines in remote areas as well as in the mining sector. Miners tend to be located in areas that provide limited terrestrial coverage making the spacebased nature of the Thuraya network highly appealing. Moreover, as Thuraya IP is a plug-and-play system, it requires no additional software for operation and does not demand sophisticated programming which also adds to its attractiveness among all these mentioned vertical market segments.

Thuraya IP's success across vertical markets, and even with individual users is based on its key qualities: Power, portability, reliability and ease-of-use. When these qualities are combined with affordable packages, there's little competition from the marketplace. The robust network, specifically designed by the Company to handle high volumes of simultaneous users and minimize congestion, has proven to be a key deciding factor for many customers and Thuraya is extremely proud of this fact.

Over the coming years as Thuraya continues its product innovation and produces further upgrades of its powerful network, the market can expect an exciting evolution in the mobile satellite services industry, of which Thuraya will be a key player. ➡







# Executive Spotlight

## Nigel Gibson, Vice President, Telesat

Nigel Gibson is Vice President International Sales for Telesat, where he is responsible for expanding use and revenue on the Company's international fleet. These satellites include: *Telstar 11N* and *Telstar 12* which mainly serve the Americas and EMEA regions, *Anik F1* and *Telstar 14R* that serve the Americas, and *Telstar 18* over Asia. A new satellite to be launched in the second half of 2012, *Anik G1*, is now under construction by Space Systems/Loral and will offer coverage of both North and South America.



Telesat has posted a strong record of success since its merger with Loral Skynet in October 2007 and — industry experts have noticed. Telesat was named “Global Satellite Operator of the Year” in 2010 by Euroconsult and Satellite Finance. This award was followed by a World Teleport Association survey of its operator-members worldwide in which Telesat was named the satisfaction leader on both operational and commercial factors among the Big Four FSS companies (Intelsat, SES, Eutelsat and Telesat).

Latin America has been a focus of Telesat's since the 1990s. The company has considerable capacity over the region with four satellites — *Anik F1*, *Telstar 11N*, *Telstar 12*, and *Telstar 14R* — and will be adding *Anik G1* next year. *SatMagazine* was pleased to meet with Nigel Gibson and hear his views on the Latin American satellite market, its key demand drivers, along with opportunities and challenges for both operators and customers in the region.

### *SatMagazine (SM)*

*Welcome to Executive Spotlight, Nigel. Latin America has become a leading regional market for the FSS industry with new satellites, new sources of demand, and stable prices. How do you assess these trends?*

### *Nigel Gibson*

These trends are real, and quite exciting, for Telesat and our industry. One of the factors behind all the excitement is what I would call the “Latin American turnaround.” In the 2005 time-frame, analysts sized the market at about 500 C- & Ku- transponders and forecasted very modest growth for the region to 2010 — some 40 new transponders with a CAGR below two percent. What actually happened is that C- & Ku- demand increased by more than 200 transponders to 2010, placing Latin America's growth among the highest of any FSS region in the world. The demand outlook to 2015 is now equally as strong.

### *SM*

*A turnaround like that is obviously very impressive and always gets people's attention when a region, or a sports team, goes from “worst to first.” Is this simply a matter of economic growth?*

### *Nigel Gibson*

We have seen that economic growth — wherever it occurs — is a main driver of satellite demand. An expanding middle class can afford payTV services that lead to rising subscriber numbers that attract new video platforms and providers who require satellite capacity. Governments have more tax revenue to pursue digital inclusion projects — the expansion of satellite broadband. Businesses have the need for improved communications to gain efficiencies and sell to new markets.

All of these elements contribute to increased satellite demand. However, in Latin America it's been more than just economic growth. The market and regulators have come to recognize the many advantages that satellites can provide to a vast region with limited terrestrial services. When Telesat does business in the region today, we often deal with sophisticated customers who are already sold on satellites and have the authorizations in hand along with the expertise to rapidly implement a new network or service. This is a big change from just a few years ago.

### *SM*

*Telesat launched a new satellite in May, Telstar 14R, that was to bring significant new capacity to Latin America. The satellite's north solar array failed to fully deploy after separation from its launch vehicle. What impact is this anomaly having on Telesat's Latin American plans?*

### *Nigel Gibson*

*Telstar 14R* began commercial service in July and is performing well at its **63 degree West** location. Although the satellite did not bring all the new capacity we had planned on receiving, there is still a fair amount of good news for our customers. First, about 60 percent of the satellite's total planned capacity can be used. Second, *Telstar 14R* has brought more than a 50 percent increase in Ku-band capacity to Latin America compared to the satellite it replaced at **63 degrees West**, *Telstar 14*. This means more service opportunities for our customers and an expanded presence for Telesat in the region. Of course, we would still like to have even more Ku-band to meet rising demand, but *Telstar 14R* is proving to be an important addition to the Latin American market.

### *SM*

*What about your new Anik G1 satellite under construction? Will that also increase Telesat's capacity over Latin America?*

### *Nigel Gibson*

*Anik G1* is a multi-mission spacecraft that will serve the Americas as well as the Pacific Ocean region with X-band for the military. It is scheduled to launch in the second half of next year and will be co-located with Telesat's *Anik F1* at **107.3 degrees West** that already serves South America. *Anik G1* will match *F1*'s Ku-band capacity over the region and double *F1*'s C-band transponders that serve South America. *Anik F1* is highly used today, but the added C-band of *G1* creates opportunities for video distribution that we are currently exploring with in that market. *Anik G1* has full coverage of South America with high C-band power over much of the continent including Brazil. There continues to be strong demand for C-band over South America. The *2014 World Cup* and the *2016 Summer Olympics* in Brazil will add to this. Telesat's planned launch of *Anik G1* next year is stirring a great deal of interest.

# Executive Spotlight



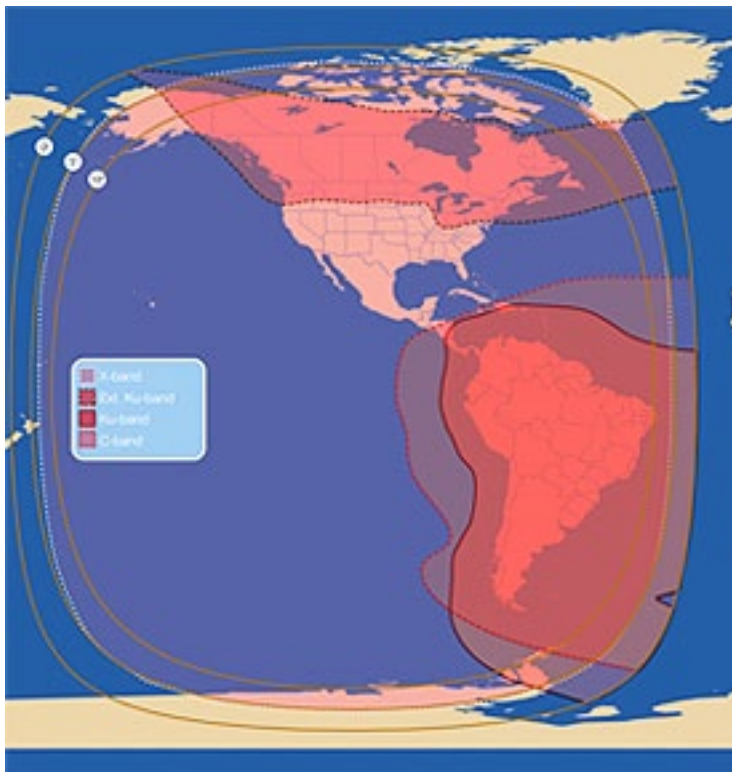
Telesat's Anik G1 satellite

**SM**

*Telesat has had a presence in Latin America since the 1990s and has really established itself as a leading FSS operator in the market. What do you see as some of the keys to your success?*

**Nigel Gibson**

We are obviously pleased with the way the market has developed but, in addition to that, Telesat made a big commitment to Latin America early on. In 1999, we launched **Telstar 12** located at **15 degrees West**, which has excellent Ku- coverage over



Anik G1 South and North American footprint

much of the region. In the same year, Telesat had the winning bid with **Anatel** to secure Brazil's **63 degree West** slot for **Telstar 14/Estrela do Sul**. A year later Telesat launched Anik F1 with extensive South American coverage in C- & Ku-. Today we have a number of people employed in Brazil and most of our business activities in the region — sales, engineering and operations — are carried out at Telesat facilities in Rio de Janeiro and Belo Horizonte. Much of our success has to do with the commitments we made to the region early on, along with our focus on service, quick response, and adhering to business practices that support our customers, versus competing with them. Telesat was very pleased that the **World Teleport Association** survey of teleport operators issued earlier this year acknowledged the value customers place on Telesat's business practices.

**SM**

*What types of demand are you seeing in the region today?*

**Nigel Gibson**

Main demand drivers in Latin America are well known to most readers and include video — both DTH and cable distribution, along with data for enterprise and government services. Cellular backhaul is another key driver of demand with the surging growth in web access from smartphone subscribers across the region. Telesat is also seeing good demand from the resource sector that consists of oil & gas companies operating in-region as well as those based in Europe and the Middle East seeking to reach across the Atlantic to countries like Brazil, Bolivia and Colombia. Telstar 12 is an ideal solution for this type of requirement going from a headquarters location in Europe and the Middle East to Latin America.

**SM**

*What are some challenges Telesat is finding in doing business in the region?*

**Nigel Gibson.**

We feel we are very well positioned at this time. Although additional C- & Ku- capacity is expected to come to the region over the next few years, there is the possibility of creating "excess supply" for operators, I believe demand will be strong enough to avoid this situation.

**SM**

*This is all very interesting, Nigel. We are sure our readers will appreciate your insights. Any other thoughts on Latin America?*

**Nigel Gibson**

Telesat greatly values its role in Latin America and we believe the region has much to be proud of. The economic crisis that affected so much of the developed world and is still roiling financial markets did not have the same effect in Latin America. Economies across the region are better managed and more resilient today and this is resulting in continued strong demand for satellite services from both businesses and the government sector. Many analysts see the long term outlook for Latin America as highly favorable, and Telesat is pleased to be delivering the types of satellite solutions that are making economic growth possible. ↩

## *VSATs: The Key To Mobile Connectivity In Africa*

*by Peter Tuomey, Marketing Director, Altobridge*

Satellite technology plays the single most important role in delivering connectivity to rural and remote village and enterprise communities throughout Africa. The vision of a ubiquitous fiber infrastructure across Africa is a noble but unrealistic aspiration. As such, VSAT deployments will continue to form the basis for rural connectivity for the foreseeable future because they deliver the only affordable, cost-effective and reliable means to reach the parts that other transmission technologies cannot.

However, is VSAT technology yet delivering to its full potential? At the recent *VSAT 2011 Forum* in London, a **Maxis** executive outlined a compelling case study for maximizing VSAT assets in the context of rural and remote communities, simply by bundling nano / pico-GSM base stations with VSAT technology. Through the use of such technology, remote enterprise communities — for example, remote palm oil plantations throughout Malaysian Borneo — could enjoy the economic and social benefits of mobile voice and mobile data connectivity, using the enterprises' existing VSAT terminals to provide the GSM backhaul.

This initiative runs contrary to the common supposition among mobile operators and regulators globally that network expansion beyond urban strongholds is commercially unviable due to high truck-roll costs, lack of backhaul infrastructure, an absence of cost-effective, reliable power sources, low consumer uptake and fearfully low ARPU's.

Central to this widely held view lies a perception that satellite backhaul is fundamentally too inefficient and, therefore, too expensive as a means of backhaul, particularly in low subscriber communities. That is, indeed, the case for standard 2G or 3G bases stations, which are manufactured with urban deployment



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**The unique Split Architecture of the solar-powered Altobridge lite-site™ saves power by eliminating data transfer over the satellite link when no calls are being made, while other features enable power saving as calls are in progress. It also restricts the use of transmission bandwidth to times when only revenue-generating traffic is being transmitted. The lite-site pictured here is in a North African setting.**

solely as their main thrust. However, for GSM base stations designed purely with a satellite backhauled, remote community connectivity in mind, the picture is altogether different.

For instance, a two-transceiver, outdoor and passively-cooled GSM base station, serving the needs of as many as 1,000 subscribers in a remote village or enterprise community, requires only 50kbps of satellite bandwidth capacity. Across Africa, that represents a monthly OPEX in the range of only USD\$300 per month. In business-case terms, that same remote site, with 750 mobile subscribers each generating a monthly ARPU of USD\$3.50 — or higher in many cases — is delivering a monthly revenue of USD\$2,625, and because each deployment is solar powered, the USD\$300 backhaul cost is the only OPEX cost incurred to be offset against the revenue.

This ‘VSAT asset sweating’ delivers purely incremental and profitable subscriber and revenue growth for mobile network operators and VSAT service providers as well as delivers a key secondary benefit — mobile voice and data connectivity for the remote enterprise workers and villagers.

These low-cost, solar-powered, mini-tower, or pole-mounted BTS solutions, have already been deployed in enterprise and village communities in the Middle East, Asia and Africa. In Niger for instance, **Orange™ Niger** has already deployed the **Altobridge lite-site™** solution throughout the country. From Tabelot and Bazagor in Central Niger to Dingazi Banda in the west, agro-pastoral communities are now, for the first time, reaping the social and economic benefits of mobile connectivity.

