

# Buying VSAT

## – an independent guide for maritime

Maritime companies that are interested in upgrading their satellite communications to VSAT will be faced with a wide range of different choices and options as to the potential system they could deploy. Knowing the ins and outs of the technology is critical in ensuring you make the best decision, writes Alan Gottlieb, Gottlieb International Group

If you are a ship owner or IT manager, choosing a VSAT service is a critical decision. Since vendors typically require commitments of 2-3 years, selecting the wrong vendor can be a career-jarring mistake resulting in significant losses and inadequate service.

If you are unfamiliar with the technicalities of satellite broadband communication, purchasing a maritime service can be as dangerous as sailing into unknown waters.

In choosing a service, potential buyers face a seemingly unfathomable series of issues including choice of L-, C- or Ku-band, coverage areas required, antenna sizes, types of available satellite hub platforms, modulation schemes, how much bandwidth will be required to run their applications, constant IP Addresses, VPNs, Committed Information Rates, IP switching platforms, and blockages.

If that's not enough, in addition to all of this the buyer needs to look at software platforms for bandwidth management, security, how to limit internet sessions and web site access, pricing, Contention Ratios, backup systems and remote maintenance and Fair Access Policies, etc. etc.

As an independent consultant in the field of maritime VSAT, Gottlieb International Group is pleased to present impartial advice and to expose some of the fallacies encountered in the VSAT selection process. Here, in excerpts from our new E-Book, 'An Independent Guide to Buying Maritime VSAT', we target some of the most frequent areas of misunderstanding.

### The Value of Trials

Trials have become a popular way to test new VSAT systems. Eager to win large fleet contracts, many vendors are offering free trials in the hope of generating sales. Unfortunately, such trials are relatively useless in evaluating the long-term performance of a service.

Sophisticated buyers know it is easy for a vendor to allocate additional bandwidth to a trial vessel, thereby creating the impression of a favourable trial outcome.

Given the possibility of winning a three-year, 50 to 100-ship contract worth \$5 to \$10 million, the incentive for such 'bait and switch' tactics does exist, especially in a highly competitive market.

Even if the trial vessel is not allocated preferential network access, service providers in the early stages of deployment are likely to have few subscribers, resulting in excellent bandwidth availability and a stunningly deceptive performance.

Once the vendor's network is more fully populated, however, the customer who

was satisfied with the trial may experience a significant decline in performance due to excessive Over-Subscription, a condition that occurs when more users join the network that it can adequately support.

Consequently, buyers should also be wary of testimonials from early stage subscribers.

A popular but deceptive sales technique is to recruit such subscribers to author complimentary articles or speak at conferences. Always ask about the duration of their experience on the Network and what applications they are running.

However, while trials are of questionable value and testimonials can be deceiving, there are ways to guarantee performance.

### Contention Ratios and Committed Information Rate (CIR)

Contention Ratio and Committed Information Rate (CIR) are the criteria by which a VSAT network can be measured.

Contention Ratio indicates the number of subscribers who typically share or contend for a fixed amount of bandwidth.

CIR or Committed Information Rate is the amount of bandwidth always available and is guaranteed under contract (Service Level Agreement). Time sensitive services such as voice, Video Conferencing, or remote PC maintenance typically require minimum bandwidth levels.

Because dedicated bandwidth is expensive, most of the services offered to the maritime VSAT market are to some degree contended services. This means any amount of bandwidth that is not guaranteed will be shared and subject to availability.

In theory, this is a sensible arrangement since it assumes that all of the subscribers will not use bandwidth at the same time, and it keeps costs down. However, if too many subscribers are sold services, network quality may suffer.

Degraded service is typically experienced in commercial services when the Contention Ratio or the number of subscribers sharing a fixed bandwidth resource exceeds 10:1.

Since the number of vessels contending for the use of a single beam varies considerably as a vendor's subscribers transverse the globe moving from beam to beam, the only way to assure that you will always have an acceptable level of service is to contract for a Committed Information Rate (CIR).

Determining how much CIR you need is a tricky affair. Since services with CIR are considerably more expensive as the



Careful consideration of all the facts is required before you install one of these on your vessel

Committed Rate increases, contracting for more CIR than you need can be a costly.

Vendors tend to offer CIRs ranging from 32 kbps to 256 kbps, or more. To determine how much you need, the best solution is to model your applications in a laboratory environment.

Considering that the contractual obligation for VSAT services under a three-year contract could easily exceed \$100,000 per vessel and that simulation is readily available at reasonable cost, the minimal investment in this service makes good business sense.

