

# Reaching **Further**

With VSAT throughput multiplying by almost a factor of 10, never-before-seen applications are sprouting in the industry. All this comes at a cost, however, and although satcom is still more expensive than terrestrial infrastructure, the gap is closing





VSAT is ideally suited for use in regions where terrestrial data networks do not exist, either for reasons of cost or due to the difficulty of installation. This is often the case for exploration installations in the Antarctic, industrial installations in third-world countries, and the requirement for secure communications in areas where security and safety have reached critical turning points.

Warren Ackerley, Business Development Director at Paradigm, says: "VSATs are frequently used to overcome geographic constraints by providing the backhaul link for mobile/GSM and 3G operators. VSAT is bringing cost-effective connectivity to remote areas of the globe, which is in turn helping to foster business development and improve medical and educational services for those regions."

"Additionally, VSAT can provide critical back-up support during times of crisis and disaster; being able to enter a disaster zone with all the equipment to quickly get connected can seriously impact the number of lives that can be saved, and VSAT technology is the key to enabling that. Paradigm has responded to that by developing the Swarm45 VSAT terminal, which fits into one case and can be placed into the overhead locker of a commercial aircraft. This allows first-response or broadcast teams to be out of the airport and on their way to the site as quickly as possible."

With the advent of HTS, speeds have improved dramatically and a lot of

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WARREN ACKERLEY, Business Development Director at Paradigm

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changes in modems and other ground infrastructure have made it possible to squeeze out even higher bitrates.

Nabil Ben Soussia, Managing Director of IEC Telecom Middle East and Kazakhstan, says speeds of between 20Mbps and 30Mbps can be easily seen, depending on the region.

“With other points, for a higher price you can witness rates of even 100Mbps, which today we can say is comparable with terrestrial infrastructure. Due to the complexity of the satellite business and the high costs involved, the cost to the customer is still higher than terrestrial networks, but closing the gap is just a matter of time,” he continues.

Alvaro Sanchez, Sales and Marketing Director, Integrasys, concurs, adding: “We have seen up to 100Mbps in iDirect and Hughes platforms, so the speeds have increased significantly from 10s to 100s of Mbps.”

The real advantage of HTS is that it enables much smaller terminals to achieve similar or better throughputs to larger terminals on other networks. In addition, larger terminals on HTS can consequently achieve really high speeds.

Ackerley thinks VSAT has reached a development level where it is now a viable candidate for high-speed data and high-quality communication and media transmission.

“The advances made by simplifying the VSAT pointing process have resulted in VSAT terminals which mimic the straightforward set-up and operation of a BGAN. With Paradigm’s new flat panel Swarm45 terminal, users can benefit from transporting a small, lightweight terminal which can be set up and pointed in under five minutes with minimal training, and still provide high-speed and high-quality communication,” he says.

This high speed, however, is also a prime candidate for interference. Ben Soussia explains that HTS satellites use a lot more Ka-band today. They also use multiple beam coverage, which can focus on a narrow beam to give higher speeds. However, even though frequency reuse on multiple spot beams is a way of increasing efficiency, it is also a source of interference generation.



Warren Ackerley, Business Development Director, Paradigm.

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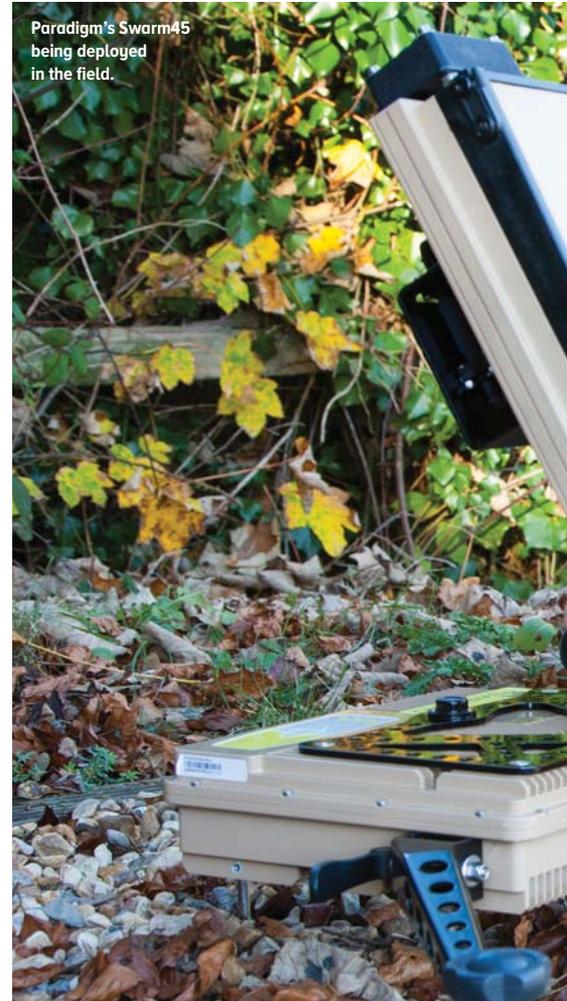
WARREN ACKERLEY, Business Development Director, Paradigm

According to him, more accurate pointing of antennas is needed to mitigate the issue.