#### **About lite-site™**

The Altobridge lite-site is a combination of two Altobridge breakthrough technologies — **Split Architecture™** and **Local Connectivity™**. Together with a cost-effective remote base station, the **altoPod™**, mobile network operators (MNOs) can bring telecommunications services to isolated areas at low cost. ➡

#### **About the author**

Peter Tuomey is the Marketing Director for Altobridge



# A Case In Point

## The Flight To SATCOM

by Andy Beers, Director of Aeronautical Sales, Thrane & Thrane

**The integration of a revolutionary small and lightweight SATCOM system aboard his aircraft has enabled practical use of time for Citation jet owner, Ulrich Spranger.**

For many business executives, travel has become a common element of everyday working life. Globalization has seen larger organizations develop an International presence, with offices located worldwide. Whether taking a domestic or overseas flight to visit another office or customer, taking time out of work to travel is often considered an inefficient use of time and resources.

With the digital age firmly taking hold, more opportunities have become available for business jet travellers to stay connected while on the move. Thanks to the introduction of services such as *Inmarsat SwiftBroadband*, aircraft operators and passengers are now able to benefit from the wide range of applications provided by high-speed Internet. Whether it's

catching up with emails before the next meeting or taking a conference call en-route to the next destination, the business-class passenger is now able to stay connected as the office-in-the-sky capability becomes a reality.

This has been the case for **Jarltech** CEO and Owner *Ulrich Spranger*, who recently purchased a **Cessna CJ1 model 525** aircraft with the view to significantly improving business efficiency. He said, "We are frequently required to travel to other office locations throughout Germany and the rest of Europe to meet with business partners and customers. Due to the nature of our business, it's vital that our travel does not impact productivity, so in purchasing the aircraft the availability of satellite communications was a key consideration."





# A Case In Point

## Better Connected

Until recently, aircraft such as Ulrich's CJ1 525 now named '**D-INER**', would not have been suitable for installation of a SwiftBroadband solution, but thanks to Inmarsat's launch of the **SwiftBroadband SB200** service last year, the availability of high-speed connectivity for smaller business jets has been made possible. Designed specifically for compact and lightweight satcom terminals to allow for an easier and more cost-effective installation, the SwiftBroadband SB200 service enables owners and operators of smaller aircraft to take advantage of a host of affordable in-flight communications services including voice calls, text messaging, emailing and Internet surfing.

Spranger continued, "It makes a lot of business sense to be able to work from the aircraft when travelling from one destination to the next. While in the air, I find I have more time with minimal interruptions, so I'm free to make calls and send emails as if I was in my office on the ground. For me, and many of my employees, this provides an added benefit that when we arrive we feel more prepared knowing that we have been keeping up to date with our work while in-flight.

"The need to stay connected when on the move has never been so important. I often notice commercial flight passengers, who when the plane has landed are using their iPhones® and Blackberrys® at the first available opportunity to check emails and get back in touch with the office. While I fully understand this pressure, if you can do that while in the air it's a much more effective use of time, in my opinion. When I arrive back from a business trip, I can rest assured that I don't have to spend extra time catching up, giving me more time to relax with my family when I am at home."

## Wi-Fi™ Capability

The SwiftBroadband system installed aboard Spranger's D-INER aircraft is **Thrane & Thrane's AVIATOR 200**, which was the first SwiftBroadband SB200 system to be introduced to the aeronautical market. Compact and lightweight, the AVIATOR 200 system provides data speeds up to 200 Kbps and a single AMBE two-channel for voice calls. The innovative system also features built-in Wi-Fi capability, making it very easy for aircraft owners and operators to offer wireless connectivity aboard.

"Aside from the use of traditional devices such as laptops and mobile phones, there is now also a growing trend for passengers to use personal tablets and smart phones to quickly and efficiently access the hub of information available online. The introduction of SwiftBroadband SB200 fully supports this by offering wireless connectivity and ensuring users of iPads®, iPhones and Blackberrys can continue during the flight," explained *Andy Beers*, Director of Aeronautical Sales for the Americas region, Thrane & Thrane, as well as the author of this article.

"The application for Wi-Fi enabled products reaches far beyond passenger use in the cabin and has begun to filter into the cockpit providing pilots and crew with access to extensive data at their fingertips. This is already proving useful for flight



# A Case In Point



Thrane & Thrane Aviator 2000

crews, offering access to real-time weather updates for example, and has sparked much debate about the replacement of traditional processes with this modern and innovative technology in the future,” Beers added.

## Endless Opportunities

The availability of high-speed connectivity to support a wide range of communications applications also offers a significant benefit to charter operators, adding value for their customers. For this reason, Ulrich Spranger is also making D-INER available to charter through German-based operator MACH airlines. He explained, “With the rise in demand for in-flight connectivity, we believe the integration of the AVIATOR 200 satellite communications system will make the aircraft extremely appealing to the charter market. In the same way that we benefit from in-flight connectivity, charter customers will be able to take advantage of the wide range of communications services provided aboard, whether it is for business or recreational use.”



Ulrich Spranger,  
CEO of Jarltech

the capability to improve productivity for business executives who regularly travel, which made it a deal maker in the decision to purchase D-INER. Without it aboard our aircraft, I don’t think I would ever be able to leave the office!”

Spranger concluded, “Thrane & Thrane’s AVIATOR 200 is a great system for smaller aircraft offering a communications solution at the right performance and right price. The system is very easy to integrate with the aircraft and has



Whatever its application, the launch of the SwiftBroadband SB200 service and systems such as the Thrane & Thrane AVIATOR 200 has, and will continue to offer, a complete communications experience to a much broader range of aircraft, where this was not achievable before. For aircraft owners such as *Ulrich Spranger*, the AVIATOR 200 offers a special benefit of increasing productivity, allowing him and his team to use their time more efficiently as well as stay connected via the latest office-in-the-sky technology. ➡

## About the author

Andy Beers joined Thrane & Thrane in January 2007 as North American Channel

Sales Manager. He currently holds the position of Director, Aeronautical Sales for the Americas Region. He is responsible for sales of Thrane & Thrane’s portfolio of SATCOM solutions to both business aviation and military/government market segments. Beers has been in the aviation industry for over 15 years. Prior to joining Thrane & Thrane, he led sales activities for a well-known aircraft electronics manufacturer, Rosen Aviation, as Vice President of Sales & Marketing and was a member of its leadership team. During his career, Beers has worked directly with aircraft OEM accounts as well as retrofit and refurbishment centers world-wide.





## *Fleet Fortunes*

*by Richard Pak, Chief Development Officer, Asia Broadcast Satellite*

Since its inception in 1996, Asia Broadcast Satellite (ABS) has grown from a single-satellite operator to operating a fleet of satellites that include ABS-1 (flagship), ABS-1A, ABS-7, ABS-3 (scheduled for operations December 2011) and ABS-2 (under construction and scheduled for launch 1H 2013).

Over the past year, ABS has recorded impressive growth with acquisitions and strategic partnerships that have expanded the company's business and goals. ABS has secured key partnerships in the region offering transponder lease to multi-platform satellite-based data and telecom service providers. ABS has also added prestigious broadcast customers such as **MTV Asia**, **Outdoor Channel** and **ITV**. The Company has also successfully established the **75 degrees East** orbital position as the preferred DTH video neighborhood.

In December of 2010, ABS established an office in Dubai to expand its presence and to meet the rapidly growing demands in the Middle East and Africa.

**ABS-1**, **ABS-1A** and **ABS-7** collectively offer significant C- and Ku-band capacity directly over the Middle East region

with broad coverage, as well as unique Ku- and Ka-beams that target specific regions over Pakistan and Afghanistan and neighboring countries.

The Middle East is experiencing tremendous growth in VSAT deployments for corporate networks and rural demand for broadband and telecommunication connectivity. Serving this region, ABS's Bahrain teleport is equipped to support **iDirect** hub-based applications, IP Backbone connections, and Co-Location services.

Africa, as a huge landmass, offers tremendous opportunity to satellite operators. There is a distinct advantage in serving this region versus other terrestrial communication networks. Fibre connectivity, although gaining ground in the continent, is still limited to coastal areas. Fibre penetration inwards to Central





Africa and the sub-Saharan region is usually slow and unstable, if available at all. The sub-Saharan region has high potential for Internet connectivity required by ISPs and voice backhauling for the telecommunications industry. This is where satellite services come into play with great effect.

**ABS-3** (3 degrees West) scheduled for launch in December of 2011 will provide additional C-and Ku-band capacity for the sub-Saharan continent with a most competitive pricing model. Although satellite bandwidth may not be able to currently compete with fibre on price, it does offer a reliable and competitive value proposition. This will be further supported with the launch of **ABS-2**, scheduled for the first quarter of 2013.

In addition to the growth of the satellite fleet, ABS is also working on its ground facilities to support services for Africa. Discussions are underway for new facilities in Nairobi and Dar Es Salaam that will allow for the provisioning of end-to-end satellite systems for VSAT, Internet trunking, and GSM backhauling.

ABS-2 will be one of the most powerful commercial satellites launched for service in the Eastern Hemisphere. The satellite have 87 active C-, Ku- and Ka-band transponders across 10 different beams, bringing increased capacity and transmission power to the Middle East, Africa, Asia Pacific, and CIS/Russia, and will be co-located at 75 degrees East.

The satellite will also feature switchable beams that can be re-oriented to blanket a particular region when demand for current orientations and coverage arise. ABS-2 is specifically designed for a wide range of satellite services. ABS-2 will provide continuity of service and expansion capacity to existing ABS-1 customers, and will also act as in-orbit spare and provide full backup for the ABS-1 transponders. ↵

## *About the author*

Richard Pak is the Senior Vice President of Business Development for Asia Broadcast Satellite (ABS). He has spent more than 14 years as an IT and Telecom professional. Mr. Pak moved to Asia in 1999 as the Regional Managing Director of the Business & Enterprise Services unit for Yahoo Inc. covering Korea, Hong Kong, Taiwan, China, Singapore, India and Australia. Mr. Pak was one of the original Internet pioneers of broadcasting and streaming technologies and built the world's first and largest Internet broadcast company (Broadcast.com) in 1995. He helped to grow Broadcast.com into the leading Internet destination for multimedia programming and took the company public in 1997, breaking NASDAQ's record for its most successful IPO. Subsequent to the phenomenal success of the IPO, Mr. Pak played a critical role in completing the merger with Yahoo Inc. totaling more than USD \$5.7 billion. Richard Pak is a graduate of Texas A&M University in Mechanical Engineering and Business Analysis with post-graduate studies at the University of Texas in Austin.



## Careers: The Road To The Future

by Bert Sadtler, President, Boxwood Executive Search

These are extremely challenging times for those seeking new careers, whether by choice or not by choice, today companies' economics compel them to re-assess their staffing needs. The bad news is that qualified professionals are finding themselves suddenly faced with the need to seek new positions... the good news is that the satellite communications industry remains ripe with new opportunities. Finding such opportunities can sometimes be a rather difficult proposition.

To assist with career searches, we asked Bert Sadtler of Boxwood Executive Search to respond to readers' questions regarding the processes of recruitment and hiring as well as how Companies can retain crucially-needed talent. Boxwood is located in the Washington DC region and has success in senior level recruitment in satellite communications, government contracting, and within the intelligence community. If you would care to submit a recruitment, hiring, or retention question specific to our satellite communications and related industries for Bert to answer, please email your question to [BertSadtler@BoxwoodSearch.com](mailto:BertSadtler@BoxwoodSearch.com).



***This issue's inquiry** — With economic times being tough and unemployment at a high level, why is our company having a hiring challenge? Our HR department has posted the opening for: Director of Business Development, Federal Sector. Candidates must possess a combination of technical SatCom expertise and demonstrated sales experience. We have received more than 50 resumes and have spoken directly with a few who turned out to be unqualified candidates. What are we missing?  
Regards — D.H.*

***Bert's reply...***

Dear D.H.,

Despite the perception of a flood of available people, there is a war for top level talent. The professionals you want to hire can make a big difference to your organization. Attracting them is not always easy.

Keeping in mind that good recruiting is more of a business function and less of an HR function, here are a few observations, questions and suggestions:

Was there a thorough discussion and preparation with the business unit leadership prior to announcing the position opening? Is everyone in synch?

Is your hiring timeline realistic? A failed hire costs an employer 5-10 times the first year earnings. Getting it right really matters. Realistic expectations can range from 30 to 120 days.

Has a detailed position description been created that is more than a summary of duties? Why would someone join your company? What makes you special? Best to tell your story and "sell to the talent before you buy".

Has the hiring manager (line of business manager) been involved in defining the technical requirements and developing an interview process to determine a candidate's cultural fit? Since the new hire is reporting to the line of business manager, best results require active involvement from the beginning to the end by the hiring manager.

Are you being specific enough? A solid recruitment campaign should yield approximately a dozen solid candidates which would then be reduced to three to five highly qualified candidates for the final round of interviews.

Results should not focus on a large number of resumes. Actually, an unmanageable number of resumes suggests the position description was not specific enough.

