

Connecting the Blue Planet

Communications at sea are now just as important as communications on land. Gone are the solitary days of those who work at sea. Now there is access to voice, data, fax, email and the Internet. Helen Jameson explores what is on the market in terms of satellite communications for the maritime sector.

Our planet is covered by 71 percent water and just 29 percent land. That's quite a statistic when you take time to sit back and think about it. The majority of the earth's surface is covered in water and whilst we strive to connect ourselves on land, this is no more important than ensuring that those at sea are well connected to each other

and the mainland as well. For merchant seamen, oil rig workers, crews on cruise ships, oil exploration teams and the many more professions that take people out to sea for days, weeks and even months, being able to communicate with friends and family and with their headquarters and colleagues also at sea, is imperative. Long peri-



ods spent away from home can dent crew morale, but access to email, broadband Internet, fax and voice services can transform the experience. It's a job that satellite is well-equipped to do and recent years have seen a fall in the price of equipment and services that help those at sea to communicate with the land.

In this day and age we are gradually running down our supply of fossil fuels and oil and gas companies must travel further afield than ever before to find new sources. In fact, the entire offshore and maritime industries now require a global reach when, even up until a few years ago they were working on a regional communications service and having to change equipment and services as they travelled from region to region and satellite footprint to satellite footprint. Not ideal, and an expensive and time consuming way of communication – but a necessity nonetheless. Nowadays, satellite technology for the maritime sector is seamless, it is technology agnostic and has a global reach. The days of installing and uninstalling equipment to suit a certain satellite provider for a certain region are over. In fact, maritime communications have come so far over recent years that crews can even use a mobile phone on board their vessels, they can communicate with headquarters using realtime information, data analysis and collection is made easy, and monitoring and analysis is speeded up. The benefits are countless. Why wouldn't a shipping company, cruiseliners, oil and gas firms and leisure craft owners turn to satellite?

FleetBroadband from Inmarsat

Launched in November 2007, Inmarsat's Fleet Broadband caters for vessels of all sizes whether they are small leisure craft or large merchant ships. There are two types of satellite terminal available.

Firstly, there is the FB500. This offers standard IP connectivity of up to 432kbps with guaranteed or 'streaming' IP data rates of 32, 64, 128 and 256kbps. It also supports 564kbps ISDN connectivity for legacy applications. The above deck dome antenna has a diameter of around 57cm and weighs around 18kg. Secondly, there is the FB250. This terminal delivers standard IP connectivity of up to 284kbps with streaming IP available. Its dome diameter is around 25cm and it weighs 2.5kg.

Both services support 4kbps voice, Group 3 Fax and standard 3G SMS text functionality.

"We know that many parts of the maritime industry want increased bandwidth whether to support crew communications, meet new regulations for shipping or to explore new ways of working and enhance operational efficiency" said Piers Cunningham, Inmarsat's head of Maritime Business. "But we also know that they want compact terminals with simple shipboard installation and use, available seamlessly on a global basis and accessed through equipment that is type approved to a trusted standard.

"FleetBroadband is the first service to meet all of these demanding requirements, and in a highly cost-effective manner. We are targeting existing Inmarsat users who want increased bandwidth and new users who will see FleetBroadband's compelling combination of form and function as a reason to move to broadband."

Airtime is being provided through nine Inmarsat distribution partners including Beza, KDDI, Korea Telecom, MCN, Morsviazspudnik, OTESAT-Maritel, SingTel, Stratos and Vizada. The service is initially available across the Atlantic and Indian Oceans from the Americas to the Pacific Rim. Full global coverage is expected towards the end of 2008 after the successful launch of the third Inmarsat Satellite in the middle of this year.

VSAT technology

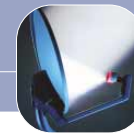
VSAT services have, and continue to prove to be the ideal means of connectivity at sea. Contending with hostile weather conditions, rough seas and high winds calls for a specific kind of VSAT that is ruggedised, stabilised and, above all is reliable. Container ships, fishing vessels, military ships and oil and gas platforms all require constant, always-on communications with the mainland via voice, data, fax, email and navigation systems. Perhaps the most significant point on satellite communications is that they can be deployed anywhere, even in the middle of an ocean.

