

Yacht Communications – To Infinity and Beyond.

Almost all communication technologies are likely to benefit from improvements and enhancements this year, although there are no revolutionary new technologies on the horizon. This is not necessarily a bad thing, as it means that the latest technology in which we have invested should get more reliable and more user-friendly.

Not very exciting, you may say but there is a treat in store for everyone of every age, for every yacht at every stage.

Communications – your voice and data links ashore

Access to good and reliable communications and specifically broadband on a yacht is without doubt one of the major contributing factors to the phenomenal growth in the large yacht market. As a result of the availability of these good communications there is now very little that an owner or guest cannot do on a yacht. He or she is always “in touch”, unless he or she chooses not to be...

So what's new?

Inmarsat Fleet Broadband (FBB)

As I write this we have just taken delivery of the first batch of FBB systems, and are currently installing the first of these. FBB provides an alternative to VSAT for broadband data communications. The main advantage of FBB is that it has very small antennas even when compared to the KVH V7 mini VSAT. The two models are the 250, at 25cm in diameter and the 500 at 50cm in diameter. The 250 has Standard IP speeds up to 284kbps with Streaming up to 128kbps, and the 500 has Standard IP speeds up to 432kbps with Streaming up to 256kbps. Both support simultaneous voice, fax and SMS. The coverage will be worldwide after the third and last Inmarsat I4 satellite for the Pacific is launched on April 28th from the Baikonur Cosmodrome in Kazakhstan. The April launch will be followed by in-orbit testing of approximately 70 to 80 days.

FBB is a great option for the more adventurous sailing yacht with worldwide “off the beaten track” destinations in mind. VSAT does not provide quite such extensive coverage, and the VSAT antenna is too large for the average world girdling yacht. If the yacht is big enough, the FBB is an ideal solution as a backup to a VSAT, to be used in any areas not covered by VSAT:

So what are the downsides of FBB? Unlike the Fleet 77, neither unit is an approved system that fulfils the GMDSS carriage requirement, so the dependable Inmarsat C is now the only



Inmarsat system that is GMDSS approved. Secondly, although the running costs are generally reduced when compared to Fleet, they are still calculated per minute or per lump of data, so FBB is more expensive than VSAT for large data downloads.

VSAT

Over the last three years, there has been a massive growth in KU Band VSAT on yachts over 30m. The most common VSAT antenna seen is the Sea Tel 4006 and its predecessor the 4003. These both start at a diameter of 127cm. Our clients love their VSAT data service and have now come to accept it as a de-facto standard on a yacht. As with every technology, after the initial euphoria has subsided, the limitations are identified and our clients want more.

The two most common additional requests for VSAT are:

- a) we want more coverage outside the standard cruising grounds and
- b) we want a smaller antenna

The first request has been addressed by a number of service providers. MTN, now one of the most widely respected service providers, originally the market leader in the cruise ship market, in collaboration with e3, they launched a yacht-specific KU Band VSAT service in 2005. Due to their background, their coverage was initially concentrated in areas where cruise ships sailed. Super yachts wander off the beaten track and due to their success in the super yacht market they have responded by increasing their coverage to include the Indian Ocean, including the Maldives, south east Asia, south west Pacific and the southern half of Africa. This has provided a number of yachts with welcome VSAT services in those areas since the start of this year. This also bodes well for yachts heading for Beijing this summer.

The second request, for smaller antennas, has been addressed by various manufacturers making 60cm antennas. These include Sea Tel who have introduced their 2406 in an 86cm diameter dome and the KNS-60 in a 78cm diameter dome, and KVH with their V7 in a 66cm diameter antenna. The Sea Tel system is a shrunk 4006 and thus can be used with the same service that is used for a 4006. However, as the dish has shrunk, so likewise will the area in which it can be used. There are a number of service providers developing spread spectrum solutions for the 2406 and the KNS-60 which will enable the user to have much greater coverage even with the smaller dish. KVH launched their 60cm antenna with a combined service last autumn. This is a spread spectrum service. The service has been successfully running in the USA since last autumn and has been available in Europe since January 15th this year.

A word of caution, choosing your VSAT service is still not as simple as “plug and play”. In any Agreement, look for bandwidth that has a guaranteed minimum or committed information rate (CIR), as if this

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isn't mentioned then you may end up not being able to communicate at all. This is likely to become more and more of an issue because available satellite bandwidth is finite and increasingly sought after, and in some places it is becoming a rare commodity. For further information please refer to my editorial published in this magazine last spring titled "VSAT – the importance of your service provider". It is available as a download from our website www.e3s.com/information, under the Yachting Matters section in Technical Articles.

Finally, on the same note, there is a potential bandwidth supply and demand problem looming. I was talking to one of the major VSAT service providers last week who told me that, due to the significant growth of VSAT in the yacht market, there is a shortage of bandwidth on some satellites. He mentioned one particular satellite that has actually run out of capacity.

The Future of Phones 2008 to 2020

The GSMA World Congress in February in Barcelona showcased all the new smart phones to be launched in 2008. The top of the range handsets are among the most technological status symbols on the planet. Each new phone is armed to the teeth with more and more features including better email, broadband access, PC synchronisation, digital, audio and video capture and reproduction, TV reception, removable storage, content, contactless payment, Bluetooth, Wi-Fi, and GPS with maps for both cars and pedestrians..

With this current seismic explosion in the handset market, where will it be in 2020? The Nokia Research Centre has published a report suggesting that by 2020 "almost everybody in the world will own a device. Handsets will be more prevalent than toothbrushes". Bad news for dental hygiene, I think! There are current discussions about the feasibility of producing a \$10 handset for use in the developing countries which have yet to subscribe to the cellular revolution.