Has there been an internal announcement to all employees for the opening? Networking internally through your employees keeps them in the corporate loop, embeds employees with the company's focus and supports employee promotions.

Have there been discussions with industry colleagues and partners? Industry networking can also serve as a form of corporate advertising.

Have processes been implemented to respond to ALL candidates in a timely matter? (Good potential candidates could have slipped by).

Are you willing to be flexible? If responses are poor, it may be time to tweak the position description by altering the requirements, changing the responsibilities or adjusting the compensation. Hope you find this helpful to put yourself in a position to attract, acquire and retain a top level professional.

Best regards — Bert Sadtler ↵





## The Academy Approach

by Martin Crawley, Bridge Technologies

**Digital media operations are the wild frontier. With the hybrid of technologies involved in delivering media to the TV-anywhere audience, and the continual rapid evolution of platforms, formats and business models, there's little chance that any digital media operation will stand still for long.**

This rolling revolution means that, industry-wide, there's no base of traditional skills and know-how to apply to the task of planning, building and maintaining digital media operations. Technical personnel with broadcast knowledge are only partly equipped, as are experts in the IT/IP domain. Hybrid delivery chains encompass both sets of skills, and some new ones as well. Because one thing that broadcasters and telcos realize quickly when they enter into the digital media game is that the whole is much more complicated than the sum of its parts.

There are many reasons for this. Without going into a great deal of detail, it's the interaction between the broadcast and IP domains that throws up new situations and problems that neither IT experts nor broadcast engineers will have previously encountered. Add to that the continual evolution of the technology and this means that the standards for monitoring parameters are, in many cases, outdated, leaving ambiguities that can lead to misunderstandings about the really important parameters for digital media monitoring in the real world.

It's for these reasons that, since its inception, **Bridge Technologies** has recognized the importance of training and a sustained initiative to educate the industry about monitoring and analysis in the hybrid media world. A large part of this effort is, of course, dedicated to in-depth training on the **VideoBRIDGE** system, but that in itself would not be completely effective as a sound understanding of the context in which the tools are deployed is almost as important.

The background of Bridge Technologies' founders is in digital media delivery — the Company's combined real-world experience in the field has revealed two important facts: That digital media delivery is a distinct world in and of itself, with its own rules and phenomena; and that knowledge and understanding of this world is scarce.

The recognition that media organizations — including Bridge's own customers and business partners — often lacked the specialized knowledge the firm had acquired through commercial operations in the field. The organizations were, therefore, not in a good position to plan their monitoring strategies. Without such

knowledge the organizations could not fully realize the capabilities and potential benefits offered by Bridge's unique monitoring solution. This led to the establishment of the **Bridgetech Academy**.

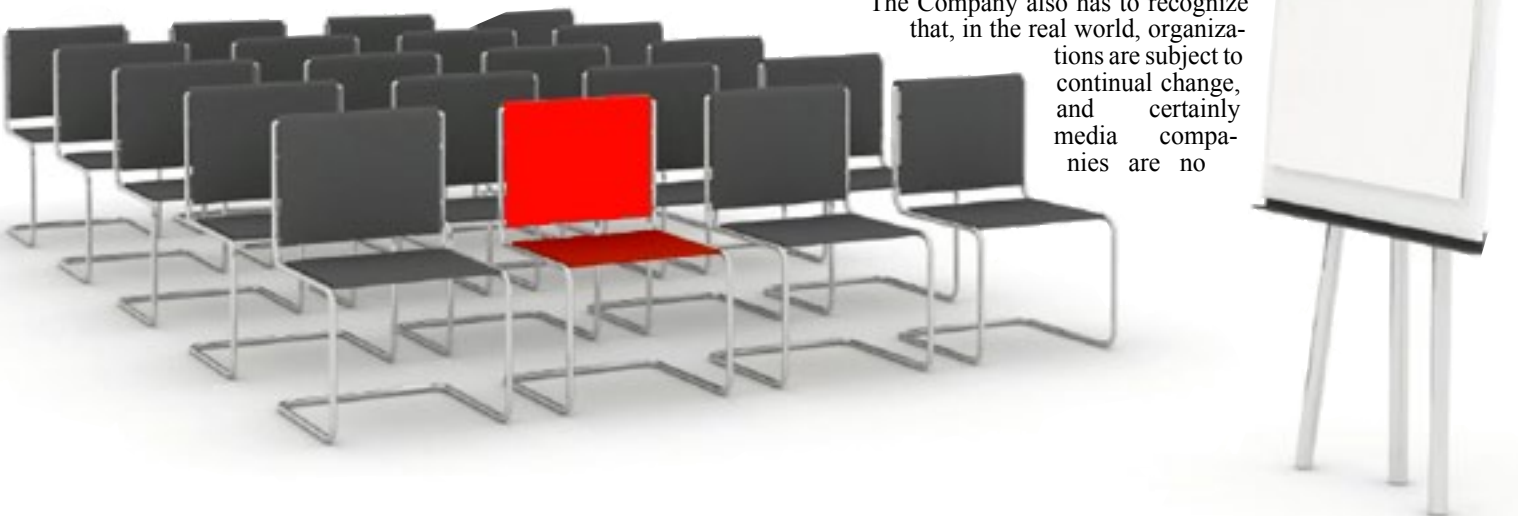
The Academy aims to span the gap that exists between the broadcast and IP worlds — a solution provided by the VideoBRIDGE system itself. A media organization may always need its broadcast engineers, and its IT/IP specialists, but in a hybrid delivery system, it's a distinct weakness if those two groups know nothing of each other's territory.

Part of what is targeted to achieve with Academy courses is an understanding that spans broadcast and IP, with enough common knowledge for a broadcast engineer to understand what happens to the signal when it passes through stages of IP transport, and for IP engineers to appreciate how to keep that broadcast signal in good condition. In other words, when the data moves from broadcast domain to IP transport stream (and possibly back again), the new breed of engineer should feel quite happy crossing that threshold, as well.

Armed with this knowledge, Academy graduates should be in a good position to help their organizations plan the best possible monitoring strategy. There is no one-size-fits-all approach to this: The diversity of operating models and variety of legacy infrastructure ensures that any two organizations will have quite different requirements. However, with the correct background knowledge and expertise gained through the courses, anyone should be able to make the right fundamental decisions about network topologies, monitoring points, integration with high-level facility management systems, and so on.

The pace of development being what it is, there's always a new technology for our customers and business partners to come to grips with — Bridge Technologies has always pursued an aggressive product development schedule that results in new features and functionality with every release. It's important that Bridge's customers and business partners are kept abreast of these improvements.

The Company also has to recognize that, in the real world, organizations are subject to continual change, and certainly media companies are no





exception. With infrastructure project cycles often lasting more than 12 months, and sometimes running into years, a great deal of time can elapse between the decision to buy, the design and deployment phase, and the launch of day-to-day operations. At any point along the way, changes of management or personnel can mean that expertise in the organization is lost. As it takes both tools and expertise to get the job done, the Academy serves a vital purpose in ensuring a continuity of knowledge.

Customers also can use the Academy to train new staff as they are recruited. This serves the dual purpose of acting as a rolling training update program as the technology develops and new features and functionality are added — all of which need to be understood and integrated into the customer's monitoring and analysis operation.

Until recently, the Academy ran their courses either at Bridgetech's Oslo base, or on the customer's premises. Now Bridge is expanding on that by adding additional methods of training to better fit in with our partners' needs and availability. More use of webinars, either in one-to-one or one-to-many sessions, are planned. Additionally, the training will be modularised in order for users and partners to tailor the training session to fit their exact needs. Regular on-line briefing sessions will be added to ensure users remain up-to-date regarding new features, and tracking tools will be added to maintain profiles of individual training delegates — such will enable Bridge to further target training course and keep partners current. ➡



#### *About the author*

Martin Crowley is a senior product manager at Bridge Technologies and the Head of the Bridge Academy

#### *About Bridge Technologies*

Bridge Technologies was founded by a team of people with solid backgrounds from the broadcast, telecommunications and media industries. With deep knowledge of the marketplace and industrial product development, Bridge Technology products have been deployed in a large number of networks worldwide.

The Company's main focus is the area between the broadcast and telecommunications spheres. Bridge Technology systems is acting as a facilitator between the two, giving equal access and a common paradigm of understanding media flow from two different perspectives.

The dramatic drop in cost of bandwidth, storage and processing power is changing *everything* in the networking space. Bridge Technologies is working to make these technical advances also benefit content production in the television and video industries.



Conversely, broadband network operators see benefits in moving into the multiservice offerings of telephony, Internet, mobility and television. Bridge Technologies is working to make this transition as seamless as possible for operators.

Bridge Technologies Co AS is a privately held company with headquarters in Oslo, Norway, and has worldwide sales and marketing operations through business partners in the European, U.S. and Asian markets.



# A Case In Point

## A Stable Connection

by *Katerina Stemberova, Marketing Manager, Vizada Networks*

Connectivity across Africa is continuously evolving and regardless of the wider availability of subsea fibre, C-band and Ku-band VSAT is still the medium of choice for businesses and organisations based, or working, on the continent. Vizada Networks' Katerina Stemberova reviews the current SATCOM situation...

The 'Agence universitaire de la Francophonie' (AUF), is an organization established to support higher education and research facilities that have selected French as their teaching language for all, or part, of their curriculum. AUF, which celebrates its 50th Anniversary this year (2011), is present on every continent, has 67 branch locations operating under nine regional offices and 779 member universities, which cover millions of students.

With headquarters at the campus of the **University of Montreal** (Canada-Quebec), it is dedicated to supporting mostly French speaking universities by fostering scientific cooperation, training and development, supporting research and excellence and enabling the sharing of expertise.

The AUF is a leader in the use of new technologies for training and research and is dedicated to achieving easier and cheaper means to share available resources between all universities. To achieve this, the organization requires reliable and stable communications between its sites and the universities it supports. The AUF has been using **Vizada Networks** connectivity services for a decade and currently has installations at seven sites for the **AUF African Great Lakes** office, providing the connectivity backbone for its 'Digital Campus' facilities.

### *Dedication To Sharing*

SATCOM services are used to connect the Digital Campuses, which are open to students, university teachers and researchers.



AUF Digital Campus at Ngozi University.



# A Case In Point



AUF Digital Campus at Ngozi University.

They enable distance learning, access to electronic resources for researchers, training on new technologies and access to the Internet, so are vital to AUF's operations in Africa and around the globe.

Currently, Vizada Networks provides an extensive list of shared and dedicated services to AUF offices and supported colleges in the African Great Lakes. The dedicated services are based on **Viznet Broadband** and offer between 256/512kbps and 256/2560Kbps depending on the site. With a mix of 2.4m and 3.7m C-band antennas the majority of sites using Viznet Broadband also have on-site installation services, remote support and space segment network management from the *Vizada Networks European NOC*.

Digital Campuses are a direct result of the AUF's dedication to sharing. They are physical and digital spaces where students, professors and researchers can communicate, form groups, access information and develop new scientific projects. Through videoconferencing, distance learning, ICT training and digital journals, Digital Campuses connect the AUF's university members, supporting collaboration and communication.

A Digital Campus, such as the one for Bujumbura, for instance, receives more than 16,000 visits from teachers, researchers and students a year so the AUF is reliant on stable connectivity regardless of the local environment. Users can find digital scientific documentation and can enroll in numerous information and communication technologies programmes, which support academic development through collaboration and sharing.

When looking for a connectivity provider, the AUF, like most African businesses and organizations, made comparisons in terms of balance, quality, service and cost. The service offering by Vizada Networks was recognized as hitting this balance and, in the decade that the AUF has been with the company, it has reported satisfaction with the permanency of the connection and customer service.



# A Case In Point

## Tanzania + The East Coast

In addition to the Viznet Broadband services it uses, AUF also takes advantage of the **Viznet Dynamic** service at l'Université de Ngozi. The service, based on a 2.4m C-band antenna, features 256/1024Kbps and advanced QoS to ensure that the AUF gets the levels of bandwidth it needs. Based on the latest **iDirect Evolution** DVB-S2/ACM platform, Viznet Dynamic offers a simple way to connect to the Internet for users looking for a cost effective service that don't have excessive bandwidth requirements. With Viznet Dynamic, the industry standard iDirect platform is further enhanced by Vizada Networks' cutting-edge proprietary bandwidth management technology resulting in high QoS and an unparalleled user experience.

Vizada Networks recognises the importance of cost-effective shared services in Africa, reflected by recent investments in Tanzania, which has opened up a wave of new connectivity options along the east coast. Connectivity in this region is already benefitting from the implementation of subsea fibre, but VSAT connectivity is still high on the agenda for customers looking for a stable, redundant Internet connection, that mitigates some of the environmental issues in the area.

One such issue is a power supply that cannot be relied upon. In order to overcome power failures, rationing issues

and keep services available, back-up power systems are a must, so Vizada Networks always consider high quality batteries, generators and UPS systems within its own and its customers' networks. Redundancy is key on the services at the new iDirect hub in Tanzania. The hub offers unmatched reliability and availability through dual redundant connectivity using Vizada Networks' direct connection to both the **SEACOM** and **EASSy** subsea cables.