Orbit gains Intelsat Type Approval for OrSat

The Orbit Technology Group launched their innovative stabilised marine antenna at Satellite 2007 and since then, it has been causing a stir within the maritime communications sector. The antenna had already received Eutelsat type approval last year but has now also been endorsed by Intelsat and, as a result, has firmly established Orbit as a major player in the maritime communications market. The newly-appointed CEO of Orbit, Dr. Ehud Netzer remarked: "These type approvals from the leading satellite companies are a significant step forward for Orbit. It demonstrates the uniqueness of the OrSat system and proves the capabilities, superiority and leadership of Orbit's technology."

The antenna system was also selected by Global Maritime Communications (GMC) to provide services to the maritime and offshore industries as a result of interoperability testing and sea trials between Hughes Network Systems and Orbit, using the HN series of satellite modems and the Orbit marine stabilised antenna. Using HugesNet in Europe, a reasonable, three-tiered pricing structure was offered to GMC.

Orbit is already a well-established player in the field of advanced mobile satcom and tracking antenna systems for air, marine and



New lightweight products

C2SAT announced the addition of new, lightweight products into its portfolio at Satellite 2008 in Washington. The C2SAT unique four axes, up to 2.4m Ku VSAT stabilised mechanical robot, has been modified upon customers' specific demands to be optimised for reflector sizes up to 1.2m, that weigh less than 100kg. A three axes 0.9m stabilised S-band VSAT has also been developed in co-operation with the customer and is tailored to their specifications. C2SAT's developments follow inquiries from military and government customers and have enabled C2SAT to develop and modify a wider product portfolio. The flexibility of the present patented 4 axes stabilised mechanical robot made it possible to tailor solutions based on the customer's demands. The low-weight, smaller VSAT can also be customised for different frequency bands and carry reflectors of up to 1.2m in size. We spoke to Fredrik Hannell, CEO of C2SAT to find out about the new addition to the family.

Question: Congratulations on the first order that has been received for the 2.4m C-band antenna. Can you tell us about the antenna and its capabilities and why it is perfectly suited to the maritime market?

Fredrik Hannell: The unique features of our new C-band antenna are its low weight and its relatively small size, achieved by installing a 2.4 meter reflector on our standard mechanical rig. Apart from being a necessary gap-filler in our maritime product portfolio, it addresses a segment where new technology can provide significant benefits when considering performance and reliability.

Question: Demand has been the driver behind the creation of your mini VSAT antenna. For which applications is this particularly suited and from which market sectors did the demand come from?

Fredrik Hannell: Our smaller VSAT antenna is specifically targeted at the government sector where the weight constraints on new systems installed on top of vessels are more critical. We reduced the size of the system whilst preserving the electronics and the same control software as our other products.

Question: In terms of the maritime market what do you believe the main trends and developments will be in 2008?

Fredrik Hannell: We see a strong demand from all segments in the market, it is as if the broadband and Internet revolution finally has reached the maritime sector. A new generation of satellite



communications equipment introduces new standards for reliability and performance. The internet generation expects similar network performance at sea as they have at home, and the revenue model of the operators is developing to meet these new requirements.

Question: Which market sectors will you be focusing on this year?

Fredrik Hannell: We will focus on the government sectors and the larger commercial customers. We are still a new player in the market, and we do not have the luxury of addressing all opportunities.

Question: And what about regions? Where are C2SAT's principal markets?

Fredrik Hannell: We see a global need for our products, and our partners and agents have a worldwide coverage.

Question: You have recently signed an agreement with DRS Technologies for a marketing and sales agreement. Is this for sale into the US military? What significance does this agreement carry?

Fredrik Hannell: It is a significant step for us, mainly because we can market our products to large customers as a part of a complete offering, which also means we can propose broader product solutions that are based on the products of both companies.

Question: And where will your primary areas of focus be for the remainder of 2008?

Fredrik Hannell: Our main focus areas will be on shipping to our customers whilst continuing to expand our sales efforts.

ground applications. Their OrSat antenna is a service oriented, flexible, robust and stable antenna built for any sea condition. It is a mature and proven system which continues to thrive. This is reflected in customer demand and satisfaction. OrSat is simple to operate, offering plug-and-play architecture and cost-effectiveness. Its key features include:

- Optimal performance at minimum size;
- Remote control and monitoring via Ethernet LAN;
- 4 axis configuration for full hemispherical coverage;
- Built in narrowband receiver;
- Interface to IRD modems;
- Above and below deck connection via a single coax cable using MUX technology;
- Built-in satellite database;
- Maintenance and data login features; and
- Tested and proven in severe conditions.