Always keep in mind that high capacity services with CIR are more expensive than fully contended services.

While some vendors of fully contended services can deliver adequate bandwidth by limiting the number of subscribers, such restrictions also limit profit. Such vendors face a delicate balancing act to maintain service levels while meeting their financial objectives.

In general, fully contended services are offered at low prices and characteristically employ moderate to very strict Fair Access Policies.

### Understanding Fair Access Policies

When evaluating a vendor, pay special attention to the company's Fair Access Policies.

Often included under the Terms and Conditions of Sale, these clauses essentially give the provider the discretion to downgrade the quality of your service should you run applications or transmit excessively large amounts of data which, in their estimation, overloads the network.

The more restrictive of these clauses prohibit the transmission of large files, web conferencing and many other activities, restrictions that would be intolerable for the commercial user.

Keep in mind that on typical container ships and tankers, unrestricted usage can easily exceed 20 gigabytes per month, possibly violating such policies.

So, if you are considering a fully contended service, understand the limitations imposed by these Policies. Know how much capacity you are permitted to use and insist on a way to monitor usage.

Beyond the Fair Access issue, one of the areas most prone to misunderstanding is the difference between platforms.

### L-band vs C-band vs Ku-band with backup

Until recently, vessels seeking global IP connectivity were limited to two choices: C-band or L-band (Inmarsat or Iridium).

For very large vessels, such as cruise ships, VLCC class oil tankers and certain types of oil service vessels, C-band based systems were and have been the preferred option. Advantages of C-band include fixed priced service, global coverage (+70 degrees north to -70 degrees south), and resistance to Rain Fade.

However, the principal disadvantage with C- is the need for a 2.4 metre stabilised antenna, a system component that weighs over a thousand kilograms, takes up an inordinate amount of deck space and costs nearly \$100,000. Hence, C-band tends to be reserved for a limited market with very specialised needs and large budgets.

Alternatives to C-band include L-band based Inmarsat FleetBroadband, Iridium OpenPort and Ku-band services.

While L-band offerings utilise much smaller antennas than C- and Ku-, they are pay-by-the-byte services sold with volume-based pricing, possibly making access to the Internet cost prohibitive.

At per megabyte charges of \$3 to \$8, usage costs could soar into the high five figures if left completely unrestricted, especially when accessing the Internet or transmitting large files.

As a potential alternative, fixed-priced Ku-band services are now available over most major shipping routes.

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Ku-band offers high capacity service and relatively unlimited broadband access at fixed-priced rates. Because it operates at a higher frequency than C-band, it can utilise much less expensive and space efficient 1.2 or 1-metre antennas.

However, unlike C-, it does not offer full global coverage and is susceptible to Rain Fade.

In order to take advantage of the low fixed-cost of Ku systems, they are typically deployed with Iridium OpenPort or FleetBroadband backup and a least cost routing device that switches between IP services as required.

This arrangement facilitates the full global coverage required by many shipping companies. Several manufacturers supply such devices, as software or hardware based systems.

**Backup – OpenPort vs FleetBroadband**

When using a back up L-band service, keep in mind that both OpenPort and FleetBroadband are pay-by-the-byte services.

While suitable for voice, e-mail, SMS and very limited data usage, their high usage costs generally rule out unregulated web browsing, large file transmission, video conferencing or other bandwidth intensive applications.

In fact, many ship owners even limit the size of e-mail attachments to one megabyte or less. So, when Ku- VSAT is unavailable, you need to limit use to voice and e-mail and 'lock out' all but

essential Internet access.

With this in mind, here is what we found when we evaluated the two services.

While OpenPort offers compelling advantages in terms of three channel simultaneous crew calling, lower data and voice charges, Polar Region access and a convenient rugged and low cost antenna, from our experience users tend to prefer the voice quality of the Inmarsat service although, given time, most users find OpenPort voice quality more than acceptable.

In terms of transmission speed, Inmarsat's FB 150 enjoys a slight advantage with its standard 150 kbps offering. Until recently, to obtain 128 kbps services on OpenPort required users to commit to a high-end pricing package and pay a premium for either 64 kbps service or 128 kbps.

However, Iridium has just announced that the need to subscribe to a high-end plan for 128 kbps service has been eliminated, along with any surcharges while, unlike Inmarsat, slower speeds will be available at discounted pricing.