The new connectivity services, which are made possible because of the implementation of a sophisticated new iDirect hub at its established facility in the Tanzanian capital, went live on September 15th and are based on the Viznet Dynamic platform. They are designed to enable reliable Internet connectivity to and from towns and villages in Tanzania and along the east coast of Africa.

The new services are primarily aimed at ISPs, organizations and businesses having branches in the Eastern Africa region who want to connect to Dar es Salaam or other major cities, directly. Using iDirect DVB-S2/ACM satellite technology in addition to Vizada Networks' proprietary technology, Viznet Dynamic delivers a secure, reliable broadband connection regardless of location or local environment. Viznet Dynamic's general satellite-based connectivity enables internet



**A IFADEM Digital center (for school teachers) in Kayanza**



# A Case In Point

access and the use of VPNs within a private shared network. It offers guaranteed high-speed and burst capability, but with the cost effectiveness of a shared platform. Unlike l'Université de Ngozi, services from the new hub use small Ku-band antennas (starting at 1.2m) that are quick and easy to deploy, and require low upfront investment in equipment.

Vizada Networks and iDirect, a leader in satellite-based IP communications technology, work closely to provide services in Africa, the Middle East and globally. iDirect's technology enables Vizada Networks to make efficient use of available bandwidth and pass the outcome of this onto customers in terms of competitive pricing. With additional in-house developed bandwidth/traffic management system, Vizada Networks is able to offer private networks, MPLS connections and voice lines over the iDirect platform.

Vizada Networks uses iDirect's latest **iDX3.0** software at the new hub in Tanzania. iDX3.0 enables service providers to switch any Evolution router back and forth between **TDMA** and **SCPC** based on dynamic bandwidth requirements. This provides adaptability to support each application with the most efficient transport technology whilst reducing infrastructure and operating costs. It also enhances visibility into SCPC link performance for overall network efficiency and provides expandability of a core platform to grow business in line with demand.

The new services for Tanzania and east coast Africa may be used as a reliable primary connection for dependable, cost-effective solution to enhance terrestrial networks. They feature advanced iDirect group QoS and Vizada Networks'

industry-leading bandwidth management systems as an extra layer to improve performance and user experience even further.

Vizada Networks understands that one of the biggest issues customers face with any connectivity across Africa is a lack of reliability and availability and it's this that the company is trying to change with its new generation services. To foster confidence in reliability and availability for all users, Viznet Dynamic provides 100 percent guaranteed *Committed Information Rate (CIR)*, guaranteed maximum contention based on the service plan and a *Maximum Information Rate (MIR)* that is fairly distributed to all users through the *Fair Use Policy*.

Supporting this are strict *Service Level Agreements (SLA)* and bandwidth visibility through a proprietary QoS system, which provides very detailed monitoring of bandwidth usage including data rate monitoring for IP address, protocol, VSAT terminal, group of terminals and network in addition to the monitoring of trends. All of this answers customers concerns about reliability and should provide a step-change in the perception of connectivity on the continent.

Although the new services on the east coast are a sign of Internet connectivity coming of age in Africa, Vizada Networks is already an established connectivity provider in Dar es Salaam and across the east coast of Africa. In addition to the new Viznet Dynamic services, connectivity is provided via the Seacom and EASSy cables, and hybrid solutions with fibre, WiMAX and P2P radio links. This extensive infrastructure provides critical redundancy so service interruptions are truly becoming a thing of the past. ➔



The Vizada Networks installed antenna at Ngozi university.



## *Carrier ID Using MetaCarrier™ Technology*

*by Frederick Morris, Vice President of Global Sales Engineering, Comtech EF Data*

Satellite operators and service providers spend a considerable amount of time on their attempts to reduce interference. There are both capital and operational expenses incurred for this effort. Capital expense elements include investment in high value tools such as those from Integral Systems, Glowlink, or Crystal Systems. Operational expenses can include subscription-based plans from Integral Systems and Glowlink. In addition, there are personnel dedicated to identifying and reducing sources of interference. There is also the lost opportunity cost; partial or whole transponders not available for use by the satellite operator.

There are long- and short-term causes of interference. Long-term may be from adjacent satellites, which would be due to either lack of coordination between users, outdated or poorly designed equipment, or small mobile antennas. In addition to these reasons, there may be deliberate interference for political reasons, or terrestrial sources, such as microwave links or radar. Short-term causes may be from users, such as cross polarization, or transmitting on the wrong frequency or satellite. It may also be caused by equipment malfunctions or incorrect back-up configurations.

The types of interference are predominantly designated by satellite operators as unauthorized carriers or from incorrect cross/co-polarization; approximately 80 percent of interference events are between these two types as reported by the operators.

Interference has a financial impact as well to satellite operators and users. When there is interference on a transponder, there is revenue lost due to the reduction of available bandwidth and power capacity. Expenses are increased, ranging from the purchase of interference monitoring or geolocation equipment,



**Comtech EF Data** developed a technology called *MetaCarrier™* that is used to embed and detect Carrier ID on video and data satellite carriers. The Meta prefix is used in its meaning of a carrier used to describe another carrier. In this case, MetaCarrier means that we have a separate carrier that contains information, which is used to describe another single carrier, a group of carriers, or a relay, such as a satellite transponder, or terrestrial wireless relay. What is unique is that the MetaCarrier is embedded using spread spectrum techniques within the carrier(s) or relay, without adding appreciable noise to the carrier(s) or relay.

The MetaCarrier technology overlays the very low data rate Carrier ID data in a spread spectrum carrier, onto the carrier that it is referencing, as shown in *Figure 1* on the next page.

It should be noted at this point that this Comtech EF Data is technology in development; products resulting from this technology are not yet available, but will be in the near future.

## Expansion

Comtech EF Data expanded on the implementation requirements for Carrier ID for the embedding of the ID and the detection of the ID using our MetaCarrier technology. For the Earth station sites that have a MetaCarrier embedder, the embedder must automatically

- **Detect the center frequency and bandwidth of the user's carrier**
- **Require no user configuration**
- **Select the optimum spreading for the modulated MetaCarrier**

For the sites with MetaCarrier decoders, the decoder must be able to scan a full transponder under the control of an external system (**Glowlink**, **Monics**, **Siemens**, etc.). The MetaCarrier decoder must be able to:

- **Accept a center frequency and bandwidth, either from an external system or a manual, local entry**
- **Acquire the MetaCarrier**
- **De-spread and demodulate the MetaCarrier to output the Carrier ID**

A decoded Carrier ID may be in the format of *Figure 2*.

The implementation of Carrier ID using MetaCarrier embedders and detectors are illustrated in *Figures 3* and *4*. In *Figure 3*, showing an SCPC network, the Carrier ID embedders are in line with the modem, connected between the IF port of the modem and the RF terminal. The site receiving the Carrier IDs via MetaCarrier does not have to be the site receiving traffic.

The MetaCarrier technology meets sIRG's Carrier ID requirements:

The ID is a small string of bytes that include lat/long, operator name, contact telephone number, etc.	√
The Carrier ID must be read in the clear, by a properly configured Carrier ID receiver, even if the referenced carrier is encrypted.	√
The Carrier ID must be transmitted in an industry accepted format, so that the number and type of Carrier ID receivers are kept to a minimum.	√ (Proposed)
The Carrier ID insertion must have a minimal effect on the data carrier overhead, efficiency, Es/No, phase noise and other carrier quality measurements.	√



Similarly, in an implementation of Carrier ID in a *Satellite News Gathering (SNG)* application as shown in *Figure 4*, the Carrier ID embedder could be an external device or firmware enabled on the modulator.

The MetaCarrier approach to Carrier ID has a minimal, almost insignificant, impact on the carrier that it references. It uses power from the referenced carrier and its impact is more pronounced with small symbol rate carriers. However, with a 224 kbps (kilo symbol per second) referenced carrier, the degradation of the referenced carrier due to the MetaCarrier is a tenth of a dB. *Figure 5* shows the calculation at this symbol rate.

Certainly the utility of Carrier ID is when the traffic carriers are in severe interference. In this situation the goal is to resolve the Carrier ID from both the carrier of interest and the interfering carrier. The MetaCarrier technology approach is robust enough to extract the Carrier ID from both carriers. The image on the spectrum analyzer in *Figure 6* shows two carriers each with a MetaCarrier, and not interfering with each other. In the equipment rack are two modems; one with an external MetaCarrier Carrier ID embedder, the other with an internal, firmware based MetaCarrier Carrier ID embedder. The external embedder has one red LED indicating that a GPS source is not present. One can see that the demodulator LEDs are lit green, indicating that traffic is passing. On the top of the rack is a MetaCarrier Carrier ID detector that is locked on the MetaCarrier. Below the spectrum analyzer is a PC that is connected to the MetaCarrier Carrier ID detector and displaying the Carrier ID from the modem with the firmware embedder.

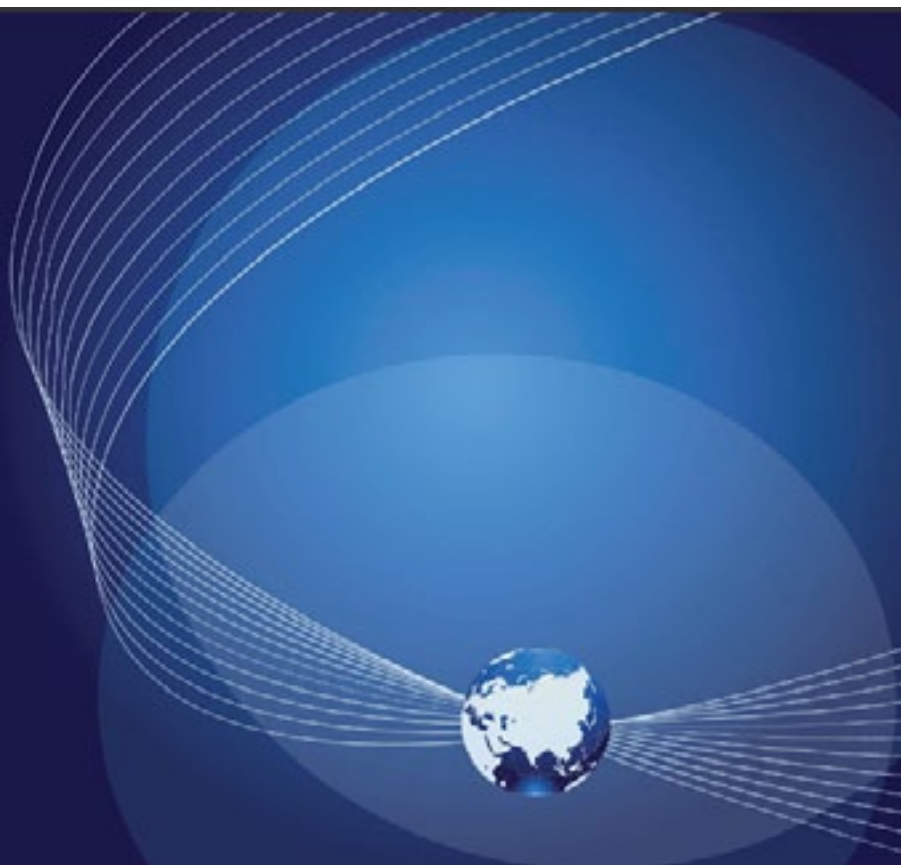
The non-interfering carriers were then moved closer to each other in frequency such that they almost completely overlapped. In *Figure 7*, one can see on the spectrum analyzer that the carriers are interfering with each other to the point that the demodulators are not locked on the modems, as indicated by the red LEDs. However, the MetaCarrier Carrier ID from the modem with the firmware version of the embedder is detected, locked, and displayed.

Although it is surprising that even now, in a 50-year-old industry, there is no provision for a universal identification of carriers on a satellite, the ability to do so for video and SCPC carriers is at hand with the MetaCarrier approach. This technology has been demonstrated by a number of representatives from satellite operators and is ready for industry adaptation. This technology provides the ability to significantly reduce the time to identify and clear transponders of interference sources. It will raise the level of communications quality in the industry and will help to reduce the capital and operational expense now attributed to interference.

Most in the industry who are familiar with the issue of interference agree that Carrier ID will not address all interference situations. However, there has never before been a Carrier ID technology soon ready for production that can be used with both SCPC and video carriers, and that addresses all operational and technical concerns. It is time for its implementation by the satellite industry. ☞

### About the author

Frederick Morris is Vice President of Global Sales Engineering. In this role, he is responsible for the technical solutions for Comtech EF Data's customers. Previously at Comtech he was General Manager of Comtech EF Data Vipersat Network Products Group. During his career, Morris has held various senior business development and technical marketing positions. Prior to joining Comtech EF Data, he was vice president of product management and development at Intelsat. Previous to Intelsat, he held the position of vice president of product management and sales support engineering at Verestar. His extensive experience also includes senior level positions in product management and business development at SES Americom, Viacast Networks, and Hughes Network Systems. Morris holds a BSEE degree from the University of Connecticut and an MS in Technology Management from the University of Maryland.