For Sanchez, Integrasys’ Satmotion Pocket is one solution.

“Major manufacturers sell it integrated in their own product portfolio, being the standard for interference nulling in VSAT networks. Some examples are Comtech, Hughes and iDirect, who provide this to their customers in the latest platforms, fully integrated. At the hub, the operators use Alusat for maintenance purposes, which complements Satmotion Pocket very nicely, adding a great feature for optimising the link and minimising interferences without having to revisit the site,” says Sanchez.

The improved modulation techniques now used in VSAT allow the frequency spectrum to be used much more efficiently.



This development, combined with more advanced error correction coding using less bandwidth, has resulted in being able to achieve much higher data rates.

Ackerley says: “Challenges caused by weather when operating on the Ka-band spectrum can also be mitigated with advances in adaptive modulation and coding techniques. These can change the modulation and FEC of an RF carrier on the fly and thus react to changing weather conditions. Should rain fade affect the condition of the link, the system will automatically change the parameters to avoid loss of signal. This has greatly improved the Ka-band signal reliability in the face of deteriorating weather conditions.

“Wet performance is also greatly



increased when using a flat panel antenna compared to a parabolic, as the signal passes through the antenna only once, reducing rain attenuation. Additionally, the flat panel design sheds water easily and avoids water pooling.”

The industry is also starting to collectively use carrier ID to combat interference from unauthorised users, unintentional or not. This is a system whereby all broadcast transmission terminals will be identified by their carrier ID, allowing any interfering terminals to be quickly located. Once identified and located, the impact from the interference can be quickly and easily fixed.

#### **Oilfields and maritime**

Oil installations, whether on land or at sea, are often beset by the cost of installing



**Nabil Ben Soussia, MD,**  
IEC Telecom  
Middle East and Kazakhstan.

terrestrial communication options. VSAT is the ideal alternative technology for the transmission and receipt of data.

According to Ben Soussia, oilfields are places where the density of people is very small. For a terrestrial operator, they don't justify the amount of cable that has to be rolled out to serve this small group of people for a short period of time.

“Terrestrial operators know that if the plan is for ten years or more it makes sense to do it, but not otherwise. This is why VSAT will remain one of the main communication tools. For VSAT, any place on the Earth is equal, and this is not the case for terrestrial links, which factor in how far away from the city a particular location is, how many people have to be served, and the investment involved,” says Ben Soussia.

Ackerley thinks that, within these sectors, the likely installation type is fixed terminal for land and offshore rigs, but only if the installation platform is fixed. For marine platforms, stabilised maritime terminals are often installed. The large quantity of high-quality geophysical survey data and video from exploration and installation equipment requires a high-quality, very reliable means of transmission, for which VSAT is the ideal communication technology.

“For maritime, the requirements can often expand into the transmission of media, as required by the cruise

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ship industry, or the live broadcast of video data from security vessels. Maintenance and trouble-shooting of remote VSATs can also be managed using Paradigm's MiCREW system.

MiCREW provides global out-of-band management of the primary satcom link. Faults can then either be fixed remotely, or if a site visit is needed then the engineer knows just what to take.

"The mobility and flexibility of a terminal such as Paradigm's Hornet100T successfully meets the needs of the exploration and oil industry. With readily available Pico cell technology, it offers a simple global communication solution for remote and isolated areas by providing an 'office-in-a-box' – all office communications can be encased in a rugged backpack or case. The Pico cell system can then be utilised to provide a private communication network anywhere in the world with no infrastructure required. VoIP, GSM, satellite and data networks can then be deployed, and all calls are routed locally so no roaming charges apply. This results in substantial cost savings," adds Ackerley.

So what are the challenges, and how can they be overcome?

Ben Soussia thinks the biggest challenge is the proliferation of terrestrial networks.

"When we have customers that grow much larger, they can be attracted by GSM operators. VSAT operators know that their cost is much higher than terrestrial operators, so this will always be a factor. There might be a reduction in costs for manufacturing, launching and operating a satellite, but it will always be more expensive. VSAT operators try to make themselves compatible with terrestrial infrastructure. In case GSM arrives to a certain location, VSAT can be used as a value-added service to terrestrial networks. VSAT can also act as a back-up and alternative route. It is a matter of flexibility."

A clear challenge to VSAT operators is the constant requirement to address the cost of equipment, along with the required research and expenditure into the next generation of equipment and technology, thinks Ackerley.



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Creating the ideal terminal to the exact geographical and installation requirements of a project can often increase the cost and technical expertise requirements. In an effort to overcome this, VSAT operators often focus on specific areas such as low-end budget installations or the maritime sector.

"In addition, VSAT communication is all too often viewed as complicated and cumbersome. Originally, terminals were heavy with auto-acquire motors and large components; set-up was lengthy and the pointing process complicated. The advances in technology for simplifying terminal set-up and developing methods for easy, accurate pointing are hugely beneficial to the VSAT market and the way it is perceived.

"For instance, the Paradigm Interface Module (PIM) is a compact and ruggedised terminal controller which provides simple, accurate pointing procedures, intuitive web interfaces and completely integrated VSAT, resulting in VSAT communication which is straightforward and simple to use," concludes Ackerley. **PRO**



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