



KEY HIGHLIGHTS

Industry

Telecommunications & Media

The Challenge

Need for durable, high performance 3G Modems facilitating satellite telecommunications in extreme environments.

The Solution

Implement Teledyne Paradise Datacom Quantum Satellite Modems.

The Results

- Reduction of satellite bandwidth requirements by over 50%
- Flexible and reliable modem platform adaptable to current and future requirements
- Robust coding and modulation standard for satellite transmission
- Intuitive diagnostic toolset
- Innovative and effective customization of specifications
- Superior technical support and responsiveness to customer needs



Satellite Cell on Wheels (SatCOW) showing 3G Mobile Base Station with Teledyne Paradise Datacom satellite modems

Telstra Leverages Advanced Satcom Modems to Cut OpEx and Free-Up Spectrum

Overcoming extreme environmental challenges to deliver reliable satcom communications

Customer Profile

Telstra, Australia's leading telecommunications and information services company, takes pride in helping their customers improve the ways in which they live and work by ensuring reliable connectivity via cutting edge technology. Its global operations provide a broad spectrum of services that include managed networks, as well as terrestrial and satellite-based data and voice services, to Asia, Europe and the Americas.

Active in China since 1989, Telstra provides managed network and international connectivity solutions and holds a leading position in China's online advertising market. Possessing one of the most technologically advanced IP backbone networks in the world, Telstra provides access to over 1,400 points of presence in 230 countries and territories across the globe.

Being the market leader brings certain responsibilities, such as those contained with Australia's Universal Service Obligation (USO). Telstra is the designated provider for USO, which is designed to ensure that everyone in Australia, regardless of where they reside geographically, has reasonable access to standard telephony services. Under the USO Obligation, Telstra is required by law to implement the infrastructure needed to serve the areas of Australia that currently lack telephony access.

With a national population of over 23 million, many of Australia's citizens are concentrated in cities along the east and west coasts. However, many are also scattered across the outback and elsewhere, far from the current reaches of terrestrial distribution.

THE CHALLENGE

Providing reliable, universal access services no matter the geographic location can be a pretty tall order for any telecommunications company. With Australia's extremely diverse geography that ranges from snow-capped mountains to deserts and tropical forests – Telstra often has to go to places where fiber optics and copper typically don't.

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In areas where terrestrial infrastructure is unreliable or doesn't exist at all, satellites are often used as an alternative means to supply communications services. Telstra's Satellite Division plays a number of critical roles here - from the provision of telephony access to mining and gas exploration operations, to wireless trunking and backhaul-links for the offshore islands, and also to emergency service crews during weather emergencies and other extreme situations.

Working in remote campsites, mining and gas exploration personnel are often exposed to isolated conditions for lengthy periods of time where no terrestrial infrastructure exists for voice or data access. In these cases, mobile systems must be dispatched to facilitate the services that will allow them to communicate with their colleagues and families. Likewise, when the country experiences massive fires and flooding, Telstra needs a reliable and quickly deployable method for providing telecommunication services to the emergency crews on the front lines.

THE SOLUTION

So the idea was born to create a knock-down, mobile network station that could be deployed to remote areas at the drop of a hat. A terminal that would allow Telstra to quickly establish communication services in a manner that was both cost-effective and reliable. Telstra's Satellite Division also needed a means other than over-land transport to get the station to site, since fires and flooding can render roads inaccessible. Therefore, the station had to be light and compact enough to transport via aircraft. The result was the creation of a new transportable base station that was aptly named the 'Satellite Cell on Wheels' or – SatCOW.

Though a number of components are necessary to construct a mobile satellite terminal, operational efficiency and service quality are largely dependent on the satellite modem. The modem is also critical to controlling costs. The largest recurring cost of operating a satellite link is directly related to the amount of satellite spectrum that is needed to facilitate the services being provided, and the chosen modem effectively determines the level of efficiency that can be achieved. So part of the Telstra team's challenge was to find a modem that, in addition to being sufficiently reliable to withstand field conditions, would make the most efficient use of the satellite. In summary, Telstra needed a satellite modem that could meet a number challenges, one that could:

- reduce the amount of satellite bandwidth needed, resulting in the lowest cost of operation.
- be seamlessly integrated into Telstra's global network.
- accommodate the long list of services that Telstra provides.
- be remotely accessed while deployed in distant and harsh environments.
- perform efficiently and reliably in extreme weather conditions such as desert heat.
- support a broad cache of network and link diagnostics tools that allows Telstra to monitor and maintain the highest quality of service.