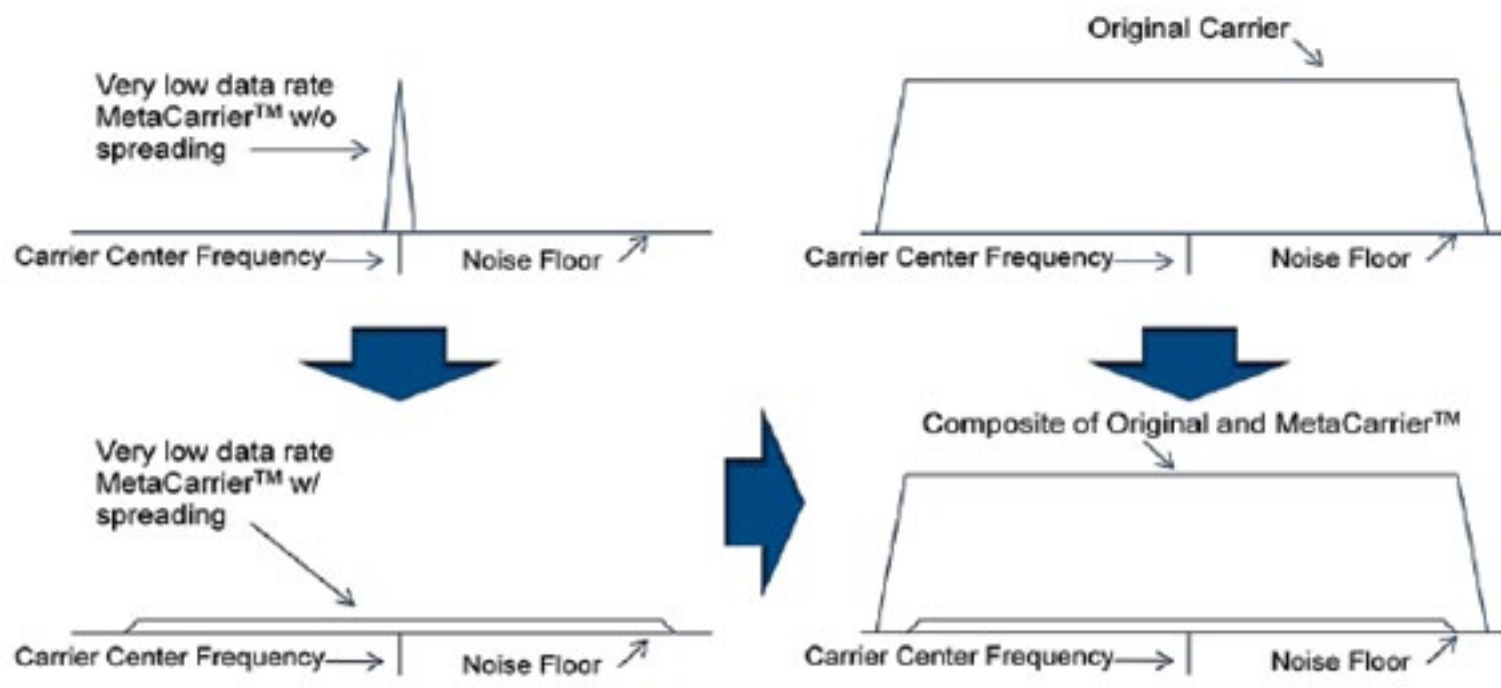


Figure 1: MetaCarrier Overlay

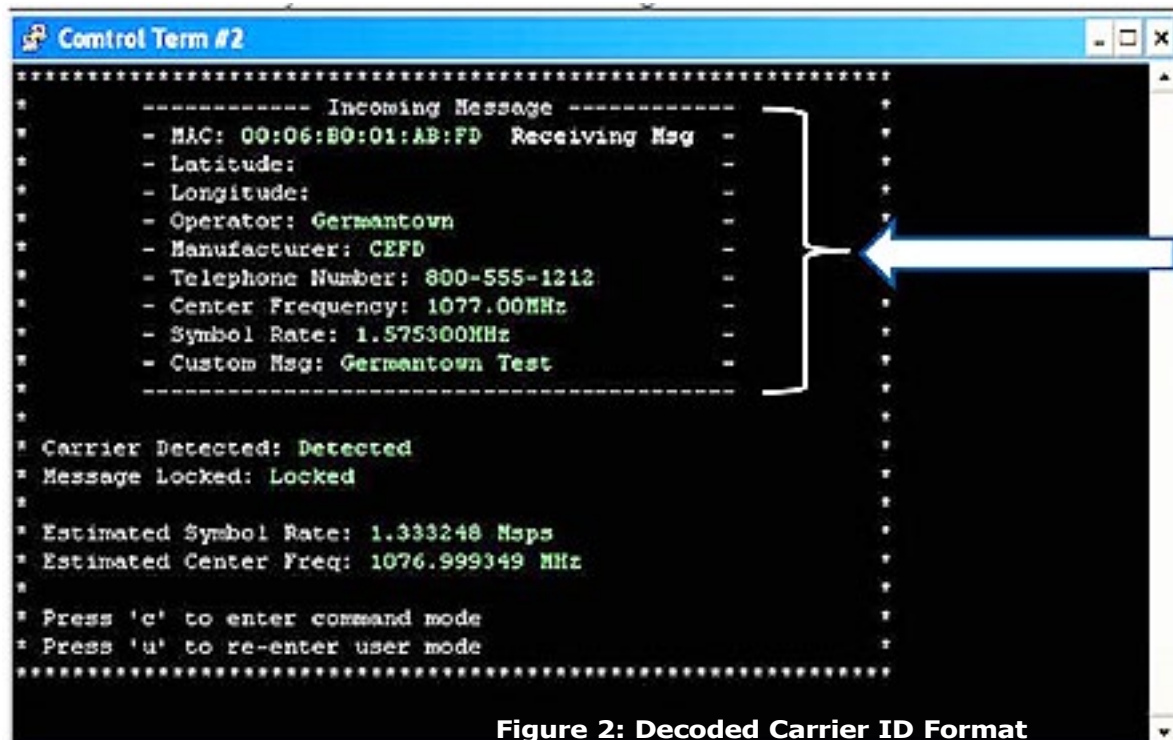


Figure 2: Decoded Carrier ID Format

# TechTalk

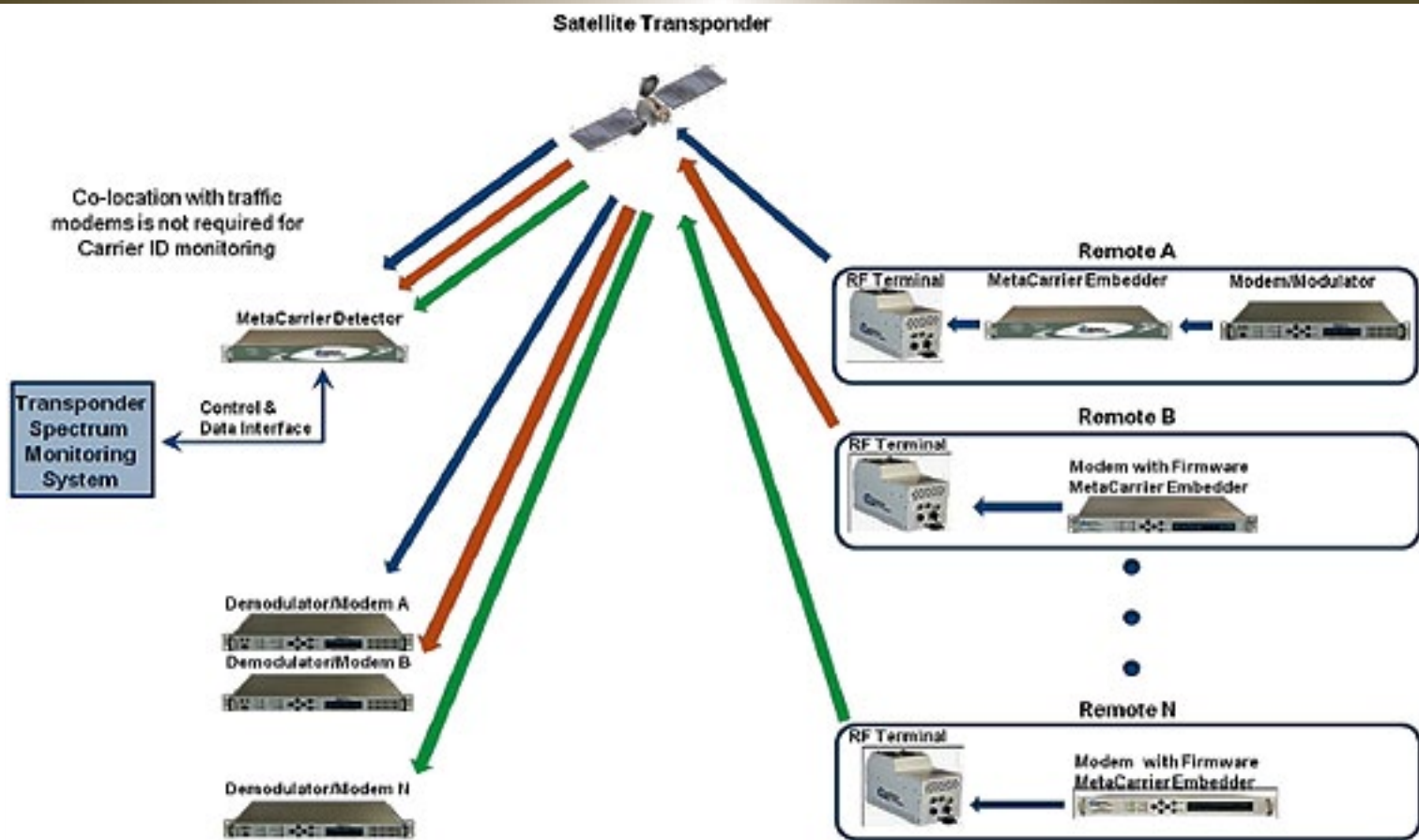


Figure 3: Carrier ID Implementation Topology — SCPC Network

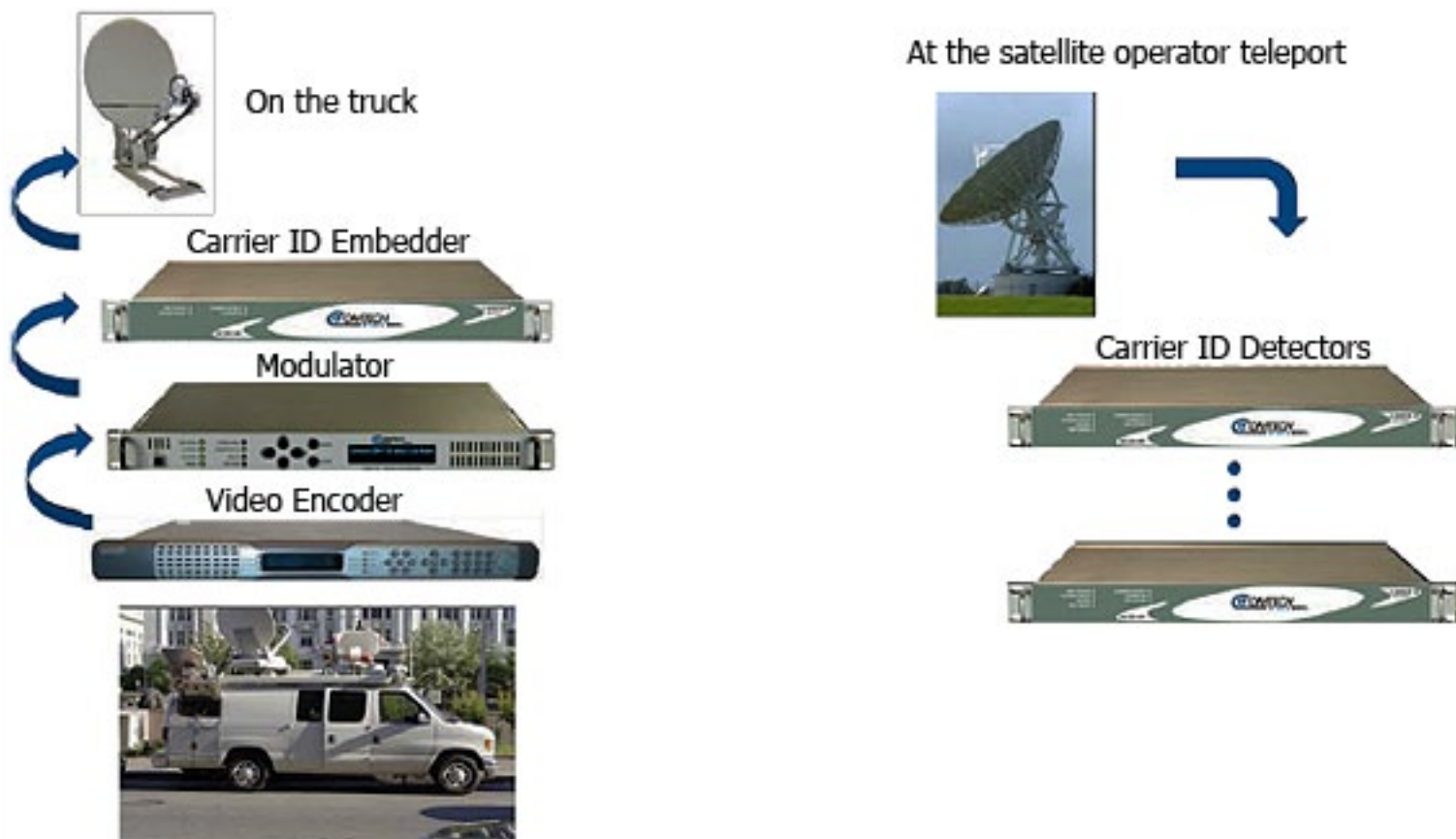


Figure 4: Carrier ID Implementation Topology — SNG Video

## Carrier ID Configuration

Carrier ID Chip Factor	4,096	
CID Carrier Chip Rate	224.000	Kcps
CID Power Ratio	-22.000	dB
CID C/N	0.1	dB
Scaling Ratio	43.75%	
Power Ratio Original Data Carrier to CID Carrier	0.002760	
Noise Power including CID	0.102760	
Difference between Original Data Carrier and CID Carrier	9.9	dB
Spread Attenuation	-36.123599	dB
Spread Ratio	-3.590219	dB
Spread Correction	-39.713819	dB
Degraded C/N	9.99536371	dB
User Input Required		