They are also predicting that the development in multi-core semiconductor architectures will allow handsets to operate at teraflop speeds, making them considerably more powerful than a current desktop computer. Storage capacity will exceed terabyte capacity before 2020.

Nokia has obviously been wondering what to do with all this predicted processing power, and as a result has unveiled a concept device codenamed the "Nokia Eco Sensor". The phone will be able to measure, among other elements, carbon monoxide levels, ground-based oxone levels, UV radiation, your own heart-rate, environmental noise etc. The phone will warn you if you are about to enter a hazardous area or an area where you may have an allergic reaction, like a hayfield, for example.

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Another new function will be a visual sensor which will use the camera and microphone to see and hear and create an image and audio record, which when using the teraflop processing capabilities with 5G cellular (1Gbit/s) broadband data speed, and using image and audio recognition software will enable “Point and Find” applications. This means in simple terms that you will be able to point your camera at something like the Eiffel Tower and it will instantly tell you it is the Eiffel Tower with full details.

Wireless broadband 4G LTE

The two most common acronyms I saw at the GSMA World Congress this year was WiMax and LTE, or 4G. LTE is a new developing wireless broadband technology due in about 2012. LTE stands for Long Term Evolution, a catchy little phrase!

WiMax has been around for a number of years now. It was destined to be the new generation of Wi-Fi, but by all accounts it seems to be headed for use primarily for wireless distribution networks in areas where wire cannot reach. Motorola had an area of Barcelona city centre, around the Sacrada Familia, Wi-Maxed up for the period of the show in order to demonstrate a Wi-Max service. The Wi-Max base station antenna could blend in well with Gaudi’s creation, and look as if they were designed 100 years ago!

With regard to 4G, it is well known that the performance of 3G HSDPA wireless broadband networks hasn’t lived up to expectations. A consortium of handset makers and telecoms, including Nokia, Nortel, T-Mobile, Vodafone, France Telecom/Orange, and Alcatel-Lucent, have completed the first set of trials of 4G wireless, and we hear the results are promising.

The 4G (3GPP LTE) wireless broadband is ambitious in its specification with speeds of 50Mbps up and 100Mbps down, and with support for no fewer than 200 simultaneous users in each 5Mhz slice of the spectrum. For those readers who haven’t a clue what that last sentence means, I can tell you it is good!

GSM services on yachts

Turning a yacht into a GSM cell at sea has been talked about for a few years now. In fact, I was responsible for early publicity about the opportunities some four years ago using the Altobridge gateway. The system required for a yacht has yet to evolve, but is expected to this year. The same systems used on cruise liners have evolved and have been around for many years and are very mature. The discerning cruise liner passenger and large ferry user now expects to be able to use their cell phone when on board the ship. Soon this will be the same for the super yacht owner and guest.



To date, the super yacht GSM cell at sea systems have all suffered from poor service. The equipment works well, but usage is limited to a select band of owners, guests and crew whose own GSM service provider has a rare bi lateral service agreement with the service provider configured on the onboard GSM system. The number of bi-lateral service agreements is so limited that quite often even the owner cannot use his own cell phone aboard his own yacht.

There is a new system being launched this year that will create a proper GSM Sea Cell service for super yachts. It will work with almost every GSM service provider. All the existing attempts have been analysed and the ultimate solution created. Keep in touch if you would like to be first to hear about this later this year.

Iridium Broadband

Iridium have announced that they are in the midst of creating Iridium NEXT, which is the next generation replacement constellation of satellites. It will be launched in 2013 to provide reliable service until at least 2030. Iridium NEXT will provide its users with a seamless transition from today's services which already include pole-to-pole coverage, security, availability and reliability, to an enhanced service with the addition of higher bandwidth, new user devices and technology.

Stratos are currently offering an upgrade path for Globalstar users to Iridium.

Cisco controlled Managed Networks

With all these data pipes available to the yacht, all of which offer slightly different services at different costs, it has become increasingly important that the yacht has a reliable and easy-to-use method to select the optimum service required. Once the best connection has been made, it needs to be monitored by the onboard network to show and record the connection details. The onboard network control system will show which off-yacht connection to use, and also the data passing around the yacht from one location to another, for example, movies from the central movie library or telemetry data from the engine room.

With all the data connections available and the applications required ranging from low bandwidth applications such as email to high bandwidth applications such as TelePresence and IPTV, it is important to carefully design the network. This network is the backbone of all the systems on board, so must be capable of handling everything you need today and may possibly need in the near future. This is not purely the domain of new yachts, as even existing yacht networks can be upgraded.

A managed network today, apart from being the data highway around the yacht, can manage and control connections to the outside world, as well as controlling security within the yacht and to

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the outside world. A managed network can control virus and spam by carrying out pre-connection “health checks” on the laptops or PDAs of any guests wishing to access the network using their own equipment. It can also ensure that the owner has guaranteed bandwidth. The network can also double up as the onboard telephone system. All this, and much more, is possible with a Cisco-controlled network.

In conclusion, we have a selection of different voice and data pipes to connect to the yacht, all of which vary by size, quality and availability. The voice and data being delivered through them is either unlimited at a fixed price, or is priced by volume. The type of these different voice and data pipes remains largely unchanged, but their size, quality and availability has changed and will continue to change in the years to come.

Due to this increase in size, quality and availability, more data-hungry quality applications may be used now and in the future. In order to ensure the quality of the environment in which these applications will run, it is absolutely essential to make sure the onboard network is managed, controllable and has a high quality specification.

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For any answers, questions or information on any of the above, please contact us.

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