Cellular backhaul at Sea

RAD's Vmux-400 GSM Abis/Ater optimisation gateway maximises bandwidth utilisation in large, central or remote site installations by eliminating redundant silence and idle frames in the Abis protocol. Supporting both point-to-point and point-to-multipoint GSM Abis/Ater optimisation, the Vmux-400 GSM Abis/Ater optimisation gateway is particularly useful in applications where landlines do not exist or are not available, and expensive satellite and/or microwave links, with their limited bandwidth, are used to backhaul the GSM traffic. When used in conjunction with other Vmux voice compression and bandwidth optimisation components, cellular operators can significantly reduce both their OpEx and CapEx. RAD's Vmux-400 was used to enable GSM backhaul for use on board cruise ships and ferries.

Maritime Communications Partner AS (MCP), a Norwegian-based provider of onboard cell phone connectivity to cruise ships and ferries that provides global coverage through leading suppliers of maritime satellite services, has come up with an ideal solution to



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help crew and passengers keep in touch via their mobile telephones regardless of being at sea and far away from their usual network's reach.

MCP employs an Ericsson Base Station System. The Base Station Controller at MCP's headquarters in the Norwegian coastal town of Grimstad, is connected over IP satellite modems to Base Transceiver Stations on a fleet of cruise ships that each year transport approximately 1.8 million passengers and 200,000 cars on eight North Sea routes between Denmark, Sweden, Norway, Holland, and Great Britain. MCP connected RAD's Vmux-400 GSM A-bis optimisation gateways at both ends of those satellite links.

The Vmux-400 enables cellular operators to lower backhaul costs across the Radio Access Network by optimising A-bis (BTS-to-BSC) bandwidth by a factor of up to 3:1, significantly reducing operating expenses.

"Interoperable with equipment from other major vendors, the Vmux-400 ensures that satellite links are utilised as efficiently as possible, eliminating inefficiencies by not transmitting idle and silent frames," explains Toby Korall, Senior Product Line Manager at RAD. "In this way, the Vmux-400 can reduce satellite, microwave or wireline bandwidth by 50 percent and more, enabling service providers to offer their customers a more attractive complete solution."

A unique feature incorporated into the Vmux-400 provides reliable regeneration of very accurate and sensitive 2.048 MHz TDM-based clocks for synchronised network operation between the BSC and BTS. This enables the use of packet-switched networks and, in

this case, the IP satellite modems on-board the ships for the transport of cellular voice traffic.

By dynamically supporting different speech codecs, moreover, RAD's Vmux-400 allows up to twelve simultaneous calls using the higher-quality Full Rate codec when demand is low and up to 24 simultaneous calls using the Half Rate codec when demand peaks, doubling the number of cellular calls that are made to and from a ship at any one time.

"RAD's Vmux-400 enables us to offer mobile services over an IP network with optimal bandwidth usage," adds Roar Walderhaug, MCP's Chief Technology Officer. "The Vmux-400 operates very satisfactorily and has proven its high stability and robustness."

Entertainment at Sea

Leisure craft and cruise ships are big business for satellite maritime communications. The luxury of having access to a comprehensive entertainment system even at sea is becoming more popular than ever. There's no need to miss your favourite TV programme ever again!

In February, Wave Entertainment Network, a wholly owned subsidiary of SeaMobile Enterprises, announced an agreement with Oceania Cruises, the world's only upper-premium cruise line, to provide Oceania Cruises' guests with the first state-of-the-art satellite television service delivered at sea. The first ship to deploy the Wave television platform will be Oceania Cruises' Insignia. The line's Nautica and Regatta are scheduled to receive the service later this year.

Wave Entertainment Network delivers an at-sea television platform that rivals what viewers currently experience at home and is a significant change in the world of maritime entertainment. The Wave programming platform is the first multi-channel, interactive television system ever to be distributed to passenger cruise ships in all ocean regions around the world. Wave offers abundant content—both linear and "on-demand"—with superior digital picture quality via its satellite delivered IPTV system.

The television and audio services provided to Oceania Cruises will include linear cable, satellite and broadcast networks, audio content, video-on-demand, adult programming, special events, and other video content typically offered via multi-channel platforms.

"We are thrilled to provide the Wave programming platform to Oceania Cruises," said Larry Lemoine, Wave Entertainment's President. "This world class entertainment solution adds to the suite of luxury services already provided on Oceania Cruises' ships. As with other SeaMobile services, our television line-up allows guests on cruise ships to experience all of the entertainment choices that they could expect on land."