## Degradation Output

Input C/N	10.0000	dB
Degradation due to CID Power Attenuation	-0.0120	dB
Degradation due to CID Carrier as Noise	-0.1183	dB
Output C/N	9.8698	dB
Output Eb/No	12.8801	dB
Total Degradation	-0.1302	dB

Figure 5: Carrier ID Power Spectral Density Reduction Calculator

*Figures 6 and 7 continued on the next page...*



# TechTalk

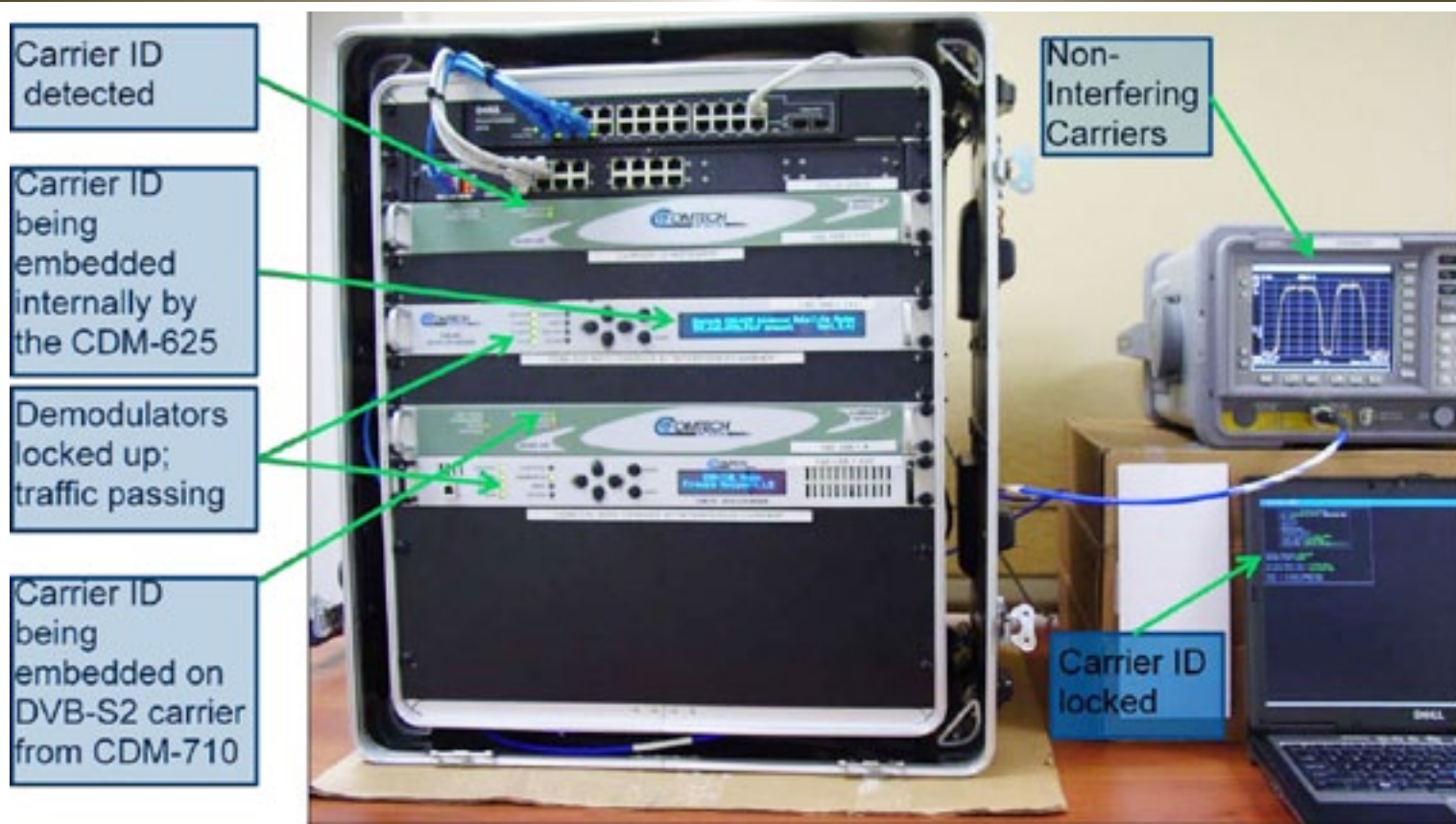


Figure 6: Non-Interfering Carriers With MetaCarriers

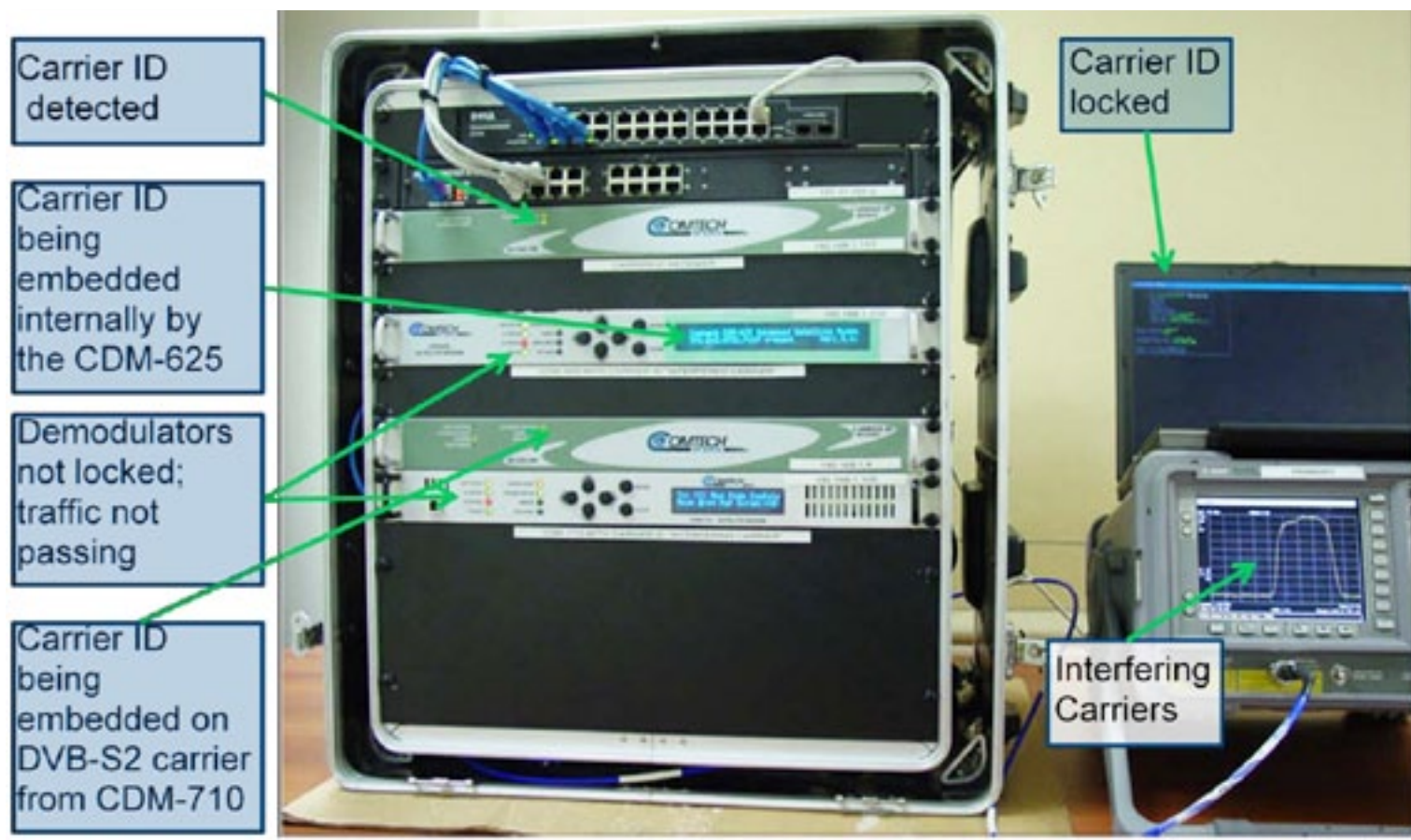


Figure 7: Interfering Carriers With MetaCarriers





## And, Speaking Of Teleports...

by *Dimitrios Papaharalabos, Head of Sales & Marketing, Europe Media Port*

A member of the World Teleport Association, Europe Media Port (EMP) was ranked first in revenue growth globally by the World Teleport Association during 2009 and 2010 and is a global provider of transmission services via satellite, fiber and transit IP. EMP delivers the highest quality transmissions of video, data and Internet to broadcasters, enterprises, ISP providers, teleports, satellite operators and governments.

### **MEA Resource**

EMP teleport solutions enjoy an ideal geographical location in SE Europe with 45 degrees West to 90 degrees East satellite access, ideal weather conditions for Ka-band data services and diverse fiber connectivity. This makes us an extremely valuable resource for broadcast and data Internet services especially to Africa and the Middle East regions.

EMP has a long-term partnership with **OTE S.A.**, the **Hellenic Telecommunications Organization**, and we are focused on providing satellite teleport services around the globe in partnership with other teleports in the region, as well as with various satellite operators.

EMP's vision is to be a leading provider in the global satellite service industry with a value proposition based upon competitive pricing, service flexibility, and the passion to deliver solutions in the most demanding markets.

Providing Ka-band hosting solutions with high speed Internet access to the **O3b Global Network** via the **Nemea** teleport in Greece, EMP provides Gateway Teleport services and was specifically selected by O3b Networks (a subsidiary of SES) for the Middle East and African (MEA) markets. The new satellite-based, fibre-quality Internet backbone for telecommunications and Internet service providers will link O3b's Gigabit IP



network connectivity and bandwidth services to MEA, Asian, and European clients. This long-term agreement will allow for the provision of a broad range of services from the Nemea teleport in Greece.

### **Nemea Know-How**

The Nemea teleport is the first of several worldwide teleport sites that enable O3b to provide global network and connectivity services. The teleport assists O3b in rolling out new, ground-breaking solutions that will provide fast Internet connectivity to African citizens, businesses, and organizations in what were





previously poorly connected regions. As the Ka-band high speed data communications market continues to develop, especially as reflected within the African and Middle East communities, there is vast growth potential for many years to come.

For the video and data markets, EMP is one of the first European teleport service providers to dedicate a large dish for newly launched satellites that blankets the entire African continent with high powered C-band footprints. Services for video distribution and data hub services to various countries in Africa have already been established and deliver a large amount of traffic from Europe to Africa, and vice versa.

For the broadcast industry, EMP provides solutions that include playout services, uplink, turnaround, space segment leasing and occasional use services. In example, offered is a customized DTH solution to the new channel **Kahkeshan TV**, broadcasting on **HOT BIRD** directly throughout Europe and the Middle East to reach a wide audience on satellite. **Kahkeshan Digisat TV** channel (<http://www.kahkeshantv.com>) is a new satellite channel whose aim is to inform and entertain Iranian and Persian-speaking viewers scattered across Europe and the Middle East with a wide variety of programs. The channel broadcasts 24 hours a day and deals with issues related to social life in Iran as well as in the world at large. Documentaries, interviews, concerts, theatre, cinema and literature are offered to viewers, among other selections.

EMP also has a new agreement to expand the Kahkeshan TV household reach to the **EUTELSAT W3A** satellite, the new DTH neighborhood for European and Middle Eastern viewers that has experienced fast growth over the last few months. Kahkeshan TV

is using the EMP facilities for playout services as well as for added value monitoring/storing systems and content management, with live insertions and partner channels content re-broadcasting.

The Company's platform on the **ATLANTIC BIRD 4** satellite, located at **7 degrees West**, enables the creation of a powerful and popular neighborhood for TV channels seeking to reach MENA (Middle East and North Africa). The connections to fiber networks are also useful for clients in the Mediterranean Basin. High Speed and secure, these connections enable governments, international groups, and security agencies and others to quickly and reliably send their data between centers.

## New Options

Constant assessment of market opportunities, analysis of service requests and client demands within this region, as well as close contacts with satellite operators, enable new services and uplink options to be instituted for MENA. When new satellites such as AMOS-5 (for C-band pan-African coverage) and YAHSAT (for the Middle East region) are launched, the opportunities, such as presented, for EMP are extremely exciting.