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— Tavechai Mektavepong
Managing Director
Paradise Datacom's Southeast Asia facility

Satellite Communications in Extreme Environments

With all of the SatCOW system elements having been identified except for the satellite modem, the Telstra team set out to find the product that would best support their requirements. Through US-based ViaSat, a provider of satellite and other digital communications products, Telstra was introduced to the Teledyne Paradise Datacom line of satellite modems. Paradise Datacom, a subsidiary of US-based Teledyne Technologies, has decades of experience providing satellite products and technologies to the communications industry.

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A flagship product line of the Paradise Datacom portfolio includes a suite of highly-sophisticated modems that contain a long list of cutting edge features that could meet the various challenges Telstra was seeking to overcome.

Colin Mackay, the Paradise VP of Engineering, states “As soon as we learned of Telstra’s requirements, we recommended our Quantum-Series modem as the product best suited to their application. The Quantum is packed with high-end features that include Viasat’s patented ‘Paired Carrier’ and DVB-S2 technology for unprecedented spectral efficiency, as well as a long list of network management tools and every imaginable interface to ensure compatibility with their system.”

Added Tavechai Mektavepong, Managing Director of Paradise Datacom’s Southeast Asia facility, “Since Telstra prides themselves

on their ability to quickly adapt to their customers’ changing needs, it is imperative that the elements of their network are sufficiently versatile to allow configuration changes on the fly. The fact that Paradise modems are software-defined ensures that new features and performance enhancements can be incorporated as soon as they become available.”

Though most of Telstra’s requirements could be met with the Quantum modem straight from the box, the engineers at Paradise were happy to perform some modifications to make the product an even better match. For example, concerns were expressed about the extreme heat the modems could be exposed to in the Australian desert. Additionally, any modem for the SatCOW project needed to be able to prioritize voice over data transmissions. In response to these and other needs that were identified on the fly, the Paradise engineering team made adjustments related to transmission delay, prioritization of voice packets over data packets and ruggedization for extreme environments were quickly identified and implemented.

The staff of the Telstra Satellite Division indicated a high level of satisfaction with the responsiveness of Paradise engineers to their feedback, and Paradise itself realized that the Telstra feedback was also helping them to discover innovative new ways to produce an even better modem moving forward.

In the end, the choice was clear for Telstra. The Teledyne Paradise Datacom modem technology, reliability and flexibility, coupled with dedicated, knowledgeable Teledyne support was “the perfect solution”.

DELIVERING RESULTS WHEN DISASTER STRIKES

Shortly after the SatCOW terminal came to fruition, a large fire in the seaside town of Warrnambool, Victoria torched over 50,000 telephone lines and caused the interruption of approximately 13,000 dedicated services, including much of their mobile phone infrastructure.

In response, Telstra mobilized seven SatCOW terminals and, within hours, was able to restore critical communications – allowing the timely coordination of emergency services and restoration efforts to the ravaged area. This is just one example of how Telstra’s SatCOW Program, powered by the Paradise Quantum modems, helped save lives and unite families by enabling communications when no other options were available.

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CONCLUSION

Today, Telstra's Satellite Division has deployed dozens of Paradise modems in their network. By utilizing Quantum technology, Telstra has increased the efficiency of their satellite links, reducing bandwidth requirements by over 50% and in turn reducing their total cost of operation. In addition, the modems' powerful, on-board diagnostics and monitoring tools help Telstra maintain the highest quality of service for the users of their network. The Telstra team was particularly pleased with the statistical graphs generated within the modem that have helped ensure that Telstra is applying the right resources at the right place and at the right time.

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An important additional benefit to the cost savings Telstra has recognized is the ability to pursue new revenue streams. Thanks to 'Quantum efficiency', more satellite-spectrum has been made available for the facilitation of additional services, giving Telstra access to new revenue streams.

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Given the performance of the modems deployed, Telstra has recommended the modems to others both internally and externally. In particular, Telstra indicated that a number of companies they service in mining and gas exploration could benefit from the Teledyne Paradise modems. Additionally, the Satellite Division recommended Paradise modems to their larger group, Telstra Global, who handles telephony and data circuits from Hong Kong.



Teledyne Paradise Datacom satellite Quantum modem