

# WHEN SIZE MATTERS – MANAGING BANDWIDTH



FROM GETTING SPEEDS THAT YOU THINK YOU'RE PAYING FOR TO CONTROLLING WHO'S ON THE INTERNET, THE LATEST DEVELOPMENTS IN MODERN YACHT COMMUNICATIONS ALL REVOLVE AROUND THE SCARCE RESOURCE OF BANDWIDTH.

BY BRANSOM BEAN

**G**OOD COMMUNICATIONS is the excuse all owners need to get afloat,” says Roger Horner, managing director of e3, which rightfully takes great pride in being the first to install VSAT on a superyacht. “An owner or charter guest can now do everything they do at home and in the office on their yacht.” The goal, he says, is to turn the yacht into a home away from home.

Indeed, when listing the reasons for the superyacht boom of the '90s and the early 21st century, communications is right at the top of the list, keeping the boss and guests in touch with business or whatever and the crew blissfully SKYPE-ing.

	GENERAL LOCATIONS					SIZE ANT	APPROX COSTS	
	PORT	ANCHOR	COASTAL	OCEAN	EQUIP		EQUIP	RUNNING
IRIDIUM	●	●	●	● 10	●	●	LOW	LOW
IRIDIUM OPEN PORT	●	●	●	● 10	●	●	MED	N/A
FLEET	●	●	●	● 8	●	●	MED	HIGH
FLEET BROAD BAND	●	●	●	● 6	●	●	MED	HIGH
VSAT	●	●	●	● 6	●	●	HIGH	MED
MINI VSAT	●	●	●	● 3	●	●	HIGH	MED
GSM	●	●	●		●	●	LOW	LOW
GPRS	●	●	●		●	●	LOW	LOW
3G	●	●	●		●	●	LOW	LOW
HSDPA	●	●	●		●	●	LOW	LOW
WI-FI	●	●			●	●	LOW	LOW
DATA SPEED GUIDE	● <64Kbps	● 64Kbps	● 128Kbps	● 256Kbps	● 1MB plus	DATA SPEEDS ARE FOR DEDICATED SERVICES AND ARE AN APPROXIMATE GUIDE		
COVERAGE GUIDE	THE HIGHER THE NUMBER IN THE OCEAN COLUMN, THE GREATER THE COVERAGE							

Table Courtesy of e3

### COMMUNICATION SYSTEMS COMPARISON: COVERAGE, SIZE AND COST

#### The Raison D'être of Comms

Yachts “need” communications and scads of bandwidth for four general reasons:

- ▶ Social contact – voice, email, social networking, music, movies and newspaper downloads, home TV streaming, home physician telemedicine
- ▶ Business contact – voice, fax, email, professional networking, VPN, video conferencing
- ▶ Safety and security – navigation warnings, chart updates, weather info, weather routing, GMDSS, ISPS, LRIT, AIS
- ▶ Management – telemetry data transmission for remote monitoring for preventative maintenance, part ordering, etc.

Sadly, the days are gone of those exotic crackling single sideband chats that always sounded like you were calling from the far reaches of the universe to communicate via those friendly, unseen voices at the likes of Portishead Radio, “Portishead Radio, Portishead Radio, this is Mike Whisky Sierra Charlie Two...how do you read? Over.” Screech, crackle, howl and then, “Standby MWSC2, I'll retrain my antenna....”

Instead, today's yacht communication spectrum spans:

- ▶ Wi-Fi

▶ WiMax – a wireless digital communications system also known as IEEE 802.16 provides broadband wireless access up to 30 miles (50 km) for fixed stations, three to 10 miles (five to 15 km) for mobile stations

- ▶ Voice and ADSL cable
- ▶ Mobile telephone – seemingly endless variants in technology, hardware and plans
- ▶ VHF now with Digital Selective Calling
- ▶ UHF and single sideband (and does anyone even use that anymore?)
- ▶ VSAT – the latest and greatest for superyachts
- ▶ L-band – Iridium and Inmarsat IsatPhone
- ▶ Inmarsat Fleet Broadband
- ▶ Iridium OpenPort – omni-directional fixed antenna for higher bandwidths

Horner says a standard superyacht package today often includes:

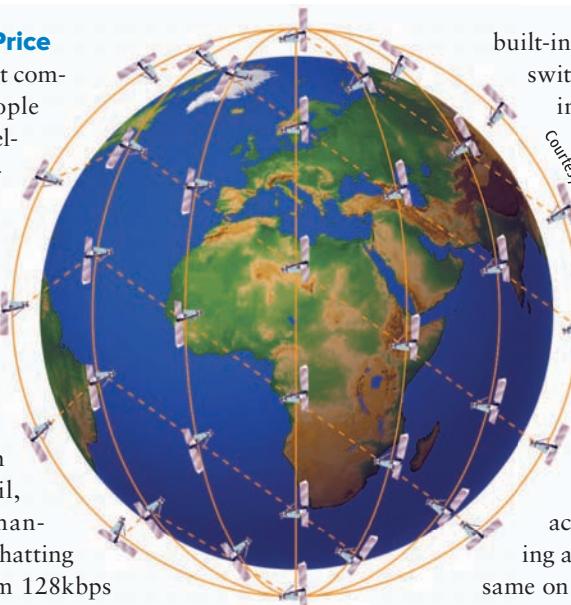
VHF	for everywhere
Voice & ADSL	in port
Wi-Fi	in port
GSM & 3G/HSDPA	in port and offshore
Inmarsat	in port and offshore worldwide
VSAT	in port, offshore and almost worldwide

**And Everything Has Its Price**

When speaking of superyacht communications, though, people usually are talking about satellite communications and generally that means the holy trinity of VSAT, Inmarsat and Iridium.

Ironically, just three years ago people weren't even sure VSAT – being somewhat adverse to rain – would even be accepted. But it was hard to argue with 24/7 connection for email, video conferencing, file handling, online shopping and chatting with a download speed from 128kbps to 2,048kbps and upload from 128kbps up to 512 kbps. Yes, there's that chunky upfront cost, US\$20,000 to US\$50,000, but once you pay your money, you get it all for a nice and neat fixed monthly charge – subject to things like contention ratio, of course.

"Some of our customers don't want VSAT at all," says Knut Natvig, marketing and communications manager



*Courtesy of Iridium*

built-in redundancy allowing them to switch satellites or networks, giving them the edge over smaller Virtual Network Operators (VNOs). Another maritime specialist, Linkscape adds value by developing its own technology and managing bandwidth by having access to more satellites via larger bandwidth pools.

"VSAT has been a very price competitive market over the last few years and price reductions have been achieved by service providers selling an inferior service that looks the same on the surface for a lot less," says Horner. "It's been a case of reading the small print or signing up and being disappointed."

One good way to get *really* disappointed with your VSAT is to neglect "contention ratio."

To get a feeling for the problem, think of a nice hot shower with a constant, solid flow – fine if it's only you enjoying that shower (please remember, we're only considering the pleasure of water volume here, nothing else). It goes without saying that if more and more people tap into your shower's water source upstream, even though the shower directly over your head could still handle the same flow, the water's just not there anymore because other people are using it. Gradually, what had been a satisfying, solid stream shrinks to a disappointing dribble. And that's what happens if a whole bunch of yachts berth together and start using the same space on the satellite – a bandwidth dribble.

As Horner explains, say company A and company B both sell a 128k/512k service. A sells one for \$4,500 while B's is just \$2,250. Why then pay double the price with company A? Quite simply because you're probably not going to be receiving the same thing, even though both are "128/512." That's because if company B's package has a contention ratio of 10:1 while company A's is 2:1, you may soon discover that with your bargain basement company B package, you're sharing your bandwidth with nine other yachts in the neighborhood.

"Bottom line, there is no such thing as 'unlimited'; you only have true unlimited when it's completely dedicated, and yes, we sell it, but completely dedicated is very, very expensive," says Dave Cinege, senior network engineer at Linkscape.

Like so many other things in life, it all comes down to your contract, so read the fine print if you expect to berth close to other yachts or you may find yourself

### THAT'S WHAT HAPPENS IF A WHOLE BUNCH OF YACHTS BERTH TOGETHER AND START USING THE SAME SPACE ON THE SATELLITE – A BANDWIDTH DRIBBLE.

for Marlink. "But when you reach a certain level of Internet and talk per month, VSAT may be an alternative with more predictable costs and unlimited usage."

Inmarsat, on the other hand, has some breathtaking per minute charges and, depending upon the size and speed of the plan, usage costs for Iridium can range between US\$5 and US\$9 per megabyte.

"Real falls in price in the VSAT market are marginal," says Horner. "However, there has been a massive increase in flexibility of contracts with shorter term options in the VSAT market."