EMP is also an established provider of **iDirect VNO** services specifically targeted to the Middle East, with uplink capabilities on various **Intelsat** and **AMOS** satellites in C- and Ku-bands. Current data traffic is estimated to be in excess of 1 Gbps for secure communications in the Middle East — this is definitely a growing market and EMP's teleport services are, therefore, positioned as a strategic solution for Internet access to the MENA markets. ↵





## *Future Trends: Satellite Communication Antennas*

*by Eric Amyotte and Dr. Luís Martins Camelo, Macdonald, Dettwiler and Associates (MDA)*

**Predicting the future is a very uncertain science. Nevertheless, in the satellite business, the trend for ever-increasing capacity, flexibility and availability of service, as well as increasingly more affordable, more compact, lighter, and even more stylish and ergonomic ground and personal terminals, has become a clear reality of this communications market segment. There is no reason to believe that these trends towards perpetual improvement will change markedly in the future, and that competitive pressures to achieve these objectives earlier and for a lower price will ever disappear. Moreover, the initial conceptualization and design phases of future missions tend to start many years before the issuance of the first associated Requests for Proposal (RFP), and therefore they provide a rather reliable and solidly based window into the future of the business and of the technology.**

Even if many such initial studies will never materialize, or will be repeatedly pushed further into the future, the underlying trends are nevertheless very apparent and a pattern of future evolution can be drawn. In addition, many missions are now in rather advanced stages of planning and conceptualization and their probability of being funded and becoming reality can be considered high.

Business ambitions tend to lead the available technical solutions, but the latter are constantly being honed and advanced by R&D efforts around the world, in a very competitive environment in which the financial stakes can be high and the challenges to be overcome are ever-present. Some of our thoughts on these future trends are expanded upon in the following sub-sections.







Feed chain in thermal enclosure during PIM testing

## Increased Power Levels

The DC power capability of spacecraft platforms is always increasing as new solar array and battery technologies evolve and become more affordable. More power available on the satellite allows for ever improving link budgets, and payloads that fully use this capability become a necessity.

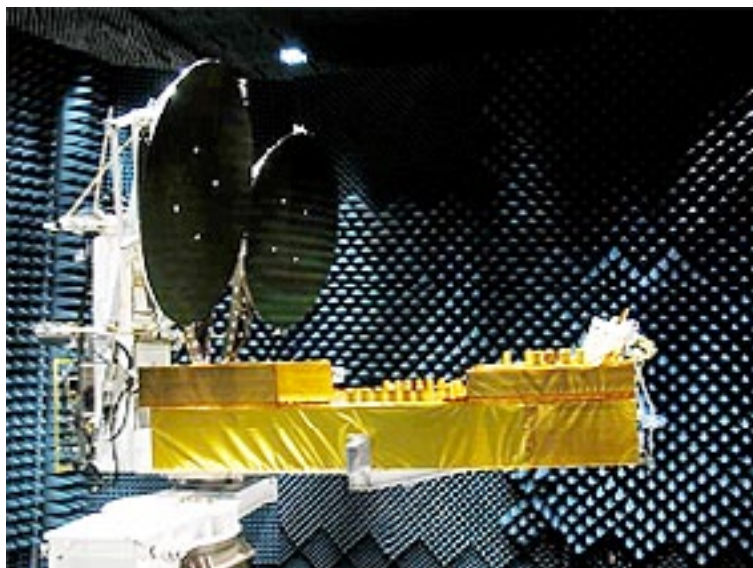
For satellite antennas this means a greater number of antennas on board (maintaining the thrust towards compact low-mass designs) and higher transmit (*i.e.*, down-link) RF power levels with the consequent power handling issues. These include more challenging multipactor and *Passive Inter Modulation (PIM)* requirements as well as more efficient thermal management solutions.

*Multipactor* is an electron avalanche phenomenon that can be established in a vacuum between two surfaces when certain conditions are met, often meaning a relatively high voltage across a relatively small gap (measured in terms of the wavelength). This phenomenon can inflict serious permanent damage to the on-board equipment, and must, generally, be avoided. Meeting future multipactor requirements will not solely hinge on developing new designs with higher threshold voltages. It will also necessitate a better understanding of the phenomenon in multi-carrier environments as is usually the case in communications satellites, more accurate modeling, more extensive testing facilities and a more pragmatic approach to the requirements specifications.

Passive Inter Modulation occurs when multiple transmit RF carriers propagate in a non-linear medium, such as is obtained, for example, when dissimilar materials are put in physical contact with each other. The PIM products represent an undesired noise that interferes with the intended communications signals and might prevent the achievement of the required signal-to-noise levels. The challenge associated with PIM under higher power levels will be compounded by the extended operating frequency bands of future systems. Wider frequency bands enable the occurrence of lower order passive inter modulation products, generally implying a much stronger level for the PIM signals.

## Wider Bands + V-Band

Higher capacity systems call for increased bandwidths, and since the level of difficulty when designing antennas increases with the bandwidth as a percentage of the center frequency, higher center frequencies are necessary. The Ka-band market is still growing, but higher frequencies such as V-band offer significant potential for increasing system capacity and are now starting to



Multibeam Ka-band Antenna in Compact Far Field Range

be exploited. The IEEE definition of V-band is 40 to 75 GHz, but for communications satellites this usually means transmit (down-link) signals in the range of 40-46 GHz and receive (up-link) signals in the range of 48-56 GHz.

Although the bandwidths as a percentage of the center frequency are generally lower at V-band, many other aspects are harder to achieve than at Ka-band (tighter manufacturing tolerances, higher RF losses, higher atmospheric propagation losses, much higher losses due to precipitation, and lower efficiency electronics, among others). Consequently, while the required V-band technological advancements are being pursued, cheaper Ka-band systems will continue to be preferred in the near future, as long as the frequency spectrum remains available. The first commercial use of V-Band may well be in gateway links for multibeam Ka-Band missions, replacing the currently used Ka-Band gateway links, and thus increasing the Ka-Band spectrum available for the user beams.

## Combined Frequency Bands

As stated previously, satellite platforms are becoming increasingly more powerful, and their power/volume ratio is increasing. Consequently, missions are becoming limited by the real-estate available to mount antennas on a spacecraft. Combining antennas to save spacecraft real-estate and increase spacecraft revenues has become one of the trends, expected to last and intensify way into the future.

Combining Tx and Rx into the same antenna is already a prevalent feature of modern satellite designs, and this tendency will continue and strengthen in the future and will also lead to antennas combining more than one frequency band. The corresponding design challenges are already the object of many R&D projects around the world. The implementation of PIM-free multiband antennas will call for advanced low-loss multiplexer technologies such as the triplexers and quadruplexers that have been required on some recent programs.



## Larger Reflectors

Ever increasing gain requirements will call for ever increasing antenna aperture sizes, which can be most efficiently achieved with reflector antenna configurations. Unfurlable mesh reflectors are commercially available, have already been used in many satellite missions and, although their price is high, they are currently the most practical means to implement these large aperture diameters.

The reflector diameter range covered by this technology is currently between 6m and 22m, although even larger reflectors will likely be available in the future. For Ku-band and higher frequency bands, the need for smaller diameters and for tight reflector surface tolerances has so far been fulfilled by solid reflector technology, often using *Carbon Fiber Reinforced Plastic (CFRP)* construction. Their size is currently limited, by the volume available inside the launch vehicle fairing, to about 3m in diameter. High accuracy reflectors in the range of diameters between 3 and 6m have not yet been developed, and are likely to be required by future wideband multiple spot beam applications. Some additional folding and deployment may be required for the larger reflectors in this diameter range so as to fit within the allowable stowed envelope, once the spacecraft volume limit or the launch vehicle fairing dimensional limits are reached. In this case, the reflector may be built as several deployable solid parts rather than one single solid reflector structure. These larger solid reflectors may also incorporate semi-rigid parts into their construction.

## Reconfigurable Antennas

The need for in-orbit reconfigurability has been gaining momentum in FSS/DBS communications satellites over the last few years. Operators would like to have the ability to reconfigure their spacecraft in orbit in order to cope with changing traffic requirements, or to be able to re-assign the spacecraft to cover a different service area or the same region from a different orbital location. These needs are accentuated by the long mission life of modern satellites, commonly reaching 15 years or more.

The market demands evolve substantially during that time and the original satellite configuration may no longer be optimal to meet them during the later stages of the mission. The design challenge is accentuated by the fact that, although operators are always keen on getting more flexibility, they do not necessarily want to pay substantially more, nor increase the risk profile of

their program, in order to obtain this flexibility. Reconfiguring an existing satellite, if such capability has been built into the design from the start, is usually the most economical and less risky approach to meet evolving market demands.

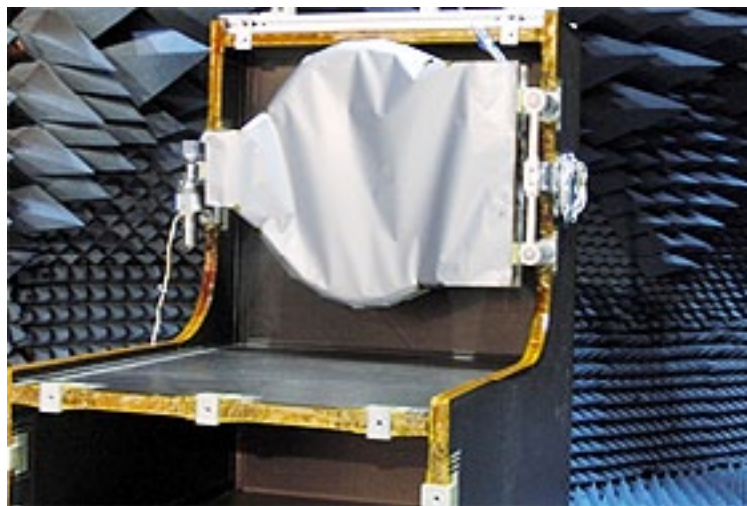
Antennas can be reconfigured by mechanical means (whereby the original antenna configuration is typically modified by rotating, translating or mechanically changing the shape of a reflector or sub-reflector), by fully electronic means, or by using hybrid solutions that combine the two types of reconfigurability. Concepts using controllable reflectarrays have also been extensively studied and the technology may eventually become sufficiently mature for use in a commercial communications satellite.

## Active Direct Radiating Array Technologies

*Active Direct Radiating Array (DRA)* antennas offer the potential for unequalled coverage flexibility from space, with significant commercial returns. However, they currently have high complexity, risk, and cost, and consequently are often bypassed in favour of more established lower-cost technologies, such as reflector-based architectures. This is especially true for *geo-stationary (GEO)* satellites, where reflector antenna solutions offer unparalleled technological maturity and are therefore hard to displace for many of the existing and planned missions.

For *Medium-altitude Earth Orbit (MEO)* satellites, and especially for *Low-altitude Earth Orbit (LEO)* missions, active arrays have already become the solution of choice in cases where wide angles of scan and moderate gain levels are required, consistent with a limited number of radiating elements (typically in the order of one hundred elements). For GEO applications a much higher gain requirement would mean a much greater number of radiating elements, however the small scan angles involved from GEO allow for a greater inter-element separation and for the use of sparse array concepts so as to limit the number of elements and the number of active controls across the array aperture.

In order to decrease risk and cost, a modular approach to building the array, comprising highly integrated tiles (incorporating RF radiating elements, feed networks and amplifiers, as well as power and control signal distribution and also structural and thermal management functions), is a promising strategy that greatly advances the feasibility of GEO based active DRAs. Advances in enabling technologies, which may include semiconductor technologies leading to higher RF power levels and higher DC-to-RF power conversion efficiencies, alternative beamforming technologies such as optical beamforming, cheaper



Mechanically reconfigurable antenna



Active Array Antenna

and highly integrated electronics, low-loss phase shifting technologies such as those using *Micro Electro Mechanical Systems (MEMS)* or others, and so on, will make active DRA solutions increasingly more attractive in the future.

Much R&D work is proceeding around the world to address this type of antennas and, as is usually the case in the space industry, many research papers and prototypes are produced before these concepts are actually included in a commercial satellite payload. It is, however, a certainty that many of these designs will eventually be used in space. ↵

## *About the authors*

Eric Amyotte is a well-known figure in the satellite communications antenna industry, with nearly 25 years of working experience at Macdonald, Dettwiler and Associates (MDA), EMS Technologies and Spar Aerospace. In addition to his industrial background, he has been featured as a speaker and a chairman in numerous workshops, conferences and seminars around the world. His experience covers a broad range of antenna types for numerous different space applications. Mr. Amyotte has been granted several patents on satellite communications antennas. He holds a B. Eng. degree from École Polytechnique de Montréal. Mr. Amyotte is currently Director of Antennas and Electronic Products at MDA.

Dr. Luís Martins Camelo has extensive experience in the design, implementation and test of satellite antennas, with close to 30 years of related work at Macdonald, Dettwiler and Associates (MDA), EMS Technologies and Spar Aerospace. Dr. Martins-Camelo's experience includes reflector and array antennas for space applications, for geo-stationary orbit as well as for low-Earth orbit, and for communication satellites as well as for space-borne remote sensing radar missions. He has published many papers in the area of antennas, and for the past 25 years he has been teaching a comprehensive course on antenna theory and design at the École Polytechnique of the University of Montreal. Dr. Martins Camelo holds a PhD in Electromagnetic Theory and Antennas from the University of Michigan (1982). Dr. Martins Camelo is currently a Staff Scientist at MDA's Antenna Engineering Department, near Montréal, Canada.





