EM Solutions is respected globally for its premium maritime and land on-the-move satcom terminals, acknowledged as a technology leader in high speed communications from moving platforms.

The history of telecommunications has evolved with the company...

Public telecommunications in past decades was circuit-switched, organized hierarchically into groups and supergroups, analog in nature, and networked as either broadcast or point to point circuits.

The emergence of digital technology in the 1970s and 1980s was a seminal change for the telecommunications industry, since that technology allowed for massive improvement in spectral efficiency and witnessed the emergence of techniques, such as forward error correction (FEC), digital filtering and equalization that improved communications quality over poor lines.

The dominance of IP and then the emergence of the internet in the late 1990s was equally important, since packet switching has simplified multiplexing, improved accessibility, and expanded network architectures, while the connectivity of the Internet has provided the broadband applications that have massively driven the growth of global telecommunications carriers. Then came the social media revolution in the 2010s; are we really better for that?

However, the physics of satellite communications (SATCOM) has always kept it apart. Long hops and limited power budgets place much lower bounds on signal to noise ratio and satellite practitioners look enviously at recent advances in terrestrial cellular networks, where MIMO antenna systems, high order modulation schemes, and low-cost terminals are meeting the ever growing demands for high speed data — where service is available. However, satellite still remains the only communications technology that is available any place, any time.

Recognizing early on that Ka-band solutions would be required to meet the growing data needs of the defence community, EM Solutions started to migrate many of its products to Ka-band in the mid-2000s and build them into more advanced systems.

Since 1998, the company had been developing bespoke and customized solutions for customers, which initially were the Australian Defence Force and local telcos. From its roots as a developer of solid-state power amplifiers, filters,
and oscillators it progressed up the value chain to develop high speed receivers and transmitters for radios, and now on-the-move terminals, to become the partner of choice for several European systems integrators and increasingly, defence forces around the world.

For example, the company’s 80W Ka-band linearized BUC still remains the only airborne qualified solid-state BUC at this power rating on the market, and was first developed specifically for a customer in Europe.

EM Solutions has a long heritage of providing communications solutions to the military. In 2008, the company won an initial sponsorship from the Australian Army to develop a land-mobile Ka-band terminal. EM Solutions were fortunate to be able to test multiple prototypes over the Optus C1 satellite and to perfect the company’s “monopulse” pointing technology before progressing to WGS certification.

The development of this unique pointing technology has taken the company on other fruitful journeys; for instance, EM Solutions designed and manufacture the E-band (80 GHz) radios operating at 10 Gbps that now link the New York financial markets, but also have application for high data rate ship-to-ship communications, offering ten times the speed of existing products.

How can a small Australian company be unique and relevant? By providing multi-band solutions, by being willing to customize SATCOM systems, and by developing superior technology, such as terminal stabilization.

In 2017, EM Solutions completed the installation of the firm’s dual Ka-band Cobra terminals onto the Australian Border Force Cape Class fleet. The company’s partnerships with Inmarsat and Intellian proved productive, enabling it to certify the terminals on the Inmarsat GX network as a fall back to operation on the WGS system.

EM Solutions then completed installation of its leading-edge tri-band Cobra terminal — which simultaneously operates in both X- and Ka-bands — for the Royal Australian Navy, and followed this with repeat orders for other naval vessels.

Meanwhile, the company’s land-mobile terminal, the Taipan, has continued to roll out for a major European army (in X-band) as it will shortly for an army in Asia (in Ku-band). By aspiring to the level of “assured” communications, EM Solutions continues to cement its position as a company known for products unmatched in reliability and robustness.

The company’s research with the University of Queensland also continued, testing innovative research on a novel reconfigurable Flat Panel Antenna — that aligns with the company’s terminal strategy to offer both broadband and monopulse steered on-the-move operation. EM Solutions hope to report on success with its prototype early next year.

EM Solutions made a number of changes on the inside to accommodate the advancements happening externally. The company grew its talent base by 20 percent, adding diversity to its pool of human capital and strengthening its existing innovative capacity.

What else did EM Solutions do with its human capital? Well, they say there is nothing more Australian than spending time in somebody else’s country — so this year, EM Solutions did that, as well.

EM Solutions sent staff to the U.S., Canada, the UK, UAE, China, Korea and Japan, and secured more than $6 million in orders from four continents.

EM Solutions sent its local people to source suppliers, support terminal installations, participate in learning opportunities, attend conferences, and to meet the people with an appetite for change — the company’s customers.

Those who stayed in Australia ensured that the innovation engine continued to hum. EM Solutions was named a Finalist in the 2017 Premier of Queensland’s Export Awards in the categories of Innovation, Defence, and Manufacturing, as well as in the 2017 Brisbane Lord Mayor’s Business Awards for Doing Business in Asia.

EM Solutions especially appreciates these local acknowledgements because such confirms the company is respected at home as well as by customers abroad.

Bringing the Australian Army’s former Special Operations Commander, Major General Jeff Sengelman, to the company’s Board was another important strategic step for EM Solutions. For a company heavily involved in the Defence industry, Jeff’s experience is priceless and EM Solutions expect his insights to greatly improve the level of care and diligence EM Solutions owes to its Defence customers.

Two of the company’s biggest advantages have been flexibility and innovation and these haven’t waned. Innovation occurs by building on the shoulders of giants that have gone before — the real giants in the innovation puzzle are those customers who embrace innovation and are prepared to fund its development. Such customers push the technology envelope and drive innovation by demanding specialized requirements, new features, and performance improvements.

As 2017 draws to a close, EM Solutions salutes its customers who are the real heroes.

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