But for "flexibility" read "confusing."

Where two or three years ago there were fewer than a dozen VSAT service providers, now there are close to 100 globally. So basic economics would suggest that the costs should be going down, but trying to compare apples to apples is the problem.

VSAT service can vary drastically between companies, with someone like major player MTN reporting 99.2 percent up time – not so surprising given they've

getting intimate on bandwidth.

"Another huge problem for yachts, being moored as often as they are, is blockage," says Cinege.

Blockage quite simply is when the yacht's VSAT antenna can't "see" the satellite because of an obstruction, i.e. another antenna, the funnel, a mast, a mountain or another yacht. Access to more satellites means the possibility of switching satellites ("reconfiguring") and Linkscape has its own modem that allows this to be done with minimal involvement by the yacht crew. It also just so happens to allow Linkscape to block viruses and activities like unauthorized file sharing that soak up bandwidth before it gets to the satellite from the yacht.

Strangely, something that seems to be overdue is what seems simple – making the entire yacht into a GSM cell – de rigueur aboard cruise ships and some aircraft. Alas, the problem is not in the technology – it's money. "On a yacht, unlike a cruise ship, you can't earn money by selling minutes," says Horner.

Over on L-band there are some changes as well.

"The major changes in the past three years have come from Iridium and Inmarsat," says Trevor Whitworth, senior vice president of sales and marketing for Telaurus Communications.

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Known for its reliability, Inmarsat has completed the launch of three new satellites, giving them "global" coverage – well, sort of global (70 degrees north to 70 degrees south) – for its new FleetBroadband service.

Reminding those who've never had the occasion to fire a sextant in anger that there are 90 degrees, not just 70, from equator to pole, Iridium says, "When we say global, we mean global; you switch it on and it works – anywhere."

After going public last year, Iridium has a new "sort-of" broadband service, OpenPort, using its aging satellite constellation. Its next generation of satellites, Iridium NEXT, is due to be launched from 2015 to 2017 to better serve what are now 400,000 subscribers at a cost of US\$492 million.

"Clearly, the boundaries between what was traditional VSAT and Inmarsat territories are becoming increasingly blurred," says Whitworth. "Indeed even Inmarsat themselves are saying that its FB [Fleet Broadband] devices might be considered as a back-up to a VSAT device."

### DEVILISHLY CLEVER

Handsets, like most electrical boxes, keep getting smaller and more capable and John Mineola of Intellian observes, "Antennas are getting smaller, cheaper, lighter and more dependable."

But in the end, it all seems to come down to bandwidth, where size does matter.

"The trend is to take a scarce resource and manage it," says Hernando Giraldo, director of business at Great Circle Systems, whose company offers the NAS3000, a dedicated server that monitors and controls the onboard Internet access.

That's "Communications Management."

In other words, if it's getting too expensive or the boss needs to use a lot of it, simply cut out other users. So now the always class-conscious superyachts have new electronic tools that not only let them know who's using bandwidth, but can also control who will be using it while switching technologies to best suit need, cost and, of course, class.

One of the most intriguing new developments in the communications realm may be a little gadget from Wired Ocean called the S-Box, which uses the fact that all superyachts have one or more TV antennas. The S-Box bypasses VSAT altogether, taking advantage of the innate asymmetry of modern broadband communications.

"Internet is highly asymmetric with consumers receiving much more data than they send," says Wired Ocean's Victor Barendse. "And all superyachts have a TV antenna and mobile communications service, such as Inmarsat."

Some bad news is that it's not good with Voice over Internet Protocol, i.e. SKYPE, but suppose all the owner wants is a big fat Sunday newspaper to fondle while sipping his first glass of Champagne.

When you get one from the Internet, basically you are sending out a short transmission asking the computer to go find it somewhere on the net. The operative word here is "short," as in "Who cares what the usage rate is, even if it's US\$10 per minute, we're not using much" short. So the S-Box zaps it up from the yacht in a quick, and thus cheap, spurt on otherwise expensive L-band (Iridium or Inmarsat). Then when it finds it, the S-Box magically arranges to have all that cumbersome print and images cascade down on Ku-band via your TV antenna.

Actually, it's old technology and by some accounts somewhat unreliable. But in a high-priced world gone mad with high technology and jargon, it does seem a little bit like getting something for nothing. And there's definitely something quite satisfying about that. **DW**