The Wave Entertainment platform uses a combination of satellite technology – delivered by SeaMobile's industry leading Maritime Telecommunications Network (MTN) - and special caching technology that allows viewers to experience live events and network programming in time slots they are accustomed to seeing. The unique store-and-forward feature of the service ensures that travellers at sea won't miss their favourite programmes while enjoying other activities during their cruise.

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"For over a year now we have utilized SeaMobile's premiere communications solutions for our guests," said Oceania Cruises' President Bob Binder. "As an innovator and leader in the cruise line industry, we have again placed our trust in SeaMobile to deliver a television product that not only enhances our guests' experience, but makes them feel right at home."

Wave Entertainment Network represents an important component of parent company SeaMobile Enterprises' vision to provide a host of dynamic communications, information, and entertainment services available in remote locations around the world.

True global coverage

Singapore Telecommunications Limited (SingTel) announced recently that it is the first satellite service provider in Asia to offer a maritime broadband service with true global coverage.

SingTel, one of Asia's leading satellite service providers, has been providing Very Small Aperture Terminal (VSAT) services with regional coverage for over two years. It is now extending its reach to provide seamless, worldwide coverage over all major shipping routes through its strategic alliances with top-tier global satellite service providers.

Mr Bill Chang, SingTel's Executive Vice President for Business, said: "In the past, VSAT deployments onboard vessels such as container ships required time-consuming re-configurations of the satellite communications equipment when the vessels move from one ocean region to another.

"SingTel's global maritime VSAT service has advanced auto-beam switching capability which eliminates the need for manual intervention. This helps shipping owners save valuable time and resources."

The new service is the first in the world that offers customers secure connectivity to offices on land over a private terrestrial network. It is fully integrated with SingTel's award-winning ConnectPlus Internet Protocol – Virtual Private Network (IP-VPN), which provides

extensive coverage in over 80 destinations worldwide.

Mr Chang said that customers will enjoy peace of mind knowing that sensitive shipboard information and data applications such as email will be safe from the threat of hackers and terrorists, as they are delivered over a secure private network.

Network congestion and latency will also not be a problem, unlike services that deliver traffic over the public Internet.

Customers can quickly and easily extend their office Virtual Private Network (VPN) applications to the sea in a secure manner. This enables the ship to become an extension of the shore-based office.

Mr Chang added: "SingTel is excited to play a key role in rejuvenating the maritime industry with this breakthrough. Our innovative solutions will transform the way our maritime customers operate, enabling them to take their businesses to the next level."

iDirect enhance maritime reach in Asia with Sat-GE

The Australian Satellite Communications (ASC) has introduced a new satellite telecommunications service across the South Pacific region. Based on iDirect VSAT technology, the service is hosted by Hawaii Pacific Teletop and covers the whole of the South Pacific from one satellite, GE-23.

To implement the service, an ASC-owned iDirect 5IF satellite hub has been commissioned on the high performance GE-23 South West Pacific and South East Pacific Ku band beams. The new service classes operating at 1024/512kbps with 512/256kbps CIR capability complement the existing ASC network operated out of the Adelaide teleport. These existing networks are already populated with large corporate and government customers on the GE-23 South Pacific beam covering Australia, New Zealand and beyond. Following the introduction of the new services ASC have recently received orders from Geoscience Australia for sites on Christmas Island that are covered by the South West Pacific beam.



“The maritime satcom industry has really taken off in the past five years. There are now no reasons why a crew member on board an oil rig, merchant vessel or yacht cannot have access to broadband services - to Internet, Voice, VoIP, email, text, fax – real time communications. It is essential for corporations to keep in constant contact with their fleets.”

Chris Joseland, Managing Director of ASC said “We chose Hawaii Pacific Teleport in preference to a US mainland teleport for a number of reasons. HPT are flexible, fast to respond and through joint cooperation will also market our platform to customers they have in the region. Hawaii is also ideally placed for the optimum look angle to the satellite GE-23 situated at 172 degrees East.”

The first customer site of the new service was commissioned last week on board a 240 foot super yacht off the coast of Tahiti. The owners of the yacht contracted ASC to upgrade their existing SeaTel stabilised antenna system and deliver a 1024/512kbps business grade broadband Internet access service with dedicated voice channels to the ocean going yacht.

Vince Waterson, VP Business Development at Hawaii Pacific Teleport said “We are pleased that ASC awarded us a three year contract to provide service on GE-23. We have also entered into a co-marketing agreement whereby we will offer their services to US government customers who have a preference for using iDirect services.”