## Backhaul Bonanza

*Amit Yafe, Director, Product Marketing, Gilat Satellite Networks*

**Satellite-based connectivity is a crucial and fundamental need for ongoing communications throughout Africa.** This year, **Gilat Satellite Networks** has continued to expand and enhance its customer base and network deployments throughout the region, supplying service providers, operators, enterprises and governments with satellite communication solutions based on industry leading **VSAT (Very Small Aperture Terminal)** solutions.

### **Market Attention**

One of the most active markets in which the Company is engaged is the cellular backhaul market. Mobile operators, both originating in Europe and those locally-based, are increasing their service coverage beyond the urban areas and into rural and more sparsely populated regions. Gilat's satellite-based VSAT technologies provide optimal backhaul solutions for cellular operators.

Advancements in VSAT technology in the last few years have made it possible for service providers to offer more attractive backhauling offerings based on this technology. In

addition, Gilat is working closely with cellular network equipment vendors so customers can enjoy integrated and certified solutions. Countries in MENA and the Mediterranean Basin can certainly benefit from our expertise.

Another important market is the government sector, both civil and defense. e-Government initiatives are bringing broadband connectivity to remote regions of the continent. These programs include **USO (Universal Service Obligation)** programs as well as long-distance learning in MENA. More capacity in fiber and satellite is enhancing the entire communications sector, leading to an increase in government-funded projects. These projects are reaching outlying geographic areas for which the most effective communications networks are satellite-based.





There is an increasing need for additional broadband services, as traditional telephony shifts to the Internet and to cellular networks. The latter, specifically, are seeking to augment their backhaul capacities, which is a mainstay of Gilat's global expertise. Indeed, new government networks and projects are easier to implement if managed by VSAT applications.

Defense and Homeland Security agencies are also looking for satellite communications to answer security, military and emergency response requirements. They typically look for mobile solutions or those that can be rapidly deployed in the field. Very high transmission rates and guaranteed bandwidth for real-time applications are key requirements as well.

In addition to government projects, projects to create, rebuild, or re-establish communications infrastructure in areas where unrest has occurred or in newly independent countries is a major thrust of international **NGO** (*non-Government Organizations*) Communications are radically disrupted with the onset of civil war, famine, disease, natural disasters — organizations and agencies are turning to satellite VSAT-based infrastructure for crucial communications with the outside world. VSAT solutions are advantageous as they provide cost effective communications over vast distances between remote sites and relief centers, or to regions where terrestrial infrastructure is lacking or nonexistent. VSATS can also be established quickly, when time is of the essence.

Cellular backhaul, as stated, is as an important business driver. According to **NSR's** report on *Wireless Backhaul via Satellite*, the main regions that will use satellite backhaul services will be Asia, Latin America, MENA and sub-Saharan Africa. A number of Gilat's commitments in this sector include arrangements with leading communications providers **Gateway Communications** and **Orange Business Services**.

### **Gateway + Orange Deployments**

Gateway Communications, a leading supplier of pan-African wholesale telecommunications, has installed a **Gilat SkyEdge II** hub at their Network Operations Center in Belgium to deploy their services across Africa. These services include cellular backhaul applications, broadband access for telecommunications companies, backbone restoration, and rural telephony. Gilat's SATCOM solutions are designed to meet the requirements of multi-star networks as well as cellular backhaul applications, a perfect fit for the growing telecommunication requirements of operators and end users across Africa.

For Gateway customers throughout Africa, this further enhances the provision of telecommunication services to mobile and fixed line operators, connecting them within Africa, and to the rest of the world.

**Orange Business Services**, the enterprise communications arm of **France Telecom S.A.** and one of the world's leading telecom brands, has also installed a Gilat SkyEdge II hub at their Bercenay-en-Othe teleport in France. This hub will facilitate the operation of a cellular backhaul network initially established in Niger. This network in Niger is deployed in multi-star topology and expands GSM network coverage to remote locations.



Gilat's SkyEdge II platforms

One of the advantages of this multi-star topology is that Orange Business Services can manage the network from their Bercenay teleport in France, all the while maintaining direct, single-hop connectivity between the SkyEdge II terminals installed within the GSM network in Niger.

Together, the MENA markets provide opportunities for Gilat to offer satellite-based connectivity for communications. Expertise as a provider of satellite-based communication solutions well positions the Company to support the continent's communications growth from North and sub-Saharan Africa to Latin, North, and South America markets to the Mediterranean, all of Asia, and around the world. ↵

# A Case In Point

## Mine Maneuvers In Papua New Guinea

In September of 2009, Allied Gold appointed Pactel International to design a solution that could provide high speed data services between their Brisbane data centers and their remote Simberi mine in Papua New Guinea. The new platform had to replace an existing, lower bandwidth communication system and had to be cost-effective, while being robust enough to withstand the extreme weather conditions and harsh environment of New Guinea.

A major service requirement of the new platform was for the **Gold Ridge** mine to be remotely monitored and managed by **Allied Gold's** IT staff in Brisbane, Australia. The platform also needed to facilitate effective low latency and high availability connectivity for critical applications such as email, file sharing, document management, as well as **Citrix** access to the ERP system hosted in Brisbane. In addition, one year later, as the company's operations expanded, a completely new link was required into Allied Gold's Gold Ridge Mine in the *Solomon Islands*, which also needed to provide high quality voice services to the corporate office in Brisbane.

### Solid Solution

**Pactel International** delivered a complete turnkey solution to Allied Gold, based on its C-band VSAT network by providing a direct link from PNG back to Brisbane. The company's new C-band VSAT platform offers the following benefits:

- **24x7 online support system + network management**
- **Automatic bandwidth shaping, delivering bandwidth-efficient applications**
- **Increased reliability and throughput**
- **Ruggedized design to suit the extreme weather conditions and harsh environment of PNG**
- **Total flexibility of system layout, with the options of placing more terminals and sharing or increasing bandwidth in the future**

Pactel's VSAT C-band platform represents a Layer 2, end-to-end, **SCPC WAN** solution, providing unprecedented performance and low latency. It is based on cutting edge technology, using the latest modulation techniques to ensure efficiency, reliability, availability and throughput.

### Challenges Faced

The design and testing of this service proceeded according to the schedule. However, a number of challenges presented themselves, including:

- **Environmental: the initial installation had to be performed in a harsh working environment with heavy rainfall during the installation process.**
- **Design: the equipment had to be designed simple enough to be installed and operated by the non-technical staff, thus reducing the installation and operation costs.**
- **Physical: The new technology had to cope with extreme weather conditions, such as high temperatures, high humidity and heavy rains.**

### Results

In spite of the challenges faced, Pactel International successfully implemented a new C-band VSAT system that was able to deliver high quality voice and data services to the remote regions of PNG. The simple and centralized administration allows for effective network monitoring of the VSAT terminals via Pactel's Network Operations Centre. It now allows for Allied Gold to remotely access critical information and monitor their sites on a continuous basis. Relevant personnel now have the ability to remotely login to check details such as throughput,

uptime and latency.

Pactel's expertise assisted in producing a system which is designed to survive in remote locations under harsh weather conditions. Its new technology delivers reliable, weather proof, cost and bandwidth efficient communications, empowering any client to deliver their services at the highest quality.

Allied Gold's staff now have access to a reliable communication system, which provides voice and data services, enabling the company to seamlessly run industry-specific applications such as:

- **High speed, bandwidth-efficient Intranet access**
- **Direct Layer 2 connectivity to domestic private IP networks**
- **Telephony and Fax over IP**
- **Real-time data exchange**
- **Remote Terminal Server access**

### Expansion Of Services

As Allied Gold expanded its exploration and development activities into the Solomon Islands in 2010, Pactel International was able to respond rapidly by creating another symmetrical link into this remote region. The new link was designed to provide similar communication services as for the Simberi Gold mine in PNG and was increased in size six months later.

*Steffen Holzt*, Executive Director of Pactel International, said, "Customers like Allied Gold are our prime focus in the resource market and we acknowledge the importance of satellite links like these into the remote regions. We appreciate the trust companies like Allied Gold have in our abilities to deliver vital communications, which whole industries can depend on."

### About Pactel International

Pactel International delivers high quality, fully customised, VSAT, ToIP (Telephony over IP) and GSM solutions to the Asia-Pacific region. Our solutions are implemented to match your specific telecommunications requirements, from point to point links through to fully managed network connection. ➡







## Driving Deliverables From Content To Data

by David Hochner, CEO, SatLink Communications

As a leading provider of global satellite transmission services, SatLink Communications emphasizes global content distribution for television, radio and data channels over satellite, fiber and IP to every corner of the world. For the MENA market, the Company's strategic location at the southeastern end of the Mediterranean Basin provides great flexibility to serve this crucial market.

From this position, SatLink is an excellent gateway for broadcast and data transmission to and from Africa, Europe and Asia. SatLink customers include broadcasters, payTV and satellite operators, ISP providers, large communication enterprises and maritime - all are able to take advantage of a complete array of advanced solutions.

SatLink delivers content for those seeking to expand their business in this region of the world and in need of high quality delivery and hosting solutions — the Company perfectly meets their requirements. For data solutions, an **iDirect** hub has been installed to enable large corporations and satellite operators to enjoy **VNO** (Virtual Network Operator) services for their data operations.

International and African originated broadcasters wishing to deliver their TV channels to *direct to home* (DTH) viewers and payTV operators' head ends throughout Africa use SatLink for transmission services, including playout facilities and content management as well as uplink and satellite capacity on the most popular broadcast satellites covering the continent. Today, SatLink delivers a mix of the most popular international TV channels to the continent including, among others, music videos and reality TV on **MTV Base**, **Reuters'** video news feeds of the world and African news and events, South Asian and Bollywood entertainment from **Doordarshan** and the **Israeli Network** channel to reach Hebrew speakers in sub-Saharan Africa.

Soon, SatLink will operate a new **MCPC** (Multi-Channel Per Carrier) C-band platform for delivering TV broadcasts to Cable TV operators, IPTV and to Mobile head ends in Africa over the **AMOS-5** satellite. This is an exciting opportunity for broadcasters as the Company is continuing the tradition of providing an exciting and vibrant broadcasting neighborhood. By sending multiple channel signals over an MCPC platform on this satellite, popular broadcast neighborhoods are given birth to bring more exposure for TV channels among African payTV operators. AMOS-5's C-band will bring customers Pan African coverage while minimizing the effects of rain or other geographic and atmospheric challenges that are quite prevalent in Africa.

In addition, SatLink has also been selected by **Spacecom** to be the prime provider of satellite engineering services, including **TT&C** (Telemetry Tracking & Commanding) and **IOT** (In Orbit Testing), among others, for the AMOS-5 satellite. The Company is one of few independent teleports to be entrusted by satellite owners and operators to perform mission critical control

services for their satellites. The most popular satellite engineering services the company conducts are the aforementioned TT&C and IOT services as well as **CSM** services, *E.I.R.P. Measurements*, *Hosting GEO Location Services* and turnkey projects. SatLink provides these services to **SES**, **AsiaSat**, **AMOS** and others. For instance, the Company provides TT&C services for **SES' NSS6** at 95 degrees East and have also conducted satellite drifting and TT&C services for **Spacecom** and other Asian based satellite operators.

The data market is also an exciting market segment in Africa for SatLink. A wide range of data-centric services are provided to satellite owners, governments, ISPs, telecoms, large enterprises, and to other teleports requiring SatLink's strategic location as a gateway to and from Africa and the massive teleport infrastructure offered.

SatLink's technologies and advanced equipment allow for the delivery of HD, 3D and SD sports, news and special events, to consumers around the world. Strategically located infrastructure and access to more than 100 Earth stations enable mass downlink and aggregation of channels for IPTV and payTV operators. With more than 100 OU feeds going through the facilities on a daily basis, 365 days a year, SatLink's OU division is a prime transmission provider for sporting events, breaking news, cultural celebrations, and other newsworthy broadcasts. Due to these capabilities, the teleport is the preferred teleport of choice for the transmission of OU feeds. The incorporation of cutting edge technology, such as high definition (HD) DVB-S2 feeds, in combination with a highly skilled technical staff, provides an advantage for broadcasters and operators seeking to enhance their global distribution networks throughout Europe, Asia and Africa.

To ensure SatLink provides smarter advanced technologies, the creative teams are always being pushed to respond with the highest quality solutions possible. Recently, the Company teamed with **Novelsat**, a high-end manufacturer and developer of the **NS3 3G-Sat** modulation technology, to test and use their bandwidth efficiency format. Using their new NS3 technology we found that it increased bandwidth efficiency — over DVB-S2 — by 28 to 50 percent, depending upon the transponder size.

Incorporating advanced technologies will enable SatLink to maintain and exceed operations goals in MENA, as well throughout the world. The Company looks forward to remaining in the forefront of technological advancements that lead to improved business operations and client satisfaction. ↵