So, in general, we find that in terms of features, the two services compare favourably. In terms of end-user satisfaction, OpenPort's rating varied significantly depending on the chosen service vendor.

Top notch, Tier 1 OpenPort vendors at the top of the distribution chain provide software to control and restrict usage, installation services, the critical site sur-

vey, supply of and management of critical firmware upgrades, excellent support and attractive discount pricing.

Conversely, sub-distributors at the edge of the dealer network tend to charge more, and offer inconsistent support, sometimes resulting in a poor user experience that is not typical of OpenPort.

So if you are considering the Iridium service, shop around. We believe that both Iridium OpenPort and FleetBroadband represent excellent options for a VSAT back up service.

**Small Antennas vs Large Antennas**

Understanding antenna size is one of the most critical considerations in selecting a VSAT service. Make no mistake, size matters.

Satellite professionals will tell you that while there are some very significant advantages to sub 1-metre antennas in terms of pricing and installation cost and reduced deck space requirements, these services typically require more transponder space and power and consequently cost more to operate than 1-metre or larger units.

In some cases where satellites operate in close proximity, the use of small antennas can create Adjacent Satellite Interference. To avoid this problem, VSAT service vendors with small antenna offerings often employ a technique known as Spread Spectrum.

Spread Spectrum spreads the energy

required to service the antenna across a large block of transponder space thereby reducing the power required and resolving the Interference problem.

For the vendor, however, employing Spread Spectrum requires a huge up-front cost and risk. Providers must lease large amounts of bandwidth and sometimes entire transponders. To achieve rapid ramp up and fill the transponder space, providers typically offer low cost services with higher Contention Ratios.

So, if you are seeking voice and basic internet and are not contemplating a sophisticated fleet wide networking application with ever increasing bandwidth requirements, then Spread Spectrum based services can be an excellent choice.

However, if you are a high end user, you need to weigh the advantages of a 1-metre or larger antenna units.

Although up-front hardware and installation costs are greater, a larger antenna has greater surface area and requires less transponder space and power. This means that services relying on the larger aperture can operate with Conventional Modulation rather than Spread Spectrum.

Unlike Spread Spectrum, Conventional Modulation running under iDirect or Vipersat platforms facilitates a business model where transponder space can be purchased in small increments and capacity increased along with the number of subscribers, thereby reducing vendor up-front investment risk.

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In addition, because larger antennas can deliver more bandwidth utilising less transponder space, there is no Adjacent Satellite Interference problem. Hence, vendors have high power capability and can offer high-end users the option of Committed Information Rates.

It is also important to consider that usage will likely increase significantly over the life of a VSAT service contract. For this reason, some vessel owners may opt for even larger 1.2 or 1.5 metre antennas with a view toward an increase in system capacity.

In the end, we find that large fleet owners with fleet-wide networking aspirations have a preference for 1-metre and larger antennas in global service applications, and they often insist upon a minimal amount of committed bandwidth or CIR.

On the other hand, some customers with less critical needs may find the lower-priced, Spread Spectrum services perfectly adequate for their needs.

### Full service vendors

When you buy a VSAT service, seek out vendors who take responsibility for the total system, including hardware and software maintenance. You should have a single point of contact for all system related issues.

When choosing a vendor, keep in mind that the components of a successful VSAT solution include the correct antenna, bandwidth and CIR, surveying the installation site and choosing the best position to install the antenna to avoid blockages and providing the appropriate L-band back-up service (Inmarsat or OpenPort).

Vendors should also provide software to monitor and control costs, crew access, and an onboard system that can reboot Network components automatically and provide remote maintenance access via the backup L-band network.

Never before has the maritime VSAT market been more competitive. Numerous new VSAT service vendors are rushing to market and Ku-band satellites with coverage over the oceans are rapidly filling to capacity - all despite the difficult economic conditions in the shipping industry.

As providers become more desperate to fill their leased transponder space, the market will abound with

new and progressively more attractive service offerings, making vendor selection even more difficult.

Prospective buyers need to exercise caution. The market is rife with misconceptions and misunderstandings, and we often find even the most sophisticated of buyers lost in the confusing claims of competing vendors.

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Alan Gottlieb is CEO of Gottlieb International Group, which specialises in assisting ship owners and managers with evaluation of satellite service offerings and helping service providers structure appropriate product offerings. The company's E-Book, 'An Independent Guide to Buying Maritime VSAT', can be ordered from [www.gottliebinternationalgroup.com](http://www.gottliebinternationalgroup.com).  
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