Andrew Jordan, VP & General Manager of SAT-GE said “We are pleased to offer ASC our uniquely positioned capacity on a satellite with extraordinarily high performance designed to serve commercial aircraft and maritime vessels crossing the Pacific with broadband Internet and multimedia. Our wide coverage enables us to bring broadband Internet access to even the most remote Pacific islands where users only require an antenna of four feet or less.”

The ASC investment is a response to rising demand for high availability business grade IP broadband as multinational companies in the region increase their focus on resource exploration, expand their maritime operations and their need for real time communication grows.

This expanded coverage also allows Australian Satellite Communications to satisfy the growing demand for critical connectivity as required by governments, the resources sector, educational and non-profit organisations.

Iridium's OpenPort set to enhance bandwidth

At Satellite 2008 in Washington in February, Iridium Satellite unveiled its new OpenPort enhanced-bandwidth marine communications system. The product will bring a new element of competition to the maritime satcom market. The OpenPort system offers a value proposition of multiple phone lines, IP connectivity and flexible data speeds of up to 128 kbps along with low equipment and airtime costs. This is in addition the Iridium's global coverage. OpenPort is expected to make market gains in the marine MSS market.

OpenPort systems have recently completed successful sea trials and there is a backlog of over 2,500 units on order from major

service providers. OpenPort is the result of extensive research and development at Iridium and investment in both their space and ground systems. “We have had an overwhelming response from our Service Providers since previewing Iridium OpenPort at our Partners' Conference in September,” said Greg Ewert, Executive Vice President of Iridium Satellite. “Globe Wireless, LLC, a leading maritime IT solution provider with over 550 ship operators and 8,600 ships worldwide, has made a major commitment to the programme as our charter customer.”

“Iridium OpenPort is fundamentally changing how the maritime industry manages voice and data communications and will provide a cost-effective way to address the severe crew shortage and increased reporting and management requirements in the industry,” said Frank Coles, CEO, Globe Wireless. “Iridium OpenPort also opens up new market segments, specifically luxury yachts, tugs, fishing and cruising vessels for which traditional marine satcom systems have been out of reach. Now, when they evaluate the value/cost trade-off, the question becomes ‘why not?’”

Iridium will target the new service toward the deep-sea shipping and commercial fishing segments. “Iridium OpenPort provides a complete integrated solution for ship-to-shore crew calling, email and IP-based data communications,” said Ewert. “Our pricing strategy replaces expensive pay-per-minute billing schemes with a straightforward, cost-effective, pay-per-megabyte plan for data transfer. Hardware upgrades from bandwidth packages associated with competing products will be a thing of the past.”

The Iridium OpenPort ship terminal provides dynamic allocation of three independent telephone lines and a high-speed data port configurable from 9.6 to 128 kbps. All voice and data circuits can be used at the same time. The unstabilised, omni-directional antenna array measures just 9 inches (230 mm) high and 22.5 inches (570 mm) in diameter – about the size of a typical small-boat radar radome. The lightweight antenna can be easily installed during a brief port visit. It contains no moving parts, which greatly reduces cabling, maintenance and repair costs. The installed cost of the OpenPort terminal is estimated to be 50 to 90 percent lower than other marine satcom systems. The price per megabyte for data throughput is also at least 30 percent lower.

Making life and business easier away from home

The maritime satcom industry has really taken off in the past five years. There are now no reasons why a crew member on board an oil rig, merchant vessel or yacht cannot have access to broadband services - to Internet, Voice, VoIP, email, text, fax – real time communications. It is essential for corporations to keep in constant contact with their fleets. Broadband is becoming the standard at sea and the market will only continue to grow. GSM is also a new proposition for shipowners to consider. Satellite backhaul can facilitate GSM connectivity anywhere on the high seas and companies such as Blue Ocean Wireless are making this a much more affordable solution.

VSAT continues to run away as probably the most popular means of satellite communication at sea.

We have seen the new stabilised antennas that are ruggedised and not fazed by the roll of the ship. They are economical and easy to use way. They are also easy to deploy and the technology is widely understood.

The result of the enhanced communications available to crew members may even result in the easier recruitment of crew for shipping companies, for example. This industry has a high turnover of staff due to the tough conditions in which they have to work. If they have the means to keep in touch even when away for long periods of time, the job is not so isolated and regular contact with friends and family is readily available.

The benefits of satellite communications on board vessels are many. It is a real force to be reckoned with and has proved time after time that it can deal with the harshest conditions that the sea can throw up. ■